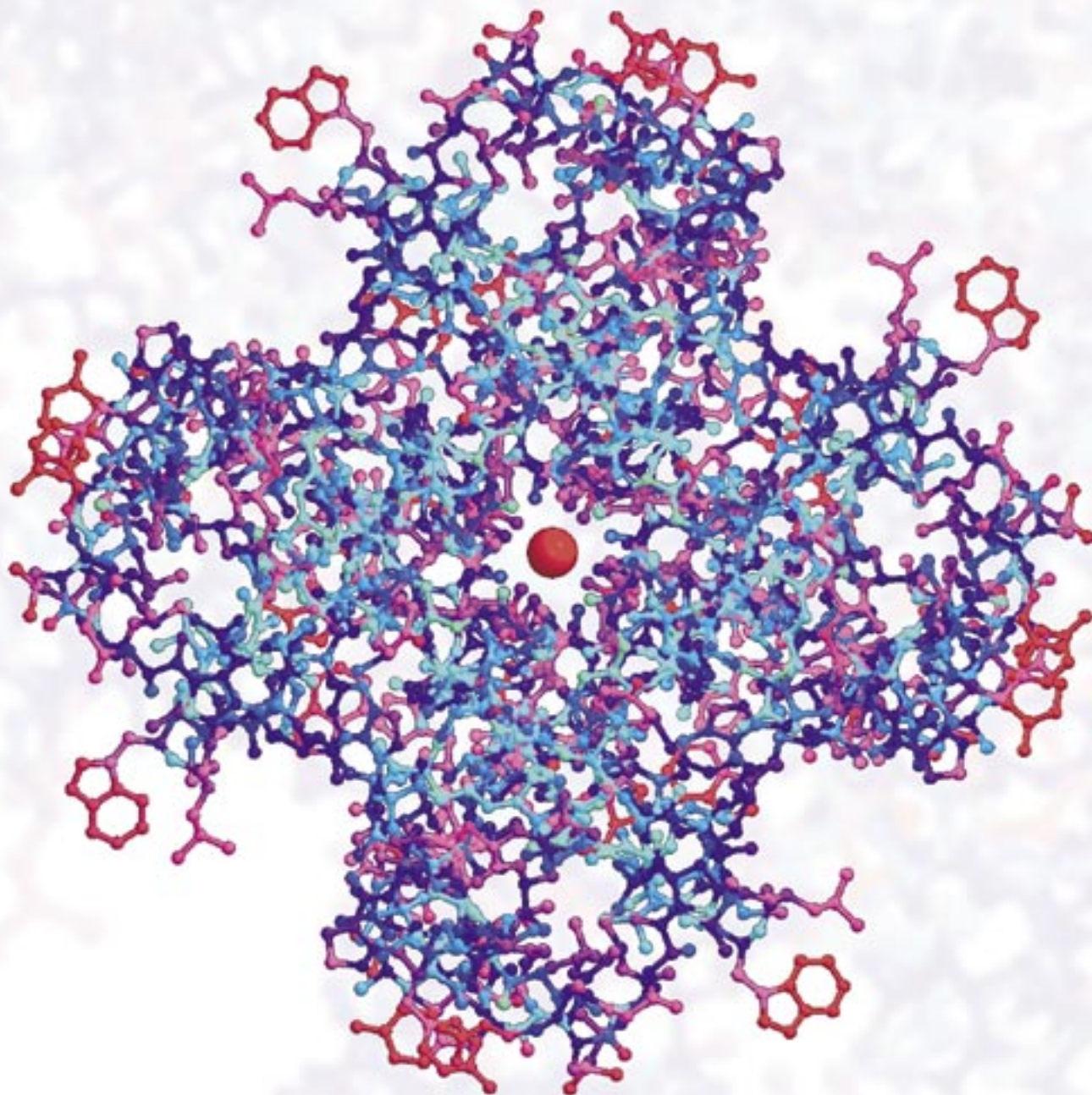


# Science and Engineering Indicators 2004

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Appendix Tables



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## Cover Image

Model of the potassium channel in the bacterium *Streptomyces lividans*.

Roderick MacKinnon's discovery of the details of this structure and his explanation for how membranes pass electrical charge through cell walls led to his 2003 Nobel Prize in Chemistry. The potassium ion is shown in red at the center of the channel in the symmetrical structure. The surrounding four identical subunits of the protein are conserved in all known potassium ion channels. MacKinnon's work was supported by the National Institutes of Health at the Cornell High Energy Synchrotron Source (CHESS), a facility developed around an accelerator funded by the National Science Foundation originally built for studies of high-energy physics. (Cover image reprinted with permission from *Science* volume 280, number 5360, issue of 3 April 1998, copyright 1998 AAAS.)

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Appendix table 1-1  
**Differences between male and female student average scale scores in mathematics and science, by age:  
 Selected years, 1969–99**

Field and year	Male minus female		
	Age 9	Age 13	Age 17
<b>Mathematics</b>			
1973 .....	-3*	-2*	8*
1978 .....	-3*	-1	7
1982 .....	-4*	1	6
1986 .....	0	2	5
1990 .....	-1	2	3
1992 .....	2	2	4
1994 .....	2	3	4
1996 .....	4	4	5
1999 .....	2	3	3
<b>Science</b>			
1969 .....	NA	NA	17*
1970 .....	5	4	NA
1973 .....	4	5	16*
1977 .....	4	7	15
1982 .....	0	11*	17*
1986 .....	6	9	13
1990 .....	3	7	10
1992 .....	8*	4	10
1994 .....	2	5	11
1996 .....	3	9	8
1999 .....	3	6	10

NA not available

\*Significantly different from 1999. Small differences between male and female scores are often not statistically significant. For example, the male/female differences were not statistically significant in 1999 for all three ages in mathematics and for 9-year-olds in science.

NOTES: Student performance on the long-term trend assessment is reported on a 0- to 500-point scale. Numbers represent the difference between male and female scores.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *NAEP 1999 Trends in Academic Progress: Three Decades of Student Performance*, NCES 2000-469 (Washington, DC: U.S. Department of Education, 2000).

Appendix table 1-2  
**Differences between white and black student and white and Hispanic student average scale scores in mathematics and science, by age: Selected years, 1969–99**

Field and year	White minus black			White minus Hispanic		
	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
<b>Mathematics</b>						
1973 .....	35*	46*	40*	23	35*	33*
1978 .....	32	42*	38*	21	34*	30
1982 .....	29	34	32	20*	22	27
1986 .....	25	24*	29	21	19	24
1990 .....	27	27	21*	21	22	26
1992 .....	27	29	26	23	20	20
1994 .....	25	29	27	27	25	22
1996 .....	25	29	27	22	25	21
1999 .....	28	32	31	26	24	22
<b>Science</b>						
1969 .....	NA	NA	54	NA	NA	NA
1970 .....	57*	49*	NA	NA	NA	NA
1973 .....	55*	53*	54	NA	NA	NA
1977 .....	55*	48*	57	38	43	35
1982 .....	42	40	58	40	32	44*
1986 .....	36	38	45	32	33	38
1990 .....	41	38	48	31	32	39
1992 .....	39	43	48	34	30*	34
1994 .....	39	43	49	39	34	45
1996 .....	37	40	47	32	34	38
1999 .....	41	39	52	34	39	30

NA not available

\*Significantly different from 1999.

NOTES: Student performance on the long-term trend assessment is reported on a 0- to 500-point scale. Numbers represent the differences between whites and blacks and whites and Hispanics.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *NAEP 1999 Trends in Academic Progress: Three Decades of Student Performance*, NCES 2000-469 (Washington, DC: U.S. Department of Education, 2000).

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Appendix table 1-3

**Average scale scores in mathematics and science, by parental education level: Selected years, 1978–99**

Variable	1978	1982	1986	1990	1992	1994	1996	1999
<b>Mathematics</b>								
13-year-olds								
Less than high school graduate .....	245	251	252	253	256	255	254	256
High school graduate.....	263	263	263	263	263	266	267	264
Some education after high school.....	273	275	274	277	278	277	277	279
College graduate .....	284	282	280	280	283	285	283	286
I don't know .....	240	252	247	248	253	252	259	258
17-year-olds								
Less than high school graduate .....	280	279	279	285	285	284	281	289
High school graduate.....	294	293	293	294	298	295	297	299
Some education after high school.....	305	304	305	308	308	305	307	308
College graduate .....	317	312	314	316	316	318	317	317
I don't know .....	276	272	281	277	290	283	287	285
<b>Science</b>								
13-year-olds								
Less than high school graduate .....	223	225	229	233	234	234	230	229
High school graduate.....	245	243	245	247	246	247	248	243
Some education after high school.....	260	259	258	263	266	260	261	261
College graduate .....	266	263	264	267	269	269	266	268
I don't know .....	222	229	227	224	232	230	236	232
17-year-olds								
Less than high school graduate .....	265	259	258	261	262	256	259	264
High school graduate.....	284	275	277	276	280	279	282	281
Some education after high school.....	296	290	295	296	296	295	297	297
College graduate .....	309	300	304	306	308	311	308	307
I don't know .....	253	252	245	248	258	247	258	265

NOTES: Scale scores can range from 0 to 500. The highest education level achieved by either parent is represented.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *NAEP 1999 Trends in Academic Progress: Three Decades of Student Performance*, NCES 2000-469 (Washington, DC: U.S. Department of Education, 2000).

Appendix table 1-4  
**Students at or above basic and proficient levels in mathematics and science, grades 4, 8, and 12, by sex:**  
**1996 and 2000**  
 (Percent)

Variable	1996			2000		
	Grade 4	Grade 8	Grade 12	Grade 4	Grade 8	Grade 12
<b>Mathematics</b>						
At or above basic						
Male.....	65*	62*	70*	70	67	66
Female.....	63*	63	69*	68	65	64
At or above proficient						
Male.....	24*	25*	18	28	29	20
Female.....	19*	23	14	24	25	14
<b>Science</b>						
At or above basic						
Male.....	68	62	60*	69	64	54
Female.....	67	61	55	64	57	51
At or above proficient						
Male.....	31	31*	25	33	36	21
Female.....	27	27	17	26	27	16

\*Significantly different from 2000.

SOURCES: U.S. Department of Education, National Center for Education Statistics (NCES), *The Nation's Report Card: Mathematics 2000*, NCES 2001-517 (Washington, DC: U.S. Department of Education, 2001); and NCES, *The Nation's Report Card: Science 2000*, NCES 2003-453 (Washington, DC: U.S. Department of Education, 2003).

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Appendix table 1-5  
**Students at or above basic and proficient levels in mathematics and science, grades 4, 8, and 12, by race/ethnicity: 1996 and 2000**  
 (Percent)

Race/ethnicity	1996			2000		
	Grade 4	Grade 8	Grade 12	Grade 4	Grade 8	Grade 12
<b>Mathematics</b>						
At or above basic						
White .....	76	74	79	80	77	74
Asian/Pacific Islander .....	73	NA	81	NA	76	80
Black.....	32	28	38	39	32	31
Hispanic .....	41	39	50	48	41	44
American Indian/Alaskan Native.....	52	51	34	53	42	57
At or above proficient						
White .....	28*	31	20	34	35	2
Asian/Pacific Islander .....	26	NA	33	NA	41	34
Black.....	5	4	4	5	6	3
Hispanic .....	8	9	6	10	10	4
American Indian/Alaskan Native ....	8	13	3	14	9	10
<b>Science</b>						
At or above basic						
White .....	79	73	68*	79	74	62
Asian/Pacific Islander .....	66	62	56	NA	64	59
Black.....	34	24	23	34	26	22
Hispanic .....	42	36	33	42	35	30
American Indian/Alaskan Native ....	59	60	52	57	39	44
At or above proficient						
White .....	37	37	27	38	41	23
Asian/Pacific Islander .....	29	30	22	NA	37	26
Black.....	7	5	4	7	7	3
Hispanic .....	9	11	7	11	12	7
American Indian/Alaskan Native ....	26	24	10	19	14	9

NA not available

\*Significantly different from 2000.

NOTE: Special analyses raised concerns about accuracy and precision of the national results for Asian/Pacific Islander fourth graders in mathematics and science in 2000 and eighth graders in mathematics in 1996; therefore, the National Center for Education Statistics (NCES) did not publish these results.

SOURCES: U.S. Department of Education, NCES, *The Nation's Report Card: Mathematics 2000*, NCES 2001-517 (Washington, DC: U.S. Department of Education, 2001); and NCES, *The Nation's Report Card: Science 2000*, NCES 2003-453 (Washington, DC: U.S. Department of Education, 2003).

Appendix table 1-6  
**Mathematics literacy scores of 15-year-olds, by country and percentile: 2000**

Country	Mean score	Percentile			
		5th	25th	75th	95th
Japan .....	557	402	504	617	688
South Korea .....	547	400	493	606	676
New Zealand .....	537	365	472	607	689
Finland .....	536	400	484	592	664
Australia .....	533	380	474	594	679
Canada .....	533	390	477	592	668
Switzerland.....	529	354	466	601	682
United Kingdom .....	529	374	470	592	676
Belgium .....	520	322	453	597	672
France .....	517	364	457	581	657
Austria.....	515	355	455	581	661
Denmark .....	515	366	458	575	649
Iceland .....	514	372	459	572	649
Liechtenstein.....	514	343	454	579	665
Sweden .....	510	347	450	574	656
Ireland .....	503	357	449	561	630
Norway .....	499	340	439	565	643
Czech Republic.....	498	335	433	564	655
OECD country mean.....	498	318	429	572	658
United States.....	493	327	427	562	652
Germany.....	490	311	423	563	649
Hungary.....	488	327	419	558	648
Russian Federation .....	478	305	407	552	648
Spain .....	476	323	416	540	621
Poland .....	470	296	402	542	632
Latvia .....	463	288	394	536	625
Italy .....	457	301	398	520	600
Portugal.....	454	297	392	520	596
Greece.....	447	260	375	524	617
Luxembourg .....	446	281	390	509	588
Mexico.....	387	254	329	445	527
Brazil .....	334	179	266	399	499

OECD Organisation for Economic Co-operation and Development

Average significantly above United States

Average significantly below United States

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Outcomes of Learning: Results From the 2000 Program for International Student Assessment of 15-Year-Olds in Reading, Mathematics, and Science Literacy*, NCES 2002-115 (Washington, DC: U.S. Department of Education, 2001).

Appendix table 1-7  
**Science literacy scores of 15-year-olds, by country and percentile: 2000**

Country	Mean score	Percentile			
		5th	25th	75th	95th
South Korea .....	552	411	499	610	674
Japan .....	550	391	495	612	688
Finland .....	538	391	481	598	674
United Kingdom .....	532	366	466	602	687
Canada .....	529	380	469	592	670
New Zealand .....	528	357	459	600	683
Australia .....	528	368	463	596	676
Austria .....	519	363	456	584	659
Ireland .....	513	361	450	578	661
Sweden .....	512	357	446	578	660
Czech Republic .....	511	355	449	577	663
France .....	501	329	429	575	663
Norway .....	500	338	437	569	649
OECD country mean .....	500	332	431	572	657
United States .....	500	330	430	571	658
Belgium .....	496	292	424	577	656
Hungary .....	496	328	423	570	659
Iceland .....	496	351	436	558	635
Switzerland .....	496	332	427	567	656
Spain .....	491	333	425	558	643
Germany .....	487	314	417	560	649
Poland .....	483	326	415	553	639
Denmark .....	481	310	410	554	645
Italy .....	478	315	411	547	633
Liechtenstein .....	476	314	409	543	629
Greece .....	461	300	393	530	616
Latvia .....	460	299	393	528	620
Russian Federation .....	460	299	392	529	625
Portugal .....	459	317	397	521	604
Luxembourg .....	443	278	382	510	593
Mexico .....	422	303	368	472	554
Brazil .....	375	230	315	432	531

OECD Organisation for Economic Co-operation and Development

Average significantly above United States

Average significantly below United States

SOURCE: OECD, Program for International Student Assessment (PISA) database, 2001. See chapter A, table A6.2, [www.oecd.org/els/education/eag2002](http://www.oecd.org/els/education/eag2002) and [www.pisa.oecd.org](http://www.pisa.oecd.org).

Appendix table 1-8  
**High school graduates who attended schools offering advanced mathematics courses (1990, 1994, and 1998),  
 by school characteristics in 1998**  
 (Percent)

Year and characteristic	Any trigonometry/ algebra III	Any precalculus/ analysis	Any statistics/ probability	Calculus	
				Any	AP/IB
1990 .....	83.4	73.5	24.1	79.2	NA
1994 .....	78.3	76.9	34.8	84.9	NA
1998 .....	70.6	80.7	35.5	85.9	64.2
School urbanicity					
Urban .....	66.7	92.2	40.3	90.4	78.1
Suburban .....	70.3	89.4	40.5	85.7	69.0
Rural .....	75.0	58.6	24.6	81.6	44.2
School size <sup>a</sup>					
Small.....	59.0	65.0	24.7	66.9	30.0
Medium.....	77.0	80.9	35.6	90.4	70.2
Large .....	64.5	94.8	45.1	91.5	79.5
School poverty <sup>b</sup>					
Very low .....	74.9	91.8	46.2	87.1	71.6
Low.....	69.2	78.9	41.6	89.6	67.7
Medium.....	74.2	74.7	20.4	82.6	53.3
High .....	74.5	62.1	8.5	75.7	64.0

AP Advanced Placement

IB International Baccalaureate

NA not available

<sup>a</sup>Small = fewer than 600 students enrolled, medium = 600–1,800, and large = more than 1,800.

<sup>b</sup>Measured by percentage of students eligible for free or reduced-priced lunches: very low = 5 percent or less, low = 6–25 percent, medium = 26–50 percent, and high = 51–100 percent.

NOTES: AP and IB courses were coded separately in 1998 and 2000 but not in prior years. AP/IB calculus courses are counted both in their specific column and in the “any calculus” column. Before 1998, AP and IB courses were coded with the general set of courses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Transcript Studies, various years.

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Appendix table 1-9  
**High school graduates who attended schools offering advanced science courses (1990, 1994, and 1998), by school characteristics in 1998**  
 (Percent)

Year and characteristic	Advanced biology		Chemistry		Physics		Advanced biology, chemistry, and physics
	Any	AP	Any	AP/IB	Any	AP/IB	
1990 .....	93.0	NA	99.1	NA	97.4	NA	90.2
1994 .....	96.7	NA	99.0	NA	97.0	NA	93.3
1998 .....	95.5	46.3	98.0	39.4	94.6	27.3	90.6
School urbanicity							
Urban .....	98.2	52.5	98.8	46.5	98.7	35.6	97.5
Suburban .....	97.9	59.2	98.1	51.7	96.1	35.6	93.3
Rural .....	90.0	24.2	96.9	17.1	88.7	8.9	80.5
School size <sup>a</sup>							
Small.....	85.8	13.1	93.4	7.4	88.2	7.0	79.9
Medium.....	97.2	48.1	99.4	41.5	94.8	27.5	91.4
Large .....	100.0	71.7	98.4	63.2	100.0	45.4	98.4
School poverty <sup>b</sup>							
Very low .....	95.2	58.1	99.3	61.7	98.4	45.0	94.7
Low.....	97.8	48.0	98.0	33.6	97.2	24.7	94.3
Medium.....	95.3	42.2	97.4	28.2	96.4	18.3	92.5
High .....	90.3	44.4	99.3	36.7	89.5	18.6	81.5

AP Advanced Placement  
 IB International Baccalaureate  
 NA not available

<sup>a</sup>Small = fewer than 600 students enrolled, medium = 600–1,800, and large = more than 1,800.

<sup>b</sup>Measured by the percentage of students eligible for free or reduced-priced lunches: very low = 5 percent or less, low = 6–25 percent, medium = 26–50 percent, and high = 51–100 percent.

NOTES: AP and IB courses were coded separately in 1998 and 2000 but not in prior years. AP/IB courses are counted both in their specific columns and in columns that correspond to the general course category. For example, AP chemistry is included in the “any chemistry” column in addition to being listed in its own column. Before 1998, AP and IB courses were coded with the general set of courses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Transcript Studies, various years.

Appendix table 1-10  
**High school graduates completing advanced mathematics courses (1990, 1994, and 1998), by student and school characteristics in 1998**  
 (Percent)

Year and characteristic	Any trigonometry/ algebra III	Any precalculus/ analysis	Any statistics/ probability	Calculus	
				Any	AP/IB
1990 .....	20.7	13.6	1.0	7.2	NA
1994 .....	24.0	17.4	2.1	10.2	NA
1998 .....	20.8	23.1	3.7	11.9	6.3
Male .....	19.4	23.1	3.4	12.0	6.8
Female .....	22.5	22.9	4.0	11.6	6.0
White .....	23.6	25.1	4.3	13.1	7.0
Asian/Pacific Islander .....	18.0	41.4	3.8	20.1	13.1
Black .....	15.5	14.0	2.1	7.2	3.3
Hispanic .....	10.9	15.4	1.7	7.1	3.7
School urbanicity					
Urban .....	19.0	28.5	3.6	13.2	7.7
Suburban .....	20.9	26.7	4.0	12.1	7.5
Rural .....	22.6	13.4	3.4	10.4	3.5
School size <sup>a</sup>					
Small .....	22.2	21.9	3.6	10.8	3.4
Medium .....	21.9	22.8	3.8	12.9	6.9
Large .....	16.7	25.1	3.4	10.3	7.7
School poverty <sup>b</sup>					
Very low .....	26.3	35.4	6.5	15.6	8.8
Low .....	18.1	23.6	4.3	12.0	6.7
Medium .....	22.4	14.9	1.7	9.2	3.9
High .....	23.6	9.8	0.8	6.9	4.9

AP Advanced Placement

IB International Baccalaureate

NA not available

<sup>a</sup>Small = fewer than 600 students enrolled, medium = 600–1,800, and large = more than 1,800.

<sup>b</sup>Measured by percentage of students eligible for free or reduced-priced lunches: very low = 5 percent or less, low = 6–25 percent, medium = 26–50 percent, and high = 51–100 percent.

NOTES: AP and IB courses were coded separately in 1998 and 2000 but not in prior years. AP/IB calculus courses are counted both in their specific column and in the “any calculus” column. Before 1998, AP and IB courses were coded with the general set of courses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Transcript Studies, various years.

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Appendix table 1-11  
**High school graduates completing advanced science courses (1990, 1994, and 1998), by student and school characteristics in 1998**  
 (Percent)

Year and characteristic	Advanced biology		Chemistry		Physics		Advanced biology, chemistry, and physics
	Any	AP/IB	Any	AP/IB	Any	AP/IB	
1990 .....	27.5	NA	45.0	NA	21.5	NA	7.4
1994 .....	34.8	NA	50.4	NA	24.5	NA	9.9
1998 .....	37.4	4.9	56.4	2.9	28.6	1.7	12.1
Male .....	33.8	4.0	53.3	3.3	31.0	2.3	11.8
Female .....	40.8	5.8	59.2	2.6	26.6	1.2	12.3
White .....	38.5	5.0	58.8	2.9	31.1	1.8	13.4
Asian/Pacific Islander ...	43.0	14.0	63.7	9.5	37.4	4.8	15.7
Black .....	35.8	3.4	51.1	1.2	20.3	0.8	7.6
Hispanic .....	31.2	3.1	45.5	2.9	19.4	1.3	8.2
School urbanicity							
Urban .....	43.0	5.9	62.4	3.9	30.8	2.7	14.0
Suburban .....	39.4	5.9	56.1	3.2	31.2	2.0	14.6
Rural .....	29.3	2.6	50.9	1.6	23.1	0.4	7.3
School size <sup>a</sup> .....							
Small .....	36.4	2.9	57.7	0.9	25.7	0.3	11.7
Medium .....	36.8	4.9	56.6	2.9	31.0	1.9	13.4
Large .....	40.1	6.6	55.0	4.8	24.8	2.6	9.2
School poverty <sup>b</sup>							
Very low .....	37.9	6.4	71.2	4.8	43.0	3.6	17.8
Low .....	39.4	4.6	54.2	1.9	26.9	0.9	11.7
Medium .....	34.1	3.4	52.4	2.2	23.6	1.3	10.2
High .....	37.7	5.3	50.7	2.1	17.4	1.0	7.5

AP Advanced Placement  
 IB International Baccalaureate  
 NA not available

<sup>a</sup>Small = fewer than 600 students enrolled, medium = 600–1,800, and large = more than 1,800.

<sup>b</sup>Measured by percentage of students eligible for free or reduced-priced lunches: very low = 5 percent or less, low = 6–25 percent, medium = 26–50 percent, and high = 51–100 percent.

NOTES: AP and IB courses were coded separately in 1998 and 2000 but not in prior years. AP/IB courses are counted both in their specific columns and in columns that correspond to the general course category. For example, AP chemistry is included in the “any chemistry” column in addition to being listed in its own column. Before 1998, AP and IB courses were coded with the general set of courses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Transcript Studies, various years.

Appendix table 1-12

**Public school teachers, by type of certification in main assignment field: 1999–2000**

Certification	All teachers	Mathematics and science teachers
Advanced or regular.....	87	81
Probationary.....	3	3
Provisionary or alternative.....	3	4
Temporary.....	1	1
Emergency.....	1	1
None.....	6	10

NOTE: Percents may not sum to 100 because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000.

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Appendix table 1-13

**Public high school students whose mathematics and science teachers majored or minored in various subject fields, by poverty level and minority enrollment in school: 1999–2000**

(Percent distribution)

Subject and school characteristics	Mathematics/ statistics major	Mathematics/ statistics minor	Mathematics education major	Science, computer science, or engineering major	Other major
<b>Mathematics</b>					
Students in poverty (percent)					
0–10 .....	45.1	3.7	31.3	4.0	15.9
More than 10 to 50.....	37.6	5.2	34.4	4.0	18.8
More than 50.....	43.4	5.8	23.6	10.3	17.0
Minority enrollment (percent)					
0–5 .....	42.5	3.7	35.3	2.4	16.2
More than 5 to 45.....	39.4	4.4	35.7	4.1	16.3
More than 45.....	41.6	6.6	24.5	7.3	19.9
<b>Biology/life sciences</b>					
Students in poverty (percent)					
0–10 .....	62.6	5.7	7.0	7.8	16.9
More than 10 to 50.....	61.2	7.1	8.0	11.6	12.0
More than 50.....	62.5	6.4	2.7	7.0	21.4
Minority enrollment (percent)					
0–5 .....	59.8	7.9	5.4	13.5	13.4
More than 5 to 45.....	64.2	4.6	6.0	8.4	16.7
More than 45.....	64.4	7.8	7.0	6.5	14.3
<b>Physical sciences</b>					
Students in poverty (percent)					
0–10 .....	41.8	10.7	14.4	15.5	17.6
More than 10 to 50.....	40.9	14.2	13.1	15.2	16.6
More than 50.....	30.8	15.7	26.1	6.0	21.5
Minority enrollment (percent)					
0–5 .....	41.4	11.2	14.4	19.3	13.6
More than 5 to 45.....	41.7	14.3	15.0	13.4	15.7
More than 45.....	40.7	14.3	18.2	7.4	19.4

NOTES: Students in poverty are those who are approved to receive free or reduced-priced lunches. Percents may not sum to 100 because of rounding. Physical sciences include chemistry, geology/earth sciences, physics, other natural sciences (except biology/life sciences), and engineering.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000.

Appendix table 1-14

**Public middle and high school mathematics and science teachers who entered profession between 1995–96 and 1999–2000 and participated in induction and mentoring activities in first year and those with either no or 10 weeks or more of practice teaching, by school level, poverty level, and minority enrollment in school: 1999–2000**

(Percent)

School characteristic	Mathematics teachers				Science teachers			
	Induction program	Mentor	No practice teaching	Practice teaching for 10 weeks or more	Induction program	Mentor	No practice teaching	Practice teaching for 10 weeks or more
Total .....	61.0	66.1	11.3	73.9	66.5	60.8	16.7	66.0
Middle school .....	58.8	72.8	6.9	75.8	73.9	64.3	15.5	64.3
High school .....	62.2	62.5	13.7	72.9	61.4	58.4	17.6	67.2
Students in poverty (percent)								
0–10 .....	55.9	57.9	8.4	82.5	70.0	57.1	11.0	74.9
More than 10 to 50 .....	66.1	64.4	12.7	71.5	59.8	54.6	16.9	65.0
More than 50 .....	60.9	63.9	28.6	61.3	50.8	61.9	32.8	48.2
Minority enrollment (percent)								
0–5 .....	62.5	64.3	4.0	81.4	61.7	57.0	7.2	76.6
More than 5 to 45 .....	66.3	61.0	8.8	77.1	66.8	62.1	13.5	72.9
More than 45 .....	54.8	63.2	29.2	59.5	52.8	54.2	32.3	51.2

NOTE: Students in poverty are those who are approved to receive free or reduced-price lunches.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000.

Appendix table 1-15

**Public middle and high school mathematics and science teachers who entered profession between 1995–96 and 1999–2000 and reported feeling well prepared in various aspects of teaching in first year, by participation in induction and mentoring activities: 1999–2000**

(Percent)

Subject and activity	Handle classroom management and discipline	Use variety of instructional methods	Teach subject matter	Use computers in classroom instruction	Plan lessons effectively	Assess students	Select/adapt curriculum and instructional materials
All mathematics teachers .....	50.5	65.1	90.1	41.5	77.5	69.7	53.9
Induction program							
Yes .....	50.8	67.2	89.4	45.1	78.2	70.9	55.8
No .....	50.0	61.8	91.1	35.7	76.4	67.9	51.0
Mentor							
Yes .....	53.5	68.7	89.6	41.8	79.3	72.6	57.1
No .....	44.6	58.2	91.0	40.8	74.0	64.1	47.8
All science teachers.....	50.8	66.0	82.9	48.0	69.4	68.8	58.6
Induction program							
Yes .....	51.7	70.1	83.8	51.3	74.7	72.5	63.6
No .....	49.1	58.0	81.0	41.5	59.0	61.6	48.6
Mentor							
Yes .....	56.6	73.6	84.9	51.5	75.3	74.3	64.6
No .....	42.0	54.4	79.7	42.6	60.3	60.4	49.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000.

Appendix table 1-16

**Public middle and high school mathematics and science teachers who thought various professional development programs they attended in past 12 months were useful, by time spent in such programs: 1999–2000**

(Percent)

Time in program (hours)	Indepth study of content	Content and performance standards	Methods of teaching	Uses of computers for instruction	Student assessment	Student discipline/ classroom management
<b>Mathematics teachers</b>						
1–8 .....	48.9	35.7	40.9	47.6	39.5	45.0
More than 8.....	73.3	63.5	65.1	74.7	64.8	65.9
<b>Science teachers</b>						
1–8 .....	58.6	38.9	38.7	50.6	34.8	35.0
More than 8.....	77.4	59.8	62.9	78.6	60.7	70.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000.

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Appendix table 1-17

**Public middle and high school teachers who reported that various problems in their schools were moderate or serious, by school level, poverty level, and minority enrollment in school: 1999–2000**

(Percent)

School characteristic	Student tardiness	Student absenteeism	Truancy	Disrespect for teachers	Student apathy	Lack of parental involvement	Students unprepared to learn
All middle and high schools .....	48.0	57.3	29.2	54.7	65.4	62.6	70.7
Middle school .....	32.6	42.2	10.2	54.3	58.8	58.3	68.3
High school .....	56.2	65.3	39.4	54.9	68.9	64.9	71.9
Students in poverty (percent)							
0–10 .....	51.6	54.5	31.3	50.7	61.8	48.9	58.7
More than 10 to 50 .....	55.7	67.9	39.0	56.3	71.6	70.0	76.0
More than 50 .....	67.4	78.2	55.7	61.2	74.0	81.8	84.6
Minority enrollment (percent)							
0–5 .....	44.9	54.9	22.1	49.9	66.3	59.4	67.7
More than 5 to 45 .....	53.2	62.1	36.2	52.0	66.3	58.6	67.2
More than 45 .....	71.8	80.2	60.7	64.5	75.8	80.9	84.2

NOTE: Students in poverty are those who are approved to receive free or reduced-price lunches.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000.

Appendix table 1-18

**Computer use by public high school teachers, by subject and minority enrollment in school: 1999–2000**

(Percent)

Subject and minority enrollment	Computers used in class	Purpose of computer use <sup>a</sup>					
		Practice/master skills	Solve problems	Learn course material	Work collaboratively	Produce multimedia projects	Correspond with experts
<b>Mathematics</b>							
All teachers .....	81.8	39.5	41.0	42.7	32.1	7.4	4.7
Minority students (percent)							
0–5 .....	79.8	33.4	35.6	35.8	30.4	11.7	6.2
More than 5 to 45.....	80.1	36.4	38.7	38.7	29.8	4.1	3.8
More than 45.....	86.3	47.5	47.2	51.8	36.4	8.7	5.0
<b>Science</b>							
All teachers .....	90.1	18.5	22.5	33.4	29.7	12.7	7.8
Minority students (percent)							
0–5 .....	92.4	15.1	19.7	29.5	26.4	8.2	6.3
More than 5 to 45.....	89.4	16.1	19.2	31.9	28.4	12.7	8.8
More than 45.....	88.7	27.6	32.9	41.2	36.6	18.5	7.2
<b>Other</b>							
All teachers .....	88.0	42.4	32.6	46.3	37.2	18.0	8.4
Minority students (percent)							
0–5 .....	88.9	41.3	32.1	45.8	35.9	17.8	8.2
More than 5 to 45.....	88.3	40.9	30.2	45.0	35.2	16.7	8.5
More than 45.....	86.4	46.6	38.0	49.8	42.4	20.5	8.7

<sup>a</sup>Data are for classes using computers in previous 2 weeks.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1999–2000.

Appendix table 1-19

**High school graduates enrolled in college the October after completing high school, by sex, race/ethnicity, and family income: 1973–2001**

Year	Sex		Race/ethnicity			Family income <sup>a</sup>		
	Male	Female	White	Black	Hispanic	Low	Middle	High
1973 .....	50	43	48	32	54	20	41	64
1974 .....	49	46	47	47	47	NA	NA	NA
1975 .....	53	49	51	42	58	31	46	64
1976 .....	47	50	49	44	53	39	41	63
1977 .....	52	49	51	49	51	28	44	66
1978 .....	51	49	51	46	42	31	44	64
1979 .....	50	48	50	47	45	31	43	63
1980 .....	47	52	50	43	52	33	42	65
1981 .....	55	53	55	43	52	34	49	68
1982 .....	49	52	53	36	43	33	42	71
1983 .....	52	53	55	38	54	35	45	70
1984 .....	56	54	59	40	44	34	48	74
1985 .....	59	57	60	42	51	40	51	75
1986 .....	56	52	57	37	44	34	48	71
1987 .....	58	55	59	52	34	37	50	74
1988 .....	57	61	61	44	57	43	55	73
1989 .....	58	62	61	53	55	48	55	71
1990 .....	58	62	63	47	43	47	54	77
1991 .....	58	67	65	46	57	39	58	78
1992 .....	60	64	64	48	55	41	57	79
1993 .....	59	64	63	56	62	50	57	79
1994 .....	61	63	65	51	49	41	58	78
1995 .....	63	61	64	51	54	34	56	83
1996 .....	60	70	67	56	51	49	63	78
1997 .....	64	70	68	59	66	57	61	82
1998 .....	62	69	69	62	47	46	65	77
1999 .....	61	64	66	59	42	49	60	76
2000 .....	60	66	66	55	53	50	59	77
2001 .....	60	64	64	55	52	44	57	80

NA not available.

<sup>a</sup>Low income is bottom 20 percent of all family incomes, high income is top 20 percent, and middle income is 60 percent in between.

NOTE: Data are for students ages 16–24 completing high school in a given year.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education 2003*, NCES 2003-067, Indicator 18 (Washington, DC: U.S. Department of Education, 2003).

Appendix table 2-1

## Institutions awarding S&amp;E degrees, by field, degree level, and institution type: 2000

Degree level and institution type	Institutions	S&E field					Engineering technologies <sup>a</sup>
		All S&E <sup>a</sup>	Natural/ agricultural sciences <sup>b</sup>	Mathematics/ computer sciences	Social/ behavioral sciences	Engineering	
Bachelor's.....	1,876	1,495	1,327	1,303	1,382	422	346
Research I.....	88	87	87	87	86	80	20
Research II.....	38	38	38	38	38	35	13
Doctorate-granting I.....	49	48	46	45	48	25	19
Doctorate-granting II.....	60	59	59	57	57	41	19
Master's I.....	437	433	417	418	432	136	140
Master's II.....	92	92	89	85	91	13	17
Liberal arts I.....	163	158	154	153	158	19	0
Liberal arts II.....	455	439	395	358	407	43	56
Two year.....	109	31	11	13	16	1	28
Specialized.....	351	94	23	43	40	21	26
Other.....	18	14	8	4	9	8	2
Not classified.....	16	2	0	2	0	0	6
Master's.....	1,402	806	487	450	671	273	80
Research I.....	87	87	87	85	86	81	9
Research II.....	38	38	38	38	38	34	5
Doctorate-granting I.....	50	50	46	45	48	20	8
Doctorate-granting II.....	60	59	54	49	55	35	7
Master's I.....	438	348	197	191	302	77	44
Master's II.....	92	34	8	7	21	3	2
Liberal arts I.....	66	25	11	6	17	3	0
Liberal arts II.....	210	57	6	6	50	3	2
Two year.....	3	0	0	0	0	0	0
Specialized.....	322	78	37	23	24	17	3
Other.....	33	28	3	0	28	0	0
Not classified.....	3	2	0	0	2	0	0
Doctoral.....	404	338	280	182	262	191	0
Research I.....	89	89	89	83	87	83	0
Research II.....	38	38	38	37	38	33	0
Doctorate-granting I.....	50	49	42	28	46	22	0
Doctorate-granting II.....	59	54	48	25	42	33	0
Master's I.....	76	43	20	3	24	11	0
Master's II.....	2	1	1	0	0	0	0
Liberal arts I.....	9	6	1	0	6	1	0
Specialized.....	63	44	38	3	8	5	0
Other.....	17	13	2	3	11	3	0
Not classified.....	1	1	1	0	0	0	0

<sup>a</sup>Engineering technologies data not included in S&E total.

<sup>b</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.

NOTE: For detailed fields of study, see National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Science and Engineering Degrees*, <http://www.nsf.gov/sbe/srs/nsf01325/htmstart.htm>.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey; and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.



Appendix table 2-2  
**Enrollment in higher education, by Carnegie institution type: 1967–2000**

Year	All institutions	Research		Doctorate-granting		Comprehensive		Liberal arts		Two year	Specialized	Other	Not classified
		I	II	I	II	I	II	I	II				
1967 .....	6,962,403	1,510,037	494,527	437,195	354,542	1,661,186	109,412	203,663	411,819	1,426,223	179,868	26,108	147,823
1968 .....	7,570,446	1,564,981	517,844	455,455	389,249	1,813,749	119,881	209,398	431,621	1,709,796	187,241	27,560	143,671
1969 .....	8,065,047	1,644,645	538,934	483,378	410,395	1,935,316	127,467	215,618	443,108	1,912,663	196,151	29,914	127,458
1970 .....	8,648,124	1,748,776	570,365	509,450	436,660	2,071,472	137,127	221,996	452,087	2,180,252	209,720	32,862	77,357
1971 .....	9,023,721	1,717,735	577,538	519,572	457,251	2,160,655	143,124	228,947	464,590	2,435,108	219,397	35,281	64,523
1972 .....	9,296,311	1,768,282	581,139	521,856	466,371	2,183,621	142,270	233,939	464,218	2,609,721	229,979	31,451	63,464
1973 .....	9,692,665	1,771,632	592,051	526,349	479,905	2,249,865	141,812	236,910	477,097	2,872,230	250,854	36,007	57,953
1974 .....	10,319,864	1,826,768	612,510	545,772	497,963	2,324,124	153,182	238,868	494,426	3,272,215	271,195	34,553	48,288
1975 .....	11,289,129	1,921,415	642,703	560,827	532,135	2,464,953	163,672	240,097	541,017	3,837,843	304,449	35,149	44,869
1976 .....	11,120,093	1,893,269	613,142	568,570	526,247	2,415,834	168,445	240,730	551,890	3,755,311	307,803	33,066	45,786
1977 .....	11,417,253	1,877,142	619,941	579,896	543,360	2,474,300	174,612	243,738	573,678	3,926,266	322,106	35,077	47,137
1978 .....	11,391,377	1,864,590	626,213	581,343	542,558	2,452,812	178,964	251,607	579,494	3,910,980	334,175	34,665	33,976
1979 .....	11,705,797	1,903,347	639,287	594,589	547,418	2,462,361	183,554	251,231	603,830	4,103,418	349,860	34,984	31,918
1980 .....	12,234,644	1,947,444	655,874	604,769	570,666	2,531,409	188,971	260,645	633,712	4,404,276	371,317	35,861	29,700
1981 .....	12,517,753	1,961,015	659,114	610,640	578,653	2,564,542	197,462	257,592	644,924	4,598,599	382,781	37,109	25,322
1982 .....	12,588,520	1,933,340	650,946	606,683	582,638	2,570,690	200,403	252,029	651,192	4,671,136	398,143	37,800	33,520
1983 .....	12,633,930	1,957,038	648,369	612,818	589,126	2,592,710	205,689	254,700	668,374	4,640,343	408,894	39,412	16,457
1984 .....	12,400,392	1,952,748	644,056	604,742	591,400	2,576,072	203,725	253,604	656,099	4,456,709	410,816	38,571	11,850
1985 .....	12,411,945	1,959,685	641,723	603,961	589,103	2,589,406	208,603	254,972	656,146	4,452,391	406,846	38,467	10,642
1986 .....	12,670,121	1,988,839	653,298	609,772	590,694	2,629,336	210,267	257,998	657,695	4,600,773	409,815	39,097	22,537
1987 .....	12,925,116	2,013,832	664,997	619,854	601,073	2,675,959	219,167	262,649	665,726	4,739,689	404,679	41,729	15,762
1988 .....	13,201,196	2,029,004	685,709	631,050	608,610	2,738,209	227,912	269,134	693,026	4,843,313	422,564	39,942	12,723
1989 .....	13,621,203	2,046,868	704,842	644,062	623,988	2,831,502	238,431	266,907	716,902	5,072,690	420,495	40,260	14,256
1990 .....	13,983,255	2,080,412	714,852	657,824	635,833	2,926,402	243,690	268,223	732,654	5,220,767	442,899	42,149	17,550
1991 .....	14,527,724	2,094,841	720,127	660,908	643,519	2,962,524	255,272	268,960	758,023	5,624,420	459,146	44,370	35,614
1992 .....	14,657,118	2,089,045	714,126	655,985	649,549	2,964,105	259,253	266,735	781,247	5,695,378	483,070	46,705	51,920
1993 .....	14,477,792	2,078,622	701,058	648,068	644,533	2,944,113	261,163	264,222	791,140	5,545,475	494,944	48,122	56,332
1994 .....	14,449,476	2,079,559	694,454	639,831	650,816	2,927,198	266,854	264,737	797,156	5,499,655	502,771	49,764	76,681
1995 .....	14,445,438	2,080,163	691,292	638,157	659,197	2,925,255	265,523	267,327	810,206	5,471,342	503,929	49,261	83,786
1996 .....	14,481,915	2,082,713	684,608	632,288	661,015	2,926,182	267,133	269,258	814,037	5,494,333	515,296	50,151	84,901
1997 .....	14,521,994	2,089,243	692,798	633,836	665,881	2,927,240	272,653	272,071	822,304	5,487,309	524,508	48,902	85,249
1998 .....	14,835,140	2,109,348	701,177	636,460	673,467	2,960,640	276,662	275,722	839,075	5,679,793	543,075	46,968	92,753
2000 .....	15,592,671	2,144,926	714,249	650,496	689,922	3,061,764	288,870	282,285	870,362	6,170,926	566,643	47,333	104,895

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Fall Enrollment Survey, various years; and National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

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Appendix table 2-3  
**S&E degrees awarded by degree level, institution type, and field: 2000**

Degree level and institution type	All fields	All S&E <sup>a</sup>	S&E field				
			Natural/ agricultural sciences <sup>b</sup>	Mathematics/ computer sciences	Social/ behavioral sciences	Engineering	Engineering technologies <sup>a</sup>
Bachelor's.....	1,253,121	398,622	101,775	49,123	188,188	59,536	15,238
Research I.....	297,126	132,007	34,387	10,785	57,657	29,178	1,714
Research II.....	98,995	34,907	9,097	2,732	15,548	7,530	1,069
Doctorate-granting I.....	80,768	22,656	4,930	3,041	11,246	3,439	938
Doctorate-granting II.....	84,006	29,135	6,695	3,902	12,339	6,199	827
Master's I.....	401,018	103,705	26,601	15,264	53,117	8,723	5,457
Master's II.....	39,255	9,022	2,360	1,724	4,593	345	594
Liberal arts I.....	56,514	27,810	8,789	2,187	16,358	476	0
Liberal arts II.....	130,987	29,959	7,673	6,191	15,224	871	1,626
Two year.....	7,426	660	161	301	188	10	1,060
Specialized.....	50,277	5,653	760	2,593	443	1,857	1,604
Other.....	5,369	2,880	322	175	1,475	908	33
Not classified.....	1,380	228	0	228	0	0	316
Master's.....	456,260	95,683	15,040	17,824	37,083	25,736	1,350
Research I.....	125,742	38,074	7,208	5,627	10,645	14,594	336
Research II.....	33,731	10,367	1,819	1,595	3,637	3,316	45
Doctorate-granting I.....	43,462	9,518	1,090	2,604	3,823	2,001	169
Doctorate-granting II.....	35,435	8,889	1,442	2,163	2,912	2,372	99
Master's I.....	156,214	21,925	2,702	4,560	11,815	2,848	544
Master's II.....	10,498	685	45	140	463	37	46
Liberal arts I.....	5,443	785	122	59	566	38	0
Liberal arts II.....	11,862	1,083	65	139	859	20	63
Two year.....	38	0	0	0	0	0	0
Specialized.....	30,678	2,345	511	937	387	510	48
Other.....	2,940	1,823	36	0	1,787	0	0
Not classified.....	217	189	0	0	189	0	0
Doctoral.....	44,818	25,389	10,003	1,856	8,146	5,384	16
Research I.....	27,497	16,948	7,188	1,335	4,294	4,131	6
Research II.....	4,925	2,811	1,152	222	847	590	7
Doctorate-granting I.....	4,754	1,982	462	197	1,063	260	0
Doctorate-granting II.....	2,378	1,317	463	91	463	300	0
Master's I.....	1,197	337	60	4	207	66	2
Master's II.....	17	10	1	0	9	0	0
Liberal arts I.....	222	81	12	0	69	0	0
Liberal arts II.....	93	16	0	0	16	0	0
Specialized.....	2,336	782	665	7	73	37	1
Other.....	1,291	1,003	0	0	1,003	0	0
Not classified.....	108	102	0	0	102	0	0

<sup>a</sup>Engineering technologies data not included in S&E total.

<sup>b</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.

NOTE: For detailed fields, see National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Science and Engineering Degrees*, <http://www.nsf.gov/sbe/srs/nsf01325/htmstart.htm>.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey; and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 2-4  
**U.S. population of 20–24-year-olds, by sex and race/ethnicity: Selected years, 1985–2020**

Sex	All races/ethnicities		White		Asian/Pacific Islander		Black		Hispanic		American Indian/ Alaskan Native	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>Both sexes</b>												
1985 .....	20,694,001	100.0	15,393,698	74.4	456,493	2.2	2,642,882	12.8	2,042,290	9.9	158,638	0.8
1990 .....	18,613,683	100.0	13,142,195	70.6	603,986	3.2	2,423,770	13.0	2,295,364	12.3	148,368	0.8
1995 .....	17,664,652	100.0	11,979,033	67.8	714,402	4.0	2,457,636	13.9	2,356,723	13.3	156,858	0.9
2000 .....	18,516,000	100.0	12,167,000	65.7	744,000	4.0	2,638,000	14.2	2,801,000	15.1	166,000	0.9
2005 .....	20,159,000	100.0	13,022,000	64.6	894,000	4.4	2,827,000	14.0	3,224,000	16.0	192,000	1.0
2010 .....	21,152,000	100.0	13,253,000	62.7	995,000	4.7	3,099,000	14.7	3,599,000	17.0	206,000	1.0
2015 .....	21,747,000	100.0	12,973,000	59.7	1,205,000	5.5	3,127,000	14.4	4,251,000	19.5	191,000	0.9
2020 .....	21,020,000	100.0	12,130,000	57.7	1,322,000	6.3	2,855,000	13.6	4,528,000	21.5	185,000	0.9
<b>Male</b>												
1985 .....	10,183,871	100.0	7,555,833	74.2	232,410	2.3	1,232,681	12.1	1,083,161	10.6	79,786	0.8
1990 .....	9,277,563	100.0	6,505,454	70.1	308,080	3.3	1,142,368	12.3	1,246,935	13.4	74,726	0.8
1995 .....	8,825,001	100.0	5,973,789	67.7	355,023	4.0	1,186,814	13.4	1,230,194	13.9	79,181	0.9
2000 .....	9,432,000	100.0	6,226,000	66.0	366,000	3.9	1,304,000	13.8	1,454,000	15.4	83,000	0.9
2005 .....	10,268,000	100.0	6,661,000	64.9	439,000	4.3	1,403,000	13.7	1,670,000	16.3	95,000	0.9
2010 .....	10,777,000	100.0	6,776,000	62.9	495,000	4.6	1,543,000	14.3	1,860,000	17.3	103,000	1.0
2015 .....	11,077,000	100.0	6,628,000	59.8	602,000	5.4	1,559,000	14.1	2,193,000	19.8	95,000	0.9
2020 .....	10,698,000	100.0	6,191,000	57.9	658,000	6.2	1,425,000	13.3	2,332,000	21.8	92,000	0.9
<b>Female</b>												
1985 .....	10,510,130	100.0	7,837,865	74.6	224,083	2.1	1,410,201	13.4	959,129	9.1	78,852	0.8
1990 .....	9,336,120	100.0	6,636,741	71.1	295,906	3.2	1,281,402	13.7	1,048,429	11.2	73,642	0.8
1995 .....	8,839,651	100.0	6,005,244	67.9	359,379	4.1	1,270,822	14.4	1,126,529	12.7	77,677	0.9
2000 .....	9,084,000	100.0	5,942,000	65.4	379,000	4.2	1,334,000	14.7	1,347,000	14.8	83,000	0.9
2005 .....	9,889,000	100.0	6,360,000	64.3	454,000	4.6	1,424,000	14.4	1,554,000	15.7	97,000	1.0
2010 .....	10,375,000	100.0	6,477,000	62.4	500,000	4.8	1,556,000	15.0	1,739,000	16.8	103,000	1.0
2015 .....	10,670,000	100.0	6,345,000	59.5	603,000	5.7	1,568,000	14.7	2,058,000	19.3	96,000	0.9
2020 .....	10,321,000	100.0	5,938,000	57.5	664,000	6.4	1,430,000	13.9	2,196,000	21.3	93,000	0.9

SOURCES: U.S. Bureau of the Census, Population Division, 1990 Census, <http://www.census.gov/population/estimates/nation>; and U.S. Bureau of the Census, Population Projections Program, *Projections of the Resident Population by Age, Sex, Race, and Hispanic Origin: 1999 to 2100* (Washington, DC, 2000), [http://www.census.gov/population/projections/nation/detail/d2001\\_10.pdf](http://www.census.gov/population/projections/nation/detail/d2001_10.pdf).

Science and Engineering Indicators – 2004

Appendix table 2-5

**Enrollment in major types of institutions, by citizenship and race/ethnicity: 1992–98**

Citizenship and race/ethnicity	All institutions	Research	Doctorate					Specialized	Other/not classified
			granting	Master's	Liberal arts	Two year	Number		
<b>1992</b>									
All students .....	14,657,118	2,803,171	1,305,534	3,223,358	1,047,982	5,695,378	483,070	98,625	
U.S. citizen/permanent resident .....	14,208,630	2,627,450	1,250,647	3,144,173	1,023,798	5,603,791	461,780	96,991	
White .....	10,876,214	2,144,509	1,003,566	2,408,743	795,838	4,100,032	351,524	72,002	
Asian/Pacific Islander .....	704,645	182,880	52,485	123,445	24,996	294,689	23,264	2,886	
Underrepresented minority .....	1,395,210	162,154	109,582	345,200	127,635	598,117	39,474	13,048	
Foreign citizen <sup>a</sup> .....	448,488	175,721	54,887	79,185	24,184	91,587	21,290	1,634	
<b>1994</b>									
All students .....	14,449,476	2,774,013	1,290,647	3,194,052	1,061,893	5,499,655	502,771	126,445	
U.S. citizen/permanent resident .....	13,992,549	2,595,018	1,235,962	3,112,014	1,037,486	5,406,855	480,460	124,754	
White .....	10,427,912	2,056,152	967,619	2,327,525	800,586	3,825,204	359,200	91,626	
Asian/Pacific Islander .....	783,961	214,587	58,278	133,252	27,834	318,867	27,771	3,372	
Underrepresented minority .....	1,451,217	171,224	117,035	363,934	132,356	611,033	42,056	13,579	
Foreign citizen <sup>a</sup> .....	456,927	178,995	54,685	82,038	24,407	92,800	22,311	1,691	
<b>1996</b>									
All students .....	14,481,915	2,767,321	1,293,303	3,193,315	1,083,295	5,494,333	515,296	135,052	
U.S. citizen/permanent resident .....	14,016,305	2,589,062	1,235,022	3,109,475	1,058,668	5,401,456	489,603	133,019	
White .....	10,226,732	2,013,170	940,583	2,283,751	810,598	3,731,434	355,132	92,064	
Asian/Pacific Islander .....	832,413	231,924	63,983	142,626	29,339	330,023	30,698	3,820	
Underrepresented minority .....	1,501,966	179,021	125,985	374,502	131,428	625,621	46,964	18,445	
Foreign citizen <sup>a</sup> .....	465,610	178,259	58,281	83,840	24,627	92,877	25,693	2,033	
<b>1998</b>									
All students .....	14,835,140	2,810,525	1,309,927	3,237,302	1,114,797	5,679,793	543,075	139,721	
U.S. citizen/permanent resident .....	14,394,111	2,626,753	1,249,159	3,150,614	1,089,399	5,623,274	516,999	137,913	
White .....	10,165,385	2,021,810	932,669	2,283,015	826,832	3,647,695	363,480	89,884	
Asian/Pacific Islander .....	955,830	245,812	69,567	152,626	30,621	417,469	35,268	4,467	
Underrepresented minority .....	1,624,403	186,416	134,501	390,097	141,093	696,144	55,532	20,620	
Foreign citizen <sup>a</sup> .....	441,029	183,772	60,768	86,688	25,398	56,519	26,076	1,808	
<b>Percent distribution</b>									
<b>1992</b>									
All students .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
U.S. citizen/permanent resident .....	96.9	93.7	95.8	97.5	97.7	98.4	95.6	98.3	
White .....	74.2	76.5	76.9	74.7	75.9	72.0	72.8	73.0	
Asian/Pacific Islander .....	4.8	6.5	4.0	3.8	2.4	5.2	4.8	2.9	
Underrepresented minority .....	9.5	5.8	8.4	10.7	12.2	10.5	8.2	13.2	
Foreign citizen <sup>a</sup> .....	3.1	6.3	4.2	2.5	2.3	1.6	4.4	1.7	
<b>1994</b>									
All students .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
U.S. citizen/permanent resident .....	96.8	93.5	95.8	97.4	97.7	98.3	95.6	98.7	
White .....	72.2	74.1	75.0	72.9	75.4	69.6	71.4	72.5	
Asian/Pacific Islander .....	5.4	7.7	4.5	4.2	2.6	5.8	5.5	2.7	
Underrepresented minority .....	10.0	6.2	9.1	11.4	12.5	11.1	8.4	10.7	
Foreign citizen <sup>a</sup> .....	3.2	6.5	4.2	2.6	2.3	1.7	4.4	1.3	
<b>1996</b>									
All students .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
U.S. citizen/permanent resident .....	96.8	93.6	95.5	97.4	97.7	98.3	95.0	98.5	
White .....	70.6	72.7	72.7	71.5	74.8	67.9	68.9	68.2	
Asian/Pacific Islander .....	5.7	8.4	4.9	4.5	2.7	6.0	6.0	2.8	
Underrepresented minority .....	10.4	6.5	9.7	11.7	12.1	11.4	9.1	13.7	
Foreign citizen <sup>a</sup> .....	3.2	6.4	4.5	2.6	2.3	1.7	5.0	1.5	
<b>1998</b>									
All students .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
U.S. citizen/permanent resident .....	97.0	93.5	95.4	97.3	97.7	99.0	95.2	98.7	
White .....	68.5	71.9	71.2	70.5	74.2	64.2	66.9	64.3	
Asian/Pacific Islander .....	6.4	8.7	5.3	4.7	2.7	7.4	6.5	3.2	
Underrepresented minority .....	10.9	6.6	10.3	12.1	12.7	12.3	10.2	14.8	
Foreign citizen <sup>a</sup> .....	3.0	6.5	4.6	2.7	2.3	1.0	4.8	1.3	

Appendix table 2-5

(Page 2 of 2)

**Enrollment in major types of institutions, by citizenship and race/ethnicity: 1992–98**

Citizenship and race/ethnicity	All institutions	Research	Doctorate granting	Master's	Liberal arts	Two year	Specialized	Other/not classified
<b>1992</b>								
All students .....	100.0	19.1	8.9	22.0	7.1	38.9	3.3	0.7
U.S. citizen/permanent resident .....	100.0	18.5	8.8	22.1	7.2	39.4	3.2	0.7
White .....	100.0	19.7	9.2	22.1	7.3	37.7	3.2	0.7
Asian/Pacific Islander .....	100.0	26.0	7.4	17.5	3.5	41.8	3.3	0.4
Underrepresented minority .....	100.0	11.6	7.9	24.7	9.1	42.9	2.8	0.9
Foreign citizen <sup>a</sup> .....	100.0	39.2	12.2	17.7	5.4	20.4	4.7	0.4
<b>1994</b>								
All students .....	100.0	19.2	8.9	22.1	7.3	38.1	3.5	0.9
U.S. citizen/permanent resident .....	100.0	18.5	8.8	22.2	7.4	38.6	3.4	0.9
White .....	100.0	19.7	9.3	22.3	7.7	36.7	3.4	0.9
Asian/Pacific Islander .....	100.0	27.4	7.4	17.0	3.6	40.7	3.5	0.4
Underrepresented minority .....	100.0	11.8	8.1	25.1	9.1	42.1	2.9	0.9
Foreign citizen <sup>a</sup> .....	100.0	39.2	12.0	18.0	5.3	20.3	4.9	0.4
<b>1996</b>								
All students .....	100.0	19.1	8.9	22.1	7.5	37.9	3.6	0.9
U.S. citizen/permanent resident .....	100.0	18.5	8.8	22.2	7.6	38.5	3.5	0.9
White .....	100.0	19.7	9.2	22.3	7.9	36.5	3.5	0.9
Asian/Pacific Islander .....	100.0	27.9	7.7	17.1	3.5	39.6	3.7	0.5
Underrepresented minority .....	100.0	11.9	8.4	24.9	8.8	41.7	3.1	1.2
Foreign citizen <sup>a</sup> .....	100.0	38.3	12.5	18.0	5.3	19.9	5.5	0.4
<b>1998</b>								
All students .....	100.0	18.9	8.8	21.8	7.5	38.3	3.7	0.9
U.S. citizen/permanent resident .....	100.0	18.2	8.7	21.9	7.6	39.1	3.6	1.0
White .....	100.0	19.9	9.2	22.5	8.1	35.9	3.6	0.9
Asian/Pacific Islander .....	100.0	25.7	7.3	16.0	3.2	43.7	3.7	0.5
Underrepresented minority .....	100.0	11.5	8.3	24.0	8.7	42.9	3.4	1.3
Foreign citizen <sup>a</sup> .....	100.0	41.7	13.8	19.7	5.8	12.8	5.9	0.4

<sup>a</sup>Includes temporary residents only.SOURCE: National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 2-6

## Freshmen intending S&amp;E major, by sex, race/ethnicity, and field: Selected years, 1975–2002

(Percent distribution)

(Page 1 of 4)

Sex, race/ethnicity, and field	1975	1977	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
All intending S&E major	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physical sciences <sup>a</sup>	10.2	9.5	8.2	7.2	7.2	6.0	6.2	6.3	6.6	6.4	6.1	6.1	6.3	6.5	6.6	6.9	7.3	6.4	7.2	6.1	6.0	5.6	5.3	5.2	5.3	5.9
Biological/agricultural sciences	28.5	23.3	20.0	17.6	17.0	15.1	15.8	17.3	16.6	17.3	17.4	16.9	17.0	17.9	19.9	22.1	23.9	24.9	26.3	24.7	24.3	23.3	22.8	20.5	20.9	22.2
Mathematics/statistics	4.6	3.9	2.9	2.9	2.9	2.8	3.3	3.5	3.4	3.2	3.0	2.7	2.7	2.7	2.6	2.6	2.3	2.6	2.4	2.1	2.0	2.2	2.0	2.2	2.1	2.4
Computer sciences	4.1	5.9	10.3	13.6	18.6	22.9	22.1	15.9	12.7	10.0	8.3	7.9	7.7	7.7	7.4	6.6	6.6	7.9	9.6	11.0	12.4	14.7	15.4	16.2	14.4	9.6
Social/behavioral sciences	26.5	26.0	24.6	22.4	20.5	18.8	19.6	23.6	26.7	29.3	32.4	36.4	33.9	33.2	29.6	30.3	29.5	30.1	28.7	26.9	26.2	28.0	27.3	28.7	29.4	30.4
Engineering	25.9	31.5	33.8	36.3	33.9	34.2	33.0	33.3	33.9	33.8	32.9	30.0	32.2	31.8	34.0	31.4	30.4	27.9	25.8	29.2	29.2	26.1	27.3	27.1	27.5	29.5
Male	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physical sciences <sup>a</sup>	12.0	10.3	9.3	8.0	7.9	6.8	6.7	6.9	7.3	7.4	7.0	7.1	7.2	7.4	7.1	7.5	7.5	6.8	7.2	5.9	6.3	5.7	5.4	5.2	5.2	5.9
Biological/agricultural sciences	26.1	20.1	17.6	15.6	15.1	13.3	13.9	14.8	14.1	14.5	14.8	15.2	14.8	15.6	16.6	18.7	20.4	20.7	20.7	18.4	17.5	16.9	15.5	13.9	14.1	15.0
Mathematics/statistics	3.8	3.2	2.4	2.3	2.2	2.1	2.6	2.5	2.7	2.8	2.4	2.3	2.5	2.4	2.1	2.3	2.0	2.4	2.1	1.8	1.7	1.9	1.8	2.0	1.8	2.2
Computer sciences	3.9	5.5	9.2	12.1	16.9	20.7	20.6	16.1	13.2	11.2	9.7	9.1	8.9	8.8	8.5	8.3	8.5	10.8	13.5	15.5	17.2	20.6	21.9	23.1	21.2	14.6
Social/behavioral sciences	18.8	17.5	15.7	14.1	13.0	12.2	12.4	14.9	17.1	17.4	19.7	22.2	20.4	20.5	17.7	18.6	18.5	18.8	17.6	16.1	15.3	16.4	15.5	16.6	17.1	18.1
Engineering	35.4	43.0	46.0	47.9	44.9	45.1	43.6	44.8	45.4	46.7	46.4	43.9	46.3	45.4	47.8	44.5	42.9	40.4	38.8	42.4	41.7	38.5	39.9	39.4	40.3	44.0
Female	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physical sciences <sup>a</sup>	6.7	7.3	6.7	5.8	5.9	4.9	5.3	5.3	5.5	5.2	4.9	4.8	5.4	5.1	5.7	6.2	6.9	6.0	6.9	6.2	5.8	5.3	5.4	5.3	5.3	5.7
Biological/agricultural sciences	33.5	28.8	24.2	21.3	20.1	18.2	18.7	21.7	21.1	21.4	21.1	19.4	19.8	21.0	24.2	26.8	28.2	30.2	33.1	32.6	33.0	31.2	32.0	28.8	29.9	31.1
Mathematics/statistics	6.2	5.0	3.9	3.8	4.2	4.0	4.4	5.2	4.5	3.9	3.8	3.2	3.2	3.4	3.1	3.0	2.8	2.8	2.6	2.5	2.5	2.4	2.3	2.4	2.5	2.6
Computer sciences	4.8	6.6	12.1	16.2	21.5	26.8	24.7	15.7	11.6	8.1	6.1	6.2	5.8	6.3	6.0	4.4	4.2	4.3	4.9	5.6	6.2	7.4	7.0	7.4	5.9	3.2
Social/behavioral sciences	41.2	42.4	39.6	36.5	33.3	30.0	31.5	37.3	42.1	47.6	51.0	54.6	52.6	50.5	46.2	45.5	43.5	44.0	42.1	40.7	39.7	43.0	42.3	44.6	45.2	45.8
Engineering	7.7	9.9	13.3	16.3	15.0	16.0	15.3	14.6	15.5	13.9	13.2	11.8	13.5	13.8	14.6	14.1	14.4	12.8	10.4	12.6	13.0	10.9	11.2	11.7	11.3	11.5
White	33.2	30.0	30.0	31.4	32.7	34.1	34.5	32.8	31.7	29.2	27.8	27.8	29.6	29.3	30.5	30.7	31.7	30.8	30.9	32.3	32.8	30.5	31.7	30.6	31.9	31.3
Physical sciences <sup>a</sup>	3.7	3.2	2.7	2.6	2.6	2.2	2.4	2.3	2.3	2.0	1.9	1.9	2.0	2.1	2.3	2.4	2.6	2.1	2.5	2.1	2.4	2.0	2.0	2.0	2.1	2.1
Biological/agricultural sciences	9.6	7.1	6.2	5.8	5.7	5.3	5.5	5.7	5.3	5.0	4.7	4.7	5.1	5.4	6.0	6.8	7.6	8.8	9.0	8.9	8.6	7.7	7.9	6.6	7.0	7.0
Mathematics/statistics	1.5	1.2	0.9	0.9	0.9	1.0	1.2	1.2	1.1	0.9	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.8	0.8
Computer sciences	1.3	1.7	2.9	4.0	5.8	7.6	7.0	4.7	3.4	2.6	2.1	1.9	1.9	1.8	1.8	1.8	1.8	2.1	2.5	3.0	3.5	3.8	4.1	4.3	4.0	2.8
Social/behavioral sciences	8.3	7.4	7.2	6.7	6.6	6.3	6.8	7.7	8.9	8.7	9.3	10.2	10.1	9.8	9.3	9.4	9.4	9.1	8.7	8.7	8.6	8.4	8.6	8.7	9.1	9.4
Engineering	8.8	9.4	10.1	11.4	11.1	11.7	11.6	11.2	10.7	10.0	8.9	8.3	9.6	9.3	10.3	9.5	9.4	7.9	7.5	8.9	9.0	7.9	8.5	8.3	9.0	9.2
Male	43.0	39.5	39.7	41.7	43.9	45.3	45.8	42.9	41.0	37.9	35.6	34.9	37.4	37.3	38.8	37.7	39.8	38.1	37.5	40.4	40.6	38.2	40.0	39.6	41.0	39.6
Physical sciences <sup>a</sup>	5.5	4.5	4.0	3.7	3.8	3.3	3.4	3.2	3.2	3.1	2.8	3.0	3.0	3.2	3.1	3.1	3.3	2.9	2.9	2.7	3.0	2.4	2.4	2.5	2.6	2.8
Biological/agricultural sciences	11.4	8.2	7.1	6.7	6.7	6.2	6.3	6.3	5.8	5.5	5.3	5.1	5.5	5.8	6.5	7.2	8.1	9.0	8.6	8.4	7.8	7.3	7.1	6.0	6.1	6.2
Mathematics/statistics	1.6	1.3	1.0	1.0	0.9	0.9	1.3	1.1	1.2	1.1	1.0	0.9	1.0	1.0	0.9	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.9	0.7	0.9
Computer sciences	1.5	2.1	3.5	4.8	7.2	9.2	9.1	6.5	5.1	4.0	3.3	3.0	3.1	2.9	3.0	2.9	3.2	3.8	4.6	5.6	6.4	7.1	7.7	8.2	7.7	5.5
Social/behavioral sciences	7.8	6.6	5.9	5.8	5.8	5.4	5.6	6.3	7.2	6.5	7.0	7.8	7.8	7.6	7.1	7.1	7.6	7.1	6.9	6.7	6.3	6.0	6.3	6.7	7.0	7.2
Engineering	15.2	16.8	18.2	19.7	19.5	20.3	20.1	19.5	18.5	17.7	16.2	15.1	17.0	16.8	18.2	16.4	16.7	14.4	13.7	16.2	16.4	14.7	15.8	15.3	16.9	17.0
Female	22.7	20.3	21.0	21.6	22.5	23.6	23.5	23.2	22.9	21.8	20.9	22.5	22.7	22.7	23.1	24.0	25.2	24.9	25.3	25.7	25.8	24.0	24.9	23.8	24.2	23.9
Physical sciences <sup>a</sup>	1.5	1.5	1.6	1.2	1.3	1.2	1.3	1.3	1.3	1.2	1.3	1.2	1.3	1.3	1.4	1.6	2.0	1.6	1.9	1.6	1.8	1.5	1.6	1.5	1.5	1.5
Biological/agricultural sciences	7.8	6.2	5.2	5.0	4.8	4.5	4.5	5.0	4.9	4.7	4.3	4.5	4.5	4.9	5.7	6.5	7.3	8.6	9.1	9.3	9.3	8.3	8.8	7.5	7.6	7.6
Mathematics/statistics	1.5	1.1	0.9	0.9	1.0	1.0	1.2	1.3	1.1	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7
Computer sciences	1.0	1.2	2.3	3.2	4.5	5.9	5.1	3.0	1.9	1.2	0.9	1.0	0.8	0.9	0.8	0.7	0.6	0.6	0.7	0.8	1.0	1.1	1.1	1.1	0.8	0.5
Social/behavioral sciences	9.0	8.4	8.3	8.0	7.6	7.4	7.8	9.2	10.5	10.8	11.2	12.5	12.5	11.9	11.4	11.3	11.2	10.7	10.5	10.5	10.1	10.1	10.4	10.6	11.1	11.1
Engineering	1.9	1.9	2.7	3.3	3.3	3.6	3.6	3.4	3.2	2.9	2.4	2.4	2.8	2.9	3.0	3.1	3.4	2.7	2.4	2.8	3.0	2.4	2.4	2.5	2.5	2.5

**Freshmen intending S&E major, by sex, race/ethnicity, and field: Selected years, 1975–2002**

(Percent distribution)

Sex, race/ethnicity, and field	1975	1977	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Asian American	50.5	43.1	49.9	50.2	49.4	51.8	52.6	49.6	51.3	47.4	47.5	45.1	44.0	42.8	44.6	43.9	42.8	45.1	41.5	48.0	45.9	45.1	47.5	44.5	42.5	43.2
Physical sciences <sup>a</sup>	5.4	4.9	4.3	3.6	4.2	4.3	3.9	4.2	4.2	3.4	2.9	2.8	2.3	2.6	2.5	2.7	2.5	2.5	2.1	2.1	2.0	2.1	1.6	1.5	1.7	1.9
Biological/agricultural sciences	17.1	9.7	8.4	8.5	8.6	8.9	11.0	10.7	11.6	11.3	12.1	11.6	9.8	10.1	12.2	13.3	13.4	13.9	13.2	12.6	11.8	11.8	11.2	10.2	10.1	11.9
Mathematics/statistics	2.7	1.4	1.7	0.7	1.4	1.0	1.7	1.2	1.1	1.2	0.9	0.9	0.8	0.9	0.8	0.8	0.7	0.7	0.6	0.7	0.6	0.5	0.6	0.6	0.7	0.8
Computer sciences	2.4	3.5	4.6	6.3	6.8	8.7	8.8	5.9	3.0	4.2	3.7	3.2	2.4	3.0	3.5	2.3	2.7	4.3	5.2	7.6	7.9	9.2	12.6	11.0	9.3	4.6
Social/behavioral sciences	7.3	5.6	5.7	5.6	5.2	6.1	5.6	6.1	7.5	6.7	8.2	9.7	9.4	9.4	8.4	8.5	8.8	7.5	7.1	7.0	6.8	7.1	6.7	7.4	7.3	8.1
Engineering	15.6	18.0	25.2	25.5	23.2	22.8	21.6	21.5	23.9	20.6	19.7	16.9	19.3	16.8	17.2	16.3	14.7	16.2	13.3	18.0	16.8	14.4	14.8	13.8	13.4	15.9
Male	60.1	55.6	60.4	61.9	60.7	62.1	63.6	61.0	61.0	57.8	56.0	53.7	52.7	52.7	55.3	52.1	51.1	54.1	50.3	58.0	57.5	54.7	60.0	56.3	54.3	55.0
Physical sciences <sup>a</sup>	7.6	6.3	5.8	4.9	5.4	5.3	4.9	5.2	5.5	4.1	3.2	3.6	3.0	3.4	3.2	3.4	2.8	3.1	2.8	2.0	2.2	2.2	2.0	1.7	1.8	2.2
Biological/agricultural sciences	17.4	10.0	8.5	9.0	7.9	9.1	12.1	10.9	10.2	10.7	11.1	11.7	10.0	10.9	12.2	12.9	13.4	13.1	12.2	11.3	9.9	10.1	8.9	8.5	8.4	10.2
Mathematics/statistics	2.7	1.6	1.3	0.6	1.2	1.0	1.3	1.1	1.2	1.0	0.7	1.0	0.6	1.0	0.8	1.0	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.9
Computer sciences	2.8	3.5	4.4	5.0	6.3	7.7	9.0	6.1	3.1	5.0	4.6	4.1	3.3	4.3	5.4	3.6	4.2	6.7	8.0	11.6	12.5	14.2	19.4	17.8	15.5	8.1
Social/behavioral sciences	5.8	4.5	3.7	4.5	3.4	4.2	3.9	5.1	6.4	4.2	5.4	7.0	5.7	6.6	5.8	5.8	6.5	5.1	4.7	4.3	4.9	4.4	4.8	5.5	5.6	6.1
Engineering	23.8	29.7	36.7	37.9	36.5	34.8	32.4	32.6	34.6	32.8	31.0	26.3	30.1	26.5	27.9	25.4	23.6	25.5	22.0	28.1	27.4	23.2	24.3	22.1	22.3	27.5
Female	39.2	29.8	38.0	36.7	37.2	41.1	40.8	37.9	40.9	36.9	38.1	36.2	34.7	33.2	34.0	35.8	34.5	35.9	32.9	37.5	34.3	36.1	35.9	34.5	32.8	33.5
Physical sciences <sup>a</sup>	3.0	3.4	2.8	2.1	2.7	3.0	2.7	3.2	2.9	2.5	2.4	2.1	1.9	1.6	1.8	2.2	2.2	1.9	1.6	2.3	1.5	1.8	1.4	1.3	1.5	1.6
Biological/agricultural sciences	16.6	9.3	8.1	8.2	9.2	8.8	10.0	10.6	13.1	11.8	13.0	11.6	9.4	9.4	12.3	13.4	13.5	14.8	14.0	14.1	13.4	13.3	13.3	11.7	12.0	13.5
Mathematics/statistics	2.7	1.3	2.1	0.9	1.6	0.9	2.0	1.2	1.5	1.2	0.9	1.0	0.8	0.8	0.7	0.8	0.8	0.8	0.6	0.6	0.6	0.5	0.6	0.7	0.7	0.8
Computer sciences	2.2	3.6	4.7	8.0	7.2	9.9	8.5	5.6	2.8	3.4	2.6	2.4	1.5	1.8	1.6	1.2	1.4	1.9	2.5	3.4	3.4	4.7	6.2	5.2	4.0	1.6
Social/behavioral sciences	9.4	7.0	8.0	6.8	7.0	8.3	7.6	6.9	8.7	9.6	11.3	12.6	13.4	12.2	10.9	11.0	10.7	9.9	9.3	10.0	8.8	9.5	8.5	8.9	8.9	9.9
Engineering	5.3	5.2	12.3	10.7	9.5	10.2	10.0	10.4	12.2	8.1	7.6	6.6	7.5	7.4	6.6	7.3	5.9	6.6	4.9	7.1	6.6	6.3	5.9	6.7	5.7	6.1
Black	28.2	26.5	29.2	31.0	33.0	36.3	35.0	30.9	33.3	29.1	31.0	31.2	32.0	31.5	35.5	37.1	37.9	34.8	35.8	36.9	38.0	35.0	37.2	36.8	35.2	35.4
Physical sciences <sup>a</sup>	1.6	1.3	1.4	1.2	1.1	1.2	1.1	1.0	1.6	1.0	1.0	0.7	1.2	0.8	1.2	1.3	1.6	1.6	1.6	1.4	1.2	1.1	1.2	1.2	1.0	1.2
Biological/agricultural sciences	5.6	4.4	3.6	3.5	4.0	4.1	4.2	5.0	4.2	3.7	4.1	4.0	4.6	4.6	5.3	6.5	7.4	7.4	8.7	8.6	8.8	7.1	7.9	7.5	7.8	8.4
Mathematics/statistics	0.8	0.7	0.6	0.7	0.8	0.9	0.6	0.6	0.7	0.6	0.6	0.6	0.4	0.5	0.6	0.7	0.6	0.8	0.7	0.6	0.6	0.5	0.6	0.5	0.4	0.5
Computer sciences	2.0	2.2	5.4	6.7	9.8	11.9	13.3	9.5	10.4	6.6	5.2	4.8	5.9	5.7	5.6	5.1	5.4	4.7	6.3	6.5	7.1	8.5	8.4	8.1	7.4	4.7
Social/behavioral sciences	12.2	10.1	9.6	8.5	7.4	6.8	7.0	7.4	6.8	8.8	9.6	13.0	10.6	11.0	10.4	10.8	10.0	10.8	9.9	10.1	10.3	11.8	11.4	11.1	12.5	12.0
Engineering	6.0	7.8	8.6	10.4	9.9	11.4	8.8	7.4	9.6	8.4	10.5	8.1	9.3	8.9	12.4	12.7	12.9	9.5	8.6	9.7	10.0	6.0	7.7	8.4	6.1	8.6
Male	33.9	34.7	35.5	37.9	40.5	43.6	41.3	37.0	39.1	35.3	36.8	35.9	36.3	35.1	41.3	43.5	44.6	39.7	40.5	40.8	43.6	37.5	41.7	41.7	37.7	40.2
Physical sciences <sup>a</sup>	2.4	2.0	1.5	1.8	1.6	1.8	1.3	1.1	1.9	1.2	1.3	1.1	1.1	1.2	1.1	1.3	2.0	1.8	1.7	1.2	1.6	1.5	1.4	1.4	1.0	1.3
Biological/agricultural sciences	6.2	5.2	4.1	3.2	4.1	4.0	4.9	5.0	3.9	3.8	4.1	4.6	4.2	4.5	4.9	6.5	6.8	6.4	7.6	6.6	7.4	5.6	5.8	5.8	5.6	5.8
Mathematics/statistics	0.9	0.7	0.7	0.8	0.8	0.9	0.8	0.5	0.8	0.8	0.7	0.5	0.4	0.4	0.6	0.6	0.6	0.8	0.8	0.5	0.5	0.5	0.6	0.4	0.4	0.4
Computer sciences	2.2	2.7	5.6	7.1	10.5	12.0	13.5	10.5	11.2	7.3	6.3	5.5	6.9	6.7	6.0	5.9	6.6	5.6	8.5	8.8	9.8	12.4	13.2	12.4	12.2	8.2
Social/behavioral sciences	10.7	9.0	7.9	6.4	6.0	5.4	5.3	7.1	5.4	7.4	6.9	9.6	7.7	7.5	7.4	8.1	7.4	8.1	6.4	6.2	6.6	7.4	7.4	6.5	7.4	8.0
Engineering	11.5	15.1	15.7	18.6	17.5	19.5	15.5	12.8	15.9	14.8	17.5	14.6	16.0	14.8	21.3	21.1	21.2	17.0	15.5	17.5	17.7	10.1	13.3	15.2	11.1	16.5
Female	24.0	20.8	24.5	26.1	27.9	31.3	30.1	26.8	28.9	25.2	26.8	28.1	29.1	29.6	31.7	33.0	34.0	31.5	32.8	34.3	34.7	33.4	34.0	34.3	33.1	32.5
Physical sciences <sup>a</sup>	1.0	0.9	1.0	0.9	1.0	0.8	0.9	0.9	1.3	0.8	0.9	0.6	1.1	0.7	1.2	1.3	1.7	1.6	1.5	1.5	1.1	0.9	1.0	1.2	1.0	1.3
Biological/agricultural sciences	5.3	3.8	3.4	3.6	3.8	4.1	3.5	4.9	4.5	3.6	3.9	3.5	4.7	5.0	5.7	6.8	7.8	7.7	9.4	9.9	9.7	8.4	9.2	8.6	9.0	10.0
Mathematics/statistics	0.7	0.7	0.6	0.7	0.8	0.9	0.4	0.7	0.6	0.5	0.6	0.6	0.5	0.5	0.6	0.7	0.6	0.8	0.7	0.6	0.8	0.5	0.6	0.5	0.4	0.5
Computer sciences	1.9	1.9	5.3	6.3	9.3	11.9	13.3	8.9	9.9	6.2	4.4	4.5	5.2	5.1	5.3	4.6	4.6	4.1	4.8	5.0	5.2	6.0	5.3	5.5	4.3	2.5
Social/behavioral sciences	13.3	11.1	10.6	9.8	8.3	7.8	7.9	7.6	7.7	9.8	11.2	15.0	12.4	13.4	12.3	12.7	11.7	12.5	12.0	12.5	12.8	14.4	13.8	14.1	15.3	14.5
Engineering	1.8	2.4	3.6	4.8	4.7	5.8	4.1	3.8	4.9	4.3	5.8	3.9	5.2	4.9	6.6	6.9	7.6	4.8	4.4	4.8	5.1	3.2	4.1	4.4	3.1	3.7

Appendix table 2-6

## Freshmen intending S&amp;E major, by sex, race/ethnicity, and field: Selected years, 1975–2002

(Percent distribution)

(Page 3 of 4)

Sex, race/ethnicity, and field	1975	1977	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002		
<b>Mexican American/Chicano and Puerto Rican American</b> .....	37.2	31.7	29.4	35.4	36.4	35.3	37.6	33.8	38.9	35.2	35.1	31.2	33.5	33.9	30.6	32.2	33.2	37.0	36.0	35.5	36.9	32.8	36.2	33.3	33.6	34.7		
Physical sciences <sup>a</sup> .....	3.6	1.2	1.9	1.9	2.3	1.5	1.5	1.9	1.9	1.4	1.5	1.5	1.7	1.8	1.4	1.5	1.6	1.6	1.3	1.3	1.4	1.4	1.0	1.4	1.2	1.6		
Biological/agricultural sciences .....	10.1	6.0	6.0	6.7	6.9	5.1	7.3	6.0	7.1	7.0	6.7	5.3	5.6	5.5	6.2	6.8	6.9	8.5	7.9	8.1	9.3	7.8	8.6	7.1	7.4	8.2		
Mathematics/statistics .....	1.8	1.0	0.4	0.8	0.5	0.9	1.1	0.6	0.7	0.8	0.5	0.5	0.6	0.8	0.3	0.7	0.4	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7		
Computer sciences .....	1.3	2.7	3.5	3.6	5.8	7.4	6.9	7.3	4.7	2.4	2.6	2.2	2.2	2.1	2.8	2.5	2.1	2.4	2.9	3.6	3.4	3.9	3.8	3.8	3.8	2.4		
Social/behavioral sciences .....	13.3	12.1	8.8	9.7	7.5	8.3	8.5	7.7	11.9	11.4	12.4	12.8	12.9	12.9	9.9	11.1	12.5	13.5	12.2	11.8	11.4	10.4	10.9	12.3	11.6	13.2		
Engineering .....	7.1	8.7	8.8	12.7	13.4	12.1	12.3	10.3	12.6	12.2	11.4	8.9	10.5	10.8	10.0	9.6	9.7	10.4	11.2	10.1	10.8	8.7	11.3	8.1	8.9	8.6		
<b>Male</b> .....	41.6	39.4	37.9	40.9	44.1	42.4	43.0	43.1	47.5	41.8	41.9	36.1	40.2	40.0	35.6	37.0	38.8	40.5	42.0	42.0	43.0	38.1	45.0	40.6	40.4	40.8		
Physical sciences <sup>a</sup> .....	5.3	1.7	3.2	2.6	3.0	2.6	2.2	2.5	2.8	1.6	1.9	1.9	2.2	2.6	1.7	1.4	2.2	2.2	1.7	1.4	1.8	2.0	1.1	1.7	1.3	1.8		
Biological/agricultural sciences .....	10.3	6.1	6.9	6.9	7.0	4.8	6.7	6.1	7.4	6.8	6.8	5.7	5.9	6.2	5.5	7.4	7.4	8.7	6.8	7.5	7.7	6.8	7.3	7.1	5.9	6.8		
Mathematics/statistics .....	2.1	1.7	0.5	0.5	0.6	0.8	1.4	0.6	0.8	0.9	0.8	0.7	0.8	0.7	0.5	0.8	0.5	0.8	0.3	0.7	0.6	0.5	0.8	0.6	0.9	1.0		
Computer sciences .....	1.7	2.9	3.8	3.1	5.9	7.5	7.2	9.3	6.5	2.9	3.2	2.7	3.1	2.7	3.9	3.4	3.1	3.7	4.7	6.3	5.7	5.7	6.8	7.3	7.1	5.2		
Social and behavioral sciences .....	10.8	10.9	7.5	7.2	5.4	6.8	6.5	7.5	9.3	7.9	9.7	9.5	10.0	8.6	7.3	8.0	9.8	8.6	7.8	8.4	8.0	7.3	6.9	7.7	7.6	7.9		
Engineering .....	11.4	16.1	16.0	20.6	22.2	19.9	19.0	17.1	20.7	21.7	19.5	15.6	18.2	19.2	16.7	16.0	15.8	16.5	20.7	17.7	19.2	15.8	22.1	16.2	17.6	18.1		
<b>Female</b> .....	31.2	24.6	22.7	30.3	28.9	29.2	32.2	25.7	31.7	29.4	29.4	27.4	28.3	29.7	26.3	27.5	28.2	33.8	31.0	30.7	31.5	28.4	28.7	27.6	28.4	30.7		
Physical sciences <sup>a</sup> .....	1.5	0.7	1.0	1.4	1.7	0.7	0.8	1.4	1.1	1.1	1.0	1.0	1.3	1.1	1.3	1.3	1.1	1.1	1.2	1.2	1.2	0.8	0.8	1.2	1.3	1.5		
Biological/agricultural sciences .....	9.5	5.8	5.4	6.4	6.6	5.4	7.9	5.9	7.0	7.5	6.6	5.1	5.6	5.1	6.7	6.2	6.5	8.4	8.7	8.7	10.3	8.6	9.4	6.9	8.2	9.2		
Mathematics/statistics .....	1.3	0.3	0.3	1.0	0.3	1.0	0.8	0.8	0.5	0.6	0.3	0.4	0.4	0.8	0.2	0.6	0.4	0.4	0.5	0.4	0.4	0.7	0.4	0.5	0.5	0.5		
Computer sciences .....	0.8	2.6	3.3	4.1	5.8	7.2	6.5	5.6	3.1	2.0	2.2	1.9	1.6	1.6	1.9	1.7	1.1	1.3	1.5	1.7	1.5	2.4	1.4	1.5	1.4	0.6		
Social/behavioral sciences .....	16.2	13.1	10.3	12.3	9.4	9.9	10.2	7.8	14.0	14.1	14.9	15.4	15.2	16.5	12.5	13.7	14.7	17.1	15.8	14.3	14.2	13.0	13.8	15.3	14.3	16.7		
Engineering .....	1.9	2.1	2.4	5.1	5.1	5.0	6.0	4.2	6.0	4.1	4.4	3.6	4.2	4.6	3.7	4.0	4.4	5.5	3.3	4.4	3.9	2.9	2.9	2.2	2.7	2.2		
<b>Other Latino</b> .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	39.8	38.0	40.9	39.5	41.3	38.2	36.1	37.2	35.2	36.6	35.4
Physical sciences <sup>a</sup> .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.0	2.8	1.4	1.4	1.8	1.2	1.3	1.3	1.4	
Biological/agricultural sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.9	9.5	7.9	10.9	8.2	9.4	8.7	7.6	7.6	7.9	7.8
Mathematics/statistics .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	0.2	1.0	0.5	0.4	0.4	0.5	0.4	0.3	0.4	0.7
Computer sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.2	2.7	3.5	4.2	4.4	5.0	5.0	4.4	2.5	
Social/behavioral sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.3	13.1	13.3	12.7	11.6	11.9	12.2	13.1	12.7	13.4	13.9
Engineering .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.0	11.0	13.2	10.5	15.5	10.3	8.5	9.8	7.6	9.1	8.9
<b>Male</b> .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43.0	40.4	48.0	44.5	51.4	43.9	41.7	45.4	43.9	45.5	42.2
Physical sciences <sup>a</sup> .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4	1.8	3.4	2.0	1.6	2.2	1.5	1.9	1.8	2.1	2.0
Biological/agricultural sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.3	8.7	7.0	8.3	8.6	7.9	7.7	5.3	6.8	7.1	6.9
Mathematics/statistics .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	0.3	1.2	0.6	0.4	0.6	0.7	0.4	0.3	0.5	0.9
Computer sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0	2.9	4.7	5.8	6.9	7.2	7.2	9.4	11.2	8.7	4.8
Social/behavioral sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.7	9.0	9.3	9.0	7.9	7.6	8.7	9.7	8.5	9.0	10.0
Engineering .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20.0	17.7	22.4	18.8	26.0	18.4	15.9	18.7	15.3	18.1	17.6
<b>Female</b> .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36.9	35.4	34.6	35.8	32.2	33.3	31.5	31.3	29.9	30.3	31.1
Physical sciences <sup>a</sup> .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6	2.0	2.2	1.2	1.1	1.3	0.9	1.1	0.9	0.9	1.5
Biological/agricultural sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.8	9.9	8.7	13.2	7.8	10.6	9.1	9.4	8.5	8.3	8.3
Mathematics/statistics .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	0.2	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.6	
Computer sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9	1.5	1.1	1.5	1.8	2.1	3.3	1.7	2.1	1.6	0.9
Social/behavioral sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	19.9	17.0	16.4	16.1	14.9	15.0	15.5	15.3	16.4	16.6	
Engineering .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.1	4.8	5.4	3.3	6.2	3.9	2.9	3.3	2.8	2.8	3.2



**Freshmen intending S&E major, by sex, race/ethnicity, and field: Selected years, 1975–2002**

(Percent distribution)

Sex, race/ethnicity, and field	1975	1977	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
American Indian/Alaskan Native .....	34.3	32.7	31.0	35.6	30.0	32.5	31.3	29.6	29.2	30.6	31.5	31.9	33.9	31.8	31.2	31.7	31.9	30.2	30.6	33.6	34.9	32.8	35.4	33.8	35.3	32.0
Physical sciences <sup>a</sup> .....	3.3	2.5	4.7	2.0	2.0	1.9	2.2	0.9	1.6	2.0	2.2	1.7	2.0	3.0	2.0	1.8	1.5	2.0	2.0	2.6	2.5	2.1	2.7	2.6	1.8	1.7
Biological/agricultural sciences .....	10.0	8.0	5.1	6.1	5.0	4.7	4.8	8.1	5.5	5.5	6.3	5.5	4.8	7.3	6.5	7.4	8.0	8.0	9.3	8.9	8.8	8.2	9.3	6.9	8.4	7.9
Mathematics/statistics .....	1.1	1.5	0.3	1.1	0.3	1.0	0.6	0.6	0.5	0.8	1.0	0.6	0.6	0.4	0.3	0.4	0.7	0.7	0.4	0.5	0.5	0.4	0.7	0.4	0.6	0.6
Computer sciences .....	1.5	2.0	3.5	5.4	5.6	8.7	8.7	5.5	5.1	2.3	2.7	2.4	2.2	2.3	3.0	2.1	2.3	2.2	3.0	3.7	5.0	4.6	4.4	4.0	4.4	2.8
Social/behavioral sciences .....	10.7	10.8	8.1	8.3	7.2	5.5	6.0	6.7	9.9	9.6	9.3	13.2	13.5	10.7	9.7	10.6	11.0	10.4	9.5	9.9	10.7	11.1	10.4	11.9	12.7	11.5
Engineering .....	7.7	7.9	9.3	12.7	9.9	10.7	9.0	7.8	6.6	10.4	10.0	8.5	10.8	8.1	9.7	9.4	8.4	6.9	6.4	8.0	7.4	6.4	7.9	8.0	7.4	7.5
Male .....	39.5	37.9	37.3	41.7	39.5	34.1	35.2	32.8	33.0	40.6	39.7	37.4	38.8	35.8	37.0	37.1	35.9	34.1	36.5	40.1	37.0	36.4	39.0	36.6	41.0	36.8
Physical sciences <sup>a</sup> .....	6.1	3.8	5.3	2.4	3.2	2.9	3.6	1.1	2.6	2.8	3.6	2.6	2.5	4.9	2.4	1.9	2.0	3.6	2.4	3.0	3.2	2.6	2.9	3.6	2.3	2.2
Biological/agricultural sciences .....	10.6	9.1	6.6	8.3	5.8	4.1	6.2	8.3	7.7	7.1	7.2	6.7	5.9	7.4	6.1	7.7	9.5	6.7	9.6	8.1	6.8	6.7	7.9	4.9	6.9	5.3
Mathematics/statistics .....	1.2	2.4	0.3	1.1	0.7	1.6	0.6	0.1	1.0	0.7	0.8	0.7	0.4	0.9	0.3	0.3	0.8	0.8	0.2	0.6	0.8	0.6	0.7	0.4	0.6	0.8
Computer sciences .....	1.2	1.5	2.2	3.5	4.0	4.6	4.5	3.3	3.8	2.3	2.6	2.9	1.5	1.3	3.0	2.7	1.9	2.6	4.1	5.5	5.8	6.7	5.4	5.1	7.2	4.0
Social/behavioral sciences .....	8.3	9.3	7.3	7.4	6.2	2.8	5.5	6.0	6.4	9.5	7.2	8.7	11.2	7.3	6.7	8.6	8.2	7.9	7.5	7.7	6.9	7.4	7.0	8.2	8.3	8.6
Engineering .....	12.1	11.8	15.6	19.0	19.6	18.1	14.8	14.0	11.5	18.2	18.3	15.8	17.3	14.0	18.5	15.9	13.5	12.5	12.7	15.2	13.5	12.4	15.1	14.4	15.7	15.9
Female .....	26.9	25.8	20.5	25.7	16.4	22.4	18.9	22.3	20.8	21.1	23.4	26.5	28.3	26.2	25.3	25.6	26.5	26.2	25.1	27.8	30.7	28.6	30.0	28.4	30.6	27.2
Physical sciences <sup>a</sup> .....	1.0	1.3	3.6	1.1	1.1	1.9	1.0	0.8	0.7	1.5	0.9	1.1	1.3	1.7	1.7	1.8	1.0	1.0	1.9	2.2	1.9	1.8	2.4	1.8	1.6	1.4
Biological/agricultural sciences .....	8.9	5.9	3.9	3.8	3.5	4.6	3.7	8.3	3.1	4.2	5.6	4.7	4.0	7.5	6.7	6.8	6.7	8.7	9.1	9.3	10.2	9.3	10.4	7.9	9.0	8.8
Mathematics/statistics .....	0.7	0.7	0.0	0.7	0.1	0.6	0.7	1.0	0.2	0.8	1.2	0.6	0.6	0.1	0.3	0.6	0.6	0.7	0.5	0.4	0.3	0.2	0.5	0.3	0.7	0.4
Computer sciences .....	0.6	1.3	0.2	2.5	1.4	2.5	3.7	2.6	1.9	1.2	0.7	1.0	1.0	1.1	1.5	0.7	1.6	0.9	0.7	1.2	2.3	1.4	1.3	0.9	1.1	0.5
Social/behavioral sciences .....	12.4	11.8	8.7	10.7	8.1	8.9	6.1	7.5	12.4	9.4	11.3	16.4	15.5	12.4	12.0	11.7	12.4	12.1	11.2	11.4	12.9	13.9	12.7	14.4	15.2	13.3
Engineering .....	3.3	4.8	4.1	6.9	2.2	3.9	3.7	2.1	2.5	4.0	3.7	2.7	5.9	3.4	3.1	4.0	4.2	2.8	1.7	3.3	3.1	2.0	2.7	3.1	3.0	2.8

NA not available

<sup>a</sup>Physical sciences include physics, chemistry, astronomy, and earth, atmospheric, and ocean sciences.

SOURCE: Higher Education Research Institute, University of California at Los Angeles, Survey of the American Freshman: National Norms, special tabulations, 2003.

Appendix table 2-7

## Freshmen intending to major in selected S&amp;E fields, by sex and race/ethnicity: Selected years, 1971–2002

(Percent)

Sex, race/ethnicity, and field	1971	1972	1973	1974	1975	1977	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Male .....	65.7	66.6	65.2	65.8	65.1	65.3	62.8	63.1	63.1	62.5	62.5	61.7	61.4	60.3	59.2	56.6	57.3	57.1	57.9	57.1	56.1	55.0	54.5	55.6	55.6	55.3	56.2	55.9	55.8	55.5	
Female .....	34.3	33.4	34.8	34.2	34.9	34.7	37.2	36.9	36.9	37.5	37.5	38.3	38.6	39.7	40.8	43.4	42.7	42.9	42.1	42.9	43.9	45.0	45.5	44.4	44.4	44.7	43.8	44.1	44.2	44.4	
White.....	92.1	90.6	91.0	90.5	89.4	87.9	86.5	86.2	87.5	85.3	85.4	85.7	83.7	84.0	83.1	80.0	81.8	78.8	76.9	78.8	79.1	76.3	76.2	75.4	76.3	75.9	74.4	72.4	71.2	72.1	
Physical sciences <sup>a</sup> .....	94.9	94.1	93.2	92.4	92.5	91.9	91.2	90.5	91.7	89.3	90.5	90.2	86.3	88.5	88.3	88.1	87.6	87.6	85.0	86.5	85.7	82.4	84.7	83.7	84.6	83.8	84.9	82.5	80.8	80.6	
Biological/agricultural sciences.....	94.3	93.6	92.3	92.0	91.2	90.7	90.0	89.9	89.5	87.6	86.3	85.6	84.2	84.2	82.9	80.3	81.9	79.1	77.5	79.0	79.4	77.3	76.6	76.4	77.0	76.3	75.3	71.5	68.9	68.3	
Social/behavioral sciences.....	89.2	87.9	88.5	87.8	85.2	84.3	84.4	84.7	87.7	85.5	86.4	87.0	88.2	85.6	85.6	80.3	83.5	79.6	79.0	80.8	81.3	78.4	78.6	78.6	78.5	76.5	76.9	74.3	71.9	73.0	
Mathematics/statistics.....	93.9	92.2	91.5	92.0	92.1	92.1	90.1	89.9	90.1	87.7	90.8	91.6	89.7	89.1	89.1	86.2	89.8	86.6	84.7	84.9	86.9	82.2	83.5	83.6	82.9	83.6	82.7	82.8	81.4	80.0	
Computer sciences.....	88.0	81.4	86.1	86.0	84.1	83.1	79.8	81.3	83.4	81.7	79.0	76.3	71.2	73.9	73.4	68.7	68.5	62.9	61.3	66.4	66.3	67.3	65.2	65.2	68.0	66.1	63.7	64.0	62.6	68.8	
Engineering.....	93.2	91.1	92.2	91.5	90.7	87.9	86.6	86.1	87.5	85.7	87.2	87.7	83.3	84.0	81.5	80.1	81.1	79.2	76.1	77.1	77.2	73.8	74.3	73.1	75.2	78.0	74.5	73.3	74.1	72.6	
Asian American.....	0.9	1.2	1.2	1.5	1.8	1.8	2.1	2.1	2.0	2.4	2.7	2.6	4.2	4.6	4.7	5.1	4.7	5.2	5.9	5.8	5.7	8.0	7.2	7.9	8.1	7.9	9.4	9.7	9.6	10.2	
Physical sciences <sup>a</sup> .....	1.1	1.2	1.4	1.9	1.9	2.2	2.3	2.1	2.2	3.1	3.2	3.5	5.4	5.0	4.5	5.1	4.0	4.7	5.2	5.1	4.6	7.0	5.5	5.6	5.4	6.4	6.2	6.5	6.9	7.3	
Biological/agricultural sciences.....	0.5	1.0	1.5	1.6	2.1	1.8	1.8	2.1	2.1	2.7	3.7	3.3	5.6	6.3	6.9	7.7	6.2	6.9	8.2	7.7	7.4	9.6	8.5	8.2	8.3	8.7	9.4	10.8	10.9	12.7	
Social/behavioral sciences.....	0.6	0.8	0.5	0.9	1.1	1.0	1.1	1.0	1.1	1.5	1.5	1.4	2.4	2.3	2.5	3.1	3.0	3.5	3.8	3.7	4.0	4.5	4.3	4.4	4.8	4.4	5.0	5.6	5.8	6.4	
Mathematics/statistics.....	0.8	1.2	1.2	1.7	2.1	1.6	2.6	1.3	1.8	1.6	2.6	1.8	2.8	3.7	3.1	3.7	3.3	3.7	4.3	4.4	4.2	4.8	4.5	5.3	5.1	4.7	6.3	6.9	8.0	8.3	
Computer sciences.....	0.9	2.9	1.5	2.3	2.2	2.4	2.0	2.0	1.5	1.9	2.0	2.0	1.9	4.0	4.5	4.7	3.4	4.7	6.2	4.7	5.5	10.0	9.3	11.4	11.4	11.0	16.1	14.8	14.4	11.8	
Engineering.....	1.5	1.7	1.5	1.7	2.1	2.4	3.1	2.9	2.6	3.0	3.4	3.5	5.7	5.8	6.0	6.4	6.4	6.4	6.7	6.9	6.3	10.5	8.9	10.2	10.3	9.8	10.8	11.1	10.9	12.8	
Black.....	6.2	6.9	6.6	6.3	7.3	7.9	8.8	9.5	8.6	10.4	10.0	9.7	10.0	8.8	9.6	11.7	10.5	12.1	13.1	11.3	11.4	11.1	11.6	11.7	11.4	11.6	10.4	11.5	11.0	10.7	
Physical sciences <sup>a</sup> .....	3.4	3.9	4.5	4.3	4.2	4.2	4.9	5.7	4.7	6.2	5.2	4.8	6.9	4.8	5.3	5.0	6.1	4.9	7.0	5.9	7.2	7.8	7.2	7.8	6.5	6.5	6.3	7.4	6.6	6.5	
Biological/agricultural sciences.....	4.2	4.5	4.8	4.7	5.1	5.6	5.7	6.1	6.1	7.8	7.7	8.9	7.8	6.4	7.3	8.6	9.0	10.0	10.0	9.1	9.3	9.0	10.6	10.7	10.5	10.2	9.6	11.3	11.4	11.3	
Social/behavioral sciences.....	9.2	9.9	9.5	9.3	11.7	11.7	11.7	11.4	9.4	10.5	10.2	10.0	7.7	9.2	9.2	13.5	10.3	12.8	13.0	10.9	10.3	11.6	11.4	12.0	12.2	13.8	11.9	12.1	13.3	12.1	
Mathematics/statistics.....	4.8	5.6	6.5	5.2	4.6	5.3	6.2	7.7	7.3	8.9	5.1	5.9	6.2	6.0	6.6	8.4	5.3	7.0	8.7	8.2	7.3	10.3	10.0	8.8	10.0	7.6	8.5	6.6	5.5	6.7	
Computer sciences.....	10.0	14.6	11.3	10.2	12.6	11.1	15.7	15.0	13.5	14.9	17.3	18.9	24.9	19.7	19.3	23.1	25.1	28.6	27.5	23.2	24.1	18.9	20.8	18.4	17.0	18.9	15.3	15.6	15.7	14.4	
Engineering.....	4.5	5.4	4.9	5.2	5.9	7.3	7.7	8.7	7.6	9.4	7.6	7.0	8.5	7.4	9.8	10.1	9.4	10.5	13.4	12.2	12.7	11.0	10.9	10.7	10.3	7.6	7.9	9.7	6.9	8.7	
Hispanic <sup>b</sup> .....	0.5	1.0	0.8	1.2	1.4	1.7	1.8	1.5	1.2	1.8	1.3	1.2	1.5	2.0	1.9	2.3	2.1	2.5	2.6	4.1	3.9	4.9	5.1	5.5	5.0	5.5	6.4	7.1	7.6	6.9	
Physical sciences <sup>a</sup> .....	0.3	0.7	0.8	1.0	1.2	0.7	1.5	1.1	1.1	1.3	0.9	1.1	1.1	1.2	1.3	1.8	1.7	2.0	1.8	2.7	2.6	3.7	2.8	3.1	3.6	3.7	3.8	5.3	5.1	5.3	
Biological/agricultural sciences.....	0.5	0.6	0.8	1.1	1.3	1.4	1.9	1.6	1.4	1.6	1.6	1.2	1.7	2.4	2.1	2.3	2.1	2.3	2.6	3.9	3.6	4.2	4.6	4.4	5.0	5.5	6.1	7.4	7.6	7.0	
Social/behavioral sciences.....	0.8	1.4	1.0	1.5	1.8	2.5	2.2	1.7	1.3	2.1	1.4	1.1	1.7	2.3	2.1	2.7	2.4	2.9	2.8	4.8	5.0	5.8	5.9	6.4	6.1	6.4	7.5	9.1	9.2	8.7	
Mathematics/statistics.....	0.4	0.8	0.8	1.0	1.4	1.4	0.9	1.3	0.4	1.6	1.1	0.6	0.7	1.3	1.0	1.4	1.5	2.0	1.1	3.0	1.9	3.5	2.6	3.5	3.3	4.4	5.2	4.7	6.4	6.1	
Computer sciences.....	0.8	1.4	0.8	1.1	1.2	2.5	2.2	1.1	1.2	1.7	1.0	1.6	1.4	1.4	1.8	2.2	1.9	2.0	3.3	4.1	3.6	4.4	4.5	5.0	4.1	4.8	4.9	5.9	6.1	5.2	
Engineering.....	0.5	1.1	0.9	1.2	1.0	1.5	1.6	1.3	1.3	1.7	1.3	1.1	1.5	2.1	1.9	2.2	2.2	2.5	2.5	3.9	3.7	5.3	5.9	5.8	4.9	5.6	7.0	6.1	7.1	5.8	
American Indian.....	0.9	1.0	0.9	0.8	0.7	0.7	0.8	0.8	0.9	0.9	1.1	0.9	0.9	0.9	1.0	0.9	1.0	1.3	1.6	1.7	1.7	2.0	2.1	2.3	3.1	2.1	2.3	1.9	1.3	1.2	
Physical sciences <sup>a</sup> .....	0.8	1.1	0.8	0.9	0.7	0.6	1.3	0.6	0.8	0.9	1.2	0.5	0.8	1.0	1.1	0.8	0.9	1.8	1.6	1.4	1.1	2.0	2.1	2.9	3.5	2.3	3.3	2.5	1.2	1.1	
Biological/agricultural sciences.....	1.0	1.1	1.0	0.9	0.8	0.8	0.7	0.8	0.9	0.9	1.1	1.5	1.1	1.0	1.1	0.9	0.8	1.7	1.7	1.8	1.8	1.9	2.2	2.3	3.1	2.1	2.5	1.8	1.4	1.3	
Social/behavioral sciences.....	1.0	1.1	0.8	0.9	0.9	0.9	0.8	0.8	1.1	0.9	1.2	1.0	0.9	1.2	1.0	0.9	1.0	1.2	1.4	1.7	1.9	2.1	2.4	2.4	2.6	3.7	2.6	2.6	2.4	1.6	1.5
Mathematics/statistics.....	1.0	0.8	0.9	0.5	0.5	0.9	0.2	0.8	0.3	1.1	0.7	0.5	0.5	0.7	1.1	0.7	0.6	0.6	0.6	1.0	1.6	1.9	1.1	1.7	2.1	1.3	2.4	0.9	1.1	1.0	
Computer sciences.....	1.4	0.8	1.5	0.4	0.8	0.7	0.9	0.9	0.9	1.1	1.4	1.1	1.3	0.7	1.1	0.9	0.9	1.3	2.1	1.8	1.9	2.0	2.2	2.4	3.7	2.1	1.9	1.4	1.1	1.1	
Engineering.....	0.7	0.8	0.7	0.7	0.7	0.5	0.7	0.7	0.9	0.9	0.9	0.7	0.6	0.9	1.0	0.8	1.0	1.1	1.5	1.6	1.5	1.7	1.8	2.0	2.3	1.6	2.0	1.7	1.0	1.0	

Appendix table 2-7

**Freshmen intending to major in selected S&E fields, by sex and race/ethnicity: Selected years, 1971–2002**

(Percent)

Sex, race/ethnicity, and field	1971	1972	1973	1974	1975	1977	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Unknown .....	0.9	1.4	1.2	1.5	1.6	1.7	2.0	1.9	1.9	1.6	1.5	1.5	1.6	1.8	1.9	2.2	1.9	2.3	2.6	1.9	1.9	2.2	2.5	3.0	3.3	3.0	3.9	3.8	3.3	3.2
Physical sciences <sup>a</sup> .....	0.9	0.9	0.9	0.9	1.5	1.8	1.5	1.9	1.6	1.6	1.8	1.4	1.4	1.6	1.8	1.4	1.8	2.1	2.1	1.8	1.7	1.7	2.5	3.4	3.4	3.1	4.0	3.2	3.2	2.9
Biological/agricultural sciences.....	0.9	1.2	1.4	1.6	1.7	1.6	1.9	1.6	2.3	1.7	1.6	1.7	1.7	2.0	2.1	2.4	1.9	2.3	2.9	2.2	2.0	2.4	2.9	3.2	3.7	3.3	3.8	3.7	3.8	3.7
Social/behavioral sciences.....	1.0	1.5	1.2	1.6	1.6	1.7	2.1	2.0	1.9	1.9	1.6	1.4	1.5	2.1	2.0	2.1	1.9	2.4	3.1	2.1	2.1	2.4	2.5	2.6	3.2	3.4	4.0	4.2	3.5	3.6
Mathematics/statistics.....	0.8	0.9	0.7	1.0	1.1	0.9	1.2	1.3	0.8	1.3	1.0	0.6	0.8	0.9	1.3	1.1	1.3	1.5	2.2	1.2	2.1	1.7	1.3	2.5	2.5	2.3	3.6	3.5	1.7	2.5
Computer sciences.....	0.5	1.0	0.4	1.2	1.5	1.5	1.7	1.7	1.6	1.3	1.2	1.5	1.0	1.5	2.2	2.1	1.6	2.1	2.3	2.5	1.6	2.0	2.2	2.8	2.9	2.6	4.0	4.1	3.4	2.8
Engineering.....	0.8	1.6	1.2	1.6	1.5	1.7	2.2	2.0	1.9	1.6	1.5	1.6	1.9	1.8	1.8	2.3	2.0	2.3	2.3	1.5	1.6	2.0	2.5	3.2	3.2	2.6	3.6	3.3	2.9	2.6

<sup>a</sup>Physical sciences include physics, chemistry, astronomy, and earth, atmospheric, and ocean sciences.<sup>b</sup>Hispanic includes three group designations from the freshman norms survey: Mexican American/Chicano, Puerto Rican American, and other Latino.

NOTE: Details may not add to 100 because students may check more than one race/ethnicity, e.g., white and Hispanic.

SOURCE: Higher Education Research Institute, University of California at Los Angeles, Survey of the American Freshman: National Norms, special tabulations, 2003.

Appendix table 2-8

**Freshmen reporting need for remediation in mathematics or science, by sex and intended major: 1977 and 2002**

(Percent)

Intended major	1977						2002					
	Science			Mathematics			Science			Mathematics		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
All S&E .....	7.8	6.0	11.3	19.1	16.0	25.1	9.7	6.8	13.3	20.2	14.9	26.9
Mathematics .....	5.9	4.8	7.2	2.8	2.1	3.8	5.6	4.6	6.6	4.7	4.6	4.7
Physical sciences <sup>a</sup> .....	5.9	4.0	10.8	16.0	12.9	24.4	8.3	5.4	12.1	14.7	10.0	20.7
Computer sciences .....	7.5	6.0	9.8	14.6	13.0	17.2	6.2	4.8	14.1	16.1	14.0	28.0
Biological/agricultural sciences.....	7.2	5.8	9.0	22.7	20.5	25.7	12.2	8.9	14.2	22.8	16.7	26.5
Social/behavioral sciences.....	10.5	6.9	13.3	27.5	22.5	31.5	11.1	7.1	13.1	27.9	20.5	31.6
Engineering .....	6.9	6.3	12.5	13.3	13.3	12.7	8.1	7.0	13.3	14.0	13.4	16.9
Non-S&E.....	11.8	8.4	14.7	26.7	23.2	29.6	10.7	8.1	12.5	24.7	20.8	27.3

<sup>a</sup>Physical sciences include physics, chemistry, astronomy, and earth, atmospheric, and ocean sciences.

SOURCE: Higher Education Research Institute, University of California at Los Angeles, Survey of the American Freshman: National Norms, special tabulations, 2003.

Appendix table 2-9

**Employment and education status of S&E bachelor's and master's degree recipients, by degree level and undergraduate GPA: 1995 and 2001**

Degree level and GPA	Graduates	Employment and education status					
		Continuing in S&E		In school, not studying S&E		Not in school, other	
		In school, studying S&E <sup>a</sup>	Employed in S&E and not in school	Employed in S&E	Employed outside S&E or unemployed	Employed outside S&E	Unemployed
1995	Number	Percent distribution					
Bachelor's .....	698,200	12.1	16.7	2.3	17.4	46.8	4.7
3.75–4.0 .....	83,400	20.5	15.7	3.3	22.7	33.3	4.5
3.25–3.74 .....	237,300	14.5	15.0	3.1	21.3	42.0	4.3
2.75–3.24 .....	287,000	9.7	17.6	1.7	15.0	51.2	4.8
Less than 2.75 .....	89,400	5.7	19.7	1.3	9.8	57.8	5.9
Master's .....	146,300	22.5	39.6	2.4	4.8	26.5	4.2
3.75–4.0 .....	33,600	31.8	36.6	3.0	3.2	21.5	4.0
3.25–3.74 .....	56,700	23.2	40.1	2.6	5.5	24.8	3.9
2.75–3.24 .....	43,900	16.6	40.6	1.6	4.6	31.5	5.2
Less than 2.75 .....	11,300	12.1	43.2	2.8	6.9	31.8	3.2
2001							
Bachelor's .....	758,300	13.0	20.4	1.6	14.8	44.9	5.2
3.75–4.0 .....	116,900	18.4	17.3	2.5	22.6	34.4	4.9
3.25–3.74 .....	283,500	16.1	18.3	1.8	17.8	41.5	4.5
2.75–3.24 .....	282,600	9.3	23.5	1.3	10.5	49.9	5.4
Less than 2.75 .....	74,400	6.7	21.9	1.0	8.2	54.9	7.3
Master's .....	160,100	17.1	45.7	1.3	4.6	27.0	4.2
3.75–4.0 .....	41,800	24.5	41.7	1.3	5.7	22.3	4.5
3.25–3.74 .....	63,600	17.1	45.6	0.9	4.3	28.7	3.4
2.75–3.24 .....	45,600	11.4	50.6	2.0	3.7	28.0	4.4
Less than 2.75 .....	8,300	10.6	40.4	0.0	7.4	33.0	8.6

GPA grade point average

<sup>a</sup>All graduates studying S&E, including those employed in S&E and non-S&E and those unemployed. Definition is based on assumption that the field being studied in school is a better indicator of future career plans than current employment.

NOTES: In the 1995 survey, S&E degrees were earned in 1993 and 1994; in the 2001 survey, S&E degrees were earned in 1999 and 2000. Retention in S&E is measured through education and job codes rather than through graduates' own evaluations. Details may not add to totals because of rounding and because a few graduates who reported that their undergraduate courses were ungraded were excluded from GPA categories but included in total rows.

SOURCE: National Science Foundation, Division of Science Resources Statistics, National Survey of Recent College Graduates, 1995 and 2001, special tabulations, 2003.

Appendix table 2-10

**Undergraduate enrollment in engineering and engineering technology programs: Selected years, 1979–2002**

Enrollment level and institution	1979	1981	1983	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Engineering</b>																					
Students .....	366,299	420,402	441,205	420,864	407,657	392,198	385,412	378,277	380,287	379,977	382,525	375,944	367,298	363,315	356,177	365,358	366,991	361,395	390,803	409,557	421,178
Full time .....	340,488	387,577	406,144	384,191	369,520	356,998	346,169	338,529	338,842	339,397	344,126	337,817	328,463	325,489	317,772	326,458	329,657	323,713	353,118	367,954	383,109
Freshman .....	103,724	115,280	109,638	103,225	99,238	95,453	98,009	95,420	94,346	93,002	93,427	88,875	85,047	86,299	85,375	90,882	94,909	93,951	101,773	106,825	107,086
Sophomore .....	78,594	87,519	89,515	79,627	76,195	73,317	71,030	71,267	72,204	71,257	71,644	69,974	68,177	67,981	66,475	67,879	69,608	69,941	76,706	78,348	81,854
Junior .....	74,928	86,633	91,233	84,875	80,386	77,085	73,761	70,483	72,666	73,516	74,871	73,449	71,753	68,894	67,190	68,812	67,638	66,975	74,055	76,938	79,806
Senior .....	77,823	92,414	109,036	110,305	107,773	104,003	97,614	94,465	92,989	94,683	98,235	98,214	96,523	95,226	92,213	92,496	90,653	86,225	92,502	96,969	106,276
Fifth year .....	5,419	5,731	6,722	6,159	5,928	7,140	5,755	6,894	6,637	6,939	5,949	7,305	6,963	7,089	6,519	6,389	6,849	6,621	8,082	8,874	8,087
Part time .....	25,811	32,825	35,061	36,673	38,137	35,200	39,243	39,748	41,445	40,580	38,399	38,127	38,835	37,826	38,405	38,900	37,334	37,682	37,685	41,603	38,069
Institutions .....	286	286	292	297	311	316	320	323	328	336	337	336	337	337	335	338	340	341	342	351	356
ABET accredited <sup>a</sup> .....	239	250	258	264	270	277	281	284	289	303	309	310	315	316	317	319	321	323	323	326	332
<b>Engineering technologies</b>																					
Students .....	NA	191,152	163,226	123,571	137,390	128,501	131,704	127,687	123,217	127,135	124,736	106,976	107,275	105,809	105,345	108,459	108,993	108,754	107,165	108,886	185,358
Full time .....	NA	134,444	112,745	83,038	90,536	80,600	79,624	76,179	72,390	75,340	73,245	65,581	66,457	63,929	62,330	67,864	68,545	69,173	66,771	71,147	72,704
First year .....	NA	65,893	53,032	34,389	39,177	32,685	33,477	32,225	30,178	31,302	30,543	24,824	24,574	25,665	26,583	30,227	28,367	29,490	29,531	31,588	30,252
Second year .....	NA	40,774	33,799	23,293	25,612	22,906	21,852	21,627	20,586	20,815	21,081	19,962	20,997	18,863	17,267	19,106	18,426	17,326	18,318	19,171	20,360
Other years associated .....	NA	872	925	466	657	1,404	1,760	1,810	1,603	2,221	2,336	2,564	3,121	2,007	2,780	3,442	6,080	5,289	2,474	2,207	2,786
Bachelor's of engineering technologies third and later years .....	NA	26,905	24,989	24,890	25,090	23,605	22,535	20,517	20,023	21,002	19,285	18,231	17,765	17,394	15,700	15,089	15,672	17,068	16,448	18,181	19,306
Part time .....	NA	56,708	50,481	40,533	46,854	47,901	52,080	51,508	50,827	51,795	51,491	41,395	40,818	41,880	43,015	40,595	40,448	39,581	40,394	37,739	39,950
Institutions .....	NA	NA	NA	200	257	291	310	286	303	302	298	263	294	289	285	285	279	280	280	282	288

ABET Accreditation Board for Engineering and Technology

NA not available

<sup>a</sup>Institutions with at least one curriculum accredited by ABET.

SOURCE: Engineering Workforce Commission, *Engineering & Technology Enrollments, Fall 2002* (Washington, DC: American Association of Engineering Societies, 2003).

Appendix table 2-11

**Engineering enrollment, by enrollment level and attendance: 1979–2002**

Year	Undergraduate						Graduate					
	Total		Full time		Part time		Total		Full time		Part time	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1979	366,299	100.0	340,488	93.0	25,811	7.0	67,152	100.0	41,384	61.6	25,768	38.4
1980	397,344	100.0	365,117	91.9	32,227	8.1	72,585	100.0	44,335	61.1	28,250	38.9
1981	420,402	100.0	387,577	92.2	32,825	7.8	77,600	100.0	47,782	61.6	29,818	38.4
1982	435,330	100.0	403,390	92.7	31,940	7.3	81,999	100.0	50,410	61.5	31,589	38.5
1983	441,205	100.0	406,144	92.1	35,061	7.9	91,040	100.0	57,366	63.0	33,674	37.0
1984	429,499	100.0	394,635	91.9	34,864	8.1	93,165	100.0	57,277	61.5	35,888	38.5
1985	420,864	100.0	384,191	91.3	36,673	8.7	95,505	100.0	60,641	63.5	34,864	36.5
1986	407,657	100.0	369,520	90.6	38,137	9.4	107,196	100.0	67,333	62.8	39,863	37.2
1987	392,198	100.0	356,998	91.0	35,200	9.0	110,778	100.0	69,343	62.6	41,435	37.4
1988	385,412	100.0	346,169	89.8	39,243	10.2	112,007	100.0	69,226	61.8	42,781	38.2
1989	378,277	100.0	338,529	89.5	39,748	10.5	114,048	100.0	68,967	60.5	45,081	39.5
1990	380,287	100.0	338,842	89.1	41,445	10.9	117,834	100.0	72,456	61.5	45,378	38.5
1991	379,977	100.0	339,397	89.3	40,580	10.7	123,497	100.0	74,568	60.4	48,929	39.6
1992	382,525	100.0	344,126	90.0	38,399	10.0	128,854	100.0	78,651	61.0	50,203	39.0
1993	375,944	100.0	337,817	89.9	38,127	10.1	128,081	100.0	78,885	61.6	49,196	38.4
1994	367,298	100.0	328,463	89.4	38,835	10.6	122,242	100.0	74,596	61.0	47,646	39.0
1995	363,315	100.0	325,489	89.6	37,826	10.4	118,506	100.0	72,215	60.9	46,291	39.1
1996	356,177	100.0	317,772	89.2	38,405	10.8	113,063	100.0	70,129	62.0	42,934	38.0
1997	365,358	100.0	326,458	89.4	38,900	10.6	112,257	100.0	70,447	62.8	41,810	37.2
1998	366,991	100.0	329,657	89.8	37,334	10.2	110,355	100.0	69,519	63.0	40,836	37.0
1999	361,485	100.0	323,713	89.6	37,682	10.4	105,006	100.0	67,634	64.4	37,372	35.6
2000	390,803	100.0	353,118	90.4	37,685	9.6	118,257	100.0	81,821	69.2	36,436	30.8
2001	409,557	100.0	367,954	89.8	41,603	10.2	128,764	100.0	87,187	67.7	41,577	32.3
2002	421,178	100.0	383,109	91.0	38,069	9.0	140,240	100.0	97,752	69.7	42,488	30.3

SOURCE: Engineering Workforce Commission, *Engineering & Technology Enrollments, Fall 2002* (Washington, DC: American Association of Engineering Societies, annual series).

Science &amp; Engineering Indicators – 2004

## S&amp;E graduate enrollment, by field, citizenship, and race/ethnicity: Selected years, 1983–2001

Field, citizenship, and race/ethnicity	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
All S&E graduate enrollment										
S&E .....	346,952	357,968	373,199	382,603	412,547	435,703	422,438	407,597	411,257	429,492
Natural sciences .....	90,485	92,422	93,718	95,982	100,825	107,341	107,795	102,697	101,889	102,655
Physical sciences .....	29,463	30,987	32,741	33,629	34,724	35,328	33,399	31,105	30,691	30,988
Earth, atmospheric, and ocean sciences .....	15,443	15,414	14,357	13,630	14,466	15,721	15,716	14,548	14,083	13,841
Biological sciences .....	45,579	46,021	46,620	48,723	51,635	56,292	58,680	57,044	57,115	57,826
Mathematics/computer sciences .....	40,691	47,332	50,559	51,729	54,633	56,213	51,962	52,710	58,817	68,859
Mathematics .....	17,358	17,563	18,508	19,247	19,952	20,000	18,504	16,719	16,257	16,663
Computer sciences .....	23,333	29,769	32,051	32,482	34,681	36,213	33,458	35,991	42,560	52,196
Agricultural sciences .....	12,402	11,534	11,088	11,168	11,476	11,950	12,422	11,852	11,988	11,911
Social/behavioral sciences .....	112,228	110,662	113,851	119,659	132,078	143,327	143,058	139,190	136,872	136,561
Psychology .....	40,905	40,721	42,612	45,528	51,343	54,557	53,641	53,126	51,864	50,798
Social sciences .....	71,323	69,941	71,239	74,131	80,735	88,770	89,417	86,064	85,008	85,763
Engineering .....	91,146	96,018	103,983	104,065	113,535	116,872	107,201	101,148	101,691	109,506
U.S. citizen/permanent resident										
S&E .....	276,749	281,178	284,436	284,538	303,940	330,037	323,935	308,636	301,367	296,194
Natural sciences .....	75,023	74,764	72,249	70,877	72,734	79,205	81,249	78,141	77,019	75,516
Physical sciences .....	21,838	22,045	22,113	21,856	21,999	23,076	21,990	20,210	19,559	18,995
Earth, atmospheric, and ocean sciences .....	13,597	13,549	12,167	11,055	11,569	12,713	12,769	12,033	11,563	11,080
Biological sciences .....	39,588	39,170	37,969	37,966	39,166	43,416	46,490	45,898	45,897	45,441
Mathematics/computer sciences .....	30,285	34,490	35,653	35,352	36,375	38,170	35,358	34,249	35,735	36,640
Mathematics .....	12,405	12,218	12,379	12,564	13,318	13,866	12,695	11,175	10,330	10,193
Computer sciences .....	17,880	22,272	23,274	22,788	23,057	24,304	22,663	23,074	25,405	26,447
Agricultural sciences .....	9,650	8,887	8,186	8,232	8,281	8,829	9,343	9,146	9,514	9,408
Social/behavioral sciences .....	98,142	95,850	97,754	102,712	114,369	126,256	126,268	122,458	118,911	117,034
Psychology .....	39,472	39,229	41,073	43,897	49,355	52,676	51,554	51,118	49,625	48,285
Social sciences .....	58,670	56,621	56,681	58,815	65,014	73,580	74,714	71,340	69,286	68,749
Engineering .....	63,649	67,187	70,594	67,365	72,181	77,577	71,717	64,642	60,188	57,596
White										
S&E .....	224,604	223,566	228,704	229,568	243,505	256,755	245,831	227,975	216,785	205,757
Natural sciences .....	65,549	64,024	61,577	60,720	61,900	64,678	65,194	61,129	59,461	57,129
Physical sciences .....	18,656	18,328	18,099	18,329	18,414	18,591	17,486	15,767	15,037	14,235
Earth, atmospheric, and ocean sciences .....	12,238	11,756	10,912	10,126	10,519	11,076	11,245	10,402	10,007	9,583
Biological sciences .....	34,655	33,940	32,566	32,265	32,967	35,011	36,463	34,960	34,417	33,311
Mathematics/computer sciences .....	23,802	25,511	26,806	26,560	26,984	27,376	24,427	22,413	22,082	22,425
Mathematics .....	10,259	9,787	9,650	10,064	10,457	10,572	9,654	8,351	7,659	7,386
Computer sciences .....	13,543	15,724	17,156	16,496	16,527	16,804	14,773	14,062	14,423	15,039
Agricultural sciences .....	8,722	7,863	7,418	7,284	7,464	7,772	8,040	7,797	8,176	7,894
Social/behavioral sciences .....	77,905	76,009	79,085	83,501	92,419	99,514	96,239	90,543	85,003	79,989
Psychology .....	32,716	32,757	34,785	37,227	40,990	42,662	40,146	38,724	36,350	33,558
Social sciences .....	45,189	43,252	44,300	46,274	51,429	56,852	56,093	51,819	48,653	46,431
Engineering .....	48,626	50,159	53,818	51,503	54,738	57,415	51,931	46,093	42,063	38,320



**S&E graduate enrollment, by field, citizenship, and race/ethnicity: Selected years, 1983–2001**

Field, citizenship, and race/ethnicity	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Asian/Pacific Islander</b>										
S&E.....	9,387	11,996	14,559	15,678	18,124	24,047	25,901	26,012	27,575	27,659
Natural sciences.....	2,276	2,572	2,871	3,354	4,031	5,879	6,498	6,541	6,550	6,683
Physical sciences.....	785	937	1,047	1,175	1,429	1,973	1,780	1,638	1,682	1,612
Earth, atmospheric, and ocean sciences.....	240	194	179	207	267	462	419	417	400	352
Biological sciences.....	1,251	1,441	1,645	1,972	2,335	3,444	4,299	4,486	4,468	4,719
Mathematics/computer sciences.....	1,666	2,491	3,235	3,430	3,729	4,577	5,164	5,677	7,158	6,713
Mathematics.....	564	623	769	703	866	1,020	1,121	1,051	1,002	997
Computer sciences.....	1,102	1,868	2,466	2,727	2,863	3,557	4,043	4,626	6,156	5,716
Agricultural sciences.....	142	138	168	227	225	271	280	302	306	258
Social/behavioral sciences.....	1,897	1,990	2,435	2,647	3,028	4,324	4,941	5,359	5,400	5,403
Psychology.....	531	559	727	817	1,040	1,470	1,598	1,909	2,043	2,165
Social sciences.....	1,366	1,431	1,708	1,830	1,988	2,854	3,343	3,450	3,357	3,238
Engineering.....	3,406	4,805	5,850	6,020	7,111	8,996	9,018	8,133	8,161	8,602
<b>Black</b>										
S&E.....	10,941	10,450	10,424	11,773	13,682	17,111	18,285	19,341	20,330	21,773
Natural sciences.....	1,850	1,844	1,682	1,938	2,148	2,799	2,994	3,318	3,360	3,475
Physical sciences.....	575	535	536	633	700	844	897	952	903	879
Earth, atmospheric, and ocean sciences.....	114	127	93	95	140	223	215	203	213	227
Biological sciences.....	1,161	1,182	1,053	1,210	1,308	1,732	1,882	2,163	2,244	2,369
Mathematics/computer sciences.....	971	1,031	1,210	1,311	1,617	1,877	1,844	1,957	2,095	2,317
Mathematics.....	403	409	441	463	524	710	689	657	594	591
Computer sciences.....	568	622	769	848	1,093	1,167	1,155	1,300	1,501	1,726
Agricultural sciences.....	129	137	133	153	145	237	297	230	277	301
Social/behavioral sciences.....	6,613	6,051	5,983	6,755	7,747	9,637	10,293	10,957	11,633	12,759
Psychology.....	1,880	1,790	1,794	2,061	2,455	3,284	3,359	3,644	3,787	4,621
Social sciences.....	4,733	4,261	4,189	4,694	5,292	6,353	6,934	7,313	7,846	8,138
Engineering.....	1,378	1,387	1,416	1,616	2,025	2,561	2,857	2,879	2,965	2,921
<b>Hispanic</b>										
S&E.....	8,810	8,613	8,822	9,433	11,040	13,380	14,112	14,984	16,533	17,983
Natural sciences.....	1,694	1,771	1,849	2,087	2,268	2,765	2,921	3,171	3,481	3,631
Physical sciences.....	563	599	591	681	649	747	731	782	895	896
Earth, atmospheric, and ocean sciences.....	224	238	227	208	250	370	365	399	400	397
Biological sciences.....	907	934	1,031	1,198	1,369	1,648	1,825	1,990	2,186	2,338
Mathematics/computer sciences.....	615	750	817	847	980	1,110	1,064	1,150	1,319	1,399
Mathematics.....	330	262	266	305	349	415	400	427	447	498
Computer sciences.....	285	488	551	542	631	695	664	723	872	901
Agricultural sciences.....	225	321	221	297	279	308	289	408	417	422
Social/behavioral sciences.....	4,835	4,290	4,205	4,495	5,389	6,501	7,030	7,443	8,392	9,333
Psychology.....	1,814	1,611	1,665	1,751	2,365	2,562	2,799	3,075	3,575	4,323
Social sciences.....	3,021	2,679	2,540	2,744	3,024	3,939	4,231	4,368	4,817	5,010
Engineering.....	1,441	1,481	1,730	1,707	2,124	2,696	2,808	2,812	2,924	3,198

**S&E graduate enrollment, by field, citizenship, and race/ethnicity: Selected years, 1983–2001**

Field, citizenship, and race/ethnicity	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>American Indian/Alaskan Native</b>										
S&E.....	911	737	782	860	1,120	1,309	1,516	1,599	1,556	1,687
Natural sciences.....	190	146	154	155	220	283	333	349	318	356
Physical sciences.....	45	35	46	44	62	81	76	70	69	81
Earth, atmospheric, and ocean sciences.....	27	23	18	26	29	45	52	82	63	70
Biological sciences.....	118	88	90	85	129	157	205	197	186	205
Mathematics/computer sciences.....	53	79	76	74	63	102	126	103	105	126
Mathematics.....	31	22	48	34	20	32	70	43	30	38
Computer sciences.....	22	57	28	40	43	70	56	60	75	88
Agricultural sciences.....	34	22	29	25	31	35	60	62	68	57
Social/behavioral sciences.....	454	368	400	484	622	680	767	846	823	921
Psychology.....	135	135	152	180	252	289	330	341	303	336
Social sciences.....	319	233	248	304	370	391	437	505	520	585
Engineering.....	180	122	123	122	184	209	230	239	242	227
<b>Unknown race/ethnicity</b>										
S&E.....	22,096	25,816	21,145	17,226	16,469	17,435	18,290	18,725	18,588	21,335
Natural sciences.....	3,464	4,407	4,116	2,623	2,167	2,801	3,309	3,633	3,849	4,242
Physical sciences.....	1,214	1,611	1,794	994	745	840	1,020	1,001	973	1,292
Earth, atmospheric, and ocean sciences.....	754	1,211	738	393	364	537	473	530	480	451
Biological sciences.....	1,496	1,585	1,584	1,236	1,058	1,424	1,816	2,102	2,396	2,499
Mathematics/computer sciences.....	3,178	4,628	3,509	3,130	3,002	3,128	2,733	2,949	2,976	3,660
Mathematics.....	818	1,115	1,205	995	1,102	1,117	761	646	598	683
Computer sciences.....	2,360	3,513	2,304	2,135	1,900	2,011	1,972	2,303	2,378	2,977
Agricultural sciences.....	398	406	217	246	137	206	377	347	270	476
Social/behavioral sciences.....	6,438	7,142	5,646	4,830	5,164	5,600	6,998	7,310	7,660	8,629
Psychology.....	2,396	2,377	1,950	1,861	2,253	2,409	3,322	3,425	3,567	3,282
Social sciences.....	4,042	4,765	3,696	2,969	2,911	3,191	3,676	3,885	4,093	5,347
Engineering.....	8,618	9,233	7,657	6,397	5,999	5,700	4,873	4,486	3,833	4,328
<b>Foreign citizen<sup>a</sup></b>										
S&E.....	70,203	76,790	88,763	98,065	108,607	105,666	98,503	98,961	109,890	133,298
Natural sciences.....	15,462	17,658	21,469	25,105	28,091	28,136	26,546	24,556	24,870	27,139
Physical sciences.....	7,625	8,942	10,628	11,773	12,725	12,252	11,409	10,895	11,132	11,993
Earth, atmospheric, and ocean sciences.....	1,846	1,865	2,190	2,575	2,897	3,008	2,947	2,515	2,520	2,761
Biological sciences.....	5,991	6,851	8,651	10,757	12,469	12,876	12,190	11,146	11,218	12,385
Mathematics/computer sciences.....	10,406	12,842	14,906	16,377	18,258	18,043	16,604	18,461	23,082	32,219
Mathematics.....	4,953	5,345	6,129	6,683	6,634	6,134	5,809	5,544	5,927	6,470
Computer sciences.....	5,453	7,497	8,777	9,694	11,624	11,909	10,795	12,917	17,155	25,749
Agricultural sciences.....	2,752	2,647	2,902	2,936	3,195	3,121	3,079	2,706	2,474	2,503
Social/behavioral sciences.....	14,086	14,812	16,097	16,947	17,709	17,071	16,790	16,732	17,961	19,527
Psychology.....	1,433	1,492	1,539	1,631	1,988	1,881	2,087	2,008	2,239	2,513
Social sciences.....	12,653	13,320	14,558	15,316	15,721	15,190	14,703	14,724	15,722	17,014
Engineering.....	27,497	28,831	33,389	36,700	41,354	39,295	35,484	36,506	41,503	51,910

<sup>a</sup>Includes temporary residents only.SOURCE: National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 2-13

## S&amp;E graduate enrollment, by field and sex: Selected years, 1975–2001

Field and sex	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Both sexes</b>														
S&E.....	302,981	311,689	319,030	331,964	346,952	357,968	373,199	382,603	412,547	435,703	422,438	407,597	411,257	429,492
Natural sciences.....	84,737	89,492	88,569	88,185	90,485	92,422	93,718	95,982	100,825	107,341	107,795	102,697	101,889	102,655
Physical sciences.....	26,310	26,864	26,701	27,360	29,463	30,987	32,741	33,629	34,724	35,328	33,399	31,105	30,691	30,988
Earth, atmospheric, and ocean sciences.....	12,079	13,446	13,731	14,263	15,443	15,414	14,357	13,630	14,466	15,721	15,716	14,548	14,083	13,841
Biological sciences.....	46,348	49,182	48,137	46,562	45,579	46,021	46,620	48,723	51,635	56,292	58,680	57,044	57,115	57,826
Mathematics/computer sciences.....	25,307	25,160	26,721	32,318	40,691	47,332	50,559	51,729	54,633	56,213	51,962	52,710	58,817	68,859
Mathematics.....	16,892	16,052	15,031	15,881	17,358	17,563	18,508	19,247	19,952	20,000	18,504	16,719	16,257	16,663
Computer sciences.....	8,415	9,108	11,690	16,437	23,333	29,769	32,051	32,482	34,681	36,213	33,458	35,991	42,560	52,196
Agricultural sciences.....	10,641	11,605	12,160	12,325	12,402	11,534	11,088	11,168	11,476	11,950	12,422	11,852	11,988	11,911
Social/behavioral sciences.....	113,964	116,675	119,772	119,551	112,228	110,662	113,851	119,659	132,078	143,327	143,058	139,190	136,872	136,561
Psychology.....	36,191	38,617	39,766	40,666	40,905	40,721	42,612	45,528	51,343	54,557	53,641	53,126	51,864	50,798
Social sciences.....	77,773	78,058	80,006	78,885	71,323	69,941	71,239	74,131	80,735	88,770	89,417	86,064	85,008	85,763
Engineering.....	68,332	68,757	71,808	79,585	91,146	96,018	103,983	104,065	113,535	116,872	107,201	101,148	101,691	109,506
<b>Male</b>														
S&E.....	NA	233,775	229,763	232,140	240,459	247,368	256,058	256,754	271,744	279,178	262,248	245,608	242,832	251,848
Natural sciences.....	NA	66,460	63,321	61,135	61,382	62,122	62,431	62,128	63,715	66,112	64,425	59,816	57,576	56,335
Physical sciences.....	NA	22,823	22,206	22,349	23,580	24,478	25,624	25,824	26,156	26,122	24,314	22,257	21,776	21,656
Earth, atmospheric, and ocean sciences.....	NA	11,169	10,846	10,847	11,548	11,489	10,581	9,776	10,015	10,695	10,282	9,132	8,358	7,949
Biological sciences.....	NA	32,468	30,269	27,939	26,254	26,155	26,226	26,528	27,544	29,295	29,829	28,427	27,442	26,730
Mathematics/computer sciences.....	NA	19,482	20,376	23,628	28,877	34,417	36,948	37,756	40,045	41,144	37,571	36,961	40,204	47,288
Mathematics.....	NA	11,933	11,009	11,400	12,158	12,209	12,912	13,262	13,654	13,362	12,246	10,851	10,214	10,386
Computer sciences.....	NA	7,549	9,367	12,228	16,719	22,208	24,036	24,494	26,391	27,782	25,325	26,110	29,990	36,902
Agricultural sciences.....	NA	9,504	9,506	9,258	9,265	8,546	8,144	8,031	7,912	7,837	7,963	7,291	7,078	6,709
Social/behavioral sciences.....	NA	73,278	70,639	66,035	59,598	57,348	57,523	58,382	62,235	64,901	63,101	59,112	56,170	54,237
Psychology.....	NA	20,518	19,424	17,900	16,648	15,597	15,683	15,673	16,556	16,567	15,877	15,507	14,494	13,215
Social sciences.....	NA	52,760	51,215	48,135	42,950	41,751	41,840	42,709	45,679	48,334	47,224	43,605	41,676	41,022
Engineering.....	NA	65,051	65,921	71,838	81,337	84,935	91,012	90,457	97,837	99,184	89,188	82,428	81,804	87,279
<b>Female</b>														
S&E.....	NA	77,914	89,267	99,824	106,493	110,600	117,141	125,849	140,803	156,525	160,190	161,989	168,425	177,644
Natural sciences.....	NA	23,032	25,248	27,050	29,103	30,300	31,287	33,854	37,110	41,229	43,370	42,881	44,313	46,320
Physical sciences.....	NA	4,041	4,495	5,011	5,883	6,509	7,117	7,805	8,568	9,206	9,085	8,848	8,915	9,332
Earth, atmospheric, and ocean sciences.....	NA	2,277	2,885	3,416	3,895	3,925	3,776	3,854	4,451	5,026	5,434	5,416	5,725	5,892
Biological sciences.....	NA	16,714	17,868	18,623	19,325	19,866	20,394	22,195	24,091	26,997	28,851	28,617	29,673	31,096
Mathematics/computer sciences.....	NA	5,678	6,345	8,690	11,814	12,915	13,611	13,973	14,588	15,069	14,391	15,749	18,613	21,571
Mathematics.....	NA	4,119	4,022	4,481	5,200	5,354	5,596	5,985	6,298	6,638	6,258	5,868	6,043	6,277
Computer sciences.....	NA	1,559	2,323	4,209	6,614	7,561	8,015	7,988	8,290	8,431	8,133	9,881	12,570	15,294
Agricultural sciences.....	NA	2,101	2,654	2,821	3,137	2,988	2,944	3,137	3,564	4,113	4,459	4,561	4,910	5,202
Social/behavioral sciences.....	NA	43,397	49,133	53,516	52,630	53,314	56,328	61,277	69,843	78,426	79,957	80,078	80,702	82,324
Psychology.....	NA	18,099	20,342	22,766	24,257	25,124	26,929	29,855	34,787	37,990	37,764	37,619	37,370	37,583
Social sciences.....	NA	25,298	28,791	30,750	28,373	28,190	29,399	31,422	35,056	40,436	42,193	42,459	43,332	44,741
Engineering.....	NA	3,706	5,887	7,747	9,809	11,083	12,971	13,608	15,698	17,688	18,013	18,720	19,887	22,227

NA not available

SOURCE: National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

## Foreign graduate student enrollment in U.S. universities for top 10 places of origin, by year and field: 1987–99

Place of origin	Foreign students <sup>a</sup>	Foreign graduate students <sup>a</sup>	Field							
			S&E	Social sciences	Physical/life sciences	Mathematics/computer sciences	Agricultural sciences	Engineering	Other sciences	Non-S&E
1987	Number		Percent distribution							
All locations.....	356,187	156,366	NA	NA	NA	NA	NA	NA	NA	NA
Top 10 locations.....	168,190	94,160	NA	NA	NA	NA	NA	NA	NA	NA
China.....	25,170	20,388	81.0	9.0	31.1	12.9	2.9	21.3	3.8	19.0
Japan.....	18,050	4,260	NA	NA	NA	NA	NA	NA	NA	NA
South Korea.....	20,520	14,939	67.3	15.9	14.5	8.8	2.9	21.1	4.1	32.7
India.....	21,010	15,547	75.4	6.8	13.6	12.8	1.6	37.5	3.1	24.6
Taiwan.....	26,660	20,875	NA	NA	NA	n/a	NA	NA	NA	NA
Canada.....	15,690	5,915	45.4	14.7	12.0	2.9	2.5	6.7	6.6	54.6
Thailand.....	6,430	3,620	NA	NA	NA	NA	NA	NA	NA	NA
Indonesia.....	9,010	2,586	NA	NA	NA	NA	NA	NA	NA	NA
Malaysia.....	19,480	4,149	50.1	11.8	5.7	13.3	4.0	12.4	2.9	49.9
Mexico.....	6,170	1,882	67.3	14.8	15.2	8.1	11.0	14.8	3.4	32.7
Other locations.....	187,997	62,206	NA	NA	NA	NA	NA	NA	NA	NA
1989	Number		Percent distribution							
All locations.....	386,851	172,536	NA	NA	NA	NA	NA	NA	NA	NA
Top 10 locations.....	196,680	110,287	NA	NA	NA	NA	NA	NA	NA	NA
China.....	33,390	27,614	81.7	8.1	33.0	13.5	2.8	21.0	3.3	18.3
Japan.....	29,840	5,819	44.1	19.6	5.5	3.1	1.5	7.4	7.0	55.9
South Korea.....	21,710	15,132	67.6	14.0	15.6	9.0	2.4	21.9	4.7	32.4
India.....	26,240	19,811	77.3	6.1	12.2	16.3	1.6	38.7	2.4	22.7
Taiwan.....	30,960	23,622	71.5	5.6	12.1	16.5	2.6	29.8	4.9	28.5
Canada.....	17,870	6,934	41.5	13.8	10.9	2.7	1.7	6.5	5.9	58.5
Thailand.....	6,630	3,633	NA	NA	NA	NA	NA	NA	NA	NA
Indonesia.....	9,390	3,071	NA	NA	NA	NA	NA	NA	NA	NA
Malaysia.....	14,110	2,709	NA	NA	NA	NA	NA	NA	NA	NA
Mexico.....	6,540	1,942	63.9	11.9	17.3	7.4	8.7	15.5	3.1	36.1
Other locations.....	190,171	62,249	NA	NA	NA	NA	NA	NA	NA	NA
1991	Number		Percent distribution							
All locations.....	419,585	197,625	NA	NA	NA	NA	NA	NA	NA	NA
Top 10 locations.....	233,870	125,769	NA	NA	NA	NA	NA	NA	NA	NA
China.....	42,940	34,824	81.5	7.7	33.2	12.0	3.0	22.6	3.0	18.5
Japan.....	40,700	7,082	43.6	18.2	5.5	2.7	1.3	7.7	8.2	56.4
South Korea.....	25,720	14,738	63.0	12.7	14.5	7.9	2.7	20.7	4.5	37.0
India.....	32,530	25,536	78.8	4.7	10.4	16.9	1.6	43.2	2.0	21.2
Taiwan.....	35,550	24,138	64.3	5.7	12.2	12.5	2.3	26.5	5.1	35.7
Canada.....	19,190	8,041	37.3	13.4	9.5	2.2	1.6	5.9	4.7	62.7
Thailand.....	7,690	4,176	40.4	10.4	3.9	6.6	2.7	11.4	5.4	59.6
Indonesia.....	10,250	2,860	52.9	10.5	6.7	6.1	8.0	18.0	3.6	47.1
Malaysia.....	12,650	2,226	55.1	10.9	6.9	8.2	3.6	21.0	4.5	44.9
Mexico.....	6,650	2,148	68.1	11.3	15.5	8.0	10.4	19.9	3.0	31.9
Other locations.....	185,715	71,856	NA	NA	NA	NA	NA	NA	NA	NA

## Foreign graduate student enrollment in U.S. universities for top 10 places of origin, by year and field: 1987-99

Place of origin	Foreign students <sup>a</sup>	Foreign graduate students <sup>a</sup>	Field							
			S&E	Social sciences	Physical/life sciences	Mathematics/computer sciences	Agricultural sciences	Engineering	Other sciences	Non-S&E
1993	Number		Percent distribution							
All locations.....	449,749	201,038	NA	NA	NA	NA	NA	NA	NA	NA
Top 10 locations.....	257,279	134,474	NA	NA	NA	NA	NA	NA	NA	NA
China.....	44,381	36,370	79.7	6.3	31.5	12.0	2.8	23.9	3.2	20.3
Japan.....	43,770	7,755	43.7	17.3	6.0	3.2	1.5	8.0	7.7	56.3
South Korea.....	31,076	15,785	59.8	12.5	14.5	7.4	2.2	18.3	4.9	40.2
India.....	34,796	27,533	79.5	4.5	10.1	17.0	1.6	43.8	2.5	20.5
Taiwan.....	37,581	24,623	61.0	5.4	10.0	11.4	1.9	27.0	5.3	39.0
Canada.....	22,655	8,455	39.9	13.6	9.4	2.5	1.5	6.2	6.7	60.1
Thailand.....	9,537	5,621	35.4	6.4	4.2	5.8	1.8	13.2	4.0	64.6
Indonesia.....	11,744	3,399	54.2	10.7	7.2	4.7	5.3	21.7	4.6	45.8
Malaysia.....	13,718	2,078	57.8	12.9	7.9	8.1	1.8	21.8	5.3	42.2
Mexico.....	8,021	2,855	63.5	12.8	12.0	7.6	8.1	16.9	6.1	36.5
Other locations.....	192,470	66,564	NA	NA	NA	NA	NA	NA	NA	NA
1995	Number		Percent distribution							
All locations.....	453,787	194,221	NA	NA	NA	NA	NA	NA	NA	NA
Top 10 locations.....	256,512	122,044	NA	NA	NA	NA	NA	NA	NA	NA
China.....	39,613	32,512	79.7	5.9	28.3	13.1	4.3	24.9	3.2	20.3
Japan.....	45,531	7,819	50.3	24.7	5.0	3.4	2.3	7.4	7.5	49.7
South Korea.....	36,231	15,045	58.7	11.2	11.8	7.0	3.3	18.7	6.7	41.3
India.....	31,743	23,593	79.5	4.2	10.4	17.7	2.8	41.3	3.1	20.5
Taiwan.....	32,702	18,904	58.0	6.7	8.6	10.1	3.4	24.2	5.0	42.0
Canada.....	23,005	8,851	39.1	15.5	7.6	1.5	2.3	4.6	7.6	60.9
Thailand.....	12,165	7,347	41.3	5.6	3.8	5.2	3.8	19.5	3.4	58.7
Indonesia.....	12,820	2,947	52.9	10.6	3.9	6.5	6.3	22.0	3.6	47.1
Malaysia.....	14,015	1,956	56.7	11.6	6.6	11.0	2.0	20.1	5.4	43.3
Mexico.....	8,687	3,070	67.4	14.7	11.6	7.1	9.8	19.3	4.9	32.6
Other locations.....	197,275	72,177	NA	NA	NA	NA	NA	NA	NA	NA
1997	Number		Percent distribution							
All locations.....	481,280	211,282	NA	NA	NA	NA	NA	NA	NA	NA
Top 10 locations.....	276,173	137,850	NA	NA	NA	NA	NA	NA	NA	NA
China.....	46,958	39,204	78.3	5.3	24.7	16.1	3.1	25.6	3.5	21.7
Japan.....	47,073	8,852	49.9	23.6	4.9	3.9	1.4	6.5	9.6	50.1
South Korea.....	42,890	18,961	54.1	10.2	9.0	6.9	2.2	18.0	7.8	45.9
India.....	33,818	25,128	76.9	4.1	9.2	17.9	1.5	41.6	2.6	23.1
Taiwan.....	30,855	17,141	51.5	6.5	7.8	10.4	1.5	19.6	5.7	48.5
Canada.....	22,051	9,408	41.8	13.7	9.7	2.3	1.5	6.7	7.9	58.2
Thailand.....	15,090	9,785	42.4	7.3	4.6	4.8	2.1	18.0	5.6	57.6
Indonesia.....	13,282	3,489	43.4	7.2	2.7	3.8	2.7	22.3	4.7	56.6
Malaysia.....	14,597	2,185	56.8	8.4	7.1	6.9	3.5	24.3	6.6	43.2
Mexico.....	9,559	3,697	63.1	12.6	9.0	5.1	10.6	19.8	6.0	36.9
Other locations.....	205,107	73,432	NA	NA	NA	NA	NA	NA	NA	NA

## Foreign graduate student enrollment in U.S. universities for top 10 places of origin, by year and field: 1987–99

Place of origin	Foreign students <sup>a</sup>	Foreign graduate students <sup>a</sup>	Field							
			S&E	Social sciences	Physical/life sciences	Mathematics/computer sciences	Agricultural sciences	Engineering	Other sciences	Non-S&E
1999	Number		Percent distribution							
All locations .....	514,723	225,383	NA	NA	NA	NA	NA	NA	NA	NA
Top 10 locations .....	279,608	144,256	NA	NA	NA	NA	NA	NA	NA	NA
China .....	54,466	44,127	NA	NA	NA	NA	NA	NA	NA	NA
Japan .....	46,872	8,897	NA	NA	NA	NA	NA	NA	NA	NA
South Korea .....	41,191	20,085	NA	NA	NA	NA	NA	NA	NA	NA
India .....	42,337	30,533	NA	NA	NA	NA	NA	NA	NA	NA
Taiwan .....	29,234	14,891	NA	NA	NA	NA	NA	NA	NA	NA
Canada .....	23,544	10,133	NA	NA	NA	NA	NA	NA	NA	NA
Thailand .....	10,983	6,872	NA	NA	NA	NA	NA	NA	NA	NA
Indonesia .....	11,300	2,708	NA	NA	NA	NA	NA	NA	NA	NA
Malaysia .....	9,074	1,984	NA	NA	NA	NA	NA	NA	NA	NA
Mexico .....	10,607	4,026	NA	NA	NA	NA	NA	NA	NA	NA
Other locations .....	235,115	81,127	NA	NA	NA	NA	NA	NA	NA	NA

NA not available

<sup>a</sup>Includes temporary residents only.

NOTES: Field-of-study data are collected biennially in fall of academic year. Student counts other than total foreign student enrollment are imputed from data reported by institutions. A large discrepancy exists between academic level figures reported by country and those provided by U.S. institutions for foreign students. Discrepancy results from differential response rates to nationality question and academic level question.

SOURCE: Institute of International Education, Annual Census of Foreign Students, special tabulations, 2001.

Science &amp; Engineering Indicators – 2004

## Full-time S&amp;E graduate students, by source and mechanism of primary support: 1980–2001

Source	All mechanisms		Research assistantship		Fellowship		Traineeship		Teaching assistantship		Other		Self-support <sup>a</sup>	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>All sources</b>														
1980 .....	238,416	100.0	51,566	21.6	20,515	8.6	17,545	7.4	53,889	22.6	19,444	8.2	75,457	31.6
1981 .....	242,049	100.0	52,711	21.8	20,095	8.3	16,771	6.9	55,745	23.0	20,205	8.3	76,522	31.6
1982 .....	244,757	100.0	52,580	21.5	20,855	8.5	14,637	6.0	58,334	23.8	20,455	8.4	77,896	31.8
1983 .....	252,017	100.0	54,904	21.8	21,342	8.5	13,512	5.4	60,071	23.8	20,955	8.3	81,233	32.2
1984 .....	253,922	100.0	57,735	22.7	21,624	8.5	13,465	5.3	61,256	24.1	20,692	8.1	79,150	31.2
1985 .....	257,287	100.0	60,995	23.7	22,540	8.8	13,665	5.3	61,822	24.0	20,635	8.0	77,630	30.2
1986 .....	266,168	100.0	66,010	24.8	22,954	8.6	13,526	5.1	62,552	23.5	22,246	8.4	78,880	29.6
1987 .....	271,056	100.0	70,214	25.9	21,953	8.1	14,096	5.2	62,847	23.2	22,166	8.2	79,780	29.4
1988 .....	275,127	100.0	74,588	27.1	22,353	8.1	14,397	5.2	63,053	22.9	21,576	7.8	79,160	28.8
1989 .....	282,648	100.0	79,045	28.0	23,450	8.3	14,524	5.1	64,296	22.7	21,082	7.5	80,251	28.4
1990 .....	292,782	100.0	80,746	27.6	25,254	8.6	15,198	5.2	64,950	22.2	22,250	7.6	84,384	28.8
1991 .....	307,010	100.0	85,175	27.7	26,695	8.7	15,403	5.0	65,214	21.2	22,940	7.5	91,583	29.8
1992 .....	322,555	100.0	88,030	27.3	28,627	8.9	15,361	4.8	65,702	20.4	23,536	7.3	101,299	31.4
1993 .....	329,644	100.0	90,154	27.3	29,132	8.8	15,445	4.7	67,290	20.4	21,347	6.5	106,276	32.2
1994 .....	332,088	100.0	92,008	27.7	28,892	8.7	15,681	4.7	66,844	20.1	21,628	6.5	107,035	32.2
1995 .....	329,283	100.0	89,946	27.3	28,887	8.8	15,943	4.8	65,976	20.0	21,844	6.6	106,687	32.4
1996 .....	328,536	100.0	87,694	26.7	28,862	8.8	15,481	4.7	65,756	20.0	21,268	6.5	109,475	33.3
1997 .....	327,289	100.0	88,001	26.9	28,956	8.8	14,488	4.4	65,425	20.0	21,678	6.6	108,741	33.2
1998 .....	327,389	100.0	88,097	26.9	29,106	8.9	14,946	4.6	65,173	19.9	21,843	6.7	108,224	33.1
1999 .....	334,421	100.0	91,261	27.3	30,093	9.0	14,694	4.4	66,286	19.8	22,678	6.8	109,409	32.7
2000 .....	342,079	100.0	94,288	27.6	31,259	9.1	14,178	4.1	66,455	19.4	22,689	6.6	113,210	33.1
2001 .....	355,115	100.0	99,724	28.1	32,176	9.1	14,155	4.0	67,992	19.1	23,884	6.7	117,184	33.0
<b>Federal</b>														
1980 .....	52,959	100.0	29,316	55.4	4,628	8.7	13,303	25.1	662	1.3	5,050	9.5	NA	NA
1981 .....	50,896	100.0	29,144	57.3	4,093	8.0	12,172	23.9	619	1.2	4,868	9.6	NA	NA
1982 .....	47,403	100.0	28,313	59.7	4,092	8.6	10,074	21.3	428	0.9	4,496	9.5	NA	NA
1983 .....	47,752	100.0	29,152	61.0	4,108	8.6	9,112	19.1	498	1.0	4,882	10.2	NA	NA
1984 .....	47,784	100.0	29,463	61.7	4,116	8.6	8,970	18.8	400	0.8	4,835	10.1	NA	NA
1985 .....	49,051	100.0	30,433	62.0	4,416	9.0	8,954	18.3	549	1.1	4,699	9.6	NA	NA
1986 .....	51,361	100.0	32,739	63.7	4,596	8.9	8,688	16.9	495	1.0	4,843	9.4	NA	NA
1987 .....	53,538	100.0	34,996	65.4	4,445	8.3	8,922	16.7	444	0.8	4,731	8.8	NA	NA
1988 .....	55,489	100.0	36,752	66.2	4,566	8.2	8,664	15.6	504	0.9	5,003	9.0	NA	NA
1989 .....	57,433	100.0	38,555	67.1	5,166	9.0	8,682	15.1	490	0.9	4,540	7.9	NA	NA
1990 .....	59,258	100.0	38,504	65.0	6,314	10.7	9,228	15.6	609	1.0	4,603	7.8	NA	NA

Appendix table 2-15

**Full-time S&E graduate students, by source and mechanism of primary support: 1980–2001**

Source	All mechanisms		Research assistantship		Fellowship		Traineeship		Teaching assistantship		Other		Self-support <sup>a</sup>	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1991 .....	63,000	100.0	40,790	64.7	7,445	11.8	9,616	15.3	476	0.8	4,673	7.4	NA	NA
1992 .....	65,607	100.0	42,586	64.9	7,757	11.8	10,040	15.3	643	1.0	4,581	7.0	NA	NA
1993 .....	67,673	100.0	44,502	65.8	7,510	11.1	10,174	15.0	846	1.3	4,641	6.9	NA	NA
1994 .....	68,550	100.0	45,621	66.6	6,939	10.1	10,407	15.2	780	1.1	4,803	7.0	NA	NA
1995 .....	67,294	100.0	44,597	66.3	6,914	10.3	10,234	15.2	739	1.1	4,810	7.1	NA	NA
1996 .....	65,240	100.0	43,370	66.5	7,044	10.8	9,869	15.1	843	1.3	4,114	6.3	NA	NA
1997 .....	64,522	100.0	43,328	67.2	7,074	11.0	9,291	14.4	908	1.4	3,921	6.1	NA	NA
1998 .....	63,759	100.0	41,826	65.6	7,033	11.0	9,658	15.1	1,120	1.8	4,122	6.5	NA	NA
1999 .....	65,809	100.0	43,057	65.4	7,337	11.1	9,712	14.8	997	1.5	4,706	7.2	NA	NA
2000 .....	67,606	100.0	44,620	66.0	7,471	11.1	9,522	14.1	1,373	2.0	4,620	6.8	NA	NA
2001 .....	68,719	100.0	46,078	67.1	7,373	10.7	9,525	13.9	1,089	1.6	4,654	6.8	NA	NA
<b>Non-Federal</b>														
1980 .....	110,000	100.0	22,250	20.2	15,887	14.4	4,242	3.9	53,227	48.4	14,394	13.1	NA	NA
1981 .....	114,631	100.0	23,567	20.6	16,002	14.0	4,599	4.0	55,126	48.1	15,337	13.4	NA	NA
1982 .....	119,458	100.0	24,267	20.3	16,763	14.0	4,563	3.8	57,906	48.5	15,959	13.4	NA	NA
1983 .....	123,032	100.0	25,752	20.9	17,234	14.0	4,400	3.6	59,573	48.4	16,073	13.1	NA	NA
1984 .....	126,988	100.0	28,272	22.3	17,508	13.8	4,495	3.5	60,856	47.9	15,857	12.5	NA	NA
1985 .....	130,606	100.0	30,562	23.4	18,124	13.9	4,711	3.6	61,273	46.9	15,936	12.2	NA	NA
1986 .....	135,927	100.0	33,271	24.5	18,358	13.5	4,838	3.6	62,057	45.7	17,403	12.8	NA	NA
1987 .....	137,738	100.0	35,218	25.6	17,508	12.7	5,174	3.8	62,403	45.3	17,435	12.7	NA	NA
1988 .....	140,478	100.0	37,836	26.9	17,787	12.7	5,733	4.1	62,549	44.5	16,573	11.8	NA	NA
1989 .....	144,964	100.0	40,490	27.9	18,284	12.6	5,842	4.0	63,806	44.0	16,542	11.4	NA	NA
1990 .....	149,140	100.0	42,242	28.3	18,940	12.7	5,970	4.0	64,341	43.1	17,647	11.8	NA	NA
1991 .....	152,427	100.0	44,385	29.1	19,250	12.6	5,787	3.8	64,738	42.5	18,267	12.0	NA	NA
1992 .....	155,649	100.0	45,444	29.2	20,870	13.4	5,321	3.4	65,059	41.8	18,955	12.2	NA	NA
1993 .....	155,695	100.0	45,652	29.3	21,622	13.9	5,271	3.4	66,444	42.7	16,706	10.7	NA	NA
1994 .....	156,503	100.0	46,387	29.6	21,953	14.0	5,274	3.4	66,064	42.2	16,825	10.8	NA	NA
1995 .....	155,302	100.0	45,349	29.2	21,973	14.1	5,709	3.7	65,237	42.0	17,034	11.0	NA	NA
1996 .....	153,821	100.0	44,324	28.8	21,818	14.2	5,612	3.6	64,913	42.2	17,154	11.2	NA	NA
1997 .....	154,026	100.0	44,673	29.0	21,882	14.2	5,197	3.4	64,517	41.9	17,757	11.5	NA	NA
1998 .....	155,406	100.0	46,271	29.8	22,073	14.2	5,288	3.4	64,053	41.2	17,721	11.4	NA	NA
1999 .....	159,203	100.0	48,204	30.3	22,756	14.3	4,982	3.1	65,289	41.0	17,972	11.3	NA	NA
2000 .....	161,263	100.0	49,668	30.8	23,788	14.8	4,656	2.9	65,082	40.4	18,069	11.2	NA	NA
2001 .....	169,212	100.0	53,646	31.7	24,803	14.7	4,630	2.7	66,903	39.5	19,230	11.4	NA	NA

NA not available

<sup>a</sup>Self-support includes any loans (including Federal loans) or support from personal or family financial contributions.

NOTES: S&E includes health fields (i.e., medical sciences and other life sciences). These fields are reported separately in the National Science Foundation, Division of Science Resources Statistics (NSF/SRS), Graduate Students and Postdoctorates in Science and Engineering, annual series.

SOURCE: NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.



Appendix table 2-16

## Full-time S&amp;E graduate students, by field and mechanism of primary support: 2001

Field	All mechanisms		Research assistantship		Fellowship		Traineeship		Teaching assistantship		Other		Self-support <sup>a</sup>	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All surveyed fields.....	355,115	100.0	99,724	28.1	32,176	9.1	14,155	4.0	67,992	19.1	23,884	6.7	117,184	33.0
S&E.....	304,476	100.0	93,510	30.7	29,600	9.7	9,198	3.0	64,692	21.2	18,714	6.1	88,762	29.2
Natural sciences.....	85,984	100.0	35,402	41.2	9,643	11.2	5,490	6.4	21,817	25.4	3,502	4.1	10,130	11.8
Physical sciences.....	27,129	100.0	11,787	43.4	2,370	8.7	457	1.7	10,536	38.8	564	2.1	1,415	5.2
Astronomy.....	860	100.0	431	50.1	148	17.2	34	4.0	213	24.8	12	1.4	22	2.6
Chemistry.....	16,012	100.0	6,732	42.0	1,400	8.7	263	1.6	6,596	41.2	305	1.9	716	4.5
Physics.....	10,023	100.0	4,536	45.3	819	8.2	160	1.6	3,710	37.0	240	2.4	558	5.6
Other, NEC.....	234	100.0	88	37.6	3	1.3	0	0.0	17	7.3	7	3.0	119	50.9
Biological sciences.....	48,351	100.0	19,442	40.2	6,208	12.8	4,936	10.2	8,720	18.0	2,344	4.8	6,701	13.9
Earth, atmospheric, and ocean sciences....	10,504	100.0	4,173	39.7	1,065	10.1	97	0.9	2,561	24.4	594	5.7	2,014	19.2
Atmospheric sciences.....	812	100.0	499	61.5	52	6.4	0	0.0	151	18.6	42	5.2	68	8.4
Geosciences.....	5,222	100.0	1,808	34.6	619	11.9	36	0.7	1,842	35.3	228	4.4	689	13.2
Oceanography.....	2,058	100.0	1,135	55.2	223	10.8	4	0.2	219	10.6	126	6.1	351	17.1
Other, NEC.....	2,412	100.0	731	30.3	171	7.1	57	2.4	349	14.5	198	8.2	906	37.6
Mathematics/computer sciences.....	42,596	100.0	7,905	18.6	2,441	5.7	353	0.8	11,985	28.1	2,944	6.9	16,968	39.8
Mathematics.....	12,498	100.0	1,428	11.4	1,397	11.2	105	0.8	6,871	55.0	687	5.5	2,010	16.1
Computer sciences.....	30,098	100.0	6,477	21.5	1,044	3.5	248	0.8	5,114	17.0	2,257	7.5	14,958	49.7
Agricultural sciences.....	9,202	100.0	5,298	57.6	493	5.4	79	0.9	1,155	12.6	398	4.3	1,779	19.3
Social/behavioral sciences.....	89,122	100.0	12,708	14.3	10,553	11.8	2,499	2.8	17,961	20.2	7,132	8.0	38,269	42.9
Social sciences.....	54,589	100.0	7,816	14.3	8,242	15.1	1,200	2.2	12,326	22.6	3,663	6.7	21,342	39.1
Anthropology (cultural/social).....	5,577	100.0	532	9.5	1,385	24.8	50	0.9	1,386	24.9	433	7.8	1,791	32.1
Economics (except agricultural).....	9,162	100.0	1,214	13.3	1,646	18.0	134	1.5	2,885	31.5	635	6.9	2,648	28.9
History/philosophy of science.....	400	100.0	27	6.8	118	29.5	6	1.5	117	29.3	29	7.3	103	25.8
Linguistics.....	2,177	100.0	211	9.7	363	16.7	51	2.3	701	32.2	212	9.7	639	29.4
Political science.....	16,672	100.0	1,774	10.6	2,649	15.9	549	3.3	2,674	16.0	1,085	6.5	7,941	47.6
Sociology.....	6,118	100.0	917	15.0	987	16.1	167	2.7	2,114	34.6	319	5.2	1,614	26.4
Other, NEC.....	14,483	100.0	3,141	21.7	1,094	7.6	243	1.7	2,449	16.9	950	6.6	6,606	45.6
Psychology.....	34,533	100.0	4,892	14.2	2,311	6.7	1,299	3.8	5,635	16.3	3,469	10.0	16,927	49.0
Engineering.....	77,572	100.0	32,197	41.5	6,470	8.3	777	1.0	11,774	15.2	4,738	6.1	21,616	27.9
Aerospace.....	2,855	100.0	1,350	47.3	292	10.2	31	1.1	366	12.8	201	7.0	615	21.5
Chemical.....	5,829	100.0	3,154	54.1	760	13.0	53	0.9	850	14.6	211	3.6	801	13.7
Civil.....	12,099	100.0	4,526	37.4	1,033	8.5	156	1.3	1,873	15.5	814	6.7	3,697	30.6
Electrical.....	25,112	100.0	9,595	38.2	1,291	5.1	92	0.4	3,963	15.8	1,418	5.6	8,753	34.9
Industrial.....	6,534	100.0	1,747	26.7	433	6.6	58	0.9	1,042	15.9	698	10.7	2,556	39.1
Mechanical.....	11,436	100.0	5,105	44.6	955	8.4	126	1.1	2,148	18.8	636	5.6	2,466	21.6
Materials.....	3,977	100.0	2,545	64.0	476	12.0	16	0.4	407	10.2	100	2.5	433	10.9
Other, NEC.....	9,730	100.0	4,175	42.9	1,230	12.6	245	2.5	1,125	11.6	660	6.8	2,295	23.6
Health fields.....	50,639	100.0	6,214	12.3	2,576	5.1	4,957	9.8	3,300	6.5	5,170	10.2	28,422	56.1

NEC not elsewhere classified

<sup>a</sup>Self-support includes any loans (including Federal loans) or support from personal or family financial contributions.SOURCE: National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 2-17

**Full-time S&E graduate students primarily supported by Federal Government, by field and mechanism of primary support: 2001**

(Percent)

Field	All mechanisms	Research assistantship	Fellowship	Traineeship	Teaching assistantship	Other
All surveyed fields.....	19.4	46.2	22.9	67.3	1.6	19.5
S&E.....	19.7	46.8	22.2	59.0	1.5	17.9
Natural sciences.....	33.6	58.6	28.8	74.1	2.3	23.6
Physical sciences.....	34.2	67.5	31.4	73.5	1.4	18.6
Astronomy.....	42.2	68.0	32.4	64.7	0.0	0.0
Chemistry.....	32.1	65.7	30.5	79.8	1.1	5.9
Physics.....	37.4	70.8	32.7	65.0	2.0	35.8
Other, NEC.....	12.8	33.0	0.0	0.0	0.0	14.3
Biological sciences.....	34.6	53.3	28.1	74.8	3.6	24.8
Earth, atmospheric, and ocean sciences.....	27.8	57.5	27.0	38.1	2.0	23.6
Atmospheric sciences.....	55.2	79.0	42.3	0.0	5.3	57.1
Geosciences.....	25.0	59.7	26.2	25.0	2.1	7.0
Oceanography.....	41.1	62.1	28.7	100.0	0.5	57.1
Other, NEC.....	13.1	30.4	23.4	42.1	0.6	14.1
Mathematics/computer sciences.....	13.2	52.8	26.6	38.5	0.6	20.2
Mathematics.....	11.1	49.2	30.1	56.2	0.6	24.0
Computer sciences.....	14.1	53.5	21.9	31.0	0.7	19.1
Agricultural sciences.....	21.1	32.8	20.7	21.5	3.2	13.1
Social/behavioral sciences.....	7.4	24.4	13.9	37.7	1.1	11.9
Social sciences.....	6.1	20.2	10.5	19.1	1.2	14.0
Anthropology (cultural/social).....	6.6	15.4	15.0	26.0	1.4	9.9
Economics (except agricultural).....	4.6	14.9	7.5	11.2	0.9	11.8
History and philosophy of science.....	5.8	14.8	15.3	0.0	0.0	3.4
Linguistics.....	6.0	29.4	11.0	27.5	1.1	2.8
Political science.....	4.0	8.8	8.8	4.7	1.6	19.8
Sociology.....	6.9	21.6	8.8	58.7	0.8	6.6
Other, NEC.....	9.0	28.5	14.0	25.9	1.6	15.8
Psychology.....	9.4	31.1	26.3	54.8	0.9	9.8
Engineering.....	22.0	43.7	24.0	34.1	1.2	21.5
Aerospace engineering.....	35.2	56.4	28.8	3.2	3.8	71.6
Chemical.....	28.8	42.8	33.8	58.5	3.2	7.1
Civil.....	15.9	32.7	21.1	11.5	1.2	22.5
Electrical.....	19.7	46.1	19.0	14.1	0.3	17.9
Industrial.....	12.3	28.7	21.7	20.7	3.6	22.6
Mechanical.....	24.1	45.3	31.4	27.8	0.5	15.9
Materials.....	37.1	52.7	24.2	37.5	2.2	7.0
Other, NEC.....	25.1	45.0	19.7	60.8	1.1	24.1
Health fields.....	17.0	36.9	31.7	82.7	3.6	25.3

NEC not elsewhere classified

SOURCE: National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 2-18  
**Full-time S&E graduate students primarily supported by Federal Government, by agency: 1980–2001**

Year	Federal agencies		National Institutes of Health		Department of Health and Human Services		National Science Foundation		Department of Defense		Department of Agriculture <sup>a</sup>		National Aeronautics and Space Administration <sup>b</sup>		Other agencies	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1980 .....	52,959	100.0	11,499	21.7	7,522	14.2	9,348	17.7	5,251	9.9	NA	NA	NA	NA	19,339	36.5
1981 .....	50,896	100.0	11,179	22.0	6,429	12.6	9,143	18.0	5,664	11.1	NA	NA	NA	NA	18,481	36.3
1982 .....	47,403	100.0	10,814	22.8	4,975	10.5	9,257	19.5	5,941	12.5	NA	NA	NA	NA	16,416	34.6
1983 .....	47,752	100.0	10,810	22.6	4,179	8.8	9,524	19.9	6,969	14.6	NA	NA	NA	NA	16,270	34.1
1984 .....	47,784	100.0	10,983	23.0	4,124	8.6	9,848	20.6	7,125	14.9	NA	NA	NA	NA	15,704	32.9
1985 .....	49,051	100.0	11,112	22.7	4,740	9.7	10,180	20.8	7,326	14.9	2,171	4.4	NA	NA	13,522	27.6
1986 .....	51,361	100.0	11,877	23.1	4,500	8.8	10,826	21.1	7,940	15.5	2,328	4.5	NA	NA	13,890	27.0
1987 .....	53,538	100.0	12,944	24.2	4,247	7.9	11,247	21.0	8,795	16.4	2,684	5.0	NA	NA	13,621	25.4
1988 .....	55,489	100.0	13,715	24.7	4,186	7.5	11,634	21.0	9,546	17.2	2,591	4.7	NA	NA	13,817	24.9
1989 .....	57,433	100.0	14,357	25.0	4,335	7.5	11,900	20.7	9,140	15.9	2,728	4.7	NA	NA	14,973	26.1
1990 .....	59,258	100.0	14,996	25.3	4,512	7.6	12,025	20.3	8,868	15.0	2,722	4.6	NA	NA	16,135	27.2
1991 .....	63,000	100.0	16,018	25.4	4,461	7.1	12,666	20.1	9,128	14.5	3,075	4.9	NA	NA	17,652	28.0
1992 .....	65,607	100.0	17,091	26.1	4,321	6.6	13,366	20.4	9,247	14.1	3,216	4.9	NA	NA	18,366	28.0
1993 .....	67,673	100.0	18,135	26.8	3,888	5.7	13,530	20.0	9,750	14.4	3,324	4.9	NA	NA	19,046	28.1
1994 .....	68,550	100.0	18,292	26.7	4,374	6.4	13,990	20.4	9,449	13.8	3,422	5.0	NA	NA	19,023	27.8
1995 .....	67,294	100.0	18,109	26.9	4,666	6.9	13,661	20.3	9,339	13.9	3,254	4.8	NA	NA	18,265	27.1
1996 .....	65,240	100.0	17,929	27.5	4,432	6.8	13,412	20.6	8,802	13.5	3,004	4.6	2,309	3.5	15,352	23.5
1997 .....	64,522	100.0	18,087	28.0	4,443	6.9	13,362	20.7	9,021	14.0	2,646	4.1	2,586	4.0	14,377	22.3
1998 .....	63,759	100.0	18,215	28.6	4,489	7.0	13,459	21.1	8,259	13.0	2,485	3.9	2,646	4.2	14,206	22.3
1999 .....	65,809	100.0	19,001	28.9	4,417	6.7	13,835	21.0	8,037	12.2	2,634	4.0	2,579	3.9	15,306	23.3
2000 .....	67,606	100.0	19,474	28.8	3,993	5.9	14,595	21.6	8,143	12.0	2,630	3.9	2,779	4.1	15,992	23.7
2001 .....	68,719	100.0	19,718	28.7	4,354	6.3	15,448	22.5	7,953	11.6	2,755	4.0	2,811	4.1	15,680	22.8

NA not available

<sup>a</sup>Data reported first in 1985.

<sup>b</sup>Data reported first in 1996.

NOTE: Percents may not sum to 100 because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

Science & Engineering Indicators – 2004

Appendix table 2-19

**Primary mechanisms of support for S&E doctorate recipients, by citizenship, sex, and race/ethnicity: 2001**

Citizenship, sex, and race/ethnicity	All mechanisms		Research assistantships		Fellowships <sup>a</sup>		Traineeships <sup>b</sup>		Teaching assistantships		Other <sup>c</sup>		Personal <sup>d</sup>		Unknown	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Non-U.S. citizen .....	9,574	100.0	4,281	44.7	1,570	16.4	49	0.5	1,629	17.0	749	7.8	701	7.3	595	6.2
Temporary resident.....	8,242	100.0	3,789	46.0	1,312	15.9	28	0.3	1,398	17.0	703	8.5	506	6.1	506	6.1
Permanent resident .....	1,332	100.0	492	36.9	258	19.4	21	1.6	231	17.3	46	3.5	195	14.6	89	6.7
U.S. citizen <sup>e</sup> .....	16,069	100.0	4,086	25.4	3,776	23.5	566	3.5	2,389	14.9	613	3.8	3,937	24.5	702	4.4
Male .....	8,962	100.0	2,682	29.9	2,063	23.0	250	2.8	1,409	15.7	417	4.7	1,750	19.5	391	4.4
Female .....	7,107	100.0	1,404	19.8	1,713	24.1	316	4.4	980	13.8	196	2.8	2,187	30.8	311	4.4
White.....	13,098	100.0	3,438	26.2	2,796	21.3	453	3.5	2,082	15.9	507	3.9	3,305	25.2	517	3.9
Asian/Pacific Islander .....	1,129	100.0	355	31.4	339	30.0	52	4.6	123	10.9	49	4.3	162	14.3	49	4.3
Underrepresented minority <sup>f</sup> .....	1,367	100.0	185	13.5	517	37.8	49	3.6	134	9.8	42	3.1	361	26.4	79	5.8
Unknown.....	475	100.0	108	22.7	124	26.1	12	2.5	50	10.5	15	3.2	109	22.9	57	12.0
Unknown citizenship.....	1,479	100.0	19	1.3	10	0.7	1	0.1	12	0.8	1	0.1	16	1.1	1,420	96.0

<sup>a</sup>Includes fellowships, scholarships, and dissertation grants.

<sup>b</sup>Includes traineeship, internship, and residency.

<sup>c</sup>Includes employer reimbursement or assistance, foreign support, and other sources.

<sup>d</sup>Includes personal savings, other personal earnings in graduate school, other family earnings or savings, and loans.

<sup>e</sup>Includes naturalized citizens.

<sup>f</sup>Includes blacks, Hispanics, and American Indian/Alaskan Natives.

NOTES: S&E includes health fields (i.e., medical and other life sciences). Data are not comparable with data for earlier years because of change in number and definition of support modes used in survey questionnaire in 1998.

SOURCE: National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

## Earned associate's degrees, by field and sex: Selected years, 1985–2000

Field and sex	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	2000
<b>Both sexes</b>													
All fields .....	459,087	440,816	440,375	459,048	486,297	508,704	519,098	546,574	544,094	540,644	546,031	549,191	543,876
S&E.....	26,486	23,130	19,733	19,810	19,352	22,722	23,420	25,581	24,228	24,600	25,771	28,646	33,651
Natural sciences .....	2,298	2,125	2,056	2,300	2,388	2,607	2,891	3,546	3,546	3,823	3,912	3,874	2,913
Physical .....	1,002	1,090	1,029	1,212	1,218	1,086	1,224	1,413	1,459	1,560	1,540	1,518	1,271
Earth, atmospheric, and ocean sciences.....	63	40	28	33	28	143	168	226	186	189	191	180	174
Biological sciences.....	1,233	995	999	1,055	1,142	1,378	1,499	1,907	1,901	2,074	2,181	2,176	1,468
Mathematics/computer sciences.....	13,680	9,953	8,846	8,600	8,640	10,376	10,275	10,634	10,410	10,160	11,425	13,742	19,598
Mathematics.....	790	667	654	760	670	744	743	766	783	759	793	843	670
Computer science.....	12,890	9,286	8,192	7,840	7,970	9,632	9,532	9,868	9,627	9,401	10,632	12,899	18,928
Agricultural sciences.....	2,023	1,569	1,656	1,696	1,724	1,978	1,896	1,938	1,910	1,895	1,865	2,007	1,943
Social/behavioral sciences.....	4,562	4,894	4,440	4,809	4,087	5,046	5,832	6,619	6,077	6,674	6,681	6,916	7,467
Psychology.....	983	1,016	1,113	1,116	997	1,209	1,235	1,756	1,600	1,584	1,606	1,760	1,445
Social sciences.....	3,579	3,878	3,327	3,693	3,090	3,837	4,597	4,863	4,477	5,090	5,075	5,156	6,022
Engineering.....	3,923	4,589	2,735	2,405	2,513	2,715	2,526	2,844	2,285	2,048	1,888	2,107	1,730
Non-S&E.....	432,601	417,686	420,642	439,238	466,945	485,982	495,678	520,993	519,866	516,044	520,260	520,545	510,225
Engineering technologies <sup>a</sup> .....	53,667	49,815	48,342	46,938	45,106	40,592	40,946	42,414	39,190	35,982	35,221	35,163	35,544
<b>Male</b>													
All fields.....	204,325	192,227	187,125	192,433	200,043	208,856	213,263	222,247	219,704	213,090	212,698	215,888	216,156
S&E.....	14,695	13,152	10,607	10,568	10,360	12,063	12,103	13,023	12,461	12,207	12,636	14,605	17,186
Natural sciences.....	1,259	1,111	1,000	1,162	1,159	1,280	1,406	1,715	1,678	1,791	1,648	1,628	1,210
Physical.....	658	663	557	706	679	591	663	783	773	830	733	707	600
Earth, atmospheric, and ocean sciences.....	47	26	20	12	23	116	130	162	148	131	126	128	116
Biological sciences.....	554	422	423	444	457	573	613	770	757	830	789	793	494
Mathematics/computer sciences.....	7,128	5,297	4,563	4,431	4,438	5,187	5,123	5,384	5,434	5,326	6,164	7,627	11,134
Mathematics.....	489	419	415	489	406	464	428	437	438	464	444	490	407
Computer science.....	6,639	4,878	4,148	3,942	4,032	4,723	4,695	4,947	4,996	4,862	5,720	7,137	10,727
Agricultural sciences.....	1,201	1,002	965	1,033	1,119	1,325	1,280	1,233	1,300	1,250	1,196	1,267	1,159
Social/behavioral sciences.....	1,606	1,650	1,671	1,825	1,411	1,911	2,098	2,217	2,071	2,061	2,011	2,299	2,191
Psychology.....	312	294	283	286	257	338	282	433	446	405	376	603	326
Social sciences.....	1,294	1,356	1,388	1,539	1,154	1,573	1,816	1,784	1,625	1,656	1,635	1,696	1,865
Engineering.....	3,501	4,092	2,408	2,117	2,233	2,360	2,196	2,474	1,978	1,779	1,617	1,784	1,492
Non-S&E.....	189,630	179,075	176,518	181,865	189,683	196,793	201,160	209,224	207,243	200,883	200,062	201,283	198,970
Engineering technologies <sup>a</sup> .....	47,946	44,158	42,766	41,435	39,777	35,666	36,129	36,899	34,196	30,947	29,990	29,949	30,079

## Earned associate's degrees, by field and sex: Selected years, 1985–2000

Field and sex	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	2000
Female													
All fields.....	254,762	248,589	253,250	266,615	286,254	299,848	305,835	324,327	324,390	327,554	333,333	333,303	327,720
S&E.....	11,791	9,978	9,126	9,242	8,992	10,659	11,317	12,558	11,767	12,393	13,135	14,041	16,465
Natural sciences.....	1,039	1,014	1,056	1,138	1,229	1,327	1,485	1,831	1,868	2,032	2,264	2,246	1,703
Physical.....	344	427	472	506	539	495	561	630	686	730	807	811	671
Earth, atmospheric, and ocean sciences.....	16	14	8	21	5	27	38	64	38	58	65	52	58
Biological sciences.....	679	573	576	611	685	805	886	1,137	1,144	1,244	1,392	1,383	974
Mathematics/computer sciences.....	6,552	4,656	4,283	4,169	4,202	5,189	5,152	5,250	4,976	4,834	5,261	6,115	8,464
Mathematics.....	301	248	239	271	264	280	315	329	345	295	349	353	263
Computer science.....	6,251	4,408	4,044	3,898	3,938	4,909	4,837	4,921	4,631	4,539	4,912	5,762	8,201
Agricultural sciences.....	822	567	691	663	605	653	616	705	610	645	669	740	784
Social/behavioral sciences.....	2,956	3,244	2,769	2,984	2,676	3,135	3,734	4,402	4,006	4,613	4,670	4,617	5,276
Psychology.....	671	722	830	830	740	871	953	1,323	1,154	1,179	1,230	1,157	1,119
Social sciences.....	2,285	2,522	1,939	2,154	1,936	2,264	2,781	3,079	2,852	3,434	3,440	3,460	4,157
Engineering.....	422	497	327	288	280	355	330	370	307	269	271	323	238
Non-S&E.....	242,971	238,611	244,124	257,373	277,262	289,189	294,518	311,769	312,623	315,161	320,198	319,262	311,255
Engineering technologies <sup>a</sup> .....	5,721	5,657	5,576	5,503	5,329	4,926	4,817	5,515	4,994	5,035	5,231	5,214	5,465

<sup>a</sup>Engineering technologies are more focused on applied skills than on fundamental science and mathematics.

NOTES: Degree data by sex do not precisely match degree data by race/ethnicity in any field. Degree data by sex were collected by U.S. Department of Education (ED), National Center for Education Statistics (NCES), Integrated Postsecondary Education Data System (IPEDS). Data by race/ethnicity were collected biennially by NCES for ED, Office for Civil Rights, from 1977 to 1989 and annually thereafter (except for 1999). For full available data series, see National Science Foundation, Division of Science Resources Statistics (NSF/SRS), WebCASPAR database system.

SOURCES: ED, NCES, IPEDS, Completions Survey, and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

## Earned associate's degrees, by field, race/ethnicity, and citizenship: Selected years, 1985–2000

Field, race/ethnicity, and citizenship	1985	1987	1989	1991	1993	1994	1995	1996	1997	1998	2000
All fields .....	459,087	440,816	440,375	486,297	519,098	546,574	544,094	540,644	546,031	549,191	543,876
S&E.....	25,957	22,167	19,479	19,154	23,118	25,172	24,228	24,600	25,771	28,646	33,651
Natural sciences.....	2,298	2,126	2,059	2,391	2,863	3,546	3,546	3,823	3,912	3,874	2,913
Physical sciences.....	1,065	1,131	1,060	1,249	1,392	1,639	1,459	1,560	1,540	1,518	1,271
Earth, atmospheric, and ocean sciences.....	0	0	0	0	0	0	186	189	191	180	174
Biological sciences.....	1,233	995	999	1,142	1,471	1,907	1,901	2,074	2,181	2,176	1,468
Mathematics/computer sciences.....	13,679	9,953	8,846	8,640	10,255	10,532	10,410	10,160	11,425	13,742	19,598
Mathematics.....	789	667	654	670	743	765	783	759	793	843	670
Computer sciences.....	12,890	9,286	8,192	7,970	9,512	9,767	9,627	9,401	10,632	12,899	18,928
Agricultural sciences.....	2,393	1,824	1,893	2,039	2,227	2,247	1,910	1,895	1,865	2,007	1,943
Social/behavioral sciences.....	3,664	3,676	3,949	3,574	5,248	6,019	6,077	6,674	6,681	6,916	7,467
Psychology.....	983	1,016	1,113	997	1,237	1,756	1,600	1,584	1,606	1,760	1,445
Social sciences.....	2,681	2,660	2,836	2,577	4,011	4,263	4,477	5,090	5,075	5,156	6,022
Engineering.....	3,923	4,588	2,732	2,510	2,525	2,828	2,285	2,048	1,888	2,107	1,730
Non-S&E.....	433,130	418,649	420,896	467,143	495,980	521,402	519,866	516,044	520,260	520,545	510,225
Engineering technologies <sup>a</sup> .....	51,579	47,434	46,180	42,595	38,473	39,889	39,190	35,982	35,221	35,163	35,544
U.S. citizen/permanent resident											
All fields.....	452,661	436,331	434,406	479,320	510,074	536,405	534,183	530,622	535,432	537,146	533,982
S&E.....	25,341	21,759	19,018	18,786	22,481	24,465	23,524	23,862	25,012	27,693	32,827
Natural sciences.....	2,258	2,057	1,985	2,339	2,758	3,434	3,390	3,677	3,740	3,717	2,830
Physical sciences.....	1,045	1,097	1,021	1,219	1,325	1,583	1,382	1,477	1,448	1,443	1,216
Earth, atmospheric, and ocean sciences.....	0	0	0	0	0	0	184	186	189	180	173
Biological sciences.....	1,213	960	964	1,120	1,433	1,851	1,824	2,014	2,103	2,094	1,441
Mathematics/computer sciences.....	13,366	9,776	8,641	8,469	9,971	10,250	10,111	9,868	11,119	13,358	19,099
Mathematics.....	750	655	636	654	696	726	744	711	749	794	637
Computer sciences.....	12,616	9,121	8,005	7,815	9,275	9,524	9,367	9,157	10,370	12,564	18,462
Agricultural sciences.....	2,359	1,812	1,870	2,018	2,194	2,202	1,892	1,877	1,846	1,956	1,920
Social/behavioral sciences.....	3,591	3,646	3,873	3,518	5,111	5,840	5,923	6,462	6,486	6,688	7,316
Psychology.....	969	1,008	1,086	989	1,220	1,732	1,581	1,552	1,567	1,702	1,423
Social sciences.....	2,622	2,638	2,787	2,529	3,891	4,108	4,342	4,910	4,919	4,986	5,893
Engineering.....	3,767	4,468	2,649	2,442	2,447	2,739	2,208	1,978	1,821	1,974	1,662
Non-S&E.....	427,320	414,572	415,388	460,534	487,593	511,940	510,659	506,760	510,420	509,453	501,155
Engineering technologies <sup>a</sup> .....	50,899	46,859	45,647	42,069	38,093	39,475	38,764	35,631	34,761	34,435	35,215
White											
All fields.....	355,422	345,546	330,557	376,869	392,637	419,962	408,126	403,072	400,307	396,735	380,777
S&E.....	18,133	16,169	13,898	13,842	15,631	17,809	16,392	16,333	16,835	18,415	20,982
Natural sciences.....	1,410	1,507	1,526	1,727	1,972	2,534	2,377	2,539	2,469	2,411	1,879
Physical sciences.....	734	917	841	968	995	1,230	1,024	1,018	999	952	799
Earth, atmospheric, and ocean sciences.....	0	0	0	0	0	0	156	165	160	155	150
Biological sciences.....	676	590	685	759	977	1,304	1,197	1,356	1,310	1,304	930
Mathematics/computer sciences.....	10,255	7,360	6,044	6,054	6,515	7,133	6,950	6,709	7,544	8,974	12,200
Mathematics.....	525	481	461	477	509	497	479	439	492	501	379
Computer sciences.....	9,730	6,879	5,583	5,577	6,006	6,636	6,471	6,270	7,052	8,473	11,821

## Earned associate's degrees, by field, race/ethnicity, and citizenship: Selected years, 1985–2000

Field, race/ethnicity, and citizenship	1985	1987	1989	1991	1993	1994	1995	1996	1997	1998	2000
Agricultural sciences.....	2,138	1,571	1,705	1,847	2,017	1,959	1,633	1,696	1,680	1,768	1,718
Social/behavioral sciences.....	2,070	2,496	2,637	2,347	3,241	4,050	3,774	3,887	3,779	3,824	4,059
Psychology.....	680	781	845	738	894	1,321	1,146	1,094	1,087	1,068	952
Social sciences.....	1,390	1,715	1,792	1,609	2,347	2,729	2,628	2,793	2,692	2,756	3,107
Engineering.....	2,260	3,235	1,986	1,867	1,886	2,133	1,658	1,502	1,363	1,438	1,126
Non-S&E.....	337,289	329,377	316,659	363,027	377,006	402,153	391,734	386,739	383,472	378,320	359,795
Engineering technologies <sup>a</sup> .....	40,934	37,383	33,584	33,792	28,442	31,457	29,646	27,506	26,522	26,208	25,643
Asian/Pacific Islander											
All fields.....	10,165	11,329	11,761	15,069	16,280	18,555	20,976	22,630	23,882	23,909	25,654
S&E.....	828	1,051	834	842	1,108	1,283	1,392	1,525	1,700	1,884	2,384
Natural sciences.....	82	102	114	212	222	294	319	381	444	421	255
Physical sciences.....	51	43	62	86	76	122	124	163	176	170	145
Earth, atmospheric, and ocean sciences.....	0	0	0	0	0	0	5	2	4	3	1
Biological sciences.....	31	59	52	126	146	172	190	216	264	248	109
Mathematics/computer sciences.....	511	464	401	388	528	566	606	620	748	920	1,471
Mathematics.....	63	69	65	65	69	77	93	104	87	100	90
Computer sciences.....	448	395	336	323	459	489	513	516	661	820	1,381
Agricultural sciences.....	4	10	6	8	6	10	10	4	4	8	19
Social/behavioral sciences.....	47	106	119	88	216	229	305	374	356	369	479
Psychology.....	8	19	14	24	33	37	57	57	63	53	51
Social sciences.....	39	87	105	64	183	192	248	317	293	316	428
Engineering.....	184	369	194	146	136	184	152	146	148	166	160
Non-S&E.....	9,337	10,278	10,927	14,227	15,172	17,272	19,584	21,105	22,182	22,025	23,270
Engineering technologies <sup>a</sup> .....	1,570	1,989	1,663	1,496	1,358	1,258	1,458	1,464	1,586	1,521	1,752
Black											
All fields.....	35,861	33,858	32,185	37,854	41,260	45,597	45,923	49,245	51,588	52,957	55,154
S&E.....	1,653	1,766	1,460	1,631	1,963	2,069	2,307	2,411	2,577	2,856	3,856
Natural sciences.....	141	171	108	135	163	186	250	226	245	281	235
Physical sciences.....	48	71	45	78	70	90	93	101	96	112	85
Earth, atmospheric, and ocean sciences.....	0	0	0	0	0	0	10	11	9	14	13
Biological sciences.....	93	100	63	57	93	96	147	114	140	155	137
Mathematics/computer sciences.....	938	961	828	921	1,004	1,120	1,091	1,140	1,219	1,564	2,481
Mathematics.....	24	38	25	27	26	39	45	36	37	33	36
Computer sciences.....	914	923	803	894	978	1,081	1,046	1,104	1,182	1,531	2,445
Agricultural sciences.....	19	27	17	14	15	20	23	18	11	9	18
Social/behavioral sciences.....	407	358	387	435	580	564	795	893	971	893	999
Psychology.....	65	73	83	103	109	149	126	147	125	111	135
Social sciences.....	342	285	304	332	471	415	669	746	846	782	864
Engineering.....	148	249	120	126	201	179	148	134	131	109	123
Non-S&E.....	34,208	32,092	30,725	36,223	39,297	43,528	43,616	46,834	49,011	50,101	51,298
Engineering technologies <sup>a</sup> .....	3,395	3,100	2,829	3,030	2,698	3,197	3,015	2,989	2,982	3,156	3,321



## Earned associate's degrees, by field, race/ethnicity, and citizenship: Selected years, 1985–2000

Field, race/ethnicity, and citizenship	1985	1987	1989	1991	1993	1994	1995	1996	1997	1998	2000
<b>Hispanic</b>											
All fields .....	22,783	22,804	23,475	29,019	33,015	35,557	38,499	39,115	42,784	45,452	50,488
S&E.....	1,380	1,635	1,453	1,463	2,152	2,329	2,498	2,542	2,773	3,103	3,868
Natural sciences .....	195	190	122	175	212	295	288	330	386	411	290
Physical sciences .....	60	37	34	45	52	92	70	106	102	119	106
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	10	3	8	3	1
Biological sciences .....	135	153	88	130	160	203	208	221	276	289	183
Mathematics/computer sciences .....	676	620	609	677	1,086	1,074	1,134	1,036	1,175	1,419	2,130
Mathematics.....	38	39	47	55	67	85	99	108	110	120	97
Computer sciences.....	638	581	562	622	1,019	989	1,035	928	1,065	1,299	2,033
Agricultural sciences.....	53	91	114	57	88	109	136	89	75	85	77
Social/behavioral sciences.....	330	365	432	401	613	703	779	955	1,025	992	1,193
Psychology .....	43	64	123	88	141	154	193	179	209	180	192
Social sciences.....	287	301	309	313	472	549	586	776	816	812	1,001
Engineering .....	126	369	176	153	153	148	161	132	112	196	178
Non-S&E .....	21,403	21,169	22,022	27,556	30,863	33,228	36,001	36,573	40,011	42,349	46,620
Engineering technologies <sup>a</sup> .....	2,084	2,359	2,232	2,411	2,398	2,478	2,777	2,742	2,728	2,621	3,283
<b>American Indian/Alaskan Native</b>											
All fields .....	2,953	3,049	3,102	3,772	4,213	4,879	5,352	5,221	5,520	6,161	5,697
S&E.....	163	195	182	257	315	419	419	466	455	500	525
Natural sciences .....	16	21	21	29	32	56	63	68	67	70	50
Physical sciences .....	8	4	2	7	7	20	22	26	20	30	13
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	0	0	1	3	0
Biological sciences .....	8	17	19	22	25	36	40	42	46	37	37
Mathematics/computer sciences .....	56	49	67	91	116	116	124	138	122	161	195
Mathematics.....	4	4	9	13	15	11	13	9	2	13	7
Computer sciences.....	52	45	58	78	101	105	111	129	120	148	188
Agricultural sciences.....	29	28	23	37	41	69	54	42	54	64	67
Social/behavioral sciences.....	51	70	59	79	118	160	156	207	187	183	196
Psychology .....	11	16	13	16	18	38	35	42	38	37	38
Social sciences.....	40	54	46	63	100	122	121	165	149	146	158
Engineering .....	11	27	12	21	8	18	22	11	25	22	17
Non-S&E .....	2,790	2,854	2,920	3,515	3,898	4,460	4,933	4,755	5,065	5,661	5,172
Engineering technologies <sup>a</sup> .....	267	219	257	232	210	263	286	269	236	286	273

Appendix table 2-21

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## Earned associate's degrees, by field, race/ethnicity, and citizenship: Selected years, 1985–2000

Field, race/ethnicity, and citizenship	1985	1987	1989	1991	1993	1994	1995	1996	1997	1998	2000
Other/unknown race/ethnicity											
All fields .....	25,477	19,745	33,326	16,737	22,669	11,855	15,307	11,339	11,351	11,932	16,212
S&E.....	3,184	943	1,191	751	1,312	556	516	585	672	935	1,212
Natural sciences .....	414	66	94	61	157	69	93	133	129	123	121
Physical sciences .....	144	25	37	35	125	29	49	63	55	60	68
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	2	5	7	2	8
Biological sciences .....	270	41	57	26	32	40	42	65	67	61	45
Mathematics/computer sciences .....	930	322	692	338	722	241	206	225	311	320	622
Mathematics.....	96	24	29	17	10	17	15	15	21	27	28
Computer sciences.....	834	298	663	321	712	224	191	210	290	293	594
Agricultural sciences.....	116	85	5	55	27	35	36	28	22	22	21
Social/behavioral sciences.....	686	251	239	168	343	134	114	146	168	427	390
Psychology .....	162	55	8	20	25	33	24	33	45	253	55
Social sciences.....	524	196	231	148	318	101	90	113	123	174	335
Engineering .....	1,038	219	161	129	63	77	67	53	42	43	58
Non-S&E .....	22,293	18,802	32,135	15,986	21,357	11,299	14,791	10,754	10,679	10,997	15,000
Engineering technologies <sup>a</sup> .....	2,649	1,809	5,082	1,108	2,987	822	1,582	661	707	643	943
Foreign citizen <sup>b</sup>											
All fields .....	6,426	4,485	5,969	6,977	9,024	10,169	9,911	10,022	10,599	12,045	9,894
S&E.....	616	408	461	368	637	707	704	738	759	953	824
Natural sciences .....	40	69	74	52	105	112	156	146	172	157	83
Physical sciences.....	20	34	39	30	67	56	77	83	92	75	55
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	2	3	2	0	1
Biological sciences .....	20	35	35	22	38	56	77	60	78	82	27
Mathematics/computer sciences.....	313	177	205	171	284	282	299	292	306	384	499
Mathematics.....	39	12	18	16	47	39	39	48	44	49	33
Computer sciences .....	274	165	187	155	237	243	260	244	262	335	466
Agricultural sciences.....	34	12	23	21	33	45	18	18	19	51	23
Social/behavioral sciences.....	73	30	76	56	137	179	154	212	195	228	151
Psychology .....	14	8	27	8	17	24	19	32	39	58	22
Social sciences.....	59	22	49	48	120	155	135	180	156	170	129
Engineering.....	156	120	83	68	78	89	77	70	67	133	68
Non-S&E .....	5,810	4,077	5,508	6,609	8,387	9,462	9,207	9,284	9,840	11,092	9,070
Engineering technologies <sup>a</sup> .....	680	575	533	526	380	414	426	351	460	728	329

<sup>a</sup>Engineering technologies are more focused on applied skills than on fundamental science and mathematics.<sup>b</sup>Includes temporary residents only.

NOTES: Degree data by sex do not precisely match degree data by race/ethnicity in any field. Degree data by sex were collected by U.S. Department of Education (ED), National Center for Education Statistics (NCES), Integrated Postsecondary Education Data System (IPEDS). Data by race/ethnicity were collected biennially by NCES for ED, Office for Civil Rights, from 1977 to 1989 and annually thereafter (except for 1999). For full available data series, see National Science Foundation, Division of Science Resources Statistics (NSF/SRS), WebCASPAR database system.

SOURCES: ED, NCES, and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

## Earned bachelor's degrees, by field and sex: Selected years, 1977–2000

Field and sex	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1996	1997	1998	2000
<b>Both sexes</b>														
All fields .....	928,228	931,340	946,877	980,679	990,877	1,003,532	1,030,171	1,107,997	1,179,278	1,174,436	1,179,815	1,186,589	1,199,579	1,253,121
S&E.....	303,798	303,162	306,792	317,571	332,273	331,526	322,821	337,675	366,035	378,148	384,674	388,482	390,618	398,622
Natural sciences .....	76,783	72,915	68,186	64,378	63,251	59,200	54,278	56,757	65,680	76,265	81,934	84,869	86,706	83,531
Physical sciences.....	16,937	17,257	17,446	16,197	16,270	15,464	14,148	13,678	14,188	14,897	15,396	15,264	15,273	14,580
Earth, atmospheric, and ocean sciences .....	5,653	6,082	6,694	7,298	7,576	6,689	3,181	2,728	3,503	4,478	4,457	4,466	4,321	4,047
Biological sciences.....	54,193	49,576	44,046	40,883	39,405	39,047	36,949	40,351	47,989	56,890	62,081	65,139	67,112	64,904
Mathematics/computer sciences.....	20,729	20,670	26,406	37,344	54,510	56,442	46,277	40,194	39,433	38,620	37,621	38,116	39,768	49,123
Mathematics.....	14,303	11,901	11,173	12,662	15,389	16,515	15,314	14,784	14,853	13,851	13,076	12,723	12,094	11,735
Computer sciences .....	6,426	8,769	15,233	24,682	39,121	39,927	30,963	25,410	24,580	24,769	24,545	25,393	27,674	37,388
Agricultural sciences.....	16,396	17,205	15,876	14,528	11,907	9,524	8,582	8,432	11,632	14,580	16,388	17,361	17,967	18,244
Social/behavioral sciences .....	148,533	138,903	132,607	128,651	125,033	131,935	146,737	170,105	186,585	185,312	185,617	185,784	185,263	188,188
Psychology.....	47,794	43,012	41,364	40,825	40,237	43,195	48,954	58,893	67,251	72,601	73,828	74,734	74,457	74,654
Social sciences .....	100,739	95,891	91,243	87,826	84,796	88,740	97,783	111,212	119,334	112,711	111,789	111,050	110,806	113,534
Engineering.....	41,357	53,469	63,717	72,670	77,572	74,425	66,947	62,187	62,705	63,371	63,114	62,352	60,914	59,536
Chemical.....	3,986	6,442	7,639	8,550	8,941	6,114	4,187	3,728	4,899	6,391	6,708	6,977	6,721	6,219
Civil .....	8,898	10,583	11,331	10,747	9,730	8,746	8,015	8,083	9,788	11,329	12,053	12,010	11,522	9,596
Electrical.....	10,018	12,440	15,040	19,205	23,668	26,791	24,318	21,520	19,598	17,579	16,667	16,434	16,322	17,672
Industrial.....	2,264	2,804	3,878	3,824	4,009	4,313	4,121	3,820	3,584	3,519	3,727	3,997	3,988	3,937
Mechanical .....	7,927	10,360	13,573	16,031	17,200	15,723	15,217	14,263	14,708	15,141	14,509	13,806	13,363	13,109
Other .....	8,264	10,840	12,256	14,313	14,024	12,738	11,089	10,773	10,128	9,412	9,450	9,128	8,998	9,003
Non-S&E .....	624,430	628,178	640,085	663,108	658,604	672,006	707,350	770,322	813,243	796,288	795,141	798,107	808,961	854,499
Engineering technologies <sup>a</sup> .....	9,864	10,906	13,567	18,602	20,476	20,577	20,098	18,294	17,022	16,607	16,228	14,631	14,825	15,238
<b>Male</b>														
All fields .....	499,121	481,394	474,336	483,395	486,660	485,003	487,566	508,952	537,536	531,146	528,000	525,282	525,714	536,158
S&E.....	198,805	193,247	190,977	194,380	203,402	199,981	189,338	189,328	200,315	202,217	203,341	201,471	200,221	197,669
Natural sciences .....	52,513	47,524	42,625	38,962	37,584	34,460	30,452	30,914	35,022	39,531	41,882	42,179	42,012	37,966
Physical sciences.....	13,560	13,358	13,137	11,586	11,434	10,792	9,777	9,253	9,424	9,605	9,694	9,382	9,279	8,590
Earth, atmospheric, and ocean sciences .....	4,479	4,695	5,028	5,450	5,715	3,629	2,380	1,946	2,453	2,954	2,972	2,924	2,722	2,430
Biological sciences .....	34,474	29,471	24,460	21,926	20,435	20,039	18,295	19,715	23,145	26,972	29,216	29,873	30,011	26,946
Mathematics/computer sciences.....	13,241	13,249	16,672	22,802	32,985	34,871	29,682	25,700	25,483	25,066	24,857	25,324	26,670	33,045
Mathematics.....	8,354	6,943	6,392	7,112	8,295	8,833	8,264	7,804	7,854	7,360	7,084	6,834	6,435	6,131
Computer sciences .....	4,887	6,306	10,280	15,690	24,690	26,038	21,418	17,896	17,629	17,706	17,773	18,490	20,235	26,914
Agricultural sciences.....	12,865	12,523	10,805	9,206	7,737	6,129	5,557	5,292	7,294	8,943	9,884	10,094	10,224	9,780
Social/behavioral sciences .....	80,873	71,363	64,221	60,392	58,770	61,500	66,888	74,900	79,792	76,256	74,920	72,992	71,740	69,558
Psychology .....	20,692	16,649	14,447	13,228	12,815	13,399	14,291	16,155	18,029	19,638	19,965	19,491	19,057	17,540
Social sciences .....	60,181	54,714	49,774	47,164	45,955	48,101	52,597	58,745	61,763	56,618	54,955	53,501	52,683	52,018

## Earned bachelor's degrees, by field and sex: Selected years, 1977–2000

Field and sex	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1996	1997	1998	2000
Engineering.....	39,313	48,588	56,654	63,018	66,326	63,021	56,759	52,522	52,724	52,421	51,798	50,882	49,575	47,320
Chemical .....	3,534	5,387	6,274	6,761	6,848	4,574	3,017	2,564	3,335	4,367	4,537	4,701	4,525	4,016
Civil .....	8,413	9,534	10,100	9,263	8,388	7,550	6,841	6,803	8,009	9,031	9,629	9,441	8,946	7,263
Electrical.....	9,750	11,781	13,940	17,283	20,936	23,227	21,130	18,757	17,339	15,409	14,695	14,416	14,310	15,322
Industrial .....	2,115	2,376	3,111	2,824	2,842	2,929	2,860	2,723	2,547	2,493	2,630	2,918	2,968	2,630
Mechanical .....	7,685	9,740	12,422	14,546	15,399	13,996	13,537	12,673	13,076	13,441	12,773	12,171	11,727	11,325
Other .....	7,816	9,770	10,807	12,341	11,913	10,745	9,374	9,002	8,418	7,680	7,534	7,235	7,099	6,764
Non-S&E.....	300,316	288,147	283,359	289,015	283,258	285,022	298,228	319,624	337,221	328,929	324,659	323,811	325,493	338,489
Engineering technologies <sup>a</sup> .....	9,173	9,942	12,034	16,473	18,224	18,429	17,999	16,329	15,114	14,704	14,382	12,925	12,993	13,291
Female														
All fields .....	429,107	449,946	472,541	497,284	504,217	518,529	542,605	599,045	641,742	643,290	651,815	661,307	673,865	716,963
S&E.....	104,993	109,915	115,815	123,191	128,871	131,545	133,483	148,347	165,720	175,931	181,333	187,011	190,397	200,953
Natural sciences .....	24,270	25,391	25,561	25,416	25,667	24,740	23,826	25,843	30,658	36,734	40,052	42,690	44,694	45,565
Physical sciences.....	3,377	3,899	4,309	4,611	4,836	4,672	4,371	4,425	4,764	5,292	5,702	5,882	5,994	5,990
Earth, atmospheric, and ocean sciences .....	1,174	1,387	1,666	1,848	1,861	1,060	801	782	1,050	1,524	1,485	1,542	1,599	1,617
Biological sciences .....	19,719	20,105	19,586	18,957	18,970	19,008	18,654	20,636	24,844	29,918	32,865	35,266	37,101	37,958
Mathematics/computer sciences.....	7,488	7,421	9,734	14,542	21,525	21,571	16,595	14,494	13,950	13,554	12,764	12,792	13,098	16,078
Mathematics.....	5,949	4,958	4,781	5,550	7,094	7,682	7,050	6,980	6,999	6,491	5,992	5,889	5,659	5,604
Computer sciences .....	1,539	2,463	4,953	8,992	14,431	13,889	9,545	7,514	6,951	7,063	6,772	6,903	7,439	10,474
Agricultural sciences.....	3,531	4,682	5,071	5,322	4,170	3,395	3,025	3,140	4,338	5,637	6,504	7,267	7,743	8,464
Social/behavioral sciences.....	67,660	67,540	68,386	68,259	66,263	70,435	79,849	95,205	106,793	109,056	110,697	112,792	113,523	118,630
Psychology .....	27,102	26,363	26,917	27,597	27,422	29,796	34,663	42,738	49,222	52,963	53,863	55,243	55,400	57,114
Social sciences .....	40,558	41,177	41,469	40,662	38,841	40,639	45,186	52,467	57,571	56,093	56,834	57,549	58,123	61,516
Engineering.....	2,044	4,881	7,063	9,652	11,246	11,404	10,188	9,665	9,981	10,950	11,316	11,470	11,339	12,216
Chemical .....	452	1,055	1,365	1,789	2,093	1,540	1,170	1,164	1,564	2,024	2,171	2,276	2,196	2,203
Civil .....	485	1,049	1,231	1,484	1,342	1,196	1,174	1,280	1,779	2,298	2,424	2,569	2,576	2,333
Electrical.....	268	659	1,100	1,922	2,732	3,564	3,188	2,763	2,259	2,170	1,972	2,018	2,012	2,350
Industrial .....	149	428	767	1,000	1,167	1,384	1,261	1,097	1,037	1,026	1,097	1,079	1,020	1,307
Mechanical .....	242	620	1,151	1,485	1,801	1,727	1,680	1,590	1,632	1,700	1,736	1,635	1,636	1,784
Other .....	448	1,070	1,449	1,972	2,111	1,993	1,715	1,771	1,710	1,732	1,916	1,893	1,899	2,239
Non-S&E.....	324,114	340,031	356,726	374,093	375,346	386,984	409,122	450,698	476,022	467,359	470,482	474,296	483,468	516,010
Engineering technologies <sup>a</sup> .....	691	964	31,533	2,129	2,252	2,148	2,099	1,965	1,908	1,903	1,846	1,706	1,832	1,947

<sup>a</sup>Engineering technologies are more focused on applied skills than on fundamental science and mathematics.

NOTES: Degree data by sex do not precisely match degree data by race/ethnicity in any field. Degree data by sex were collected by U.S. Department of Education (ED), National Center for Education Statistics (NCES), Integrated Postsecondary Education Data System (IPEDS). Data by race/ethnicity were collected biennially by NCES for ED, Office for Civil Rights, from 1977 to 1989 and annually thereafter (except for 1999). For full available data series, see National Science Foundation, Division of Science Resources Statistics (NSF/SRS), WebCASPAR database system.

SOURCES: ED, NCES, IPEDS, Completions Survey, and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

## Earned bachelor's degrees, by field, race/ethnicity, and citizenship: Selected years, 1977-2000

Field, race/ethnicity, and citizenship	1977	1979	1981	1985	1987	1989	1991	1993	1995	1997	1998	2000
All fields .....	928,228	931,340	946,877	990,877	1,003,532	1,030,171	1,107,997	1,179,278	1,174,436	1,186,589	1,199,579	1,253,121
S&E .....	337,834	334,632	337,739	342,970	343,070	337,431	356,785	388,435	378,148	388,482	390,618	398,622
Natural sciences.....	76,811	72,939	68,221	63,252	59,202	54,278	56,758	65,568	76,265	84,869	86,706	83,531
Physical sciences.....	22,618	23,363	24,175	23,847	20,155	17,329	16,407	17,691	14,897	15,264	15,273	14,580
Earth, atmospheric, and ocean sciences.....	0	0	0	0	0	0	0	0	4,478	4,466	4,321	4,047
Biological sciences.....	54,193	49,576	44,046	39,405	39,047	36,949	40,351	47,877	56,890	65,139	67,112	64,904
Mathematics/computer sciences.....	20,729	20,670	26,406	54,388	56,442	46,277	40,194	39,347	38,620	38,116	39,768	49,123
Mathematics.....	14,303	11,901	11,173	15,267	16,515	15,314	14,784	14,870	13,851	12,723	12,094	11,735
Computer sciences.....	6,426	8,769	15,233	39,121	39,927	30,963	25,410	24,477	24,769	25,393	27,674	37,388
Agricultural sciences.....	21,531	23,247	22,033	12,418	9,727	8,795	8,643	11,827	14,580	17,361	17,967	18,244
Social/behavioral sciences.....	169,086	154,976	145,684	135,341	143,276	161,134	189,004	209,023	185,312	185,784	185,263	188,188
Psychology.....	47,794	43,012	41,364	40,237	43,195	48,954	58,893	67,251	72,601	74,734	74,457	74,654
Social sciences.....	121,292	111,964	104,320	95,104	100,081	112,180	130,111	141,772	112,711	111,050	110,806	113,534
Engineering.....	49,677	62,800	75,395	77,571	74,423	66,947	62,186	62,670	63,371	62,352	60,914	59,536
Non-S&E.....	590,394	596,708	609,138	647,907	660,462	692,740	751,212	790,843	796,288	798,107	808,961	854,499
Engineering technologies <sup>a</sup> .....	0	0	0	20,533	20,577	20,098	18,294	16,987	16,607	14,631	14,825	15,238
U.S. citizen/permanent resident												
All fields.....	912,484	913,487	924,246	961,619	974,940	1,003,714	1,078,340	1,146,907	1,137,424	1,147,815	1,160,692	1,214,326
S&E.....	329,537	324,834	324,773	328,899	329,393	325,108	344,061	374,633	363,463	373,745	375,909	383,438
Natural sciences.....	75,212	71,357	66,586	61,557	57,705	52,800	55,087	63,587	74,259	82,736	84,608	81,577
Physical sciences.....	22,047	22,668	23,443	23,067	19,520	16,724	15,799	16,927	14,247	14,671	14,680	14,048
Earth, atmospheric, and ocean sciences.....	0	0	0	0	0	0	0	0	4,405	4,388	4,239	4,001
Biological sciences.....	53,165	48,689	43,143	38,490	38,185	36,076	39,288	46,660	55,607	63,677	65,689	63,528
Mathematics/computer sciences.....	20,146	19,929	25,173	51,509	53,209	43,599	37,579	36,591	35,730	35,568	37,178	45,758
Mathematics.....	13,985	11,536	10,717	14,504	15,860	14,771	14,206	14,318	13,258	12,190	11,641	11,256
Computer sciences.....	6,161	8,393	14,456	37,005	37,349	28,828	23,373	22,273	22,472	23,378	25,537	34,502
Agricultural sciences.....	21,088	22,768	21,417	11,981	9,438	8,529	8,373	11,478	14,322	17,108	17,674	17,986
Social/behavioral sciences.....	166,988	152,744	143,165	132,471	140,507	158,305	185,418	204,812	180,591	180,778	180,178	183,114
Psychology.....	47,325	42,567	40,878	39,694	42,701	48,443	58,202	66,421	71,659	73,685	73,287	73,390
Social sciences.....	119,663	110,177	102,287	92,777	97,806	109,862	127,216	138,391	108,932	107,093	106,891	109,724
Engineering.....	46,103	58,036	68,432	71,381	68,534	61,875	57,604	58,165	58,561	57,555	56,271	55,003
Non-S&E.....	582,947	588,653	599,473	632,720	645,547	678,606	734,279	772,274	773,961	774,070	784,783	830,888
Engineering technologies <sup>a</sup> .....	0	0	0	19,256	19,591	19,439	17,582	16,546	16,057	14,074	14,234	14,797
White												
All fields.....	807,857	802,665	807,509	826,356	819,477	840,326	892,363	931,603	892,785	877,759	878,018	895,129
S&E.....	292,802	287,126	284,166	281,394	272,090	266,862	278,190	297,171	275,819	274,800	272,561	270,416
Natural sciences.....	68,112	63,703	58,541	52,359	47,202	42,642	43,409	49,021	55,649	60,307	60,478	57,564
Physical sciences.....	20,417	20,958	21,249	20,541	16,653	14,238	13,145	13,941	10,940	10,934	10,763	10,096
Earth, atmospheric, and ocean sciences.....	0	0	0	0	0	0	0	0	4,012	3,986	3,803	3,561
Biological sciences.....	47,695	42,745	37,292	31,818	30,549	28,404	30,264	35,080	40,697	45,387	45,912	43,907
Mathematics/computer sciences.....	18,110	17,633	22,013	43,484	42,446	33,998	28,998	27,824	26,087	25,278	25,972	30,114
Mathematics.....	12,602	10,229	9,447	12,163	13,265	12,287	11,649	11,669	10,486	9,432	8,903	8,395
Computer sciences.....	5,508	7,404	12,566	31,321	29,181	21,711	17,349	16,155	15,601	15,846	17,069	21,719

## Earned bachelor's degrees, by field, race/ethnicity, and citizenship: Selected years, 1977–2000

Field, race/ethnicity, and citizenship	1977	1979	1981	1985	1987	1989	1991	1993	1995	1997	1998	2000
Agricultural sciences .....	20,196	21,700	20,237	11,233	8,696	7,938	7,704	10,556	12,873	15,246	15,616	15,655
Social/behavioral sciences.....	144,312	131,439	122,519	113,326	117,255	132,203	152,917	164,917	137,444	132,303	129,921	128,016
Psychology .....	41,494	36,648	34,718	33,959	35,761	40,506	48,134	53,763	55,914	55,346	54,225	52,397
Social sciences.....	102,818	94,791	87,801	79,367	81,494	91,697	104,783	111,154	81,530	76,957	75,696	75,619
Engineering .....	42,072	52,651	60,856	60,992	56,491	50,081	45,162	44,853	43,766	41,666	40,574	39,067
Non-S&E.....	515,055	515,539	523,343	544,962	547,387	573,464	614,173	634,432	616,966	602,959	605,457	624,713
Engineering technologies <sup>a</sup> .....	0	0	0	16,673	16,541	16,156	14,279	13,245	12,675	10,988	11,044	10,871
Asian/Pacific Islander												
All fields.....	13,907	15,542	18,908	25,562	31,921	37,573	41,725	50,587	59,295	67,358	69,988	75,265
S&E .....	6,203	7,171	9,145	13,323	16,934	19,138	20,552	24,504	28,604	32,568	34,004	35,553
Natural sciences.....	1,693	1,903	2,092	2,715	3,459	3,829	4,542	6,201	8,392	10,161	10,545	9,585
Physical sciences .....	377	439	599	763	894	922	983	1,098	1,245	1,525	1,584	1,462
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	0	0	102	95	92	98
Biological sciences .....	1,316	1,464	1,493	1,952	2,565	2,907	3,559	5,103	7,045	8,541	8,869	8,025
Mathematics/computer sciences .....	479	587	1,061	2,929	3,489	3,287	2,925	3,160	3,335	3,655	4,054	6,292
Mathematics .....	316	324	392	885	1,034	1,019	915	915	964	852	834	891
Computer sciences.....	163	263	669	2,044	2,455	2,268	2,010	2,245	2,371	2,803	3,220	5,401
Agricultural sciences .....	242	324	314	165	182	144	128	163	282	396	439	454
Social/behavioral sciences.....	2,578	2,499	2,612	3,032	4,214	5,803	6,737	8,573	9,810	11,271	11,964	12,368
Psychology .....	807	781	843	845	1,154	1,575	1,885	2,538	3,331	4,067	4,267	4,188
Social sciences.....	1,771	1,718	1,769	2,187	3,060	4,228	4,852	6,035	6,479	7,204	7,697	8,180
Engineering .....	1,211	1,858	3,066	4,482	5,590	6,075	6,220	6,407	6,785	7,085	7,002	6,854
Non-S&E.....	7,704	8,371	9,763	12,239	14,987	18,435	21,173	26,083	30,691	34,790	35,984	39,712
Engineering technologies <sup>a</sup> .....	0	0	0	542	807	839	768	768	730	474	476	738
Black												
All fields.....	58,700	60,301	60,729	57,563	55,103	56,837	65,009	76,667	85,287	92,067	95,878	104,212
S&E .....	19,552	18,827	18,895	17,040	17,230	17,385	19,987	24,421	26,911	29,825	30,751	32,924
Natural sciences.....	3,107	3,195	3,181	2,877	2,713	2,613	2,864	3,575	4,266	5,234	5,680	5,880
Physical sciences .....	692	704	911	830	823	697	753	836	970	1,053	1,057	1,090
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	0	0	64	57	70	51
Biological sciences .....	2,415	2,491	2,270	2,047	1,890	1,916	2,111	2,739	3,232	4,124	4,553	4,739
Mathematics/computer sciences .....	1,073	1,159	1,371	2,913	3,654	3,249	2,808	3,178	3,475	3,448	3,632	4,402
Mathematics .....	712	652	585	770	834	792	811	965	958	1,016	966	905
Computer sciences.....	361	507	786	2,143	2,820	2,457	1,997	2,213	2,517	2,432	2,666	3,497
Agricultural sciences .....	309	346	380	219	157	143	162	219	253	367	409	450
Social/behavioral sciences.....	13,678	12,352	11,514	8,992	8,391	9,313	11,924	14,872	16,072	17,699	18,011	19,129
Psychology .....	3,221	3,218	3,308	2,667	2,451	2,743	3,688	4,618	5,741	6,647	6,852	7,572
Social sciences.....	10,457	9,134	8,206	6,325	5,940	6,570	8,236	10,254	10,331	11,052	11,159	11,557
Engineering .....	1,385	1,775	2,449	2,039	2,315	2,067	2,229	2,577	2,845	3,077	3,019	3,063
Non-S&E.....	39,148	41,474	41,834	40,523	37,873	39,452	45,022	52,246	58,376	62,242	65,127	71,288
Engineering technologies <sup>a</sup> .....	0	0	0	1,277	1,269	1,208	1,227	1,132	1,321	1,424	1,370	1,431

## Earned bachelor's degrees, by field, race/ethnicity, and citizenship: Selected years, 1977–2000

Field, race/ethnicity, and citizenship	1977	1979	1981	1985	1987	1989	1991	1993	1995	1997	1998	2000
<b>Hispanic</b>												
All fields.....	27,043	29,719	33,167	36,391	38,196	41,361	49,027	57,845	66,691	74,938	78,125	88,324
S&E .....	9,628	10,432	11,312	12,031	12,419	13,327	15,351	18,442	21,359	24,445	25,712	27,984
Natural sciences .....	2,043	2,320	2,568	2,729	2,731	2,653	2,797	3,251	3,901	4,648	5,197	5,456
Physical sciences .....	484	495	617	660	585	563	533	599	716	740	796	883
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	0	0	84	113	118	127
Biological sciences .....	1,559	1,825	1,951	2,069	2,146	2,090	2,264	2,652	3,101	3,795	4,283	4,446
Mathematics/computer sciences .....	435	495	688	1,380	1,696	1,568	1,695	1,566	1,836	1,887	2,077	2,754
Mathematics .....	321	288	275	335	321	373	480	470	522	560	604	599
Computer sciences .....	114	207	413	1,045	1,375	1,195	1,215	1,096	1,314	1,327	1,473	2,155
Agricultural sciences .....	228	314	390	250	233	196	213	217	383	559	631	634
Social/behavioral sciences.....	5,632	5,748	5,846	5,485	5,205	6,349	8,080	10,447	11,588	13,226	13,682	15,065
Psychology .....	1,608	1,737	1,813	1,734	1,702	2,152	2,746	3,587	4,543	5,282	5,509	6,127
Social sciences.....	4,024	4,011	4,033	3,751	3,503	4,197	5,334	6,860	7,045	7,944	8,173	8,938
Engineering .....	1,290	1,555	1,820	2,187	2,554	2,561	2,566	2,961	3,651	4,125	4,125	4,075
Non-S&E.....	17,415	19,287	21,855	24,360	25,777	28,034	33,676	39,403	45,332	50,493	52,413	60,340
Engineering technologies <sup>a</sup> .....	0	0	0	525	664	634	731	853	884	723	739	1,068
<b>American Indian/Alaskan Native</b>												
All fields.....	3,328	3,410	3,593	4,246	3,866	3,967	4,486	5,574	6,454	7,238	7,706	8,431
S&E .....	1,166	1,194	1,206	1,384	1,290	1,238	1,344	1,819	1,995	2,298	2,392	2,611
Natural sciences .....	225	212	202	259	216	207	245	304	383	441	505	487
Physical sciences .....	68	63	65	98	72	62	69	93	72	69	81	65
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	0	0	26	31	25	43
Biological sciences .....	157	149	137	161	144	145	176	211	285	341	399	379
Mathematics/computer sciences .....	41	52	39	198	164	143	123	136	168	156	177	241
Mathematics .....	26	41	18	59	52	53	43	55	58	57	65	69
Computer sciences .....	15	11	21	139	112	90	80	81	110	99	112	172
Agricultural sciences .....	113	84	96	54	43	58	53	64	124	146	151	190
Social/behavioral sciences.....	652	682	674	664	657	653	765	1,139	1,099	1,292	1,305	1,365
Psychology .....	167	177	196	201	180	208	235	335	407	496	515	518
Social sciences.....	485	505	478	463	477	445	530	804	692	796	790	847
Engineering .....	135	164	195	209	210	177	158	176	221	263	254	328
Non-S&E.....	2,162	2,216	2,387	2,862	2,576	2,729	3,142	3,755	4,459	4,940	5,314	5,820
Engineering technologies <sup>a</sup> .....	0	0	0	103	78	105	75	111	115	101	105	109

## Earned bachelor's degrees, by field, race/ethnicity, and citizenship: Selected years, 1977–2000

Field, race/ethnicity, and citizenship	1977	1979	1981	1985	1987	1989	1991	1993	1995	1997	1998	2000
Other/unknown race/ethnicity												
All fields.....	1,649	1,850	340	11,501	26,377	23,650	25,730	24,631	26,912	28,455	30,977	42,965
S&E .....	186	84	49	3,727	9,430	7,158	8,637	8,276	8,775	9,809	10,489	13,950
Natural sciences .....	32	24	2	618	1,384	856	1,230	1,235	1,668	1,945	2,203	2,605
Physical sciences .....	9	9	2	175	493	242	316	360	304	350	399	452
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	0	0	117	106	131	121
Biological sciences .....	23	15	0	443	891	614	914	875	1,247	1,489	1,673	2,032
Mathematics/computer sciences .....	8	3	1	605	1,760	1,354	1,030	727	829	1,144	1,266	1,955
Mathematics .....	8	2	0	292	354	247	308	244	270	273	269	397
Computer sciences .....	0	1	1	313	1,406	1,107	722	483	559	871	997	1,558
Agricultural sciences .....	0	0	0	60	127	50	113	259	407	394	428	603
Social/behavioral sciences .....	136	24	0	972	4,785	3,984	4,995	4,864	4,578	4,987	5,295	7,171
Psychology .....	28	6	0	288	1,453	1,259	1,514	1,580	1,723	1,847	1,919	2,588
Social sciences .....	108	18	0	684	3,332	2,725	3,481	3,284	2,855	3,140	3,376	4,583
Engineering .....	10	33	46	1,472	1,374	914	1,269	1,191	1,293	1,339	1,297	1,616
Non-S&E.....	1,463	1,766	291	7,774	16,947	16,492	17,093	16,355	18,137	18,646	20,488	29,015
Engineering technologies <sup>a</sup> .....	0	0	0	136	232	497	502	437	332	364	500	580
Foreign citizen <sup>b</sup>												
All fields.....	15,744	17,853	22,631	29,258	28,592	26,457	29,657	32,371	37,012	38,774	38,887	38,795
S&E.....	8,297	9,798	12,966	14,071	13,677	12,323	12,724	13,802	14,685	14,737	14,709	15,184
Natural sciences .....	1,599	1,582	1,635	1,695	1,497	1,478	1,671	1,981	2,006	2,133	2,098	1,954
Physical sciences .....	571	695	732	780	635	605	608	764	650	593	593	532
Earth, atmospheric, and ocean sciences .....	0	0	0	0	0	0	0	0	73	78	82	46
Biological sciences .....	1,028	887	903	915	862	873	1,063	1,217	1,283	1,462	1,423	1,376
Mathematics/computer sciences .....	583	741	1,233	2,879	3,233	2,678	2,615	2,756	2,890	2,548	2,590	3,365
Mathematics.....	318	365	456	763	655	543	578	552	593	533	453	479
Computer sciences .....	265	376	777	2,116	2,578	2,135	2,037	2,204	2,297	2,015	2,137	2,886
Agricultural sciences.....	443	479	616	437	289	266	270	349	258	253	293	258
Social/behavioral sciences.....	2,098	2,232	2,519	2,870	2,769	2,829	3,586	4,211	4,721	5,006	5,085	5,074
Psychology .....	469	445	486	543	494	511	691	830	942	1,049	1,170	1,264
Social sciences.....	1,629	1,787	2,033	2,327	2,275	2,318	2,895	3,381	3,779	3,957	3,915	3,810
Engineering .....	3,574	4,764	6,963	6,190	5,889	5,072	4,582	4,505	4,810	4,797	4,643	4,533
Non-S&E.....	7,447	8,055	9,665	15,187	14,915	14,134	16,933	18,569	22,327	24,037	24,178	23,611
Engineering technologies <sup>a</sup> .....	0	0	0	1,277	986	659	712	441	550	557	591	441

<sup>a</sup>Engineering technologies are more focused on applied skills than on fundamental science and mathematics.

<sup>b</sup>Includes temporary residents only.

NOTES: Degree data by sex do not precisely match degree data by race/ethnicity in any field. Degree data by sex were collected by U.S. Department of Education (ED), National Center for Education Statistics (NCES), Integrated Postsecondary Education Data System (IPEDS). Data by race/ethnicity were collected biennially by NCES for ED, Office for Civil Rights, from 1977 to 1989 and annually thereafter (except for 1999). For full available data series, see National Science Foundation, Division of Science Resources Statistics (NSF/SRS), WebCASPAR database system.

SOURCES: ED, NCES, and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.



## Earned master's degrees, by field and sex: Selected years, 1975–2000

Field and sex	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1998	2000
<b>Both sexes</b>														
All fields .....	293,651	318,241	302,075	296,798	290,931	287,213	290,532	311,050	338,498	370,973	399,428	420,954	431,871	456,260
S&E.....	63,198	67,397	64,226	64,366	67,733	70,578	72,603	76,425	78,368	86,425	94,309	93,485	93,918	95,683
Natural sciences .....	12,392	12,454	12,306	11,257	10,985	10,860	10,624	10,648	10,082	10,202	11,219	12,170	11,763	11,182
Physical sciences.....	4,298	3,641	3,650	3,366	3,285	3,605	3,574	3,876	3,777	3,965	4,241	4,141	3,969	3,512
Biological sciences.....	6,591	7,154	6,879	6,015	5,741	5,095	4,999	4,953	4,806	4,840	5,495	6,594	6,368	6,325
Earth, atmospheric, and ocean sciences .....	1,503	1,659	1,777	1,876	1,959	2,160	2,051	1,819	1,499	1,397	1,483	1,435	1,426	1,345
Mathematics/computer sciences.....	6,637	6,496	6,101	6,787	8,177	10,004	11,808	12,829	12,956	14,100	14,495	14,088	15,277	17,824
Mathematics.....	4,338	3,698	3,046	2,569	2,856	2,903	3,327	3,430	3,632	3,751	3,932	3,599	3,525	3,295
Computer sciences .....	2,299	2,798	3,055	4,218	5,321	7,101	8,481	9,399	9,324	10,349	10,563	10,489	11,752	14,529
Agricultural sciences .....	2,439	2,906	3,137	3,092	3,395	3,113	2,776	2,570	2,600	3,272	3,574	3,927	3,862	3,858
Social/behavioral sciences .....	26,563	29,529	27,403	26,779	26,290	25,629	25,325	26,635	28,717	31,187	36,391	37,426	36,878	37,083
Psychology.....	7,104	8,320	8,031	8,039	8,439	8,481	8,165	8,652	9,802	10,412	13,132	13,633	13,146	13,708
Social sciences .....	19,459	21,209	19,372	18,740	17,851	17,148	17,160	17,983	18,915	20,775	23,259	23,793	23,732	23,375
Engineering.....	15,167	16,012	15,279	16,451	18,886	20,972	22,070	23,743	24,013	27,664	28,630	25,874	26,138	25,736
Chemical.....	1,078	1,179	1,276	1,406	1,545	1,814	1,386	1,321	1,025	1,220	1,369	1,345	1,372	1,352
Civil .....	3,268	3,606	3,165	3,428	3,504	3,542	3,267	3,296	3,404	4,438	5,168	4,880	4,736	4,140
Electrical.....	3,471	3,788	3,596	3,902	4,819	5,649	6,895	7,849	7,942	8,828	8,743	7,341	7,971	8,339
Industrial.....	1,687	1,609	1,502	1,631	1,432	1,463	1,728	1,823	2,039	2,745	2,873	2,935	3,109	3,048
Mechanical .....	2,032	2,094	2,012	2,419	2,683	3,272	3,380	3,703	3,680	4,169	4,368	3,756	3,551	3,378
Other .....	3,631	3,736	3,728	3,665	4,903	5,232	5,414	5,751	5,923	6,264	6,109	5,617	5,399	5,479
Non-S&E .....	230,453	250,844	237,849	232,432	223,198	216,635	217,929	234,625	260,130	284,548	305,119	327,469	337,953	360,577
Engineering technologies <sup>a</sup> .....	371	505	496	532	622	816	883	1,135	1,188	1,555	1,577	1,414	1,700	1,350
<b>Male</b>														
All fields .....	162,115	168,210	153,772	147,431	145,114	143,716	141,655	149,399	156,895	169,753	179,198	181,457	185,061	191,234
S&E.....	49,410	50,899	46,614	45,505	46,734	48,247	48,759	50,845	50,441	55,454	58,518	55,223	55,335	54,213
Natural sciences .....	9,569	9,152	8,725	7,836	7,351	7,080	6,770	6,664	6,134	6,174	6,627	6,832	6,475	5,944
Physical sciences.....	3,645	2,981	2,971	2,691	2,600	2,775	2,684	2,836	2,703	2,794	2,958	2,808	2,529	2,297
Biological sciences .....	4,615	4,738	4,287	3,675	3,236	2,666	2,555	2,491	2,315	2,374	2,637	3,076	3,014	2,815
Earth, atmospheric, and ocean sciences .....	1,309	1,433	1,467	1,470	1,515	1,639	1,531	1,337	1,116	1,006	1,032	948	932	832
Mathematics/computer sciences.....	4,871	4,730	4,469	4,939	5,684	6,951	8,011	8,833	8,709	9,773	10,130	9,620	10,393	11,458
Mathematics.....	2,910	2,398	1,989	1,692	1,871	1,887	2,026	2,060	2,146	2,219	2,353	2,110	2,055	1,797
Computer sciences .....	1,961	2,332	2,480	3,247	3,813	5,064	5,985	6,773	6,563	7,554	7,777	7,510	8,338	9,661
Agricultural sciences .....	2,140	2,481	2,498	2,386	2,467	2,215	1,882	1,719	1,660	2,007	2,103	2,232	2,153	2,039
Social/behavioral sciences .....	18,035	19,222	16,580	15,222	14,101	13,273	12,796	12,968	13,282	13,930	15,660	15,360	15,339	14,376
Psychology .....	4,059	4,316	3,688	3,371	3,254	3,064	2,838	2,814	2,994	2,928	3,735	3,715	3,606	3,415
Social sciences .....	13,976	14,906	12,892	11,851	10,847	10,209	9,958	10,154	10,288	11,002	11,925	11,645	11,733	10,961

## Earned master's degrees, by field and sex: Selected years, 1975–2000

Field and sex	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1998	2000
Engineering.....	14,795	15,314	14,342	15,122	17,131	18,728	19,300	20,661	20,656	23,570	23,998	21,179	20,975	20,396
Chemical .....	1,051	1,110	1,156	1,230	1,369	1,529	1,143	1,092	852	996	1,063	1,013	1,028	1,008
Civil .....	3,161	3,421	2,951	3,112	3,122	3,128	2,792	2,851	2,864	3,607	4,123	3,781	3,582	3,065
Electrical.....	3,413	3,654	3,453	3,681	4,484	5,154	6,178	6,933	7,008	7,777	7,539	6,197	6,595	6,781
Industrial.....	1,631	1,534	1,374	1,465	1,226	1,236	1,409	1,465	1,603	2,190	2,361	2,331	2,433	2,400
Mechanical.....	2,012	2,039	1,939	2,292	2,517	3,044	3,133	3,377	3,320	3,769	3,918	3,337	3,090	2,923
Other .....	3,527	3,556	3,469	3,342	4,413	4,637	4,645	4,943	5,009	5,231	4,994	4,520	4,247	4,219
Non-S&E.....	112,705	117,311	107,158	101,926	98,380	95,469	92,896	98,554	106,454	114,299	120,680	126,234	129,726	137,021
Engineering technologies <sup>a</sup> .....	281	389	371	380	519	674	678	892	888	1,172	1,136	1,012	1,158	902
Female														
All fields.....	131,536	150,031	148,303	149,367	145,817	143,497	148,877	161,651	181,603	201,220	220,230	239,497	246,810	265,026
S&E.....	13,788	16,498	17,612	18,861	20,999	22,331	23,844	25,580	27,927	30,971	35,791	38,262	38,583	41,470
Natural sciences.....	2,823	3,302	3,581	3,421	3,634	3,780	3,854	3,984	3,948	4,028	4,592	5,338	5,288	5,238
Physical sciences.....	653	660	679	675	685	830	890	1,040	1,074	1,171	1,283	1,333	1,440	1,215
Biological sciences.....	1,976	2,416	2,592	2,340	2,505	2,429	2,444	2,462	2,491	2,466	2,858	3,518	3,354	3,510
Earth, atmospheric, and ocean sciences.....	194	226	310	406	444	521	520	482	383	391	451	487	494	513
Mathematics/computer sciences.....	1,766	1,766	1,632	1,848	2,493	3,053	3,797	3,996	4,247	4,327	4,365	4,468	4,884	6,366
Mathematics.....	1,428	1,300	1,057	877	985	1,016	1,301	1,370	1,486	1,532	1,579	1,489	1,470	1,498
Computer sciences.....	338	466	575	971	1,508	2,037	2,496	2,626	2,761	2,795	2,786	2,979	3,414	4,868
Agricultural sciences.....	299	425	639	706	928	898	894	851	940	1,265	1,471	1,695	1,709	1,819
Social/behavioral sciences.....	8,528	10,307	10,823	11,557	12,189	12,356	12,529	13,667	15,435	17,257	20,731	22,066	21,539	22,707
Psychology.....	3,045	4,004	4,343	4,668	5,185	5,417	5,327	5,838	6,808	7,484	9,397	9,918	9,540	10,293
Social sciences.....	5,483	6,303	6,480	6,889	7,004	6,939	7,202	7,829	8,627	9,773	11,334	12,148	11,999	12,414
Engineering.....	372	698	937	1,329	1,755	2,244	2,770	3,082	3,357	4,094	4,632	4,695	5,163	5,340
Chemical .....	27	69	120	176	176	285	243	229	173	224	306	332	344	344
Civil .....	107	185	214	316	382	414	475	445	540	831	1,045	1,099	1,154	1,075
Electrical.....	58	134	143	221	335	495	717	916	934	1,051	1,204	1,144	1,376	1,558
Industrial.....	56	75	128	166	206	227	319	358	436	555	512	604	676	648
Mechanical.....	20	55	73	127	166	228	247	326	360	400	450	419	461	455
Other .....	104	180	259	323	490	595	769	808	914	1,033	1,115	1,097	1,152	1,260
Non-S&E.....	117,748	133,533	130,691	130,506	124,818	121,166	125,033	136,071	153,676	170,249	184,439	201,235	208,227	223,556
Engineering technologies <sup>a</sup> .....	90	116	125	152	103	142	205	243	300	383	441	402	542	448

<sup>a</sup>Engineering technologies are more focused on applied skills than on fundamental science and mathematics.

NOTES: Degree data by sex do not precisely match degree data by race/ethnicity in any field. Degree data by sex were collected by U.S. Department of Education (ED), National Center for Education Statistics (NCES), Integrated Postsecondary Education Data System (IPEDS). Data by race/ethnicity were collected biennially by NCES for ED, Office for Civil Rights, from 1977 to 1989 and annually thereafter (except for 1999). For full available data series, see National Science Foundation, Division of Science Resources Statistics (NSF/SRS), WebCASPAR database system.

SOURCES: ED, NCES, IPEDS, Completions Survey, and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

## Earned master's degrees, by field, race/ethnicity, and citizenship: Selected years, 1977-2000

Field, race/ethnicity, and citizenship	1977	1979	1981	1985	1987	1989	1991	1993	1995	1997	1998	2000
All fields .....	318,241	302,075	296,798	287,213	290,532	311,050	338,498	370,973	399,428	420,954	431,871	456,260
S&E .....	63,779	59,684	59,598	64,726	66,774	70,333	72,828	81,415	94,309	93,485	93,918	95,683
Natural sciences .....	12,499	12,343	11,315	10,893	10,637	10,656	10,088	10,163	11,219	12,170	11,763	11,182
Physical sciences .....	5,345	5,464	5,300	5,802	5,638	5,703	5,282	5,365	4,241	4,141	3,969	3,512
Earth, atmospheric, and ocean sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	1,483	1,435	1,426	1,345
Biological sciences .....	7,154	6,879	6,015	5,091	4,999	4,953	4,806	4,798	5,495	6,594	6,368	6,325
Mathematics/computer sciences .....	6,496	6,101	6,787	9,989	11,808	12,829	12,956	14,251	14,495	14,088	15,277	17,824
Mathematics .....	3,698	3,046	2,569	2,888	3,327	3,430	3,632	4,084	3,932	3,599	3,525	3,295
Computer sciences .....	2,798	3,055	4,218	7,101	8,481	9,399	9,324	10,167	10,563	10,489	11,752	14,529
Agricultural sciences .....	3,735	4,007	4,017	3,152	2,824	2,604	2,625	3,299	3,574	3,927	3,862	3,858
Social/behavioral sciences .....	24,798	21,723	20,763	19,757	19,448	20,509	23,152	26,044	36,391	37,426	36,878	37,083
Psychology .....	8,320	8,031	8,039	8,481	8,165	8,652	9,802	11,020	13,132	13,633	13,146	13,708
Social sciences .....	16,478	13,692	12,724	11,276	11,283	11,857	13,350	15,024	23,259	23,793	23,732	23,375
Engineering .....	16,251	15,510	16,716	20,935	22,057	23,735	24,007	27,658	28,630	25,874	26,138	25,736
Non-S&E .....	254,462	242,391	237,200	222,487	223,758	240,717	265,670	289,558	305,119	327,469	337,953	360,577
Engineering technologies <sup>a</sup> .....	NA	NA	NA	816	883	1,135	1,188	1,555	1,577	1,414	1,700	1,350
U.S. citizen/permanent resident												
All fields .....	300,896	282,648	274,740	260,261	262,268	278,927	300,887	326,864	350,672	371,477	379,666	400,689
S&E .....	55,974	51,140	49,849	52,220	53,729	55,190	55,779	61,265	72,092	72,220	71,295	70,933
Natural sciences .....	11,366	11,173	10,161	9,321	9,072	8,782	7,835	7,712	8,582	9,603	9,366	9,097
Physical sciences .....	4,689	4,758	4,514	4,704	4,582	4,465	3,778	3,763	2,774	2,734	2,680	2,372
Earth, atmospheric, and ocean sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	1,198	1,198	1,218	1,150
Biological sciences .....	6,677	6,415	5,647	4,617	4,490	4,317	4,057	3,949	4,610	5,671	5,468	5,575
Mathematics/computer sciences .....	5,760	5,164	5,419	7,595	8,905	9,411	9,078	9,334	9,483	9,122	9,456	10,150
Mathematics .....	3,328	2,574	2,105	2,203	2,491	2,454	2,573	2,946	2,816	2,606	2,499	2,184
Computer sciences .....	2,432	2,590	3,314	5,392	6,414	6,957	6,505	6,388	6,667	6,516	6,957	7,966
Agricultural sciences .....	3,071	3,282	3,307	2,546	2,257	1,974	2,022	2,605	2,921	3,269	3,264	3,342
Social/behavioral sciences .....	23,071	19,971	18,809	17,517	17,219	18,035	20,357	23,075	32,175	32,988	32,232	32,431
Psychology .....	8,149	7,868	7,769	8,185	7,945	8,393	9,485	10,688	12,659	13,231	12,686	13,241
Social sciences .....	14,922	12,103	11,040	9,332	9,274	9,642	10,872	12,387	19,516	19,757	19,546	19,190
Engineering .....	12,706	11,550	12,153	15,241	16,276	16,988	16,487	18,539	18,931	17,238	16,977	15,913
Non-S&E .....	244,922	231,508	224,891	208,041	208,539	223,737	245,108	265,599	278,580	299,257	308,371	329,756
Engineering technologies <sup>a</sup> .....	NA	NA	NA	692	756	1,004	1,016	1,276	1,268	1,153	1,432	1,146
White												
All fields .....	266,109	249,401	241,255	223,649	216,807	230,322	247,524	265,668	277,437	288,353	291,962	297,226
S&E .....	50,420	45,748	43,967	43,982	43,360	43,945	44,513	47,975	54,610	53,769	52,328	49,850
Natural sciences .....	10,545	10,235	9,328	8,214	7,579	7,445	6,482	6,222	6,813	7,567	7,341	6,989
Physical sciences .....	4,363	4,373	4,115	4,133	3,834	3,766	3,129	3,078	2,152	2,088	2,023	1,774
Earth, atmospheric, and ocean sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	1,019	1,084	1,106	1,036
Biological sciences .....	6,182	5,862	5,213	4,081	3,745	3,679	3,353	3,144	3,642	4,395	4,212	4,179
Mathematics/computer sciences .....	5,256	4,625	4,708	6,176	6,729	6,818	6,705	6,818	6,576	6,110	6,172	6,090
Mathematics .....	3,048	2,352	1,890	1,873	2,012	2,032	2,068	2,354	2,222	2,005	1,895	1,655
Computer sciences .....	2,208	2,273	2,818	4,303	4,717	4,786	4,637	4,464	4,354	4,105	4,277	4,435
Agricultural sciences .....	2,860	3,047	3,083	2,345	2,044	1,817	1,818	2,282	2,447	2,809	2,827	2,864

## Earned master's degrees, by field, race/ethnicity, and citizenship: Selected years, 1977–2000

Field, race/ethnicity, and citizenship	1977	1979	1981	1985	1987	1989	1991	1993	1995	1997	1998	2000
Social/behavioral sciences .....	20,315	17,759	16,701	15,061	14,171	15,033	16,873	18,733	24,943	24,791	23,903	22,887
Psychology .....	7,201	7,078	7,019	7,220	6,698	7,075	7,973	8,810	10,367	10,444	9,820	9,646
Social sciences .....	13,114	10,681	9,682	7,841	7,473	7,958	8,900	9,923	14,576	14,347	14,083	13,241
Engineering.....	11,444	10,082	10,147	12,186	12,837	12,832	12,635	13,920	13,831	12,492	12,085	11,020
Non-S&E .....	215,689	203,653	197,288	179,667	173,447	186,377	203,011	217,693	222,827	234,584	239,634	247,376
Engineering technologies <sup>a</sup> .....	NA	NA	NA	526	581	802	830	1,041	982	950	1,115	835
Asian/Pacific Islander												
All fields .....	5,145	5,519	6,304	7,805	8,129	10,174	11,070	13,169	15,906	17,912	19,936	21,412
S&E.....	1,749	1,929	2,170	3,285	3,455	4,100	4,310	4,846	5,989	6,180	6,554	6,990
Natural sciences .....	307	365	298	392	417	501	482	554	714	883	869	857
Physical sciences.....	142	160	153	213	227	278	251	249	238	278	248	240
Earth, atmospheric, and ocean sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	50	30	30	22
Biological sciences .....	165	205	145	179	190	223	231	305	426	575	591	595
Mathematics/computer sciences.....	198	253	376	779	962	1,072	1,203	1,303	1,494	1,560	1,795	2,208
Mathematics.....	90	104	97	164	183	178	189	197	228	238	216	180
Computer sciences .....	108	149	279	615	779	894	1,014	1,106	1,266	1,322	1,579	2,028
Agricultural sciences.....	81	104	67	58	47	44	50	61	97	103	83	94
Social/behavioral sciences .....	426	357	350	505	379	491	567	668	1,112	1,315	1,356	1,452
Psychology .....	95	87	77	129	113	131	170	191	289	364	379	472
Social sciences .....	331	270	273	376	266	360	397	477	823	951	977	980
Engineering.....	737	850	1,079	1,551	1,650	1,992	2,008	2,260	2,572	2,319	2,451	2,379
Non-S&E .....	3,396	3,590	4,134	4,520	4,674	6,074	6,760	8,323	9,917	11,732	13,382	14,422
Engineering technologies <sup>a</sup> .....	NA	NA	NA	25	46	40	60	40	55	49	62	53
Black												
All fields .....	21,041	19,422	17,152	13,960	13,173	13,455	15,857	18,897	22,954	26,948	28,616	33,305
S&E.....	2,321	2,003	1,801	1,742	1,784	1,652	2,090	2,554	4,210	4,870	4,894	5,492
Natural sciences .....	300	303	278	240	246	202	210	240	310	380	336	347
Physical sciences.....	94	86	107	89	79	78	73	105	132	132	131	117
Earth, atmospheric, and ocean sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	15	12	15	7
Biological sciences .....	206	217	171	151	167	124	137	135	163	236	190	223
Mathematics/computer sciences.....	200	136	137	233	280	257	383	406	513	565	566	678
Mathematics.....	133	71	67	53	73	59	100	98	140	154	142	98
Computer sciences .....	67	65	70	180	207	198	283	308	373	411	424	580
Agricultural sciences.....	51	79	73	50	55	36	51	70	74	96	95	84
Social/behavioral sciences .....	1,530	1,239	1,053	889	800	802	1,048	1,274	2,648	3,155	3,183	3,725
Psychology .....	506	476	424	426	376	395	454	544	802	1,059	1,020	1,346
Social sciences .....	1,024	763	629	463	424	407	594	730	1,846	2,096	2,163	2,379
Engineering.....	240	246	260	330	403	355	398	564	665	674	714	658
Non-S&E .....	18,720	17,419	15,351	12,218	11,389	11,803	13,767	16,343	18,744	22,078	23,722	27,813
Engineering technologies <sup>a</sup> .....	NA	NA	NA	37	42	55	47	61	85	86	150	116

## Earned master's degrees, by field, race/ethnicity, and citizenship: Selected years, 1977–2000

Field, race/ethnicity, and citizenship	1977	1979	1981	1985	1987	1989	1991	1993	1995	1997	1998	2000
<b>Hispanic</b>												
All fields .....	7,071	6,470	7,439	7,730	7,781	8,133	9,684	11,371	13,905	16,360	17,416	20,803
S&E.....	1,325	1,001	1,237	1,514	1,584	1,585	1,736	2,092	2,945	3,220	3,462	3,746
Natural sciences .....	178	180	174	266	248	218	232	265	296	353	341	394
Physical sciences.....	69	65	71	127	122	92	96	114	95	116	129	96
Earth, atmospheric, and ocean sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	34	23	20	28
Biological sciences .....	109	115	103	139	126	126	136	151	167	214	192	268
Mathematics/computer sciences.....	91	61	102	149	183	178	213	240	282	274	304	388
Mathematics.....	45	36	42	55	60	34	85	78	72	63	85	100
Computer sciences .....	46	25	60	94	123	144	128	162	210	211	219	288
Agricultural sciences.....	67	47	77	66	62	48	49	69	96	105	116	133
Social/behavioral sciences .....	738	498	599	687	579	673	774	937	1,560	1,723	1,894	1,979
Psychology .....	321	191	217	344	271	360	391	463	622	718	787	837
Social sciences .....	417	307	382	343	308	313	383	474	938	1,005	1,107	1,142
Engineering.....	251	215	285	346	512	468	468	581	711	765	807	852
Non-S&E .....	5,746	5,469	6,202	6,216	6,197	6,548	7,948	9,279	10,960	13,140	13,954	17,057
Engineering technologies <sup>a</sup> .....	NA	NA	NA	6	17	10	19	25	40	26	49	41
<b>American Indian/Alaskan Native</b>												
All fields .....	968	999	1,034	1,257	1,049	1,082	1,125	1,344	1,542	1,844	1,951	2,099
S&E.....	148	165	165	228	147	209	200	253	307	370	372	383
Natural sciences .....	36	45	26	39	20	35	26	38	39	41	45	44
Physical sciences.....	21	29	11	21	9	18	13	12	15	11	14	9
Earth, atmospheric, and ocean sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	4	5	10	9
Biological sciences .....	15	16	15	18	11	17	13	26	20	25	21	26
Mathematics/computer sciences.....	15	24	19	48	25	45	23	22	27	39	24	41
Mathematics.....	12	8	7	7	3	6	9	8	11	14	9	9
Computer sciences .....	3	16	12	41	22	39	14	14	16	25	15	32
Agricultural sciences.....	12	5	7	6	3	6	8	8	13	18	23	23
Social/behavioral sciences .....	62	67	82	88	61	90	103	135	185	219	226	211
Psychology .....	26	20	32	37	35	33	49	57	81	97	108	69
Social sciences .....	36	47	50	51	26	57	54	78	104	122	118	142
Engineering.....	23	24	31	47	38	33	40	50	43	53	54	64
Non-S&E .....	820	834	869	1,029	902	873	925	1,091	1,235	1,474	1,579	1,716
Engineering technologies <sup>a</sup> .....	NA	NA	NA	2	26	2	3	8	6	3	6	3

## Earned master's degrees, by field, race/ethnicity, and citizenship: Selected years, 1977–2000

Field, race/ethnicity, and citizenship	1977	1979	1981	1985	1987	1989	1991	1993	1995	1997	1998	2000
<b>Other/unknown race/ethnicity</b>												
All fields .....	562	837	1,556	5,860	15,329	15,761	15,627	16,415	18,928	20,060	19,785	25,844
S&E.....	11	294	509	1,469	3,399	3,699	2,930	3,545	4,031	3,811	3,685	4,472
Natural sciences .....	0	45	57	170	562	381	403	393	410	379	434	466
Physical sciences.....	0	45	57	121	311	233	216	205	142	109	135	136
Earth, atmospheric, and ocean sciences .....	0	NA	NA	NA	NA	NA	NA	NA	76	44	37	46
Biological sciences .....	0	NA	NA	49	251	148	187	188	192	226	262	284
Mathematics/computer sciences.....	0	65	77	210	726	1,041	551	545	591	574	595	745
Mathematics.....	0	3	2	51	160	145	122	211	143	132	152	142
Computer sciences .....	0	62	75	159	566	896	429	334	448	442	443	603
Agricultural sciences.....	0	NA	NA	21	46	23	46	115	194	138	120	144
Social/behavioral sciences .....	0	51	24	287	1,229	946	992	1,328	1,727	1,785	1,670	2,177
Psychology .....	0	16	NA	29	452	399	448	623	498	549	572	871
Social sciences .....	0	35	24	258	777	547	544	705	1,229	1,236	1,098	1,306
Engineering.....	11	133	351	781	836	1,308	938	1,164	1,109	935	866	940
Non-S&E .....	551	543	1,047	4,391	11,930	12,062	12,697	12,870	14,897	16,249	16,100	21,372
Engineering technologies <sup>a</sup> .....	0	NA	NA	96	44	95	57	101	100	39	50	98
<b>Foreign citizen<sup>b</sup></b>												
All fields .....	17,345	19,427	22,058	26,952	28,264	32,123	37,611	44,109	48,756	49,477	52,205	55,571
S&E.....	7,805	8,544	9,749	12,506	13,045	15,143	17,049	20,150	22,217	21,265	22,623	24,750
Natural sciences .....	1,133	1,170	1,154	1,572	1,565	1,874	2,253	2,451	2,637	2,567	2,397	2,085
Physical sciences.....	656	706	786	1,098	1,056	1,238	1,504	1,602	1,467	1,407	1,289	1,140
Earth, atmospheric, and ocean sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	285	237	208	195
Biological sciences .....	477	464	368	474	509	636	749	849	885	923	900	750
Mathematics/computer sciences.....	736	937	1,368	2,394	2,903	3,418	3,878	4,917	5,012	4,966	5,821	7,674
Mathematics.....	370	472	464	685	836	976	1,059	1,138	1,116	993	1,026	1,111
Computer sciences .....	366	465	904	1,709	2,067	2,442	2,819	3,779	3,896	3,973	4,795	6,563
Agricultural sciences.....	664	725	710	606	567	630	603	694	653	658	598	516
Social/behavioral sciences .....	1,727	1,752	1,954	2,240	2,229	2,474	2,795	2,969	4,216	4,438	4,646	4,652
Psychology .....	171	163	270	296	220	259	317	332	473	402	460	467
Social sciences .....	1,556	1,589	1,684	1,944	2,009	2,215	2,478	2,637	3,743	4,036	4,186	4,185
Engineering.....	3,545	3,960	4,563	5,694	5,781	6,747	7,520	9,119	9,699	8,636	9,161	9,823
Non-S&E .....	9,540	10,883	12,309	14,446	15,219	16,980	20,562	23,959	26,539	28,212	29,582	30,821
Engineering technologies <sup>a</sup> .....	NA	NA	NA	124	127	131	172	279	309	261	268	204

NA not available

<sup>a</sup>Engineering technologies are more focused on applied skills than on fundamental science and mathematics.<sup>b</sup>Includes temporary residents only.

NOTES: Degree data by sex do not precisely match degree data by race/ethnicity in any field. Degree data by sex were collected by U.S. Department of Education (ED), National Center for Education Statistics (NCES), Integrated Postsecondary Education Data System (IPEDS). Data by race/ethnicity were collected biennially by NCES for ED, Office for Civil Rights, from 1977 to 1989 and annually thereafter (except for 1999). For full available data series, see National Science Foundation, Division of Science Resources Statistics (NSF/SRS), WebCASPAR database system.

SOURCES: ED, NCES, and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

## Earned doctoral degrees, by field, sex, and citizenship: Selected years, 1977–2001

Field, sex, and citizenship	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001
<b>Both sexes</b>														
All fields .....	31,716	31,239	31,356	31,281	31,297	32,370	34,327	37,533	39,800	41,747	42,559	41,097	41,340	40,744
S&E.....	18,519	18,440	18,914	19,274	19,664	20,694	22,706	25,063	26,640	27,866	28,663	27,347	27,543	27,122
Natural sciences .....	6,894	6,962	7,013	7,179	7,326	7,679	8,100	9,091	9,562	9,996	10,436	9,967	10,014	9,816
Physical sciences.....	2,721	2,674	2,627	2,814	2,934	3,238	3,261	3,626	3,699	3,841	3,769	3,579	3,408	3,389
Earth, atmospheric, and ocean sciences.....	689	642	583	624	599	602	723	815	771	780	878	805	757	749
Biological sciences.....	3,484	3,646	3,803	3,741	3,793	3,839	4,116	4,650	5,092	5,375	5,789	5,583	5,849	5,678
Mathematics/computer sciences.....	964	979	960	987	998	1,190	1,471	1,838	2,026	2,187	2,032	1,938	1,908	1,832
Mathematics.....	933	769	728	701	688	740	859	1,038	1,146	1,190	1,123	1,083	1,049	1,006
Computer sciences .....	31	210	232	286	310	450	612	800	880	997	909	855	859	826
Agricultural sciences.....	782	855	982	1,015	1,110	976	1,086	1,073	968	1,036	982	966	942	848
Social/behavioral sciences .....	6,720	6,582	6,774	6,673	6,335	6,337	6,532	6,806	7,189	7,309	7,674	7,737	7,767	7,511
Psychology.....	2,990	3,091	3,358	3,347	3,118	3,173	3,208	3,250	3,420	3,430	3,562	3,673	3,618	3,433
Social sciences .....	3,730	3,491	3,416	3,326	3,217	3,164	3,324	3,556	3,769	3,879	4,112	4,064	4,149	4,078
Engineering.....	2,648	2,494	2,528	2,781	3,166	3,712	4,543	5,214	5,698	6,008	6,118	5,332	5,320	5,502
Chemical.....	329	315	317	392	504	584	712	691	737	708	767	674	725	726
Civil .....	336	302	358	397	391	477	538	575	624	656	656	584	555	593
Electrical.....	667	611	549	625	716	779	1,137	1,405	1,543	1,731	1,721	1,478	1,542	1,577
Industrial.....	73	82	66	86	92	120	162	165	236	284	246	212	176	205
Mechanical .....	372	366	360	379	513	657	760	875	1,030	1,025	1,023	855	863	953
Materials.....	248	236	234	268	303	392	380	489	535	588	582	469	451	499
Other .....	623	582	644	634	647	703	854	1,014	993	1,016	1,123	1,060	1,008	949
Medical/other life sciences <sup>a</sup> .....	511	568	657	639	729	800	974	1,041	1,197	1,330	1,421	1,407	1,592	1,613
Non-S&E .....	13,197	12,799	12,442	12,007	11,633	11,676	11,621	12,470	13,160	13,881	13,896	13,750	13,797	13,622
<b>Male</b>														
All fields .....	23,858	22,302	21,464	20,748	20,553	20,938	21,814	23,524	24,384	25,161	24,951	23,435	23,155	22,769
S&E.....	15,107	14,467	14,412	14,222	14,333	14,907	15,968	17,354	17,976	18,595	18,558	17,236	17,035	16,736
Natural sciences .....	5,804	5,661	5,561	5,478	5,513	5,679	5,791	6,429	6,496	6,683	6,818	6,495	6,315	6,187
Physical sciences.....	2,477	2,382	2,318	2,441	2,467	2,710	2,642	2,934	2,880	2,944	2,893	2,733	2,568	2,550
Earth, atmospheric, and ocean sciences .....	630	584	527	529	491	490	575	631	602	608	663	591	522	512
Biological sciences .....	2,697	2,695	2,716	2,508	2,555	2,479	2,574	2,864	3,014	3,131	3,262	3,171	3,225	3,125
Mathematics/computer sciences.....	837	833	822	838	859	1,000	1,208	1,514	1,602	1,727	1,594	1,495	1,506	1,398
Mathematics.....	811	650	616	588	582	615	704	835	865	919	851	803	790	730
Computer sciences .....	26	183	206	250	277	385	504	679	737	808	743	692	716	668
Agricultural sciences.....	726	775	848	882	939	805	859	860	736	804	715	682	668	555
Social/behavioral sciences .....	4,834	4,427	4,396	4,065	3,765	3,628	3,597	3,479	3,637	3,633	3,643	3,560	3,568	3,458
Psychology .....	1,902	1,831	1,885	1,750	1,577	1,475	1,408	1,249	1,322	1,246	1,163	1,210	1,205	1,134
Social sciences .....	2,932	2,596	2,511	2,315	2,188	2,153	2,189	2,230	2,315	2,387	2,480	2,350	2,363	2,324

## Earned doctoral degrees, by field, sex, and citizenship: Selected years, 1977–2001

Field, sex, and citizenship	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001
Engineering.....	2,574	2,432	2,429	2,657	2,968	3,470	4,168	4,703	5,097	5,270	5,319	4,505	4,455	4,564
Chemical.....	319	306	306	369	463	524	632	605	638	597	641	550	571	544
Civil.....	328	298	348	384	371	459	484	529	558	575	572	495	465	481
Electrical.....	646	600	527	612	681	747	1,070	1,312	1,403	1,545	1,561	1,310	1,335	1,372
Industrial.....	68	77	60	80	86	107	144	146	207	231	205	169	140	160
Mechanical.....	366	361	354	371	487	640	731	810	955	954	929	751	766	859
Materials.....	238	228	217	238	271	347	335	412	449	489	470	376	367	393
Other.....	609	562	617	603	609	646	772	889	887	879	941	854	811	755
Medical/other life sciences <sup>a</sup> .....	332	339	356	302	289	325	345	369	408	478	469	499	523	574
Non-S&E.....	8,751	7,835	7,052	6,526	6,220	6,031	5,846	6,170	6,408	6,566	6,393	6,199	6,120	6,033
Female														
All fields.....	7,858	8,937	9,892	10,533	10,744	11,432	12,513	13,873	15,121	16,416	17,249	17,484	18,114	17,901
S&E.....	3,412	3,973	4,502	5,052	5,331	5,787	6,738	7,600	8,429	9,130	9,872	9,985	10,451	10,330
Natural sciences.....	1,090	1,301	1,452	1,701	1,813	2,000	2,309	2,631	2,990	3,265	3,556	3,435	3,683	3,615
Physical sciences.....	244	292	309	373	467	528	619	679	780	878	852	831	835	834
Earth, atmospheric, and ocean sciences.....	59	58	56	95	108	112	148	179	160	170	209	210	230	236
Biological sciences.....	787	951	1,087	1,233	1,238	1,360	1,542	1,773	2,050	2,217	2,495	2,394	2,618	2,545
Mathematics/computer sciences.....	127	146	138	149	139	190	263	316	402	451	413	433	399	431
Mathematics.....	122	119	112	113	106	125	155	199	264	265	263	277	258	276
Computer sciences.....	5	27	26	36	33	65	108	117	138	186	150	156	141	155
Agricultural sciences.....	56	80	134	133	171	171	227	209	228	228	260	280	274	288
Social/behavioral sciences.....	1,886	2,155	2,378	2,608	2,570	2,709	2,935	3,309	3,510	3,647	3,957	4,149	4,191	4,044
Psychology.....	1,088	1,260	1,473	1,597	1,541	1,698	1,800	1,996	2,088	2,181	2,365	2,453	2,410	2,296
Social sciences.....	798	895	905	1,011	1,029	1,011	1,135	1,313	1,422	1,466	1,592	1,696	1,781	1,748
Engineering.....	74	62	99	124	198	242	375	467	522	696	750	789	837	925
Chemical.....	10	9	11	23	41	60	80	83	94	109	122	123	151	180
Civil.....	8	4	10	13	20	18	54	41	54	76	80	89	88	111
Electrical.....	21	11	22	13	35	32	67	79	125	173	150	155	195	203
Industrial.....	5	5	6	6	6	13	18	17	27	50	40	43	35	44
Mechanical.....	6	5	6	8	26	17	29	57	57	64	88	96	96	91
Materials.....	10	8	17	30	32	45	45	77	78	95	106	88	83	105
Other.....	14	20	27	31	38	57	82	113	87	129	164	195	189	191
Medical/other life sciences <sup>a</sup> .....	179	229	301	337	440	475	629	668	777	843	936	899	1,067	1,027
Non-S&E.....	4,446	4,964	5,390	5,481	5,413	5,645	5,775	6,273	6,692	7,286	7,377	7,499	7,663	7,571



## Earned doctoral degrees, by field, sex, and citizenship: Selected years, 1977–2001

Field, sex, and citizenship	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001
U.S. citizen														
All fields .....	26,145	25,474	25,068	24,393	23,377	22,984	23,402	25,572	26,448	27,743	28,162	27,984	27,955	26,907
S&E.....	14,313	14,212	14,311	14,133	13,688	13,572	14,198	15,407	15,811	16,426	17,076	16,885	16,812	16,069
Natural sciences .....	5,541	5,702	5,725	5,767	5,635	5,486	5,620	6,026	6,005	6,109	6,338	6,169	6,265	6,164
Physical sciences.....	2,071	2,040	1,956	2,077	2,050	2,095	1,984	2,120	2,093	2,137	2,131	2,035	1,890	1,860
Earth, atmospheric, and ocean sciences .....	558	531	472	475	435	410	518	592	463	478	537	474	474	428
Biological sciences .....	2,912	3,131	3,297	3,215	3,150	2,981	3,118	3,314	3,449	3,494	3,670	3,660	3,901	3,876
Mathematics/computer sciences.....	716	715	650	592	566	588	731	850	921	1,038	960	959	904	833
Mathematics.....	691	552	482	412	377	345	393	462	496	554	530	539	517	468
Computer sciences .....	25	163	168	180	189	243	338	388	425	484	430	420	387	365
Agricultural sciences.....	489	545	594	649	683	584	606	564	457	492	467	443	447	401
Social/behavioral sciences.....	5,678	5,505	5,621	5,462	4,975	4,750	4,648	5,102	5,321	5,463	5,613	5,856	5,859	5,462
Psychology .....	2,774	2,852	3,112	3,048	2,805	2,747	2,684	2,953	3,071	3,084	3,041	3,223	3,154	2,938
Social sciences.....	2,904	2,653	2,509	2,414	2,170	2,003	1,964	2,149	2,250	2,379	2,572	2,633	2,705	2,524
Engineering.....	1,475	1,294	1,170	1,164	1,279	1,558	1,864	2,086	2,228	2,386	2,739	2,486	2,217	2,139
Chemical .....	166	144	131	174	240	294	382	348	324	291	321	333	339	327
Civil .....	162	153	157	154	130	162	188	173	168	206	249	261	220	222
Electrical.....	383	331	275	259	270	320	440	554	630	683	753	639	530	467
Industrial .....	39	45	35	27	29	44	51	50	89	108	102	87	67	72
Mechanical .....	211	192	158	145	193	241	259	297	347	383	456	398	341	385
Materials .....	133	116	99	118	144	176	173	211	228	238	271	225	221	202
Other .....	381	313	315	287	273	321	371	453	442	477	587	543	499	464
Medical/other life sciences <sup>a</sup> .....	414	451	551	499	550	606	729	779	879	938	959	972	1,120	1,070
Non-S&E .....	11,832	11,262	10,757	10,260	9,689	9,412	9,204	10,165	10,637	11,317	11,086	11,099	11,143	10,838
Male														
All fields .....	19,172	17,585	16,367	15,140	14,228	13,574	13,396	14,384	14,512	14,966	15,049	14,513	14,146	13,593
S&E.....	11,419	10,822	10,468	9,808	9,309	9,008	9,028	9,609	9,651	9,860	10,139	9,728	9,386	8,962
Natural sciences .....	4,662	4,629	4,510	4,327	4,192	3,965	3,914	4,175	3,998	3,989	4,079	3,913	3,824	3,775
Physical sciences .....	1,901	1,826	1,732	1,789	1,726	1,733	1,582	1,707	1,647	1,617	1,658	1,564	1,408	1,393
Earth, atmospheric, and ocean sciences .....	511	481	425	396	348	328	404	444	351	366	390	338	319	280
Biological sciences .....	2,250	2,322	2,353	2,142	2,118	1,904	1,928	2,024	2,000	2,006	2,031	2,011	2,097	2,102
Mathematics/computer sciences .....	625	597	550	489	472	473	566	674	714	790	734	704	687	613
Mathematics.....	604	460	402	336	307	280	300	369	371	422	387	374	373	332
Computer sciences.....	21	137	148	153	165	193	266	305	343	368	347	330	314	281
Agricultural sciences.....	456	494	506	549	563	468	450	436	333	380	332	298	300	251
Social/behavioral sciences.....	3,981	3,597	3,502	3,152	2,751	2,486	2,276	2,296	2,448	2,426	2,416	2,469	2,468	2,287
Psychology .....	1,767	1,700	1,747	1,578	1,396	1,259	1,146	1,105	1,200	1,093	988	1,043	1,021	955
Social sciences.....	2,214	1,897	1,755	1,574	1,355	1,227	1,130	1,191	1,248	1,333	1,428	1,426	1,447	1,332

## Earned doctoral degrees, by field, sex, and citizenship: Selected years, 1977–2001

Field, sex, and citizenship	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001
Engineering .....	1,433	1,255	1,117	1,080	1,160	1,409	1,615	1,807	1,932	2,012	2,324	2,059	1,798	1,730
Chemical .....	162	140	123	160	211	250	322	297	265	221	260	268	248	246
Civil .....	155	152	152	144	121	153	151	152	138	170	204	207	178	163
Electrical .....	371	324	264	249	250	306	411	510	573	604	679	577	461	423
Industrial .....	37	41	29	23	25	36	41	39	69	82	77	58	50	50
Mechanical .....	206	188	154	139	178	231	240	263	314	355	409	346	294	351
Materials .....	128	111	92	99	125	144	138	164	186	185	213	176	174	155
Other .....	374	299	303	266	250	289	312	382	387	395	482	427	393	342
Medical/other life sciences <sup>a</sup> .....	262	250	283	211	171	207	207	221	226	263	254	285	309	306
Non-S&E .....	7,753	6,763	5,899	5,332	4,919	4,566	4,368	4,775	4,861	5,106	4,910	4,785	4,760	4,631
Female														
All fields .....	6,973	7,889	8,701	9,253	9,149	9,410	10,006	11,185	11,931	12,775	13,079	13,471	13,806	13,314
S&E .....	2,894	3,390	3,843	4,325	4,379	4,564	5,170	5,796	6,156	6,564	6,921	7,157	7,425	7,107
Natural sciences .....	879	1,073	1,215	1,440	1,443	1,521	1,706	1,850	2,007	2,118	2,255	2,256	2,441	2,389
Physical sciences .....	170	214	224	288	324	362	402	412	446	519	472	471	482	467
Earth, atmospheric, and ocean sciences .....	47	50	47	79	87	82	114	148	112	112	146	136	155	148
Biological sciences .....	662	809	944	1,073	1,032	1,077	1,190	1,290	1,449	1,487	1,637	1,649	1,804	1,774
Mathematics/computer sciences .....	91	118	100	103	94	115	165	176	206	248	225	255	217	220
Mathematics .....	87	92	80	76	70	65	93	93	124	132	143	165	144	136
Computer sciences .....	4	26	20	27	24	50	72	83	82	116	82	90	73	84
Agricultural sciences .....	33	51	88	100	120	116	156	128	124	112	134	145	147	150
Social/behavioral sciences .....	1,697	1,908	2,119	2,310	2,224	2,264	2,372	2,805	2,870	3,037	3,189	3,387	3,390	3,175
Psychology .....	1,007	1,152	1,365	1,470	1,409	1,488	1,538	1,847	1,869	1,991	2,046	2,180	2,132	1,983
Social sciences .....	690	756	754	840	815	776	834	958	1,001	1,046	1,143	1,207	1,258	1,192
Engineering .....	42	39	53	84	119	149	249	279	296	374	414	427	419	409
Chemical .....	4	4	8	14	29	44	60	51	59	70	61	65	91	81
Civil .....	7	1	5	10	9	9	37	21	30	36	45	54	42	59
Electrical .....	12	7	11	10	20	14	29	44	57	79	74	62	69	44
Industrial .....	2	4	6	4	4	8	10	11	20	26	25	29	17	22
Mechanical .....	5	4	4	6	15	10	19	34	33	28	46	52	47	34
Materials .....	5	5	7	19	19	32	35	47	42	53	58	49	47	47
Other .....	7	14	12	21	23	32	59	71	55	82	105	116	106	122
Medical/other life sciences <sup>a</sup> .....	152	201	268	288	379	399	522	558	653	675	704	687	811	764
Non-S&E .....	4,079	4,499	4,858	4,928	4,770	4,846	4,836	5,389	5,775	6,211	6,158	6,314	6,381	6,207

<sup>a</sup>Medical/other life sciences are reported separately from S&E fields in National Science Foundation, Division of Science Resources Statistics (NSF/SRS), higher education publications.

NOTE: For detailed fields, see NSF/SRS, *Science and Engineering Doctorate Awards*, <http://www.nsf.gov/sbe/srs/nsf01325/htmstart.htm>.

SOURCES: NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

## Earned doctoral degrees, by field, citizenship, and race/ethnicity: Selected years, 1977–2001

Field, race/ethnicity, and citizenship	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001
All fields .....	31,716	31,239	31,356	31,281	31,297	32,370	34,327	37,533	39,800	41,747	42,559	41,097	41,340	40,744
S&E .....	18,519	18,440	18,914	19,274	19,664	20,694	22,706	25,063	26,640	27,866	28,663	27,347	27,543	27,122
Natural sciences.....	6,894	6,962	7,013	7,179	7,326	7,679	8,100	9,091	9,562	9,996	10,436	9,967	10,014	9,816
Physical sciences.....	2,721	2,674	2,627	2,814	2,934	3,238	3,261	3,626	3,699	3,841	3,769	3,579	3,408	3,389
Earth, atmospheric, and ocean sciences.....	689	642	583	624	599	602	723	815	771	780	878	805	757	749
Biological sciences.....	3,484	3,646	3,803	3,741	3,793	3,839	4,116	4,650	5,092	5,375	5,789	5,583	5,849	5,678
Mathematics/computer sciences.....	964	979	960	987	998	1,190	1,471	1,838	2,026	2,187	2,032	1,938	1,908	1,832
Mathematics.....	933	769	728	701	688	740	859	1,038	1,146	1,190	1,123	1,083	1,049	1,006
Computer sciences.....	31	210	232	286	310	450	612	800	880	997	909	855	859	826
Agricultural sciences.....	782	855	982	1,015	1,110	976	1,086	1,073	968	1,036	982	966	942	848
Social/behavioral sciences.....	6,720	6,582	6,774	6,673	6,335	6,337	6,532	6,806	7,189	7,309	7,674	7,737	7,767	7,511
Psychology.....	2,990	3,091	3,358	3,347	3,118	3,173	3,208	3,250	3,420	3,430	3,562	3,673	3,618	3,433
Social sciences.....	3,730	3,491	3,416	3,326	3,217	3,164	3,324	3,556	3,769	3,879	4,112	4,064	4,149	4,078
Engineering.....	2,648	2,494	2,528	2,710	3,166	3,712	4,543	5,214	5,698	6,008	6,118	5,332	5,320	5,502
Medical/other life sciences <sup>a</sup> .....	511	568	657	639	729	800	974	1,041	1,197	1,330	1,421	1,407	1,592	1,613
Non-S&E .....	13,197	12,799	12,442	12,007	11,633	11,676	11,621	12,470	13,160	13,881	13,896	13,750	13,797	13,622
U.S. citizen														
All fields.....	26,145	25,474	25,068	24,393	23,377	22,984	23,402	25,572	26,448	27,743	28,162	27,984	27,955	26,907
S&E.....	14,313	14,212	14,311	14,133	13,688	13,572	14,198	15,407	15,811	16,426	17,076	16,885	16,812	16,069
Natural sciences.....	5,541	5,702	5,725	5,767	5,635	5,486	5,620	6,026	6,005	6,109	6,338	6,169	6,265	6,164
Physical sciences.....	2,071	2,040	1,956	2,077	2,050	2,095	1,984	2,120	2,093	2,137	2,131	2,035	1,890	1,860
Earth, atmospheric, and ocean sciences.....	558	531	472	475	435	410	518	592	463	478	537	474	474	428
Biological sciences.....	2,912	3,131	3,297	3,215	3,150	2,981	3,118	3,314	3,449	3,494	3,670	3,660	3,901	3,876
Mathematics/computer sciences.....	716	715	650	592	566	588	731	850	921	1,038	960	959	904	833
Mathematics.....	691	552	482	412	377	345	393	462	496	554	530	539	517	468
Computer sciences.....	25	163	168	180	189	243	338	388	425	484	430	420	387	365
Agricultural sciences.....	489	545	594	649	683	584	606	564	457	492	467	443	447	401
Social/behavioral sciences.....	5,678	5,505	5,621	5,462	4,975	4,750	4,648	5,102	5,321	5,463	5,613	5,856	5,859	5,462
Psychology.....	2,774	2,852	3,112	3,048	2,805	2,747	2,684	2,953	3,071	3,084	3,041	3,223	3,154	2,938
Social sciences.....	2,904	2,653	2,509	2,414	2,170	2,003	1,964	2,149	2,250	2,379	2,572	2,633	2,705	2,524
Engineering.....	1,475	1,294	1,170	1,164	1,279	1,558	1,864	2,086	2,228	2,386	2,739	2,486	2,217	2,139
Medical/other life sciences <sup>a</sup> .....	414	451	551	499	550	606	729	779	879	938	959	972	1,120	1,070
Non-S&E.....	11,832	11,262	10,757	10,260	9,689	9,412	9,204	10,165	10,637	11,317	11,086	11,099	11,143	10,838
U.S. permanent resident														
All fields.....	1,368	1,320	1,281	1,274	1,324	1,578	1,626	1,857	2,259	4,318	2,931	2,306	1,957	1,822
S&E.....	1,042	995	932	934	966	1,129	1,151	1,345	1,701	3,615	2,350	1,729	1,489	1,332
Natural sciences.....	375	330	287	264	275	332	358	417	581	1,655	1,022	757	600	559
Physical sciences.....	191	165	147	120	137	147	147	180	237	704	366	242	202	183
Earth, atmospheric, and ocean sciences.....	22	33	16	30	30	25	29	26	41	116	70	51	34	36
Biological sciences.....	162	132	124	114	108	160	182	211	303	835	586	464	364	340
Mathematics/computer sciences.....	55	63	63	73	66	83	93	118	178	349	189	138	126	109
Mathematics.....	54	51	43	46	42	51	35	55	94	217	99	66	56	54
Computer sciences.....	1	12	20	27	24	32	58	63	84	132	90	72	70	55
Agricultural sciences.....	27	29	35	36	43	48	45	56	49	106	83	51	55	28

## Earned doctoral degrees, by field, citizenship, and race/ethnicity: Selected years, 1977–2001

Field, race/ethnicity, and citizenship	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001
Social/behavioral sciences.....	212	210	211	211	232	271	263	306	364	443	394	304	281	271
Psychology.....	47	45	47	64	59	59	54	65	90	101	89	70	76	75
Social sciences.....	165	165	164	147	173	212	209	241	274	342	305	234	205	196
Engineering.....	326	323	301	319	315	355	365	388	469	956	593	402	352	296
Medical/other life sciences <sup>a</sup> .....	47	40	35	31	35	40	27	60	60	106	69	77	75	69
Non-S&E.....	326	325	349	340	358	449	475	512	558	703	581	577	468	490
<b>White</b>														
All fields.....	23,523	22,314	22,473	22,277	21,305	21,119	21,568	23,180	24,035	24,689	23,962	23,892	23,687	22,587
S&E.....	13,187	12,671	13,078	13,143	12,674	12,605	13,185	14,040	14,529	14,722	14,655	14,554	14,392	13,618
Natural sciences.....	5,109	5,093	5,220	5,376	5,246	5,108	5,230	5,567	5,510	5,503	5,528	5,400	5,427	5,281
Physical sciences.....	1,877	1,774	1,757	1,931	1,906	1,956	1,828	1,969	1,911	1,924	1,883	1,839	1,691	1,647
Earth, atmospheric, and ocean sciences.....	515	498	448	445	424	394	498	557	455	464	487	433	430	394
Biological sciences.....	2,717	2,821	3,015	3,000	2,916	2,758	2,904	3,041	3,144	3,115	3,158	3,128	3,306	3,240
Mathematics/computer sciences.....	672	657	610	570	527	548	688	773	885	985	840	861	798	746
Mathematics.....	649	505	448	396	350	319	369	418	476	535	479	505	463	427
Computer sciences.....	23	152	162	174	177	229	319	355	409	450	361	356	335	319
Agricultural sciences.....	458	502	551	614	659	554	570	545	438	473	411	398	414	371
Social/behavioral sciences.....	5,147	4,863	5,100	4,999	4,551	4,383	4,287	4,598	4,872	4,836	4,761	4,948	4,906	4,564
Psychology.....	2,529	2,541	2,849	2,788	2,590	2,516	2,453	2,651	2,803	2,723	2,525	2,702	2,603	2,438
Social sciences.....	2,618	2,322	2,251	2,211	1,961	1,867	1,834	1,947	2,069	2,113	2,236	2,246	2,303	2,126
Engineering.....	1,420	1,156	1,093	1,129	1,189	1,459	1,726	1,837	2,024	2,092	2,287	2,110	1,886	1,746
Medical/other life sciences <sup>a</sup> .....	381	400	504	455	502	553	684	720	800	833	828	837	961	910
Non-S&E.....	10,336	9,643	9,395	9,134	8,631	8,514	8,383	9,140	9,506	9,967	9,307	9,338	9,295	8,969
<b>Asian/Pacific Islander</b>														
All fields.....	893	1,081	1,070	1,042	1,069	1,166	1,261	1,529	2,002	4,297	3,110	2,499	2,271	2,201
S&E.....	755	899	855	817	843	959	1,003	1,222	1,644	3,752	2,617	2,023	1,804	1,742
Natural sciences.....	312	349	320	326	322	331	377	448	648	1,773	1,192	901	768	789
Physical sciences.....	157	166	149	136	152	143	156	171	260	749	400	253	203	202
Earth, atmospheric, and ocean sciences.....	20	20	14	26	19	18	22	17	22	104	71	39	27	35
Biological sciences.....	135	163	157	164	151	170	199	260	366	920	721	609	538	552
Mathematics/computer sciences.....	42	55	56	54	50	67	76	123	156	344	204	144	146	109
Mathematics.....	42	46	40	34	33	41	24	57	79	207	97	57	70	48
Computer sciences.....	0	9	16	20	17	26	52	66	77	137	107	87	76	61
Agricultural sciences.....	21	23	25	33	24	38	23	24	29	78	63	46	30	16
Social/behavioral sciences.....	109	142	141	120	132	161	145	178	240	432	364	333	322	300
Psychology.....	31	33	41	44	44	47	55	59	73	121	126	132	146	120
Social sciences.....	78	109	100	76	88	114	90	119	167	311	238	201	176	180
Engineering.....	247	301	285	247	281	327	360	405	526	1,032	707	512	439	422
Medical/other life sciences <sup>a</sup> .....	24	29	28	37	34	35	22	44	45	93	87	87	99	106
Non-S&E.....	138	182	215	225	226	207	258	307	358	545	493	476	467	459

## Earned doctoral degrees, by field, citizenship, and race/ethnicity: Selected years, 1977–2001

Field, race/ethnicity, and citizenship	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001
<b>Black</b>														
All fields .....	1,187	1,102	1,109	1,008	1,043	907	963	1,165	1,278	1,461	1,474	1,760	1,749	1,721
S&E.....	365	367	367	354	397	350	396	503	527	610	670	771	786	760
Natural sciences .....	70	74	78	72	84	82	92	99	120	152	172	196	187	195
Physical sciences.....	32	37	24	25	27	20	31	32	41	42	52	66	62	54
Earth, atmospheric, and ocean sciences .....	2	3	4	1	4	2	4	3	4	3	8	14	7	5
Biological sciences .....	36	34	50	46	53	60	57	64	75	107	112	116	118	136
Mathematics/computer sciences.....	9	12	11	6	10	13	9	19	14	16	11	30	32	34
Mathematics.....	9	11	9	3	7	11	8	11	8	5	7	12	14	19
Computer sciences .....	0	1	2	3	3	2	1	8	6	11	4	18	18	15
Agricultural sciences.....	15	8	11	12	16	13	14	17	16	17	24	24	18	12
Social/behavioral sciences .....	233	229	226	219	230	186	219	273	268	295	310	366	393	363
Psychology .....	94	115	112	112	105	93	97	129	118	149	151	172	190	174
Social sciences .....	139	114	114	107	125	93	122	144	150	146	159	194	203	189
Engineering.....	15	19	19	29	34	25	33	55	50	70	98	98	81	92
Medical/other life sciences <sup>a</sup> .....	23	25	22	16	23	31	29	40	59	60	55	57	75	64
Non-S&E .....	822	735	742	654	646	557	567	662	751	851	804	989	963	961
<b>Hispanic</b>														
All fields .....	489	547	529	611	634	708	694	868	972	1,064	1,199	1,323	1,307	1,262
S&E.....	208	237	245	292	310	368	393	509	566	603	691	767	762	698
Natural sciences .....	72	78	77	81	95	123	139	176	206	213	231	259	269	244
Physical sciences.....	34	33	30	27	30	56	59	65	79	73	69	63	78	65
Earth, atmospheric, and ocean sciences .....	12	6	6	11	6	5	9	16	13	13	16	21	18	15
Biological sciences .....	26	39	41	43	59	62	71	95	114	127	146	175	173	164
Mathematics/computer sciences.....	12	12	5	7	18	15	15	21	23	21	36	29	29	23
Mathematics.....	12	10	5	7	12	11	11	9	16	15	20	15	15	15
Computer sciences .....	0	2	0	0	6	4	4	12	7	6	16	14	14	8
Agricultural sciences.....	4	6	16	6	12	15	18	15	20	21	26	15	26	19
Social/behavioral sciences .....	91	114	126	163	149	170	163	220	227	241	269	336	322	292
Psychology .....	40	50	66	95	69	95	93	122	131	146	171	215	211	174
Social sciences .....	51	64	60	68	80	75	70	98	96	95	98	121	111	118
Engineering.....	24	24	16	29	22	34	47	61	66	77	97	82	82	91
Medical/other life sciences <sup>a</sup> .....	5	3	5	6	14	11	11	16	24	30	32	46	34	29
Non-S&E .....	281	310	284	319	324	340	301	359	406	461	508	556	545	564
<b>American Indian/Alaskan Native</b>														
All fields .....	66	81	85	82	96	115	94	132	120	147	167	214	169	151
S&E.....	31	29	33	33	43	56	56	61	49	76	85	120	92	80
Natural sciences .....	13	6	7	12	17	18	23	23	16	22	19	35	31	27
Physical sciences.....	6	1	1	6	3	7	10	10	5	7	10	9	9	12
Earth, atmospheric, and ocean sciences .....	0	2	0	2	1	0	6	3	4	0	2	6	5	0
Biological sciences .....	7	3	6	4	13	11	7	10	7	15	7	20	17	15
Mathematics/computer sciences.....	1	1	1	1	0	3	2	1	2	2	2	2	3	3
Mathematics.....	1	0	1	0	0	0	0	0	1	2	1	1	2	2
Computer sciences .....	0	1	0	1	0	3	2	1	1	0	1	1	1	1

## Earned doctoral degrees, by field, citizenship, and race/ethnicity: Selected years, 1977–2001

Field, race/ethnicity, and citizenship	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2000	2001
Agricultural sciences.....	1	0	1	1	4	2	2	4	1	2	5	1	4	0
Social/behavioral sciences.....	15	19	15	15	19	23	19	22	22	32	36	64	42	37
Psychology.....	9	10	9	9	10	16	11	13	15	14	18	35	22	17
Social sciences.....	6	9	6	6	9	7	8	9	7	18	18	29	20	20
Engineering.....	1	3	4	1	1	7	7	6	2	9	17	12	8	7
Medical/other life sciences <sup>a</sup> .....	0	0	5	3	2	3	3	5	6	9	6	6	4	6
Non-S&E.....	35	52	52	49	53	59	38	71	71	71	82	94	77	71
Other/unknown race/ethnicity														
All fields.....	1,355	1,669	1,083	647	554	547	448	555	300	403	1,181	602	729	807
S&E.....	809	1,004	665	428	387	363	316	417	197	278	708	379	465	503
Natural sciences.....	340	432	310	164	146	156	117	130	86	101	218	135	183	187
Physical sciences.....	156	194	142	72	69	60	47	53	34	46	83	47	49	63
Earth, atmospheric, and ocean sciences.....	31	35	16	20	11	16	8	22	6	10	23	12	21	15
Biological sciences.....	153	203	152	72	66	80	62	55	46	45	112	76	113	109
Mathematics/computer sciences.....	35	41	30	27	27	25	34	31	19	19	56	31	22	27
Mathematics.....	32	31	22	18	17	14	16	22	10	7	25	15	9	11
Computer sciences.....	3	10	8	9	10	11	18	9	9	12	31	16	13	16
Agricultural sciences.....	17	35	25	19	11	10	24	15	2	7	21	10	10	11
Social/behavioral sciences.....	295	348	224	157	126	98	78	117	56	70	267	113	155	177
Psychology.....	118	148	82	64	46	39	29	44	21	32	139	37	58	90
Social sciences.....	177	200	142	93	80	59	49	73	35	38	128	76	97	87
Engineering.....	94	114	54	48	67	61	56	110	29	62	126	74	73	77
Medical/other life sciences <sup>a</sup> .....	28	34	22	13	10	13	7	14	5	19	20	16	22	24
Non-S&E.....	546	665	418	219	167	184	132	138	103	125	473	223	264	304
Foreign citizen <sup>b</sup>														
All fields.....	3,480	3,617	3,984	4,540	5,253	5,668	6,686	9,382	9,973	8,829	9,193	9,059	9,649	9,780
S&E.....	2,735	2,761	3,071	3,530	4,160	4,601	5,553	7,859	8,353	7,253	7,782	7,526	7,951	8,242
Natural sciences.....	828	788	826	971	1,166	1,430	1,624	2,515	2,750	2,074	2,637	2,656	2,742	2,704
Physical sciences.....	411	420	448	543	626	808	893	1,264	1,265	931	1,084	1,127	1,154	1,213
Earth, atmospheric, and ocean sciences.....	98	69	87	103	115	124	122	186	236	173	231	242	203	252
Biological sciences.....	319	299	291	325	425	498	609	1,065	1,249	970	1,322	1,287	1,385	1,239
Mathematics/computer sciences.....	170	181	228	282	329	446	524	849	867	749	771	774	804	791
Mathematics.....	167	149	188	209	240	302	346	509	518	384	441	444	443	435
Computer sciences.....	3	32	40	73	89	144	178	340	349	365	330	330	361	356
Agricultural sciences.....	260	268	327	311	355	295	362	443	449	429	392	459	415	358
Social/behavioral sciences.....	656	651	683	699	789	792	961	1,234	1,280	1,228	1,154	1,157	1,238	1,300
Psychology.....	73	73	81	81	81	86	107	134	150	165	137	153	164	152
Social sciences.....	583	578	602	618	708	706	854	1,100	1,130	1,063	1,017	1,004	1,074	1,148
Engineering.....	780	820	951	1,180	1,422	1,540	1,948	2,646	2,792	2,527	2,555	2,194	2,446	2,772
Medical/other life sciences <sup>a</sup> .....	41	53	56	87	99	98	134	172	215	246	273	286	306	317
Non-S&E.....	745	856	913	1,010	1,093	1,067	1,133	1,523	1,620	1,576	1,411	1,533	1,698	1,538

<sup>a</sup>Medical/other life sciences are reported separately from S&E fields in National Science Foundation, Division of Science Resources Statistics (NSF/SRS), higher education publications.

<sup>b</sup>Includes temporary residents only.

NOTES: Data by race/ethnicity include U.S. citizens and permanent residents. For detailed fields, see NSF/SRS, *Science and Engineering Doctorate Awards*, <http://www.nsf.gov/sbe/srs/nsf01325/htmstart.htm>.

SOURCE: NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

## Earned doctoral degrees, by field and citizenship: 1985–2001

Field and citizenship	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All fields .....	31,297	31,902	32,370	33,500	34,327	36,067	37,533	38,890	39,800	41,037	41,747	42,438	42,559	42,654	41,097	41,340	40,744
S&E.....	19,664	20,207	20,694	21,814	22,706	23,824	25,063	25,787	26,640	27,501	27,866	28,567	28,663	28,783	27,347	27,543	27,122
Natural sciences <sup>a</sup> .....	7,326	7,486	7,679	8,156	8,100	8,590	9,091	9,374	9,562	10,004	9,996	10,356	10,436	10,485	9,967	10,014	9,816
Mathematics/computer sciences.....	998	1,128	1,190	1,264	1,471	1,597	1,838	1,927	2,026	2,021	2,187	2,042	2,032	2,104	1,938	1,908	1,832
Agricultural sciences.....	1,110	997	976	1,015	1,086	1,174	1,073	1,063	968	1,078	1,036	1,036	982	1,037	966	942	848
Social/behavioral sciences.....	6,335	6,450	6,337	6,310	6,532	6,613	6,806	6,873	7,189	7,280	7,309	7,500	7,674	7,730	7,737	7,767	7,511
Engineering.....	3,166	3,376	3,712	4,187	4,543	4,894	5,214	5,438	5,698	5,822	6,008	6,309	6,118	5,927	5,332	5,320	5,502
Medical/other life sciences <sup>b</sup> .....	729	770	800	882	974	956	1,041	1,112	1,197	1,296	1,330	1,324	1,421	1,500	1,407	1,592	1,613
Non-S&E.....	11,633	11,695	11,676	11,686	11,621	12,243	12,470	13,103	13,160	13,536	13,881	13,871	13,896	13,871	13,750	13,797	13,622
U.S. citizen																	
All degrees.....	23,377	23,088	22,984	23,290	23,402	24,905	25,572	26,010	26,448	27,150	27,743	27,777	28,162	28,459	27,984	27,955	26,907
S&E.....	13,688	13,592	13,572	14,025	14,198	14,888	15,407	15,368	15,811	16,127	16,426	16,574	17,076	17,310	16,885	16,812	16,069
Natural sciences <sup>a</sup> .....	5,635	5,560	5,486	5,742	5,620	5,876	6,026	5,991	6,005	6,127	6,109	6,086	6,338	6,397	6,169	6,265	6,164
Mathematics/computer sciences.....	566	569	588	626	731	723	850	876	921	930	1,038	912	960	1,052	959	904	833
Agricultural sciences.....	683	579	584	539	606	630	564	511	457	519	492	473	467	464	443	447	401
Social/behavioral sciences.....	4,975	4,933	4,750	4,681	4,648	4,981	5,102	5,072	5,321	5,375	5,463	5,574	5,613	5,758	5,856	5,859	5,462
Engineering.....	1,279	1,383	1,558	1,780	1,864	1,957	2,086	2,109	2,228	2,215	2,386	2,596	2,739	2,567	2,486	2,217	2,139
Medical/other life sciences <sup>b</sup> .....	550	568	606	657	729	721	779	809	879	961	938	933	959	1,072	972	1,120	1,070
Non-S&E.....	9,689	9,496	9,412	9,265	9,204	10,017	10,165	10,642	10,637	11,023	11,317	11,203	11,086	11,149	11,099	11,143	10,838
Non-U.S. citizen																	
All degrees.....	6,577	6,758	7,246	7,865	8,312	9,842	11,239	11,969	12,232	13,172	13,147	13,414	12,124	12,198	11,365	11,606	11,602
S&E.....	5,126	5,325	5,730	6,256	6,704	8,006	9,204	9,772	10,054	10,876	10,868	11,195	10,132	10,163	9,255	9,440	9,574
Natural sciences <sup>a</sup> .....	1,441	1,539	1,762	1,927	1,982	2,483	2,932	3,224	3,331	3,730	3,729	3,997	3,659	3,681	3,413	3,342	3,263
Mathematics/computer sciences.....	395	481	529	569	617	803	967	997	1,045	1,064	1,098	1,070	960	953	912	930	900
Agricultural sciences.....	398	372	343	421	407	502	499	539	498	551	535	545	475	541	510	470	386
Social/behavioral sciences.....	1,021	1,073	1,063	1,086	1,224	1,342	1,540	1,578	1,644	1,720	1,671	1,705	1,548	1,559	1,461	1,519	1,571
Engineering.....	1,737	1,725	1,895	2,097	2,313	2,675	3,034	3,161	3,261	3,492	3,483	3,527	3,148	3,061	2,596	2,798	3,068
Medical/other life sciences <sup>b</sup> .....	134	135	138	156	161	201	232	273	275	319	352	351	342	368	363	381	386
Non-S&E.....	1,451	1,433	1,516	1,609	1,608	1,836	2,035	2,197	2,178	2,296	2,279	2,219	1,992	2,035	2,110	2,166	2,028
Permanent resident																	
All degrees.....	1,324	1,433	1,578	1,622	1,626	1,698	1,857	1,980	2,259	3,747	4,318	3,765	2,931	2,702	2,306	1,957	1,822
S&E.....	966	1,029	1,129	1,165	1,151	1,232	1,345	1,429	1,701	3,110	3,615	3,092	2,350	2,101	1,729	1,489	1,332
Natural sciences <sup>a</sup> .....	275	274	332	358	358	380	417	475	581	1,363	1,655	1,407	1,022	928	757	600	559
Mathematics/computer sciences.....	66	83	83	86	93	102	118	120	178	270	349	250	189	178	138	126	109
Agricultural sciences.....	43	47	48	71	45	57	56	62	49	97	106	103	83	79	51	55	28
Social/behavioral sciences.....	232	247	271	249	263	269	306	315	364	453	443	456	394	355	304	281	271
Engineering.....	315	343	355	366	365	389	388	411	469	838	956	793	593	479	402	352	296
Medical/other life sciences <sup>b</sup> .....	35	35	40	35	27	35	60	46	60	89	106	83	69	82	77	75	69
Non-S&E.....	358	404	449	457	475	466	512	551	558	637	703	673	581	601	577	468	490

## Earned doctoral degrees, by field and citizenship: 1985–2001

Field and citizenship	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Temporary resident																	
All degrees .....	5,253	5,325	5,668	6,243	6,686	8,144	9,382	9,989	9,973	9,425	8,829	9,649	9,193	9,496	9,059	9,649	9,780
S&E.....	4,160	4,296	4,601	5,091	5,553	6,774	7,859	8,343	8,353	7,766	7,253	8,103	7,782	8,062	7,526	7,951	8,242
Natural sciences <sup>a</sup> .....	1,166	1,265	1,430	1,569	1,624	2,103	2,515	2,749	2,750	2,367	2,074	2,590	2,637	2,753	2,656	2,742	2,704
Mathematics/computer sciences .....	329	398	446	483	524	701	849	877	867	794	749	820	771	775	774	804	791
Agricultural sciences.....	355	325	295	350	362	445	443	477	449	454	429	442	392	462	459	415	358
Social/behavioral sciences.....	789	826	792	837	961	1,073	1,234	1,263	1,280	1,267	1,228	1,249	1,154	1,204	1,157	1,238	1,300
Engineering .....	1,422	1,382	1,540	1,731	1,948	2,286	2,646	2,750	2,792	2,654	2,527	2,734	2,555	2,582	2,194	2,446	2,772
Medical/other life sciences <sup>b</sup> .....	99	100	98	121	134	166	172	227	215	230	246	268	273	286	286	306	317
Non-S&E .....	1,093	1,029	1,067	1,152	1,133	1,370	1,523	1,646	1,620	1,659	1,576	1,546	1,411	1,434	1,533	1,698	1,538
Citizenship unknown																	
All degrees .....	1,343	2,056	2,140	2,345	2,613	1,320	722	911	1,120	715	857	1,247	2,273	1,997	1,748	1,779	2,235
S&E.....	850	1,290	1,392	1,533	1,804	930	452	647	775	498	572	798	1,455	1,310	1,207	1,291	1,479
Natural sciences <sup>a</sup> .....	250	387	431	487	498	231	133	159	226	147	158	273	439	407	385	407	389
Mathematics/computer sciences.....	37	78	73	69	123	71	21	54	60	27	51	60	112	99	67	74	99
Agricultural sciences.....	29	46	49	55	73	42	10	13	13	8	9	18	40	32	13	25	61
Social/behavioral sciences.....	339	444	524	543	660	290	164	223	224	185	175	221	513	413	420	389	478
Engineering.....	150	268	259	310	366	262	94	168	209	115	139	186	231	299	250	305	295
Medical/other life sciences <sup>b</sup> .....	45	67	56	69	84	34	30	30	43	16	40	40	120	60	72	91	157
Non-S&E .....	493	766	748	812	809	390	270	264	345	217	285	449	818	687	541	488	756

<sup>a</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.

<sup>b</sup>Medical/other life sciences are reported separately from S&E fields in National Science Foundation, Division of Science Resources Statistics (NSF/SRS), higher education publications.

NOTE: For detailed fields, see NSF/SRS, *Science and Engineering Doctorate Awards*, <http://www.nsf.gov/sbe/srs/nsf01325/htmstart.htm>.

SOURCE: NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.



Appendix table 2-29

## Time from bachelor's to S&amp;E doctoral degree, by doctoral degree field: 1973–2001

Year	Engineering	Physical sciences	Earth, atmospheric, and ocean sciences	Mathematics	Computer sciences	Agricultural sciences	Biological sciences	Psychology	Social sciences
1973	7.9	6.6	8.0	7.0	0.0	8.0	7.0	6.8	8.3
1974	7.8	6.6	8.0	7.0	0.0	8.0	7.0	6.9	8.5
1975	7.6	6.6	7.9	7.0	0.0	8.0	7.0	6.9	8.7
1976	7.5	6.5	7.9	7.0	0.0	8.4	7.0	7.0	8.8
1977	7.5	6.9	8.0	7.0	7.4	8.1	7.0	7.2	9.0
1978	7.6	6.9	8.0	7.2	7.8	8.0	7.0	7.5	9.0
1979	7.6	6.5	7.8	7.2	7.8	8.0	7.0	7.9	9.6
1980	7.8	6.6	8.2	7.0	7.3	8.1	7.0	8.0	9.7
1981	8.0	6.5	8.2	7.0	7.7	8.0	7.0	8.4	9.8
1982	8.0	6.5	8.5	7.1	7.9	8.0	7.3	8.6	10.0
1983	8.0	6.8	8.5	7.3	8.5	8.5	7.5	9.0	10.1
1984	8.0	6.8	8.9	8.0	9.0	8.4	8.0	9.3	10.4
1985	8.2	7.0	8.9	8.0	9.1	9.0	8.0	9.5	10.9
1986	8.2	7.0	9.0	7.3	9.3	9.1	8.0	9.9	10.8
1987	8.2	7.0	9.0	8.0	9.2	9.6	8.2	10.0	11.0
1988	8.1	7.0	9.5	8.1	9.5	9.9	8.3	10.2	11.2
1989	8.3	7.0	9.2	8.0	9.0	10.0	8.3	10.2	11.0
1990	8.3	7.1	9.0	8.0	9.0	10.4	8.3	10.0	11.3
1991	8.6	7.3	9.3	8.3	8.9	10.3	8.4	10.2	11.2
1992	8.9	7.4	9.8	8.9	9.3	10.3	8.7	10.3	11.3
1993	9.0	7.6	10.5	8.6	9.6	10.8	8.6	10.0	11.1
1994	9.0	7.6	10.7	8.9	9.7	10.8	8.8	9.6	11.4
1995	9.1	7.7	10.8	8.6	9.5	11.0	8.7	9.8	11.2
1996	9.0	7.6	11.0	8.3	10.0	11.4	8.7	9.6	11.0
1997	8.9	7.3	10.7	8.7	9.8	10.9	8.5	9.3	11.0
1998	8.9	7.2	10.5	8.0	10.3	11.2	8.3	9.1	10.8
1999	8.8	7.1	10.5	8.0	10.0	11.0	8.2	9.0	11.0
2000	8.7	7.3	10.1	7.7	10.0	11.0	8.2	9.0	10.8
2001	8.4	7.0	10.0	8.0	9.5	10.5	8.1	9.0	10.9
	Years enrolled from bachelor's to doctoral degree (median)								
1973	5.9	5.8	6.0	5.9	0.0	5.6	5.8	5.5	6.0
1974	5.8	5.7	6.0	5.6	0.0	5.5	5.8	5.5	6.1
1975	5.7	5.6	6.0	5.6	0.0	5.6	5.8	5.6	6.1
1976	5.8	5.7	6.0	5.8	0.0	5.5	5.9	5.7	6.2
1977	5.8	5.8	6.0	6.0	6.1	5.6	5.9	5.8	6.5
1978	5.8	5.9	6.2	5.9	5.9	5.5	5.9	5.9	6.5
1979	5.7	5.6	6.2	6.0	6.0	5.5	6.0	6.1	6.8
1980	5.8	5.8	6.3	6.0	6.0	5.8	6.0	6.3	6.9
1981	5.8	5.7	6.6	6.0	6.1	5.7	6.0	6.4	7.0
1982	5.9	5.8	6.5	6.0	6.5	6.0	6.1	6.6	7.2
1983	5.9	6.0	7.0	6.3	6.8	6.0	6.3	6.8	7.4
1984	5.9	6.0	6.9	6.2	6.8	6.0	6.5	7.0	7.5
1985	6.0	6.0	7.0	6.4	6.4	6.1	6.5	7.1	7.6
1986	6.0	6.0	7.1	6.1	6.6	6.1	6.5	7.1	7.6
1987	6.0	6.0	7.0	6.5	6.8	6.5	6.6	7.2	7.8
1988	6.0	6.0	7.3	6.4	6.9	6.4	6.8	7.3	7.9
1989	6.1	6.0	7.0	6.3	6.8	6.6	6.7	7.4	7.9
1990	6.3	6.2	7.3	6.7	6.8	6.8	7.0	7.6	8.0
1991	6.3	6.2	7.4	6.7	6.9	6.8	6.8	7.5	8.0
1992	6.4	6.4	7.5	7.0	7.0	6.6	7.0	7.5	8.0
1993	6.5	6.4	7.7	7.0	7.2	6.9	7.0	7.3	8.1
1994	6.5	6.5	7.8	6.9	7.3	6.8	7.0	7.3	8.0
1995	6.5	6.6	7.9	6.9	7.4	6.7	7.0	7.3	8.0
1996	6.5	6.5	7.8	6.8	7.2	6.9	7.0	7.3	7.9
1997	6.6	6.5	7.7	7.0	7.6	7.0	7.0	7.3	8.0
1998	6.8	6.4	7.6	6.8	7.6	7.0	7.0	7.2	8.0
1999	6.8	6.4	7.7	6.9	7.6	7.0	6.9	7.3	8.0
2000	6.8	6.5	7.8	6.8	7.5	7.1	7.0	7.2	8.1
2001	6.7	6.4	7.5	6.7	7.4	7.3	7.0	7.3	8.2

SOURCE: National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

## Postdocs at U.S. universities, by field and citizenship status: 1977–2001

Citizenship	All S&E fields	Engineering	Physical sciences	Earth, atmospheric, and ocean sciences	Mathematics	Computer sciences	Agricultural sciences	Biological sciences	Medical/ other life sciences <sup>a</sup>	Psychology	Social sciences
<b>All academic postdocs</b>											
1977 .....	19,445	1,245	4,197	375	86	59	294	6,599	5,843	399	348
1979 .....	18,101	1,067	4,056	315	162	38	227	6,867	4,515	454	400
1980 .....	18,399	981	4,279	312	162	43	257	7,085	4,376	475	429
1981 .....	19,634	1,040	4,477	346	113	35	290	7,680	4,863	471	319
1982 .....	19,363	980	4,298	340	194	47	291	7,724	4,685	520	284
1983 .....	20,712	1,108	4,458	420	170	80	307	8,348	5,042	437	342
1984 .....	21,535	1,203	4,408	493	203	59	374	8,693	5,353	423	326
1985 .....	22,387	1,356	4,539	379	226	70	371	9,131	5,455	510	350
1986 .....	23,721	1,405	4,860	420	201	75	409	9,704	5,804	521	322
1987 .....	24,881	1,446	4,968	424	229	103	441	10,365	6,066	460	379
1988 .....	26,123	1,690	5,201	496	284	96	462	10,667	6,409	498	320
1989 .....	27,932	1,928	5,366	453	225	84	506	11,441	7,026	536	367
1990 .....	29,565	1,950	5,592	594	249	71	517	11,928	7,762	464	438
1991 .....	30,865	2,262	5,722	625	206	120	557	12,478	8,008	508	379
1992 .....	32,747	2,369	5,792	692	201	145	621	13,177	8,864	525	361
1993 .....	34,322	2,446	5,669	765	224	164	695	13,803	9,657	521	378
1994 .....	36,377	2,606	5,884	824	239	185	699	14,409	10,590	551	390
1995 .....	35,926	2,648	5,851	845	262	213	694	14,689	9,766	582	376
1996 .....	37,107	2,677	5,828	861	326	250	674	14,915	10,538	594	444
1997 .....	38,481	2,971	5,968	942	308	322	702	15,104	11,217	586	361
1998 .....	40,086	2,853	6,004	902	279	374	669	15,787	12,210	617	391
1999 .....	40,771	3,196	6,157	925	351	334	712	16,129	11,797	716	454
2000 .....	43,137	3,313	6,270	1,155	385	366	786	16,770	12,891	730	471
2001 .....	42,989	3,118	6,212	1,035	354	361	799	16,921	12,931	830	428
<b>U.S. citizen/permanent resident</b>											
1977 .....	13,302	593	2,465	270	47	47	210	4,624	4,433	360	253
1979 .....	12,036	414	2,026	205	82	25	146	4,975	3,444	420	299
1980 .....	11,893	303	2,116	210	70	30	159	4,989	3,283	445	288
1981 .....	12,340	332	2,109	219	52	18	177	5,310	3,504	417	202
1982 .....	12,129	323	1,923	218	68	35	171	5,339	3,413	455	184
1983 .....	13,193	414	2,064	260	80	36	224	5,791	3,716	376	232
1984 .....	13,548	439	1,987	328	103	41	268	5,913	3,861	377	231
1985 .....	13,528	443	2,026	253	112	45	226	5,953	3,785	456	229
1986 .....	14,041	460	2,213	278	100	48	243	6,102	3,921	471	205
1987 .....	14,133	497	2,178	261	119	69	273	6,256	3,801	387	292
1988 .....	14,420	588	2,260	307	151	57	311	6,103	3,976	425	242
1989 .....	14,863	657	2,267	271	95	47	306	6,354	4,178	434	254
1990 .....	15,115	613	2,213	377	99	40	317	6,382	4,446	381	247
1991 .....	15,135	655	2,202	389	92	84	317	6,413	4,328	407	248
1992 .....	15,800	767	2,248	415	92	98	348	6,589	4,616	401	226
1993 .....	16,727	843	2,213	460	107	89	362	6,940	5,092	386	235

## Postdocs at U.S. universities, by field and citizenship status: 1977–2001

Citizenship	All S&E fields	Engineering	Physical sciences	Earth, atmospheric, and ocean sciences	Mathematics	Computer sciences	Agricultural sciences	Biological sciences	Medical/other life sciences <sup>a</sup>	Psychology	Social sciences
1994 .....	17,986	1,018	2,421	514	131	96	349	7,265	5,517	426	249
1995 .....	18,142	999	2,578	502	117	113	380	7,408	5,319	465	261
1996 .....	18,412	1,050	2,489	504	137	121	342	7,496	5,482	483	308
1997 .....	18,916	1,089	2,512	573	138	146	360	7,310	6,081	453	254
1998 .....	19,710	950	2,371	530	127	188	350	7,698	6,744	487	265
1999 .....	18,865	1,018	2,259	535	152	144	364	7,368	6,144	535	346
2000 .....	19,474	1,069	2,271	705	149	151	321	7,088	6,825	561	334
2001 .....	18,388	968	2,040	599	154	138	316	6,993	6,270	615	295
Foreign citizen <sup>b</sup>											
1977 .....	6,143	652	1,732	105	39	12	84	1,975	1,410	39	95
1979 .....	6,065	653	2,030	110	80	13	81	1,892	1,071	34	101
1980 .....	6,506	678	2,163	102	92	13	98	2,096	1,093	30	141
1981 .....	7,294	708	2,368	127	61	17	113	2,370	1,359	54	117
1982 .....	7,234	657	2,375	122	126	12	120	2,385	1,272	65	100
1983 .....	7,519	694	2,394	160	90	44	83	2,557	1,326	61	110
1984 .....	7,987	764	2,421	165	100	18	106	2,780	1,492	46	95
1985 .....	8,859	913	2,513	126	114	25	145	3,178	1,670	54	121
1986 .....	9,680	945	2,647	142	101	27	166	3,602	1,883	50	117
1987 .....	10,748	949	2,790	163	110	34	168	4,109	2,265	73	87
1988 .....	11,703	1,102	2,941	189	133	39	151	4,564	2,433	73	78
1989 .....	13,069	1,271	3,099	182	130	37	200	5,087	2,848	102	113
1990 .....	14,450	1,337	3,379	217	150	31	200	5,546	3,316	83	191
1991 .....	15,730	1,607	3,520	236	114	36	240	6,065	3,680	101	131
1992 .....	16,947	1,602	3,544	277	109	47	273	6,588	4,248	124	135
1993 .....	17,595	1,603	3,456	305	117	75	333	6,863	4,565	135	143
1994 .....	18,391	1,588	3,463	310	108	89	350	7,144	5,073	125	141
1995 .....	17,784	1,649	3,273	343	145	100	314	7,281	4,447	117	115
1996 .....	18,695	1,627	3,339	357	189	129	332	7,419	5,056	111	136
1997 .....	19,565	1,882	3,456	369	170	176	342	7,794	5,136	133	107
1998 .....	20,376	1,903	3,633	372	152	186	319	8,089	5,466	130	126
1999 .....	21,906	2,178	3,898	390	199	190	348	8,761	5,653	181	108
2000 .....	23,663	2,244	3,999	450	236	215	465	9,682	6,066	169	137
2001 .....	24,601	2,150	4,172	436	200	223	483	9,928	6,661	215	133

<sup>a</sup>Medical/other life sciences are reported separately from S&E fields in National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Graduate Students and Postdoctorates in Science and Engineering*, available on the SRS website.

<sup>b</sup>Includes temporary residents only.

SOURCE: NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 2-31

(Page 1 of 4)

## Plans of foreign recipients of U.S. S&amp;E doctorates to stay in United States, by field and place of origin: 1990–2001

Field and place of origin	Foreign S&E doctorate recipients			Plans to stay			Firm plans to stay		
	1990–93	1994–97	1998–2001	1990–93	1994–97	1998–2001	1990–93	1994–97	1998–2001
	Number			Percent					
<b>All S&amp;E fields</b>									
All non-U.S. citizens.....	35,830	41,562	36,878	63.4	69.3	76.3	40.9	43.3	54.1
East/South Asia .....	21,181	25,867	20,751	68.6	75.4	83.2	44.1	46.2	58.5
China .....	7,283	10,564	9,351	93.5	96.6	96.2	58.0	57.3	67.5
Taiwan .....	4,588	4,716	2,829	56.0	54.3	68.8	33.8	28.9	42.2
Japan.....	536	651	655	42.7	44.0	54.9	29.6	31.6	36.8
South Korea .....	4,319	3,960	3,124	38.7	42.3	65.7	24.4	25.8	45.1
India.....	3,253	4,760	3,601	85.6	90.1	94.0	62.6	61.8	73.2
Other.....	1,202	1,216	1,191	48.3	46.9	45.6	31.2	27.5	31.1
West Asia .....	3,834	3,556	2,921	59.5	60.4	67.2	32.7	34.4	46.1
Iran .....	887	607	361	84.8	83.2	93.3	43.9	43.3	61.3
Israel.....	344	318	164	55.2	60.8	63.3	37.5	40.9	42.3
Turkey.....	474	619	918	56.5	56.1	61.5	33.6	37.0	43.7
Other.....	2,129	2,012	1,478	51.2	54.9	65.0	27.5	29.8	44.5
Pacifica/Australasia .....	833	893	683	49.2	50.6	59.7	33.1	28.7	43.1
Australia.....	167	207	178	57.2	54.7	65.5	41.9	37.9	48.6
Indonesia .....	275	297	211	24.5	23.8	45.7	18.6	10.1	32.8
New Zealand.....	79	94	90	46.1	64.3	62.3	36.0	49.0	49.4
Other.....	312	295	204	65.8	68.0	67.3	39.2	32.3	45.8
Africa .....	2,013	1,785	1,350	48.2	55.1	70.3	24.5	25.8	40.7
Egypt .....	460	341	299	33.0	50.2	62.0	16.1	23.8	43.7
Nigeria .....	286	175	111	79.8	87.1	90.1	36.1	29.9	39.5
South Africa .....	136	138	138	45.6	47.7	69.0	34.7	34.5	45.5
Other.....	1,131	1,131	802	46.9	52.8	70.7	23.8	24.6	39.0
Europe .....	3,826	4,943	6,068	61.2	67.2	76.2	44.5	47.9	57.5
Greece .....	616	577	377	65.1	59.5	74.3	45.8	40.8	56.5
United Kingdom.....	534	477	504	76.2	77.5	80.8	57.7	59.5	62.4
Germany .....	529	753	832	58.6	64.3	66.5	43.0	44.6	52.4
Italy.....	298	327	370	48.6	49.6	62.2	36.5	31.9	49.8
France.....	302	320	321	43.6	53.7	71.2	29.4	32.0	48.4
Spain .....	207	227	242	48.8	56.3	56.1	38.5	45.7	40.8
Other.....	1,340	2,262	3,422	63.0	73.4	81.5	45.4	53.0	61.1
North/South America .....	3,504	3,657	3,968	49.9	51.6	56.9	36.0	36.1	42.4
Canada .....	1,137	1,073	1,152	58.4	66.1	73.3	46.9	49.8	56.9
Mexico .....	486	560	736	41.7	38.2	39.8	27.0	24.0	29.3
Argentina .....	266	239	269	53.7	64.9	65.3	36.9	43.2	51.3
Brazil .....	500	646	576	26.3	28.4	35.3	16.7	21.0	25.6
Chile .....	204	145	124	47.6	36.4	54.2	34.3	23.0	44.0
Colombia.....	161	173	184	51.7	50.9	64.3	34.5	32.0	47.5
Peru .....	122	117	108	66.9	74.6	67.7	45.5	46.8	44.5
Other.....	628	704	819	55.0	56.5	59.3	37.1	37.9	41.1
Country unknown .....	639	933	1,139	76.9	60.6	55.8	50.3	40.3	35.2
<b>Natural/agricultural sciences<sup>a</sup></b>									
All non-U.S. citizens.....	13,955	17,206	15,606	69.0	75.9	81.1	47.6	49.8	58.4
East/South Asia .....	8,342	10,849	9,006	78.8	84.8	89.3	54.7	54.8	63.8
China .....	4,061	6,030	5,158	94.4	97.1	96.6	64.0	61.2	68.0
Taiwan .....	1,412	1,524	977	64.2	64.7	75.2	41.8	39.2	50.7
Japan .....	154	169	182	57.3	61.6	73.2	42.9	44.8	49.4
South Korea .....	1,296	1,301	1,016	57.1	60.9	81.2	43.1	44.9	63.5
India.....	955	1,378	1,225	85.7	90.6	94.0	64.7	61.4	69.6
Other .....	464	447	448	48.1	53.1	48.7	32.9	34.8	35.2
West Asia .....	1,116	1,110	899	60.0	61.3	68.8	36.1	35.7	49.8
Iran .....	241	198	120	84.6	81.5	91.3	50.8	41.5	64.2
Israel.....	73	88	52	64.6	73.5	71.5	46.3	53.9	45.7
Turkey.....	90	148	243	64.6	51.8	52.8	40.9	34.3	38.8
Other.....	712	676	484	51.0	56.0	71.5	29.8	32.1	52.6
Pacifica/Australasia .....	360	378	272	49.9	57.0	58.4	32.9	31.9	39.2
Australia .....	52	85	60	54.0	54.9	67.1	39.0	36.0	49.9
Indonesia .....	100	97	61	15.0	30.4	42.8	11.3	18.7	31.8
New Zealand.....	34	37	36	37.7	63.8	49.2	31.6	46.3	34.9
Other .....	174	159	115	68.9	71.9	64.8	42.5	33.1	38.6

Appendix table 2-31

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## Plans of foreign recipients of U.S. S&amp;E doctorates to stay in United States, by field and place of origin: 1990–2001

Field and place of origin	Foreign S&E doctorate recipients			Plans to stay			Firm plans to stay		
	1990–93	1994–97	1998–2001	1990–93	1994–97	1998–2001	1990–93	1994–97	1998–2001
	Number			Percent					
Africa .....	783	693	492	44.4	53.5	69.9	21.9	23.8	39.9
Egypt .....	150	58	51	33.0	45.4	65.5	16.4	19.8	52.8
Nigeria .....	83	59	42	88.9	95.5	92.1	37.9	38.2	40.1
South Africa .....	45	51	62	47.6	49.4	62.2	37.0	31.8	44.3
Other .....	505	525	337	40.7	50.4	69.1	19.9	22.3	37.1
Europe .....	1,516	2,128	2,739	60.9	68.1	78.8	45.5	49.8	59.9
Greece .....	177	175	122	65.8	52.3	72.4	49.4	36.8	58.1
United Kingdom .....	248	217	262	75.8	77.3	79.7	60.5	61.9	62.9
Germany .....	254	372	396	54.5	62.6	68.1	41.8	44.2	55.1
Italy .....	104	111	119	49.5	52.2	58.6	36.6	37.2	47.8
France .....	120	153	127	40.3	53.1	68.3	24.3	38.0	41.7
Spain .....	75	111	83	60.2	58.0	58.8	43.5	44.5	38.4
Other .....	538	989	1,630	61.6	75.9	84.9	44.9	55.3	64.1
North/South America .....	1,585	1,697	1,739	48.3	54.1	58.5	35.9	38.7	44.7
Canada .....	483	477	498	60.1	71.5	79.3	50.4	56.3	63.8
Mexico .....	257	292	343	40.0	38.5	36.5	27.1	23.4	27.5
Argentina .....	126	126	125	45.0	62.0	67.8	34.7	41.7	52.6
Brazil .....	210	290	229	21.7	27.9	32.2	12.9	24.9	23.9
Chile .....	87	73	56	63.1	48.4	64.2	48.0	32.5	53.0
Colombia .....	84	73	91	46.0	59.0	71.0	29.4	39.2	54.9
Peru .....	43	35	39	56.7	75.2	73.4	44.5	58.2	45.3
Other .....	295	331	358	50.6	60.1	58.5	32.6	38.0	40.5
Country unknown .....	253	373	461	76.1	65.9	64.3	50.1	50.5	39.3
Mathematics/computer sciences									
All non-U.S. citizens .....	3,800	4,184	3,695	67.5	70.9	78.6	45.9	46.1	57.9
East/South Asia .....	2,349	2,512	1,886	71.0	75.8	85.3	47.8	47.2	61.8
China .....	901	929	765	92.2	97.1	95.8	58.3	53.4	70.9
Taiwan .....	485	421	280	60.1	51.5	70.7	41.7	27.7	40.1
Japan .....	48	32	47	57.0	41.9	86.3	44.1	24.8	63.1
South Korea .....	353	357	297	25.9	37.0	69.9	11.9	20.1	41.9
India .....	415	630	397	86.9	89.0	94.8	69.0	68.4	79.6
Other .....	147	143	100	51.6	57.1	57.1	32.7	38.4	44.0
West Asia .....	309	321	280	61.9	61.6	64.7	36.8	41.7	45.3
Iran .....	67	48	26	83.8	81.7	65.4	40.4	49.4	46.2
Israel .....	70	63	13	65.5	77.6	38.4	53.8	61.8	30.7
Turkey .....	27	67	84	37.0	58.9	69.0	18.5	38.7	48.8
Other .....	142	143	147	53.1	48.4	55.0	29.4	31.6	37.7
Pacifica/Australasia .....	76	87	69	68.4	67.6	76.6	52.4	45.0	55.9
Australia .....	13	27	25	76.9	72.1	68.0	53.8	51.8	48.0
Indonesia .....	5	16	5	40.0	6.3	60.0	40.0	0.0	40.0
New Zealand .....	5	13	6	0.0	68.1	100.0	0.0	68.1	83.3
Other .....	22	17	6	90.3	52.9	100.0	66.9	35.3	50.0
Africa .....	124	106	93	65.8	63.4	83.8	33.5	34.7	51.7
Egypt .....	28	34	13	54.8	51.0	69.2	23.8	17.6	61.5
Nigeria .....	5	0	0	na	na	na	0.0	na	na
South Africa .....	6	0	7	50.0	na	100.0	50.0	na	57.1
Other .....	74	59	58	65.5	58.5	85.0	30.2	34.9	51.3
Europe .....	570	805	943	64.2	69.4	79.0	47.8	50.6	60.9
Greece .....	85	114	48	67.5	61.1	74.4	51.0	47.4	53.0
United Kingdom .....	46	37	52	76.8	82.2	81.7	65.6	54.8	69.6
Germany .....	82	103	107	63.6	65.4	65.8	46.0	47.5	50.9
Italy .....	62	67	50	45.1	39.9	71.5	37.3	29.0	60.8
France .....	29	21	24	60.2	66.7	54.2	47.5	25.9	25.0
Spain .....	20	17	23	37.2	58.8	46.4	21.1	47.0	42.1
Other .....	236	441	636	68.8	77.0	83.4	49.5	56.8	64.4

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## Plans of foreign recipients of U.S. S&amp;E doctorates to stay in United States, by field and place of origin: 1990–2001

Field and place of origin	Foreign S&E doctorate recipients			Plans to stay			Firm plans to stay		
	1990–93	1994–97	1998–2001	1990–93	1994–97	1998–2001	1990–93	1994–97	1998–2001
	Number			Percent					
North/South America .....	321	288	331	53.7	49.3	57.0	39.8	33.4	42.3
Canada .....	104	82	98	63.4	67.3	69.6	46.9	55.3	52.4
Mexico .....	41	49	61	41.5	33.3	40.8	26.0	17.1	30.9
Argentina .....	22	9	16	71.4	87.5	84.8	61.8	62.5	69.6
Brazil .....	54	60	58	37.4	31.6	46.1	29.1	20.4	31.4
Chile .....	23	5	0	33.9	40.0	na	17.0	0.0	na
Colombia .....	6	16	18	33.3	43.8	44.5	16.7	25.0	33.3
Peru .....	5	0	0	0.0	na	na	0.0	na	na
Other .....	48	40	62	54.5	55.6	57.4	42.8	30.6	40.8
Country unknown .....	51	73	93	76.2	61.2	47.2	52.3	36.2	41.9
Social/behavioral sciences									
All non-U.S. citizens .....	5,981	6,537	6,054	47.5	49.7	56.8	30.3	29.6	39.6
East/South Asia .....	2,637	3,145	2,536	42.6	49.4	56.4	26.2	27.5	37.9
China .....	444	721	589	85.6	88.6	86.5	46.2	48.6	61.4
Taiwan .....	389	474	365	33.0	25.9	37.0	18.5	9.0	19.8
Japan .....	240	305	330	36.5	44.0	45.3	23.5	32.0	29.3
South Korea .....	955	904	650	21.5	22.4	36.2	12.6	10.2	21.7
India .....	359	486	389	73.5	77.2	84.9	55.3	50.7	63.6
Other .....	250	255	213	29.5	34.1	34.0	18.9	17.9	20.9
West Asia .....	673	617	478	47.3	43.8	55.7	25.8	25.4	39.6
Iran .....	112	56	27	80.8	83.3	59.8	35.5	38.4	27.4
Israel .....	103	109	68	49.3	51.5	55.9	36.0	32.0	42.4
Turkey .....	76	98	140	55.2	33.1	52.8	33.0	27.1	43.5
Other .....	382	354	243	36.3	37.9	55.3	18.6	20.3	37.2
Pacifica/Australasia .....	236	249	190	36.4	37.4	47.6	23.7	19.5	36.6
Australia .....	66	60	64	50.1	45.8	57.6	39.1	30.3	44.4
Indonesia .....	74	86	50	8.7	6.9	19.5	4.4	2.1	9.7
New Zealand .....	25	29	27	44.0	58.1	50.6	26.4	43.4	46.9
Other .....	67	74	49	51.0	52.9	58.9	28.9	17.9	45.8
Africa .....	505	448	352	50.1	49.1	66.2	24.7	18.2	32.8
Egypt .....	49	34	13	19.6	47.1	45.6	6.4	19.1	36.7
Nigeria .....	123	73	43	71.7	76.8	84.0	29.9	14.7	42.6
South Africa .....	50	41	30	42.9	39.9	72.0	27.0	26.0	37.4
Other .....	283	300	261	48.6	44.4	63.8	26.3	17.8	30.8
Europe .....	889	983	1,189	60.6	61.3	67.1	44.8	43.4	51.9
Greece .....	100	92	62	62.8	57.3	71.0	38.6	39.7	52.0
United Kingdom .....	175	166	142	73.8	73.5	79.9	49.2	57.2	59.1
Germany .....	129	169	170	63.9	65.9	69.2	48.8	48.3	53.0
Italy .....	86	110	127	50.6	52.7	60.4	39.6	33.5	50.6
France .....	46	51	77	45.3	52.6	73.3	39.9	21.0	56.4
Spain .....	80	63	89	43.7	54.7	50.3	39.7	45.6	40.0
Other .....	273	332	522	60.7	59.7	66.1	46.4	42.3	51.3
North/South America .....	921	913	1,076	48.3	48.6	51.1	34.5	35.1	36.5
Canada .....	367	348	376	53.2	56.3	63.0	42.9	40.5	46.3
Mexico .....	98	103	156	39.8	31.9	35.2	22.1	23.9	22.4
Argentina .....	66	60	77	53.8	57.1	48.9	28.9	34.9	34.1
Brazil .....	94	91	131	28.3	36.1	35.6	19.9	24.4	27.4
Chile .....	57	37	35	31.6	26.5	43.9	23.1	15.0	32.5
Colombia .....	29	43	32	48.3	37.0	45.9	32.2	13.7	35.4
Peru .....	41	48	45	53.7	62.0	58.4	31.7	41.9	46.3
Other .....	169	183	224	51.8	50.0	53.1	35.8	43.3	35.6
Country unknown .....	120	194	233	65.8	36.9	29.7	36.6	17.7	19.6

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**Plans of foreign recipients of U.S. S&E doctorates to stay in United States, by field and place of origin: 1990–2001**

Field and place of origin	Foreign S&E doctorate recipients			Plans to stay			Firm plans to stay		
	1990–93	1994–97	1998–2001	1990–93	1994–97	1998–2001	1990–93	1994–97	1998–2001
	Number			Percent					
Engineering									
All non-U.S. citizens .....	12,094	13,635	11,523	63.6	69.9	79.2	36.7	40.7	54.7
East/South Asia .....	7,853	9,361	7,323	65.7	73.1	84.4	37.7	42.1	58.4
China .....	1,877	2,884	2,839	94.3	97.2	97.5	46.9	52.5	67.1
Taiwan .....	2,302	2,297	1,207	53.9	53.7	72.6	29.8	26.4	42.3
Japan .....	94	145	96	28.9	24.3	40.1	17.5	14.5	27.4
South Korea .....	1,715	1,398	1,161	36.4	38.8	67.7	19.0	19.3	42.9
India .....	1,524	2,266	1,590	88.0	92.7	96.0	61.2	62.6	76.7
Other .....	341	371	430	61.5	44.4	45.2	37.5	21.6	28.7
West Asia .....	1,736	1,508	1,264	63.5	66.4	70.7	32.5	35.4	46.0
Iran .....	467	305	184	85.8	84.5	96.3	42.5	44.1	62.7
Israel .....	98	58	21	46.4	42.6	52.6	20.3	20.4	15.1
Turkey .....	278	306	451	54.9	65.3	67.5	32.3	40.9	45.5
Other .....	893	839	604	57.6	62.3	66.0	29.0	31.6	42.4
Pacifica/Australasia .....	161	179	152	57.6	46.4	68.9	37.7	28.3	52.2
Australia .....	24	32	18	66.7	56.8	82.1	50.0	52.9	52.4
Indonesia .....	86	94	89	48.8	28.4	61.7	37.4	11.3	47.3
New Zealand .....	0	6	0	na	60.0	na	na	40.0	na
Other .....	43	41	21	66.8	74.5	76.2	25.1	47.8	61.9
Africa .....	601	538	413	47.9	60.5	71.3	25.6	32.9	46.0
Egypt .....	233	215	214	33.7	49.4	61.8	17.6	25.5	41.2
Nigeria .....	66	39	15	81.7	93.8	93.3	40.9	46.7	32.0
South Africa .....	33	37	28	43.6	50.4	68.4	34.5	38.2	52.0
Other .....	269	247	146	51.9	66.5	82.4	27.1	35.5	54.0
Europe .....	851	1,027	1,197	60.5	69.5	77.2	40.3	46.6	55.1
Greece .....	254	196	145	64.8	66.0	77.4	44.4	41.4	58.5
United Kingdom .....	65	57	48	84.3	87.4	88.8	62.5	60.5	61.4
Germany .....	64	109	159	57.6	68.0	59.4	32.8	40.1	45.9
Italy .....	46	39	74	45.3	51.3	64.7	28.5	20.5	43.7
France .....	103	93	93	42.1	52.7	72.7	25.4	30.8	54.5
Spain .....	22	33	44	35.7	56.1	65.9	30.3	42.5	45.5
Other .....	293	500	634	63.3	74.3	83.7	41.9	52.6	58.1
North/South America .....	677	759	822	54.2	51.0	61.0	36.7	32.6	45.3
Canada .....	183	166	180	60.9	71.1	79.9	45.7	49.8	61.5
Mexico .....	90	116	176	48.0	44.2	49.5	32.6	28.4	38.6
Argentina .....	48	36	47	66.8	87.8	80.5	40.2	66.7	70.8
Brazil .....	142	205	158	27.3	24.6	35.8	15.3	14.3	24.7
Chile .....	34	24	22	36.5	22.0	47.7	24.4	8.9	43.2
Colombia .....	36	29	41	69.0	49.9	70.6	50.6	36.2	43.8
Peru .....	28	28	18	67.9	78.6	25.4	35.7	35.7	12.7
Other .....	116	150	175	71.4	56.5	68.7	49.4	33.0	49.1
Country unknown .....	215	293	352	85.6	68.4	64.7	58.6	41.9	39.8

na not applicable

\*Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.

NOTES: Data include foreign doctoral recipients who are either permanent or temporary residents. Recipients who plan to stay think they will locate in the United States; those with firm plans have a postdoctoral research appointment or academic, industrial, or other firm employment in the United States.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Earned Doctorates, special tabulations, 2003.

Appendix table 2-32

**Trends in population of 20–24-year-olds, by selected countries and regions: 1980–2015**

(Thousands)

Year	Western Europe	Africa	South America	United States	China	India	Japan
1980	30,440	40,984	22,762	21,584	85,211	62,229	7,904
1981	30,945	42,201	23,404	21,508	89,116	63,681	7,959
1982	31,458	43,455	24,065	21,433	93,201	65,167	8,015
1983	31,980	44,746	24,744	21,358	97,472	66,688	8,071
1984	32,510	46,075	25,442	21,283	101,940	68,244	8,127
1985	33,049	47,444	26,160	20,694	106,612	69,837	8,184
1986	32,865	48,798	26,438	20,434	110,434	71,349	8,329
1987	32,683	50,190	26,719	20,174	114,392	72,893	8,477
1988	32,501	51,622	27,003	19,654	118,493	74,470	8,628
1989	32,321	53,094	27,290	19,134	122,740	76,082	8,781
1990	32,141	54,609	27,580	18,614	128,517	77,910	8,800
1991	31,611	56,302	27,892	19,855	127,163	79,264	9,009
1992	31,089	58,048	28,208	19,512	125,824	80,642	9,224
1993	30,576	59,849	28,527	19,174	124,498	82,043	9,443
1994	30,071	61,705	28,850	18,842	123,187	83,469	9,668
1995	29,575	63,618	29,177	17,665	121,889	84,920	9,898
1996	29,073	65,587	29,820	17,508	116,730	85,748	9,623
1997	28,580	67,617	30,476	17,448	111,789	86,585	9,355
1998	28,095	69,711	31,148	18,139	107,057	87,430	9,095
1999	27,619	71,868	31,834	18,328	102,526	88,283	8,842
2000	27,150	74,093	32,535	18,516	98,186	89,144	8,596
2001	26,988	76,362	32,910	18,927	98,580	91,233	8,374
2002	26,828	78,701	33,289	19,132	98,975	93,371	8,157
2003	26,668	81,112	33,673	19,338	99,372	95,558	7,947
2004	26,510	83,596	34,061	19,748	99,770	97,797	7,741
2005	26,352	86,157	34,454	20,159	100,170	100,089	7,541
2006	26,290	88,212	34,546	20,407	103,289	101,355	7,345
2007	26,228	90,315	34,639	20,531	106,505	102,637	7,154
2008	26,167	92,469	34,732	20,656	109,821	103,935	6,968
2009	26,105	94,674	34,825	20,904	113,241	105,250	6,787
2010	26,044	96,932	34,918	21,152	116,767	106,581	6,610
2011	25,826	98,548	34,927	21,301	113,525	107,432	6,498
2012	25,609	100,191	34,937	21,375	110,373	108,289	6,388
2013	25,394	101,861	34,946	21,450	107,308	109,154	6,280
2014	25,181	103,559	34,956	21,598	104,329	110,025	6,174
2015	24,970	105,286	34,965	21,747	101,432	110,903	6,070

NOTE: For individual countries included within each region and the 20- to 24-year-old population of individual countries, see United Nation's population website, given below.

SOURCES: United Nations, Population Division, *World Population Prospects: The 2002 Revision*, Population database, <http://esa.un.org/unpp/index.asp?panel=2>; and U.S. Bureau of the Census, Population Division, 1990 Census and Projections Program, *Projections of the Resident Population by Age, Sex, Race, and Hispanic Origin: 1999 to 2100* (Washington, DC), [www.census.gov/population/estimates/nation](http://www.census.gov/population/estimates/nation).



## First university degrees and ratio of first university degrees and S&amp;E degrees to 24-year-old population in selected locations, by region: 2000 or most recent year (revised)

Region/location	All first university degrees	All S&E	Natural sciences <sup>a</sup>	Mathematics/computer sciences	Agricultural sciences	Social/behavioral sciences <sup>b</sup>	Engineering	24-year-olds	First university degrees	NS&E degrees	Social/behavioral science degrees
	Number								Ratio to 24-year-old population <sup>c</sup>		
All regions <sup>d</sup> .....	7,438,071	2,838,044	699,110	177,387	106,601	847,920	1,007,026	74,233,401	10.0	2.7	1.1
Asia <sup>d</sup> .....	2,528,607	1,176,103	275,969	23,810	42,316	356,203	477,805	46,635,694	5.4	1.8	0.8
Cambodia <sup>e</sup> .....	2,905	525	106	125	68	148	78	157,000	1.9	0.2	0.1
China (2001).....	567,839	337,352	63,517	NA	19,005	35,267	219,563	19,639,000	2.9	1.5	0.2
Hong Kong (1995).....	11,362	5,425	2,370	NA	NA	1,233	1,822	104,000	10.9	4.0	1.2
India (1990).....	750,000	176,036	147,036	NA	NA	NA	29,000	17,700,800	4.2	1.0	NA
Indonesia (1997).....	144,314	97,095	10,711	NA	NA	65,740	20,644	4,125,800	3.5	0.8	1.6
Japan (2001).....	542,314	359,019	14,192	4,965	14,084	221,300	104,478	1,719,400	31.5	8.0	12.9
Kazakstan (1995).....	45,536	13,252	6,779	NA	NA	952	5,521	290,600	15.7	4.2	0.3
Laos.....	1,762	389	63	30	100	23	173	94,000	1.9	0.4	0.0
Malaysia (1990).....	10,511	4,760	1,685	NA	NA	2,198	877	406,800	2.6	0.6	0.5
Singapore (1995).....	5,599	5,599	2,103	NA	NA	1,820	1,676	49,600	11.3	7.6	3.7
South Korea.....	209,747	96,859	13,427	9,299	5,859	11,766	56,508	783,600	26.8	10.9	1.5
Taiwan (2001).....	117,430	48,624	3,684	9,391	3,200	5,762	26,587	385,894	30.4	11.1	1.5
Thailand (1995).....	119,288	31,168	10,296	NA	NA	9,994	10,878	1,179,200	10.1	1.8	0.8
Middle East <sup>d</sup> .....	422,908	143,092	35,889	11,987	10,435	43,496	41,285	3,874,135	10.9	2.6	1.1
Egypt <sup>f</sup> (1995).....	85,608	13,578	6,710	NA	NA	1,437	5,431	1,258,800	6.8	1.0	0.1
Iran.....	69,211	33,625	6,016	3,301	4,785	9,542	9,981	1,371,000	5.0	1.8	0.7
Israel.....	30,267	14,259	945	2,054	171	8,327	2,762	102,200	29.6	5.8	8.1
Jordan (1996).....	12,633	3,539	1,753	NA	NA	986	800	101,800	12.4	2.5	1.0
Lebanon.....	11,990	3,030	674	418	28	1,433	477	63,200	19.0	2.5	2.3
Morocco (short).....	24,680	7,972	3,020	960	NA	3,771	221	590,400	4.8	0.9	0.6
Morocco (long).....	3,598	1,228	7	151	427	38	605	NA	NA	NA	NA
Oman.....	2,344	217	51	7	45	0	114	51,400	4.6	0.4	0.0
Palestine.....	8,807	2,615	513	758	66	746	532	55,000	16.0	3.4	1.4
Qatar.....	1,320	353	138	62	0	85	68	6,600	20.0	4.1	1.3
Saudi Arabia (1996).....	26,641	5,879	4,201	NA	NA	828	850	389,800	6.8	1.3	0.2
Syria (1995).....	16,600	4,530	1,398	NA	NA	NA	3,132	342,600	4.8	1.3	NA
Tunisia (1996).....	10,327	3,198	1,719	NA	NA	760	719	191,200	5.4	1.3	0.4
Turkey (short).....	118,882	49,069	8,744	4,276	4,913	15,543	15,593	1,318,000	9.0	2.5	1.2
Sub-Saharan Africa <sup>d</sup> .....	96,296	25,335	5,855	469	3,696	10,262	5,053	1,931,824	5.0	0.8	0.5
Eritrea.....	790	360	70	46	74	11	159	67,000	1.2	0.5	0.0
Ethiopia <sup>f</sup> .....	17,579	3,664	264	233	1,404	536	1,227	1,152,400	1.5	0.3	0.0
Ghana.....	7,122	2,951	916	0	362	1,177	496	376,800	1.9	0.5	0.3
Kenya <sup>f</sup> .....	15,620	3,870	1,120	71	1,494	445	740	627,000	2.5	0.5	0.1
Lesotho.....	425	177	54	0	16	107	0	36,600	1.2	0.2	0.3
Madagascar.....	3,084	1,091	270	22	0	599	200	281,400	1.1	0.2	0.2
South Africa (1996).....	32,957	10,920	2,937	NA	NA	6,494	1,489	861,000	3.8	0.5	0.8
Tanzania.....	4,208	1,071	NA	87	299	88	597	650,800	0.6	0.2	0.0
Uganda.....	15,301	1,591	294	56	121	816	304	426,200	3.6	0.2	0.2
Europe <sup>d</sup> .....	2,348,771	836,456	230,506	70,003	24,568	173,240	338,139	9,844,745	23.9	6.7	1.8
European Union.....	1,330,025	477,973	112,797	60,763	16,738	107,746	179,929	4,903,035	27.1	7.6	2.2
Austria (short).....	1,662	744	0	46	0	0	698	92,400	16.4	4.5	1.1
Austria (long).....	13,470	4,434	752	476	236	1,057	1,913	NA	NA	NA	NA
Belgium (long).....	22,526	8,211	1,451	519	498	2,396	3,347	125,200	18.0	4.6	1.9

## First university degrees and ratio of first university degrees and S&amp;E degrees to 24-year-old population in selected locations, by region: 2000 or most recent year (revised)

Region/location	All first university degrees	All S&E	Natural sciences <sup>a</sup>	Mathematics/computer sciences	Agricultural sciences	Social/behavioral sciences <sup>b</sup>	Engineering	24-year-olds	First university degrees	NS&E degrees	Social/behavioral science degrees
	Number								Ratio to 24-year-old population <sup>c</sup>		
Denmark (1998) .....	11,951	4,962	1,882	209	171	1,925	775	65,000	18.4	4.7	3.0
Finland (short) .....	13,441	4,662	37	356	391	198	3,680	65,600	38.5	13.2	2.3
Finland (long) .....	11,828	5,521	958	490	141	1,319	2,613	NA	NA	NA	NA
France (short) .....	226,314	91,030	33,511	13,910	95	31,057	12,457	762,200	36.1	11.2	4.1
France (long) .....	49,002	25,130	0	1,132	2,162	0	21,836	NA	NA	NA	NA
Germany (short) (2001) .....	56,681	25,868	487	1,165	960	60	23,196	892,800	20.0	6.4	0.9
Germany (long) (2001) .....	121,937	39,295	11,029	6,139	1,180	7,824	13,123	NA	NA	NA	NA
Greece (long) .....	18,556	4,576	2,570	NA	NA	221	1,785	155,000	12.0	2.8	0.1
Iceland (short) .....	1,318	354	72	58	9	122	93	4,200	31.4	5.5	2.9
Ireland .....	18,669	6,636	2,231	1,405	196	790	2,014	69,000	27.1	8.5	1.1
Italy (short) .....	11,568	3,729	147	740	102	59	2,681	726,600	20.7	5.9	2.0
Italy (long) .....	139,109	53,534	8,738	4,087	1,243	14,462	25,004	NA	NA	NA	NA
Netherlands (short) .....	66,932	17,586	2,185	1,278	1,336	5,461	7,326	187,000	37.3	6.8	2.9
Netherlands (long) .....	2,877	607	52	57	75	0	423	NA	NA	NA	NA
Portugal (short) .....	2,587	425	70	NA	NA	32	323	160,200	16.3	2.8	2.3
Portugal (long) .....	23,482	7,823	1,895	NA	NA	3,685	2,243	NA	NA	NA	NA
Spain (short) .....	87,464	23,302	0	4,606	3,236	0	15,460	637,200	32.6	8.1	2.2
Spain (long) .....	120,114	42,511	10,908	4,404	1,503	13,975	11,721	NA	NA	NA	NA
Sweden (short) .....	32,573	11,475	1,256	1,263	178	1,892	6,886	102,200	33.4	9.5	2.1
Sweden (long) .....	1,524	379	0	0	53	278	48	NA	NA	NA	NA
United Kingdom <sup>a</sup> (2001) .....	274,440	95,180	32,570	18,420	2,970	20,930	20,280	696,600	39.4	10.7	3.0
European Free Trade Association .....	41,449	11,005	1,286	1,110	379	3,240	4,990	141,264	29.3	5.5	2.3
Norway (short) .....	17,959	3,166	32	609	52	1,764	709	54,400	41.2	5.2	3.8
Norway (long) .....	4,462	1,694	114	164	154	280	982	NA	NA	NA	NA
Switzerland (short) .....	7,648	2,488	6	15	84	123	2,260	76,600	24.8	6.5	1.6
Switzerland (long) .....	11,380	3,657	1,134	322	89	1,073	1,039	NA	NA	NA	NA
Central/Eastern Europe .....	977,297	347,478	116,423	8,130	7,451	62,254	153,220	4,800,446	20.4	5.9	1.3
Albania (long) .....	4,350	436	37	42	50	129	178	107,600	4.0	0.3	0.1
Armenia (long) .....	10,206	1,343	NA	NA	335	NA	1,008	51,600	19.8	2.6	NA
Bulgaria .....	20,166	4,798	43	409	205	3,906	235	122,400	16.5	0.7	3.2
Croatia .....	8,847	3,003	465	486	309	216	1,527	64,000	13.8	4.4	0.3
Czech Republic (short) .....	10,010	3,484	258	489	129	1,828	780	174,400	14.6	4.9	1.4
Czech Republic (long) .....	15,534	7,550	821	1,660	939	602	3,528	NA	NA	NA	NA
Estonia .....	2,272	289	37	21	9	87	135	20,000	11.4	1.0	0.4
Georgia .....	19,797	4,824	995	170	446	110	3,103	79,600	24.9	5.9	0.1
Hungary (short) .....	30,320	4,320	0	181	1,024	0	3,115	165,200	28.4	11.9	1.2
Hungary (long) .....	16,658	17,364	516	369	635	2,023	13,821	NA	NA	NA	NA
Latvia (short) .....	9,051	2,374	235	347	46	1,142	604	32,600	55.7	6.4	6.1
Latvia (long) .....	9,114	1,695	183	217	48	833	414	NA	NA	NA	NA
Lithuania .....	11,617	3,983	313	490	177	530	2,473	51,800	22.4	6.7	1.0
Macedonia <sup>a</sup> .....	3,180	943	147	182	94	68	452	37,800	8.4	2.3	0.2
Poland (1996) .....	147,536	43,304	7,544	NA	NA	14,142	21,618	599,490	24.6	4.9	2.4
Romania (short) .....	39,013	11,899	1,249	1,014	975	2,029	6,632	390,400	17.1	4.3	0.9
Romania (long) .....	27,631	8,479	880	740	686	1,464	4,709	NA	NA	NA	NA
Russia (long) (1999) .....	554,814	216,017	101,320	NA	NA	32,288	82,409	2,170,000	25.6	8.5	1.5

## First university degrees and ratio of first university degrees and S&amp;E degrees to 24-year-old population in selected locations, by region: 2000 or most recent year (revised)

Region/location	All first university degrees	All S&E	Natural sciences <sup>a</sup>	Mathematics/computer sciences	Agricultural sciences	Social/behavioral sciences <sup>b</sup>	Engineering	24-year-olds	First university degrees	NS&E degrees	Social/behavioral science
											degrees
									Ratio to 24-year-old population <sup>c</sup>		
									Number		
Serbia-Montenegro <sup>d</sup> .....	12,545	4,477	601	378	579	323	2,596	159,600	7.9	2.6	0.2
Slovak Republic (short).....	5,226	851	29	242	29	76	475	82,430	24.4	6.3	0.4
Slovak Republic (long).....	14,903	4,630	367	693	736	232	2,602	NA	NA	NA	NA
Slovenia.....	4,507	1,415	383	NA	NA	226	806	29,000	15.5	4.1	0.8
America <sup>d</sup> .....	1,907,776	622,870	140,020	64,961	24,274	259,393	134,222	11,628,603	16.4	3.1	2.2
North America.....	1,531,958	500,391	97,532	64,569	23,268	219,134	95,888	6,491,403	23.6	4.3	3.4
Canada.....	116,160	53,307	10,353	5,424	1,236	26,660	9,634	397,200	29.2	6.7	6.7
Costa Rica.....	4,393	1,074	104	214	167	264	325	70,600	6.2	1.1	0.4
Cuba.....	16,769	3,374	1,009	219	384	408	1,354	201,800	8.3	1.5	0.2
Mexico.....	135,233	42,049	1,701	9,589	3,237	3,338	24,184	2,038,406	6.6	1.9	0.2
Nicaragua (1997).....	6,282	1,965	834	NA	NA	276	855	80,397	7.8	2.1	0.3
United States.....	1,253,121	398,622	83,531	49,123	18,244	188,188	59,536	3,703,000	33.8	5.7	5.1
South America.....	375,818	122,479	42,488	392	1,006	40,259	38,334	5,137,200	7.3	1.6	0.8
Argentina (1996).....	37,878	16,106	5,369	NA	NA	7,325	3,412	672,200	5.6	1.3	1.1
Bolivia.....	15,341	5,115	563	392	1,006	997	2,157	148,000	10.4	2.8	0.7
Brazil (1996).....	245,401	78,049	32,556	NA	NA	27,421	18,072	3,300,000	7.4	1.5	0.8
Chile (1996).....	23,010	10,531	2,358	NA	NA	4,516	3,657	239,400	9.6	2.5	1.9
Colombia (1996).....	54,188	12,678	1,642	NA	NA	NA	11,036	777,600	7.0	1.6	NA
Oceania <sup>d</sup> .....	133,713	34,188	10,871	6,157	1,312	5,326	10,522	318,400	42.0	9.1	1.7
Australia (short).....	106,985	28,737	8,454	5,433	1,069	4,737	9,044	269,200	41.9	9.3	1.8
Australia (long).....	5,760	1,122	69	332	47	181	493	NA	NA	NA	NA
New Zealand (short).....	17,177	3,529	2,292	358	156	408	315	49,200	42.6	8.0	0.8
New Zealand (long).....	3,791	800	56	34	40	0	670	NA	NA	NA	NA

NA not available

NS&amp;E natural sciences and engineering

<sup>a</sup>Includes physical, biological, earth, atmospheric, and ocean sciences.<sup>b</sup>Japanese social science data also include business administration.<sup>c</sup>Number of degrees per 100 24-year-olds. For countries with both short and long degrees, the ratios are calculated with both short and long degrees as the numerator.<sup>d</sup>Includes only those locations for which relatively recent data are available.<sup>e</sup>Engineering and agriculture degrees are long, more than 5 years.<sup>f</sup>Engineering degrees are long.<sup>g</sup>Includes former colleges and polytechnics. Data for the United Kingdom were revised. Data are now rounded to the nearest 10. Detail may not sum to total because of rounding. Ratios are based on unrounded data.

NOTES: NS&E degrees include natural, agricultural, and computer sciences; mathematics; and engineering. Data for first university degrees use the International Standard Classification of Education (ISCED 97), level 5A. First university degree programs in most countries are less than 5 years. However, in some countries, especially European, some level 5A degree programs are more than 5 years and noted as long. When a country has first university degrees that are less than 5 years and some more than 5 years, such as Germany, the duration is noted as short or long. An unspecified duration means less than 5 years.

SOURCES: Organisation for Economic Co-operation and Development, Center for Education Research and Innovation, *Education at a Glance 2002*; United Nations Educational, Scientific, and Cultural Organization (UNESCO), UNESCO Institute for Statistics database, <http://www.unesco.org/statistics>; Iberoamerican Network of Science and Technology Indicators (RICYT), *Principales Indicadores de Ciencia y Tecnología* (Buenos Aires, 1999); China—National Research Center for Science and Technology for Development, special tabulations, 2002; India—Department of Science and Technology, *Research and Development Statistics 1996–97* (New Delhi, 1999); Japan—Government of Japan, Ministry of Education, Culture and Science, *Monbusho Survey of Education*, special tabulations (Tokyo, 2003); Taiwan—Ministry of Education, *Educational Statistics of the Republic of China: 2002* (Taipei, 2002); Germany—Federal Statistical Office, *Prüfungen an Hochschulen 2001* (Wiesbaden, 2002); United Kingdom—Higher Education Statistics Agency special tabulations (Cheltenham, 2003); Russia—Center for Science Research and Statistics, unpublished tabulations (2001); Brazil—Ministry of Education and Culture, *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*, unpublished tabulations, 2001; Mexico—National Association of Universities and Institutions of Higher Education, *Anuario Estadístico 2001: Población Escolar de Nivel Licenciatura en Universidades e Institutos Tecnológicos*, (Mexico, 2002); and United States—National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 2-34

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## S&amp;E first university degrees in selected Western and Asian countries, by field: 1975–2001 (revised)

Country and field	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
<b>China</b>														
All fields .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	183,241	207,405	225,312	249,337
S&E fields .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	127,405	138,724	157,893	175,584
Natural sciences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9,336	9,115	8,045	8,153
Mathematics/computer sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8,604	8,974	11,115	13,079
Agricultural sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13,394	13,850	14,615	14,531
Social/behavioral sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16,515	19,619	22,707	27,713
Engineering.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	79,556	87,166	101,411	112,108
<b>Japan</b>														
All fields .....	313,072	326,167	339,819	356,981	374,887	378,666	386,057	382,466	369,069	372,247	373,302	376,260	382,655	382,828
S&E fields .....	220,141	227,361	234,536	245,610	257,303	255,867	260,248	256,995	245,201	246,689	247,258	249,377	252,688	252,294
Natural sciences .....	7,014	7,483	7,479	7,985	8,248	8,636	8,651	8,710	8,575	9,054	9,166	9,435	9,817	9,895
Mathematics/computer sciences.....	2,490	2,529	2,755	2,703	2,829	2,918	3,152	3,045	3,148	3,180	3,532	3,379	3,572	3,493
Agricultural sciences.....	9,480	9,965	10,455	10,937	12,794	11,182	11,555	11,016	10,658	11,189	10,928	10,991	11,266	10,584
Social/behavioral sciences.....	134,645	139,258	143,416	151,519	158,023	158,394	160,520	159,450	151,996	151,626	151,072	151,056	150,956	150,819
Engineering.....	66,512	68,126	70,431	72,466	75,409	74,737	76,370	74,774	70,824	71,640	72,560	74,516	77,077	77,503
<b>South Korea</b>														
All fields .....	34,725	34,725	37,374	41,447	45,964	50,973	56,528	62,688	77,272	90,888	118,584	137,848	149,582	161,983
S&E fields .....	14,633	14,486	15,412	17,070	18,931	21,022	23,744	27,037	36,327	37,973	45,079	50,517	53,093	58,057
Natural sciences .....	3,111	2,713	2,889	3,165	3,468	3,800	4,164	4,562	5,202	6,241	8,112	6,913	7,082	7,673
Mathematics/computer sciences.....	398	398	464	563	683	828	1,005	1,393	1,589	1,918	2,888	2,839	3,149	5,824
Agricultural sciences.....	2,546	2,680	2,822	2,971	3,128	3,293	3,837	4,493	4,603	4,327	4,068	5,483	6,395	8,050
Social/behavioral sciences.....	1,423	1,423	1,379	1,452	1,528	1,609	1,694	1,783	4,297	3,297	6,472	7,670	8,867	9,619
Engineering.....	7,155	7,272	7,858	8,919	10,124	11,492	13,044	14,806	20,636	22,190	23,539	27,612	27,600	26,891
<b>United States</b>														
All fields .....	928,228	929,784	931,340	939,109	946,877	963,778	980,679	985,778	990,877	997,205	1,003,532	1,016,852	1,030,171	1,069,084
S&E fields .....	303,798	303,480	303,162	304,977	306,792	312,182	317,571	324,922	332,273	331,900	331,526	327,174	322,821	330,248
Natural sciences .....	76,783	74,849	72,915	70,551	68,186	66,282	64,378	63,815	63,251	61,226	59,200	56,739	54,278	55,518
Mathematics/computer sciences.....	20,729	20,700	20,670	23,538	26,406	31,875	37,344	45,927	54,510	55,476	56,442	51,360	46,277	43,236
Agricultural sciences.....	16,396	16,801	17,205	16,541	15,876	15,202	14,528	13,218	11,907	10,716	9,524	9,053	8,582	8,507
Social/behavioral sciences.....	148,533	143,718	138,903	135,755	132,607	130,629	128,651	126,842	125,033	128,484	131,935	139,336	146,737	158,421
Engineering.....	41,357	47,413	53,469	58,593	63,717	68,194	72,670	75,121	77,572	75,999	74,425	70,686	66,947	64,567
<b>United Kingdom*</b>														
All fields .....	55,450	56,950	60,280	63,560	65,900	68,030	69,320	71,500	73,950	72,710	72,000	71,430	70,870	70,310
S&E fields .....	32,260	31,190	33,190	35,710	36,930	38,130	37,630	38,720	40,200	41,280	40,550	39,120	39,870	40,530
Natural sciences .....	10,900	11,140	11,250	11,620	11,880	12,090	12,410	12,900	13,330	12,920	12,500	11,420	12,210	12,050
Mathematics/computer sciences.....	2,940	2,890	2,870	2,900	3,060	3,120	3,460	3,770	4,140	4,490	4,540	4,470	4,540	4,510
Agricultural sciences.....	860	950	1,090	1,180	1,220	1,420	1,400	1,420	1,480	1,450	1,450	1,340	1,370	1,360
Social/behavioral sciences.....	9,610	8,640	9,930	11,410	11,660	11,930	10,330	10,510	10,660	11,910	12,430	12,040	12,480	12,990
Engineering.....	7,950	7,570	8,060	8,610	9,110	9,580	10,050	10,130	10,590	10,510	9,630	9,860	9,270	9,630
<b>Germany</b>														
All first university degrees combined														
All fields .....	97,399	95,054	104,175	101,391	110,930	111,458	109,666	118,163	124,027	127,413	131,969	134,582	138,955	141,815
S&E fields .....	59,225	59,743	64,035	62,643	60,951	60,885	61,030	64,790	67,161	69,100	71,542	75,166	78,233	80,757
Natural sciences.....	7,899	8,265	8,391	8,306	8,084	8,114	8,748	9,981	10,018	10,048	10,312	10,327	10,611	11,571
Mathematics/computer sciences.....	5,334	5,641	5,486	5,049	4,697	4,528	4,361	4,356	4,306	4,173	4,272	4,590	4,729	4,847
Agricultural sciences.....	2,282	2,161	2,324	2,668	3,045	3,480	3,763	4,148	4,374	4,468	4,390	4,792	4,644	4,578
Social/behavioral sciences.....	28,169	28,131	31,033	31,025	27,907	27,752	26,585	25,756	26,383	27,735	29,236	31,516	34,006	35,906
Engineering.....	15,541	15,545	16,801	15,595	17,218	17,011	17,573	20,549	22,080	22,676	23,332	23,941	24,243	23,855
3–5-year degree														
All fields .....	31,865	29,258	33,315	30,781	34,070	34,675	35,425	39,725	41,893	44,649	48,003	50,362	52,753	53,661
S&E fields.....	26,530	24,193	26,615	25,174	27,072	27,449	27,529	29,133	29,799	31,929	34,074	36,830	39,080	40,137
Natural sciences.....	304	117	106	185	328	588	535	533	464	486	549	593	599	677
Mathematics/computer sciences.....	268	203	175	217	492	504	463	493	645	842	1,009	1,175	1,336	1,475
Agricultural sciences.....	719	666	749	956	1,178	1,295	1,413	1,388	1,390	1,417	1,474	1,587	1,565	1,588
Social/behavioral sciences.....	14,113	12,548	14,221	14,050	13,674	14,081	13,774	13,016	12,622	13,779	15,061	16,876	19,031	19,910
Engineering.....	11,126	10,659	11,364	9,766	11,400	10,981	11,344	13,703	14,678	15,405	15,981	16,599	16,549	16,487
6–7-year degree														
All fields .....	65,534	65,796	70,860	70,610	76,860	76,783	74,241	78,438	82,134	82,764	83,966	84,220	86,202	88,154
S&E fields.....	32,695	35,550	37,420	37,469	33,879	33,436	33,501	35,657	37,362	37,171	37,468	38,336	39,153	40,620
Natural sciences.....	7,595	8,148	8,285	8,121	7,756	7,526	8,213	9,448	9,554	9,562	9,763	9,734	10,012	10,894
Mathematics/computer sciences.....	5,066	5,438	5,311	4,832	4,205	4,024	3,898	3,863	3,661	3,331	3,263	3,415	3,393	3,372
Agricultural sciences.....	1,563	1,495	1,575	1,712	1,867	2,185	2,350	2,760	2,984	3,051	2,916	3,205	3,079	2,990
Social/behavioral sciences.....	14,056	15,583	16,812	16,975	14,233	13,671	12,811	12,740	13,761	13,956	14,175	14,640	14,975	15,996
Engineering.....	4,415	4,886	5,437	5,829	5,818	6,030	6,229	6,846	7,402	7,271	7,351	7,342	7,694	7,368

Appendix table 2-34  
S&E first university degrees in selected Western and Asian countries, by field: 1975–2001 (revised)

(Page 2 of 2)

Country and field	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>China</b>													
All fields	275,056	273,684	262,088	298,438	347,068	310,291	325,484	353,566	381,647	404,666	440,935	495,624	567,839
S&E fields	173,681	181,771	190,805	193,088	223,447	235,313	216,555	281,245	296,723	322,769	359,478	330,061	337,352
Natural sciences	7,802	6,598	5,580	11,087	24,206	25,509	21,027	39,113	40,213	42,351	49,214	52,934	63,517
Mathematics/computer sciences	13,408	13,847	14,301	12,520	12,520	12,520	12,520	NA	NA	NA	NA	NA	NA
Agricultural sciences	15,014	14,542	14,085	16,994	15,445	16,365	13,933	16,559	16,525	17,453	19,154	18,229	19,005
Social/behavioral sciences	28,728	32,163	36,009	31,656	29,622	32,075	31,641	50,134	58,095	67,611	78,205	51,439	35,267
Engineering	108,729	114,620	120,830	120,831	141,654	148,844	137,434	175,439	181,890	195,354	212,905	207,459	219,563
<b>Japan</b>													
All fields	376,688	400,103	428,079	437,878	445,774	461,898	493,277	512,814	524,512	529,606	532,436	538,683	545,512
S&E fields	247,643	263,985	284,617	292,085	295,743	307,159	330,210	341,792	348,897	352,289	350,535	353,465	359,019
Natural sciences	9,900	9,866	10,452	10,386	10,757	11,460	12,089	12,896	13,386	13,521	13,662	13,300	14,192
Mathematics/computer sciences	3,395	3,554	3,765	3,790	4,221	4,574	4,884	5,132	5,103	5,174	4,906	4,941	4,965
Agricultural sciences	10,252	11,733	12,282	12,284	13,021	14,361	14,970	15,157	13,838	15,698	14,150	15,562	14,084
Social/behavioral sciences	147,087	157,477	170,721	177,240	179,338	186,580	200,875	208,143	213,619	215,385	214,377	216,506	221,300
Engineering	77,009	81,355	87,397	88,385	88,406	91,184	97,392	100,464	102,951	102,511	103,440	103,156	104,478
<b>South Korea</b>													
All fields	166,845	165,916	175,586	178,632	208,834	183,372	184,214	190,390	196,566	204,390	209,444	214,498	NA
S&E fields	58,789	61,477	73,011	76,736	78,830	81,218	84,350	87,644	91,278	91,296	94,078	96,859	NA
Natural sciences	8,249	8,514	9,703	11,828	11,634	11,443	11,828	12,175	12,532	14,302	13,865	13,427	NA
Mathematics/computer sciences	6,274	6,676	7,547	8,229	8,502	8,784	12,351	13,220	14,151	10,394	9,847	9,299	NA
Agricultural sciences	8,027	8,005	6,586	6,628	7,843	9,281	7,767	7,193	6,662	4,831	5,345	5,859	NA
Social/behavioral sciences	8,098	10,211	18,483	18,251	17,808	17,376	16,955	16,789	16,624	16,624	14,195	11,766	NA
Engineering	28,141	28,071	30,692	31,800	33,043	34,334	35,449	38,267	41,309	45,145	50,827	56,508	NA
<b>United States</b>													
All fields	1,107,997	1,143,638	1,179,278	1,176,857	1,174,436	1,177,126	1,179,815	1,183,202	1,186,589	1,199,579	NA	1,253,121	NA
S&E fields	337,675	351,855	366,035	372,092	378,148	381,411	384,674	386,578	388,482	390,618	NA	398,622	NA
Natural sciences	56,757	61,219	65,680	70,973	76,265	79,100	81,934	83,402	84,869	86,706	NA	83,531	NA
Mathematics/computer sciences	40,194	39,814	39,433	39,027	38,620	38,121	37,621	37,869	38,116	39,768	NA	49,123	NA
Agricultural sciences	8,432	10,032	11,632	13,106	14,580	15,484	16,388	16,875	17,361	17,967	NA	18,244	NA
Social/behavioral sciences	170,105	178,345	186,585	185,949	185,312	185,465	185,617	185,701	185,784	185,263	NA	188,188	NA
Engineering	62,187	62,446	62,705	63,038	63,371	63,243	63,114	62,733	62,352	60,914	NA	59,536	NA
<b>United Kingdom<sup>a</sup></b>													
All fields	73,660	77,160	79,640	178,670	196,820	214,960	340,590	251,250	258,750	261,210	263,670	274,440	272,670
S&E fields	41,250	39,510	40,730	72,000	75,290	79,950	83,840	88,610	90,820	90,630	92,380	95,310	95,180
Natural sciences	11,510	12,290	12,430	18,400	21,070	24,120	27,610	28,940	31,220	31,480	32,230	33,630	32,570
Mathematics/computer sciences	4,530	4,610	5,220	9,800	10,580	11,430	12,340	13,280	13,000	13,930	14,630	17,120	18,420
Agricultural sciences	1,340	1,300	1,210	1,400	1,650	2,120	2,300	2,570	2,800	2,760	2,860	2,910	2,970
Social/behavioral sciences	14,060	11,580	12,120	23,600	22,150	20,790	19,510	20,490	20,780	19,880	20,650	21,170	20,930
Engineering	9,820	9,740	9,740	18,800	19,840	21,500	22,080	23,320	23,020	22,570	22,010	20,490	20,280
<b>Germany</b>													
All first university degrees combined													
All fields	145,087	147,607	152,919	157,911	97,399	97,399	97,399	97,399	212,970	202,635	197,151	190,076	182,427
S&E fields	85,961	89,257	92,324	95,297	98,304	101,464	104,789	108,290	111,923	106,652	99,079	94,535	89,990
Natural sciences	12,473	13,190	13,803	13,925	14,116	14,311	14,507	14,707	14,909	13,324	12,390	11,467	10,543
Mathematics/computer sciences	5,306	5,725	6,828	6,970	7,718	8,546	9,463	10,479	11,603	10,949	10,541	9,864	9,187
Agricultural sciences	4,894	4,920	4,953	4,815	4,823	4,831	4,839	4,847	4,855	4,832	4,992	4,935	4,878
Social/behavioral sciences	37,038	38,119	37,552	42,027	44,223	46,401	48,563	50,714	52,855	48,042	46,013	43,318	40,622
Engineering	26,250	27,303	29,188	27,560	27,424	27,376	27,416	27,544	27,701	29,505	25,143	24,952	24,760
3–5-year degree													
All fields	54,631	55,852	58,855	60,588	63,337	66,212	69,216	72,357	75,641	71,307	70,126	68,139	66,151
S&E fields	40,880	41,737	40,922	43,759	43,618	43,554	43,565	43,650	43,807	41,721	41,092	40,351	39,609
Natural sciences	689	645	678	813	777	743	710	679	649	573	615	539	463
Mathematics/computer sciences	1,603	1,881	2,186	2,341	2,488	2,645	2,812	2,989	3,177	2,833	2,881	2,960	3,038
Agricultural sciences	2,081	2,082	2,230	2,194	2,242	2,292	2,342	2,394	2,447	2,370	2,472	2,526	2,580
Social/behavioral sciences	20,095	20,336	19,034	21,656	22,254	22,868	23,500	24,148	24,815	22,299	21,322	19,654	17,985
Engineering	16,412	16,793	16,794	16,755	15,856	15,006	14,201	13,440	12,719	13,646	13,802	14,673	15,543
6–7-year degree													
All fields	90,456	91,755	94,064	97,323	117,636	125,706	132,451	138,673	137,329	131,328	127,025	121,937	116,276
S&E fields	45,081	47,520	51,402	51,538	54,686	57,910	61,223	64,640	68,116	64,931	57,987	54,184	50,381
Natural sciences	11,784	12,545	13,125	13,112	13,339	13,568	13,797	14,028	14,260	12,751	11,775	10,928	10,080
Mathematics/computer sciences	3,703	3,844	4,642	4,629	5,229	5,901	6,651	7,490	8,426	8,116	7,660	6,905	6,149
Agricultural sciences	2,813	2,838	2,723	2,621	2,581	2,539	2,496	2,453	2,408	2,462	2,520	2,409	2,298
Social/behavioral sciences	16,943	17,783	18,518	20,371	21,969	23,533	25,064	26,565	28,040	25,743	24,691	23,664	22,637
Engineering	9,838	10,510	12,394	10,805	11,567	12,370	13,215	14,104	14,982	15,859	11,341	10,279	9,217

<sup>a</sup>Data for the United Kingdom were revised. Data are now rounded to the nearest 10. Detail may not sum to total because of rounding. Percents are based on unrounded data.

SOURCES: China—National Research Center for Science and Technology for Development, unpublished tabulations; Japan—Government of Japan, Ministry of Education, Culture and Science, *Monbusho Survey of Education*, annual series (Tokyo, 2001); South Korea—Ministry of Education, *Statistical Yearbook of Education*, annual series (Seoul) various years and Organization for Economic Co-operation and Development, Center for Education Research and Innovation, *Education at a Glance 2002*; Taiwan—Ministry of Education, *Educational Statistics of the Republic of China*, annual series (Taipei, 2000); Germany—Federal Statistical Office, *Prüfungen an Hochschulen 2001*, annual series (Wiesbaden, 2002); United Kingdom—Higher Education Statistics Agency, special tabulations (Cheltenham, 2003); and United States—National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.

## First university degrees and ratio of first university degrees and S&amp;E degrees to 24-year-old population, by sex, in selected locations, by region: 2000 or most recent year (revised)

Sex, region and location	All first university degrees	All S&E	Natural sciences <sup>a</sup>	Mathematics/computer sciences	Agricultural sciences	Social/behavioral sciences <sup>b</sup>	Engineering	24-year-olds	First university degrees	NS&E degrees	Social/behavioral science degrees
											Ratio to 24-year-old population <sup>c</sup>
Male											
Asia											
Cambodia .....	1,817	415	67	98	64	109	77	77,800	2.3	0.39	0.14
Japan (2001).....	335,850	275,451	10,110	3,761	7,854	160,525	93,201	880,400	38.1	13.05	18.23
Kyrgyzstan .....	7,915	3,281	805	171	297	710	1,298	44,000	18.0	5.84	1.61
Laos .....	1,135	314	42	20	81	15	156	47,400	2.4	0.63	0.03
South Korea .....	113,573	63,881	6,843	4,289	3,805	6,729	42,215	403,200	28.2	14.17	1.67
Taiwan (2001) .....	59,091	35,661	2,466	6,268	1,482	2,225	23,220	197,531	29.9	16.93	1.13
Middle East											
Iran .....	37,530	20,103	2,529	1,736	2,787	4,776	8,275	700,600	5.4	2.19	0.68
Israel .....	11,625	6,986	413	1,344	85	3,034	2,110	52,600	22.1	7.51	5.77
Lebanon .....	4,778	1,309	348	254	10	326	371	31,800	15.0	3.09	1.03
Morocco .....	15,863	5,529	1,886	800	337	2,365	141	300,600	5.3	1.05	0.79
Oman .....	1,353	146	36	0	5	0	105	29,200	4.6	0.50	0.00
Palestine .....	4,550	1,443	195	381	49	415	403	28,400	16.0	3.62	1.46
Qatar .....	353	158	46	15	0	29	68	3,600	9.8	3.58	0.81
Turkey .....	69,775	31,118	4,397	2,469	3,046	9,262	11,944	673,600	10.4	3.24	1.38
Sub-Saharan Africa											
Eritrea .....	676	330	60	44	64	10	152	33,400	2.0	0.96	0.03
Ethiopia .....	13,122	3,254	234	202	1,240	426	1,152	574,400	2.3	0.49	0.07
Ghana .....	5,232	2,227	694	0	294	801	438	188,600	2.8	0.76	0.42
Kenya .....	9,151	2,821	861	57	1,023	226	654	312,000	2.9	0.83	0.07
Uganda .....	12,931	892	240	40	92	322	198	212,600	6.1	0.27	0.15
Tanzania .....	3,015	918	NA	73	237	64	544	323,200	0.9	0.26	0.02
Europe											
Austria .....	7,939	3,487	407	442	138	355	2,145	47,600	16.7	6.58	0.75
Belgium .....	11,273	5,052	829	391	292	859	2,681	63,600	17.7	6.59	1.35
Denmark .....	3,277	1,291	238	145	85	800	23	33,200	9.9	1.48	2.41
Finland .....	10,319	6,940	432	542	308	521	5,137	33,400	30.9	19.22	1.56
France .....	119,281	64,647	16,616	10,002	1,031	10,427	26,571	388,600	30.7	13.95	2.68
Germany (2001).....	96,418	60,037	5,536	6,584	2,218	21,839	23,860	460,200	21.0	8.30	4.75
Hungary .....	18,810	6,314	278	461	868	868	3,839	84,800	22.2	6.42	1.02
Iceland .....	469	192	30	45	9	38	70	2,200	21.3	7.00	1.73
Ireland .....	8,640	3,824	955	887	130	213	1,639	35,200	24.5	10.26	0.61
Italy .....	66,568	32,883	3,910	2,354	946	5,350	20,323	370,200	18.0	7.44	1.45
Netherlands .....	32,084	13,001	1,440	1,121	960	2,692	6,788	95,400	33.6	10.81	2.82
Norway .....	8,041	3,147	77	657	108	1,071	1,234	27,800	28.9	7.47	3.85
Spain .....	85,347	37,984	4,696	5,919	2,717	4,829	19,823	325,600	26.2	10.18	1.48
Sweden .....	13,551	7,333	513	740	121	772	5,187	52,400	25.9	12.52	1.47
Switzerland .....	11,084	4,581	775	281	134	421	2,970	39,200	28.3	10.61	1.07
United Kingdom <sup>d</sup> (1999).....	121,680	54,990	15,450	10,750	1,260	8,770	18,760	357,800	34.0	12.92	2.45
Central/Eastern Europe											
Czech Republic.....	12,441	7,142	510	1,899	660	945	3,128	89,000	14.0	6.96	1.06
Albania .....	1,155	192	28	28	14	86	36	55,200	2.1	0.19	0.16
Armenia .....	4,662	1,047	NA	NA	246	NA	801	26,000	17.9	4.03	NA
Bulgaria.....	6,118	1,781	43	159	122	1,330	127	62,600	9.8	0.72	2.12

## First university degrees and ratio of first university degrees and S&amp;E degrees to 24-year-old population, by sex, in selected locations, by region: 2000 or most recent year (revised)

Sex, region and location	All first university degrees	All S&E	Natural sciences <sup>a</sup>	Mathematics/computer sciences	Agricultural sciences	Social/behavioral sciences <sup>b</sup>	Engineering	24-year-olds	First university degrees	NS&E degrees	Social/behavioral science degrees
											Ratio to 24-year-old population <sup>c</sup>
Number									Ratio to 24-year-old population <sup>c</sup>		
Croatia .....	7,866	2,607	401	429	271	191	1,315	32,600	24.1	7.41	0.59
Estonia .....	800	167	10	13	8	18	118	10,200	7.8	1.46	0.18
Georgia .....	8,800	2,770	300	43	225	27	2,175	40,400	21.8	6.79	0.07
North America											
Canada .....	51,805	25,434	4,470	3,886	644	8,937	7,497	210,000	24.7	7.86	4.26
Costa Rica .....	1,749	702	58	149	127	107	261	36,200	4.8	1.64	0.30
Cuba .....	5,702	1,802	208	155	267	136	1,036	76,200	7.5	2.19	0.18
Mexico .....	66,488	28,961	867	5,103	2,499	2,259	18,233	972,000	6.8	2.75	0.23
United States .....	536,158	197,669	37,966	33,045	9,780	69,558	47,320	1,889,200	28.4	6.78	3.68
Oceania											
Australia .....	48,187	18,178	3,942	4,214	657	1,872	7,493	137,600	35.0	11.85	1.36
New Zealand .....	7,572	2,403	1,259	265	137	110	632	25,400	29.8	9.03	0.43
Female											
Asia											
Cambodia .....	745	110	39	27	4	39	1	79,200	0.9	0.09	0.05
Japan (2001) .....	209,632	83,826	4,082	1,204	6,488	60,775	11,277	839,000	25.0	2.75	7.24
Kyrgyzstan .....	8,839	3,229	1,231	303	65	903	727	43,600	20.3	5.33	2.07
Laos .....	591	75	21	10	19	8	17	46,600	1.3	0.14	0.02
South Korea .....	100,925	32,978	6,584	5,010	2,054	5,037	14,293	380,400	26.5	7.35	1.32
Taiwan (2001) .....	58,339	12,963	1,218	3,123	1,718	3,537	3,367	187,363	31.1	5.03	1.89
Middle East											
Iran .....	31,681	13,522	3,487	1,565	1,998	4,766	1,706	670,400	4.7	1.31	0.71
Israel .....	18,642	7,273	532	710	86	5,293	652	49,600	37.6	3.99	10.67
Lebanon .....	6,616	1,650	326	164	18	1,036	106	31,400	21.1	1.96	3.30
Morocco .....	12,415	3,229	1,141	311	90	1,444	243	290,000	4.3	0.62	0.50
Oman .....	991	71	15	7	40	0	9	22,200	4.5	0.32	0.00
Palestine .....	4,093	1,172	318	377	17	331	129	26,600	15.4	3.16	1.24
Qatar .....	967	195	92	47	0	56	0	3,000	32.2	4.63	1.87
Turkey .....	49,107	17,951	4,347	1,807	1,867	6,281	3,649	644,400	7.6	1.81	0.97
Sub-Saharan Africa											
Eritrea .....	114	30	10	2	10	1	7	33,600	0.3	0.09	0.00
Ethiopia .....	3,725	410	30	31	164	110	75	578,000	0.6	0.05	0.02
Ghana .....	1,890	724	222	0	68	376	58	188,200	1.0	0.18	0.20
Kenya .....	5,470	1,049	259	14	471	219	86	315,000	1.7	0.26	0.07
Uganda .....	2,370	699	54	16	29	494	106	213,800	1.1	0.10	0.23
Tanzania .....	1,079	153	NA	14	62	24	53	327,600	0.3	0.04	0.01
Europe											
Austria .....	7,193	1,691	345	80	98	702	466	44,800	16.1	2.21	1.57
Belgium .....	11,253	3,159	622	128	206	1,537	666	61,600	18.3	2.63	2.50
Denmark .....	3,458	1,073	221	64	86	684	18	31,800	10.9	1.22	2.15
Finland .....	14,950	3,243	563	304	224	996	1,156	32,200	46.4	6.98	3.09
France .....	156,035	51,513	16,895	5,040	1,226	20,630	7,722	373,600	41.8	8.27	5.52
Germany (2001) .....	86,909	29,953	5,007	2,603	2,660	16,341	3,342	432,600	20.1	3.15	3.78
Hungary .....	28,168	3,309	238	89	791	1,155	1,036	81,000	34.8	2.66	1.43
Iceland .....	971	177	57	13	0	84	23	2,000	48.6	4.65	4.20
Ireland .....	10,767	2,856	1,276	518	66	577	419	33,800	31.9	6.74	1.71

## First university degrees and ratio of first university degrees and S&amp;E degrees to 24-year-old population, by sex, in selected locations, by region: 2000 or most recent year (revised)

Sex, region and location	All first university degrees	All S&E	Natural sciences <sup>a</sup>	Mathematics/computer sciences	Agricultural sciences	Social/behavioral sciences <sup>b</sup>	Engineering	24-year-olds	First university degrees	NS&E degrees	Social/behavioral science degrees
	Number								Ratio to 24-year-old population <sup>c</sup>		
Italy .....	84,109	24,380	4,975	2,473	399	9,171	7,362	356,400	23.6	4.27	2.57
Netherlands .....	37,725	5,192	797	214	451	2,769	961	91,600	41.2	2.65	3.02
Norway .....	14,380	1,707	63	116	98	973	457	26,600	54.1	2.76	3.66
Spain .....	122,231	27,829	6,212	3,091	2,022	9,146	7,358	311,600	39.2	6.00	2.94
Sweden .....	20,546	4,521	743	523	110	1,398	1,747	49,800	41.3	6.27	2.81
Switzerland .....	7,944	1,564	365	56	39	775	329	37,400	21.2	2.11	2.07
United Kingdom <sup>d</sup> (1999).....	142,000	37,390	16,780	3,880	1,600	11,890	3,250	338,800	41.9	7.53	3.51
Central/Eastern Europe											
Czech Republic.....	13,103	3,892	569	250	408	1,485	1,180	85,400	15.3	2.82	1.74
Albania .....	669	236	9	14	28	43	142	52,400	1.3	0.37	0.08
Armenia .....	5,544	296	0	0	89	0	207	25,600	21.7	1.16	0.00
Bulgaria.....	14,048	3,046	29	250	83	2,576	108	59,800	23.5	0.79	4.31
Croatia .....	981	396	64	57	38	25	212	31,400	3.1	1.18	0.08
Estonia .....	1,472	122	27	8	1	69	17	9,800	15.0	0.54	0.70
Georgia .....	10,997	2,054	695	127	221	83	928	39,200	28.1	5.03	0.21
North America											
Canada .....	75,326	27,916	5,883	1,538	592	17,723	2,180	200,600	37.6	5.08	8.83
Costa Rica .....	2,644	372	46	65	40	157	64	34,600	7.6	0.62	0.45
Cuba .....	11,067	958	187	64	117	272	318	73,000	15.2	0.94	0.37
Mexico .....	68,745	13,088	834	4,486	738	1,079	5,951	1,007,000	6.8	1.19	0.11
United States .....	716,963	200,953	45,565	16,078	8,464	118,630	12,216	1,822,200	39.3	4.52	6.51
Oceania											
Australia.....	64,558	11,681	4,581	1,551	459	3,046	2,044	131,600	49.1	6.56	2.31
New Zealand.....	13,396	1,926	1,089	127	59	298	353	24,000	55.8	6.78	1.24

NA not available

NS&amp;E natural sciences and engineering

<sup>a</sup>Includes physical, biological, earth, atmospheric, and ocean sciences.<sup>b</sup>Japanese social science data also include business administration.<sup>c</sup>Number of degrees per 100 24-year-olds.<sup>d</sup>Includes former colleges and polytechnics. Data for the United Kingdom were revised. Data are now rounded to the nearest 10. Detail may not sum to total because of rounding. Ratios are based on unrounded data.

NOTES: NS&amp;E degrees include natural, agricultural, and computer sciences; mathematics; and engineering. Data for first university degrees use the International Standard Classification of Education (ISCED 97), level 5A. Long (more than 5 years) and short (less than 5 years) first university degrees are combined.

SOURCES: Organisation for Economic Co-operation and Development, Center for Education Research and Innovation, *Education at a Glance 2002*; United Nations Educational, Scientific, and Cultural Organization (UNESCO), UNESCO Institute for Statistics database, <http://www.unesco.org/statistics>; Japan—Government of Japan, Ministry of Education, Culture and Science, *Monbusho Survey of Education* (Tokyo) and special tabulations 2003; Taiwan—Ministry of Education, *Educational Statistics of the Republic of China: 2002* (Taipei, 2002); Germany—Federal Statistical Office, *Prüfungen an Hochschulen 2001* (Wiesbaden, 2002); United Kingdom—Higher Education Statistics Agency (Cheltenham, 2003), special tabulations; Russia—Center for Science Research and Statistics, special tabulations (2001); Mexico—National Association of Universities and Institutions of Higher Education, *Anuario Estadístico 2001: Población Escolar de Nivel Licenciatura en Universidades e Institutos Tecnológicos, 2002*; and United States—National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>.



Appendix table 2-36

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## Earned S&amp;E doctoral degrees in selected regions and locations, by field: 2000 or most recent year (revised)

Region and location	All doctoral degrees	All S&E	Natural sciences <sup>a</sup>	Mathematics/ computer sciences	Agricultural sciences	Social/ behavioral sciences	Engineering	Non-S&E
All regions.....	207,383	114,337	46,715	7,389	7,761	20,054	32,418	93,046
Asia <sup>b</sup> .....	47,489	24,409	8,658	373	3,085	1,467	10,826	23,080
China (2001).....	13,001	8,153	2,655	NA	536	621	4,341	4,848
India (1997).....	10,408	4,764	3,498	NA	968	NA	298	5,644
Japan <sup>c</sup> (2001).....	16,078	7,401	1,586	NA	1,241	610	3,964	8,677
Kyrgyzstan.....	396	256	161	19	8	20	48	140
South Korea.....	6,143	2,865	614	247	242	108	1,654	3,278
Taiwan (2001).....	1,463	970	144	107	90	108	521	493
Middle East <sup>b</sup> .....	5,759	2,902	1,307	241	265	495	594	2,857
Iran.....	1,609	305	104	33	33	59	76	1,304
Israel.....	688	497	271	58	23	68	77	191
Morocco.....	1,338	1,039	689	89	0	152	109	299
Turkey.....	2,124	1,061	243	61	209	216	332	1,063
Sub-Saharan Africa <sup>b</sup> .....	2,064	679	253	0	142	143	141	1,385
Ghana.....	733	211	71	NA	29	29	82	522
Kenya.....	1,331	468	182	NA	113	114	59	863
Europe <sup>b</sup> .....	97,840	53,119	23,567	4,412	2,577	8,927	13,636	44,721
European Union.....	72,763	39,220	18,634	4,057	1,654	6,003	8,872	33,543
Austria.....	1,790	913	321	91	30	131	340	877
Belgium.....	1,147	789	479	NA	48	109	153	358
Denmark.....	913	462	207	NA	69	NA	186	451
Finland.....	1,891	974	285	61	36	218	374	917
France.....	9,903	6,577	3,959	800	22	876	920	3,326
Germany (2001).....	24,796	11,803	5,974	956	472	2,181	2,220	12,993
Greece.....	932	367	128	44	36	66	93	565
Ireland.....	501	325	214	19	16	27	49	176
Italy.....	3,557	1,731	55	704	163	92	717	1,826
Netherlands.....	2,483	1,309	464	0	183	242	420	1,174
Portugal.....	1,586	871	186	149	35	212	289	715
Spain.....	6,007	2,730	1,438	323	144	417	408	3,277
Sweden.....	3,049	1,848	540	149	65	253	841	1,201
United Kingdom <sup>d</sup> (2001).....	14,210	8,520	4,380	760	340	1,180	1,860	5,690
European Free Trade Association.....	3,391	1,418	729	129	76	149	335	1,973
Norway.....	658	195	7	NA	36	77	75	463
Switzerland.....	2,733	1,223	722	129	40	72	260	1,510
Central/Eastern Europe.....	21,686	12,481	4,204	226	847	2,775	4,429	9,205
Bulgaria.....	308	158	51	17	24	8	58	150
Croatia.....	262	191	62	14	13	43	59	71
Czech Republic.....	895	606	183	143	45	51	184	289
Estonia.....	127	37	19	3	2	4	9	90
Georgia.....	467	287	91	NA	15	120	61	180
Hungary.....	717	412	162	32	32	83	103	305
Lithuania.....	217	208	34	8	7	45	114	9
Russia.....	18,274	10,409	3,567	NA	676	2,415	3,751	7,865
Serbia and Montenegro.....	419	173	35	9	33	6	90	246

Appendix table 2-36

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## Earned S&amp;E doctoral degrees in selected regions and locations, by field: 2000 or most recent year (revised)

Region and location	All doctoral degrees	All S&E	Natural sciences <sup>a</sup>	Mathematics/ computer sciences	Agricultural sciences	Social/ behavioral sciences	Engineering	Non-S&E
America <sup>b</sup> .....	50,544	31,198	12,015	2,188	1,512	8,738	6,745	19,346
North/Central America.....	46,475	28,590	10,824	2,095	1,039	8,421	6,211	17,885
Canada.....	3,978	2,249	718	184	112	656	579	1,729
Costa Rica.....	760	204	14	61	32	96	1	556
Mexico.....	993	628	276	18	47	158	129	365
United States (2001).....	40,744	25,509	9,816	1,832	848	7,511	5,502	15,235
South America.....	4,069	2,608	1,191	93	473	317	534	1,461
Argentina (1996).....	408	382	218	8	97	18	41	26
Brazil (1999).....	3,604	2,176	924	85	376	299	492	1,428
Chile (1996).....	57	50	49	NA	NA	NA	1	7
Oceania								
Australia.....	3,687	2,030	915	175	180	284	476	1,657

NA not available

<sup>a</sup>Includes physical, biological, earth, atmospheric, and ocean sciences.<sup>b</sup>Includes only those locations for which relatively recent data are available.<sup>c</sup>Includes thesis doctorates, called *ronbun hakase*, earned by employees in industry.<sup>d</sup>Data for the United Kingdom were revised. Data are now rounded to the nearest 10. Detail may not sum to total because of rounding.

NOTES: Data for doctoral degrees use the International Standard Classification of Education (ISCED 97), level 6. S&amp;E data do not include health fields.

SOURCES: Organisation for Economic Co-operation and Development, Center for Education Research and Innovation, *Education at a Glance 2002*; United Nations Educational, Scientific, and Cultural Organization (UNESCO), UNESCO Institute for Statistics database, <http://www.unesco.org/statistics>; Iberoamerican Network of Science and Technology Indicators (RICYT), *Principales Indicadores de Ciencia y Tecnología* (Buenos Aires, 1999); China—National Research Center for Science and Technology for Development, special tabulations (2002); India—Department of Science and Technology, *Research and Development Statistics 1996–97* (New Delhi, 1999); Japan—Government of Japan, Ministry of Education, Culture and Science, *Monbusho Survey of Education*, special tabulations (Tokyo, 2003), and Division of Higher Education, special tabulations, 2003; Taiwan—Ministry of Education, *Educational Statistics of the Republic of China: 2002* (Taipei, 2002); France—National Ministry of Education and Research, *Rapport sur les Études Doctorales* (Paris, 2001); Germany—Federal Statistical Office, *Prüfungen an Hochschulen 2001* (Wiesbaden, 2002); United Kingdom—Higher Education Statistics Agency, special tabulations (Cheltenham, 2003); Russia—Center for Science Research and Statistics, unpublished tabulations, 2001; Argentina and Chile—RICYT; Brazil—Ministry of Education and Culture, Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, unpublished tabulations, 2001; Mexico—National Association of Universities and Institutions of Higher Education, *Anuario Estadístico 2001: Población Escolar de Posgrado* (Mexico, 2002); and United States—National Science Foundation, Division of Science Resources Statistics, *Science and Engineering Doctorate Awards: 2001*, NSF 03-300 (Arlington, VA, 2002).

Appendix table 2-37

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## Earned S&amp;E doctoral degrees in selected regions and locations, by sex and field: 2000 or 2001 (revised)

Sex, region, and location	All fields	All S&E	Natural sciences <sup>a</sup>	Mathematics/ computer sciences	Agricultural sciences	Social/ behavioral sciences	Engineering	Non-S&E
<b>Male</b>								
Asia .....	16,362	8,809	1,839	304	1,014	887	4,765	7,266
Japan <sup>b</sup> .....	10,177	5,397	1,149	0	730	706	2,812	4,780
Kyrgyzstan .....	151	126	81	9	6	4	26	25
South Korea.....	4,886	2,425	501	197	213	96	1,418	2,461
Taiwan.....	1,148	861	108	98	65	81	509	287
Middle East .....	4,310	2,648	798	183	179	339	428	1,662
Iran.....	1,151	368	84	26	31	45	72	783
Israel.....	385	303	157	48	12	30	56	82
Morocco.....	1,439	1,275	419	72	0	108	65	164
Turkey.....	1,335	702	138	37	136	156	235	633
Sub-Saharan Africa.....	1,804	523	219	0	114	67	123	1,281
Ghana.....	740	194	68	0	28	24	74	546
Kenya.....	1,064	329	151	0	86	43	49	735
Europe.....	58,727	35,246	14,352	3,169	1,587	5,396	10,628	23,600
European Union.....	43,283	25,812	11,263	2,887	987	3,788	6,887	17,644
Austria.....	1,142	644	206	76	21	66	275	498
Belgium.....	757	536	299	0	37	70	130	221
Denmark.....	562	318	143	0	30	0	145	417
Finland.....	1,068	635	166	45	21	114	289	433
France.....	5,833	4,152	2,327	635	10	494	686	1,681
Germany.....	17,807	9,603	4,394	883	331	1,944	2,051	8,204
Ireland.....	265	175	104	12	14	10	35	90
Italy.....	1,680	988	20	381	76	45	466	692
Netherlands.....	1,739	982	345	0	133	151	353	757
Spain.....	3,364	1,605	783	204	93	211	314	1,759
Sweden.....	1,932	1,303	331	121	42	152	657	629
United Kingdom <sup>c</sup> .....	7,130	4,870	2,150	530	180	530	1,490	2,260
European Free Trade Association .....	2,315	1,062	520	116	56	78	292	1,253
Norway.....	439	140	3	0	27	46	64	299
Switzerland.....	1,876	922	517	116	29	32	228	954
Central/Eastern Europe .....	13,129	8,372	2,569	166	544	1,530	3,449	4,703
Bulgaria.....	218	133	29	8	11	6	42	85
Croatia.....	180	139	28	7	7	19	43	41
Czech Republic.....	637	462	123	131	36	29	143	175
Estonia.....	72	42	14	1	1	2	9	30
Georgia.....	270	169	27	0	9	54	52	47
Hungary.....	443	271	107	19	20	56	69	172
Russia.....	11,309	7,156	2,241		460	1,364	3,091	4,153
America.....	26,305	18,302	6,816	1,602	698	3,897	5,165	8,003
Canada.....	2,427	1,542	510	147	78	306	501	885
Costa Rica.....	476	177	8	44	26	47	0	299
Mexico.....	633	421	183	13	39	86	100	212
United States.....	22,769	16,162	6,115	1,398	555	3,458	4,564	6,607
Oceania.....								
Australia.....	2,211	1,372	573	136	120	152	391	839
<b>Female</b>								
Asia.....	4,536	1,599	390	77	270	394	468	2,937
Japan <sup>b</sup> .....	2,985	1,006	194	0	223	320	269	1,979
Kyrgyzstan.....	245	130	80	10	2	16	22	115
South Korea.....	991	354	80	58	20	31	165	637
Taiwan.....	315	109	36	9	25	27	12	206
Middle East.....	2,364	1,169	509	58	86	156	166	1,195
Iran.....	595	74	20	7	2	14	4	521
Israel.....	303	194	114	10	11	38	21	109
Morocco.....	677	542	270	17	0	44	44	135
Turkey.....	789	359	105	24	73	60	97	430
Sub-Saharan Africa.....	513	190	34	0	28	76	18	323
Ghana.....	64	20	3	0	1	5	8	44
Kenya.....	449	170	31	0	27	71	10	279

Appendix table 2-37

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## Earned S&amp;E doctoral degrees in selected regions and locations, by sex and field: 2000 or 2001 (revised)

Sex, region, and location	All fields	All S&E	Natural sciences <sup>a</sup>	Mathematics/ computer sciences	Agricultural sciences	Social/ behavioral sciences	Engineering	Non-S&E
Europe.....	33,576	15,345	8,056	929	816	2,990	2,405	18,305
European Union.....	24,322	11,004	6,281	873	533	1,725	1,586	13,392
Austria .....	648	269	115	15	9	65	65	379
Belgium .....	390	253	180	0	11	39	23	137
Denmark.....	351	144	64	0	39	0	41	310
Finland.....	823	339	119	16	15	104	85	484
France.....	4,070	2,425	1,632	165	12	382	234	1,645
Germany.....	6,989	2,200	1,580	73	141	237	169	4,789
Ireland.....	236	150	110	7	2	14	13	57
Italy.....	1,877	743	35	323	87	47	251	1,134
Netherlands.....	744	327	119	0	50	91	67	417
Spain.....	2,643	1,125	655	119	51	206	94	1,518
Sweden.....	1,117	545	209	28	23	101	184	572
United Kingdom <sup>b</sup> .....	4,430	2,480	1,460	130	90	440	360	1,950
European Free Trade Association .....	1,076	356	209	13	20	71	43	720
Norway.....	219	55	4	0	9	31	11	164
Switzerland.....	857	301	205	13	11	40	32	556
Central/Eastern Europe .....	8,178	3,985	1,566	43	263	1,194	776	4,193
Bulgaria.....	158	93	22	9	13	2	16	65
Croatia.....	158	128	34	7	6	24	16	30
Czech Republic.....	258	144	60	12	9	22	41	114
Estonia.....	77	17	5	2	1	2	0	60
Georgia.....	288	209	64	0	6	66	9	79
Hungary.....	274	141	55	13	12	27	34	133
Russia.....	6,965	3,253	1,326	216	1,051	660	3,712	
America.....	20,171	10,319	3,874	490	336	4,515	1,033	9,902
Canada.....	1,551	707	208	37	34	350	78	844
Costa Rica.....	359	102	6	17	6	49	1	257
Mexico.....	360	207	93	5	8	72	29	153
United States.....	17,901	9,303	3,567	431	288	4,044	925	8,598
Oceania								
Australia.....	1,476	658	342	39	60	132	85	818

NA not available

<sup>a</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.<sup>b</sup>Japanese data for male/female breakouts are for the number who have completed doctoral degree course work in S&E fields; this number is very close to conferred degrees.<sup>c</sup>Data for the United Kingdom were revised. Data are now rounded to the nearest 10. Detail may not sum to total because of rounding.

NOTES: Data for doctoral degrees use the International Standard Classification of Education (ISCED 97), level 6. Data from national sources are for 2001; data from international sources are for 2000.

SOURCES: Organisation for Economic Co-operation and Development, Center for Education Research and Innovation, *Education at a Glance 2002*; United Nations Educational, Scientific, and Cultural Organization (UNESCO), the UNESCO Institute for Statistics database, <http://www.unesco.org/statistics>. Japan—Government of Japan, Ministry of Education, Culture and Science, *Monbusho Survey of Education* (Tokyo, 2002); Taiwan—Ministry of Education, *Educational Statistics of the Republic of China: 2002* (Taipei, 2002); Germany—Federal Statistical Office, *Prüfungen an Hochschulen 2001* (Wiesbaden, 2002); United Kingdom—Higher Education Statistics Agency, special tabulations (Cheltenham, 2002); Russia—Center for Science Research and Statistics, unpublished tabulations (2001); Mexico—National Association of Universities and Institutions of Higher Education, *Anuario Estadístico 2001: Población Escolar de Posgrado* (Mexico, 2002); and United States—National Science Foundation, Division of Science Resources Statistics, *Science and Engineering Doctorate Awards: 2001*, NSF 03-300 (Arlington, VA, 2002).

## S&amp;E doctoral degrees in selected Western industrialized countries, by field: 1975–2001 (revised)

Country and field	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
France <sup>a</sup> .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
All S&E.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Natural sciences <sup>b</sup> .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mathematics/computer sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Agricultural sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Social/behavioral sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Germany <sup>c</sup> .....	11,418	11,531	11,386	11,755	11,939	12,222	12,283	12,963	13,637	14,133	14,951	15,530	16,064	17,321
All S&E.....	4,588	4,742	4,922	4,677	4,821	4,780	4,710	4,937	4,978	5,153	5,738	6,091	6,576	7,101
Natural sciences <sup>b</sup> .....	2,238	2,364	2,443	2,287	2,380	2,462	2,444	2,313	2,404	2,315	2,986	3,184	3,440	3,844
Mathematics/computer sciences.....	242	250	294	242	273	227	213	261	274	239	274	278	294	332
Agricultural sciences.....	338	347	323	327	281	331	317	361	361	411	414	406	468	450
Social/behavioral sciences.....	1,015	1,042	1,024	995	959	949	913	1,012	966	1,014	968	1,064	1,068	1,150
Engineering.....	755	739	838	826	928	811	823	990	973	1,174	1,096	1,159	1,306	1,325
United Kingdom <sup>d</sup> .....	5,340	5,210	5,330	5,600	5,700	5,800	5,980	6,330	6,530	6,290	6,210	6,490	6,840	7,590
All S&E.....	4,020	3,980	4,120	4,240	4,220	4,290	4,460	4,740	4,760	4,570	4,610	4,760	5,020	5,660
Natural sciences <sup>b</sup> .....	2,080	2,070	2,160	2,190	2,300	2,300	2,390	2,520	2,430	2,410	2,410	2,500	2,580	2,790
Mathematics/computer sciences.....	240	260	280	280	270	260	310	300	290	290	280	290	320	370
Agricultural sciences.....	210	170	210	190	190	180	200	190	180	220	160	260	190	240
Social/behavioral sciences.....	430	480	510	540	500	530	540	600	660	660	690	690	730	900
Engineering.....	1,060	1,010	960	1,030	970	1,020	1,030	1,130	1,200	990	1,070	1,030	1,190	1,360
United States.....	32,952	32,946	31,716	30,875	31,239	31,020	31,356	31,111	31,282	31,337	31,297	31,902	32,370	33,500
All S&E.....	8,799	18,472	18,008	17,653	17,872	17,775	18,257	18,275	18,635	18,748	18,935	19,437	19,894	20,932
Natural sciences <sup>b</sup> .....	7,198	7,075	6,894	6,748	6,962	6,952	7,013	7,244	7,179	7,339	7,326	7,486	7,679	8,156
Mathematics/computer sciences.....	1,147	1,003	964	959	979	962	960	940	987	993	998	1,128	1,190	1,264
Agricultural sciences.....	905	788	782	853	855	912	982	951	1,015	997	1,110	997	976	1,015
Social/behavioral sciences.....	6,538	6,768	6,720	6,668	6,582	6,470	6,774	6,494	6,673	6,506	6,335	6,450	6,337	6,310
Engineering.....	3,011	2,838	2,648	2,425	2,494	2,479	2,528	2,646	2,781	2,913	3,166	3,376	3,712	4,187

Appendix table 2-38

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## S&amp;E doctoral degrees in selected Western industrialized countries, by field: 1975–2001 (revised)

Country and field	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
France <sup>a</sup> .....	5,963	6,782	7,198	8,585	9,295	10,602	9,801	10,963	11,073	10,582	10,173	NA	NA
All S&E.....	4,888	5,158	5,384	6,377	6,820	7,555	7,027	8,511	8,962	8,359	7,054	NA	NA
Natural sciences <sup>b</sup> .....	2,615	2,841	2,883	3,525	3,631	3,866	3,572	4,052	4,394	3,924	2,966	NA	NA
Mathematics/computer sciences.....	722	795	831	976	1,065	1,203	1,129	1,241	869	845	769	NA	NA
Agricultural sciences.....	37	53	38	38	52	94	84	194	207	179	179	NA	NA
Social/behavioral sciences.....	672	488	539	663	797	1,018	815	1,285	1,629	1,559	1,390	NA	NA
Engineering.....	842	981	1,093	1,175	1,275	1,374	1,427	1,739	1,863	1,852	1,750	NA	NA
Germany <sup>c</sup> .....	17,901	22,372	22,462	21,438	22,000	22,000	22,387	22,849	24,174	24,890	24,545	24,671	24,796
All S&E.....	7,568	10,762	10,465	10,148	10,200	10,200	10,889	11,472	11,728	11,966	11,984	11,895	11,803
Natural sciences <sup>b</sup> .....	4,095	5,319	5,326	5,638	5,700	5,700	5,868	6,078	6,418	6,625	6,271	6,123	5,974
Mathematics/computer sciences.....	383	429	418	464	500	500	663	810	785	855	980	968	956
Agricultural sciences.....	518	997	709	602	500	500	507	512	521	562	522	497	472
Social/behavioral sciences.....	1,200	1,544	1,483	1,344	1,400	1,400	1,741	1,803	1,775	1,824	1,982	2,082	2,181
Engineering.....	1,372	2,473	2,529	2,100	2,100	2,100	2,110	2,269	2,229	2,100	2,229	2,225	2,220
United Kingdom <sup>d</sup> .....	7,850	8,240	8,390	8,400	8,720	9,000	7,560	9,760	10,210	10,990	11,340	14,120	14,210
All S&E.....	5,820	6,210	6,300	6,110	6,100	6,330	5,130	6,530	6,770	7,270	7,390	8,620	8,520
Natural sciences <sup>b</sup> .....	2,940	3,110	3,150	3,050	3,030	3,200	2,580	3,380	3,420	3,670	3,670	4,370	4,380
Mathematics/computer sciences.....	420	470	540	520	530	600	450	600	590	570	680	770	760
Agricultural sciences.....	240	240	250	280	280	330	270	350	320	390	330	340	340
Social/behavioral sciences.....	880	920	910	940	740	700	500	640	680	810	910	1,140	1,180
Engineering.....	1,350	1,470	1,450	1,330	1,520	1,500	1,330	1,560	1,760	1,840	1,810	2,010	1,860
United States.....	34,327	36,067	37,534	38,890	39,801	41,034	41,743	42,414	42,555	42,683	41,140	41,340	40,744
All S&E.....	21,732	22,868	24,022	24,675	25,443	26,205	26,536	27,243	27,242	27,283	25,940	25,951	25,509
Natural sciences <sup>b</sup> .....	8,100	8,590	9,091	9,374	9,562	10,004	9,996	10,356	10,436	10,485	9,967	10,014	9,816
Mathematics/computer sciences.....	1,471	1,597	1,838	1,927	2,026	2,021	2,187	2,042	2,032	2,104	1,938	1,908	1,832
Agricultural sciences.....	1,086	1,174	1,073	1,063	968	1,078	1,036	1,036	982	1,037	966	942	848
Social/behavioral sciences.....	6,532	6,613	6,806	6,873	7,189	7,280	7,309	7,500	7,674	7,730	7,737	7,767	7,511
Engineering.....	4,543	4,894	5,214	5,438	5,698	5,822	6,008	6,309	6,118	5,927	5,332	5,320	5,502

NA not available

<sup>a</sup>French doctoral degrees are not available in the same data series before 1989 or after 1999.<sup>b</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.<sup>c</sup>German doctoral degrees include those of former East Germany from 1990 and thereafter.<sup>d</sup>Data for the United Kingdom were revised. Data are now rounded to the nearest 10. Detail may not sum to total because of rounding.SOURCES: France—National Ministry of Education and Research, *Rapport sur les Études Doctorales*, annual series (Paris); Germany—Federal Statistical Office, *Prüfungen an Hochschulen*, annual series (Wiesbaden); United Kingdom—Higher Education Statistics Agency, special tabulations (Cheltenham, 2003); United States—National Science Foundation, Division of Science Resources Statistics (NSF/SRS), Survey of Earned Doctorates, annual series; and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Science &amp; Engineering Indicators – 2004

## S&amp;E doctoral degrees in selected Asian countries/economies, by field: 1975–2001

Country/economy and field	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
China.....	0	0	0	0	0	0	0	13	19	91	234	307	622	1,682
All S&E.....	0	0	0	0	0	0	0	NA	NA	NA	125	127	218	797
Natural sciences <sup>a</sup> .....	0	0	0	0	0	0	0	NA	NA	NA	33	27	52	165
Mathematics/computer sciences.....	0	0	0	0	0	0	0	NA	NA	NA	23	10	31	75
Agricultural sciences.....	0	0	0	0	0	0	0	NA	NA	NA	1	0	8	55
Social/behavioral sciences.....	0	0	0	0	0	0	0	NA	NA	NA	0	1	0	26
Engineering.....	0	0	0	0	0	0	0	NA	NA	NA	68	89	127	476
India.....	2,015	2,337	2,710	3,144	3,646	4,229	4,904	5,688	6,597	6,934	7,139	7,346	7,603	7,598
All S&E.....	1,909	2,143	2,408	2,600	2,917	3,061	3,356	3,600	3,886	4,162	3,976	4,052	4,123	4,208
Natural sciences <sup>a</sup> .....	1,484	1,651	1,837	2,044	2,261	2,385	2,516	2,654	2,800	2,954	2,892	2,922	2,937	3,038
Mathematics/computer sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Agricultural sciences.....	289	317	348	422	480	483	558	566	575	698	575	576	583	576
Social/behavioral sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering.....	136	174	223	134	176	193	282	380	511	510	509	554	603	594
Japan <sup>b</sup> .....	4,592	5,138	5,322	5,648	5,812	6,269	6,599	6,810	7,233	7,477	7,978	8,533	9,157	9,602
All S&E.....	2,127	2,371	2,492	2,478	2,515	2,611	2,632	2,631	2,676	2,802	3,088	3,095	3,248	3,511
Natural sciences <sup>a</sup> .....	676	717	843	782	814	822	791	762	774	807	860	820	837	881
Mathematics/computer sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Agricultural sciences.....	381	490	518	442	430	527	529	521	515	614	697	646	715	746
Social/behavioral sciences.....	84	85	88	88	76	76	76	93	97	90	127	136	149	167
Engineering.....	986	1,079	1,043	1,166	1,195	1,186	1,236	1,255	1,290	1,291	1,404	1,493	1,547	1,717
South Korea.....	557	557	566	574	583	592	601	610	845	1,109	1,400	1,645	1,906	2,125
All S&E.....	128	128	99	116	139	169	212	269	281	360	548	631	759	871
Natural sciences <sup>a</sup> .....	29	29	22	30	41	55	75	102	83	124	212	201	277	207
Mathematics/computer sciences.....	0	0	0	0	0	0	0	0	0	0	0	0	0	73
Agricultural sciences.....	48	48	40	43	45	48	52	55	60	77	89	105	110	155
Social/behavioral sciences.....	31	31	23	23	24	24	25	25	41	39	50	52	102	90
Engineering.....	20	20	14	20	29	42	60	87	97	120	197	273	270	346
Taiwan.....	37	37	45	28	43	64	64	74	86	99	115	200	225	249
All S&E.....	21	21	24	17	26	30	49	44	58	85	109	172	197	197
Natural sciences <sup>a</sup> .....	2	2	4	7	4	6	8	5	8	14	20	22	35	35
Mathematics/computer sciences.....	0	0	0	0	1	1	1	3	4	2	4	13	14	14
Agricultural sciences.....	4	4	4	5	7	5	15	8	17	15	10	28	28	28
Social/behavioral sciences.....	7	7	13	2	6	8	10	13	15	23	16	26	22	22
Engineering.....	8	8	3	3	8	10	15	15	14	31	59	83	98	98

Appendix table 2-39

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## S&amp;E doctoral degrees in selected Asian countries/economies, by field: 1975–2001

Country/economy and field	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
China.....	1,904	2,127	2,556	2,540	2,114	3,590	4,364	4,950	6,793	8,518	10,160	11,383	12,465
All S&E.....	1,024	1,069	1,198	1,357	1,895	2,741	3,417	4,428	5,328	6,358	6,778	7,304	7,617
Natural sciences <sup>a</sup> .....	141	209	252	304	528	918	1,191	1,479	1,678	2,246	2,135	2,306	2,655
Mathematics/computer sciences.....	78	89	95	101	103	139	187	264	334	350	417	NA	NA
Agricultural sciences.....	56	20	37	68	92	125	182	256	328	416	444	462	536
Social/behavioral sciences.....	23	36	47	61	102	170	198	234	325	446	513	514	621
Engineering.....	726	715	767	823	1,069	1,389	1,659	2,195	2,643	2,900	3,269	4,484	4,341
India.....	8,284	8,586	8,374	8,383	8,720	9,923	9,070	10,397	10,408	10,408 <sup>c</sup>	NA	NA	NA
All S&E.....	4,209	4,166	4,212	4,183	4,021	4,565	4,000	5,015	4,764	4,764	NA	NA	NA
Natural sciences <sup>a</sup> .....	3,044	2,976	2,950	3,044	2,997	3,467	2,950	3,861	3,498	3,498	NA	NA	NA
Mathematics/computer sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Agricultural sciences.....	579	583	633	688	701	769	715	780	968	968	NA	NA	NA
Social/behavioral sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering.....	586	607	629	451	323	329	335	374	298	298	NA	NA	NA
Japan <sup>b</sup> .....	10,036	10,633	10,758	10,885	11,576	12,160	12,645	13,820	13,921	14,800	15,470	15,357	16,078
All S&E.....	3,561	3,704	3,874	4,056	4,438	4,877	5,205	6,006	6,157	6,575	7,082	7,089	7,401
Natural sciences <sup>a</sup> .....	876	835	863	892	1,009	1,132	1,182	1,243	1,315	1,481	1,542	1,579	1,586
Mathematics/computer sciences.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Agricultural sciences.....	734	719	791	870	824	894	956	1,108	1,043	1,094	1,100	1,147	1,241
Social/behavioral sciences.....	177	183	191	200	243	241	276	358	388	420	506	563	610
Engineering.....	1,774	1,967	2,029	2,094	2,362	2,610	2,791	3,297	3,411	3,580	3,934	3,800	3,964
South Korea.....	2,458	2,481	2,984	3,211	3,583	3,999	4,462	4,723	4,999	5,586	5,586	6,143	NA
All S&E.....	984	945	1,135	1,228	1,421	1,650	1,920	2,046	2,189	2,260	2,607	2,865	NA
Natural sciences <sup>a</sup> .....	192	170	225	202	244	296	358	391	427	433	438	614	NA
Mathematics/computer sciences.....	105	75	99	106	124	145	169	178	187	161	188	247	NA
Agricultural sciences.....	175	154	156	151	172	196	223	199	178	180	230	242	NA
Social/behavioral sciences.....	97	107	189	217	222	227	232	236	240	240	168	108	NA
Engineering.....	415	439	466	552	659	786	938	1,042	1,157	1,246	1,583	1,654	NA
Taiwan.....	314	410	410	608	701	808	848	1,053	1,187	1,282	1,337	1,400	1,463
All S&E.....	257	312	370	450	513	592	650	783	839	907	892	931	970
Natural sciences <sup>a</sup> .....	42	47	62	82	97	115	115	154	163	172	150	147	144
Mathematics/computer sciences.....	18	24	32	42	45	49	55	63	88	93	119	113	107
Agricultural sciences.....	36	33	36	39	48	60	63	65	79	78	76	83	90
Social/behavioral sciences.....	41	43	31	23	36	56	44	66	76	87	65	87	108
Engineering.....	120	165	209	264	287	312	373	435	433	477	482	502	521

NA not available

<sup>a</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.<sup>b</sup>Japanese data include thesis doctorates, called *ronbun hakase*, earned by employees in industry. In Japanese higher education data, mathematics is included in natural sciences; computer sciences are included in engineering.<sup>c</sup>Indian 1998 data are estimated.

SOURCES: China—National Research Center for Science and Technology for Development and *Educational Yearbook, 2002*; India—Department of Science and Technology, *Research and Development Statistics 1996–97* (New Delhi, 1999); Japan—Government of Japan, Ministry of Education, Culture and Science, *Monbusho Survey of Education* (Tokyo, annual series); and Division of Higher Education, special tabulations, 2003. South Korea—Ministry of Education, *Statistical Yearbook of Education* (Seoul, annual series), and Organisation for Economic Co-operation and Development, Center for Education Research and Innovation, *Education at a Glance 2002*, and Taiwan—Ministry of Education, *Educational Statistics of the Republic of China* (Taipei, annual series).



Appendix table 2-40

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## Foreign S&amp;E student enrollment in United Kingdom universities, by enrollment level, location of origin, and field: 1994, 1998, and 2001 (revised)

Enrollment level and location of origin	All S&E	Natural/ agricultural sciences <sup>a</sup>	Mathematics/ computer sciences	Social/ behavioral sciences	Engineering
<b>1994</b>					
All undergraduate.....	393,040	131,370	69,720	79,260	112,690
All foreign.....	34,530	7,770	4,270	6,550	15,940
Greece.....	3,830	720	610	570	1,920
Malaysia.....	3,760	170	490	400	2,700
Irish Republic.....	3,110	1,300	340	220	1,260
Germany.....	2,660	1,010	210	640	800
France.....	2,640	880	270	470	1,010
Hong Kong.....	2,200	220	410	470	1,110
Singapore.....	1,990	140	200	270	1,390
United States.....	1,220	520	50	560	90
Canada.....	170	90	20	40	20
China.....	150	10	20	10	110
Other.....	12,820	2,730	1,660	2,910	5,530
Percent foreign.....	8.8	5.9	6.1	8.3	14.1
All graduate.....	99,980	35,270	15,170	22,890	26,650
All foreign.....	28,850	8,100	3,490	8,010	9,260
Greece.....	2,410	580	460	500	870
Malaysia.....	1,570	320	200	220	820
Irish Republic.....	1,040	490	110	170	280
Germany.....	1,290	390	200	340	360
France.....	950	290	80	190	400
Hong Kong.....	1,030	90	190	400	360
Singapore.....	570	80	150	90	260
United States.....	1,090	240	70	670	110
Canada.....	600	140	40	320	110
China.....	1,330	410	140	120	660
Other.....	16,970	5,070	1,870	4,990	5,040
Percent foreign.....	28.9	23.0	23.0	35.0	34.7
<b>1998</b>					
All undergraduate.....	419,530	149,640	85,900	84,090	99,900
All foreign.....	48,870	11,260	6,650	10,150	20,810
Greece.....	10,640	2,040	1,470	1,880	5,60
Malaysia.....	4,210	170	450	320	3,270
France.....	3,580	1,050	370	580	1,580
Irish Republic.....	3,490	1,720	430	350	990
Germany.....	2,630	840	250	830	720
United States.....	1,970	650	120	1,080	130
Hong Kong.....	1,720	280	460	290	700
Japan.....	720	220	80	360	70
India.....	470	40	70	90	270
China.....	330	40	150	40	100
Other.....	19,110	4,240	2,830	4,320	7,720
Percent foreign.....	11.6	7.5	7.7	12.1	20.8
All graduate.....	116,450	40,560	19,400	27,680	28,810
All foreign.....	36,630	9,950	4,750	11,100	10,820
Greece.....	4,280	1,090	640	820	1,730
Malaysia.....	1,330	240	230	180	680
France.....	1,730	610	140	280	710
Irish Republic.....	1,400	590	260	260	290
Germany.....	1,830	570	230	530	510
United States.....	1,460	380	110	810	160
Hong Kong.....	990	140	120	430	300
Japan.....	930	150	40	650	90
India.....	850	200	130	300	210
China.....	1,490	330	280	200	680
Other.....	20,350	5,660	2,580	6,650	5,460
Percent foreign.....	31.5	24.5	24.5	40.1	37.6

Appendix table 2-40

(Page 2 of 2)

## Foreign S&amp;E student enrollment in United Kingdom universities, by enrollment level, location of origin, and field: 1994, 1998, and 2001 (revised)

Enrollment level and location of origin	All S&E	Natural/ agricultural sciences <sup>a</sup>	Mathematics/ computer sciences	Social/ behavioral sciences	Engineering
<b>2001</b>					
All undergraduate.....	430,600	143,520	108,130	83,950	95,010
All foreign.....	41,970	8,720	8,750	8,160	16,350
Greece.....	7,6230	1,420	1,200	1,480	3,520
China.....	3,060	390	1,160	570	940
Irish Republic.....	2,140	990	280	200	680
Germany.....	1,800	510	280	670	340
Malaysia.....	2,960	120	500	220	2,120
France.....	2,210	490	330	330	1,060
United States.....	800	420	90	210	90
Hong Kong.....	2,200	410	620	340	820
India.....	790	80	260	100	360
Japan.....	590	170	90	250	80
Other.....	17,810	3,710	3,960	3,800	6,340
Percent foreign.....	9.7	6.1	8.1	9.7	17.2
All graduate.....	124,530	40,840	24,580	27,770	31,340
All foreign.....	43,980	10,290	8,640	11,320	13,730
Greece.....	6,050	1,230	1,060	1,090	2,670
China.....	3,510	440	1,400	460	1,220
Irish Republic.....	1,290	540	210	240	300
Germany.....	1,740	510	300	480	460
Malaysia.....	1,730	180	350	130	1,070
France.....	1,850	630	190	300	730
United States.....	1,860	470	160	1,040	190
Hong Kong.....	670	90	150	190	250
India.....	2,060	350	890	270	550
Japan.....	1,020	180	60	700	80
Other.....	22,210	5,680	3,870	6,440	6,220
Percent foreign.....	35.3	25.2	35.2	40.8	43.8

<sup>a</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.

NOTE: Data for the United Kingdom were revised. Data are now rounded to the nearest 10. Detail may not sum to total because of rounding. Percents are based on unrounded data.

SOURCE: Higher Education Statistics Agency, special tabulations (Cheltenham, 2003).

Appendix table 2-41  
**Foreign S&E student enrollment in French universities, by enrollment level and field: 1996 and 2002**

Enrollment level	All S&E	Economics/ business	Social sciences/ humanities	Life sciences	Material/ physical sciences	Engineering science and technology
<b>1996</b>						
Undergraduate <sup>a</sup> .....	249,511	36,969	95,282	29,355	38,896	49,009
Foreign .....	17,530	4,705	5,204	1,748	2,397	3,476
Percent foreign .....	7.0	12.7	5.5	6.0	6.2	7.1
Graduate <sup>b</sup> .....	93,366	19,932	28,302	15,015	13,563	16,554
Foreign .....	18,518	3,264	5,860	2,583	2,892	3,919
Percent foreign .....	19.8	16.4	20.7	17.2	21.3	23.7
<b>2002</b>						
Undergraduate <sup>a</sup> .....	249,789	45,236	93,473	25,883	22,232	62,965
Foreign .....	31,336	9,703	8,220	3,008	3,220	7,185
Percent foreign .....	12.5	21.4	8.8	11.6	14.5	11.4
Graduate <sup>b</sup> .....	109,348	26,534	34,199	16,419	12,834	19,362
Foreign .....	27,250	7,279	7,425	2,775	3,422	6,349
Percent foreign .....	24.9	27.4	21.7	16.9	26.7	32.8

<sup>a</sup>Undergraduate data include enrollment in all programs designated as license, maîtrise, and several as *university diploma* and *engineering formation*.

<sup>b</sup>Graduate enrollment includes four advanced, two predoctoral, and two doctoral degree programs.

NOTE: Some of the broad fields, such as economics/business and social sciences/humanities, include some non-S&E disciplines.

SOURCE: French National Ministry of Education and Research, special tabulations, (Paris, 2003).

Appendix table 2-42

**Foreign S&E student enrollment in Japanese universities, by enrollment level, location of origin, and field: 2001**

Enrollment level and location of origin	All S&E	Natural sciences <sup>a</sup>	Agricultural sciences	Social/behavioral sciences	Engineering <sup>b</sup>	Other
All undergraduate <sup>c</sup> .....	1,606,727	88,711	62,450	988,554	467,012	880,406
Foreign.....	25,968	440	598	20,379	4,551	18,541
China.....	8,430	73	140	7,332	885	7,059
South Korea.....	6,602	175	144	5,124	1,159	5,833
Malaysia.....	1,151	11	28	306	806	224
Thailand.....	159	8	9	83	59	196
Vietnam.....	129	5	4	71	49	100
Indonesia.....	122	4	5	51	62	135
United States.....	42	1	1	39	1	790
Brazil.....	42	3	6	14	19	119
Bangladesh.....	39	0	1	18	20	50
Australia.....	35	0	0	34	1	235
Percent foreign.....	1.1	0.3	0.5	1.4	0.7	2.0
All graduate.....	128,896	18,855	18,798	25,076	66,167	62,229
Master's.....	105,142	12,897	7,576	23,563	61,106	45,655
Doctoral.....	29,450	6,302	4,131	6,751	12,266	36,075
Foreign.....	15,614	1,075	1,945	6,240	6,354	9,626
China.....	6,099	348	661	2,624	2,466	5,289
South Korea.....	2,160	137	224	939	860	2,249
Indonesia.....	663	60	174	88	341	179
Bangladesh.....	410	72	142	20	176	239
Thailand.....	423	12	88	97	226	209
Malaysia.....	216	6	19	90	101	74
Philippines.....	166	24	61	39	42	119
Vietnam.....	168	12	32	46	78	66
Sri Lanka.....	132	13	28	21	70	38
India.....	98	12	24	16	46	49
Percent foreign.....	9.64	4.82	9.38	17.99	7.93	16.07

<sup>a</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.

<sup>b</sup>Computer sciences are included in engineering.

<sup>c</sup>Undergraduate includes 4-year colleges and universities.

NOTE: Data are for students of non-Japanese citizenship, including permanent residents.

SOURCE: Government of Japan, Ministry of Education, Culture and Science, Division of Higher Education, special tabulations (Tokyo, 2003).

Appendix table 2-43  
**S&E student enrollment in Canadian universities, by enrollment level, top locations of origin, and field: 1985 and 1998**

Enrollment level and locations of origin	All S&E	Mathematics/ physical sciences	Agricultural/ biological sciences	Social sciences related fields	Engineering/ applied sciences
<b>1985</b>					
Undergraduate					
All S&E .....	336,922	45,944	32,113	207,134	51,731
Foreign .....	29,243	6,632	2,149	14,584	5,878
Hong Kong .....	7,281	2,551	257	3,363	1,110
United States .....	1,969	306	278	1,120	265
Malaysia .....	1,871	591	113	817	350
United Kingdom .....	1,290	325	145	627	193
Trinidad/Tobago .....	833	137	91	484	121
Singapore .....	738	201	35	465	37
Morocco .....	701	197	58	327	119
Iran .....	497	137	94	71	195
India .....	465	114	60	157	134
Vietnam .....	459	118	21	67	253
Other .....	13,139	1,955	997	7,086	3,101
Percent foreign .....	8.7	14.4	6.7	7.0	11.4
Graduate					
All S&E .....	56,688	8,850	5,785	31,053	11,000
Foreign .....	9,423	2,124	1,020	3,493	2,786
United States .....	958	193	143	532	90
China .....	655	209	73	136	237
India .....	751	194	113	124	320
Hong Kong .....	616	149	19	226	222
United Kingdom .....	363	84	42	181	56
France .....	311	38	24	160	89
Morocco .....	221	69	16	87	49
Greece .....	205	51	9	67	78
Iran .....	200	48	11	40	101
Malaysia .....	167	36	16	46	69
Other .....	4,976	4,976	4,976	4,976	4,976
Percent foreign .....	16.6	24.0	17.6	11.2	25.3
<b>1998</b>					
Undergraduate					
All S&E .....	392,144	49,277	46,474	233,432	62,961
Foreign .....	37,014	7,642	3,309	18,047	8,016
Hong Kong .....	5,385	1,095	285	2,942	1,063
China .....	2,401	905	71	974	451
Taiwan .....	1,865	391	197	848	429
United Kingdom .....	1,453	277	152	636	388
United States .....	1,418	151	228	875	164
India .....	1,292	268	155	461	408
France .....	1,140	115	114	690	221
Sri Lanka .....	1,865	391	197	848	429
South Korea .....	896	191	115	404	186
Iran .....	852	255	163	171	263
Other .....	18,447	3,603	1,632	9,198	4,014
Percent foreign .....	9.4	15.5	7.1	7.7	12.7
Graduate					
All S&E .....	79,676	12,011	7,910	43,224	16,531
Foreign .....	16,716	3,626	1,605	6,234	5,251
China .....	3,702	1,230	281	767	1,424
France .....	1,120	184	106	604	226
India .....	826	136	82	231	377
United States .....	822	122	133	485	82
Iran .....	673	109	90	65	409
Morocco .....	465	115	34	196	120
Romania .....	465	147	19	111	188
Hong Kong .....	403	64	20	200	119
Tunisia .....	361	52	15	217	77
Germany .....	315	85	38	144	48
Other .....	7,564	1,382	787	3,214	2,181
Percent foreign .....	21.0	30.2	20.3	14.4	31.8

SOURCE: Statistics Canada, Center for Education Statistics, special tabulations (Ontario, 2003).

Appendix table 2-44

## Doctoral degrees earned by foreign students in selected industrialized countries, by field: 2001 or most recent year (revised)

Country and field	All	Foreign	Percent foreign
France (1999)	10,241	2,157	21.1
S&E	6,703	1,394	20.8
Natural sciences <sup>a</sup>	2,615	432	16.5
Mathematics/computer sciences	769	221	28.7
Agricultural sciences	179	32	17.9
Social/behavioral sciences	1,390	324	23.3
Engineering	1,750	385	22.0
Non-S&E	3,538	763	21.6
Germany	24,796	1,739	7.0
S&E	11,093	1,029	9.3
Natural sciences <sup>a</sup>	5,502	472	8.6
Mathematics/computer sciences	956	89	9.3
Agricultural sciences	472	136	28.8
Social/behavioral sciences	1,908	91	4.8
Engineering	2,255	241	10.7
Non-S&E	13,703	710	5.2
Japan <sup>b</sup>	10,320	1,412	13.7
S&E	5,468	772	14.1
Natural sciences <sup>a</sup>	1,341	84	6.3
Mathematics/computer sciences	NA	NA	NA
Agricultural sciences	953	210	22.0
Social/behavioral sciences	383	57	14.9
Engineering	2,791	421	15.1
Non-S&E	4,852	640	13.2
United Kingdom <sup>c</sup> (2002)	14,210	5,070	35.7
S&E	8,520	3,140	36.9
Natural sciences <sup>a</sup>	4,380	1,120	25.6
Mathematics/computer sciences	760	330	43.5
Agricultural sciences	340	150	46.0
Social/behavioral sciences	1,180	580	49.0
Engineering	1,860	950	51.2
Non-S&E	5,690	1,930	34.0
United States	40,744	11,602	28.5
S&E	26,357	9,574	36.3
Natural sciences <sup>a</sup>	10,664	3,649	34.2
Mathematics/computer sciences	1,832	900	49.1
Agricultural sciences	848	386	45.5
Social/behavioral sciences	7,511	1,571	20.9
Engineering	5,502	3,068	55.8
Non-S&E	14,387	2,028	14.1

NA not available

<sup>a</sup>Natural sciences include physical, biological, earth, atmospheric, and ocean sciences.<sup>b</sup>Japanese data are for university-based doctorates only, excluding *ronbun hakase* doctorates awarded for research within industry. Japanese data include mathematics in natural sciences and computer sciences in engineering.<sup>c</sup>Data for the United Kingdom were revised. Data are now rounded to the nearest 10. Detail may not sum to total because of rounding. Percents are based on unrounded data.

NOTE: For each country, data are for doctoral degree recipients with foreign citizenship, including permanent and temporary residents.

SOURCES: France—National Ministry of Education and Research, *Rapport sur les Études Doctorales 2001* (Paris, 2002); Germany—Federal Statistical Office, *Prüfungen an Hochschulen 2001* (Wiesbaden, 2002); Japan—Government of Japan, Ministry of Education, Culture and Science, Division of Higher Education, special tabulations (Tokyo, 2003); United Kingdom—Higher Education Statistics Agency, special tabulations (Cheltenham, 2003), and United States—National Science Foundation, Division of Science Resources Statistics, *Science and Engineering Doctorate Awards: 2001*, NSF 03-300 (Arlington, VA, 2002).

Appendix table 3-1

(Page 1 of 5)

**SESTAT degree field and occupational category**

Field	Occupation
S&E	S&E
Mathematics/computer sciences	Mathematical/computer scientists
Computer and information sciences	Computer/information scientists
Computer sciences	Computer engineers—software
Computer systems analysis	Computer scientists, except systems analysts
Information services and systems	Computer systems analysts
Other	Information systems scientists/analysts
Mathematics	Other
Applied mathematics	Mathematical scientists
General mathematics	Mathematicians
Operations research	Operations research analysts, modeling
Statistics	Statisticians
Other	Other
	Postsecondary teachers
	Computer sciences
	Mathematics
Life/related sciences	Life scientists
Agricultural/food sciences	Agricultural/food scientists
Animal sciences	Biological scientists
Food sciences/technology	Biochemists/biophysicists
Plant sciences	Biological scientists
Other	Medical scientists, except practitioners
Biological sciences	Other
Biochemistry/biophysics	Environmental life scientists
Biology	Forestry/conservation
Botany	Postsecondary teachers
Cell/molecular biology	Agriculture
Ecology	Biological sciences
Genetics, plant and animal	Medical sciences
Microbiology	Other
Nutritional science	
Pharmacology, human and animal	
Physiology, human and animal	
Zoology	
Other	
Environmental life sciences	
Environmental science studies	
Forestry sciences	
Health/related sciences (included under life sciences for doctoral programs only)	
Audiology/speech pathology	
Health services administration	
Health/medical assistants	
Health/medical technologies	
Medical preparatory programs	
Medicine	
Nursing, 4 years or longer	
Pharmacy	
Physical therapy/other rehabilitation	
Public health, including environment	
Other	

Appendix table 3-1

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**SESTAT degree field and occupational category**

Field	Occupation
Physical/related sciences	Physical scientists
Chemistry, except biochemistry	Chemists, except biochemists
Earth science, geology, and oceanography	Earth scientists, geologists, and oceanographers
Atmospheric sciences/meteorology	Atmospheric and space scientists
Earth sciences	Geologists
Geology	Oceanographers
Other geological sciences	Physicists and astronomers
Oceanography	Astronomers
Physics and astronomy	Physicists
Physics	Other
Astronomy/astrophysics	Postsecondary teachers
Other	Chemistry
	Physics
	Earth, environmental, and marine science
Social/related sciences	Social scientists
Economics	Economists
Agricultural economics	Political/related scientists
Economics	Psychologists
Political/related sciences	Sociologists/anthropologists
International relations	Anthropologists
Political science/government	Sociologists
Public policy studies	Other
Psychology	Historians, science and technology
Clinical	Other
Counseling	Postsecondary teachers
Educational	Economics
Experimental	Political science
General	Psychology
Industrial/organizational	Sociology
Social	Other
Other	
Sociology/anthropology	
Anthropology/archaeology	
Area/ethnic studies	
Criminology	
Geography	
History of science	
Linguistics	
Philosophy of science	
Sociology	
Other	



Appendix table 3-1

(Page 3 of 5)

**SESTAT degree field and occupational category**

Field	Occupation
Engineering	Engineers
Aerospace/related	Aerospace/related
Aerospace, aeronautical, and astronautical	Architectural/civil
Architectural/civil	Civil
Architectural	Chemical
Civil	Electrical/related
Chemical	Computer—hardware
Electrical/related	Electrical/electronics
Computer and systems	Industrial
Electrical, electronics, and communications	Mechanical
Industrial	Other
Mechanical	Agricultural
Other	Bioengineers/biomedical
Agricultural	Environmental
Bioengineering/biomedical	Naval architects/marine
Engineering sciences, mechanics and physics	Materials/metallurgical
Environmental	Mining/geological
General	Nuclear
Geophysical	Petroleum
Materials, including ceramics and textiles	Sales
Metallurgical	Other
Mining and minerals	Postsecondary teachers
Naval architecture and marine	Engineering
Nuclear	
Petroleum	
Other	
Non-S&E	Non-S&E
Management/administration	Managers and administrators
Agricultural business/production	Top and mid-level managers, executives, and administrators
Accounting	Accountants, auditors, and other financial specialists
Business administration/management	Personnel, training, and labor relations specialists
Business, general	Other
Business and managerial economics	
Financial management	
Other	
Health/related (included in non-S&E for bachelor's and master's programs only)	Health-related occupations
Audiology/speech pathology	Health practitioners
Health services administration	Registered nurses, pharmacists, dietitians, and therapists
Health/medical assistance	Technologists/technicians
Health/medical technologies	Other
Medical preparatory programs	
Medicine nursing, 4 years or longer	
Pharmacy	
Physical therapy/rehabilitation	
Public health, including environment	
Other	

Appendix table 3-1

(Page 4 of 5)

**SESTAT degree field and occupational category**

Field	Occupation
Teaching/education	Teachers, except S&E postsecondary teachers
Education administration	Prekindergarten/kindergarten
Computer teacher education	Elementary school
Counselor education and guidance	Secondary:
Elementary teacher education	Computer, mathematics, or sciences
Mathematics teacher education	Social sciences
Physical education and coaching	Other
Preelementary teacher education	Special education
Science teacher education	Other precollegiate education
Secondary teacher education	Postsecondary teachers
Special education	Art, drama, and music
Social science teacher education	Business, commerce, and marketing
Other	Education
	English
	Foreign language
	History
	Home economics
	Law
	Physical education
	Social work
	Theology
	Trade/industrial
	Other health specialties
	Other
Social service/related disciplines	Social services/related occupations
Social work	Clergy/other religious workers
Other philosophy, religion, theology	Counselors, educational and vocational
	Social workers
Technology/technical disciplines	Technologists/technicians
Computer programming	Computer programmers
Data processing technology	Electrical, electronics, industrial, and mechanical engineering technicians
Electrical and electronics technologies	Drafting occupations
Industrial production technologies	Surveying and mapping engineering technicians
Mechanical engineering-related technologies	Other engineering technologists and technicians
Other engineering-related technologies	Surveyors
	Technologists and technicians
	Biological/life sciences
	Mathematical sciences
	Physical sciences
Sales/marketing	Sales/marketing
Business marketing/marketing management	Insurance, securities, real estate, and business services
Marketing research	Commodities, except retail
	Retail
	Other
Arts, humanities, and related disciplines	Art/humanities, and related occupations
English language, literature, and letters	Artists, editors, entertainers, public relations, and writers
Other foreign languages/literature	Historians, except science and technology
Liberal arts/general studies	
History	
Dramatic arts	
Fine arts	
Music	
Other visual/performing arts	

Appendix table 3-1

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**SESTAT degree field and occupational category**

Field	Occupation
Other	Other
Architecture/environmental design	Accounting clerks/bookkeepers
Other conservation, renewable natural resources	Secretaries, receptionists, and typists
Actuarial science	Other administrative
Communications	Architects
Journalism	Farmers, foresters, and fishermen
Other	Lawyers and judges
Criminal justice and protective services	Librarians, archivists, and curators
Home economics	Actuaries
Law, prelaw, and legal studies	Food preparation and service workers
Library science	Protective service workers
Parks, recreation, leisure, and fitness studies	Other service occupations, except health
Public administration	Construction trades, miners, and well drillers
Other public affairs	Mechanics and repairers
Other	Precision production
	Operators and related occupations
	Transportation and material movers
	Other

SESTAT Scientists and Engineers Statistical Data System

NOTES: Individual occupations included in SESTAT adhere to the Standard Occupational Classification (SOC), a U.S. Government standard classification scheme. SOC was developed through an interagency committee headed by the Office of Management and Budget. It is used by Federal agencies that collect employment and occupational data and was meant to provide comparability of data among different Federal statistics agencies. Major and minor S&E groupings of occupations as shown in this table were developed by the National Science Foundation.

SOURCE: National Science Foundation, Division of Science Resources Statistics, SESTAT, 1999.

Appendix table 3-2

**College graduates in nonacademic S&E occupations: 1980, 1990, and 2000**

Occupation	1980	1990	2000
All S&E occupations .....	1,413,000	2,459,000	3,664,000
Engineers .....	853,000	1,295,000	1,623,000
Life scientists .....	83,000	119,000	181,000
Mathematical/computer scientists .....	177,000	495,000	1,280,000
Physical scientists .....	143,000	219,000	259,000
Social scientists.....	158,000	332,000	318,000

SOURCES: U.S. Decennial Census Public Use Microdata Samples, 1980 and 1990; and National Bureau of Economic Research's Merged Outgoing Rotation Group Files from the Bureau of Labor Statistics' Current Population Survey.

*Science & Engineering Indicators – 2004*

Appendix table 3-3  
**Growth of employment in S&E occupations: 1983–2002**

Year	Number employed	Percent of U.S. workforce
1983 .....	2,925,000	2.6
1984 .....	3,010,000	2.7
1985 .....	3,128,000	2.7
1986 .....	3,328,000	2.8
1987 .....	3,355,000	2.8
1988 .....	3,499,000	2.9
1989 .....	3,593,000	2.9
1990 .....	3,750,000	3.0
1991 .....	3,924,000	3.1
1992 .....	3,768,000	3.0
1993 .....	3,963,000	3.1
1994 .....	4,379,000	3.3
1995 .....	4,384,000	3.3
1996 .....	4,557,000	3.4
1997 .....	4,775,000	3.5
1998 .....	5,074,000	3.7
1999 .....	5,294,000	3.8
2000 .....	5,544,000	3.9
2001 .....	5,581,000	3.9
2002 .....	5,412,000	3.8

SOURCES: U.S. Decennial Census Public Use Microdata Samples, 1980 and 1990; and National Bureau of Economic Research's Merged Outgoing Rotation Group Files from the Bureau of Labor Statistics' Current Population Survey.

Appendix table 3-4

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**Total S&E jobs, by occupation: 2000 and projected 2010**

(Thousands)

Occupation	2000	2010	Projected change
All occupations .....	145,571	167,754	22,183
All S&E occupations.....	4,706	6,904	2,197
Scientists .....	3,241	5,301	2,059
Life scientists.....	184	218	33
Agriculture and food scientists .....	17	19	2
Biological scientists.....	73	88	15
Conservation scientists and foresters.....	29	31	2
Conservation scientists .....	16	18	1
Foresters .....	12	13	1
Medical scientists .....	37	47	10
Other .....	28	33	5
Mathematical/computer sciences.....	2,408	4,308	1,900
Computer specialists.....	2,318	4,213	1,895
Computer scientists/systems analysts.....	459	729	269
Computer/information scientists, research.....	28	39	11
Computer systems analysts .....	431	689	258
Computer software engineers .....	697	1,361	664
Applications.....	380	760	380
Systems software .....	317	601	284
Computer support specialists.....	506	996	491
Database administrators .....	106	176	70
Network/computer systems administrators .....	229	416	187
Network systems/data communication analysts.....	119	211	92
Other .....	203	325	122
Mathematical sciences .....	89	95	5
Mathematical scientists/technicians.....	85	90	5
Actuaries .....	14	15	1
Mathematicians .....	4	4	—
Operations research analysts.....	47	51	4
Statisticians.....	19	20	—
Other .....	5	5	—
Physical sciences .....	239	283	44
Astronomers/physicists .....	10	11	1
Atmospheric/space scientists.....	7	8	1
Chemists/materials scientists.....	92	110	18
Chemists .....	84	100	16
Materials scientists .....	8	9	2
Environmental scientists/geoscientists .....	97	118	21
Environmental scientists/specialists, including health.....	64	78	14
Geoscientists, except hydrologists and geographers.....	25	30	5
Hydrologists.....	8	10	2
Other .....	33	36	3
Social scientists/related occupations.....	410	492	82
Economists .....	22	26	4
Market/survey researchers.....	113	142	30
Market research analysts.....	90	112	22
Survey researchers .....	23	30	8
Psychologists .....	182	214	33
Social scientists .....	15	17	3
Urban/regional planners .....	30	35	5
Other .....	49	58	8

Appendix table 3-4

(Page 2 of 2)

**Total S&E jobs, by occupation: 2000 and projected 2010**

(Thousands)

Occupation	2000	2010	Projected change
Engineers .....	1,465	1,603	138
Aerospace .....	50	57	7
Agricultural .....	2	3	—
Biomedical .....	7	9	2
Chemical .....	33	34	1
Civil .....	232	256	24
Computer hardware .....	60	75	15
Electrical and electronics .....	288	319	31
Electrical .....	157	175	18
Electronics, except computer .....	130	144	14
Environmental .....	52	66	14
Industrial, including health and safety .....	198	210	12
Health and safety, except mining safety engineers and inspectors .....	44	49	5
Industrial .....	154	161	7
Marine engineers/naval architects .....	5	5	—
Materials .....	33	35	2
Mechanical .....	221	251	29
Mining/geological, including mining safety .....	6	6	—
Nuclear .....	14	14	—
Petroleum .....	9	8	-1
Other .....	253	254	1

— no change

NOTE: Details may not add to totals because of rounding.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Office of Occupational Statistics and Employment Projections, (Washington, DC, 2001).

**Employed individuals with S&E highest degrees whose jobs are closely or somewhat related to field of highest degree, by degree level and years since degree: 1999**

(Percent)

Degree and field	Employed individuals	Years since degree							
		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36 or more
<b>All degree levels<sup>a</sup></b>									
All S&E fields .....	76.8	77.5	80.1	81.1	77.7	73.0	73.0	74.2	70.1
Engineering .....	89.6	91.9	91.0	91.1	89.6	89.2	88.6	88.1	80.2
Aerospace .....	79.8	85.7	74.7	80.6	75.9	95.5	80.4	92.6	44.9
Chemical .....	86.7	85.8	91.2	88.9	83.7	91.1	87.6	89.7	71.7
Civil .....	92.0	92.0	93.0	93.8	89.6	88.9	94.0	94.4	92.8
Electrical .....	92.9	95.5	92.4	93.8	95.8	93.0	89.5	89.6	83.2
Industrial .....	83.9	89.9	86.7	88.6	80.6	77.5	85.6	71.9	69.9
Mechanical .....	89.5	91.8	91.0	90.9	90.4	89.9	89.1	85.6	80.6
Other .....	86.5	90.0	91.2	87.7	87.0	83.1	84.0	82.5	77.2
Life sciences .....	74.4	75.8	83.8	79.0	72.6	69.1	70.1	70.4	64.3
Agriculture .....	74.6	80.8	80.9	77.6	73.4	70.2	69.4	78.5	60.8
Biological sciences .....	74.4	74.5	84.9	79.2	73.3	69.1	70.6	69.4	63.4
Health/medical .....	73.3	79.6	77.3	80.8	64.6	66.4	66.8	46.3	99.1
Mathematics/computer sciences .....	87.7	92.2	89.4	90.8	91.4	88.0	77.2	71.8	68.4
Computer sciences .....	93.3	94.8	93.4	92.9	92.9	94.6	87.6	87.2	S
Mathematics .....	80.5	86.8	81.0	84.6	88.4	84.1	74.6	70.9	68.1
Physical sciences .....	77.8	83.0	84.4	77.4	75.1	75.7	72.7	83.7	67.2
Chemistry .....	79.8	87.2	90.2	80.8	79.6	75.5	71.7	85.1	61.7
Geosciences .....	72.1	79.0	76.0	69.2	71.1	71.2	66.8	82.7	59.9
Physics and astronomy .....	79.5	81.8	81.6	78.1	72.2	82.3	75.9	82.2	84.2
Other .....	79.4	68.7	85.4	87.4	80.0	78.0	83.5	78.1	59.5
Social sciences .....	65.9	66.8	68.0	68.2	66.6	63.1	63.7	62.6	63.0
Economics .....	71.9	78.6	72.4	70.8	72.7	65.7	65.8	71.1	76.4
Political science .....	55.5	56.6	57.6	54.5	56.0	54.1	53.6	50.5	58.0
Psychology .....	72.0	72.6	75.0	76.0	73.2	69.3	68.3	63.7	62.6
Sociology and anthropology .....	61.5	61.9	64.3	62.2	60.9	60.2	59.6	65.4	57.9
Other .....	62.7	62.9	63.1	70.5	56.9	56.9	71.7	61.0	47.9
<b>Bachelor's</b>									
All S&E fields .....	72.4	72.3	76.0	76.8	73.8	68.1	68.8	69.6	67.8
Engineering .....	88.6	91.0	89.9	90.0	88.6	88.6	89.3	86.1	80.5
Aerospace .....	76.8	77.8	68.9	77.0	75.8	95.7	90.5	88.7	39.8
Chemical .....	84.5	83.6	89.9	86.0	82.1	90.9	84.0	88.7	70.3
Civil .....	92.4	91.9	91.6	93.3	87.7	92.7	95.5	96.3	93.7
Electrical .....	92.3	95.0	91.4	92.6	95.5	91.9	92.1	86.8	83.8
Industrial .....	82.9	86.8	84.6	89.0	78.9	79.8	86.6	72.3	71.9
Mechanical .....	89.1	91.9	90.5	90.6	91.4	88.1	88.7	83.7	81.2
Other .....	82.8	88.5	92.3	84.9	84.0	74.7	79.3	74.8	77.8



**Employed individuals with S&E highest degrees whose jobs are closely or somewhat related to field of highest degree, by degree level and years since degree: 1999**

(Percent)

Degree and field	Employed individuals	Years since degree							
		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36 or more
Life sciences .....	69.0	70.5	80.8	73.4	66.8	63.5	64.1	64.1	58.2
Agriculture .....	72.3	76.7	79.5	73.8	71.7	69.8	66.8	79.2	60.4
Biological sciences.....	68.2	68.7	81.8	73.0	66.5	62.0	64.0	61.1	54.0
Health/medical.....	67.8	77.2	72.6	76.3	52.7	61.5	59.6	S	S
Mathematics/computer sciences.....	86.1	90.2	87.4	90.0	91.3	84.4	75.0	70.8	66.0
Computer sciences .....	92.8	93.2	91.8	93.0	93.3	94.6	87.8	S	S
Mathematics.....	77.6	84.5	78.4	81.0	87.1	78.7	72.4	69.7	65.7
Physical sciences.....	72.2	79.0	80.5	71.2	69.4	71.8	64.3	78.4	61.0
Chemistry .....	74.5	83.0	90.3	76.3	73.7	69.1	62.3	81.6	56.5
Geosciences .....	65.7	73.8	64.4	64.2	65.7	65.5	60.7	73.3	54.5
Physics and astronomy .....	74.7	80.7	76.6	64.6	66.2	93.8	62.5	74.5	79.6
Other .....	74.5	61.1	77.6	85.2	73.6	75.1	84.7	S	58.6
Social sciences .....	60.2	61.7	63.7	58.8	59.5	57.3	58.5	58.1	60.3
Economics .....	68.9	76.2	71.1	66.5	69.5	61.4	61.9	64.4	74.8
Political science .....	52.1	51.0	55.9	51.2	53.4	50.0	49.0	50.0	57.3
Psychology.....	63.3	66.2	67.9	60.8	63.1	60.6	59.6	49.5	55.8
Sociology and anthropology .....	59.1	59.2	62.2	56.0	58.4	59.2	56.8	65.4	55.2
Other .....	57.3	58.3	57.5	63.2	45.3	49.4	70.7	59.4	48.6
Master's									
All S&E fields.....	87.6	91.2	90.7	91.1	86.1	84.3	81.6	83.2	76.0
Engineering.....	91.8	93.2	93.1	94.8	92.7	90.3	87.0	92.5	74.8
Aerospace.....	84.6	93.7	85.1	95.0	73.4	93.9	58.4	95.6	S
Chemical.....	93.8	92.7	98.2	100.0	90.8	92.1	100.0	88.5	70.3
Civil .....	90.4	91.8	96.5	95.1	95.4	75.4	88.4	89.4	85.4
Electrical.....	94.2	96.3	94.3	96.6	96.7	96.1	82.1	95.7	78.4
Industrial.....	86.5	93.9	91.2	86.4	89.2	72.1	88.7	S	S
Mechanical .....	90.8	91.5	93.0	91.6	83.0	97.1	91.9	93.1	73.7
Other .....	91.8	90.5	89.2	93.9	93.8	95.3	92.8	92.6	56.4
Life sciences .....	85.8	92.4	86.4	89.5	83.9	83.1	80.1	79.9	79.9
Agriculture .....	78.5	91.8	74.9	94.1	75.8	65.2	S	70.6	S
Biological sciences.....	86.8	94.3	88.3	87.9	84.5	86.2	79.2	83.8	84.0
Health/medical.....	91.4	86.1	91.6	93.2	92.9	100.0	S	S	S
Mathematics/computer sciences.....	91.5	96.0	94.4	93.1	91.2	96.8	80.6	70.8	74.6
Computer sciences .....	94.3	97.8	97.4	92.1	91.3	94.6	87.2	S	S
Mathematics.....	87.0	91.2	87.1	96.8	91.0	98.4	77.6	70.3	73.9
Physical sciences.....	83.9	90.5	92.4	79.7	79.6	76.8	80.4	89.4	80.8
Chemistry .....	84.9	95.0	87.1	76.8	84.0	81.7	82.8	93.5	69.4
Geosciences .....	81.1	87.6	93.1	73.3	85.2	76.0	68.1	S	S
Physics and astronomy .....	82.6	87.2	91.4	91.1	60.4	64.7	86.7	84.4	92.3
Other .....	94.3	91.7	100.0	91.0	100.0	100.0	S	S	S

**Employed individuals with S&E highest degrees whose jobs are closely or somewhat related to field of highest degree, by degree level and years since degree: 1999**

(Percent)

Degree and field	Employed individuals	Years since degree							
		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36 or more
Social sciences .....	83.1	86.8	85.3	89.6	81.4	78.0	78.5	76.6	73.4
Economics .....	82.3	89.5	75.3	93.4	82.3	72.4	71.7	100.0	90.0
Political science .....	71.6	85.7	65.3	75.8	59.7	69.1	71.2	S	S
Psychology .....	88.7	90.8	93.8	93.0	86.0	85.0	82.4	91.0	85.6
Sociology and anthropology .....	74.9	82.2	75.0	87.0	66.1	56.1	88.1	61.6	S
Other .....	77.8	76.9	88.9	83.2	86.4	75.7	70.4	63.3	S
Doctoral									
All S&E fields .....	92.6	95.0	93.5	92.5	92.4	91.1	90.1	92.0	92.7
Engineering .....	92.6	94.4	93.0	91.4	94.8	91.5	87.4	95.6	92.6
Aerospace .....	94.6	95.9	95.5	91.0	100.0	100.0	87.6	100.0	78.4
Chemical .....	92.9	95.3	91.5	89.1	97.0	90.5	91.4	97.0	94.7
Civil .....	95.3	94.8	94.1	97.4	99.2	90.1	100.0	87.5	95.9
Electrical .....	94.3	95.9	94.1	96.4	96.1	95.2	86.0	97.9	92.1
Industrial .....	87.9	98.0	90.7	90.2	100.0	100.0	60.0	S	S
Mechanical .....	91.4	91.1	90.9	93.9	91.7	90.6	86.1	100.0	92.8
Other .....	90.8	93.6	92.9	85.3	92.7	88.7	85.3	93.0	93.0
Life sciences .....	92.9	95.6	95.3	90.8	91.3	90.9	92.1	92.8	92.0
Agriculture .....	91.1	94.4	95.9	87.2	91.8	87.9	89.7	93.1	78.4
Biological sciences .....	93.0	95.5	95.2	91.2	91.3	90.9	92.3	92.8	93.8
Health/medical .....	95.3	100.0	92.9	93.9	91.2	99.6	96.5	86.1	S
Mathematics/computer sciences .....	93.1	96.0	92.3	93.3	93.6	93.1	88.3	90.3	97.9
Computer sciences .....	97.7	98.5	96.4	97.0	98.4	100.0	S	S	S
Mathematics .....	91.1	93.8	88.6	91.0	91.6	92.3	88.1	90.3	97.9
Physical science .....	89.5	91.8	87.7	91.8	90.9	87.8	86.9	88.7	89.4
Chemistry .....	91.1	95.7	91.0	92.6	91.4	91.4	88.3	87.3	88.1
Geosciences .....	92.6	92.3	88.1	91.6	91.5	94.5	93.9	97.0	100.0
Physics and astronomy .....	85.6	86.5	81.4	90.1	90.4	79.3	83.0	88.7	87.8
Other .....	96.3	93.1	100.0	100.0	81.7	100.0	S	S	S
Social sciences .....	94.7	96.3	96.4	95.1	93.2	92.9	93.3	93.9	96.8
Economics .....	97.2	95.7	96.9	97.3	95.9	99.1	97.3	98.5	98.1
Political sciences .....	91.3	93.7	92.3	88.2	97.1	88.0	89.8	87.7	90.6
Psychology .....	96.1	98.0	97.9	96.7	94.7	94.0	93.7	95.7	97.1
Sociology and anthropology .....	91.2	92.2	94.5	91.4	89.2	88.8	91.7	85.3	100.0
Other .....	91.9	96.4	93.0	94.3	85.8	90.3	91.6	90.8	100.0

S suppressed for reasons of confidentiality and/or data reliability

\*Includes professional degrees.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

**Employed individuals with S&E highest degrees whose jobs are closely related to field of highest degree, by degree level and years since degree: 1999**

(Percent)

Degree and field	Employed individuals	Years since degree							
		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36 or more
<b>All degree levels<sup>a</sup></b>									
All S&E fields .....	45.7	49.1	50.3	51.3	47.3	39.2	37.0	42.5	36.9
Engineering .....	54.6	58.7	55.8	55.5	56.9	52.4	50.4	52.6	45.2
Aerospace .....	45.3	53.7	42.7	45.4	52.8	37.3	41.1	50.7	35.1
Chemical .....	45.2	47.1	48.2	47.1	41.4	43.5	40.2	53.3	41.2
Civil .....	65.8	68.0	70.0	71.1	68.2	58.3	65.3	62.9	57.0
Electrical .....	59.7	63.7	57.9	60.4	67.2	59.0	48.4	56.4	55.2
Industrial .....	37.7	47.2	29.3	40.2	39.5	32.9	45.2	S	27.4
Mechanical .....	50.2	53.3	55.2	46.0	50.2	56.1	48.0	49.8	40.1
Other .....	50.7	58.6	55.1	55.4	49.3	43.2	48.2	45.8	36.1
Life sciences .....	48.3	50.8	58.3	56.3	45.8	40.5	41.5	45.0	38.2
Agriculture .....	48.0	57.9	52.8	60.7	40.8	41.0	49.1	53.5	22.0
Biological sciences .....	48.6	50.0	60.6	55.2	47.3	41.2	39.6	43.8	42.7
Health/medical .....	45.7	48.7	43.7	53.8	48.6	32.0	44.3	24.4	84.3
Mathematics/computer sciences .....	60.8	70.0	66.6	67.9	68.0	48.8	36.1	38.4	41.1
Computer sciences .....	74.6	76.7	73.3	74.6	77.0	73.8	59.6	66.6	S
Mathematics .....	43.2	56.2	52.5	48.5	50.2	34.5	30.2	36.7	40.4
Physical sciences .....	47.4	57.3	57.6	47.3	45.0	41.1	37.2	48.8	38.9
Chemistry .....	51.4	66.1	62.7	54.8	50.7	44.6	36.6	51.2	34.5
Geosciences .....	44.8	51.3	56.7	40.0	41.1	41.0	38.6	61.1	39.6
Physics and astronomy .....	41.8	49.3	45.5	38.9	32.1	37.5	35.2	44.6	51.5
Other .....	49.3	42.9	66.6	56.9	69.4	33.1	45.2	S	S
Social sciences .....	33.7	37.2	36.7	36.2	33.6	29.8	27.6	32.4	25.3
Economics .....	28.9	34.4	26.8	29.0	27.4	27.4	22.4	37.3	29.1
Political science .....	23.5	27.9	30.4	14.9	25.5	18.4	20.6	16.2	20.9
Psychology .....	41.1	44.6	43.4	51.7	40.9	35.3	29.8	39.2	25.1
Sociology and anthropology .....	30.3	33.0	36.2	23.7	26.5	30.3	27.5	32.0	25.9
Other .....	36.5	36.2	40.3	46.7	35.8	28.9	36.9	36.1	22.5
<b>Bachelor's</b>									
All S&E fields .....	39.5	42.0	44.5	44.8	41.7	33.1	31.0	36.3	33.3
Engineering .....	52.2	54.9	52.5	53.3	55.5	51.4	48.8	48.9	45.1
Aerospace .....	41.2	45.3	36.4	39.5	51.9	33.5	45.5	51.2	29.8
Chemical .....	42.0	43.0	46.6	39.9	38.7	42.7	37.5	56.0	36.8
Civil .....	65.4	67.2	70.1	72.0	66.7	59.7	65.2	58.8	57.3
Electrical .....	57.0	59.0	52.5	57.4	66.4	57.7	47.4	51.9	58.1
Industrial .....	34.4	39.6	22.5	37.6	40.6	26.3	43.3	S	30.0
Mechanical .....	48.9	50.8	54.7	46.1	50.2	54.0	45.9	47.0	40.6
Other .....	45.8	53.8	50.1	52.9	46.1	39.2	43.6	37.2	34.2

**Employed individuals with S&E highest degrees whose jobs are closely related to field of highest degree, by degree level and years since degree: 1999**

(Percent)

Degree and field	Employed individuals	Years since degree							
		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36 or more
Life sciences .....	41.8	44.2	53.9	50.0	39.6	33.6	34.4	39.3	30.5
Agriculture .....	45.6	52.2	49.9	58.5	39.4	41.3	48.4	53.3	20.6
Biological sciences.....	41.0	42.8	55.8	46.2	40.0	32.4	31.0	36.7	32.5
Health/medical.....	40.2	45.2	41.0	54.9	37.3	27.3	34.1	S	S
Mathematics/computer sciences.....	57.8	66.6	63.2	66.5	66.8	46.6	28.7	34.0	35.8
Computer sciences .....	73.7	74.2	70.9	74.7	77.3	76.5	55.4	S	S
Mathematics.....	37.8	51.8	47.4	42.7	44.3	29.7	23.2	32.5	35.1
Physical sciences .....	41.6	54.1	55.7	40.1	38.6	34.8	29.4	41.8	31.8
Chemistry .....	47.3	64.1	64.1	51.6	45.3	37.3	30.2	46.8	29.7
Geosciences .....	37.0	45.2	46.8	30.8	33.7	36.7	32.6	S	32.0
Physics and astronomy .....	31.9	45.7	38.7	24.1	20.8	25.9	12.3	38.2	42.6
Other .....	44.9	37.6	66.0	53.4	63.0	30.3	48.9	S	S
Social sciences .....	25.5	30.0	30.3	21.7	22.8	21.6	21.1	25.7	21.2
Economics .....	23.2	29.1	23.0	20.2	22.0	21.2	13.5	31.9	26.9
Political science .....	19.6	23.1	28.0	11.0	19.3	12.8	18.2	15.5	18.2
Psychology.....	27.0	34.2	32.1	28.1	23.1	20.6	16.0	19.9	14.7
Sociology/anthropology .....	27.6	29.2	33.8	16.0	23.8	29.3	26.1	29.8	24.0
Other .....	30.5	30.3	34.6	41.5	26.6	21.5	32.4	31.4	22.5
Master's									
All S&E fields.....	60.1	67.6	64.1	65.5	59.5	52.0	48.6	54.1	48.2
Engineering.....	59.8	64.6	61.6	61.3	61.0	53.3	54.9	60.1	41.7
Aerospace.....	52.7	57.8	51.5	71.9	54.0	S	S	S	S
Chemical.....	53.9	59.0	48.3	76.7	54.3	44.0	37.3	S	60.8
Civil .....	66.6	68.6	70.0	67.2	72.4	52.2	66.4	74.5	53.6
Electrical.....	65.7	71.3	67.9	66.7	69.4	61.6	51.7	66.4	38.6
Industrial.....	45.9	57.8	41.4	48.8	30.9	40.3	60.3	S	S
Mechanical .....	53.8	59.4	55.4	43.0	49.6	63.2	57.4	58.9	34.0
Other .....	55.4	59.8	58.2	59.2	52.7	46.3	56.6	50.7	S
Life sciences .....	60.6	71.6	63.9	66.4	55.7	54.9	52.6	49.1	60.8
Agriculture .....	49.2	73.0	49.6	69.7	37.1	S	S	S	S
Biological sciences.....	63.3	75.4	69.5	68.9	57.3	60.7	51.4	48.9	69.8
Health/medical.....	62.3	55.5	52.2	S	75.1	62.4	S	S	S
Mathematics/computer sciences.....	67.9	77.4	75.4	71.6	71.0	52.3	50.6	45.0	62.1
Computer sciences .....	76.5	82.0	79.4	73.9	76.3	66.5	64.9	S	S
Mathematics.....	54.3	64.8	65.5	63.5	60.5	42.4	44.1	42.6	61.1
Physical sciences .....	53.6	66.6	57.5	52.3	53.5	47.9	41.0	49.9	59.3
Chemistry .....	56.1	72.8	45.5	58.0	60.6	64.0	35.3	58.0	40.0
Geosciences .....	54.2	61.9	67.0	47.6	59.5	38.7	36.0	S	S
Physics and astronomy .....	47.1	64.3	51.0	42.7	24.0	38.8	51.7	32.8	70.7
Other .....	63.0	59.3	66.7	67.9	92.3	S	S	S	S

Appendix table 3-6

**Employed individuals with S&E highest degrees whose jobs are closely related to field of highest degree, by degree level and years since degree: 1999**

(Percent)

Degree and field	Employed individuals	Years since degree							
		1–5	6–10	11–15	16–20	21–25	26–30	31–35	36 or more
Social sciences .....	57.7	64.3	60.3	68.4	55.8	50.8	43.3	56.3	40.1
Economics .....	48.0	53.0	40.3	79.9	41.0	35.7	44.8	57.6	S
Political science .....	39.9	50.8	41.9	35.4	43.3	39.3	S	S	S
Psychology .....	67.4	74.1	70.0	77.8	62.9	61.5	50.1	79.7	54.3
Sociology/anthropology .....	40.8	61.1	44.0	46.8	27.5	22.8	S	43.3	S
Other social sciences .....	53.3	53.8	69.0	54.5	57.3	47.4	48.1	51.0	S
Doctoral									
All S&E fields .....	69.2	73.4	71.8	70.3	68.5	66.1	62.7	67.1	69.8
Engineering .....	63.6	69.2	64.3	61.0	67.0	60.4	52.5	67.5	62.8
Aerospace .....	62.1	75.5	73.3	48.9	74.2	70.2	49.0	43.4	S
Chemical .....	57.2	65.5	57.6	43.7	62.2	47.6	61.9	59.8	66.1
Civil .....	71.9	79.8	67.9	75.1	80.1	74.2	61.3	72.3	66.8
Electrical .....	66.1	69.1	67.1	71.7	71.0	65.5	48.2	70.1	64.9
Industrial .....	58.5	62.4	66.5	58.6	S	96.8	37.7	S	S
Mechanical .....	61.1	62.2	62.2	61.3	52.1	66.5	53.7	78	47.5
Other .....	63.3	70.9	62.9	59.3	66.5	53.9	50.3	75.6	68.8
Life sciences .....	71.5	75.4	73.8	71.4	68.0	70.1	67.8	70.9	71.5
Agriculture .....	69.7	76.1	72.2	66.7	67.5	66.8	73.6	66.9	50.9
Biological sciences .....	71.6	74.9	74.2	71.8	67.8	70.6	67.0	71.1	73.7
Health/medical .....	76.1	87.8	68.2	79.9	76.6	66.9	68.6	86.1	S
Mathematics/computer sciences .....	70.0	73.9	69.7	76.5	70.0	65.5	56.5	69.5	87.9
Computer sciences .....	78.0	78.2	75.2	81.4	72.2	94.2	S	S	S
Mathematics .....	66.6	69.9	64.7	73.4	69.0	62.2	55.8	69.5	87.9
Physical sciences .....	59.7	62.4	62.9	61.8	59.5	56.1	53.7	60.7	60.4
Chemistry .....	59.9	67.8	65.8	59.0	59.4	54.9	54.1	56.2	60.2
Geosciences .....	74.6	72.3	74.5	80.7	71.4	70.1	72.2	83.1	79.0
Physics and astronomy .....	53.7	51.9	51.9	58.6	55.8	49.9	48.7	61.6	55.0
Other .....	63.7	59.0	73.0	55.6	54.0	100.0	S	S	S
Social sciences .....	77.3	81.8	82.0	79.0	74.9	71.6	74.1	71.9	80.4
Economics .....	77.8	80.3	85.8	77.1	72.3	78.8	78.1	67.3	76.7
Political science .....	69.7	70.6	76.6	72.8	83.8	59.0	63.6	59.6	69.7
Psychology .....	81.7	85.7	85.9	83.4	79.5	76.2	77.9	76.8	83.1
Sociology and anthropology .....	71.2	78.9	78.2	71.1	63.4	63.7	71.9	70.1	91.7
Other .....	68.3	78.4	63.1	71.3	65.5	62.5	66.5	77.7	56.8

S suppressed for reasons of confidentiality and/or data reliability

\*Includes professional degrees.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

## Individuals with current or past S&amp;E occupations, by highest degree, occupation, and employment status: 1999

Degree and occupation	All S&E occupations	Employed			Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time		Total	Retired	Not seeking job
All degree levels <sup>a</sup>								
All S&E occupations.....	4,120,700	3,540,800	3,267,400	273,400	56,000	523,900	364,400	159,400
Scientists.....	2,464,500	2,170,500	1,949,400	221,100	30,200	263,800	146,100	117,700
Mathematical/computer scientists.....	1,277,900	1,167,400	1,092,400	74,900	14,700	95,800	52,700	43,100
Computer/information scientists.....	1,147,400	1,058,100	1,011,400	46,700	13,400	75,800	41,000	34,900
Mathematical scientists.....	45,100	36,200	31,200	5,000	900	8,000	4,700	3,300
Postsecondary teachers.....	85,400	73,000	49,800	23,200	400	12,000	7,100	4,900
Life/related scientists.....	406,100	341,900	311,800	30,100	4,400	59,800	28,800	31,000
Agricultural/food scientists.....	47,500	39,700	37,000	2,700	400	7,400	4,400	2,900
Biological scientists.....	244,800	206,500	192,700	13,800	2,200	36,100	12,800	23,300
Environmental life scientists.....	22,800	19,800	18,300	1,600	S	2,200	2,200	S
Postsecondary teachers.....	90,900	75,800	63,800	12,100	1,000	14,100	9,400	4,700
Physical/related scientists.....	360,600	297,900	272,000	25,900	5,800	57,000	39,300	17,700
Chemists, except biochemists.....	155,200	121,700	116,000	5,700	3,700	29,800	20,700	9,200
Earth scientists, geologists, oceanographers.....	83,900	72,800	66,900	5,900	1,400	9,600	7,000	2,700
Physicists/astronomers.....	37,900	30,400	27,900	2,500	S	7,000	5,800	1,200
Other.....	24,000	22,200	20,900	1,300	S	1,800	700	1,100
Postsecondary teachers.....	59,600	50,700	40,200	10,400	200	8,700	5,200	3,500
Social/related scientists.....	419,900	363,400	273,200	90,200	5,300	51,300	25,200	26,000
Economists.....	42,200	35,400	31,500	3,900	400	6,400	3,500	2,900
Political/related scientists.....	13,500	11,600	9,800	1,800	S	1,700	400	1,300
Psychologists.....	223,700	197,000	141,600	55,400	2,700	24,000	10,200	13,800
Sociologists/anthropologists.....	21,200	17,600	14,200	3,400	700	2,900	900	2,000
Other.....	15,800	13,600	11,500	2,100	600	1,600	800	700
Postsecondary teachers.....	103,500	88,100	64,600	23,600	600	14,700	9,400	5,300
Engineers.....	1,656,200	1,370,300	1,318,000	52,300	25,800	260,000	218,300	41,700
Aerospace/related.....	93,700	67,400	65,200	2,200	1,800	24,400	22,000	2,400
Chemical.....	101,100	79,900	77,100	2,700	1,900	19,300	16,400	3,000
Civil/architectural.....	265,900	223,700	214,400	9,300	2,600	39,600	33,300	6,300
Electrical/related.....	432,800	362,300	350,600	11,700	5,000	65,500	56,000	9,500
Industrial.....	98,100	81,200	77,200	3,900	1,600	15,400	11,800	3,600
Mechanical.....	317,400	265,800	257,900	7,900	5,500	46,100	40,300	5,800
Other.....	309,400	258,700	249,800	8,900	7,200	43,500	33,300	10,300
Postsecondary teachers.....	37,900	31,400	25,800	5,600	200	6,200	5,300	900

## Individuals with current or past S&amp;E occupations, by highest degree, occupation, and employment status: 1999

Degree and occupation	All S&E occupations	Employed			Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time		Total	Retired	Not seeking job
<b>Bachelor's</b>								
All S&E occupations .....	2,350,500	1,994,400	1,870,600	123,800	32,700	323,300	223,200	100,100
Scientists .....	1,228,500	1,087,100	997,300	89,800	16,200	125,200	54,000	71,200
Mathematical/computer scientists .....	804,900	740,500	700,600	39,900	9,500	54,900	25,200	29,700
Computer/information scientists .....	773,400	715,400	686,700	28,800	9,200	48,800	22,500	26,300
Mathematical scientists .....	16,400	12,400	9,900	2,500	S	3,700	2,300	S
Postsecondary teachers .....	15,100	12,700	4,000	8,700	S	2,400	S	2,000
Life/related scientists .....	166,500	135,500	120,400	15,100	1,700	29,200	8,400	20,900
Agricultural/food scientists .....	24,900	20,100	19,000	1,100	S	4,600	2,600	2,000
Biological scientists .....	107,700	87,900	80,900	7,000	S	19,200	3,300	15,900
Environmental life scientists .....	17,100	14,600	13,600	S	S	1,700	1,700	S
Postsecondary teachers .....	16,800	12,800	6,800	6,000	S	3,700	S	2,900
Physical/related scientists .....	172,700	139,600	127,400	12,200	2,900	30,200	18,700	11,500
Chemists, except biochemists .....	90,400	70,500	68,100	2,400	1,900	18,000	11,300	6,800
Earth scientists, geologists, oceanographers .....	43,200	38,000	34,700	3,300	S	4,400	3,200	1,300
Physicists/astronomers .....	10,800	7,200	6,100	1,100	S	3,400	2,900	500
Other .....	14,100	13,100	13,000	S	S	1,000	S	S
Postsecondary teachers .....	14,200	10,900	5,500	5,400	S	3,300	S	2,300
Social/related scientists .....	84,400	71,400	48,900	22,500	2,000	11,000	1,700	9,200
Economists .....	14,500	11,800	10,300	1,500	S	2,500	S	1,000
Political/related scientists .....	6,500	5,800	4,800	1,000	S	S	S	S
Psychologists .....	38,100	32,100	23,300	8,800	1,200	4,700	S	4,700
Sociologists/anthropologists .....	9,100	6,900	5,800	1,100	S	1,600	S	S
Other .....	4,600	4,500	3,500	1,000	S	S	S	S
Postsecondary teachers .....	11,600	10,400	S	9,200	S	1,200	S	1,200
Engineers .....	1,122,000	907,400	873,300	34,000	16,600	198,000	169,200	28,800
Aerospace/related .....	55,300	36,300	34,900	1,400	1,400	17,600	15,900	1,700
Chemical .....	66,200	51,100	49,300	1,800	800	14,400	12,000	2,400
Civil/architectural .....	195,600	160,800	154,600	6,200	1,500	33,200	28,200	5,000
Electrical/ related .....	288,800	233,500	225,500	8,100	3,100	52,200	45,800	6,400
Industrial .....	76,400	62,700	59,600	3,100	1,400	12,300	9,900	2,400
Mechanical .....	234,400	194,300	188,900	5,300	3,600	36,600	32,700	3,900
Other .....	198,800	163,000	157,400	5,600	4,800	31,000	23,900	7,000
Postsecondary teachers .....	6,400	5,600	3,100	2,500	S	800	S	100

## Individuals with current or past S&amp;E occupations, by highest degree, occupation, and employment status: 1999

Degree and occupation	All S&E occupations	Employed			Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time		Total	Retired	Not seeking job
Master's								
All S&E occupations.....	1,188,100	1,032,100	921,500	110,600	17,300	138,800	90,800	48,000
Scientists .....	752,300	655,500	559,900	95,700	9,700	87,000	51,000	36,000
Mathematical/computer scientists.....	393,700	354,100	323,200	30,900	4,700	34,900	22,900	12,000
Computer/information scientists.....	333,700	304,800	288,000	16,800	4,000	24,800	17,000	7,800
Mathematical scientists .....	19,900	16,000	14,000	2,000	S	3,400	1,700	1,700
Postsecondary teachers .....	40,200	33,300	21,300	12,000	S	6,700	4,200	2,500
Life/related scientists.....	86,700	72,500	64,500	8,100	1,300	12,900	6,600	6,200
Agricultural/food scientists.....	11,900	10,400	9,400	1,000	S	1,400	S	800
Biological scientists.....	50,800	42,700	39,700	3,100	500	7,600	3,400	4,200
Environmental life scientists.....	4,300	4,000	3,500	S	S	S	S	S
Postsecondary teachers .....	19,700	15,500	11,900	3,600	600	3,700	2,400	1,200
Physical/related scientists.....	88,500	73,000	63,800	9,100	1,400	14,100	9,600	4,500
Chemists, except biochemists.....	30,500	23,000	21,100	2,000	1,000	6,500	4,700	1,800
Earth scientists, geologists, oceanographers .....	28,600	24,300	22,200	2,000	400	3,900	2,700	1,200
Physicists/astronomers .....	10,200	8,500	7,800	700	S	1,800	1,300	500
Other .....	7,800	7,300	6,300	1,100	S	500	S	S
Postsecondary teachers .....	11,400	9,800	6,500	3,300	S	1,500	700	800
Social/related scientists .....	183,400	155,900	108,400	47,500	2,300	25,200	11,900	13,300
Economists .....	18,000	15,200	13,100	2,000	S	2,700	900	1,700
Political/related scientists.....	5,100	4,200	3,500	800	S	700	S	600
Psychologists .....	118,100	102,400	70,400	32,000	1,100	14,500	7,500	7,000
Sociologists/anthropologists.....	7,500	6,900	5,100	1,800	S	S	S	S
Other .....	6,800	5,700	4,800	900	S	S	S	S
Postsecondary teachers .....	28,000	21,500	11,400	10,100	300	6,200	3,100	3,000
Engineers.....	435,900	376,500	361,700	14,900	7,600	51,800	39,800	12,000
Aerospace/related .....	32,700	26,300	25,700	600	S	6,100	5,600	500
Chemical.....	25,000	20,700	19,900	700	700	3,600	3,200	500
Civil and architectural.....	64,300	57,200	54,600	2,700	900	6,100	4,800	1,300
Electrical/related .....	123,100	109,400	106,100	3,200	1,600	12,000	9,000	3,000
Industrial.....	20,700	17,400	16,600	800	S	3,100	1,900	1,200
Mechanical .....	72,200	62,000	59,900	2,100	1,800	8,500	6,600	1,800
Other.....	88,200	76,900	74,300	2,600	1,800	9,500	6,500	3,000
Postsecondary teachers .....	9,600	6,600	4,400	2,200	S	2,900	2,200	600



## Individuals with current or past S&amp;E occupations, by highest degree, occupation, and employment status: 1999

Degree and occupation	All S&E occupations	Employed			Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time		Total	Retired	Not seeking job
Doctoral								
All S&E occupations.....	547,800	484,100	447,100	37,000	5,800	57,900	48,000	9,900
Scientists .....	452,200	399,900	366,100	33,800	4,100	48,200	39,000	9,200
Mathematical/computer scientists.....	72,800	67,100	63,000	4,100	500	5,300	4,400	900
Computer/information scientists.....	34,100	32,400	31,300	1,100	200	1,500	1,100	400
Mathematical scientists .....	8,900	7,900	7,400	500	100	900	700	200
Postsecondary teachers .....	29,900	26,800	24,300	2,500	200	2,900	2,600	300
Life/related scientists.....	137,500	121,100	115,300	5,800	1,200	15,200	12,000	3,200
Agricultural/food scientists.....	10,700	9,200	8,600	600	100	1,400	1,300	100
Biological scientists.....	78,900	70,000	66,900	3,000	900	8,100	5,500	2,600
Environmental life scientists.....	1,500	1,200	1,100	S	S	200	200	S
Postsecondary teachers .....	46,400	40,800	38,700	2,100	100	5,500	5,000	500
Physical/related scientists.....	99,000	84,900	80,500	4,400	1,500	12,700	11,000	1,700
Chemists, except biochemists.....	34,200	28,100	26,900	1,200	700	5,400	4,700	700
Earth scientists, geologists, oceanographers.....	11,900	10,400	9,800	600	300	1,300	1,000	200
Physicists/astronomers.....	16,800	14,700	14,000	700	S	1,900	1,600	300
Other .....	2,000	1,800	1,700	100	S	200	200	S
Postsecondary teachers .....	34,000	29,800	28,100	1,700	200	4,000	3,500	500
Social/related scientists .....	142,800	126,900	107,300	19,600	900	15,000	11,600	3,300
Economists .....	9,400	8,100	7,700	400	S	1,200	1,000	200
Political/related scientists.....	1,700	1,400	1,400	S	S	300	300	S
Psychologists.....	62,900	58,000	43,900	14,000	400	4,500	2,700	1,800
Sociologists/anthropologists.....	4,600	3,700	3,200	500	S	800	700	100
Other .....	3,300	2,400	2,100	300	S	800	700	100
Postsecondary teachers .....	60,900	53,300	49,000	4,300	300	7,300	6,300	1,100
Engineers.....	95,600	84,200	81,000	3,200	1,700	9,700	9,000	700
Aerospace/related .....	5,200	4,600	4,400	200	S	500	500	S
Chemical.....	9,700	8,100	7,800	200	300	1,300	1,200	100
Civil/architectural .....	5,400	5,100	4,700	400	S	200	200	S
Electrical/related .....	19,900	18,400	18,000	400	300	1,300	1,200	100
Industrial.....	1,100	1,000	1,000	S	S	S	S	S
Mechanical .....	10,300	9,100	8,800	300	200	1,000	1,000	S
Other.....	22,100	18,800	18,100	700	500	2,800	2,600	200
Postsecondary teachers .....	21,800	19,200	18,300	900	100	2,500	2,400	200

S suppressed for reasons of confidentiality and/or data reliability

\*Includes professional degrees.

NOTE: For unemployed individuals, occupation is for their previous reported job.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

Appendix table 3-8  
**Unemployment rate for S&E and other occupations: 1983–2002**  
 (Percent)

Year	All U.S. workers	All S&E occupations	S&E technicians	Computer programmers
1983 .....	9.9	3.0	6.1	3.1
1984 .....	7.4	2.1	3.6	1.4
1985 .....	7.0	1.8	3.8	2.0
1986 .....	6.9	2.2	3.8	2.4
1987 .....	6.2	2.2	3.4	3.1
1988 .....	5.5	1.8	2.9	3.0
1989 .....	5.2	1.5	3.3	1.5
1990 .....	5.7	1.9	4.3	3.1
1991 .....	7.2	2.6	4.6	3.5
1992 .....	7.9	3.2	5.5	2.9
1993 .....	7.2	3.5	5.7	2.8
1994 .....	6.2	3.0	4.4	2.5
1995 .....	5.6	2.3	3.8	1.5
1996 .....	5.4	1.8	3.8	1.2
1997 .....	4.9	1.5	2.0	1.9
1998 .....	4.4	1.6	2.9	1.6
1999 .....	4.1	1.4	2.4	2.6
2000 .....	3.9	1.6	3.0	1.7
2001 .....	4.8	2.4	3.2	5.1
2002 .....	5.8	3.9	5.4	6.5

SOURCE: National Bureau of Economic Research's Merged Outgoing Rotation Group Files from the Bureau of Labor Statistics' Current Population Survey.

*Science & Engineering Indicators – 2004*

## Employed individuals in S&amp;E occupations, by highest degree, occupation, and employment sector: 1999

Degree and occupation	Employed individuals	Business/industry				Education			Government		
		Total	Profit	Self-employed	Nonprofit	Total	4-year college/university	Other	Total	Federal	State/local
All degree levels <sup>a</sup>											
All S&E occupations.....	3,540,800	2,482,400	2,263,300	105,200	114,000	608,500	496,400	112,100	449,900	241,100	208,800
Scientists .....	2,170,500	1,373,600	1,197,400	80,200	96,000	541,800	434,200	107,600	255,100	137,300	117,800
Mathematical/computer scientists.....	1,167,400	943,800	886,800	21,500	35,600	132,200	95,000	37,300	91,300	52,600	38,600
Computer/information scientists.....	1,058,100	925,900	871,900	21,200	32,900	52,100	40,000	12,100	80,100	44,300	35,800
Mathematical scientists .....	36,200	17,300	14,300	300	2,700	7,800	7,500	400	11,100	8,400	2,700
Postsecondary teachers .....	73,000	600	600	S	S	72,300	47,500	24,800	S	S	S
Life/related scientists .....	341,900	113,400	92,600	8,000	12,800	163,300	148,900	14,400	65,300	36,700	28,500
Agricultural/food scientists.....	39,700	26,000	22,800	2,600	600	6,100	5,300	700	7,700	4,800	2,900
Biological scientists.....	206,500	80,900	66,000	3,700	11,200	81,200	79,100	2,100	44,400	24,600	19,900
Environmental life scientists.....	19,800	5,500	3,400	1,600	400	1,200	700	S	13,100	7,400	5,700
Postsecondary teachers .....	75,800	1,100	S	S	S	74,800	63,800	11,000	S	S	S
Physical/related scientists.....	297,900	161,200	148,800	6,300	6,100	82,400	73,200	9,100	54,300	31,300	23,000
Chemists, except biochemists .....	121,700	94,400	90,900	1,100	2,500	11,400	11,400	S	15,900	6,000	9,900
Earth scientists, geologists, and oceanographers....	72,800	43,100	38,700	3,500	900	9,100	8,300	700	20,700	14,100	6,600
Physicists/astronomers .....	30,400	13,600	11,100	200	2,400	10,000	9,900	100	6,800	5,900	900
Other .....	22,200	9,900	8,200	1,500	300	1,600	1,600	S	10,700	5,000	5,700
Postsecondary teachers .....	50,700	S	S	S	S	50,300	42,000	8,300	200	S	S
Social/related scientists .....	363,400	155,200	69,200	44,500	41,600	163,900	117,100	46,800	44,300	16,600	27,700
Economists .....	35,400	21,800	17,400	2,100	2,300	2,200	2,200	S	11,400	6,600	4,800
Political/related scientists.....	11,600	4,500	900	900	2,600	2,600	2,600	S	4,600	2,500	2,000
Psychologists .....	197,000	116,000	45,100	39,800	31,100	59,400	23,000	36,400	21,600	4,400	17,200
Sociologists/anthropologists.....	17,600	5,500	2,800	300	2,400	7,300	6,900	300	4,800	1,900	2,900
Other .....	13,600	7,100	2,900	1,100	3,100	4,600	4,000	700	1,900	1,200	700
Postsecondary teachers .....	88,100	300	S	S	S	87,900	78,400	9,500	S	S	S
Engineers .....	1,370,300	1,108,800	1,065,900	25,000	18,000	66,700	62,100	4,500	194,800	103,800	90,900
Aerospace/related .....	67,400	50,800	49,900	300	600	2,500	2,500	S	14,100	14,000	S
Chemical.....	79,900	74,900	72,800	1,300	800	2,000	1,900	S	3,000	2,600	S
Civil/architectural .....	223,700	142,400	132,700	7,600	2,000	3,600	3,400	S	77,700	17,200	60,500
Electrical/related .....	362,300	310,300	300,600	4,300	5,400	10,700	9,700	1,000	41,300	33,300	8,000
Industrial.....	81,200	75,900	73,200	1,100	1,500	1,500	1,500	S	3,800	3,100	700
Mechanical .....	265,800	245,200	237,100	5,400	2,700	5,300	5,200	S	15,300	12,100	3,200
Other.....	258,700	209,400	199,600	4,900	4,900	9,700	9,600	200	39,600	21,500	18,100
Postsecondary teachers .....	31,400	S	S	S	S	31,400	28,300	3,100	S	S	S

## Employed individuals in S&amp;E occupations, by highest degree, occupation, and employment sector: 1999

Degree and occupation	Employed individuals	Business/industry				Educational			Government		
		Total	Profit	Self-employed	Nonprofit	Total	4-year college/university	Other	Total	Federal	State/local
<b>Bachelor's</b>											
All S&E occupations.....	1,994,400	1,555,000	1,465,300	37,200	52,500	171,800	142,500	29,300	267,600	130,200	137,500
Scientists .....	1,087,100	802,300	738,000	22,000	42,300	150,400	123,500	26,900	134,300	66,100	68,200
Mathematical/computer scientists.....	740,500	630,000	592,300	13,300	24,400	51,000	36,100	14,900	59,500	31,900	27,600
Computer/information scientists.....	715,400	624,800	587,900	13,100	23,800	35,600	26,100	9,500	55,000	28,600	26,400
Mathematical scientists .....	12,400	4,900	4,200	S	S	3,000	2,800	S	4,500	3,300	1,200
Postsecondary teachers .....	12,700	S	S	S	S	12,500	7,300	5,200	S	S	S
Life/related scientists .....	135,500	55,600	47,500	3,800	4,300	47,300	43,000	4,300	32,500	15,900	16,700
Agricultural/food scientists.....	20,100	15,500	13,900	S	S	1,200	1,200	S	3,400	2,500	900
Biological scientists.....	87,900	36,600	31,300	1,700	3,700	32,700	31,500	1,200	18,600	7,300	11,300
Environmental life scientists.....	14,600	3,300	2,000	S	S	S	S	S	10,500	6,100	4,400
Postsecondary teachers .....	12,800	S	S	S	S	12,500	10,000	2,500	S	S	S
Physical/related scientists.....	139,600	87,200	82,400	2,800	2,000	22,300	21,200	1,100	30,200	14,000	16,200
Chemists, except biochemists .....	70,500	55,000	53,300	S	1,500	5,300	5,300	S	10,100	2,700	7,500
Earth scientists, geologists, and oceanographers....	38,000	24,000	21,800	2,000	S	2,800	2,800	S	11,100	7,300	3,800
Physicists/astronomers .....	7,200	2,400	2,200	S	S	3,400	3,400	S	1,500	1,100	S
Other .....	13,100	5,700	5,100	S	S	S	S	S	7,300	2,800	4,500
Postsecondary teachers .....	10,900	S	S	S	S	10,700	9,700	S	S	S	S
Social/related scientists .....	71,400	29,600	15,800	2,200	11,600	29,800	23,100	6,700	12,100	4,300	7,800
Economists .....	11,800	6,200	5,400	S	S	700	700	S	4,900	1,600	3,300
Political/related scientists.....	5,800	2,000	S	S	1,000	1,000	1,000	S	2,800	1,400	1,300
Psychologists .....	32,100	16,500	7,900	S	7,800	13,000	7,800	5,200	2,700	S	2,300
Sociologists/anthropologists.....	6,900	2,400	S	S	S	3,100	3,000	S	S	S	S
Other social/related scientists .....	4,500	2,500	S	S	1,600	1,700	1,400	S	S	S	S
Postsecondary teachers .....	10,400	S	S	S	S	10,400	9,200	S	S	S	S
Engineers .....	907,400	752,700	727,200	15,200	10,300	21,400	19,000	2,400	133,300	64,100	69,300
Aerospace/related .....	36,300	29,000	28,700	S	S	600	600	S	6,800	6,800	S
Chemical.....	51,100	47,800	46,800	S	S	1,200	1,200	S	2,100	1,700	S
Civil/architectural .....	160,800	98,100	92,800	4,000	1,400	1,900	1,800	S	60,800	11,700	49,100
Electrical/related .....	233,500	202,100	196,300	2,700	3,100	4,400	3,600	800	27,100	20,400	6,700
Industrial.....	62,700	58,600	56,800	S	700	1,200	1,200	S	2,900	2,400	S
Mechanical .....	194,300	181,000	175,600	3,800	1,600	2,300	2,300	S	11,000	8,700	2,300
Other.....	163,000	136,000	130,200	2,700	3,100	4,300	4,200	S	22,700	12,500	10,200
Postsecondary teachers .....	5,600	S	S	S	S	5,500	4,200	1,300	S	S	S

## Employed individuals in S&amp;E occupations, by highest degree, occupation, and employment sector: 1999

Degree and occupation	Employed individuals	Business/industry				Educational			Government		
		Total	Profit	Self-employed	Nonprofit	Total	4-year college/university	Other	Total	Federal	State/local
<b>Master's</b>											
All S&E occupations.....	1,032,100	719,400	639,100	41,200	39,100	178,400	111,800	66,600	134,300	75,500	58,800
Scientists .....	655,500	415,600	348,300	33,300	34,000	159,200	94,100	65,100	80,800	42,500	38,300
Mathematical/computer scientists.....	354,100	276,400	260,300	7,000	9,000	50,200	29,900	20,300	27,600	17,800	9,800
Computer/information scientists.....	304,800	268,400	253,500	7,000	7,900	13,600	11,200	2,400	22,800	14,100	8,800
Mathematical scientists .....	16,000	8,000	6,800	S	1,200	3,300	3,300	S	4,700	3,700	1,000
Postsecondary teachers .....	33,300	S	S	S	S	33,300	15,500	17,800	S	S	S
Life/related scientists .....	72,500	25,000	19,100	2,100	3,900	27,800	20,900	6,900	19,700	9,800	9,900
Agricultural/food scientists.....	10,400	5,600	4,400	1,200	S	2,200	1,500	S	2,600	700	1,900
Biological scientists.....	42,700	17,000	13,300	S	3,200	10,900	10,700	S	14,800	8,100	6,800
Environmental life scientists.....	4,000	1,700	1,200	S	S	S	S	S	2,200	1,000	1,200
Postsecondary teachers .....	15,500	S	S	S	S	14,800	8,700	6,100	S	S	S
Physical/related scientists .....	73,000	40,100	36,200	2,300	1,600	19,400	14,200	5,200	13,500	8,200	5,300
Chemists, except biochemists .....	23,000	16,800	16,100	S	S	3,100	3,100	S	3,100	1,400	1,800
Earth scientists, geologists, and oceanographers....	24,300	15,400	14,100	1,200	S	2,900	2,700	S	5,900	3,700	2,200
Physicists/astronomers .....	8,500	4,700	3,700	S	1,000	2,300	2,300	S	1,500	1,300	S
Other .....	7,300	3,200	2,200	800	S	1,200	1,200	S	2,900	1,800	1,200
Postsecondary teachers .....	9,800	S	S	S	S	9,800	4,900	4,900	S	S	S
Social/related scientists .....	155,900	74,100	32,700	21,900	19,400	61,800	29,100	32,700	20,000	6,700	13,300
Economists .....	15,200	10,300	7,800	1,100	1,400	300	300	S	4,600	3,300	1,300
Political/related scientists.....	4,200	2,000	S	S	1,400	900	900	S	1,300	600	S
Psychologists .....	102,400	57,300	22,400	19,900	15,000	34,600	7,700	26,900	10,600	1,400	9,200
Sociologists/anthropologists.....	6,900	1,800	900	S	1,000	2,500	2,400	S	2,600	S	1,700
Other .....	5,700	2,700	1,300	S	700	2,000	1,800	S	1,100	S	S
Postsecondary teachers .....	21,500	S	S	S	S	21,500	16,000	5,500	S	S	S
Engineers .....	376,500	303,800	290,800	7,900	5,100	19,200	17,700	1,500	53,500	33,000	20,500
Aerospace/related .....	26,300	18,600	18,400	S	200	1,500	1,500	S	6,200	6,200	S
Chemical.....	20,700	19,800	19,200	S	300	300	300	S	500	500	S
Civil/architectural .....	57,200	40,300	36,700	3,300	S	1,100	1,100	S	15,800	5,000	10,800
Electrical/related .....	109,400	92,500	89,700	1,100	1,700	5,000	4,900	S	11,900	10,600	1,300
Industrial.....	17,400	16,300	15,600	S	800	300	300	S	800	600	S
Mechanical .....	62,000	56,600	54,600	1,300	700	1,800	1,800	S	3,600	2,800	800
Other.....	76,900	59,600	56,600	1,800	1,200	2,600	2,600	S	14,700	7,200	7,500
Postsecondary teachers .....	6,600	S	S	S	S	6,600	5,200	1,400	S	S	S

## Employed individuals in S&amp;E occupations, by highest degree, occupation, and employment sector: 1999

Degree and occupation	Employed individuals	Business/industry				Educational			Government		
		Total	Profit	Self-employed	Nonprofit	Total	4-year college/university	Other	Total	Federal	State/local
<b>Doctoral</b>											
All S&E occupations.....	484,100	195,000	150,000	24,700	20,300	244,300	229,900	14,400	44,800	32,900	11,900
Scientists .....	399,900	144,000	103,200	23,000	17,700	218,300	204,400	13,800	37,700	26,900	10,800
Mathematical/computer scientists.....	67,100	32,600	29,400	1,100	2,000	30,700	28,700	2,000	3,800	2,700	1,100
Computer/information scientists.....	32,400	27,800	25,800	900	1,100	2,800	2,700	S	1,800	1,300	500
Mathematical scientists .....	7,900	4,400	3,200	200	900	1,600	1,400	100	1,900	1,400	500
Postsecondary teachers .....	26,800	300	300	S	S	26,300	24,500	1,800	S	S	S
Life/related scientists .....	121,100	30,400	24,200	1,900	4,300	78,500	75,600	2,900	12,200	10,200	2,000
Agricultural/food scientists.....	9,200	4,900	4,400	400	100	2,700	2,600	S	1,700	1,600	100
Biological scientists.....	70,000	25,000	19,600	1,400	4,000	34,800	34,200	600	10,100	8,300	1,800
Environmental life scientists.....	1,200	400	200	S	200	400	400	S	400	300	S
Postsecondary teachers .....	40,800	S	S	S	S	40,700	38,300	2,300	S	S	S
Physical/related scientists .....	84,900	33,800	30,200	1,100	2,500	40,600	37,800	2,800	10,400	8,800	1,600
Chemists, except biochemists .....	28,100	22,500	21,400	500	600	3,000	2,900	S	2,600	1,900	700
Earth scientists, geologists, and oceanographers....	10,400	3,600	2,800	300	500	3,300	2,900	400	3,400	2,800	600
Physicists/astronomers .....	14,700	6,600	5,200	200	1,200	4,300	4,200	S	3,800	3,600	300
Other .....	1,800	1,000	800	100	S	300	300	S	500	500	S
Postsecondary teachers .....	29,800	S	S	S	S	29,700	27,400	2,300	S	S	S
Social/related scientists .....	126,900	47,100	19,300	18,800	8,900	68,500	62,300	6,100	11,300	5,200	6,100
Economists .....	8,100	5,000	3,900	400	700	1,200	1,200	S	1,900	1,700	300
Political/related scientists.....	1,400	500	200	S	200	600	600	S	300	300	S
Psychologists .....	58,000	39,200	14,400	17,500	7,300	11,100	7,500	3,500	7,700	2,500	5,200
Sociologists/anthropologists.....	3,700	1,300	600	300	400	1,600	1,500	100	900	500	400
Other .....	2,400	1,000	300	300	300	1,000	700	S	500	300	200
Postsecondary teachers .....	53,300	300	S	S	S	53,000	50,700	2,200	S	S	S
Engineers .....	84,200	51,000	46,700	1,700	2,500	26,100	25,500	600	7,100	5,900	1,200
Aerospace/related .....	4,600	3,200	2,900	S	300	400	400	S	900	900	S
Chemical.....	8,100	7,200	6,700	200	300	500	500	S	400	400	S
Civil and architectural.....	5,100	3,400	2,700	400	400	600	600	S	1,100	500	700
Electrical/related .....	18,400	15,300	14,100	500	700	1,300	1,200	S	1,800	1,800	S
Industrial.....	1,000	900	800	S	S	S	S	S	100	100	S
Mechanical .....	9,100	7,300	6,800	100	300	1,200	1,200	S	600	500	S
Other.....	18,800	13,800	12,700	400	600	2,800	2,700	S	2,200	1,800	400
Postsecondary teachers .....	19,200	S	S	S	S	19,200	18,800	400	S	S	S

S suppressed for reasons of confidentiality and/or data reliability

\*Includes professional degrees.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

Appendix table 3-10  
**Workers with bachelor's or higher degrees: 1983–2002**  
 (Percent)

Year	All S&E occupations	Non-S&E occupations	S&E technicians	Computer programmers
1983 .....	74.3	18.8	21.4	49.9
1984 .....	75.0	19.3	20.2	52.4
1985 .....	74.8	19.6	21.1	51.8
1986 .....	74.4	19.8	22.3	55.9
1987 .....	74.9	20.3	20.1	56.7
1988 .....	74.8	20.9	22.1	56.6
1989 .....	75.3	21.4	21.9	61.1
1990 .....	75.7	21.7	21.1	54.2
1991 .....	76.5	22.0	21.3	59.4
1992 .....	76.8	21.9	20.4	57.3
1993 .....	76.4	22.4	21.4	59.7
1994 .....	76.2	22.6	20.2	60.1
1995 .....	75.8	23.0	21.1	56.4
1996 .....	76.0	23.5	22.3	59.1
1997 .....	77.4	23.7	20.1	56.0
1998 .....	76.3	24.3	22.1	57.7
1999 .....	76.0	24.8	21.9	59.0
2000 .....	76.2	24.8	21.1	60.2
2001 .....	75.4	25.3	21.3	60.6
2002 .....	74.6	26.1	20.4	65.7

SOURCE: National Bureau of Economic Research's Merged Outgoing Rotation Group Files from the Bureau of Labor Statistics' Current Population Survey.

## Employed individuals with S&amp;E highest degree, by highest degree, field of highest degree, and employment sector: 1999

Degree and field	Employed individuals	Business/industry				Education			Government		
		Total	Profit	Self-employed	Nonprofit	Total	4-year college/university	Other	Total	Federal	State/local
All degree levels <sup>a</sup>											
All S&E fields .....	7,980,100	5,545,400	4,657,400	432,300	455,700	1,379,100	701,700	677,400	1,055,600	450,600	605,000
Sciences .....	6,043,700	3,945,200	3,167,800	353,400	423,900	1,279,100	621,000	658,200	819,400	319,200	500,200
Mathematics/computer sciences.....	1,045,800	804,100	732,600	37,000	34,600	164,100	66,600	97,500	77,600	46,600	31,000
Computer/information sciences.....	586,500	506,200	472,700	16,800	16,600	40,900	25,100	15,900	39,400	25,300	14,200
Mathematical sciences .....	459,300	298,000	259,900	20,100	18,000	123,200	41,500	81,700	38,100	21,400	16,800
Life/related sciences .....	1,287,700	768,700	603,900	78,400	86,500	345,200	219,700	125,500	173,800	78,800	95,000
Agricultural and food sciences .....	230,400	167,800	128,100	33,400	6,300	35,800	23,400	12,500	26,700	13,500	13,300
Biological sciences.....	955,300	540,600	426,500	39,600	74,500	295,300	189,400	105,900	119,400	53,700	65,700
Environmental life sciences.....	102,100	60,300	49,400	5,300	5,700	14,100	7,000	7,100	27,600	11,600	16,000
Physical/related sciences .....	596,400	398,400	352,500	29,000	17,000	124,500	90,000	34,500	73,500	42,400	31,100
Chemistry, except biochemistry.....	276,200	195,100	175,000	11,900	8,300	55,800	41,000	14,800	25,300	12,000	13,200
Earth science, geology, and oceanography .....	152,800	98,200	86,900	8,700	2,500	27,000	16,600	10,400	27,600	14,500	13,100
Physics and astronomy .....	144,000	90,400	78,900	6,500	5,000	38,400	30,900	7,600	15,200	13,000	2,200
Other .....	23,500	14,700	11,600	1,900	1,200	3,300	1,500	1,800	5,400	2,800	2,600
Social and related sciences.....	3,088,400	1,957,800	1,465,300	208,100	284,400	638,900	243,900	394,900	491,700	150,700	341,000
Economics .....	406,500	320,300	267,300	37,800	15,200	43,500	27,800	15,600	42,700	26,000	16,700
Political/related sciences.....	567,000	394,200	325,000	34,200	35,000	72,900	34,300	38,600	99,900	44,600	55,300
Psychology.....	1,166,100	701,000	475,200	84,600	141,200	297,600	95,800	201,800	167,600	37,800	129,800
Sociology and anthropology .....	592,700	343,900	250,800	30,100	63,000	126,300	55,100	71,300	122,500	24,700	97,700
Other .....	356,100	198,400	146,900	21,400	30,100	98,600	30,900	67,600	59,100	17,600	41,400
Engineering .....	1,935,800	1,599,700	1,489,100	78,900	31,700	100,000	80,800	19,200	236,200	131,400	104,800
Aerospace and related .....	76,300	59,900	54,900	3,600	1,400	4,800	3,900	900	11,700	10,700	900
Chemical.....	147,700	130,200	126,500	1,700	2,100	6,200	5,800	500	11,200	6,900	4,300
Civil and architectural.....	330,200	230,800	208,000	18,900	3,900	13,100	11,100	2,100	86,300	24,300	62,000
Electrical and related.....	587,000	507,000	479,900	18,100	9,000	29,900	24,600	5,200	50,100	38,700	11,400
Industrial.....	106,200	91,700	80,400	8,500	2,900	6,000	3,000	3,000	8,500	6,700	1,800
Mechanical .....	386,000	338,700	319,200	13,900	5,700	14,500	11,800	2,700	32,700	21,100	11,600
Other.....	302,500	241,300	220,100	14,300	6,800	25,400	20,500	4,900	35,700	23,100	12,700



## Employed individuals with S&amp;E highest degree, by highest degree, field of highest degree, and employment sector: 1999

Degree and field	Employed individuals	Business/industry				Educational			Government		
		Total	Profit	Self-employed	Nonprofit	Total	4-year college/ university	Other	Total	Federal	State/ local
<b>Bachelor's</b>											
All S&E fields .....	5,866,100	4,312,700	3,654,300	323,800	334,500	762,800	305,400	457,300	790,700	314,100	476,500
Sciences .....	4,486,100	3,148,800	2,571,400	262,600	314,800	718,000	275,500	442,400	619,400	225,300	394,100
Mathematics/computer sciences.....	742,700	595,500	539,600	29,100	26,800	89,100	23,700	65,400	58,000	32,300	25,700
Computer/information sciences.....	413,500	364,000	338,100	13,300	12,600	20,800	11,400	9,400	28,700	17,300	11,400
Mathematics.....	329,200	231,500	201,600	15,800	14,200	68,300	12,300	56,000	29,300	15,000	14,300
Life and related sciences.....	947,000	631,000	501,800	62,600	66,500	190,000	101,700	88,200	126,100	50,200	75,800
Agricultural and food sciences .....	182,300	143,100	109,200	29,300	4,600	18,100	9,600	8,500	21,100	10,200	10,900
Biological sciences.....	686,000	438,000	351,300	28,600	58,000	163,200	88,600	74,600	84,800	32,500	52,300
Environmental life sciences.....	78,700	49,900	41,300	4,800	3,900	8,700	3,500	5,200	20,100	7,500	12,600
Physical and related sciences.....	360,500	264,800	234,500	19,700	10,600	51,300	32,100	19,200	44,400	20,600	23,800
Chemistry, except biochemistry.....	175,100	130,500	116,000	9,300	5,200	26,800	18,500	8,300	17,800	7,200	10,600
Earth science, geology, and oceanography .....	101,800	72,100	64,500	5,900	1,700	10,900	5,000	5,900	18,800	8,900	10,000
Physics and astronomy .....	66,900	49,800	44,400	2,700	2,700	11,800	8,300	3,500	5,300	3,800	1,500
Other .....	16,600	12,300	9,600	1,800	S	1,800	300	1,500	2,500	800	1,700
Social and related sciences.....	2,415,500	1,643,600	1,284,000	150,100	209,500	383,300	117,400	265,900	388,600	121,700	267,000
Economics .....	340,300	284,900	238,200	34,300	12,400	22,800	10,900	11,900	32,600	20,400	12,200
Political and related sciences .....	482,900	350,100	295,600	27,800	26,700	47,800	15,700	32,100	85,000	37,100	47,900
Psychology.....	794,500	525,400	387,300	44,700	93,400	154,000	45,500	108,400	115,200	29,000	86,200
Sociology and anthropology .....	525,200	319,600	236,000	27,300	56,300	95,100	31,700	63,400	110,500	21,400	89,100
Other .....	272,600	163,600	126,800	16,100	20,700	63,700	13,600	50,100	45,400	13,800	31,600
Engineering .....	1,379,400	1,163,300	1,082,300	61,300	19,800	44,800	29,900	14,900	171,300	88,900	82,400
Aerospace and related .....	53,600	43,200	40,000	2,700	500	2,300	1,700	600	8,000	7,600	S
Chemical.....	112,000	100,000	97,600	900	1,500	3,100	2,700	400	9,000	5,300	3,700
Civil and architectural.....	247,000	173,700	157,700	14,000	2,100	6,400	5,000	1,500	66,800	17,600	49,200
Electrical and related.....	407,400	356,900	336,800	13,900	6,200	14,000	9,400	4,600	36,500	27,000	9,400
Industrial.....	79,500	70,900	61,500	7,700	1,700	3,100	600	2,500	5,400	4,400	1,000
Mechanical .....	304,200	270,700	254,500	12,000	4,200	6,400	4,700	1,700	27,000	16,500	10,600
Other.....	175,800	147,800	134,200	9,900	3,700	9,500	5,900	3,600	18,500	10,500	8,100

## Employed individuals with S&amp;E highest degree, by highest degree, field of highest degree, and employment sector: 1999

Degree and field	Employed individuals	Business/industry				Educational			Government		
		Total	Profit	Self-employed	Nonprofit	Total	4-year college/university	Other	Total	Federal	State/local
Master's											
All S&E fields .....	1,491,200	954,600	790,600	73,900	90,100	329,600	133,900	195,700	207,000	95,700	111,300
Sciences .....	1,040,400	585,600	445,100	59,100	81,400	304,500	111,900	192,600	150,200	60,100	90,100
Mathematics/computer sciences.....	262,600	192,700	178,700	7,100	6,900	52,600	21,400	31,200	17,200	12,300	4,900
Computer/information sciences.....	160,900	135,500	128,500	3,300	3,800	15,700	9,300	6,300	9,700	7,100	2,600
Mathematics.....	101,700	57,200	50,200	3,800	3,200	37,000	12,100	24,900	7,500	5,200	2,300
Life and related sciences.....	164,100	75,400	55,400	9,200	10,800	58,600	27,500	31,100	30,200	15,200	15,000
Agricultural and food sciences .....	30,100	17,000	12,500	3,400	1,100	9,200	5,800	3,500	3,800	1,800	1,900
Biological sciences.....	116,200	49,400	35,900	5,300	8,100	45,900	20,100	25,800	20,900	10,600	10,300
Environmental life sciences.....	17,900	9,000	7,000	400	1,600	3,400	1,600	1,800	5,500	2,800	2,800
Physical and related sciences.....	109,200	67,300	58,800	6,300	2,200	25,600	14,500	11,100	16,200	11,000	5,200
Chemistry, except biochemistry.....	37,400	24,600	22,200	1,100	1,400	9,400	4,900	4,500	3,400	1,800	1,600
Earth science, geology, and oceanography .....	34,200	21,400	18,800	2,400	S	7,100	3,500	3,600	5,700	3,100	2,600
Physics and astronomy .....	32,500	19,600	16,300	2,900	400	8,400	5,600	2,800	4,500	4,300	S
Other .....	5,100	1,800	1,600	S	S	800	S	200	2,500	1,700	800
Social and related sciences.....	499,800	248,000	150,200	36,500	61,300	165,600	48,400	117,200	86,200	21,400	64,800
Economics .....	43,700	28,300	23,800	2,500	2,000	7,800	4,300	3,500	7,600	3,500	4,100
Political and related sciences.....	67,400	40,700	27,700	5,600	7,500	13,500	7,700	5,800	13,200	6,600	6,600
Psychology.....	276,100	128,900	68,300	22,200	38,300	104,600	19,800	84,800	42,600	5,600	37,000
Sociology and anthropology .....	44,400	19,400	12,600	1,800	5,000	15,000	8,500	6,500	10,000	2,300	7,700
Other .....	68,100	30,700	17,800	4,400	8,500	24,700	8,100	16,600	12,700	3,400	9,400
Engineering .....	450,800	369,000	345,500	14,800	8,700	25,100	21,900	3,100	56,700	35,600	21,100
Aerospace and related .....	17,800	13,700	12,400	S	700	1,100	900	S	3,000	2,500	S
Chemical.....	22,000	19,800	19,100	S	300	700	600	S	1,600	1,000	600
Civil and architectural.....	73,300	52,300	46,300	4,500	1,400	3,000	2,700	S	18,100	5,800	12,200
Electrical and related.....	151,300	130,700	125,200	3,400	2,000	8,600	8,100	S	12,100	10,200	1,900
Industrial.....	23,500	19,100	17,200	S	1,200	1,500	1,100	S	2,900	2,100	800
Mechanical .....	68,300	59,200	56,700	1,500	900	4,000	3,100	900	5,100	4,000	1,000
Other.....	94,600	74,300	68,500	3,600	2,200	6,200	5,300	900	14,100	9,900	4,200

## Employed individuals with S&amp;E highest degree, by highest degree, field of highest degree, and employment sector: 1999

Degree and field	Employed individuals	Business/industry				Educational			Government		
		Total	Profit	Self-employed	Nonprofit	Total	4-year college/ university	Other	Total	Federal	State/ local
<b>Doctoral</b>											
All S&E fields .....	614,600	274,700	211,300	33,600	29,900	283,000	261,200	21,800	56,800	40,100	16,700
Sciences .....	509,000	207,300	150,000	30,700	26,700	253,000	232,300	20,700	48,700	33,200	15,400
Mathematics/computer sciences.....	40,600	15,800	14,200	800	800	22,400	21,500	900	2,300	2,000	400
Computer/information sciences.....	12,100	6,600	6,100	300	200	4,500	4,400	100	1,000	800	200
Mathematics.....	28,500	9,200	8,100	500	600	17,900	17,100	800	1,300	1,200	200
Life and related sciences.....	176,200	62,400	46,600	6,500	9,200	96,600	90,500	6,100	17,200	13,100	4,100
Agricultural and food sciences .....	18,100	7,700	6,300	800	600	8,500	8,000	600	1,900	1,400	400
Biological sciences.....	153,100	53,300	39,200	5,700	8,400	86,100	80,700	5,400	13,700	10,600	3,100
Environmental life sciences.....	5,000	1,400	1,100	100	200	2,000	1,900	200	1,600	1,000	600
Physical and related sciences.....	125,700	65,600	58,500	3,000	4,100	47,500	43,300	4,200	12,700	10,500	2,200
Chemistry, except biochemistry.....	63,600	40,000	36,800	1,500	1,700	19,500	17,600	2,000	4,100	3,000	1,100
Earth science, geology, and oceanography .....	16,500	4,600	3,600	500	500	9,000	8,100	900	2,900	2,300	500
Physics and astronomy .....	43,800	20,300	17,500	900	1,800	18,200	17,000	1,300	5,400	4,900	400
Other .....	1,800	700	500	S	S	700	700	S	400	300	100
Social and related sciences.....	166,400	63,500	30,600	20,400	12,500	86,500	77,000	9,400	16,400	7,700	8,800
Economics .....	22,500	7,200	5,400	1,000	800	12,900	12,600	300	2,500	2,000	500
Political and related sciences .....	16,700	3,300	1,700	800	800	11,700	10,900	800	1,600	900	800
Psychology.....	88,800	44,000	19,000	16,700	8,300	35,500	29,400	6,100	9,300	3,200	6,000
Sociology and anthropology .....	23,100	4,800	2,100	1,000	1,700	16,300	14,900	1,400	2,000	1,000	1,000
Other .....	15,300	4,200	2,300	1,000	900	10,100	9,200	900	1,000	500	500
Engineering .....	105,600	67,400	61,300	2,900	3,200	30,100	28,900	1,100	8,100	6,900	1,200
Aerospace and related .....	4,900	2,900	2,500	200	200	1,400	1,300	S	600	600	S
Chemical.....	13,600	10,500	9,800	400	400	2,500	2,400	S	600	600	S
Civil and architectural.....	9,900	4,800	4,000	300	400	3,700	3,400	300	1,400	800	600
Electrical and related.....	28,300	19,500	17,900	800	800	7,300	7,100	200	1,500	1,400	S
Industrial.....	3,300	1,700	1,600	S	S	1,400	1,300	S	200	200	S
Mechanical .....	13,500	8,800	8,000	300	500	4,100	4,000	S	600	600	S
Other.....	32,100	19,200	17,500	800	900	9,700	9,300	400	3,100	2,700	500

S suppressed for reasons of confidentiality and/or data reliability

<sup>a</sup>Includes professional degrees.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

Appendix table 3-12

**Median annual salaries of U.S. individuals in S&E occupations, by occupation and highest degree: 1999**

(Dollars)

Occupation	Employed individuals	Highest degree			
		Bachelor's	Master's	Doctoral	Professional
All S&E occupations .....	60,000	59,000	64,000	68,000	73,000
Scientists .....	58,800	55,000	60,000	65,000	79,000
Mathematical/computer scientists .....	64,000	60,800	68,000	71,200	60,000
Computer/information scientists .....	65,000	61,000	70,000	81,000	62,000
Mathematical scientists .....	61,700	56,000	60,000	74,400	S
Postsecondary teachers .....	48,000	30,000	41,000	60,000	S
Life and related scientists .....	47,700	37,000	43,800	62,000	123,000
Agricultural/food scientists .....	45,000	41,500	42,500	64,000	S
Biological scientists .....	44,000	36,000	44,000	61,300	103,000
Environmental life scientists .....	46,000	44,700	50,000	61,000	S
Postsecondary teachers .....	56,100	28,700	42,000	62,000	130,000
Physical and related scientists .....	45,000	45,000	52,000	70,000	S
Chemists, except biochemists .....	51,000	45,000	52,000	75,000	S
Earth scientists, geologists, and oceanographers .....	53,000	49,000	55,000	72,000	S
Physicists and astronomers .....	72,000	50,000	73,700	80,000	S
Other .....	42,000	40,000	43,000	68,800	S
Postsecondary teachers .....	51,000	15,000	38,000	59,600	S
Social and related scientists .....	47,000	30,000	41,000	60,000	57,000
Economists .....	67,000	53,000	70,000	92,000	S
Political and related scientists .....	36,000	35,000	33,000	65,000	S
Psychologists .....	43,200	26,500	40,000	60,000	57,000
Sociologists and anthropologists .....	38,000	28,000	39,000	56,000	S
Other .....	45,000	31,000	42,000	62,000	S
Postsecondary teachers .....	51,500	S	36,000	55,000	56,000
Engineers .....	65,000	60,000	70,000	79,000	65,000
Aerospace and related .....	71,000	69,400	75,000	83,600	S
Chemical .....	71,900	65,000	80,000	80,000	S
Civil and architectural .....	58,000	55,300	65,000	68,900	S
Electrical and related .....	70,000	65,000	75,000	86,000	63,000
Industrial .....	57,000	55,000	60,200	84,800	S
Mechanical .....	62,400	60,000	68,000	75,000	S
Other .....	65,000	60,600	69,400	77,000	S
Postsecondary teachers .....	64,000	39,000	52,000	72,800	S

S suppressed for reasons of confidentiality and/or data reliability

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

## Individuals in labor force in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and age: 1999

Degree, occupation, sex, and race/ethnicity	Age (years)										
	All ages	Less than 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 or more
<b>All degree levels<sup>a</sup></b>											
All S&E occupations.....	3,596,800	85,400	420,000	461,300	594,700	581,900	494,700	428,300	278,300	152,000	100,200
Male.....	2,745,900	50,300	287,000	339,700	444,300	439,700	385,800	342,500	232,400	133,700	90,700
Female.....	850,900	35,100	133,000	121,600	150,400	142,300	108,900	85,800	45,900	18,300	9,500
White.....	2,940,900	63,900	321,100	353,500	475,100	476,800	419,300	370,400	239,700	131,600	89,500
Asian/Pacific Islander.....	396,600	12,400	58,700	67,500	71,600	59,400	45,100	37,500	25,500	12,900	5,900
Black.....	124,900	4,000	17,700	17,900	21,900	22,700	16,100	11,600	7,200	4,100	1,800
Hispanic.....	123,100	4,800	20,500	20,300	24,500	21,300	12,900	8,000	5,200	2,900	2,700
Other.....	11,300	S	1,900	2,200	1,600	1,800	1,300	800	700	500	200
Scientists.....	2,200,700	58,700	263,600	283,300	357,000	349,100	326,200	263,200	171,500	78,400	49,700
Male.....	1,482,800	30,800	160,900	187,800	234,900	230,400	226,300	181,800	127,600	61,800	40,600
Female.....	717,900	27,900	102,800	95,500	122,100	118,700	99,900	81,500	43,900	16,600	9,100
White.....	1,797,800	43,000	200,700	215,300	280,800	284,100	278,900	230,100	151,300	69,500	44,100
Asian/Pacific Islander.....	237,100	8,600	37,300	43,400	45,900	38,200	26,300	19,400	11,100	4,100	2,900
Black.....	86,400	3,100	11,300	12,200	14,600	14,500	12,000	8,100	5,900	3,000	1,500
Hispanic.....	72,700	3,700	13,100	11,200	14,700	11,400	8,400	5,100	2,600	1,600	1,000
Other.....	6,700	S	1,300	1,200	1,000	900	600	600	600	200	100
Mathematical/computer scientists.....	1,182,100	23,800	130,900	165,100	226,200	202,400	178,100	136,000	78,200	29,300	12,100
Male.....	861,400	17,100	100,300	124,200	155,700	140,600	132,200	97,300	59,500	24,700	9,900
Female.....	320,600	6,700	30,600	40,900	70,600	61,800	45,900	38,700	18,700	4,600	2,200
White.....	933,200	16,500	90,300	118,600	177,800	160,800	148,600	115,600	68,600	26,100	10,400
Asian/Pacific Islander.....	155,500	4,700	25,900	31,700	29,400	26,200	18,100	12,400	5,400	900	700
Black.....	53,000	1,100	7,800	8,000	9,400	8,700	7,100	5,400	3,300	1,500	600
Hispanic.....	37,700	1,400	6,100	6,200	9,300	6,300	4,200	2,500	700	800	300
Other.....	2,700	S	900	600	400	S	S	S	S	S	S
Life/related scientists.....	346,300	14,400	41,600	42,400	50,800	52,200	50,400	40,300	28,900	14,700	10,500
Male.....	219,500	5,000	18,400	24,600	29,700	32,900	35,700	29,200	21,700	12,500	9,700
Female.....	126,800	9,400	23,200	17,800	21,200	19,300	14,700	11,100	7,200	2,200	800
White.....	288,800	10,500	33,500	34,800	39,500	43,300	44,300	35,200	26,100	12,600	9,000
Asian/Pacific Islander.....	38,300	2,300	5,300	5,400	8,400	5,200	3,300	3,600	2,300	1,300	1,100
Black.....	6,600	500	300	500	900	1,300	1,800	700	200	400	100
Hispanic.....	11,000	1,100	2,400	1,400	1,700	2,100	800	600	200	300	300
Other.....	1,600	S	S	300	300	200	300	100	100	S	S
Physical/related scientists.....	303,600	8,400	39,600	35,000	45,100	47,300	41,200	32,300	27,800	15,200	11,600
Male.....	232,800	4,600	25,400	23,400	35,000	35,600	32,300	27,400	24,200	13,500	11,400
Female.....	70,800	3,800	14,200	11,500	10,000	11,800	8,900	4,900	3,600	1,700	200
White.....	256,700	7,300	33,900	27,900	35,600	40,600	35,300	28,800	23,300	13,400	10,700

## Individuals in labor force in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and age: 1999

Degree, occupation, sex, and race/ethnicity	Age (years)										
	All ages	Less than 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 or more
Asian/Pacific Islander .....	28,300	400	3,100	4,200	5,300	4,400	3,600	2,200	3,000	1,500	600
Black .....	9,400	500	1,000	1,600	2,300	1,400	900	700	800	100	100
Hispanic.....	8,300	200	1,500	1,200	1,700	800	1,200	500	700	200	S
Other .....	900	S	100	100	200	100	100	100	100	S	S
Social/related scientists .....	368,700	12,100	51,400	40,800	34,800	47,200	56,500	54,600	36,500	19,200	15,500
Male .....	169,000	4,100	16,700	15,500	14,500	21,300	26,000	27,900	22,100	11,100	9,600
Female.....	199,700	8,000	34,700	25,200	20,300	25,900	30,400	26,800	14,400	8,100	5,900
White .....	319,100	8,700	43,000	34,200	27,900	39,400	50,600	50,400	33,300	17,400	14,000
Asian/Pacific Islander .....	15,000	1,200	3,000	2,000	2,700	2,300	1,400	1,200	300	300	500
Black .....	17,300	1,100	2,200	2,100	2,000	3,100	2,200	1,300	1,600	1,100	600
Hispanic.....	15,700	900	3,100	2,300	2,100	2,100	2,200	1,500	1,100	300	200
Other .....	1,500	S	S	200	100	200	100	200	200	S	100
Engineers.....	1,396,100	26,700	156,300	178,000	237,700	232,800	168,500	165,100	106,900	73,600	50,500
Male.....	1,263,100	19,400	126,100	151,900	209,400	209,200	159,500	160,700	104,900	71,900	50,100
Female.....	133,000	7,300	30,200	26,100	28,300	23,600	9,000	4,400	2,000	1,700	500
White .....	1,143,200	20,900	120,500	138,100	194,300	192,700	140,400	140,400	88,400	62,200	45,400
Asian/Pacific Islander .....	159,400	3,800	21,500	24,100	25,700	21,200	18,800	18,100	14,400	8,800	3,000
Black.....	38,600	900	6,300	5,700	7,300	8,100	4,100	3,500	1,300	1,000	300
Hispanic.....	50,400	1,100	7,400	9,100	9,800	9,900	4,500	2,900	2,600	1,400	1,700
Other.....	4,600	S	600	1,000	600	900	700	300	100	S	S
Bachelor's											
All S&E occupations .....	2,027,200	82,500	316,900	269,100	347,100	328,700	257,400	202,300	112,200	65,600	45,500
Male.....	1,589,700	48,800	221,700	206,600	267,200	258,400	213,500	172,800	95,300	61,700	43,800
Female.....	437,500	33,700	95,200	62,500	79,900	70,300	43,900	29,500	16,900	3,900	1,700
White .....	1,707,300	62,100	250,000	222,500	294,900	278,800	223,500	176,400	98,400	58,000	42,700
Asian/Pacific Islander .....	160,900	11,400	34,500	22,500	22,300	21,100	18,800	15,300	9,000	4,900	1,100
Black.....	76,400	4,000	13,600	10,700	14,900	13,800	8,100	6,100	3,100	1,900	S
Hispanic.....	76,000	4,700	17,500	11,800	14,000	14,000	6,200	4,200	1,500	800	1,400
Other.....	6,600	S	1,300	1,600	900	1,000	900	S	S	S	S
Scientists .....	1,103,200	56,500	192,000	154,900	192,300	173,900	148,900	98,000	54,900	21,300	10,600
Male .....	754,600	29,800	121,100	107,700	129,500	116,800	110,900	71,700	38,800	18,900	9,400
Female.....	348,600	26,700	70,900	47,100	62,800	57,100	38,000	26,300	16,100	2,400	S
White .....	920,900	41,600	150,100	127,900	161,700	146,300	129,700	85,200	49,000	19,200	10,200
Asian/Pacific Islander .....	89,000	7,900	21,900	13,300	12,600	11,900	10,300	6,700	3,200	900	S
Black.....	48,500	3,100	8,300	7,200	9,400	8,200	5,400	3,700	2,200	S	S
Hispanic.....	41,600	3,600	11,000	5,800	8,000	7,000	3,400	2,200	S	S	S
Other .....	3,100	S	700	700	500	S	S	S	S	S	S

## Individuals in labor force in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and age: 1999

Degree, occupation, sex, and race/ethnicity	Age (years)										
	All ages	Less than 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65 or more
Mathematical/computer scientists.....	750,000	23,100	100,300	107,900	151,900	129,000	110,900	71,700	36,300	14,600	4,200
Male .....	546,000	16,700	77,700	82,100	102,400	88,600	85,000	52,300	25,300	12,900	2,900
Female.....	204,000	6,400	22,500	25,800	49,500	40,400	26,000	19,400	11,000	1,800	S
White .....	619,300	16,000	73,800	88,200	127,000	107,000	95,100	62,200	32,700	13,400	3,800
Asian/Pacific Islander .....	66,200	4,600	14,000	9,800	11,000	10,300	8,700	5,200	2,200	S	S
Black .....	35,800	1,100	6,700	5,300	7,000	6,300	4,400	2,900	1,300	S	S
Hispanic.....	27,100	1,400	5,500	4,100	6,600	5,000	2,800	1,300	S	S	S
Other .....	1,700	S	400	S	S	S	S	S	S	S	S
Life/related scientists .....	137,200	13,700	32,500	20,300	14,800	16,100	18,300	9,900	7,200	2,700	1,800
Male .....	77,900	4,600	14,900	11,900	8,900	8,500	13,100	7,200	4,600	2,500	1,800
Female.....	59,300	9,100	17,600	8,500	5,900	7,600	5,200	2,700	2,600	S	S
White .....	118,500	10,300	26,300	17,800	13,400	14,400	16,700	8,200	6,900	2,700	1,800
Asian/Pacific Islander .....	10,100	1,800	3,800	1,600	700	S	S	1,100	S	S	S
Black .....	2,000	500	S	S	S	S	S	S	S	S	S
Hispanic.....	5,700	1,100	2,100	600	S	1,000	S	S	S	S	S
Other .....	900	S	S	S	S	S	S	S	S	S	S
Physical/related scientists .....	142,500	8,100	31,600	18,300	20,700	20,600	14,000	11,900	9,800	3,600	3,900
Male .....	103,100	4,500	19,600	11,500	16,500	16,300	10,300	9,200	8,100	3,300	3,900
Female.....	39,400	3,600	12,000	6,800	4,200	4,300	3,800	2,700	1,700	S	S
White .....	123,000	7,000	27,400	14,800	17,100	18,600	12,200	10,700	8,100	3,000	3,900
Asian/Pacific Islander .....	8,600	S	2,100	1,400	800	900	1,000	S	S	S	S
Black .....	6,100	500	700	1,300	1,700	S	S	S	S	S	S
Hispanic.....	4,600	200	1,300	S	900	S	S	S	S	S	S
Other .....	S	S	S	S	S	S	S	S	S	S	S
Social/related scientists .....	73,400	11,600	27,700	8,400	4,900	8,100	5,700	4,400	S	S	S
Male .....	27,600	4,000	8,900	2,200	S	3,400	2,600	3,000	S	S	S
Female.....	45,800	7,600	18,800	6,100	3,200	4,700	3,100	S	S	S	S
White .....	60,200	8,300	22,600	7,100	4,200	6,200	5,700	4,100	S	S	S
Asian/Pacific Islander .....	4,000	1,100	2,000	S	S	S	S	S	S	S	S
Black .....	4,600	1,000	900	S	S	S	S	S	S	S	S
Hispanic.....	4,300	900	2,100	S	S	S	S	S	S	S	S
Other .....	S	S	S	S	S	S	S	S	S	S	S
Engineers .....	924,000	26,000	124,900	114,200	154,800	154,800	108,500	104,300	57,300	44,300	34,900
Male.....	835,100	19,000	100,600	98,800	137,700	141,600	102,600	101,100	56,500	42,700	34,500
Female.....	88,800	7,000	24,300	15,400	17,100	13,200	5,900	3,200	800	1,500	S
White .....	786,400	20,500	99,900	94,600	133,100	132,500	93,800	91,200	49,500	38,800	32,500
Asian/Pacific Islander .....	71,900	3,500	12,500	9,200	9,700	9,200	8,500	8,600	5,700	4,000	900
Black.....	27,900	900	5,400	3,500	5,500	5,600	2,700	2,300	S	S	S
Hispanic.....	34,400	1,100	6,500	6,100	6,000	7,000	2,800	2,000	1,100	S	1,200
Other.....	3,400	S	500	900	400	500	700	S	S	S	S

## Individuals in labor force in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and age: 1999

Degree, occupation, sex, and race/ethnicity	Age (years)										
	All ages	Less than 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 or more
<b>Master's</b>											
All S&E occupations.....	1,049,400	2,900	93,800	143,800	171,800	166,300	155,300	145,200	95,800	48,000	26,500
Male.....	763,100	1,500	59,900	100,500	123,200	118,100	112,600	107,700	79,900	38,100	21,600
Female.....	286,300	1,400	34,000	43,200	48,600	48,300	42,700	37,500	15,900	9,800	4,900
White.....	820,500	1,800	64,300	96,800	128,300	133,000	128,100	125,100	79,600	40,900	22,500
Asian/Pacific Islander.....	155,500	1,000	22,400	33,400	29,700	21,500	16,300	13,800	11,000	4,100	2,300
Black.....	36,600	S	3,700	6,200	5,600	6,500	6,200	3,700	2,400	1,400	1,000
Hispanic.....	33,600	S	2,800	6,900	7,800	4,700	4,500	2,300	2,600	1,300	500
Other.....	3,100	S	600	500	400	600	S	300	S	S	S
Scientists.....	665,300	2,200	64,700	91,600	104,100	103,000	105,300	95,400	57,600	25,900	15,400
Male.....	416,400	1,000	36,100	57,200	65,000	64,000	65,000	58,700	42,700	16,100	10,500
Female.....	248,900	1,200	28,600	34,400	39,100	39,100	40,300	36,700	14,900	9,700	4,900
White.....	523,100	1,400	44,800	60,600	75,900	82,200	88,100	83,500	50,000	23,300	13,400
Asian/Pacific Islander.....	92,600	700	14,300	22,200	19,400	14,300	8,900	7,400	4,100	S	700
Black.....	27,700	S	3,000	4,300	4,000	4,200	5,000	2,700	2,100	1,300	1,000
Hispanic.....	19,800	S	2,000	4,100	4,500	2,100	3,100	1,600	1,300	700	S
Other.....	2,100	S	600	400	300	200	S	200	S	S	S
Mathematical/computer scientists.....	358,800	700	28,800	50,200	62,700	60,300	56,400	52,500	31,400	10,500	5,300
Male.....	257,000	400	21,200	36,600	44,100	42,300	38,900	35,700	25,100	8,200	4,500
Female.....	101,800	S	7,600	13,600	18,700	18,000	17,500	16,800	6,300	2,300	800
White.....	259,800	500	14,900	26,200	43,400	44,900	45,200	43,800	27,300	9,100	4,400
Asian/Pacific Islander.....	74,000	S	11,600	19,400	14,600	12,400	7,400	5,800	2,200	S	S
Black.....	15,300	S	1,200	2,600	2,300	1,900	2,600	2,000	1,400	700	600
Hispanic.....	8,800	S	600	1,900	2,300	1,000	1,100	900	S	S	S
Other.....	900	S	S	S	S	S	S	S	S	S	S
Life/related scientists.....	73,800	700	7,000	9,300	14,300	11,900	9,800	10,900	5,900	3,600	S
Male.....	44,500	S	2,700	5,400	7,200	6,700	7,000	7,100	5,100	2,300	S
Female.....	29,400	S	4,300	3,900	7,000	5,200	2,800	3,800	800	1,300	S
White.....	62,300	S	5,500	7,800	11,200	10,500	8,400	9,900	5,500	3,000	S
Asian/Pacific Islander.....	7,200	S	1,000	800	2,100	800	400	700	S	S	S
Black.....	2,200	S	200	S	500	S	500	S	S	S	S
Hispanic.....	1,800	S	200	400	500	S	S	S	S	S	S
Other.....	300	S	S	S	S	S	S	S	S	S	S
Physical/related scientists.....	74,400	300	6,300	8,900	11,000	12,500	14,400	8,700	6,800	3,000	2,600
Male.....	54,300	S	4,600	6,100	7,700	7,700	10,800	7,200	5,500	2,100	2,600
Female.....	20,000	S	1,700	2,800	3,300	4,800	3,600	1,400	1,300	900	S
White.....	62,900	200	5,100	7,100	8,900	10,800	12,700	7,900	5,200	2,700	2,300
Asian/Pacific Islander.....	7,200	S	700	1,300	1,300	1,000	700	500	1,400	S	S
Black.....	2,000	S	300	200	300	600	400	S	S	S	S
Hispanic.....	1,900	S	200	400	300	S	S	S	S	S	S
Other.....	400	S	S	S	S	S	S	S	S	S	S



## Individuals in labor force in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and age: 1999

Degree, occupation, sex, and race/ethnicity	Age (years)										
	All ages	Less than 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65 or more
Social/related scientists .....	158,300	500	22,600	23,100	16,100	18,400	24,800	23,300	13,600	8,800	7,100
Male .....	60,600	S	7,600	9,100	6,100	7,200	8,300	8,700	7,000	3,500	3,100
Female .....	97,600	400	15,000	14,100	10,100	11,200	16,500	14,600	6,500	5,200	4,000
White .....	138,200	400	19,300	19,500	12,400	15,900	21,900	21,800	12,000	8,500	6,500
Asian/Pacific Islander .....	4,200	S	900	700	1,400	S	S	300	S	S	S
Black .....	8,100	S	1,300	1,400	900	1,300	1,400	500	600	S	S
Hispanic .....	7,200	S	900	1,400	1,500	900	1,100	600	S	S	S
Other .....	500	S	S	S	S	S	S	S	S	S	S
Engineers .....	384,100	700	29,200	52,100	67,700	63,300	50,000	49,800	38,200	22,100	11,100
Male .....	346,700	500	23,800	43,300	58,200	54,100	47,600	49,000	37,200	22,000	11,100
Female .....	37,400	300	5,400	8,800	9,500	9,200	2,400	S	900	S	S
White .....	297,400	400	19,500	36,200	52,400	50,900	40,000	41,600	29,600	17,600	9,100
Asian/Pacific Islander .....	62,900	300	8,200	11,200	10,300	7,200	7,300	6,500	6,900	3,600	1,600
Black .....	8,900	S	700	1,900	1,500	2,300	1,200	1,000	S	S	S
Hispanic .....	13,800	S	800	2,800	3,300	2,600	1,500	600	1,300	600	S
Other .....	1,000	S	S	S	S	400	S	S	S	S	S
Doctoral											
All S&E occupations .....	489,900	S	9,000	47,100	73,200	79,300	75,400	75,300	67,900	37,400	25,100
Male .....	372,900	S	5,400	31,800	52,100	57,900	56,800	58,000	55,800	32,900	22,200
Female .....	117,000	S	3,700	15,300	21,100	21,400	18,600	17,300	12,100	4,500	2,900
White .....	386,100	S	6,700	33,000	49,900	58,100	61,800	63,500	59,700	31,900	21,600
Asian/Pacific Islander .....	78,000	S	1,800	11,400	19,100	16,300	9,700	8,200	5,400	3,700	2,200
Black .....	11,100	S	300	1,000	1,500	2,100	1,600	1,900	1,400	800	600
Hispanic .....	13,000	S	300	1,500	2,500	2,600	2,100	1,500	1,100	800	600
Other .....	1,600	S	S	200	200	200	200	200	300	200	100
Scientists .....	404,000	S	6,800	35,700	58,000	65,800	65,400	64,600	56,700	30,200	20,700
Male .....	293,500	S	3,700	22,300	38,600	45,500	47,500	47,600	44,800	25,800	17,800
Female .....	110,400	S	3,200	13,500	19,400	20,300	17,900	16,900	11,900	4,500	2,900
White .....	328,500	S	5,600	26,000	41,200	50,000	55,200	56,100	50,500	26,200	17,800
Asian/Pacific Islander .....	53,500	S	1,000	7,600	13,400	11,600	6,700	5,300	3,600	2,500	1,700
Black .....	9,400	S	100	700	1,200	1,900	1,400	1,700	1,400	700	600
Hispanic .....	11,100	S	100	1,300	2,100	2,200	1,900	1,300	1,000	700	500
Other .....	1,500	S	S	200	200	200	200	200	300	200	100
Mathematical/computer scientists .....	67,500	S	1,900	6,500	10,500	10,700	10,000	11,300	10,100	4,100	2,600
Male .....	55,300	S	1,400	4,900	8,300	8,900	8,200	8,800	8,600	3,600	2,400
Female .....	12,300	S	500	1,500	2,200	1,800	1,800	2,500	1,400	500	100
White .....	49,900	S	1,500	3,800	6,300	6,900	7,800	9,100	8,600	3,500	2,300
Asian/Pacific Islander .....	14,600	S	300	2,400	3,800	3,300	1,800	1,400	800	500	200

## Individuals in labor force in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and age: 1999

Degree, occupation, sex, and race/ethnicity	Age (years)										
	All ages	Less than 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65 or more
Black .....	1,400	S	S	100	100	200	100	400	400	100	100
Hispanic.....	1,600	S	S	200	300	200	200	300	300	S	S
Other .....	100	S	S	S	S	S	S	S	S	S	S
Life/related scientists .....	122,300	S	2,000	12,500	20,900	21,600	19,800	17,100	15,400	7,400	5,600
Male .....	86,900	S	800	7,400	12,900	15,300	14,100	13,100	11,800	6,800	4,800
Female.....	35,400	S	1,200	5,200	8,000	6,300	5,700	4,000	3,500	600	800
White .....	96,600	S	1,600	8,900	14,500	16,000	17,100	14,700	13,300	6,100	4,400
Asian/Pacific Islander .....	19,600	S	400	2,900	5,100	4,000	2,000	1,900	1,700	900	700
Black .....	2,200	S	S	200	400	600	300	300	200	100	100
Hispanic.....	3,500	S	S	400	800	900	400	200	200	300	300
Other .....	400	S	S	S	100	100	S	100	S	S	S
Physical/related scientists .....	86,300	S	1,800	7,700	13,200	14,200	12,800	11,700	11,300	8,600	5,000
Male .....	75,000	S	1,200	5,700	10,700	11,600	11,200	11,000	10,600	8,100	4,800
Female.....	11,300	S	500	1,900	2,600	2,600	1,600	800	700	500	100
White .....	70,400	S	1,500	5,900	9,300	11,200	10,500	10,200	10,100	7,600	4,300
Asian/Pacific Islander .....	12,500	S	300	1,500	3,100	2,500	1,900	1,200	800	800	500
Black .....	1,300	S	S	100	300	200	300	100	100	S	100
Hispanic.....	1,800	S	S	200	500	300	200	200	200	100	S
Other .....	300	S	S	S	S	S	S	100	100	S	S
Social/related scientists .....	127,800	S	1,200	9,100	13,500	19,300	22,800	24,400	19,900	10,100	7,600
Male .....	76,400	S	200	4,200	6,800	9,800	14,000	14,700	13,700	7,200	5,800
Female.....	51,400	S	900	4,900	6,700	9,500	8,800	9,700	6,200	2,800	1,800
White .....	111,600	S	1,100	7,400	11,100	15,900	19,800	22,100	18,600	9,000	6,800
Asian/Pacific Islander .....	6,800	S	100	800	1,300	1,800	1,000	900	200	300	300
Black .....	4,600	S	S	300	400	900	800	800	700	500	300
Hispanic.....	4,200	S	S	500	600	700	1,100	600	300	300	200
Other .....	700	S	S	100	100	100	100	S	200	S	100
Engineers .....	85,900	S	2,200	11,400	15,200	13,500	10,000	10,800	11,200	7,200	4,400
Male.....	79,400	S	1,700	9,600	13,500	12,400	9,300	10,400	11,000	7,200	4,300
Female.....	6,500	S	500	1,800	1,700	1,200	700	400	200	S	100
White .....	57,600	S	1,000	7,000	8,700	8,100	6,600	7,400	9,200	5,700	3,800
Asian/Pacific Islander .....	24,500	S	800	3,700	5,700	4,800	3,000	2,900	1,800	1,200	500
Black.....	1,700	S	200	300	300	300	200	200	100	100	S
Hispanic.....	1,900	S	200	300	400	300	200	200	100	100	S
Other.....	100	S	S	S	S	S	S	S	S	S	S

S suppressed for reasons of confidentiality and/or data reliability

\*Includes professional degrees.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

## Individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and employment status: 1999

Degree and occupation	All individuals	Employed			Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time		Total	Retired	Not seeking job
<b>All degree levels<sup>a</sup></b>								
All S&E occupations.....	4,120,700	3,540,800	3,267,400	273,400	56,000	523,900	364,400	159,400
Male.....	3,126,200	2,705,000	2,570,200	134,800	40,900	380,300	325,000	55,400
Female.....	994,400	835,800	697,200	138,600	15,100	143,500	39,500	104,100
White.....	3,406,400	2,896,600	2,658,900	237,600	44,400	465,500	337,600	127,900
Asian/Pacific Islander.....	430,300	390,500	373,400	17,100	6,100	33,800	14,100	19,700
Black.....	135,100	121,600	113,300	8,400	3,300	10,200	6,000	4,200
Hispanic.....	135,800	120,900	111,400	9,500	2,200	12,700	6,100	6,600
Other.....	13,000	11,300	10,500	800	100	1,700	700	1,000
Scientists.....	2,464,500	2,170,500	1,949,400	221,100	30,200	263,800	146,100	117,700
Male.....	1,626,100	1,464,800	1,373,400	91,400	18,000	143,400	110,000	33,400
Female.....	838,400	705,800	576,000	129,700	12,200	120,500	36,100	84,300
White.....	2,025,100	1,774,200	1,580,400	193,800	23,600	227,300	132,000	95,300
Asian/Pacific Islander.....	257,100	233,900	222,100	11,800	3,200	20,000	6,300	13,600
Black.....	94,200	84,000	76,300	7,600	2,400	7,900	4,800	3,100
Hispanic.....	80,200	71,800	64,700	7,100	900	7,500	2,700	4,800
Other.....	7,900	6,700	5,900	800	100	1,200	300	900
Mathematical/computer scientists.....	1,277,900	1,167,400	1,092,400	74,900	14,700	95,800	52,700	43,100
Male.....	913,700	850,600	816,400	34,200	10,800	52,300	38,900	13,300
Female.....	364,200	316,700	276,000	40,700	3,900	43,500	13,800	29,700
White.....	1,018,600	922,200	856,900	65,300	11,100	85,400	47,300	38,100
Asian/Pacific Islander.....	161,000	153,600	148,800	4,700	1,900	5,500	2,400	3,100
Black.....	55,600	51,400	48,900	2,500	1,700	2,600	1,500	1,100
Hispanic.....	39,800	37,600	35,200	2,400	S	2,100	1,400	700
Other.....	2,900	2,700	2,600	S	S	S	S	S
Life and related scientists.....	406,100	341,900	311,800	30,100	4,400	59,800	28,800	31,000
Male.....	251,000	217,500	204,000	13,400	2,100	31,500	22,400	9,100
Female.....	155,100	124,400	107,700	16,700	2,300	28,300	6,400	21,800
White.....	334,800	285,100	259,400	25,800	3,600	46,100	24,400	21,700
Asian/Pacific Islander.....	46,700	37,700	35,700	1,900	600	8,400	2,300	6,100
Black.....	9,200	6,600	5,700	900	S	2,600	1,300	1,200
Hispanic.....	13,400	10,900	9,600	1,400	100	2,400	800	1,600
Other.....	2,000	1,600	1,400	200	S	400	S	400
Physical and related scientists.....	360,600	297,900	272,000	25,900	5,800	57,000	39,300	17,700
Male.....	272,900	229,400	213,900	15,500	3,400	40,000	33,300	6,700
Female.....	87,700	68,400	58,100	10,400	2,400	17,000	6,000	10,900
White.....	306,900	252,500	229,300	23,200	4,200	50,200	37,000	13,200

## Individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and employment status: 1999

Degree and occupation	All individuals	Employed				Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time	Total		Retired	Not seeking job	
Asian/Pacific Islander .....	32,800	27,800	26,100	1,700	500	4,400	1,000	3,500	
Black .....	10,800	8,800	8,400	400	600	1,400	1,100	300	
Hispanic.....	9,200	7,800	7,200	600	500	900	200	600	
Other .....	1,000	900	900	S	S	S	S	S	
Social and related scientists.....	419,900	363,400	273,200	90,200	5,300	51,300	25,200	26,000	
Male .....	188,500	167,300	139,000	28,300	1,700	19,600	15,400	4,200	
Female.....	231,400	196,200	134,200	62,000	3,600	31,700	9,900	21,800	
White .....	364,700	314,400	234,800	79,600	4,700	45,600	23,300	22,300	
Asian/Pacific Islander .....	16,700	14,800	11,400	3,400	S	1,700	700	1,000	
Black.....	18,600	17,200	13,200	3,900	100	1,300	900	400	
Hispanic.....	17,800	15,500	12,700	2,800	200	2,100	300	1,800	
Other .....	2,100	1,500	1,000	500	S	600	S	500	
Engineers.....	1,656,200	1,370,300	1,318,000	52,300	25,800	260,000	218,300	41,700	
Male.....	1,500,100	1,240,200	1,196,900	43,400	22,900	237,000	215,000	22,000	
Female.....	156,000	130,000	121,200	8,900	2,900	23,100	3,300	19,800	
White .....	1,381,300	1,122,400	1,078,500	43,800	20,800	238,200	205,600	32,600	
Asian/Pacific Islander .....	173,200	156,600	151,300	5,300	2,800	13,800	7,700	6,100	
Black.....	40,900	37,700	36,900	700	900	2,300	1,200	1,100	
Hispanic.....	55,600	49,100	46,700	2,400	1,300	5,300	3,400	1,900	
Other.....	5,100	4,600	4,600	S	S	500	400	S	
Bachelor's									
All S&E occupations.....	2,350,500	1,994,400	1,870,600	123,800	32,700	323,300	223,200	100,100	
Male.....	1,831,300	1,564,700	1,496,100	68,700	25,000	241,500	206,800	34,700	
Female.....	519,200	429,700	374,500	55,200	7,800	81,700	16,400	65,300	
White .....	1,996,900	1,680,900	1,571,500	109,400	26,400	289,500	209,000	80,500	
Asian/Pacific Islander .....	179,300	158,300	152,000	6,300	2,600	18,400	6,900	11,500	
Black.....	82,600	73,900	71,100	2,800	2,500	6,200	3,500	2,800	
Hispanic.....	83,800	74,800	69,800	5,000	1,200	7,700	3,300	4,500	
Other.....	7,900	6,600	6,200	S	S	1,400	500	800	
Scientists .....	1,228,500	1,087,100	997,300	89,800	16,200	125,200	54,000	71,200	
Male.....	815,200	744,300	705,000	39,400	10,300	60,600	40,400	20,200	
Female.....	413,300	342,800	292,300	50,500	5,900	64,600	13,600	51,000	
White .....	1,027,000	908,100	828,300	79,800	12,800	106,000	48,500	57,600	
Asian/Pacific Islander .....	98,900	87,700	83,800	3,900	1,300	9,900	2,000	7,900	
Black.....	53,100	46,600	44,200	2,400	1,900	4,500	2,600	1,900	
Hispanic.....	45,500	41,500	38,200	3,300	S	3,900	S	3,100	
Other.....	4,000	3,100	2,700	S	S	900	S	800	

## Individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and employment status: 1999

Degree and occupation	All individuals	Employed			Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time		Total	Retired	Not seeking job
Mathematical/computer scientists.....	804,900	740,500	700,600	39,900	9,500	54,900	25,200	29,700
Male .....	572,600	538,900	522,100	16,800	7,100	26,700	19,000	7,700
Female.....	232,300	201,600	178,500	23,100	2,500	28,200	6,200	22,000
White .....	669,100	612,200	575,600	36,600	7,100	49,800	22,600	27,200
Asian/Pacific Islander .....	68,400	65,400	64,000	1,400	S	2,200	900	1,300
Black .....	37,700	34,200	33,700	500	1,600	1,900	1,100	800
Hispanic.....	28,000	27,000	25,600	1,400	S	900	S	400
Other .....	1,800	1,700	1,700	S	S	S	S	S
Life and related scientists .....	166,500	135,500	120,400	15,100	1,700	29,200	8,400	20,900
Male .....	90,400	76,900	69,800	7,100	S	12,500	5,800	6,800
Female.....	76,000	58,600	50,500	8,000	700	16,700	2,600	14,100
White .....	139,500	117,100	104,100	13,000	1,400	20,900	6,700	14,200
Asian/Pacific Islander .....	15,400	9,800	8,900	900	S	5,200	S	4,400
Black .....	3,400	2,000	1,700	300	S	1,400	S	800
Hispanic.....	7,100	5,700	4,900	800	S	1,400	S	1,100
Other .....	1,200	900	700	S	S	S	S	S
Physical and related scientists .....	172,700	139,600	127,400	12,200	2,900	30,200	18,700	11,500
Male .....	121,200	101,700	94,600	7,000	1,400	18,100	14,500	3,700
Female.....	51,500	38,000	32,700	5,200	1,500	12,100	4,300	7,800
White .....	149,200	120,600	109,200	11,400	2,400	26,200	17,400	8,800
Asian/Pacific Islander .....	10,700	8,400	8,000	S	S	2,100	S	1,800
Black .....	7,400	5,800	5,700	100	S	1,300	1,000	300
Hispanic.....	5,100	4,600	4,200	300	S	500	S	500
Other .....	300	S	S	S	S	S	S	S
Social and related scientists.....	84,400	71,400	48,900	22,500	2,000	11,000	1,700	9,200
Male .....	30,900	26,800	18,400	8,500	S	3,300	S	2,100
Female.....	53,500	44,600	30,600	14,100	1,200	7,700	S	7,100
White .....	69,300	58,300	39,500	18,800	1,900	9,100	1,700	7,400
Asian/Pacific Islander .....	4,400	4,000	2,800	1,300	S	S	S	S
Black .....	4,600	4,600	3,200	1,400	S	S	S	S
Hispanic.....	5,400	4,200	3,500	800	S	1,100	S	1,100
Other .....	S	S	S	S	S	S	S	S
Engineers .....	1,122,000	907,400	873,300	34,000	16,600	198,000	169,200	28,800
Male .....	1,016,100	820,400	791,100	29,300	14,700	181,000	166,400	14,500
Female.....	105,900	86,900	82,200	4,700	1,900	17,100	2,800	14,300
White .....	969,900	772,800	743,200	29,600	13,600	183,500	160,500	23,000
Asian/Pacific Islander .....	80,400	70,600	68,200	2,400	1,300	8,600	4,900	3,600
Black .....	29,600	27,300	26,900	400	600	1,700	S	800
Hispanic.....	38,200	33,300	31,600	1,700	1,100	3,800	2,500	1,400
Other .....	3,900	3,400	3,400	S	S	400	400	S

## Individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and employment status: 1999

Degree and occupation	All individuals	Employed			Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time		Total	Retired	Not seeking job
<b>Master's</b>								
All S&E occupations.....	1,188,100	1,032,100	921,500	110,600	17,300	138,800	90,800	48,000
Male.....	853,800	751,200	705,200	46,000	11,900	90,800	74,100	16,700
Female.....	334,300	280,900	216,400	64,500	5,400	48,000	16,700	31,300
White.....	941,500	807,200	713,300	93,900	13,300	121,000	83,000	38,000
Asian/Pacific Islander.....	166,600	153,000	144,400	8,600	2,500	11,000	4,100	7,000
Black.....	39,600	35,900	31,400	4,600	700	3,000	2,000	1,000
Hispanic.....	37,300	32,800	29,600	3,100	800	3,700	1,700	2,000
Other.....	3,300	3,100	2,800	300	S	S	S	S
Scientists.....	752,300	655,500	559,900	95,700	9,700	87,000	51,000	36,000
Male.....	461,000	411,400	376,500	34,900	5,000	44,600	34,800	9,800
Female.....	291,300	244,200	183,400	60,800	4,700	42,400	16,300	26,200
White.....	598,400	516,000	433,500	82,500	7,200	75,200	46,200	29,100
Asian/Pacific Islander.....	99,300	91,100	85,100	5,900	1,500	6,700	2,100	4,600
Black.....	30,100	27,300	23,000	4,300	400	2,400	1,700	700
Hispanic.....	22,300	19,100	16,400	2,700	600	2,500	1,000	1,500
Other.....	2,200	2,100	1,800	300	S	S	S	S
Mathematical/computer scientists.....	393,700	354,100	323,200	30,900	4,700	34,900	22,900	12,000
Male.....	277,700	253,700	238,800	14,800	3,300	20,700	16,100	4,600
Female.....	116,000	100,500	84,400	16,100	1,400	14,200	6,800	7,400
White.....	290,400	256,200	230,600	25,600	3,600	30,600	20,800	9,800
Asian/Pacific Islander.....	76,700	72,900	70,000	2,900	1,000	2,700	1,100	1,600
Black.....	16,000	15,200	13,800	1,500	S	600	400	200
Hispanic.....	9,800	8,800	7,900	900	S	900	S	300
Other.....	900	900	800	S	S	S	S	S
Life and related scientists.....	86,700	72,500	64,500	8,100	1,300	12,900	6,600	6,200
Male.....	50,700	44,000	41,100	3,000	400	6,300	4,800	1,400
Female.....	36,000	28,500	23,400	5,100	800	6,600	1,800	4,800
White.....	72,000	61,200	54,200	7,000	1,000	9,800	5,200	4,600
Asian/Pacific Islander.....	8,900	7,100	6,500	500	S	1,600	S	1,100
Black.....	3,100	2,200	1,900	S	S	900	S	S
Hispanic.....	2,400	1,800	1,600	200	S	500	S	400
Other.....	300	300	S	S	S	S	S	S
Physical and related scientists.....	88,500	73,000	63,800	9,100	1,400	14,100	9,600	4,500
Male.....	65,200	53,700	48,800	4,900	600	10,900	8,500	2,400
Female.....	23,200	19,300	15,100	4,200	800	3,200	1,100	2,100
White.....	75,100	62,300	54,500	7,800	600	12,200	9,200	3,000
Asian/Pacific Islander.....	8,800	7,100	6,100	900	S	1,500	S	1,400
Black.....	2,100	1,800	1,600	200	S	S	S	S
Hispanic.....	2,100	1,400	1,300	S	S	S	S	S
Other.....	400	400	300	S	S	S	S	S

## Individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and employment status: 1999

Degree and occupation	All individuals	Employed				Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time	Total		Retired	Not seeking job	
Social and related scientists.....	183,400	155,900	108,400	47,500	2,300	25,200	11,900	13,300	
Male.....	67,400	60,000	47,800	12,200	600	6,700	5,300	1,500	
Female.....	116,100	95,900	60,500	35,300	1,700	18,400	6,600	11,800	
White.....	160,800	136,200	94,100	42,100	2,000	22,700	10,900	11,700	
Asian/Pacific Islander.....	5,000	4,000	2,400	1,600	S	800	S	500	
Black.....	8,900	8,100	5,800	2,200	S	800	S	S	
Hispanic.....	8,000	7,100	5,600	1,500	S	800	S	700	
Other.....	600	500	400	S	S	S	S	S	
Engineers.....	435,900	376,500	361,700	14,900	7,600	51,800	39,800	12,000	
Male.....	392,800	339,800	328,700	11,100	6,900	46,200	39,300	6,800	
Female.....	43,000	36,700	33,000	3,800	700	5,600	S	5,200	
White.....	343,100	291,300	279,800	11,400	6,100	45,700	36,800	8,900	
Asian/Pacific Islander.....	67,300	62,000	59,300	2,700	1,000	4,300	2,000	2,400	
Black.....	9,500	8,600	8,300	300	300	600	S	300	
Hispanic.....	15,000	13,600	13,200	400	S	1,200	700	500	
Other.....	1,000	1,000	1,000	S	S	S	S	S	
Doctoral									
All S&E occupations.....	547,800	484,100	447,100	37,000	5,800	57,900	48,000	9,900	
Male.....	418,200	368,900	349,600	19,200	4,000	45,300	42,000	3,400	
Female.....	129,600	115,200	97,500	17,700	1,700	12,600	6,100	6,600	
White.....	438,000	381,600	349,100	32,500	4,500	51,900	43,500	8,300	
Asian/Pacific Islander.....	81,900	77,000	74,800	2,200	1,000	3,900	2,900	1,000	
Black.....	11,900	11,000	10,000	1,000	100	800	500	300	
Hispanic.....	14,200	12,900	11,700	1,200	100	1,100	900	200	
Other.....	1,800	1,600	1,500	100	S	200	200	S	
Scientists.....	452,200	399,900	366,100	33,800	4,100	48,200	39,000	9,200	
Male.....	329,500	290,900	274,400	16,400	2,700	36,000	33,100	2,900	
Female.....	122,700	109,100	91,700	17,400	1,400	12,200	5,900	6,300	
White.....	372,000	325,100	295,400	29,700	3,400	43,500	35,700	7,800	
Asian/Pacific Islander.....	56,500	53,100	51,100	1,900	400	3,000	2,000	1,000	
Black.....	10,200	9,300	8,300	1,000	100	700	500	200	
Hispanic.....	11,900	11,000	9,900	1,100	100	800	700	200	
Other.....	1,700	1,500	1,300	100	S	200	200	S	
Mathematical/computer scientists.....	72,800	67,100	63,000	4,100	500	5,300	4,400	900	
Male.....	59,400	54,900	52,300	2,600	400	4,200	3,500	600	
Female.....	13,400	12,200	10,700	1,500	100	1,100	800	300	
White.....	54,200	49,500	46,300	3,100	400	4,300	3,600	700	
Asian/Pacific Islander.....	15,100	14,500	14,000	400	S	600	400	200	

## Individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and employment status: 1999

Degree and occupation	All individuals	Employed			Unemployed, seeking job	Not in labor force		
		Total	Full time	Part time		Total	Retired	Not seeking job
Black .....	1,500	1,400	1,000	400	S	100	S	S
Hispanic.....	1,900	1,600	1,600	S	S	300	300	S
Other .....	100	S	S	S	S	S	S	S
Life and related scientists .....	137,500	121,100	115,300	5,800	1,200	15,200	12,000	3,200
Male .....	98,100	86,200	83,400	2,800	600	11,200	10,300	900
Female.....	39,400	34,900	31,900	3,000	600	4,000	1,700	2,300
White .....	110,300	95,600	91,000	4,600	1,000	13,800	11,100	2,700
Asian/Pacific Islander .....	20,700	19,500	18,900	500	200	1,100	700	400
Black .....	2,200	2,100	1,900	200	S	100	S	S
Hispanic.....	3,800	3,500	3,100	400	100	300	200	100
Other .....	500	400	400	S	S	S	S	S
Physical and related scientists .....	99,000	84,900	80,500	4,400	1,500	12,700	11,000	1,700
Male .....	86,000	73,700	70,200	3,500	1,300	11,000	10,300	700
Female.....	13,000	11,200	10,300	900	100	1,700	700	1,000
White .....	82,200	69,200	65,400	3,800	1,200	11,800	10,300	1,400
Asian/Pacific Islander .....	13,300	12,300	11,900	400	200	800	500	300
Black .....	1,300	1,200	1,200	100	S	S	S	S
Hispanic.....	1,900	1,800	1,700	100	S	100	100	S
Other .....	300	300	300	S	S	S	S	S
Social and related scientists.....	142,800	126,900	107,300	19,600	900	15,000	11,600	3,300
Male .....	85,900	76,100	68,500	7,600	300	9,500	8,900	700
Female.....	56,800	50,800	38,800	12,000	600	5,400	2,700	2,700
White .....	125,300	110,800	92,700	18,100	800	13,700	10,700	3,000
Asian/Pacific Islander .....	7,300	6,800	6,200	500	S	500	400	100
Black .....	5,100	4,500	4,200	300	100	600	400	100
Hispanic.....	4,300	4,100	3,500	600	S	100	100	100
Other .....	700	700	600	100	S	S	S	S
Engineers.....	95,600	84,200	81,000	3,200	1,700	9,700	9,000	700
Male.....	88,700	78,000	75,200	2,800	1,300	9,300	8,900	400
Female.....	6,900	6,200	5,800	400	400	400	S	300
White .....	66,000	56,500	53,700	2,800	1,100	8,400	7,900	500
Asian/Pacific Islander .....	25,400	23,900	23,700	200	600	900	900	100
Black.....	1,800	1,700	1,600	S	S	S	S	S
Hispanic.....	2,200	1,900	1,900	100	S	300	300	S
Other.....	200	100	100	S	S	S	S	S

S suppressed for reasons of confidentiality and/or data reliability

\*Includes professional degrees.

NOTE: For unemployed individuals, occupation is for previous reported job.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.



**Median annual salaries of U.S. individuals in S&E occupations, by highest degree, occupation, sex, race/ethnicity, and years since degree: 1999**

(Dollars)

Degree, occupation, sex, and race/ethnicity	Employed individuals	Years since highest degree							
		Less than 5	5–9	10–14	15–19	20–24	25–29	30–34	35 or more
<b>All degree levels<sup>a</sup></b>									
All S&E occupations.....	60,000	46,000	57,000	64,000	69,000	70,000	70,600	72,000	70,000
Male.....	64,000	48,800	60,000	66,000	70,000	70,700	72,100	74,000	70,100
Female.....	50,000	40,000	50,000	57,000	60,000	58,700	60,000	57,000	52,000
White.....	61,000	45,000	56,000	65,000	70,000	70,000	71,000	73,000	70,000
Asian/Pacific Islander.....	62,000	53,000	63,000	68,000	70,000	72,000	70,000	67,200	64,800
Black.....	53,000	45,000	54,000	55,000	60,000	58,000	53,000	53,000	46,500
Hispanic.....	55,000	44,000	56,000	58,000	65,000	61,000	68,500	67,000	68,000
Other.....	52,000	42,000	50,000	57,000	55,000	65,000	75,000	88,000	S
Scientists.....	58,800	43,000	54,500	62,000	65,300	65,000	67,600	68,100	65,000
Male.....	62,000	47,800	58,500	65,900	70,000	68,000	70,000	71,000	70,000
Female.....	50,000	37,000	48,000	55,000	58,100	58,000	60,000	56,000	49,000
White.....	59,700	41,000	53,000	62,000	65,000	65,000	68,000	70,000	69,000
Asian/Pacific Islander.....	60,000	54,000	63,000	67,000	73,000	69,000	67,500	60,000	58,200
Black.....	50,000	44,000	50,000	51,500	58,000	55,600	50,000	50,000	46,500
Hispanic.....	51,000	41,000	56,000	56,000	65,000	56,000	60,000	54,500	55,000
Other.....	45,000	38,000	47,500	50,000	36,000	54,000	74,200	70,000	S
Mathematical/computer scientists.....	64,000	55,000	62,000	66,000	69,000	70,000	70,000	69,000	64,000
Male.....	65,900	55,000	64,000	70,000	71,000	71,000	72,000	70,000	65,000
Female.....	58,000	50,000	57,000	58,400	60,000	60,000	63,000	62,000	58,000
White.....	65,000	53,000	60,000	67,000	68,600	70,000	70,000	69,200	65,000
Asian/Pacific Islander.....	65,000	60,000	70,000	70,000	75,000	70,000	62,000	69,100	59,000
Black.....	54,000	49,000	54,000	53,700	60,000	57,000	48,000	34,500	S
Hispanic.....	59,000	51,000	65,000	58,600	68,000	59,000	60,000	S	S
Other.....	54,000	54,000	30,000	60,000	S	S	S	S	S
Life and related scientists.....	47,700	29,000	43,000	52,800	60,000	56,000	63,000	61,000	72,100
Male.....	51,000	30,000	45,000	53,000	61,000	60,000	67,000	69,000	73,500
Female.....	39,000	28,100	40,000	49,800	55,000	52,000	50,600	46,000	40,000
White.....	49,000	28,100	42,000	53,000	60,000	58,000	63,000	61,000	72,100
Asian/Pacific Islander.....	43,000	30,000	44,700	50,400	76,000	54,000	80,000	68,000	58,200
Black.....	42,000	30,000	49,000	48,000	44,000	41,500	57,000	30,900	S
Hispanic.....	35,500	25,000	40,000	48,000	40,000	28,500	34,000	80,000	S
Other.....	39,000	35,000	43,000	87,000	43,000	43,100	S	S	S
Physical and related scientists.....	52,000	35,000	46,000	60,000	63,800	62,500	65,000	73,000	60,000
Male.....	56,000	35,000	47,500	60,000	65,000	68,000	66,000	75,000	74,000
Female.....	41,400	33,300	43,000	49,000	51,000	55,000	50,000	50,000	49,000
White.....	52,300	34,000	46,000	60,000	65,000	65,000	65,000	79,800	69,000
Asian/Pacific Islander.....	53,400	40,000	50,000	65,000	65,000	68,000	85,000	54,000	52,000
Black.....	43,000	30,000	45,000	43,000	41,700	38,000	43,000	S	S
Hispanic.....	43,000	30,000	37,000	51,000	50,000	48,000	89,500	79,000	S
Other.....	49,000	32,500	60,000	S	39,000	80,000	S	S	S

## Median annual salaries of U.S. individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and years since degree: 1999

(Dollars)

Degree, occupation, sex, and race/ethnicity	Employed individuals	Years since highest degree							
		Less than 5	5-9	10-14	15-19	20-24	25-29	30-34	35 or more
Social and related scientists.....	47,000	33,000	42,000	50,000	60,000	60,000	63,000	64,000	62,000
Male.....	54,000	35,000	46,000	56,000	66,000	62,000	64,500	61,000	65,000
Female.....	40,000	32,000	39,000	45,000	52,000	58,000	62,000	64,000	40,000
White.....	48,000	32,500	42,000	51,000	60,000	59,000	63,000	64,000	65,000
Asian/Pacific Islander.....	48,000	36,000	49,400	65,000	66,000	68,000	60,000	75,000	S
Black.....	40,000	30,000	35,000	45,000	48,000	59,000	30,000	S	S
Hispanic.....	40,000	35,600	46,000	45,000	45,000	45,000	75,000	S	S
Other.....	49,000	45,000	50,000	50,000	55,000	53,000	S	S	S
Engineers.....	65,000	49,000	60,000	65,000	70,900	73,000	75,000	75,000	71,700
Male.....	65,000	50,000	60,000	66,000	72,000	74,000	76,000	75,000	73,000
Female.....	55,500	47,000	58,000	64,000	60,000	60,000	65,000	73,000	68,100
White.....	65,000	48,900	59,800	66,000	72,000	73,000	76,800	75,000	71,700
Asian/Pacific Islander.....	64,400	52,000	63,200	68,000	69,600	75,000	70,200	70,000	69,000
Black.....	58,000	48,000	60,000	59,300	65,000	65,000	70,000	S	S
Hispanic.....	58,000	47,000	56,000	60,000	65,000	75,000	72,000	67,000	80,000
Other.....	60,000	44,000	52,000	63,000	S	73,000	S	S	S
Bachelor's									
All S&E occupations.....	59,000	43,000	53,000	61,000	67,000	65,600	69,000	70,000	66,000
Male.....	60,000	45,000	55,000	63,000	68,600	68,400	70,000	70,000	67,200
Female.....	50,000	38,000	47,800	56,900	58,000	55,600	55,000	56,000	58,000
White.....	60,000	42,000	53,000	62,000	67,500	67,000	69,500	70,000	67,000
Asian/Pacific Islander.....	58,000	45,000	55,000	60,000	66,000	69,000	62,000	60,000	60,000
Black.....	50,600	44,000	50,000	54,000	60,000	56,000	53,000	53,000	63,400
Hispanic.....	53,500	42,600	53,000	57,000	64,000	59,000	60,000	60,000	68,000
Other.....	46,000	36,000	47,500	57,000	60,000	73,000	S	S	S
Scientists.....	55,000	40,000	50,000	60,000	63,800	62,000	64,000	61,800	59,000
Male.....	60,000	44,000	54,000	64,200	66,000	65,000	65,000	65,000	63,400
Female.....	48,000	33,300	45,000	55,200	57,000	55,000	51,600	55,000	52,000
White.....	56,000	40,000	50,000	60,700	65,000	62,700	64,700	64,000	62,000
Asian/Pacific Islander.....	55,000	45,500	53,000	63,000	61,000	68,600	62,000	54,000	50,000
Black.....	48,000	42,000	45,000	50,000	58,000	55,000	50,000	50,000	S
Hispanic.....	50,000	40,000	56,000	57,000	58,000	55,000	50,000	S	S
Other.....	36,000	33,000	S	40,500	35,000	S	S	S	S

## Median annual salaries of U.S. individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and years since degree: 1999

(Dollars)

Degree, occupation, sex, and race/ethnicity	Employed individuals	Years since highest degree							
		Less than 5	5-9	10-14	15-19	20-24	25-29	30-34	35 or more
Mathematical/computer scientists.....	60,800	50,000	59,000	65,000	66,000	68,000	67,600	66,000	63,400
Male.....	64,000	50,000	60,000	67,000	70,000	70,000	69,000	70,000	65,000
Female.....	56,000	47,000	54,000	58,000	60,000	58,700	62,000	64,000	58,000
White.....	62,200	50,000	60,000	65,000	67,000	70,000	68,000	68,000	64,000
Asian/Pacific Islander.....	60,000	53,000	58,200	63,000	70,000	70,000	62,000	60,000	S
Black.....	50,000	45,000	50,000	53,000	58,000	60,000	48,000	S	S
Hispanic.....	57,000	47,800	64,800	57,000	66,000	62,000	S	S	S
Other.....	35,000	45,000	S	S	S	S	S	S	S
Life and related scientists.....	37,000	25,000	36,000	40,000	47,500	45,000	50,000	50,000	55,000
Male.....	41,500	25,000	36,000	45,000	46,700	45,000	51,800	54,000	S
Female.....	33,600	24,000	35,000	36,000	47,500	48,000	34,000	36,000	S
White.....	38,000	25,000	36,000	41,000	48,000	48,000	50,000	51,000	55,000
Asian/Pacific Islander.....	35,000	26,000	35,000	S	S	42,000	S	S	S
Black.....	36,000	28,000	S	S	S	S	S	S	S
Hispanic.....	28,500	19,500	S	S	S	S	S	S	S
Other.....	36,000	S	S	S	S	S	S	S	S
Physical and related scientists.....	45,000	30,000	40,000	52,000	53,400	55,000	60,000	56,500	52,000
Male.....	47,000	28,000	40,000	52,500	55,000	55,000	62,000	68,000	52,000
Female.....	38,000	31,000	36,000	47,500	50,000	55,000	40,700	50,000	S
White.....	45,000	30,000	40,000	52,000	55,000	55,000	60,000	70,000	50,000
Asian/Pacific Islander.....	41,400	36,000	40,000	S	40,000	55,000	S	52,800	S
Black.....	43,000	29,000	45,000	36,000	S	S	S	S	S
Hispanic.....	37,000	29,000	36,000	S	S	44,000	S	S	S
Other.....	S	S	S	S	S	S	S	S	S
Social and related scientists.....	30,000	27,500	28,000	48,000	70,000	45,000	36,000	S	S
Male.....	35,000	26,500	26,000	S	70,000	S	35,000	S	S
Female.....	29,700	28,000	28,000	37,000	S	45,000	S	S	S
White.....	30,000	26,400	28,000	48,000	80,000	45,000	36,000	S	S
Asian/Pacific Islander.....	30,000	30,000	S	S	S	S	S	S	S
Black.....	30,000	18,000	S	S	S	S	S	S	S
Hispanic.....	27,000	26,000	S	S	S	S	S	S	S
Other.....	S	S	S	S	S	S	S	S	S
Engineers.....	60,000	45,000	55,000	62,000	70,000	70,000	72,000	72,000	69,000
Male.....	62,000	45,000	55,000	62,000	70,000	70,000	72,000	72,000	70,000
Female.....	52,000	45,000	54,000	60,500	60,000	60,000	65,000	S	68,100
White.....	62,000	45,000	55,000	63,000	70,000	70,000	73,000	73,000	70,000
Asian/Pacific Islander.....	59,100	45,000	58,000	60,000	66,000	69,000	60,300	65,000	64,800
Black.....	56,000	45,000	57,000	59,300	64,000	63,000	70,000	S	S
Hispanic.....	56,000	45,000	53,000	58,000	64,000	70,000	68,500	60,000	70,500
Other.....	60,000	40,000	60,000	63,000	S	73,000	S	S	S

## Median annual salaries of U.S. individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and years since degree: 1999

(Dollars)

Degree, occupation, sex, and race/ethnicity	Employed individuals	Years since highest degree							
		Less than 5	5-9	10-14	15-19	20-24	25-29	30-34	35 or more
<b>Master's</b>									
All S&E occupations.....	64,000	52,500	63,000	69,100	71,600	72,000	75,000	72,000	77,000
Male.....	68,000	56,000	65,000	70,000	75,000	74,000	75,000	75,000	80,000
Female.....	50,000	42,000	54,000	54,800	56,000	58,000	61,000	56,000	41,000
White.....	64,400	50,000	61,600	69,100	72,000	72,000	75,000	72,000	76,000
Asian/Pacific Islander.....	65,300	58,000	70,000	75,000	75,000	72,000	70,700	73,000	89,900
Black.....	54,000	50,000	65,000	51,000	59,000	58,000	30,000	S	S
Hispanic.....	58,000	50,000	62,000	61,000	72,000	60,000	72,400	67,000	S
Other.....	54,000	54,000	54,000	73,800	S	S	S	S	S
Scientists.....	60,000	49,500	60,000	63,000	65,000	62,000	68,000	64,000	59,700
Male.....	63,900	55,000	64,000	67,900	72,000	68,000	70,000	69,000	72,100
Female.....	48,000	39,200	49,000	50,000	55,000	58,000	61,000	56,000	41,000
White.....	58,000	44,000	56,000	61,000	65,000	63,500	68,000	64,000	59,700
Asian/Pacific Islander.....	65,000	60,000	70,000	70,000	75,000	60,000	60,000	56,000	S
Black.....	50,000	48,000	62,000	45,000	55,900	54,000	30,000	S	S
Hispanic.....	51,000	43,000	58,000	55,000	65,000	52,000	S	S	S
Other.....	52,500	52,500	55,000	S	S	S	S	S	S
Mathematical/computer scientists.....	68,000	60,000	68,000	72,000	75,000	71,000	75,000	65,000	74,000
Male.....	70,000	62,000	70,000	75,000	80,000	75,000	76,000	70,000	72,000
Female.....	61,000	57,000	62,000	62,700	69,600	63,000	67,000	62,000	S
White.....	68,000	60,000	65,000	70,600	75,000	74,000	75,400	65,000	74,000
Asian/Pacific Islander.....	70,000	62,000	75,000	77,000	80,000	61,000	60,000	60,000	S
Black.....	60,000	54,800	72,000	63,000	63,900	54,000	S	S	S
Hispanic.....	66,000	65,000	75,000	74,000	76,000	52,000	S	S	S
Other.....	55,000	S	S	S	S	S	S	S	S
Life and related scientists.....	43,800	33,000	42,000	41,300	52,000	50,000	54,000	49,300	58,000
Male.....	46,000	30,000	42,000	40,000	52,000	52,000	54,000	51,000	S
Female.....	41,000	34,000	41,000	49,700	50,000	49,000	51,000	46,000	S
White.....	45,000	32,000	40,000	41,300	56,000	49,000	54,000	49,300	S
Asian/Pacific Islander.....	41,000	35,000	42,800	40,000	S	52,000	S	S	S
Black.....	42,000	34,000	50,000	S	44,000	S	S	S	S
Hispanic.....	40,000	28,000	40,000	S	S	S	S	S	S
Other.....	S	S	S	S	S	S	S	S	S
Physical and related scientists.....	52,000	36,000	52,000	62,200	63,000	69,000	62,300	73,000	45,000
Male.....	58,000	35,000	54,000	65,000	70,000	70,000	65,000	73,000	69,000
Female.....	42,400	36,000	46,000	52,000	41,000	42,400	57,000	S	S
White.....	55,000	36,000	55,000	62,200	65,000	69,000	62,300	79,800	45,000
Asian/Pacific Islander.....	50,000	43,000	46,000	63,000	51,000	S	S	55,000	S
Black.....	44,700	33,000	44,700	S	S	S	S	S	S
Hispanic.....	36,000	32,000	55,000	S	S	S	S	S	S
Other.....	50,000	S	S	S	S	S	S	S	S

## Median annual salaries of U.S. individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and years since degree: 1999

(Dollars)

Degree, occupation, sex, and race/ethnicity	Employed individuals	Years since highest degree							
		Less than 5	5-9	10-14	15-19	20-24	25-29	30-34	35 or more
Social and related scientists .....	41,000	32,000	40,000	45,000	46,000	50,000	60,000	64,000	80,000
Male .....	47,500	32,500	39,000	50,000	53,000	50,000	60,000	50,000	80,000
Female .....	38,000	31,000	40,000	41,000	46,000	51,400	60,000	64,000	S
White .....	42,000	30,000	39,000	46,000	50,000	50,000	60,000	64,000	80,000
Asian/Pacific Islander .....	48,000	36,000	35,000	S	S	S	S	S	S
Black .....	35,000	29,000	37,500	45,000	40,000	58,000	S	S	S
Hispanic .....	42,000	38,000	46,000	42,000	S	S	S	S	S
Other .....	40,000	S	S	S	S	S	S	S	S
Engineers .....	70,000	56,000	66,000	74,000	78,000	79,000	80,000	84,000	95,000
Male .....	70,000	56,000	67,000	75,000	78,000	79,000	80,000	84,000	95,000
Female .....	61,000	55,000	65,000	70,000	70,000	76,600	S	S	S
White .....	71,000	57,000	67,000	75,000	79,000	79,100	82,000	82,500	100,000
Asian/Pacific Islander .....	68,000	55,000	65,000	75,000	70,000	78,000	75,000	95,000	90,000
Black .....	62,000	54,000	65,000	59,000	78,000	105,000	S	S	S
Hispanic .....	62,000	54,100	65,000	66,000	78,000	75,800	72,400	S	S
Other .....	60,000	57,500	50,000	S	S	S	S	S	S
Doctoral									
All S&E occupations .....	68,000	50,000	61,500	68,000	75,000	78,000	80,000	85,500	85,000
Male .....	71,000	54,000	65,000	70,000	78,000	80,000	82,000	86,000	87,000
Female .....	55,000	42,000	55,000	58,800	65,500	69,000	72,000	75,000	70,000
White .....	68,000	48,000	60,000	67,000	75,000	78,000	80,000	86,000	85,000
Asian/Pacific Islander .....	70,000	58,000	67,000	73,000	80,000	85,000	84,000	85,000	104,000
Black .....	60,000	45,000	56,800	67,000	67,000	65,000	69,000	76,000	84,000
Hispanic .....	58,000	40,000	56,000	60,000	67,000	80,000	77,000	85,000	S
Other .....	56,000	44,000	49,000	53,000	65,000	80,000	78,000	S	S
Scientists .....	65,000	44,000	58,000	65,000	72,000	75,000	77,300	83,400	85,000
Male .....	68,000	46,000	60,000	68,000	75,000	76,000	78,000	84,000	85,000
Female .....	55,000	40,800	53,000	57,900	64,900	67,500	72,000	75,000	70,000
White .....	65,000	43,200	57,000	65,000	72,000	75,000	77,000	84,000	84,000
Asian/Pacific Islander .....	64,000	50,000	60,000	70,000	78,000	80,000	80,000	80,000	104,000
Black .....	60,000	44,000	52,000	67,000	66,000	61,000	69,000	76,000	84,000
Hispanic .....	56,000	38,000	55,000	56,000	65,000	77,000	76,000	82,500	S
Other .....	55,000	43,000	49,000	53,000	65,000	80,000	68,500	S	S
Mathematical/computer scientists .....	71,200	60,000	70,000	75,000	75,000	76,000	78,600	80,000	80,000
Male .....	75,000	64,000	74,000	75,000	78,000	78,000	79,000	80,500	80,000
Female .....	62,000	54,000	65,000	70,000	66,800	70,000	68,000	80,000	S
White .....	71,500	55,500	70,000	74,400	71,000	76,000	79,000	81,000	80,000
Asian/Pacific Islander .....	73,000	68,000	70,000	77,000	80,000	80,000	73,000	80,000	S

## Median annual salaries of U.S. individuals in S&amp;E occupations, by highest degree, occupation, sex, race/ethnicity, and years since degree: 1999

(Dollars)

Degree, occupation, sex, and race/ethnicity	Employed individuals	Years since highest degree							
		Less than 5	5-9	10-14	15-19	20-24	25-29	30-34	35 or more
Black .....	71,000	58,200	71,000	74,000	78,000	65,000	63,000	S	S
Hispanic.....	60,800	65,000	60,800	57,400	65,500	58,000	72,000	S	S
Other .....	60,500	62,000	S	S	S	S	S	S	S
Life and related scientists .....	62,000	34,000	54,000	65,000	74,000	76,000	80,000	86,000	85,000
Male .....	65,000	34,000	55,000	67,000	75,000	78,000	80,000	85,000	86,000
Female.....	53,000	33,000	53,000	60,000	65,000	68,000	80,000	89,100	63,000
White .....	64,600	35,000	55,000	65,800	73,200	75,000	80,000	86,900	85,000
Asian/Pacific Islander .....	54,300	31,000	53,800	61,500	78,000	80,000	80,000	85,000	110,000
Black .....	51,000	35,000	48,000	64,800	62,000	76,000	69,000	S	S
Hispanic.....	58,000	35,000	60,000	60,400	80,000	85,000	85,000	95,000	S
Other .....	56,000	35,000	54,300	87,000	65,000	63,000	S	S	S
Physical and related scientists .....	70,000	50,000	62,000	67,000	80,000	83,000	78,000	87,500	92,000
Male .....	71,000	50,000	62,000	70,000	80,000	83,000	78,000	88,000	94,000
Female.....	61,000	50,000	63,800	53,000	80,000	80,000	77,200	60,000	83,000
White .....	70,400	48,000	63,000	67,000	80,000	83,000	79,000	88,000	90,000
Asian/Pacific Islander .....	67,000	58,000	66,100	72,800	76,000	85,000	79,000	60,000	104,000
Black .....	58,000	42,000	42,900	67,000	70,500	73,000	75,000	S	S
Hispanic.....	63,000	38,000	61,500	67,000	67,000	85,000	63,000	79,000	S
Other .....	61,000	56,000	52,000	S	S	80,000	S	S	S
Social and related scientists.....	60,000	44,000	53,000	60,000	67,000	69,400	71,100	75,000	80,000
Male .....	63,500	45,800	55,700	63,000	70,000	70,500	73,000	75,000	80,900
Female.....	52,000	42,000	50,000	55,000	60,000	64,000	65,000	70,400	75,000
White .....	60,000	43,500	54,000	59,000	68,000	69,700	71,000	72,500	80,000
Asian/Pacific Islander .....	57,000	45,000	50,000	72,000	60,000	77,000	78,000	75,000	S
Black .....	60,000	45,000	50,000	67,000	62,300	60,000	80,000	S	S
Hispanic.....	50,900	38,900	51,000	48,000	55,000	77,000	77,000	S	S
Other .....	53,000	44,000	49,000	53,000	55,000	80,000	S	S	S
Engineers .....	79,000	65,000	75,000	78,700	85,000	90,000	94,000	96,000	91,000
Male.....	80,000	67,000	75,000	80,000	85,000	90,000	94,000	96,000	91,000
Female.....	68,000	58,000	72,000	72,000	85,000	90,900	70,000	S	S
White .....	80,000	66,000	75,000	80,000	85,000	90,000	95,000	94,000	91,000
Asian/Pacific Islander .....	77,000	68,000	75,000	75,000	88,000	92,000	85,000	110,000	100,000
Black.....	67,000	62,000	75,000	74,000	78,000	84,500	75,500	S	S
Hispanic.....	65,000	54,000	68,000	71,000	85,000	100,000	S	S	S
Other.....	80,000	67,000	S	S	S	S	S	S	S

S suppressed for reasons of confidentiality and/or data reliability

\*Includes professional degrees.

NOTES: Median annual salaries are for full-time employment. Very large or very small values may reflect very small cell sizes and should be interpreted with caution.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

Appendix table 3-16

**Employed U.S. scientists and engineers, by highest degree attained, occupation, sex, and race/ethnicity: 1999**

Degree and occupation	Employed individuals	Sex		Race/ethnicity				
		Male	Female	White	Black	Hispanic	Asian/Pacific Islander	Other
<b>All degree levels<sup>a</sup></b>								
All S&E occupations.....	3,540,800	2,705,000	835,800	2,896,600	121,600	120,900	390,500	11,300
Scientists .....	2,170,500	1,464,800	705,800	1,774,200	84,000	71,800	233,900	6,700
Mathematical/computer scientists.....	1,167,400	850,600	316,700	922,200	51,400	37,600	153,600	2,700
Life/related scientists .....	341,900	217,500	124,400	285,100	6,600	10,900	37,700	1,600
Physical/related scientists .....	297,900	229,400	68,400	252,500	8,800	7,800	27,800	900
Social/related scientists .....	363,400	167,300	196,200	314,400	17,200	15,500	14,800	1,500
Engineers .....	1,370,300	1,240,200	130,000	1,122,400	37,700	49,100	156,600	4,600
<b>Bachelor's</b>								
S&E occupations .....	1,994,400	1,564,700	429,700	1,680,900	73,900	74,800	158,300	6,600
Scientists .....	1,087,100	744,300	342,800	908,100	46,600	41,500	87,700	3,100
Mathematical/computer scientists.....	740,500	538,900	201,600	612,200	34,200	27,000	65,400	1,700
Life/related scientists .....	135,500	76,900	58,600	117,100	2,000	5,700	9,800	900
Physical/related scientists.....	139,600	101,700	38,000	120,600	5,800	4,600	8,400	S
Social/related scientists .....	71,400	26,800	44,600	58,300	4,600	4,200	4,000	S
Engineers.....	907,400	820,400	86,900	772,800	27,300	33,300	70,600	3,400
<b>Master's</b>								
S&E occupations .....	1,032,100	751,200	280,900	807,200	35,900	32,800	153,000	3,100
Scientists .....	655,500	411,400	244,200	516,000	27,300	19,100	91,100	2,100
Mathematical/computer scientists.....	354,100	253,700	100,500	256,200	15,200	8,800	72,900	900
Life/related scientists.....	72,500	44,000	28,500	61,200	2,200	1,800	7,100	300
Physical/related scientists.....	73,000	53,700	19,300	62,300	1,800	1,400	7,100	400
Social/related scientists .....	155,900	60,000	95,900	136,200	8,100	7,100	4,000	500
Engineers.....	376,500	339,800	36,700	291,300	8,600	13,600	62,000	1,000
<b>Doctoral</b>								
S&E occupations .....	484,100	368,900	115,200	381,600	11,000	12,900	77,000	1,600
Scientists .....	399,900	290,900	109,100	325,100	9,300	11,000	53,100	1,500
Mathematical/computer scientists.....	67,100	54,900	12,200	49,500	1,400	1,600	14,500	S
Life/related scientists.....	121,100	86,200	34,900	95,600	2,100	3,500	19,500	400
Physical/related scientists.....	84,900	73,700	11,200	69,200	1,200	1,800	12,300	300
Social/related scientists .....	126,900	76,100	50,800	110,800	4,500	4,100	6,800	700
Engineers.....	84,200	78,000	6,200	56,500	1,700	1,900	23,900	100

S suppressed for reasons of confidentiality and/or data reliability

<sup>a</sup>Includes professional degrees.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

Appendix table 3-17

**Employment status and salaries of 1997 and 1998 bachelor's and master's degree recipients, by degree field: 1999**

Degree and field	All degree holders	Full-time student	Not full-time student			Median salary for full-time employed <sup>a</sup>
			Employed in S&E	Employed in other occupation	Not employed	
<b>Bachelor's</b>						
All S&E fields .....	743,400	165,500	161,900	377,300	38,800	\$30,000
Sciences .....	628,800	150,800	83,100	359,300	35,500	28,000
Computer/information sciences .....	46,000	S	27,000	15,100	S	44,000
Life/related sciences .....	164,000	54,300	20,900	79,100	9,800	25,000
Agricultural/food sciences .....	15,700	3,200	S	10,000	0	27,000
Biological sciences .....	134,900	48,800	16,200	62,000	7,800	25,000
Environmental life sciences, including forestry .....	13,500	2,300	3,000	7,100	S	26,000
Mathematics/related sciences .....	23,700	4,800	3,900	13,900	S	30,000
Physical/related sciences .....	36,500	12,600	11,100	11,900	1,000	29,000
Chemistry, except biochemistry .....	20,100	7,900	6,300	5,500	S	29,000
Earth sciences, geology, and oceanography .....	8,700	1,900	2,500	4,000	S	26,000
Physics and astronomy .....	7,200	2,600	2,200	2,200	S	35,000
Other .....	600	S	S	S	S	S
Psychology .....	146,700	34,400	7,300	95,200	9,800	25,000
Social/related sciences .....	211,800	42,400	13,000	144,100	12,300	28,000
Economics .....	32,700	4,900	3,300	22,600	S	35,000
Political/related sciences .....	71,700	20,500	4,100	42,300	4,700	29,000
Sociology/anthropology .....	69,500	11,700	S	51,600	S	25,000
Other .....	37,900	5,300	S	27,600	2,800	26,000
Engineering .....	114,600	14,600	78,700	18,000	3,300	43,000
Aerospace/related .....	2,400	500	1,300	500	S	41,000
Chemical .....	12,400	1,900	8,500	1,600	S	45,000
Civil/architectural .....	20,200	2,500	14,200	2,800	S	37,000
Electrical, electronic, computer, and communications .....	34,200	4,000	25,500	4,200	S	46,000
Industrial .....	6,000	400	3,700	1,500	S	41,000
Mechanical .....	26,300	2,600	18,500	4,600	S	43,000
Other .....	13,200	2,700	7,200	2,800	S	40,000
<b>Master's</b>						
All S&E fields .....	157,000	32,100	71,800	46,300	6,800	\$46,000
Sciences .....	110,400	24,300	39,400	41,200	5,500	40,000
Computer/information sciences .....	20,000	1,600	14,200	3,700	S	58,000
Life/related sciences .....	16,600	4,900	5,000	6,000	S	34,000
Agricultural/food sciences .....	2,300	S	S	S	S	35,000
Biological sciences .....	11,600	4,300	3,400	3,600	S	34,000
Environmental life sciences, including forestry .....	2,600	S	S	1,400	S	36,000
Mathematics/related sciences .....	7,200	1,800	3,200	1,700	S	44,000
Physical and related sciences .....	9,100	2,900	4,100	1,600	S	42,000
Chemistry, except biochemistry .....	3,700	1,200	1,700	S	S	43,000
Earth sciences, geology, and oceanography .....	3,000	600	1,600	600	S	37,000
Physics and astronomy .....	2,300	1,100	800	S	S	40,000
Other .....	S	S	S	S	S	S
Psychology .....	30,000	6,900	7,700	13,200	2,200	32,000
Social/related sciences .....	27,500	6,200	5,100	14,900	1,300	40,000
Economics .....	4,300	1,300	S	1,600	S	45,000
Political/related sciences .....	9,400	1,900	1,600	5,600	S	40,000
Sociology/anthropology .....	4,300	1,400	S	1,700	S	31,000
Other .....	9,500	1,500	S	6,100	S	38,000
Engineering .....	46,700	7,900	32,500	5,100	1,300	55,000
Aerospace/related .....	1,500	400	800	S	S	50,000
Chemical .....	2,300	500	1,400	S	S	55,000
Civil/architectural .....	6,600	S	4,700	S	S	45,000
Electrical, electronic, computer, and communications .....	16,300	2,400	12,500	1,000	S	60,000
Industrial .....	3,600	S	2,400	S	S	55,000
Mechanical .....	6,800	1,100	4,900	S	S	51,000
Other .....	9,600	2,000	5,700	1,600	S	52,000

S suppressed for reasons of confidentiality and/or data reliability

<sup>a</sup>Salary data for self-employed individuals, full-time students, and people who worked at principal job less than 35 hours per week are not included. Salary data are for principal job only.

NOTE: Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, National Survey of Recent College Graduates, 1999.



## Individuals in labor force with S&amp;E highest degrees, by highest degree, degree field, sex, race/ethnicity, and age: 1999

Degree, field, sex, and race/ethnicity	Age (years)										
	All ages	Under 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65 or more
<b>All degree levels<sup>a</sup></b>											
All S&E fields .....	8,131,400	277,100	1,142,100	998,000	1,076,100	1,171,400	1,210,700	1,045,800	632,700	330,400	247,100
Male .....	5,307,200	118,600	613,400	630,200	701,700	770,100	805,500	736,500	468,600	262,300	200,300
Female .....	2,824,200	158,500	528,800	367,800	374,400	401,300	405,200	309,200	164,000	68,100	46,800
White .....	6,667,600	216,500	111,000	791,800	862,700	955,800	1,024,800	893,900	536,400	280,200	223,100
Asian/Pacific Islander .....	674,000	28,000	100,800	100,700	98,600	77,300	75,700	48,000	24,700	9,100	
Black .....	429,600	15,600	72,100	53,000	57,500	63,300	65,600	49,000	30,800	14,100	8,600
Hispanic .....	329,800	16,400	70,000	48,600	51,500	49,800	38,500	23,500	15,600	10,100	5,800
Other .....	30,300	600	6,700	3,700	3,700	3,900	4,500	3,700	1,900	1,300	400
<b>Sciences .....</b>	<b>6,163,800</b>	<b>238,100</b>	<b>920,500</b>	<b>743,200</b>	<b>748,400</b>	<b>847,600</b>	<b>974,900</b>	<b>821,400</b>	<b>481,600</b>	<b>225,100</b>	<b>162,900</b>
Male .....	3,527,200	89,400	433,100	410,200	415,100	482,400	581,400	518,400	321,700	158,700	116,800
Female .....	2,636,500	148,700	487,300	333,100	333,300	365,300	393,400	303,000	160,000	66,400	46,100
White .....	5,096,700	187,400	721,000	600,900	604,400	697,800	828,600	706,600	412,800	191,600	145,700
Asian/Pacific Islander .....	415,000	21,300	72,800	58,900	57,800	61,400	49,800	48,300	26,500	12,700	5,500
Black .....	375,100	14,300	62,200	44,200	47,800	51,700	61,300	44,100	28,600	12,800	8,000
Hispanic .....	251,600	14,500	58,600	36,300	35,600	33,700	31,400	19,200	12,000	6,900	3,400
Other .....	25,300	600	5,900	2,900	2,700	3,000	3,800	3,200	1,800	1,100	200
<b>Mathematics/computer sciences .....</b>	<b>1,058,900</b>	<b>24,100</b>	<b>115,600</b>	<b>155,600</b>	<b>195,100</b>	<b>165,100</b>	<b>148,400</b>	<b>133,200</b>	<b>75,100</b>	<b>33,700</b>	<b>13,100</b>
Male .....	717,900	15,800	77,000	106,600	127,400	110,800	99,700	92,800	52,400	26,100	9,400
Female .....	341,000	8,200	38,600	49,000	67,700	54,300	48,700	40,400	22,700	7,700	3,800
White .....	834,600	18,400	82,900	113,000	149,800	127,100	123,200	112,400	66,700	29,500	11,600
Asian/Pacific Islander .....	123,700	3,100	18,200	23,700	23,300	22,900	14,200	11,900	4,300	1,300	800
Black .....	61,300	1,600	8,900	11,700	12,700	8,000	7,100	5,900	2,800	2,000	600
Hispanic .....	34,800	1,000	4,700	6,500	8,600	6,300	3,400	2,400	900	800	S
Other .....	4,600	S	800	800	700	800	600	500	300	S	S
<b>Life/related sciences .....</b>	<b>1,311,700</b>	<b>57,500</b>	<b>197,800</b>	<b>139,400</b>	<b>155,600</b>	<b>209,100</b>	<b>216,200</b>	<b>163,500</b>	<b>100,200</b>	<b>43,300</b>	<b>29,200</b>
Male .....	764,200	20,400	95,700	74,900	83,100	121,200	131,900	113,300	67,900	33,100	22,700
Female .....	547,500	37,100	102,100	64,500	72,500	87,800	84,400	50,100	32,300	10,100	6,500
White .....	1,094,800	44,800	160,000	112,200	128,500	176,000	185,600	141,400	87,100	34,100	25,100
Asian/Pacific Islander .....	99,200	6,000	16,800	13,300	12,200	14,000	11,700	12,100	7,600	4,400	1,300
Black .....	61,700	3,500	8,600	6,300	8,200	11,100	11,000	6,100	3,500	1,900	1,600
Hispanic .....	50,800	3,200	11,100	6,800	6,000	7,600	7,400	3,100	2,000	2,500	1,100
Other .....	5,300	S	1,300	800	800	400	500	800	100	300	S
<b>Physical/related sciences .....</b>	<b>635,300</b>	<b>13,900</b>	<b>65,400</b>	<b>60,300</b>	<b>84,900</b>	<b>100,300</b>	<b>93,300</b>	<b>77,000</b>	<b>67,400</b>	<b>41,700</b>	<b>31,100</b>
Male .....	492,900	7,700	41,500	42,500	66,200	75,400	75,900	61,300	59,000	35,100	28,200
Female .....	142,400	6,100	24,000	17,800	18,700	24,900	17,400	15,600	8,400	6,600	2,900
White .....	532,700	11,800	54,100	48,900	69,000	85,100	78,800	63,500	56,900	36,500	28,000
Asian/Pacific Islander .....	58,300	800	5,500	6,600	9,400	9,400	8,200	8,300	6,000	2,900	1,300
Black .....	22,800	600	2,600	2,700	2,900	2,300	3,100	3,400	2,300	1,600	1,200
Hispanic .....	18,900	600	2,800	2,000	3,400	3,100	2,700	1,200	1,900	700	500
Other .....	2,600	S	300	200	300	500	500	500	200	S	S

Individuals in labor force with S&E highest degrees, by highest degree, degree field, sex, race/ethnicity, and age: 1999

Degree, field, sex, and race/ethnicity	Age (years)										
	All ages	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 or more
Social and related sciences.....	3,157,800	142,700	541,700	387,900	312,800	373,100	517,000	447,800	239,000	106,400	89,400
Male.....	1,552,100	45,500	219,000	186,100	138,300	174,900	274,000	250,900	142,300	64,500	56,600
Female.....	1,605,700	97,200	322,700	201,800	174,500	198,200	243,000	196,900	96,600	41,900	32,800
White.....	2,634,700	112,400	423,900	326,800	257,200	309,600	441,100	389,200	202,100	91,500	81,000
Asian/Pacific Islander.....	133,800	11,500	32,300	15,400	13,000	15,200	15,700	15,900	8,500	4,200	2,200
Black.....	229,300	8,600	42,100	23,600	24,100	30,300	40,100	28,700	19,900	7,200	4,600
Hispanic.....	147,100	9,700	40,000	21,000	17,600	16,700	17,900	12,500	7,200	2,900	1,600
Other.....	12,800	S	3,500	1,100	1,000	1,300	2,200	1,400	1,200	600	100
Engineering.....	1,967,600	39,000	221,700	254,800	327,700	323,800	235,900	224,300	151,000	105,300	84,200
Male.....	1,780,000	29,200	180,200	220,100	286,600	287,700	224,100	218,100	147,000	103,500	83,400
Female.....	187,700	9,800	41,500	34,700	41,100	36,100	11,800	6,200	4,100	1,800	700
White.....	1,570,900	29,000	161,500	191,000	258,400	258,000	196,100	187,300	123,600	88,600	77,400
Asian/Pacific Islander.....	258,900	6,700	38,200	41,900	42,900	37,200	27,500	27,500	21,500	12,000	3,600
Black.....	54,500	1,300	9,900	8,800	9,600	11,600	4,300	4,800	2,300	1,300	600
Hispanic.....	78,200	1,900	11,400	12,300	15,900	16,100	7,200	4,300	3,600	3,200	2,400
Other.....	5,100	S	800	800	1,000	800	700	500	100	S	S
Bachelor's											
All S&E.....	5,982,400	273,600	1,013,200	767,000	795,100	847,800	861,600	694,700	368,400	197,400	163,500
Male.....	3,827,100	117,000	538,300	476,300	509,500	559,300	576,400	494,000	267,500	156,800	132,100
Female.....	2,155,300	156,500	475,000	290,800	285,600	288,500	285,200	200,700	101,000	40,600	31,400
White.....	4,971,800	214,400	792,800	632,300	659,500	703,600	739,000	597,500	311,400	169,200	152,200
Asian/Pacific Islander.....	379,000	26,800	83,000	48,400	45,300	52,300	41,200	42,600	24,800	11,600	3,000
Black.....	345,500	15,600	66,400	44,600	48,700	50,600	49,900	34,700	20,700	9,700	4,800
Hispanic.....	263,200	16,200	65,100	39,000	39,400	38,700	28,100	16,800	10,300	6,400	3,300
Other.....	22,800	600	5,900	2,800	2,200	2,700	3,500	3,000	1,300	600	S
Sciences.....	4,581,400	235,900	833,500	591,900	565,300	616,000	698,800	539,600	275,000	126,700	98,700
Male.....	2,560,000	88,600	392,000	324,200	309,000	350,800	420,700	343,000	176,400	87,500	67,700
Female.....	2,021,400	147,300	441,500	267,700	256,300	265,200	278,200	196,500	98,600	39,200	31,100
White.....	3,808,700	186,100	655,900	489,800	468,400	512,800	599,400	463,700	233,000	108,600	91,100
Asian/Pacific Islander.....	247,900	20,600	59,600	31,900	26,200	33,600	27,000	29,000	13,300	4,900	1,800
Black.....	301,800	14,300	57,600	38,300	41,100	41,000	46,500	30,900	19,200	8,500	4,400
Hispanic.....	204,100	14,400	55,100	29,900	28,000	26,500	23,100	13,500	8,300	4,200	1,300
Other.....	18,800	600	5,300	2,200	1,600	2,000	2,700	2,500	1,200	500	S

## Individuals in labor force with S&amp;E highest degrees, by highest degree, degree field, sex, race/ethnicity, and age: 1999

Degree, field, sex, and race/ethnicity	Age (years)										
	All ages	Under 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65 or more
Mathematics/computer sciences.....	751,800	23,600	94,800	119,800	149,800	113,000	100,500	84,800	41,000	17,200	7,100
Male .....	498,300	15,500	62,300	80,800	95,500	74,900	68,000	57,900	26,300	12,200	4,900
Female.....	253,500	8,100	32,600	39,000	54,400	38,100	32,500	26,900	14,700	5,000	2,200
White.....	609,100	18,100	71,800	93,400	118,900	90,200	85,500	71,500	37,300	15,700	6,700
Asian/Pacific Islander.....	60,900	2,900	10,200	9,900	11,700	10,700	6,800	6,800	1,600	S	S
Black.....	49,800	1,600	8,100	10,100	11,100	6,300	5,700	4,200	1,300	1,200	S
Hispanic.....	28,800	1,000	4,500	5,600	7,600	5,400	1,900	1,900	S	S	S
Other.....	3,200	S	300	700	500	S	600	500	S	S	S
Life and related sciences.....	966,000	56,800	185,300	106,700	109,400	152,700	154,400	107,400	52,800	22,900	17,600
Male .....	547,100	20,100	90,100	56,700	58,000	89,500	93,300	75,700	33,900	16,900	12,900
Female.....	418,900	36,600	95,200	50,000	51,400	63,200	61,100	31,700	18,900	6,000	4,700
White.....	815,100	44,600	150,200	86,800	94,400	129,200	134,600	94,800	46,200	18,500	15,800
Asian/Pacific Islander.....	57,400	5,400	15,100	8,100	3,600	7,600	5,800	6,600	3,500	1,500	S
Black.....	49,300	3,500	8,100	5,500	6,800	9,400	8,500	3,600	1,800	S	S
Hispanic.....	40,300	3,200	10,600	5,900	4,200	6,300	5,300	1,800	1,300	1,600	S
Other.....	3,900	S	1,300	600	S	300	S	S	S	S	S
Physical and related sciences.....	390,500	13,700	55,300	39,200	51,700	61,900	56,000	41,500	30,800	23,900	16,500
Male .....	294,000	7,600	34,800	26,800	41,700	46,000	45,600	31,100	25,900	19,800	14,700
Female.....	96,500	6,100	20,500	12,400	10,100	16,000	10,400	10,300	4,900	4,200	1,800
White.....	333,900	11,700	46,000	33,000	44,900	54,700	48,200	33,700	25,500	21,000	15,100
Asian/Pacific Islander.....	23,900	700	4,200	2,400	2,100	3,300	3,400	4,000	2,300	1,100	S
Black.....	17,900	600	2,400	2,300	2,200	1,800	2,200	2,600	1,700	1,400	S
Hispanic.....	13,100	600	2,400	1,300	2,400	1,800	1,700	800	1,100	S	S
Other.....	1,800	S	300	S	S	S	S	S	S	S	S
Social and related sciences.....	2,473,100	141,800	498,000	326,200	254,300	288,300	387,900	305,900	150,400	62,600	57,500
Male .....	1,220,600	45,400	204,900	159,900	113,800	140,400	213,800	178,300	90,300	38,600	35,100
Female.....	1,252,600	96,500	293,200	166,400	140,500	147,900	174,100	127,600	60,100	24,000	22,300
White.....	2,050,700	111,700	388,000	276,500	210,100	238,700	331,100	263,800	124,000	53,400	53,400
Asian/Pacific Islander.....	105,800	11,500	30,100	11,500	8,800	12,000	11,000	11,700	5,900	2,200	S
Black.....	184,800	8,600	39,000	20,300	21,000	23,600	30,100	20,500	14,500	4,800	2,400
Hispanic.....	121,900	9,700	37,600	17,100	13,800	13,000	14,100	9,000	5,200	1,900	S
Other.....	9,900	S	3,400	700	600	900	1,600	1,000	800	S	S
Engineering.....	1,401,000	37,700	179,800	175,100	229,800	231,800	162,800	155,100	93,400	70,700	64,800
Male.....	1,267,200	28,400	146,200	152,000	200,500	208,500	155,700	150,900	91,000	69,300	64,500
Female.....	133,800	9,300	33,500	23,000	29,300	23,300	7,100	4,200	2,400	1,400	S
White.....	1,163,100	28,300	136,900	142,500	191,100	190,700	139,600	133,800	78,500	60,600	61,200
Asian/Pacific Islander.....	131,100	6,300	23,400	16,500	19,000	18,700	14,200	13,600	11,400	6,600	1,200
Black.....	43,700	1,300	8,800	6,300	7,600	9,500	3,300	3,900	1,500	1,200	S
Hispanic.....	59,000	1,800	10,000	9,100	11,400	12,200	5,000	3,400	2,000	2,200	2,000
Other.....	5,100	S	700	600	600	700	700	S	S	S	S

Individuals in labor force with S&E highest degrees, by highest degree, degree field, sex, race/ethnicity, and age: 1999

Degree, field, sex, and race/ethnicity	Age (years)										
	All ages	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 or more
<b>Master's</b>											
All S&E .....	1,517,400	3,500	118,300	176,200	195,600	225,200	248,000	247,300	171,900	82,100	49,300
Male.....	1,004,100	1,600	69,300	117,200	131,300	140,400	155,500	164,200	124,700	61,600	38,300
Female.....	513,300	1,900	49,000	59,000	64,300	84,800	92,600	83,100	47,200	20,500	11,000
White .....	1,195,900	2,100	81,300	121,200	144,900	178,800	203,200	208,700	145,300	68,600	41,700
Asian/Pacific Islander .....	198,000	1,100	26,000	39,300	33,600	27,500	23,100	22,200	14,900	7,200	3,100
Black.....	69,500	S	5,600	7,200	6,700	10,000	13,300	11,500	8,300	3,700	3,000
Hispanic.....	49,000	200	4,600	7,900	9,100	8,100	7,700	4,600	3,300	2,100	1,400
Other.....	5,100	S	700	600	1,200	700	800	S	S	500	S
<b>Sciences</b>											
All S&E .....	1,058,200	2,200	79,000	110,100	116,200	150,300	188,000	191,200	129,000	57,300	35,000
Male.....	591,000	800	37,300	60,700	61,800	76,800	99,300	109,800	83,200	37,000	24,300
Female.....	467,200	1,400	41,700	49,400	54,400	73,400	88,700	81,500	45,900	20,200	10,700
White .....	858,400	1,400	58,100	80,600	88,000	121,400	154,900	164,200	111,600	48,400	29,900
Asian/Pacific Islander .....	102,400	700	12,300	18,900	17,000	15,500	13,800	12,000	7,600	3,400	1,200
Black.....	60,500	S	4,500	5,000	5,100	8,200	12,600	10,800	7,700	3,600	2,800
Hispanic.....	32,600	S	3,500	5,000	5,100	4,600	5,900	4,000	1,900	1,400	1,100
Other.....	4,300	S	600	500	900	600	800	S	S	400	S
<b>Mathematics/computer sciences</b>											
All S&E .....	266,400	500	19,200	32,100	39,200	45,500	41,600	42,000	27,900	13,600	4,700
Male.....	185,000	400	13,600	22,700	27,200	30,400	26,200	29,500	20,600	11,200	3,200
Female.....	81,400	S	5,600	9,400	12,100	15,100	15,400	12,500	7,300	2,400	1,500
White .....	194,300	300	10,000	17,100	27,000	32,200	32,600	35,700	24,000	11,400	3,900
Asian/Pacific Islander .....	55,200	S	7,800	12,700	9,500	10,700	6,400	4,400	2,200	S	S
Black.....	10,900	S	800	1,500	1,600	1,600	1,300	1,600	1,500	800	S
Hispanic.....	4,900	S	200	800	900	700	1,200	S	S	S	S
Other.....	1,100	S	S	S	S	S	S	S	S	S	S
<b>Life and related sciences</b>											
All S&E .....	166,900	700	10,000	16,800	21,700	26,300	29,900	27,400	22,500	8,700	2,800
Male.....	93,000	S	4,500	8,800	9,600	11,900	16,900	17,300	14,800	6,500	2,500
Female.....	73,900	500	5,400	8,000	12,200	14,400	13,100	10,100	7,800	2,200	S
White .....	138,500	S	7,700	14,100	16,900	23,900	24,700	22,200	19,800	6,800	2,100
Asian/Pacific Islander .....	15,500	S	1,300	1,500	2,800	1,400	2,100	3,000	1,600	1,100	S
Black.....	7,800	S	500	500	800	700	1,800	1,500	1,100	S	S
Hispanic.....	4,300	S	500	500	800	300	1,000	800	S	S	S
Other.....	800	S	S	S	400	S	S	S	S	S	S
<b>Physical and related sciences</b>											
All S&E .....	115,300	200	7,900	10,600	14,000	18,400	19,500	16,000	17,300	5,200	6,300
Male.....	86,300	S	5,200	7,600	9,300	13,100	14,600	12,300	15,000	3,600	5,400
Female.....	29,000	S	2,700	2,900	4,700	5,300	4,900	3,700	2,300	1,600	S
White .....	95,700	S	6,300	8,000	11,500	15,300	15,800	13,700	14,600	4,800	5,600
Asian/Pacific Islander .....	12,400	S	1,100	1,900	1,700	1,900	2,100	1,500	1,800	S	S
Black.....	3,300	S	200	200	300	200	700	S	S	S	S
Hispanic.....	3,400	S	400	400	400	800	800	S	S	S	S
Other.....	500	S	S	S	S	S	S	S	S	S	S

## Individuals in labor force with S&amp;E highest degrees, by highest degree, degree field, sex, race/ethnicity, and age: 1999

Degree, field, sex, and race/ethnicity	Age (years)										
	All ages	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 or more
Social and related sciences.....	509,700	900	41,900	50,600	41,200	60,100	96,900	105,800	61,300	29,800	21,200
Male.....	226,800	S	14,000	21,500	15,700	21,500	41,600	50,700	32,900	15,700	13,100
Female.....	282,900	800	27,900	29,100	25,500	38,600	55,300	55,100	28,400	14,100	8,000
White.....	429,900	700	34,200	41,500	32,600	50,000	81,700	92,500	53,100	25,400	18,200
Asian/Pacific Islander.....	19,400	S	2,100	2,800	2,900	1,500	3,100	3,100	2,000	1,400	S
Black.....	38,400	S	3,100	2,800	2,400	5,600	8,800	7,200	4,600	2,100	1,800
Hispanic.....	20,000	S	2,400	3,300	3,100	2,800	2,800	2,700	1,400	700	700
Other.....	2,000	S	S	300	S	300	400	S	S	S	S
Engineering.....	459,200	1,300	39,300	66,100	79,400	74,900	60,100	56,100	42,900	24,800	14,300
Male.....	413,100	800	32,000	56,500	69,500	63,500	56,100	54,500	41,600	24,600	14,000
Female.....	46,100	500	7,400	9,600	9,900	11,300	3,900	1,600	1,300	S	S
White.....	337,500	700	23,200	40,600	56,900	57,400	48,300	44,600	33,700	20,300	11,800
Asian/Pacific Islander.....	95,500	400	13,700	20,400	16,600	12,000	9,300	10,200	7,300	3,800	1,800
Black.....	9,000	S	1,100	2,200	1,600	1,800	700	700	600	S	S
Hispanic.....	16,400	100	1,200	2,900	4,000	3,500	1,800	600	1,400	600	S
Other.....	800	S	S	100	300	S	S	S	S	S	S
Doctoral											
All S&E.....	623,400	S	10,100	54,200	85,000	96,900	99,900	101,400	91,300	50,500	34,200
Male.....	472,600	S	5,800	36,300	60,700	69,500	73,200	77,200	76,200	43,900	29,800
Female.....	150,700	S	4,200	17,900	24,300	27,500	26,600	24,200	15,100	6,600	4,400
White.....	491,900	S	7,700	37,700	57,900	72,100	81,500	85,200	78,700	41,900	29,200
Asian/Pacific Islander.....	96,900	S	2,000	13,200	21,900	18,700	13,000	10,900	8,300	5,900	3,000
Black.....	14,600	S	100	1,300	2,000	2,700	2,400	2,700	1,900	800	800
Hispanic.....	17,600	S	300	1,800	3,000	3,000	2,700	2,100	2,000	1,600	1,100
Other.....	2,400	S	S	200	300	500	300	400	400	200	100
Sciences.....	515,900	S	7,500	40,600	66,400	79,900	86,900	88,200	76,600	40,700	29,200
Male.....	372,900	S	3,800	24,800	44,000	53,800	61,000	64,500	61,900	34,200	24,900
Female.....	143,000	S	3,600	15,800	22,400	26,100	25,900	23,700	14,700	6,500	4,400
White.....	421,600	S	6,400	29,800	47,500	62,200	73,100	76,300	67,200	34,200	24,800
Asian/Pacific Islander.....	64,600	S	1,000	8,100	14,600	12,300	8,900	7,300	5,600	4,300	2,500
Black.....	12,800	S	100	1,000	1,600	2,400	2,200	2,400	1,700	700	800
Hispanic.....	14,800	S	100	1,400	2,400	2,600	2,400	1,800	1,800	1,300	1,000
Other.....	2,200	S	S	200	200	500	200	400	400	200	100
Mathematics/computer sciences.....	40,800	S	1,500	3,700	6,000	6,600	6,200	6,300	6,200	2,900	1,300
Male.....	34,700	S	1,100	3,100	4,800	5,500	5,500	5,400	5,500	2,700	1,200
Female.....	6,100	S	400	700	1,200	1,100	700	1,000	600	300	100
White.....	31,200	S	1,200	2,500	3,800	4,600	5,000	5,300	5,400	2,500	1,000
Asian/Pacific Islander.....	7,700	S	300	1,100	2,000	1,500	900	800	600	300	200
Black.....	600	S	S	S	S	100	100	100	100	S	100
Hispanic.....	1,000	S	S	100	100	200	200	200	100	S	S
Other.....	300	S	S	S	S	S	S	S	S	S	S

## Individuals in labor force with S&amp;E highest degrees, by highest degree, degree field, sex, race/ethnicity, and age: 1999

Degree, field, sex, and race/ethnicity	Age (years)										
	All ages	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 or more
Life and related sciences.....	178,400	S	2,500	15,700	24,500	29,800	31,900	28,700	24,900	11,700	8,800
Male .....	123,600	S	1,100	9,200	15,500	19,500	21,700	20,400	19,200	9,800	7,200
Female.....	54,800	S	1,400	6,500	9,000	10,200	10,200	8,300	5,600	1,900	1,600
White .....	140,700	S	2,100	11,200	17,100	22,700	26,200	24,400	21,100	8,800	7,100
Asian/Pacific Islander .....	26,300	S	300	3,700	5,700	5,000	3,800	2,600	2,500	1,900	800
Black .....	4,600	S	S	300	500	900	700	1,000	600	300	200
Hispanic.....	6,200	S	S	500	1,000	1,100	1,000	500	600	700	700
Other .....	600	S	S	100	100	100	100	200	S	100	S
Physical and related sciences.....	128,500	S	2,300	10,300	18,900	20,000	17,800	19,000	19,300	12,600	8,300
Male .....	111,600	S	1,500	7,700	15,000	16,400	15,700	17,400	18,200	11,700	8,100
Female.....	16,800	S	800	2,500	3,900	3,600	2,100	1,600	1,100	900	300
White .....	102,000	S	1,900	7,600	12,300	15,100	14,800	15,600	16,800	10,600	7,300
Asian/Pacific Islander .....	22,100	S	300	2,300	5,500	4,200	2,600	2,800	1,900	1,600	800
Black .....	1,600	S	S	200	400	300	200	200	200	100	100
Hispanic.....	2,500	S	S	200	600	400	200	300	500	200	S
Other .....	300	S	S	S	S	S	S	100	100	S	S
Social and related sciences.....	168,300	S	1,200	10,800	17,000	23,500	31,000	34,200	26,300	13,500	10,800
Male .....	103,000	S	200	4,700	8,800	12,400	18,200	21,400	18,900	10,100	8,300
Female.....	65,300	S	1,000	6,100	8,200	11,100	12,800	12,800	7,400	3,400	2,500
White .....	147,600	S	1,100	8,600	14,300	19,700	27,100	31,100	24,000	12,300	9,400
Asian/Pacific Islander .....	8,600	S	100	1,100	1,300	1,700	1,600	1,100	600	500	600
Black .....	6,100	S	S	500	700	1,100	1,200	1,000	900	300	400
Hispanic.....	5,100	S	S	600	600	900	1,000	800	600	300	300
Other .....	900	S	S	100	100	100	100	100	200	100	100
Engineering .....	107,400	S	2,600	13,600	18,600	17,100	13,000	13,200	14,700	9,800	5,000
Male.....	99,700	S	2,000	11,500	16,700	15,700	12,200	12,700	14,400	9,700	4,900
Female.....	7,700	S	600	2,100	1,900	1,400	800	500	400	100	S
White .....	70,300	S	1,400	7,800	10,400	9,900	8,300	8,900	11,500	7,700	4,300
Asian/Pacific Islander .....	32,300	S	1,000	5,100	7,300	6,400	4,100	3,600	2,800	1,600	600
Black.....	1,800	S	S	300	300	300	200	300	200	100	S
Hispanic.....	2,800	S	200	400	600	400	300	300	300	400	S
Other.....	u200	S	S	S	S	S	S	S	S	S	S

S suppressed for reasons of confidentiality and/or data reliability

\*Includes professional degrees.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

Appendix table 3-19  
**Employed S&E degree holders over age 50, by selected fields: 1999**  
 (Percent)

Field	Degree holders
Sociology/anthropology.....	39.9
Political science.....	35.2
Mechanical engineering.....	34.4
Chemistry.....	32.4
Physics.....	29.4
Civil engineering.....	26.9
Economics.....	23.9
Mathematics.....	23.3
Chemical engineering.....	23.0
Agricultural sciences.....	22.3
Biological sciences.....	22.1
Electrical engineering.....	21.6
Geosciences.....	21.3
Psychology.....	18.8
Computer sciences.....	10.1

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

Science & Engineering Indicators – 2004

Appendix table 3-20  
**Older S&E degree holders working full time, by highest degree: 1999**  
 (Percent)

Age (years)	Bachelor's	Master's	Doctoral
55 .....	74.5	76.7	86.3
56 .....	74.2	79.9	89.3
57 .....	72.8	81.7	86.2
58 .....	64.6	77.4	85.0
59 .....	64.1	69.5	83.7
60 .....	66.9	61.0	77.5
61 .....	58.5	57.7	75.5
62 .....	47.7	54.8	74.9
63 .....	45.7	48.5	63.4
64 .....	41.6	44.5	64.7
65 .....	29.8	28.3	50.9
66 .....	21.8	24.3	43.9
67 .....	15.3	16.5	40.8
68 .....	17.4	21.6	25.0
69 .....	13.5	12.9	27.2
70 .....	13.8	S	18.4

S suppressed for reasons of confidentiality and/or data reliability

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

*Science & Engineering Indicators – 2004*



Appendix table 3-21

**Foreign-born U.S. residents with S&E highest degree, by place of birth: 1999**

Place of birth	Residents
India .....	164,600
China.....	135,300
Germany.....	69,800
Philippines.....	67,000
United Kingdom.....	65,400
Taiwan.....	64,800
Canada.....	59,400
Korea.....	46,700
Vietnam.....	44,300
Iran.....	39,900
Former Soviet Union.....	38,000
Mexico.....	31,700
Japan.....	30,700
Other foreign born.....	431,800

NOTE: Data do not include individuals with only foreign degrees who were not in the United States in 1990.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

Appendix table 3-22

**Foreign-born U.S. residents with S&E doctorates, by place of birth: 1999**

Place of birth	Residents
China.....	37,900
India.....	30,100
United Kingdom.....	13,100
Taiwan.....	10,900
Canada.....	8,400
Germany.....	7,200
Iran.....	4,800
Former Soviet Union.....	4,600
Korea.....	4,500
Philippines.....	3,400
Poland.....	3,200
Japan.....	2,800
Argentina.....	2,700
Other foreign born.....	58,400

NOTE: Data do not include individuals with only foreign degrees who were not in the United States in 1990.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Scientists and Engineers Statistical Data System (SESTAT), 1999.

*Science & Engineering Indicators – 2004*

Appendix table 3-23

**Permanent visas to immigrants in S&E occupations: 1988–2001**

(Thousands)

Year	Total	Engineers	Natural scientists	Mathematical/ computer scientists	Social scientists
1988 .....	11.0	8.1	1.2	1.2	0.5
1989 .....	11.8	8.7	1.2	1.5	0.4
1990 .....	12.6	9.3	1.2	1.6	0.5
1991 .....	14.1	10.5	1.3	1.7	0.6
1992 .....	22.9	15.6	2.8	3.4	1.1
1993 .....	23.6	14.5	3.9	4.2	1.0
1994 .....	17.2	10.7	3.1	2.8	0.7
1995 .....	14.1	9.0	2.4	2.1	0.6
1996 .....	19.4	11.6	3.7	3.3	0.8
1997 .....	17.1	10.3	3.5	2.6	0.7
1998 .....	13.5	7.9	2.5	2.5	0.6
1999 .....	7.0	3.2	1.8	1.4	0.5
2000 .....	15.8	7.3	3.2	4.7	0.5
2001 .....	33.9	16.1	4.6	12.7	0.5

SOURCE: U.S. Department of Homeland Security, Bureau of Citizenship and Immigration Services, administrative records, 1988–2001.

Appendix table 3-24

**Nonimmigrant visas issued in selected classifications: FY 1998–2002**

Visa symbol	Class	1998	1999	2000	2001	2002
B-1	Temporary visitor for business .....	192,837	93,019	75,919	84,201	75,642
B-2	Temporary visitor for pleasure .....	854,738	642,676	509,031	381,431	255,487
B-1/B-2	Temporary visitor for business and pleasure .....	3,226,799	3,447,822	3,567,580	3,527,118	2,528,105
F-1	Student (academic or language training program).....	251,565	262,542	284,053	293,357	234,322
H-1B	Temporary worker of distinguished merit and ability performing services other than as registered nurse.....	91,360	116,513	133,290	161,643	118,351
H-3	Trainee .....	1,830	1,892	1,514	1,613	1,387
J-1	Exchange visitor .....	192,451	211,349	236,837	261,769	253,841
L-1	Intracompany transferee (executive, managerial, and specialized personnel continuing employment with international firm or corporation) .....	38,307	41,739	54,963	59,384	57,721
O-1	Person with extraordinary ability in sciences, arts, education, business, or athletics .....	4,257	5,009	6,466	6,666	6,026
O-2	Person accompanying and assisting in artistic or athletic performance by O-1 .....	1,778	2,185	1,894	1,918	1,972
TN	NAFTA professional.....	295	484	906	787	699

SOURCE: U.S. Department of State, Immigrant Visa Control and Reporting Division, 1998–2002.

Appendix table 4-1  
GDP and GDP implicit price deflators: 1953–2003

Year	Calendar year			Fiscal year		
	GDP (billions)		GDP price deflator <sup>a</sup>	GDP (billions)		GDP price deflator <sup>a</sup>
	Current dollars	Constant 1996 dollars		Current dollars	Constant 1996 dollars	
1953	379.9	1,973.9	19.25	373.4	1,941.8	19.23
1954	381.1	1,960.5	19.44	378.0	1,942.4	19.46
1955	415.2	2,099.5	19.78	395.2	2,014.3	19.62
1956	438.0	2,141.1	20.45	427.7	2,123.6	20.14
1957	461.5	2,183.9	21.13	450.7	2,157.5	20.89
1958	467.9	2,162.8	21.64	461.1	2,142.7	21.52
1959	507.4	2,319.0	21.88	492.1	2,250.1	21.87
1960	527.4	2,376.7	22.19	518.9	2,345.8	22.12
1961	545.7	2,432.0	22.44	531.8	2,370.9	22.43
1962	586.5	2,578.9	22.74	568.5	2,506.6	22.68
1963	618.7	2,690.4	23.00	599.7	2,609.7	22.98
1964	664.4	2,846.5	23.34	641.3	2,758.3	23.25
1965	720.1	3,028.5	23.78	687.9	2,907.4	23.66
1966	789.3	3,227.5	24.46	754.2	3,120.4	24.17
1967	834.1	3,308.3	25.21	813.5	3,261.8	24.94
1968	911.5	3,466.1	26.30	868.4	3,360.7	25.84
1969	985.3	3,571.4	27.59	949.2	3,514.3	27.01
1970	1,039.7	3,578.0	29.06	1,013.2	3,556.3	28.49
1971	1,128.6	3,697.7	30.52	1,081.4	3,614.3	29.92
1972	1,240.4	3,898.4	31.82	1,181.5	3,772.3	31.32
1973	1,385.5	4,123.4	33.60	1,308.1	3,999.1	32.71
1974	1,501.0	4,099.0	36.62	1,442.1	4,115.6	35.04
1975	1,635.2	4,084.4	40.03	1,559.8	4,033.6	38.67
1976	1,823.9	4,311.7	42.30	1,736.7	4,194.9	41.40
1977	2,031.4	4,511.8	45.02	1,971.3	4,428.9	44.51
1978	2,295.9	4,760.6	48.23	2,218.6	4,664.8	47.56
1979	2,566.4	4,912.1	52.25	2,503.8	4,869.3	51.42
1980	2,795.6	4,900.9	57.04	2,732.1	4,879.6	55.99
1981	3,131.3	5,021.0	62.37	3,061.6	4,984.7	61.42
1982	3,259.2	4,919.3	66.25	3,228.6	4,912.7	65.72
1983	3,534.9	5,132.3	68.88	3,440.5	5,014.6	68.61
1984	3,932.7	5,505.2	71.44	3,839.4	5,397.0	71.14
1985	4,213.0	5,717.1	73.69	4,136.6	5,628.8	73.49
1986	4,452.9	5,912.4	75.31	4,401.4	5,848.3	75.26
1987	4,742.5	6,113.3	77.58	4,647.0	6,009.3	77.33
1988	5,108.3	6,368.4	80.21	5,014.7	6,279.4	79.86
1989	5,489.1	6,591.8	83.27	5,405.5	6,518.1	82.93
1990	5,803.2	6,707.9	86.51	5,735.6	6,665.4	86.05
1991	5,986.2	6,676.4	89.66	5,930.4	6,633.6	89.40
1992	6,318.9	6,880.0	91.84	6,218.6	6,778.5	91.74
1993	6,642.3	7,062.6	94.05	6,558.4	6,982.2	93.93
1994	7,054.3	7,347.7	96.01	6,944.6	7,237.0	95.96
1995	7,400.5	7,543.8	98.10	7,324.0	7,470.4	98.04
1996	7,813.2	7,813.2	100.00	7,694.6	7,694.6	100.00
1997	8,318.4	8,159.5	101.95	8,185.2	8,028.6	101.95
1998	8,781.5	8,508.9	103.20	8,663.9	8,379.8	103.39
1999	9,274.3	8,858.9	104.65	9,141.4	8,719.2	104.80
2000	9,824.6	9,191.4	106.89	9,715.4	9,091.8	106.86
2001	10,082.2	9,214.6	109.42	10,032.3	9,164.3	109.47
2002 <sup>b</sup>	10,442.0	9,439.8	110.62	10,336.6	9,322.2	110.29
2003 <sup>b</sup>	10,884.4	9,709.5	112.10	10,756.8	9,578.1	111.71

GDP gross domestic product

<sup>a</sup>1996 = 100.

<sup>b</sup>Projected data.

SOURCES: FY GDP and deflators for 1953–2001 are from Office of Management and Budget, *Budget of the United States, Fiscal Year 2004* (Washington, DC, 2003); calendar-year GDP and deflators for 1953–2001 are from U.S. Bureau of Economic Analysis, Washington, DC, various years, <http://www.bea.gov>; and all projected values were provided by Office of Management and Budget based on economic assumptions in *FY 2004 Budget of the United States, Fiscal Year 2004*.

Appendix table 4-2

**PPP and market exchange rates, by selected country: 1981–2002**

(Foreign currency/U.S. dollar)

Year	PPP							Market exchange rate	
	Canada	France	Germany <sup>a</sup>	Italy	Japan	Russian Federation	United Kingdom	Germany <sup>a</sup>	Japan
1981 .....	1.27	0.87	1.23	0.46	241.46	—	0.53	1.16	220.54
1982 .....	1.31	0.92	1.21	0.51	231.67	—	0.53	1.24	249.08
1983 .....	1.31	0.96	1.19	0.56	225.65	—	0.54	1.31	237.51
1984 .....	1.30	0.99	1.16	0.60	221.39	—	0.54	1.46	237.52
1985 .....	1.28	1.01	1.14	0.63	218.40	—	0.55	1.51	238.54
1986 .....	1.29	1.04	1.14	0.66	216.91	—	0.55	1.11	168.52
1987 .....	1.31	1.04	1.13	0.68	210.16	—	0.56	0.92	144.64
1988 .....	1.31	1.03	1.10	0.70	203.80	—	0.58	0.90	128.15
1989 .....	1.32	1.02	1.08	0.71	199.17	—	0.59	0.96	137.96
1990 .....	1.30	1.01	1.07	0.73	195.30	—	0.60	0.83	144.79
1991 .....	1.29	0.99	1.07	0.76	193.06	—	0.64	0.85	134.71
1992 .....	1.28	0.98	1.06	0.75	188.16	0.02	0.62	0.80	126.65
1993 .....	1.26	1.00	1.08	0.79	184.31	0.18	0.64	0.85	111.20
1994 .....	1.25	1.01	1.06	0.79	180.59	0.72	0.65	0.83	102.21
1995 .....	1.18	0.98	1.03	0.80	169.94	1.83	0.65	0.73	94.06
1996 .....	1.19	1.00	1.04	0.82	165.62	2.58	0.64	0.77	108.78
1997 .....	1.18	0.99	0.99	0.82	163.01	2.95	0.63	0.89	120.99
1998 .....	1.19	0.99	0.99	0.81	166.63	3.33	0.65	0.90	130.91
1999 .....	1.19	0.97	0.98	0.80	162.04	5.41	0.65	0.94	113.91
2000 .....	1.21	0.95	0.95	0.79	155.28	7.25	0.65	1.09	107.77
2001 .....	1.20	0.94	0.95	0.79	149.81	8.35	0.65	1.12	121.53
2002 .....	1.19	0.94	0.95	0.80	145.62	—	0.66	—	—

— data not used in this report

PPP purchasing power parity

<sup>a</sup>Data for 1981–90 are for West Germany.SOURCE: Organisation for Economic Co-operation and Development, *Main Science and Technology Indicators* (Paris, 2002).*Science & Engineering Indicators – 2004*

Appendix table 4-3

## U.S. R&amp;D expenditures, by performing sector and source of funds: 1953–2002

(Millions of current dollars)

(Page 1 of 2)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs <sup>b</sup>		
	Funding sector:	Total	Federal	Total	Federal <sup>c</sup>	Industry <sup>d</sup>	Federal <sup>e</sup>	Total	Federal	Non-Federal <sup>e</sup>	Industry	U&C	Non-profits	Federal <sup>f</sup>	Total	Federal <sup>c</sup>	Industry	Non-profits	Federal <sup>g</sup>
1953		5,160	1,015	3,630	1,430	2,200	—	273	149	40	21	37	27	131	112	58	26	28	—
1954		5,621	963	4,070	1,750	2,320	—	301	165	45	24	40	29	161	127	65	31	31	—
1955		6,386	973	4,517	2,057	2,460	228	342	191	50	27	42	32	187	131	64	35	32	9
1956		8,537	1,130	6,272	2,995	3,277	370	391	221	57	32	46	36	217	146	71	37	38	11
1957		9,866	1,297	7,324	3,928	3,396	365	433	242	64	37	51	40	267	167	79	37	51	14
1958		10,963	1,507	8,066	4,436	3,630	371	491	280	72	39	56	45	316	195	95	38	62	18
1959		12,519	1,681	9,200	5,217	3,983	448	586	356	81	40	61	50	349	234	125	42	67	22
1960		13,750	1,801	10,032	5,604	4,428	516	705	453	90	40	67	55	385	264	148	48	68	48
1961		14,500	1,987	10,353	5,685	4,668	491	834	557	101	40	75	62	440	304	169	49	86	92
1962		15,630	2,188	11,037	6,008	5,029	420	993	687	112	41	84	70	500	363	200	54	109	130
1963		17,543	2,558	12,216	6,856	5,360	439	1,178	839	125	41	96	78	580	408	234	55	119	165
1964		19,058	2,965	13,049	7,257	5,792	418	1,375	995	138	41	114	88	629	417	250	55	112	205
1965		20,243	3,156	13,812	7,367	6,445	364	1,595	1,167	150	42	136	101	630	472	286	62	124	215
1966		22,104	3,308	15,193	7,977	7,216	387	1,818	1,335	160	45	165	114	652	537	329	70	138	210
1967		23,344	3,444	15,966	7,946	8,020	417	2,035	1,491	168	52	200	126	696	561	342	74	145	225
1968		24,691	3,497	17,014	8,145	8,869	440	2,187	1,586	185	58	221	139	722	596	364	81	151	235
1969		26,000	3,790	17,844	7,987	9,857	469	2,280	1,624	208	61	233	155	731	642	388	93	161	245
1970		26,280	4,154	17,594	7,306	10,288	482	2,418	1,686	237	66	259	171	727	677	410	95	172	230
1971		26,980	4,409	17,829	7,175	10,654	520	2,565	1,760	262	72	290	182	735	709	427	98	184	215
1972		28,739	4,676	19,004	7,469	11,535	547	2,757	1,890	282	79	312	195	785	771	472	101	198	200
1973		31,003	4,837	20,704	7,600	13,104	597	2,953	2,009	302	90	343	211	841	882	566	105	211	190
1974		33,398	5,132	22,239	7,572	14,667	688	3,216	2,160	320	104	393	239	926	988	639	114	235	210
1975		35,753	5,561	23,460	7,878	15,582	809	3,570	2,400	348	118	432	272	1,067	1,062	675	124	262	225
1976		39,471	5,890	26,107	8,671	17,436	926	3,899	2,619	369	131	480	300	1,266	1,139	711	135	292	245
1977		43,368	6,211	28,863	9,523	19,340	992	4,346	2,893	394	155	569	337	1,467	1,213	740	147	326	275
1978		48,740	6,962	32,222	10,107	22,115	1,103	4,996	3,329	443	182	679	364	1,772	1,353	830	160	363	333
1979		55,407	7,471	37,062	11,354	25,708	1,192	5,715	3,848	482	215	785	386	2,013	1,564	985	174	405	390
1980		63,240	7,831	43,228	12,752	30,476	1,304	6,455	4,335	519	264	920	419	2,306	1,641	1,000	189	452	475
1981		72,293	8,605	50,425	14,997	35,428	1,410	7,085	4,670	581	314	1,058	463	2,484	1,747	1,038	206	504	538
1982		80,808	9,501	57,166	17,061	40,105	1,509	7,603	4,879	621	363	1,207	534	2,544	1,961	1,175	224	561	525
1983		90,010	10,830	63,683	19,095	44,588	1,624	8,251	5,210	658	432	1,357	595	2,840	2,182	1,313	244	626	600
1984		102,282	11,916	73,061	21,657	51,404	1,770	9,154	5,748	721	518	1,514	654	3,243	2,513	1,550	265	698	625
1985		114,692	13,093	82,376	25,333	57,043	1,870	10,308	6,388	834	630	1,743	713	3,616	2,767	1,700	289	778	663
1986		120,285	13,504	85,932	26,000	59,932	1,917	11,540	7,028	969	745	2,019	780	3,973	2,882	1,700	314	867	538
1987		126,249	13,588	90,160	28,757	61,403	2,027	12,807	7,768	1,065	831	2,262	882	4,287	2,878	1,569	342	967	501
1988		133,898	14,342	94,893	28,221	66,672	2,140	14,220	8,592	1,165	933	2,527	1,003	4,581	3,213	1,762	372	1,078	510
1989		141,921	15,231	99,860	26,359	73,501	2,227	15,632	9,315	1,274	1,061	2,852	1,131	4,756	3,669	2,062	405	1,202	547
1990		151,978	15,671	107,404	25,802	81,602	2,312	16,936	9,936	1,399	1,166	3,187	1,249	4,894	4,126	2,346	440	1,340	636
1991		160,891	15,249	114,675	24,095	90,580	2,296	18,203	10,664	1,483	1,242	3,457	1,358	5,120	4,652	2,679	479	1,494	696
1992		165,250	15,853	116,757	22,369	94,388	2,256	19,385	11,525	1,525	1,320	3,568	1,448	5,259	4,993	2,806	521	1,666	748

## U.S. R&amp;D expenditures, by performing sector and source of funds: 1953–2002

(Millions of current dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs <sup>b</sup>		
	Funding sector:	Total	Federal	Total	Federal <sup>c</sup>	Industry <sup>d</sup>	Federal <sup>e</sup>	Total	Federal	Non-Federal <sup>e</sup>	Industry	U&C	Non-profits	Federal <sup>f</sup>	Total	Federal <sup>c</sup>	Industry	Non-profits	Federal <sup>g</sup>
1993 .....		165,782	16,531	115,435	20,844	94,591	2,024	20,487	12,302	1,557	1,391	3,708	1,530	5,289	5,267	2,843	567	1,857	749
1994 .....		169,212	16,355	117,392	20,261	97,131	2,220	21,595	12,987	1,622	1,456	3,937	1,594	5,294	5,599	2,911	617	2,071	758
1995 .....		183,617	16,904	129,830	21,178	108,652	2,279	22,603	13,582	1,750	1,547	4,109	1,616	5,367	5,827	2,847	671	2,308	808
1996 .....		197,288	16,585	142,371	21,356	121,015	2,255	23,702	14,073	1,860	1,671	4,434	1,665	5,395	6,209	2,906	730	2,574	772
1997 .....		212,121	16,819	155,409	21,798	133,611	2,117	24,866	14,517	1,921	1,807	4,836	1,785	5,463	6,626	3,014	809	2,804	821
1998 .....		226,305	17,362	167,102	22,086	145,016	2,062	26,151	15,147	1,970	1,947	5,168	1,919	5,559	7,225	3,281	880	3,064	843
1999 .....		243,517	17,851	180,712	20,536	160,176	1,999	28,135	16,223	2,095	2,077	5,630	2,110	5,652	8,175	3,761	975	3,440	993
2000 .....		264,725	17,917	197,604	17,183	180,421	1,935	30,633	17,681	2,242	2,180	6,205	2,327	5,741	9,429	4,449	1,103	3,877	1,465
2001 preliminary .....		273,565	21,048	198,505	16,899	181,606	1,965	33,295	19,332	2,375	2,263	6,819	2,507	5,957	10,667	5,309	1,110	4,248	2,129
2002 preliminary .....		276,185	23,788	194,430	17,085	177,345	2,235	36,019	21,066	2,472	2,341	7,455	2,685	6,060	11,620	5,918	1,083	4,619	2,034

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years are not directly comparable to data for 1997 and earlier years. For FY 1998, \$479 million in passthrough funds were reported. For FY 2002, \$865 million in passthrough funds are estimated.

<sup>b</sup>Beginning in 2001, data for nonprofit FFRDCs are reported by FFRDCs. In prior years, data were collected from the Federal agencies supporting the FFRDCs.

<sup>c</sup>Expenditures of industry FFRDCs for 1953–54 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

<sup>d</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

<sup>e</sup>Because of limitations in the survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofit support for their own R&D.

<sup>f</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures before 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Technical notes explaining methodological issues of measurement will be provided in National Science Foundation, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. This table incorporates the latest revisions to prior-year data. Do not use data published earlier.

SOURCES: National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.



Appendix table 4-4

## U.S. inflation-adjusted R&amp;D expenditures, by performing sector and source of funds: 1953–2002

(Millions of constant 1996 dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs <sup>b</sup>		
	Funding sector:	Total	Federal	Total	Federal <sup>c</sup>	Industry <sup>d</sup>	Federal <sup>e</sup>	Total	Federal	Non-Federal <sup>e</sup>	Industry	U&C	Non-profits	Federal <sup>f</sup>	Total	Federal <sup>c</sup>	Industry	Non-profits	Federal <sup>g</sup>
1953		26,805	5,273	18,857	7,429	11,429	—	1,416	774	205	106	190	140	681	579	299	135	145	—
1954		28,912	4,951	20,936	9,002	11,934	—	1,548	846	229	121	203	149	826	651	332	159	159	—
1955		32,286	4,918	22,836	10,399	12,437	1,153	1,729	966	253	137	212	162	945	662	324	177	162	43
1956		41,746	5,528	30,670	14,645	16,024	1,809	1,912	1,081	276	154	225	176	1,061	711	345	181	186	54
1957		46,693	6,139	34,662	18,590	16,072	1,727	2,049	1,143	303	173	241	189	1,261	788	372	175	241	66
1958		50,659	6,962	37,274	20,499	16,774	1,712	2,269	1,294	333	180	256	206	1,458	901	439	176	287	83
1959		57,217	7,683	42,048	23,844	18,204	2,045	2,678	1,625	368	181	279	226	1,595	1,067	569	192	306	101
1960		61,966	8,115	45,210	25,255	19,955	2,325	3,175	2,039	406	180	302	248	1,735	1,190	667	216	306	216
1961		64,616	8,856	46,136	25,334	20,802	2,186	3,714	2,480	448	178	332	276	1,961	1,355	753	218	383	408
1962		68,734	9,620	48,536	26,420	22,115	1,847	4,365	3,019	493	178	369	306	2,199	1,596	880	237	479	572
1963		76,276	11,124	53,113	29,809	23,304	1,907	5,122	3,646	543	176	417	339	2,520	1,774	1,017	239	517	717
1964		81,653	12,705	55,908	31,093	24,816	1,791	5,889	4,263	589	174	486	377	2,695	1,787	1,071	236	480	878
1965		85,127	13,272	58,082	30,980	27,103	1,531	6,705	4,907	629	175	572	423	2,647	1,985	1,203	261	521	904
1966		90,367	13,523	62,114	32,612	29,501	1,582	7,433	5,458	654	184	673	464	2,664	2,193	1,343	286	564	859
1967		92,600	13,663	63,332	31,519	31,813	1,654	8,072	5,912	666	204	791	498	2,761	2,225	1,357	294	575	893
1968		93,881	13,297	64,692	30,970	33,722	1,671	8,316	6,030	702	219	838	527	2,745	2,266	1,384	308	574	894
1969		94,238	13,738	64,676	28,949	35,727	1,698	8,264	5,884	754	219	845	562	2,650	2,325	1,404	337	584	888
1970		90,435	14,294	60,544	25,141	35,403	1,659	8,319	5,800	816	225	890	588	2,500	2,328	1,409	327	592	791
1971		88,402	14,445	58,417	23,509	34,908	1,702	8,404	5,765	858	236	949	596	2,407	2,321	1,397	321	603	704
1972		90,316	14,694	59,723	23,473	36,251	1,717	8,664	5,940	886	248	979	611	2,467	2,421	1,482	317	622	629
1973		92,271	14,394	61,619	22,619	39,000	1,775	8,789	5,978	897	266	1,021	626	2,503	2,625	1,685	313	628	565
1974		91,203	14,015	60,729	20,677	40,052	1,877	8,781	5,898	874	284	1,072	653	2,529	2,698	1,744	312	642	573
1975		89,315	13,893	58,606	19,680	38,926	2,020	8,917	5,996	869	295	1,078	679	2,666	2,652	1,686	310	655	562
1976		93,312	13,925	61,719	20,499	41,220	2,189	9,216	6,191	872	310	1,135	708	2,992	2,692	1,681	320	691	579
1977		96,330	13,797	64,112	21,153	42,959	2,203	9,653	6,425	875	343	1,263	747	3,259	2,695	1,644	327	724	611
1978		101,057	14,435	66,809	20,956	45,853	2,286	10,358	6,901	919	376	1,408	754	3,673	2,806	1,721	332	754	689
1979		106,042	14,299	70,932	21,730	49,202	2,282	10,937	7,365	922	411	1,502	738	3,852	2,994	1,885	333	775	746
1980		110,869	13,728	75,785	22,356	53,429	2,286	11,317	7,599	909	462	1,612	735	4,043	2,877	1,753	332	792	833
1981		115,910	13,796	80,848	24,045	56,803	2,260	11,360	7,487	932	503	1,696	742	3,983	2,801	1,663	330	807	862
1982		121,975	14,342	86,288	25,752	60,536	2,278	11,475	7,364	937	548	1,821	805	3,839	2,960	1,774	339	848	792
1983		130,676	15,722	92,455	27,722	64,733	2,357	11,979	7,564	955	627	1,969	863	4,123	3,169	1,905	354	909	871
1984		143,171	16,679	102,269	30,315	71,954	2,478	12,813	8,045	1,009	724	2,119	915	4,540	3,518	2,170	372	977	875
1985		155,641	17,767	111,787	34,378	77,409	2,538	13,988	8,669	1,131	855	2,365	968	4,907	3,755	2,307	392	1,056	899
1986		159,720	17,932	114,104	34,524	79,580	2,545	15,323	9,331	1,287	989	2,680	1,036	5,275	3,826	2,257	417	1,152	714
1987		162,734	17,515	116,216	37,068	79,148	2,612	16,508	10,013	1,372	1,071	2,916	1,136	5,526	3,710	2,023	441	1,247	646
1988		166,935	17,881	118,306	35,184	83,122	2,668	17,728	10,712	1,452	1,163	3,150	1,250	5,711	4,005	2,197	464	1,344	635
1989		170,434	18,291	119,923	31,655	88,268	2,674	18,773	11,186	1,530	1,274	3,425	1,358	5,711	4,406	2,476	486	1,444	657
1990		175,677	18,115	124,152	29,825	94,327	2,672	19,577	11,485	1,617	1,347	3,683	1,444	5,657	4,769	2,711	509	1,549	735
1991		179,446	17,008	127,900	26,874	101,026	2,561	20,302	11,893	1,653	1,385	3,856	1,515	5,711	5,189	2,988	534	1,666	776
1992		179,933	17,261	127,131	24,356	102,774	2,456	21,107	12,549	1,660	1,437	3,885	1,576	5,726	5,436	3,055	567	1,814	814

## U.S. inflation-adjusted R&amp;D expenditures, by performing sector and source of funds: 1953–2002

(Millions of constant 1996 dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>				U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs <sup>b</sup>			
	Funding sector:			Total	Federal <sup>c</sup>	Industry <sup>d</sup>		Federal <sup>e</sup>	Total	Federal	Non-Federal <sup>e</sup>		Industry	U&C	Non-profits		Total	Federal <sup>c</sup>	Industry
1993 .....		176,270	17,576	122,738	22,163	100,575	2,152	21,783	13,080	1,655	1,479	3,943	1,627	5,624	5,601	3,023	603	1,975	796
1994 .....		176,245	17,035	122,271	21,103	101,168	2,312	22,492	13,527	1,689	1,516	4,101	1,660	5,514	5,831	3,032	642	2,157	790
1995 .....		187,174	17,231	132,345	21,588	110,756	2,323	23,041	13,845	1,784	1,577	4,188	1,647	5,471	5,940	2,902	684	2,353	823
1996 .....		197,288	16,585	142,371	21,356	121,015	2,255	23,702	14,073	1,860	1,671	4,434	1,665	5,395	6,209	2,906	730	2,574	772
1997 .....		208,064	16,497	152,436	21,381	131,055	2,077	24,391	14,239	1,885	1,773	4,744	1,751	5,358	6,500	2,956	793	2,750	805
1998 .....		219,288	16,824	161,921	21,401	140,519	1,998	25,340	14,677	1,909	1,886	5,008	1,860	5,387	7,001	3,179	853	2,969	817
1999 .....		232,697	17,058	172,683	19,624	153,059	1,910	26,885	15,503	2,002	1,985	5,380	2,016	5,401	7,812	3,594	932	3,287	949
2000 .....		247,663	16,763	184,868	16,075	168,793	1,811	28,659	16,541	2,097	2,039	5,805	2,177	5,371	8,821	4,162	1,032	3,627	1,371
2001 preliminary .....		250,024	19,237	181,423	15,445	165,978	1,796	30,430	17,668	2,170	2,068	6,232	2,292	5,444	9,750	4,852	1,015	3,883	1,945
2002 preliminary .....		249,678	21,505	175,769	15,445	160,324	2,020	32,562	19,044	2,234	2,116	6,740	2,427	5,478	10,505	5,350	979	4,176	1,839

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years are not directly comparable to data for 1997 and earlier years. For FY 1998, \$479 million in passthrough funds were reported. For FY 2002, \$865 million in passthrough funds are estimated.

<sup>b</sup>Beginning in 2001, data for nonprofit FFRDCs are reported by FFRDCs. In prior years, data were collected from the Federal agencies supporting the FFRDCs.

<sup>c</sup>Expenditures of industry FFRDCs for 1953–54 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

<sup>d</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

<sup>e</sup>Because of limitations in the survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofit support for their own R&D.

<sup>f</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures before 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Technical notes explaining methodological issues of measurement will be provided in National Science Foundation, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. This table incorporates the latest revisions to prior-year data. Do not use data published earlier.

SOURCES: National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Science & Engineering Indicators – 2004

Appendix table 4-5

## U.S. R&amp;D expenditures, by source of funds and performing sector: 1953–2002

(Millions of current dollars)

(Page 1 of 2)

Year	Funding sector:	Total	Federal Government							Industry			U&C	Nonprofit		Non-Federal <sup>a</sup>			
	Performing sector:		Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profit <sup>e</sup>	Nonprofit FFRDCs <sup>b,e</sup>	Total	Industry <sup>f</sup>	U&C <sup>c</sup>	Non-profit	Total	U&C <sup>c</sup>	U&C <sup>c</sup>		
1953		5,160	2,783	1,015	1,430	—	149	131	58	—	2,247	2,200	21	26	37	55	28	27	40
1954		5,621	3,102	963	1,750	—	165	161	65	—	2,375	2,320	24	31	40	60	31	29	45
1955		6,386	3,708	973	2,057	228	191	187	64	9	2,522	2,460	27	35	42	64	32	32	50
1956		8,537	5,015	1,130	2,995	370	221	217	71	11	3,346	3,277	32	37	46	74	38	36	57
1957		9,866	6,191	1,297	3,928	365	242	267	79	14	3,470	3,396	37	37	51	91	51	40	64
1958		10,963	7,022	1,507	4,436	371	280	316	95	18	3,707	3,630	39	38	56	107	62	45	72
1959		12,519	8,197	1,681	5,217	448	356	349	125	22	4,065	3,983	40	42	61	117	67	50	81
1960		13,750	8,954	1,801	5,604	516	453	385	148	48	4,516	4,428	40	48	67	123	68	55	90
1961		14,500	9,420	1,987	5,685	491	557	440	169	92	4,757	4,668	40	49	75	148	86	62	101
1962		15,630	10,132	2,188	6,008	420	687	500	200	130	5,124	5,029	41	54	84	179	109	70	112
1963		17,543	11,670	2,558	6,856	439	839	580	234	165	5,456	5,360	41	55	96	197	119	78	125
1964		19,058	12,719	2,965	7,257	418	995	629	250	205	5,888	5,792	41	55	114	200	112	88	138
1965		20,243	13,185	3,156	7,367	364	1,167	630	286	215	6,549	6,445	42	62	136	225	124	101	150
1966		22,104	14,197	3,308	7,977	387	1,335	652	329	210	7,331	7,216	45	70	165	252	138	114	160
1967		23,344	14,561	3,444	7,946	417	1,491	696	342	225	8,146	8,020	52	74	200	271	145	126	168
1968		24,691	14,989	3,497	8,145	440	1,586	722	364	235	9,008	8,869	58	81	221	290	151	139	185
1969		26,000	15,233	3,790	7,987	469	1,624	731	388	245	10,011	9,857	61	93	233	316	161	155	208
1970		26,280	14,993	4,154	7,306	482	1,686	727	410	230	10,449	10,288	66	95	259	343	172	171	237
1971		26,980	15,239	4,409	7,175	520	1,760	735	427	215	10,824	10,654	72	98	290	366	184	182	262
1972		28,739	16,038	4,676	7,469	547	1,890	785	472	200	11,715	11,535	79	101	312	393	198	195	282
1973		31,003	16,639	4,837	7,600	597	2,009	841	566	190	13,299	13,104	90	105	343	422	211	211	302
1974		33,398	17,326	5,132	7,572	688	2,160	926	639	210	14,885	14,667	104	114	393	474	235	239	320
1975		35,753	18,615	5,561	7,878	809	2,400	1,067	675	225	15,824	15,582	118	124	432	534	262	272	348
1976		39,471	20,328	5,890	8,671	926	2,619	1,266	711	245	17,702	17,436	131	135	480	592	292	300	369
1977		43,368	22,101	6,211	9,523	992	2,893	1,467	740	275	19,642	19,340	155	147	569	662	326	337	394
1978		48,740	24,434	6,962	10,107	1,103	3,329	1,772	830	333	22,457	22,115	182	160	679	727	363	364	443
1979		55,407	27,253	7,471	11,354	1,192	3,848	2,013	985	390	26,097	25,708	215	174	785	791	405	386	482
1980		63,240	30,002	7,831	12,752	1,304	4,335	2,306	1,000	475	30,929	30,476	264	189	920	871	452	419	519
1981		72,293	33,740	8,605	14,997	1,410	4,670	2,484	1,038	538	35,948	35,428	314	206	1,058	967	504	463	581
1982		80,808	37,194	9,501	17,061	1,509	4,879	2,544	1,175	525	40,692	40,105	363	224	1,207	1,095	561	534	621
1983		90,010	41,511	10,830	19,095	1,624	5,210	2,840	1,313	600	45,264	44,588	432	244	1,357	1,220	626	595	658
1984		102,282	46,508	11,916	21,657	1,770	5,748	3,243	1,550	625	52,187	51,404	518	265	1,514	1,351	698	654	721
1985		114,692	52,662	13,093	25,333	1,870	6,388	3,616	1,700	663	57,962	57,043	630	289	1,743	1,491	778	713	834
1986		120,285	54,659	13,504	26,000	1,917	7,028	3,973	1,700	538	60,991	59,932	745	314	2,019	1,647	867	780	969
1987		126,249	58,498	13,588	28,757	2,027	7,768	4,287	1,569	501	62,576	61,403	831	342	2,262	1,849	967	882	1,065
1988		133,898	60,148	14,342	28,221	2,140	8,592	4,581	1,762	510	67,977	66,672	933	372	2,527	2,081	1,078	1,003	1,165
1989		141,921	60,495	15,231	26,359	2,227	9,315	4,756	2,062	547	74,966	73,501	1,061	405	2,852	2,333	1,202	1,131	1,274
1990		151,978	61,596	15,671	25,802	2,312	9,936	4,894	2,346	636	83,208	81,602	1,166	440	3,187	2,589	1,340	1,249	1,399
1991		160,891	60,799	15,249	24,095	2,296	10,664	5,120	2,679	696	92,300	90,580	1,242	479	3,457	2,852	1,494	1,358	1,483
1992		165,250	60,815	15,853	22,369	2,256	11,525	5,259	2,806	748	96,229	94,388	1,320	521	3,568	3,113	1,666	1,448	1,525

## U.S. R&amp;D expenditures, by source of funds and performing sector: 1953–2002

(Millions of current dollars)

Year	Funding sector:	Total	Federal Government							Industry			U&C	Nonprofit		Non-Federal <sup>a</sup>			
	Performing sector:		Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profit <sup>e</sup>	Nonprofit FFRDCs <sup>b,e</sup>	Total	Industry <sup>f</sup>	U&C <sup>c</sup>	Non-profit	U&C <sup>c</sup>	U&C <sup>c</sup>		
1993	.....	165,782	60,581	16,531	20,844	2,024	12,302	5,289	2,843	749	96,549	94,591	1,391	567	3,708	3,387	1,857	1,530	1,557
1994	.....	169,212	60,787	16,355	20,261	2,220	12,987	5,294	2,911	758	99,203	97,131	1,456	617	3,937	3,664	2,071	1,594	1,622
1995	.....	183,617	62,965	16,904	21,178	2,279	13,582	5,367	2,847	808	110,870	108,652	1,547	671	4,109	3,924	2,308	1,616	1,750
1996	.....	197,288	63,341	16,585	21,356	2,255	14,073	5,395	2,906	772	123,416	121,015	1,671	730	4,434	4,238	2,574	1,665	1,860
1997	.....	212,121	64,548	16,819	21,798	2,117	14,517	5,463	3,014	821	136,227	133,611	1,807	809	4,836	4,589	2,804	1,785	1,921
1998	.....	226,305	66,340	17,362	22,086	2,062	15,147	5,559	3,281	843	147,843	145,016	1,947	880	5,168	4,984	3,064	1,919	1,970
1999	.....	243,517	67,015	17,851	20,536	1,999	16,223	5,652	3,761	993	163,229	160,176	2,077	975	5,630	5,549	3,440	2,110	2,095
2000	.....	264,725	66,371	17,917	17,183	1,935	17,681	5,741	4,449	1,465	183,703	180,421	2,180	1,103	6,205	6,204	3,877	2,327	2,242
2001 preliminary	.....	273,565	72,637	21,048	16,899	1,965	19,332	5,957	5,309	2,129	184,978	181,606	2,263	1,110	6,819	6,756	4,248	2,507	2,375
2002 preliminary	.....	276,185	78,185	23,788	17,085	2,235	21,066	6,060	5,918	2,034	180,769	177,345	2,341	1,083	7,455	7,304	4,619	2,685	2,472

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Because of limitations in the survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofit support for their own R&D.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–54 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–63.

<sup>c</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years are not directly comparable to data for 1997 and earlier years. For FY 1998, \$479 million in passthrough funds were reported. For FY 2002, \$865 million in passthrough funds are estimated.

<sup>d</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

<sup>e</sup>Beginning in 2001, data for nonprofit FFRDCs are reported by FFRDCs. In prior years, data were collected from the Federal agencies supporting the FFRDCs.

<sup>f</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures before 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Technical notes explaining methodological issues of measurement will be provided in National Science Foundation, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. This table incorporates the latest revisions to prior-year data. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Appendix table 4-6

## U.S. inflation-adjusted R&amp;D expenditures, by source of funds and performing sector: 1953–2002

(Millions of constant 1996 dollars)

(Page 1 of 2)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits		Non-Federal <sup>a</sup>		
	Performing sector:		Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b,e</sup>	Total	Industry <sup>f</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	
1953		26,805	14,455	5,273	7,429	—	774	681	299	—	11,670	11,429	106	135	190	286	145	140	205
1954		28,912	15,957	4,951	9,002	—	846	826	332	—	12,215	11,934	121	159	203	309	159	149	229
1955		32,286	18,747	4,918	10,399	1,153	966	945	324	43	12,750	12,437	137	177	212	324	162	162	253
1956		41,746	24,523	5,528	14,645	1,809	1,081	1,061	345	54	16,359	16,024	154	181	225	362	186	176	276
1957		46,693	29,298	6,139	18,590	1,727	1,143	1,261	372	66	16,420	16,072	173	175	241	431	241	189	303
1958		50,659	32,447	6,962	20,499	1,712	1,294	1,458	439	83	17,130	16,774	180	176	256	492	287	206	333
1959		57,217	37,462	7,683	23,844	2,045	1,625	1,595	569	101	18,576	18,204	181	192	279	532	306	226	368
1960		61,966	40,352	8,115	25,255	2,325	2,039	1,735	667	216	20,352	19,955	180	216	302	554	306	248	406
1961		64,616	41,978	8,856	25,334	2,186	2,480	1,961	753	408	21,199	20,802	178	218	332	660	383	276	448
1962		68,734	44,557	9,620	26,420	1,847	3,019	2,199	880	572	22,531	22,115	178	237	369	785	479	306	493
1963		76,276	50,739	11,124	29,809	1,907	3,646	2,520	1,017	717	23,720	23,304	176	239	417	857	517	339	543
1964		81,653	54,496	12,705	31,093	1,791	4,263	2,695	1,071	878	25,225	24,816	174	236	486	857	480	377	589
1965		85,127	55,444	13,272	30,980	1,531	4,907	2,647	1,203	904	27,538	27,103	175	261	572	944	521	423	629
1966		90,367	58,040	13,523	32,612	1,582	5,458	2,664	1,343	859	29,971	29,501	184	286	673	1,028	564	464	654
1967		92,600	57,758	13,663	31,519	1,654	5,912	2,761	1,357	893	32,311	31,813	204	294	791	1,073	575	498	666
1968		93,881	56,991	13,297	30,970	1,671	6,030	2,745	1,384	894	34,249	33,722	219	308	838	1,101	574	527	702
1969		94,238	55,211	13,738	28,949	1,698	5,884	2,650	1,404	888	36,283	35,727	219	337	845	1,145	584	562	754
1970		90,435	51,594	14,294	25,141	1,659	5,800	2,500	1,409	791	35,955	35,403	225	327	890	1,180	592	588	816
1971		88,402	49,930	14,445	23,509	1,702	5,765	2,407	1,397	704	35,465	34,908	236	321	949	1,199	603	596	858
1972		90,316	50,401	14,694	23,473	1,717	5,940	2,467	1,482	629	36,816	36,251	248	317	979	1,234	622	611	886
1973		92,271	49,519	14,394	22,619	1,775	5,978	2,503	1,685	565	39,579	39,000	266	313	1,021	1,254	628	626	897
1974		91,203	47,314	14,015	20,677	1,877	5,898	2,529	1,744	573	40,648	40,052	284	312	1,072	1,295	642	653	874
1975		89,315	46,502	13,893	19,680	2,020	5,996	2,666	1,686	562	39,531	38,926	295	310	1,078	1,335	655	679	869
1976		93,312	48,056	13,925	20,499	2,189	6,191	2,992	1,681	579	41,849	41,220	310	320	1,135	1,399	691	708	872
1977		96,330	49,092	13,797	21,153	2,203	6,425	3,259	1,644	611	43,629	42,959	343	327	1,263	1,472	724	747	875
1978		101,057	50,662	14,435	20,956	2,286	6,901	3,673	1,721	689	46,561	45,853	376	332	1,408	1,507	754	754	919
1979		106,042	52,159	14,299	21,730	2,282	7,365	3,852	1,885	746	49,946	49,202	411	333	1,502	1,513	775	738	922
1980		110,869	52,599	13,728	22,356	2,286	7,599	4,043	1,753	833	54,223	53,429	462	332	1,612	1,527	792	735	909
1981		115,910	54,097	13,796	24,045	2,260	7,487	3,983	1,663	862	57,637	56,803	503	330	1,696	1,550	807	742	932
1982		121,975	56,141	14,342	25,752	2,278	7,364	3,839	1,774	792	61,422	60,536	548	339	1,821	1,653	848	805	937
1983		130,676	60,265	15,722	27,722	2,357	7,564	4,123	1,905	871	65,714	64,733	627	354	1,969	1,772	909	863	955
1984		143,171	65,101	16,679	30,315	2,478	8,045	4,540	2,170	875	73,050	71,954	724	372	2,119	1,892	977	915	1,009
1985		155,641	71,465	17,767	34,378	2,538	8,669	4,907	2,307	899	78,656	77,409	855	392	2,365	2,023	1,056	968	1,131
1986		159,720	72,579	17,932	34,524	2,545	9,331	5,275	2,257	714	80,987	79,580	989	417	2,680	2,188	1,152	1,036	1,287
1987		162,734	75,404	17,515	37,068	2,612	10,013	5,526	2,023	646	80,660	79,148	1,071	441	2,916	2,383	1,247	1,136	1,372
1988		166,935	74,988	17,881	35,184	2,668	10,712	5,711	2,197	635	84,749	83,122	1,163	464	3,150	2,595	1,344	1,250	1,452
1989		170,434	72,650	18,291	31,655	2,674	11,186	5,711	2,476	657	90,028	88,268	1,274	486	3,425	2,802	1,444	1,358	1,530
1990		175,677	71,201	18,115	29,825	2,672	11,485	5,657	2,711	735	96,183	94,327	1,347	509	3,683	2,993	1,549	1,444	1,617
1991		179,446	67,811	17,008	26,874	2,561	11,893	5,711	2,988	776	102,945	101,026	1,385	534	3,856	3,181	1,666	1,515	1,653
1992		179,933	66,219	17,261	24,356	2,456	12,549	5,726	3,055	814	104,779	102,774	1,437	567	3,885	3,390	1,814	1,576	1,660
1993		176,270	64,414	17,576	22,163	2,152	13,080	5,624	3,023	796	102,657	100,575	1,479	603	3,943	3,601	1,975	1,627	1,655

## Appendix table 4-6

## U.S. inflation-adjusted R&amp;D expenditures, by source of funds and performing sector: 1953–2002

(Millions of constant 1996 dollars)

Year	Funding sector:		Federal Government								Industry				U&C		Nonprofits		Non-Federal <sup>a</sup>
	Performing sector:	Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b,e</sup>	Total	Industry <sup>f</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1994 .....		176,245	63,313	17,035	21,103	2,312	13,527	5,514	3,032	790	103,326	101,168	1,516	642	4,101	3,816	2,157	1,660	1,689
1995 .....		187,174	64,184	17,231	21,588	2,323	13,845	5,471	2,902	823	113,017	110,756	1,577	684	4,188	4,000	2,353	1,647	1,784
1996 .....		197,288	63,341	16,585	21,356	2,255	14,073	5,395	2,906	772	123,416	121,015	1,671	730	4,434	4,238	2,574	1,665	1,860
1997 .....		208,064	63,313	16,497	21,381	2,077	14,239	5,358	2,956	805	133,622	131,055	1,773	793	4,744	4,501	2,750	1,751	1,885
1998 .....		219,288	64,283	16,824	21,401	1,998	14,677	5,387	3,179	817	143,258	140,519	1,886	853	5,008	4,829	2,969	1,860	1,909
1999 .....		232,697	64,037	17,058	19,624	1,910	15,503	5,401	3,594	949	155,976	153,059	1,985	932	5,380	5,303	3,287	2,016	2,002
2000 .....		247,663	62,093	16,763	16,075	1,811	16,541	5,371	4,162	1,371	171,863	168,793	2,039	1,032	5,805	5,804	3,627	2,177	2,097
2001 preliminary .....		250,024	66,387	19,237	15,445	1,796	17,668	5,444	4,852	1,945	169,060	165,978	2,068	1,015	6,232	6,174	3,883	2,292	2,170
2002 preliminary .....		249,678	70,681	21,505	15,445	2,020	19,044	5,478	5,350	1,839	163,420	160,324	2,116	979	6,740	6,603	4,176	2,427	2,234

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Because of limitations in the survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofit support for their own R&D.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–54 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–63.

<sup>c</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years are not directly comparable to data for 1997 and earlier years. For FY 1998, \$479 million in passthrough funds were reported. For FY 2002, \$865 million in passthrough funds are estimated.

<sup>d</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

<sup>e</sup>Beginning in 2001, data for nonprofit FFRDCs are reported by FFRDCs. In prior years, data were collected from the Federal agencies supporting the FFRDCs.

<sup>f</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and for Federal Government expenditures before 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Technical notes explaining methodological issues of measurement will be provided in National Science Foundation, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. This table incorporates the latest revisions to prior-year data. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Science &amp; Engineering Indicators – 2004

Appendix table 4-7

## U.S. basic research expenditures, by performing sector and source of funds: 1953–2002

(Millions of current dollars)

(Page 1 of 2)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:	Total	Federal	Total	Federal <sup>b</sup>	Industry <sup>c</sup>	Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry	U&C	Non-profits	Federal <sup>e</sup>	Total	Federal <sup>b</sup>	Industry	Non-profits	Federal <sup>b</sup>
1953		460	102	151	19	132	—	123	82	7	13	6	16	36	48	27	9	12	—
1954		509	96	166	23	143	—	148	97	10	15	8	18	44	55	31	11	13	—
1955		579	98	189	27	162	—	180	117	14	17	12	21	50	63	36	13	14	—
1956		718	114	253	37	216	—	220	143	19	20	15	24	58	74	42	15	17	—
1957		814	124	271	41	230	—	261	167	25	23	20	27	72	87	49	15	23	—
1958		944	149	295	43	252	—	312	202	31	24	24	31	85	103	59	16	28	—
1959		1,087	165	320	72	248	—	388	263	38	24	28	36	95	120	72	18	30	—
1960		1,286	184	376	79	297	—	485	341	45	25	33	41	106	136	85	21	30	—
1961		1,512	230	395	81	314	—	598	432	54	25	40	48	126	164	105	22	37	—
1962		1,824	252	488	143	345	—	737	546	64	25	48	55	148	200	130	24	46	—
1963		2,115	285	522	147	375	—	909	689	75	25	58	63	175	225	150	25	50	—
1964		2,390	339	507	123	384	36	1,071	824	84	25	70	68	200	238	166	25	47	—
1965		2,665	375	563	157	406	30	1,221	944	94	27	86	70	218	260	179	29	52	—
1966		2,932	410	593	142	451	33	1,380	1,066	104	29	106	75	239	278	188	32	58	—
1967		3,168	434	595	168	427	35	1,554	1,188	114	34	136	83	263	289	194	34	61	—
1968		3,377	482	607	145	462	36	1,681	1,265	131	38	156	91	276	296	196	37	63	—
1969		3,490	545	581	123	458	37	1,754	1,288	153	40	171	103	272	302	192	43	67	—
1970		3,592	562	566	122	444	35	1,855	1,323	179	43	196	115	265	311	195	44	72	—
1971		3,723	581	557	101	456	36	1,968	1,385	194	50	214	127	252	329	207	45	77	—
1972		3,849	603	554	91	463	38	2,038	1,437	195	55	216	134	270	347	216	47	84	—
1973		4,106	652	595	96	499	43	2,103	1,489	196	59	223	137	343	371	232	49	90	—
1974		4,513	715	650	114	536	51	2,282	1,609	204	66	250	153	415	401	245	54	102	—
1975		4,883	760	677	104	573	61	2,480	1,768	212	72	264	164	476	430	255	59	116	—
1976		5,376	850	750	116	634	72	2,675	1,924	218	75	283	175	556	474	278	65	131	—
1977		6,013	943	836	135	701	80	2,967	2,114	232	89	334	198	667	521	301	72	148	—
1978		6,961	1,044	941	156	785	97	3,376	2,399	260	107	398	213	906	598	351	79	168	—
1979		7,840	1,112	1,054	161	893	108	3,828	2,719	286	128	466	229	1,050	689	413	87	190	—
1980		8,794	1,212	1,205	170	1,035	124	4,315	3,061	307	156	544	248	1,167	771	461	95	215	—
1981		9,828	1,343	1,477	164	1,313	135	4,737	3,331	338	183	615	269	1,284	853	505	105	243	—
1982		10,821	1,522	1,776	253	1,523	125	5,091	3,475	368	215	716	317	1,366	941	551	115	275	—
1983		12,064	1,733	2,106	346	1,760	122	5,518	3,689	396	260	816	358	1,536	1,050	613	127	311	—
1984		13,483	1,877	2,472	340	2,132	135	6,145	4,087	436	313	915	395	1,709	1,147	656	139	351	—
1985		14,854	1,947	2,731	358	2,373	128	7,024	4,606	514	389	1,075	440	1,793	1,231	681	153	397	—
1986		17,253	2,026	3,930	434	3,496	123	7,943	5,122	606	466	1,262	488	1,915	1,317	700	168	449	—
1987		18,547	2,047	4,181	598	3,583	191	8,644	5,527	659	514	1,399	545	2,086	1,399	707	185	507	—
1988		19,801	2,116	4,163	656	3,507	352	9,343	5,937	705	565	1,529	607	2,272	1,531	756	203	573	24
1989		21,914	2,309	4,818	986	3,832	423	10,218	6,422	766	637	1,714	680	2,371	1,730	860	223	647	46
1990		23,018	2,319	4,629	869	3,760	490	11,125	6,888	847	705	1,929	756	2,470	1,922	947	245	730	65
1991		27,143	2,378	7,376	1,251	6,125	464	12,061	7,423	912	764	2,127	836	2,657	2,129	1,036	269	825	77
1992		27,608	2,419	6,528	712	5,816	479	12,910	8,058	941	814	2,202	893	2,867	2,340	1,114	295	931	67

## U.S. basic research expenditures, by performing sector and source of funds: 1953–2002

(Millions of current dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs	
	Funding sector:	Total	Federal	Total	Federal <sup>b</sup>	Industry <sup>c</sup>	Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry	U&C	Non-profits	Federal <sup>e</sup>	Total	Federal <sup>b</sup>	Industry	Non-profits	Federal <sup>b</sup>
1993 .....		28,742	2,621	6,427	466	5,961	495	13,643	8,637	952	851	2,268	936	2,953	2,532	1,157	324	1,051	72
1994 .....		29,650	2,547	6,514	436	6,078	510	14,393	9,135	991	889	2,405	973	2,934	2,678	1,137	356	1,186	75
1995 .....		29,647	2,689	5,569	190	5,379	575	15,139	9,629	1,069	945	2,509	987	2,702	2,899	1,170	390	1,338	75
1996 .....		32,770	2,680	7,498	650	6,848	687	16,033	10,087	1,148	1,032	2,738	1,028	2,606	3,187	1,248	428	1,510	79
1997 .....		36,903	2,746	9,795	1,029	8,766	611	17,651	10,912	1,250	1,177	3,149	1,163	2,671	3,322	1,317	449	1,557	108
1998 .....		35,252	3,003	5,853	1,002	4,851	564	19,309	11,875	1,331	1,315	3,491	1,296	2,660	3,651	1,461	489	1,701	213
1999 .....		38,710	3,347	6,571	1,209	5,362	546	20,900	12,773	1,429	1,417	3,841	1,439	2,765	4,185	1,734	541	1,910	397
2000 .....		42,367	3,765	6,960	943	6,017	529	22,760	13,887	1,536	1,493	4,250	1,594	2,873	4,864	2,099	612	2,153	616
2001 preliminary .....		46,723	4,317	7,911	754	7,157	537	24,646	15,127	1,619	1,542	4,649	1,709	2,912	5,495	2,520	616	2,359	904
2002 preliminary .....		49,567	4,617	7,751	762	6,989	611	26,678	16,484	1,685	1,596	5,082	1,830	2,962	6,020	2,854	601	2,565	928

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

<sup>d</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>e</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years.

Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.



Appendix table 4-8

## U.S. inflation-adjusted basic research expenditures, by performing sector and source of funds: 1953–2002

(Millions of constant 1996 dollars)

(Page 1 of 2)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:			Total	Federal <sup>b</sup>	Industry <sup>c</sup>		Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry		U&C	Non-profits	Federal <sup>e</sup>		Total	Federal <sup>b</sup>
1953	.....	2,387	527	784	99	686	—	639	423	34	68	31	83	187	249	140	47	62	—
1954	.....	2,616	494	854	118	736	—	759	496	49	77	43	93	226	283	159	57	67	—
1955	.....	2,927	493	956	137	819	—	907	589	70	86	59	104	253	319	182	66	71	—
1956	.....	3,511	555	1,237	181	1,056	—	1,076	697	93	95	76	115	284	359	203	73	83	—
1957	.....	3,850	587	1,283	194	1,088	—	1,233	788	117	106	93	128	338	409	230	71	109	—
1958	.....	4,360	689	1,363	199	1,165	—	1,442	933	144	111	111	143	393	474	270	74	129	—
1959	.....	4,968	752	1,463	329	1,133	—	1,773	1,200	172	110	130	162	432	548	329	82	137	—
1960	.....	5,795	827	1,694	356	1,338	—	2,183	1,534	203	110	151	185	478	613	383	95	135	—
1961	.....	6,736	1,023	1,760	361	1,399	—	2,663	1,923	239	111	177	212	559	731	468	98	165	—
1962	.....	8,021	1,108	2,146	629	1,517	—	3,239	2,399	280	110	210	240	649	880	572	106	202	—
1963	.....	9,196	1,237	2,270	639	1,630	—	3,950	2,996	326	107	250	272	761	978	652	109	217	—
1964	.....	10,238	1,452	2,172	527	1,645	152	4,587	3,528	361	107	298	291	855	1,020	711	107	201	—
1965	.....	11,207	1,575	2,368	660	1,707	126	5,132	3,968	397	111	362	294	915	1,091	751	122	219	—
1966	.....	11,985	1,676	2,424	581	1,844	133	5,642	4,358	423	119	435	307	975	1,135	767	131	237	—
1967	.....	12,566	1,720	2,360	666	1,694	137	6,162	4,710	452	133	538	329	1,043	1,144	768	135	242	—
1968	.....	12,840	1,833	2,308	551	1,757	137	6,390	4,810	497	143	594	346	1,048	1,125	745	141	240	—
1969	.....	12,650	1,976	2,106	446	1,660	132	6,356	4,667	554	143	620	372	986	1,095	696	156	243	—
1970	.....	12,362	1,934	1,948	420	1,528	119	6,383	4,551	617	148	673	394	910	1,068	669	151	248	—
1971	.....	12,199	1,904	1,825	331	1,494	118	6,448	4,536	635	162	701	414	826	1,078	678	147	252	—
1972	.....	12,095	1,894	1,741	286	1,455	118	6,403	4,516	614	173	679	421	849	1,091	679	148	264	—
1973	.....	12,220	1,940	1,771	286	1,485	126	6,259	4,430	584	174	664	406	1,021	1,103	689	146	268	—
1974	.....	12,323	1,952	1,775	311	1,464	139	6,230	4,394	557	180	683	416	1,132	1,095	669	147	278	—
1975	.....	12,197	1,898	1,691	260	1,431	152	6,194	4,417	531	179	658	410	1,188	1,074	637	148	289	—
1976	.....	12,709	2,010	1,773	274	1,499	170	6,323	4,548	515	177	670	413	1,314	1,120	656	154	309	—
1977	.....	13,356	2,094	1,857	300	1,557	177	6,589	4,696	515	198	742	439	1,481	1,158	669	159	329	—
1978	.....	14,434	2,165	1,951	323	1,628	200	7,000	4,974	539	221	826	441	1,878	1,239	728	164	348	—
1979	.....	15,006	2,129	2,017	308	1,709	207	7,325	5,204	547	244	892	438	2,009	1,319	789	166	363	—
1980	.....	15,418	2,125	2,113	298	1,815	218	7,565	5,366	538	273	954	435	2,045	1,352	809	167	376	—
1981	.....	15,757	2,153	2,368	263	2,105	216	7,594	5,341	542	293	987	432	2,059	1,367	810	168	389	—
1982	.....	16,334	2,297	2,681	382	2,299	189	7,685	5,245	556	325	1,081	478	2,062	1,421	832	174	415	—
1983	.....	17,514	2,515	3,057	502	2,555	177	8,011	5,355	575	377	1,185	519	2,229	1,524	889	184	451	—
1984	.....	18,873	2,627	3,460	476	2,984	189	8,601	5,720	610	438	1,281	553	2,392	1,605	919	195	492	—
1985	.....	20,157	2,643	3,706	486	3,220	173	9,532	6,250	698	528	1,459	597	2,433	1,671	924	207	539	—
1986	.....	22,910	2,690	5,218	576	4,642	164	10,546	6,801	804	618	1,676	647	2,543	1,748	929	223	596	—
1987	.....	23,907	2,639	5,389	771	4,618	246	11,141	7,124	849	663	1,804	703	2,689	1,803	912	238	653	—
1988	.....	24,687	2,638	5,190	818	4,372	439	11,648	7,401	879	704	1,907	757	2,832	1,909	943	253	714	30
1989	.....	26,317	2,773	5,786	1,184	4,602	508	12,270	7,712	919	765	2,058	816	2,847	2,077	1,033	267	777	56
1990	.....	26,607	2,680	5,351	1,005	4,346	566	12,859	7,962	979	815	2,230	874	2,855	2,222	1,095	283	844	75
1991	.....	30,273	2,652	8,227	1,395	6,831	518	13,452	8,278	1,017	852	2,372	932	2,963	2,375	1,155	300	920	86
1992	.....	30,061	2,634	7,108	775	6,333	521	14,057	8,774	1,025	887	2,398	973	3,121	2,548	1,213	321	1,014	73

## U.S. inflation-adjusted basic research expenditures, by performing sector and source of funds: 1953–2002

(Millions of constant 1996 dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:	Total	Federal	Total	Federal <sup>b</sup>	Industry <sup>c</sup>	Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry	U&C	Non-profits	Federal <sup>e</sup>	Total	Federal <sup>b</sup>	Industry	Non-profits	Federal <sup>b</sup>
1993 .....		30,560	2,787	6,834	495	6,338	526	14,506	9,183	1,012	905	2,411	995	3,140	2,692	1,230	344	1,117	77
1994 .....		30,883	2,653	6,785	454	6,331	531	14,991	9,515	1,032	926	2,505	1,014	3,056	2,790	1,184	370	1,235	78
1995 .....		30,221	2,741	5,677	194	5,483	586	15,432	9,815	1,089	963	2,558	1,006	2,754	2,955	1,193	398	1,364	77
1996 .....		32,770	2,680	7,498	650	6,848	687	16,033	10,087	1,148	1,032	2,738	1,028	2,606	3,187	1,248	428	1,510	79
1997 .....		36,198	2,693	9,608	1,009	8,598	599	17,313	10,704	1,226	1,155	3,088	1,140	2,620	3,259	1,291	440	1,527	106
1998 .....		34,158	2,910	5,672	971	4,701	546	18,710	11,507	1,289	1,274	3,383	1,256	2,578	3,538	1,415	474	1,649	206
1999 .....		36,990	3,198	6,279	1,155	5,124	522	19,971	12,206	1,366	1,354	3,670	1,376	2,642	3,999	1,657	517	1,825	379
2000 .....		39,637	3,522	6,511	882	5,629	495	21,293	12,992	1,437	1,397	3,976	1,491	2,688	4,551	1,964	573	2,014	576
2001 preliminary .....		42,702	3,945	7,230	689	6,541	491	22,525	13,825	1,480	1,410	4,249	1,562	2,662	5,022	2,303	563	2,156	827
2002 preliminary .....		44,810	4,174	7,007	689	6,318	552	24,117	14,902	1,523	1,443	4,595	1,655	2,678	5,442	2,580	544	2,319	839

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

<sup>d</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>e</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Appendix table 4-9

## U.S. basic research expenditures, by source of funds and performing sector: 1953–2002

(Millions of current dollars)

(Page 1 of 2)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:		Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>
1953		460	265	102	19	—	82	36	27	—	154	132	13	9	6	28	12	16	7
1954		509	291	96	23	—	97	44	31	—	169	143	15	11	8	31	13	18	10
1955		579	327	98	27	—	117	50	36	—	192	162	17	13	12	35	14	21	14
1956		718	393	114	37	—	143	58	42	—	251	216	20	15	15	41	17	24	19
1957		814	452	124	41	—	167	72	49	—	268	230	23	15	20	50	23	27	25
1958		944	538	149	43	—	202	85	59	—	292	252	24	16	24	59	28	31	31
1959		1,087	666	165	72	—	263	95	72	—	290	248	24	18	28	66	30	36	38
1960		1,286	794	184	79	—	341	106	85	—	343	297	25	21	33	71	30	41	45
1961		1,512	973	230	81	—	432	126	105	—	361	314	25	22	40	85	37	48	54
1962		1,824	1,218	252	143	—	546	148	130	—	394	345	25	24	48	101	46	55	64
1963		2,115	1,446	285	147	—	689	175	150	—	425	375	25	25	58	113	50	63	75
1964		2,390	1,687	339	123	36	824	200	166	—	434	384	25	25	70	115	47	68	84
1965		2,665	1,901	375	157	30	944	218	179	—	462	406	27	29	86	122	52	70	94
1966		2,932	2,077	410	142	33	1,066	239	188	—	512	451	29	32	106	133	58	75	104
1967		3,168	2,280	434	168	35	1,188	263	194	—	495	427	34	34	136	144	61	83	114
1968		3,377	2,400	482	145	36	1,265	276	196	—	537	462	38	37	156	154	63	91	131
1969		3,490	2,456	545	123	37	1,288	272	192	—	541	458	40	43	171	170	67	103	153
1970		3,592	2,500	562	122	35	1,323	265	195	—	531	444	43	44	196	187	72	115	179
1971		3,723	2,562	581	101	36	1,385	252	207	—	551	456	50	45	214	204	77	127	194
1972		3,849	2,654	603	91	38	1,437	270	216	—	565	463	55	47	216	218	84	134	195
1973		4,106	2,853	652	96	43	1,489	343	232	—	607	499	59	49	223	227	90	137	196
1974		4,513	3,148	715	114	51	1,609	415	245	—	656	536	66	54	250	254	102	153	204
1975		4,883	3,423	760	104	61	1,768	476	255	—	704	573	72	59	264	280	116	164	212
1976		5,376	3,796	850	116	72	1,924	556	278	—	774	634	75	65	283	305	131	175	218
1977		6,013	4,240	943	135	80	2,114	667	301	—	862	701	89	72	334	346	148	198	232
1978		6,961	4,953	1,044	156	97	2,399	906	351	—	970	785	107	79	398	380	168	213	260
1979		7,840	5,562	1,112	161	108	2,719	1,050	413	—	1,107	893	128	87	466	419	190	229	286
1980		8,794	6,195	1,212	170	124	3,061	1,167	461	—	1,286	1,035	156	95	544	463	215	248	307
1981		9,828	6,762	1,343	164	135	3,331	1,284	505	—	1,600	1,313	183	105	615	512	243	269	338
1982		10,821	7,292	1,522	253	125	3,475	1,366	551	—	1,854	1,523	215	115	716	591	275	317	368
1983		12,064	8,037	1,733	346	122	3,689	1,536	613	—	2,146	1,760	260	127	816	668	311	358	396
1984		13,483	8,803	1,877	340	135	4,087	1,709	656	—	2,584	2,132	313	139	915	746	351	395	436
1985		14,854	9,512	1,947	358	128	4,606	1,793	681	—	2,915	2,373	389	153	1,075	837	397	440	514
1986		17,253	10,320	2,026	434	123	5,122	1,915	700	—	4,130	3,496	466	168	1,262	936	449	488	606
1987		18,547	11,156	2,047	598	191	5,527	2,086	707	—	4,282	3,583	514	185	1,399	1,052	507	545	659
1988		19,801	12,113	2,116	656	352	5,937	2,272	756	24	4,274	3,507	565	203	1,529	1,180	573	607	705
1989		21,914	13,417	2,309	986	423	6,422	2,371	860	46	4,692	3,832	637	223	1,714	1,326	647	680	766
1990		23,018	14,046	2,319	869	490	6,888	2,470	947	65	4,710	3,760	705	245	1,929	1,486	730	756	847
1991		27,143	15,286	2,378	1,251	464	7,423	2,657	1,036	77	7,157	6,125	764	269	2,127	1,660	825	836	912
1992		27,608	15,715	2,419	712	479	8,058	2,867	1,114	67	6,925	5,816	814	295	2,202	1,824	931	893	941

## U.S. basic research expenditures, by source of funds and performing sector: 1953–2002

(Millions of current dollars)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:		Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1993 .....		28,742	16,400	2,621	466	495	8,637	2,953	1,157	72	7,136	5,961	851	324	2,268	1,987	1,051	936	952
1994 .....		29,650	16,773	2,547	436	510	9,135	2,934	1,137	75	7,323	6,078	889	356	2,405	2,159	1,186	973	991
1995 .....		29,647	17,030	2,689	190	575	9,629	2,702	1,170	75	6,714	5,379	945	390	2,509	2,325	1,338	987	1,069
1996 .....		32,770	18,037	2,680	650	687	10,087	2,606	1,248	79	8,308	6,848	1,032	428	2,738	2,538	1,510	1,028	1,148
1997 .....		36,903	19,394	2,746	1,029	611	10,912	2,671	1,317	108	10,392	8,766	1,177	449	3,149	2,719	1,557	1,163	1,250
1998 .....		35,252	20,777	3,003	1,002	564	11,875	2,660	1,461	213	6,655	4,851	1,315	489	3,491	2,998	1,701	1,296	1,331
1999 .....		38,710	22,770	3,347	1,209	546	12,773	2,765	1,734	397	7,320	5,362	1,417	541	3,841	3,349	1,910	1,439	1,429
2000 .....		42,367	24,713	3,765	943	529	13,887	2,873	2,099	616	8,122	6,017	1,493	612	4,250	3,747	2,153	1,594	1,536
2001 preliminary .....		46,723	27,071	4,317	754	537	15,127	2,912	2,520	904	9,316	7,157	1,542	616	4,649	4,068	2,359	1,709	1,619
2002 preliminary .....		49,567	29,218	4,617	762	611	16,484	2,962	2,854	928	9,186	6,989	1,596	601	5,082	4,395	2,565	1,830	1,685

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>d</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

<sup>e</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Appendix table 4-10

## U.S. inflation-adjusted basic research expenditures, by source of funds and performing sector: 1953–2002

(Millions of constant 1996 dollars)

(Page 1 of 2)

Year	Funding sector:	Total	Federal Government							Industry			U&C	Nonprofits		Non-Federal <sup>a</sup>			
	Performing sector:		Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	U&C <sup>c</sup>		
1953		2,387	1,377	527	99	—	423	187	140	—	800	686	68	47	31	145	62	83	34
1954		2,616	1,494	494	118	—	496	226	159	—	869	736	77	57	43	159	67	93	49
1955		2,927	1,653	493	137	—	589	253	182	—	971	819	86	66	59	174	71	104	70
1956		3,511	1,919	555	181	—	697	284	203	—	1,225	1,056	95	73	76	198	83	115	93
1957		3,850	2,137	587	194	—	788	338	230	—	1,266	1,088	106	71	93	237	109	128	117
1958		4,360	2,484	689	199	—	933	393	270	—	1,349	1,165	111	74	111	273	129	143	144
1959		4,968	3,042	752	329	—	1,200	432	329	—	1,325	1,133	110	82	130	299	137	162	172
1960		5,795	3,578	827	356	—	1,534	478	383	—	1,543	1,338	110	95	151	320	135	185	203
1961		6,736	4,334	1,023	361	—	1,923	559	468	—	1,609	1,399	111	98	177	377	165	212	239
1962		8,021	5,356	1,108	629	—	2,399	649	572	—	1,733	1,517	110	106	210	442	202	240	280
1963		9,196	6,285	1,237	639	—	2,996	761	652	—	1,846	1,630	107	109	250	489	217	272	326
1964		10,238	7,226	1,452	527	152	3,528	855	711	—	1,859	1,645	107	107	298	493	201	291	361
1965		11,207	7,994	1,575	660	126	3,968	915	751	—	1,941	1,707	111	122	362	513	219	294	397
1966		11,985	8,489	1,676	581	133	4,358	975	767	—	2,093	1,844	119	131	435	544	237	307	423
1967		12,566	9,044	1,720	666	137	4,710	1,043	768	—	1,962	1,694	133	135	538	571	242	329	452
1968		12,840	9,124	1,833	551	137	4,810	1,048	745	—	2,040	1,757	143	141	594	586	240	346	497
1969		12,650	8,903	1,976	446	132	4,667	986	696	—	1,959	1,660	143	156	620	614	243	372	554
1970		12,362	8,603	1,934	420	119	4,551	910	669	—	1,827	1,528	148	151	673	642	248	394	617
1971		12,199	8,393	1,904	331	118	4,536	826	678	—	1,804	1,494	162	147	701	667	252	414	635
1972		12,095	8,341	1,894	286	118	4,516	849	679	—	1,776	1,455	173	148	679	685	264	421	614
1973		12,220	8,493	1,940	286	126	4,430	1,021	689	—	1,805	1,485	174	146	664	674	268	406	584
1974		12,323	8,597	1,952	311	139	4,394	1,132	669	—	1,791	1,464	180	147	683	695	278	416	557
1975		12,197	8,552	1,898	260	152	4,417	1,188	637	—	1,758	1,431	179	148	658	698	289	410	531
1976		12,709	8,973	2,010	274	170	4,548	1,314	656	—	1,830	1,499	177	154	670	722	309	413	515
1977		13,356	9,417	2,094	300	177	4,696	1,481	669	—	1,914	1,557	198	159	742	768	329	439	515
1978		14,434	10,269	2,165	323	200	4,974	1,878	728	—	2,012	1,628	221	164	826	788	348	441	539
1979		15,006	10,646	2,129	308	207	5,204	2,009	789	—	2,119	1,709	244	166	892	801	363	438	547
1980		15,418	10,860	2,125	298	218	5,366	2,045	809	—	2,255	1,815	273	167	954	811	376	435	538
1981		15,757	10,841	2,153	263	216	5,341	2,059	810	—	2,566	2,105	293	168	987	821	389	432	542
1982		16,334	11,007	2,297	382	189	5,245	2,062	832	—	2,798	2,299	325	174	1,081	893	415	478	556
1983		17,514	11,668	2,515	502	177	5,355	2,229	889	—	3,116	2,555	377	184	1,185	970	451	519	575
1984		18,873	12,322	2,627	476	189	5,720	2,392	919	—	3,617	2,984	438	195	1,281	1,044	492	553	610
1985		20,157	12,909	2,643	486	173	6,250	2,433	924	—	3,955	3,220	528	207	1,459	1,135	539	597	698
1986		22,910	13,703	2,690	576	164	6,801	2,543	929	—	5,484	4,642	618	223	1,676	1,243	596	647	804
1987		23,907	14,380	2,639	771	246	7,124	2,689	912	—	5,519	4,618	663	238	1,804	1,356	653	703	849
1988		24,687	15,101	2,638	818	439	7,401	2,832	943	30	5,329	4,372	704	253	1,907	1,471	714	757	879
1989		26,317	16,113	2,773	1,184	508	7,712	2,847	1,033	56	5,635	4,602	765	267	2,058	1,593	777	816	919
1990		26,607	16,236	2,680	1,005	566	7,962	2,855	1,095	75	5,444	4,346	815	283	2,230	1,718	844	874	979
1991		30,273	17,049	2,652	1,395	518	8,278	2,963	1,155	86	7,983	6,831	852	300	2,372	1,852	920	932	1,017
1992		30,061	17,111	2,634	775	521	8,774	3,121	1,213	73	7,541	6,333	887	321	2,398	1,987	1,014	973	1,025

## U.S. inflation-adjusted basic research expenditures, by source of funds and performing sector: 1953–2002

(Millions of constant 1996 dollars)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:		Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1993 .....		30,560	17,438	2,787	495	526	9,183	3,140	1,230	77	7,587	6,338	905	344	2,411	2,112	1,117	995	1,012
1994 .....		30,883	17,470	2,653	454	531	9,515	3,056	1,184	78	7,627	6,331	926	370	2,505	2,249	1,235	1,014	1,032
1995 .....		30,221	17,359	2,741	194	586	9,815	2,754	1,193	77	6,844	5,483	963	398	2,558	2,370	1,364	1,006	1,089
1996 .....		32,770	18,037	2,680	650	687	10,087	2,606	1,248	79	8,308	6,848	1,032	428	2,738	2,538	1,510	1,028	1,148
1997 .....		36,198	19,023	2,693	1,009	599	10,704	2,620	1,291	106	10,193	8,598	1,155	440	3,088	2,667	1,527	1,140	1,226
1998 .....		34,158	20,133	2,910	971	546	11,507	2,578	1,415	206	6,448	4,701	1,274	474	3,383	2,905	1,649	1,256	1,289
1999 .....		36,990	21,759	3,198	1,155	522	12,206	2,642	1,657	379	6,995	5,124	1,354	517	3,670	3,200	1,825	1,376	1,366
2000 .....		39,637	23,120	3,522	882	495	12,992	2,688	1,964	576	7,599	5,629	1,397	573	3,976	3,505	2,014	1,491	1,437
2001 preliminary .....		42,702	24,742	3,945	689	491	13,825	2,662	2,303	827	8,514	6,541	1,410	563	4,249	3,718	2,156	1,562	1,480
2002 preliminary .....		44,810	26,414	4,174	689	552	14,902	2,678	2,580	839	8,305	6,318	1,443	544	4,595	3,973	2,319	1,655	1,523

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>d</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

<sup>e</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Appendix table 4-11

## U.S. applied research expenditures, by performing sector and source of funds: 1953–2002

(Millions of current dollars)

(Page 1 of 2)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:	Total	Federal	Total	Federal <sup>b</sup>	Industry <sup>c</sup>	Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry	U&C	Non-profits	Federal <sup>e</sup>	Total	Federal <sup>b</sup>	Industry	Non-profits	Federal <sup>b</sup>
1953		1,289	347	726	288	438	—	134	59	30	7	28	10	48	35	14	11	10	—
1954		1,378	330	814	322	492	—	137	60	32	8	28	10	58	40	16	13	11	—
1955		1,514	333	928	368	560	—	142	63	32	9	27	11	68	43	18	14	11	—
1956		1,928	387	1,268	474	794	—	146	65	33	10	27	11	79	49	21	14	14	—
1957		2,414	446	1,670	678	992	—	147	63	34	12	27	11	94	58	24	14	20	—
1958		2,758	516	1,911	774	1,137	—	152	66	35	12	27	12	111	69	30	14	25	—
1959		2,940	577	1,991	813	1,178	—	167	78	37	13	28	12	121	85	43	15	27	—
1960		3,065	615	2,029	833	1,196	—	186	93	39	13	29	12	129	108	63	17	28	—
1961		3,123	668	1,977	812	1,165	—	199	104	40	13	30	13	145	135	83	17	35	—
1962		3,698	709	2,449	1,011	1,438	—	216	119	41	14	30	13	163	162	98	19	45	—
1963		3,865	809	2,457	1,007	1,450	—	230	128	42	14	32	14	186	183	115	19	49	—
1964		4,193	947	2,538	978	1,560	54	256	142	45	14	37	18	203	196	130	19	47	—
1965		4,377	994	2,612	992	1,620	50	304	176	46	13	42	27	206	213	140	21	52	—
1966		4,668	1,012	2,790	986	1,804	68	351	208	47	14	48	34	213	234	153	24	57	—
1967		4,850	1,069	2,832	983	1,849	85	389	238	46	16	54	36	225	251	166	25	60	—
1968		5,141	1,112	3,037	956	2,081	91	405	250	46	16	55	39	221	276	186	28	62	—
1969		5,455	1,229	3,192	920	2,272	96	417	257	48	16	54	43	213	308	210	32	66	—
1970		5,737	1,334	3,330	952	2,378	82	451	280	51	18	56	47	213	328	225	33	70	—
1971		5,853	1,355	3,348	907	2,441	87	499	306	61	19	67	47	216	349	241	34	74	—
1972		6,148	1,434	3,407	845	2,562	109	619	391	74	21	82	52	224	357	243	35	79	—
1973		6,660	1,527	3,715	883	2,832	115	725	450	88	26	100	62	203	376	257	36	83	—
1974		7,354	1,652	4,168	905	3,263	130	794	477	96	32	118	72	191	420	290	39	91	—
1975		8,105	1,912	4,431	991	3,440	153	934	550	113	39	141	92	219	456	315	42	100	—
1976		8,999	2,068	4,945	1,033	3,912	190	1,042	596	127	45	166	109	263	492	338	45	109	—
1977		9,668	2,081	5,424	1,113	4,311	218	1,126	626	134	51	194	121	297	523	355	48	120	—
1978		10,708	2,242	6,065	1,195	4,870	239	1,247	676	151	61	232	128	324	592	409	52	132	—
1979		12,103	2,415	6,975	1,305	5,670	256	1,418	793	161	71	263	129	360	680	480	55	144	—
1980		13,751	2,546	8,175	1,625	6,550	281	1,622	912	174	88	308	140	421	706	489	60	158	—
1981		16,409	2,731	10,401	2,042	8,359	315	1,781	953	199	108	363	159	422	758	521	64	173	—
1982		18,291	2,802	11,956	2,593	9,363	379	1,915	1,007	207	121	402	178	433	808	550	69	189	—
1983		20,406	2,991	13,513	3,227	10,286	447	2,116	1,122	215	141	443	194	473	866	585	74	207	—
1984		22,526	2,961	15,218	3,677	11,541	568	2,332	1,226	234	168	491	212	548	899	594	79	226	—
1985		25,410	3,135	17,625	4,717	12,908	630	2,527	1,296	262	198	547	224	579	913	581	85	247	—
1986		27,257	3,204	19,131	4,049	15,082	628	2,780	1,393	298	229	620	240	554	961	600	91	270	—
1987		27,852	3,366	19,190	4,037	15,153	560	3,219	1,643	333	260	707	276	532	986	593	98	295	—
1988		29,528	3,362	20,377	3,846	16,531	372	3,779	1,957	377	302	818	325	547	1,026	599	105	322	66
1989		32,280	3,566	22,317	4,324	17,993	377	4,188	2,120	417	347	933	370	603	1,159	695	112	352	70
1990		34,907	3,652	24,399	5,967	18,432	398	4,405	2,139	453	377	1,031	404	689	1,284	780	120	384	81
1991		38,648	4,094	27,013	5,588	21,425	452	4,608	2,230	468	392	1,091	428	927	1,468	921	129	419	86
1992		37,915	4,337	25,660	4,476	21,184	489	4,880	2,413	479	414	1,120	454	940	1,528	933	138	456	81

## U.S. applied research expenditures, by performing sector and source of funds: 1953–2002

(Millions of current dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>						U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs	
	Funding sector:			Total	Federal <sup>b</sup>	Industry <sup>c</sup>	Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry	U&C	Non-profits	Federal <sup>e</sup>	Total	Federal <sup>b</sup>	Industry	Non-profits	Federal <sup>b</sup>
1993 .....		37,297	4,838	24,251	4,295	19,956	452	5,146	2,539	496	443	1,181	487	962	1,544	900	148	497	103
1994 .....		36,623	4,985	22,988	3,616	19,372	511	5,387	2,640	517	464	1,256	508	982	1,659	960	158	541	111
1995 .....		40,856	4,952	26,919	3,164	23,755	459	5,655	2,775	559	494	1,311	516	1,050	1,692	934	170	589	129
1996 .....		43,160	4,872	29,010	3,640	25,370	227	5,879	2,859	584	524	1,390	522	1,270	1,781	960	182	640	122
1997 .....		46,547	4,997	32,430	2,648	29,782	217	5,511	2,549	551	517	1,384	510	1,337	1,926	1,011	205	711	128
1998 .....		46,364	5,146	32,208	2,632	29,576	241	5,215	2,286	524	518	1,375	511	1,372	2,060	1,060	223	777	123
1999 .....		51,864	5,530	36,418	3,109	33,309	272	5,843	2,739	546	542	1,467	550	1,251	2,420	1,301	247	872	130
2000 .....		56,511	6,105	38,818	2,688	36,130	263	6,688	3,342	579	563	1,603	601	1,329	3,099	1,837	279	983	209
2001 preliminary .....		63,609	7,164	43,486	3,603	39,883	267	7,350	3,706	620	591	1,780	654	1,473	3,567	2,209	281	1,077	302
2002 preliminary .....		64,802	8,083	42,590	3,643	38,947	304	8,007	4,105	645	611	1,946	701	1,645	3,901	2,456	275	1,171	271

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

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<sup>c</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

<sup>d</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

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NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Science & Engineering Indicators – 2004



Appendix table 4-12

## U.S. inflation-adjusted applied research expenditures, by performing sector and source of funds: 1953–2002

(Millions of constant 1996 dollars)

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Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:			Total	Federal <sup>b</sup>	Industry <sup>c</sup>		Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry		U&C	Non-profits	Federal <sup>e</sup>		Total	Federal <sup>b</sup>
1953		6,696	1,803	3,771	1,496	2,275	—	694	306	157	34	145	52	247	182	73	57	52	—
1954		7,088	1,695	4,187	1,656	2,531	—	702	306	162	39	144	51	298	206	82	67	57	—
1955		7,652	1,684	4,692	1,860	2,831	—	715	319	163	43	137	53	344	217	91	71	56	—
1956		9,425	1,890	6,200	2,318	3,883	—	714	318	162	49	132	54	384	237	100	68	68	—
1957		11,422	2,108	7,903	3,209	4,695	—	693	298	161	54	128	52	445	272	111	66	95	—
1958		12,745	2,384	8,831	3,577	5,254	—	700	303	163	55	126	53	511	319	139	65	116	—
1959		13,435	2,635	9,100	3,716	5,384	—	763	354	169	57	128	55	551	386	194	69	123	—
1960		13,813	2,769	9,144	3,754	5,390	—	836	419	174	59	130	54	579	484	282	77	126	—
1961		13,917	2,977	8,810	3,619	5,192	—	885	461	178	58	132	56	646	599	368	76	156	—
1962		16,260	3,116	10,770	4,446	6,324	—	950	521	178	59	134	57	715	710	429	84	198	—
1963		16,802	3,517	10,683	4,378	6,304	—	998	554	183	61	141	59	809	796	500	83	213	—
1964		17,965	4,055	10,874	4,190	6,684	231	1,095	608	194	58	160	75	870	840	557	81	201	—
1965		18,406	4,178	10,984	4,172	6,812	208	1,276	738	195	55	177	111	864	896	589	88	219	—
1966		19,082	4,137	11,406	4,031	7,375	278	1,435	850	192	57	198	137	871	955	623	98	233	—
1967		19,238	4,238	11,234	3,899	7,334	337	1,541	942	181	61	214	143	893	996	658	99	238	—
1968		19,548	4,226	11,548	3,635	7,913	346	1,540	949	175	61	209	146	838	1,049	707	106	236	—
1969		19,773	4,455	11,569	3,335	8,235	348	1,511	930	174	58	195	154	772	1,116	761	116	239	—
1970		19,744	4,590	11,459	3,276	8,183	282	1,550	962	176	60	192	160	733	1,129	774	114	241	—
1971		19,178	4,440	10,970	2,972	7,998	285	1,635	1,003	198	61	219	154	706	1,142	788	111	242	—
1972		19,323	4,506	10,707	2,656	8,052	341	1,944	1,227	233	64	257	162	704	1,120	762	110	248	—
1973		19,822	4,546	11,057	2,628	8,429	342	2,156	1,338	261	77	297	183	603	1,119	765	107	247	—
1974		20,081	4,512	11,382	2,471	8,910	354	2,167	1,301	262	86	322	195	520	1,146	792	106	249	—
1975		20,248	4,776	11,069	2,476	8,594	382	2,333	1,373	283	96	351	230	547	1,140	787	104	249	—
1976		21,274	4,890	11,690	2,442	9,248	448	2,463	1,408	301	105	391	258	621	1,162	798	106	259	—
1977		21,475	4,621	12,048	2,472	9,576	484	2,500	1,389	299	113	431	268	660	1,162	789	107	267	—
1978		22,202	4,648	12,575	2,478	10,097	495	2,585	1,401	314	125	481	264	672	1,227	848	107	273	—
1979		23,164	4,622	13,349	2,498	10,852	490	2,713	1,517	309	137	504	247	689	1,301	919	106	276	—
1980		24,108	4,463	14,332	2,849	11,483	492	2,844	1,599	304	155	540	246	738	1,238	857	104	277	—
1981		26,308	4,379	16,676	3,274	13,402	505	2,855	1,527	319	173	581	255	677	1,215	836	102	277	—
1982		27,610	4,229	18,047	3,914	14,133	572	2,890	1,519	313	183	607	268	653	1,219	830	104	285	—
1983		29,625	4,343	19,618	4,685	14,933	649	3,072	1,629	312	205	643	282	687	1,257	849	107	300	—
1984		31,531	4,145	21,302	5,147	16,155	795	3,264	1,716	328	235	688	297	768	1,258	831	111	317	—
1985		34,482	4,254	23,918	6,401	17,517	855	3,430	1,759	355	268	743	304	786	1,240	789	115	336	—
1986		36,193	4,254	25,403	5,376	20,027	833	3,691	1,849	396	304	824	318	735	1,276	797	121	359	—
1987		35,901	4,338	24,736	5,204	19,532	722	4,149	2,118	429	335	912	356	685	1,271	764	126	381	—
1988		36,814	4,191	25,405	4,795	20,610	463	4,712	2,440	470	377	1,020	405	682	1,279	746	131	402	82
1989		38,765	4,283	26,801	5,193	21,608	453	5,029	2,546	501	417	1,121	445	724	1,392	834	135	423	84
1990		40,351	4,222	28,204	6,897	21,306	460	5,092	2,473	523	436	1,192	467	796	1,484	901	139	444	94
1991		43,105	4,566	30,128	6,232	23,896	504	5,140	2,487	522	437	1,216	478	1,033	1,638	1,027	144	467	96
1992		41,284	4,722	27,940	4,874	23,066	532	5,314	2,627	521	451	1,219	495	1,024	1,664	1,016	150	497	89

## U.S. inflation-adjusted applied research expenditures, by performing sector and source of funds: 1953–2002

(Millions of constant 1996 dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:			Total	Federal <sup>b</sup>	Industry <sup>c</sup>		Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry		U&C	Non-profits	Federal <sup>e</sup>		Total	Federal <sup>b</sup>
1993 .....		39,656	5,144	25,785	4,567	21,219	481	5,472	2,700	527	471	1,256	518	1,023	1,642	957	157	528	109
1994 .....		38,145	5,192	23,943	3,766	20,177	532	5,611	2,750	539	484	1,308	530	1,022	1,728	999	165	563	116
1995 .....		41,647	5,048	27,440	3,225	24,215	468	5,764	2,829	569	503	1,337	526	1,070	1,725	952	173	600	131
1996 .....		43,160	4,872	29,010	3,640	25,370	227	5,879	2,859	584	524	1,390	522	1,270	1,781	960	182	640	122
1997 .....		45,656	4,901	31,810	2,597	29,212	213	5,405	2,500	540	507	1,357	501	1,312	1,890	992	201	697	126
1998 .....		44,926	4,986	31,209	2,550	28,659	234	5,053	2,215	508	502	1,333	495	1,329	1,996	1,027	216	752	119
1999 .....		49,559	5,284	34,800	2,971	31,829	260	5,584	2,618	522	517	1,402	525	1,196	2,312	1,243	236	833	124
2000 .....		52,868	5,712	36,316	2,515	33,801	246	6,257	3,127	542	527	1,499	562	1,243	2,899	1,718	261	919	195
2001 preliminary .....		58,135	6,548	39,744	3,293	36,451	244	6,718	3,387	566	540	1,627	598	1,347	3,260	2,019	257	984	276
2002 preliminary .....		58,583	7,307	38,502	3,293	35,209	275	7,239	3,711	583	552	1,759	633	1,487	3,527	2,220	248	1,058	245

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

<sup>d</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>e</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Science & Engineering Indicators – 2004

Appendix table 4-13

## U.S. applied research expenditures, by source of funds and performing sector: 1953–2002

(Millions of current dollars)

(Page 1 of 2)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:		Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1953	.....	1,289	756	347	288	—	59	48	14	—	456	438	7	11	28	20	10	10	30
1954	.....	1,378	785	330	322	—	60	58	16	—	513	492	8	13	28	21	11	10	32
1955	.....	1,514	850	333	368	—	63	68	18	—	583	560	9	14	27	22	11	11	32
1956	.....	1,928	1,025	387	474	—	65	79	21	—	818	794	10	14	27	25	14	11	33
1957	.....	2,414	1,304	446	678	—	63	94	24	—	1,018	992	12	14	27	31	20	11	34
1958	.....	2,758	1,496	516	774	—	66	111	30	—	1,163	1,137	12	14	27	37	25	12	35
1959	.....	2,940	1,630	577	813	—	78	121	43	—	1,206	1,178	13	15	28	39	27	12	37
1960	.....	3,065	1,732	615	833	—	93	129	63	—	1,226	1,196	13	17	29	40	28	12	39
1961	.....	3,123	1,811	668	812	—	104	145	83	—	1,195	1,165	13	17	30	48	35	13	40
1962	.....	3,698	2,098	709	1,011	—	119	163	98	—	1,471	1,438	14	19	30	58	45	13	41
1963	.....	3,865	2,245	809	1,007	—	128	186	115	—	1,483	1,450	14	19	32	63	49	14	42
1964	.....	4,193	2,454	947	978	54	142	203	130	—	1,593	1,560	14	19	37	65	47	18	45
1965	.....	4,377	2,556	994	992	50	176	206	140	—	1,654	1,620	13	21	42	79	52	27	46
1966	.....	4,668	2,640	1,012	986	68	208	213	153	—	1,842	1,804	14	24	48	91	57	34	47
1967	.....	4,850	2,765	1,069	983	85	238	225	166	—	1,890	1,849	16	25	54	96	60	36	46
1968	.....	5,141	2,815	1,112	956	91	250	221	186	—	2,125	2,081	16	28	55	101	62	39	46
1969	.....	5,455	2,925	1,229	920	96	257	213	210	—	2,320	2,272	16	32	54	109	66	43	48
1970	.....	5,737	3,085	1,334	952	82	280	213	225	—	2,429	2,378	18	33	56	117	70	47	51
1971	.....	5,853	3,111	1,355	907	87	306	216	241	—	2,494	2,441	19	34	67	121	74	47	61
1972	.....	6,148	3,244	1,434	845	109	391	224	243	—	2,618	2,562	21	35	82	131	79	52	74
1973	.....	6,660	3,434	1,527	883	115	450	203	257	—	2,894	2,832	26	36	100	145	83	62	88
1974	.....	7,354	3,644	1,652	905	130	477	191	290	—	3,333	3,263	32	39	118	163	91	72	96
1975	.....	8,105	4,139	1,912	991	153	550	219	315	—	3,520	3,440	39	42	141	192	100	92	113
1976	.....	8,999	4,486	2,068	1,033	190	596	263	338	—	4,001	3,912	45	45	166	218	109	109	127
1977	.....	9,668	4,689	2,081	1,113	218	626	297	355	—	4,410	4,311	51	48	194	241	120	121	134
1978	.....	10,708	5,084	2,242	1,195	239	676	324	409	—	4,982	4,870	61	52	232	259	132	128	151
1979	.....	12,103	5,609	2,415	1,305	256	793	360	480	—	5,797	5,670	71	55	263	273	144	129	161
1980	.....	13,751	6,273	2,546	1,625	281	912	421	489	—	6,698	6,550	88	60	308	298	158	140	174
1981	.....	16,409	6,985	2,731	2,042	315	953	422	521	—	8,531	8,359	108	64	363	332	173	159	199
1982	.....	18,291	7,763	2,802	2,593	379	1,007	433	550	—	9,553	9,363	121	69	402	367	189	178	207
1983	.....	20,406	8,846	2,991	3,227	447	1,122	473	585	—	10,501	10,286	141	74	443	401	207	194	215
1984	.....	22,526	9,574	2,961	3,677	568	1,226	548	594	—	11,788	11,541	168	79	491	438	226	212	234
1985	.....	25,410	10,939	3,135	4,717	630	1,296	579	581	—	13,191	12,908	198	85	547	471	247	224	262
1986	.....	27,257	10,427	3,204	4,049	628	1,393	554	600	—	15,402	15,082	229	91	620	510	270	240	298
1987	.....	27,852	10,730	3,366	4,037	560	1,643	532	593	—	15,511	15,153	260	98	707	571	295	276	333
1988	.....	29,528	10,749	3,362	3,846	372	1,957	547	599	66	16,938	16,531	302	105	818	647	322	325	377
1989	.....	32,280	11,755	3,566	4,324	377	2,120	603	695	70	18,452	17,993	347	112	933	722	352	370	417
1990	.....	34,907	13,705	3,652	5,967	398	2,139	689	780	81	18,930	18,432	377	120	1,031	788	384	404	453
1991	.....	38,648	14,297	4,094	5,588	452	2,230	927	921	86	21,946	21,425	392	129	1,091	847	419	428	468
1992	.....	37,915	13,670	4,337	4,476	489	2,413	940	933	81	21,736	21,184	414	138	1,120	911	456	454	479

## U.S. applied research expenditures, by source of funds and performing sector: 1953–2002

(Millions of current dollars)

Year	Funding sector:	Federal Government								Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:	Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1993 .....		37,297	14,089	4,838	4,295	452	2,539	962	900	103	20,547	19,956	443	148	1,181	984	497	487	496
1994 .....		36,623	13,805	4,985	3,616	511	2,640	982	960	111	19,995	19,372	464	158	1,256	1,049	541	508	517
1995 .....		40,856	13,463	4,952	3,164	459	2,775	1,050	934	129	24,418	23,755	494	170	1,311	1,104	589	516	559
1996 .....		43,160	13,949	4,872	3,640	227	2,859	1,270	960	122	26,076	25,370	524	182	1,390	1,162	640	522	584
1997 .....		46,547	12,888	4,997	2,648	217	2,549	1,337	1,011	128	30,504	29,782	517	205	1,384	1,221	711	510	551
1998 .....		46,364	12,860	5,146	2,632	241	2,286	1,372	1,060	123	30,317	29,576	518	223	1,375	1,287	777	511	524
1999 .....		51,864	14,332	5,530	3,109	272	2,739	1,251	1,301	130	34,098	33,309	542	247	1,467	1,421	872	550	546
2000 .....		56,511	15,773	6,105	2,688	263	3,342	1,329	1,837	209	36,972	36,130	563	279	1,603	1,584	983	601	579
2001 preliminary .....		63,609	18,724	7,164	3,603	267	3,706	1,473	2,209	302	40,755	39,883	591	281	1,780	1,731	1,077	654	620
2002 preliminary .....		64,802	20,507	8,083	3,643	304	4,105	1,645	2,456	271	39,833	38,947	611	275	1,946	1,871	1,171	701	645

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>d</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

<sup>e</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Appendix table 4-14

## U.S. inflation-adjusted applied research expenditures, by source of funds and performing sector: 1953–2002

(Millions of constant 1996 dollars)

(Page 1 of 2)

Year	Funding sector:	Federal Government								Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:	Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1953		6,696	3,925	1,803	1,496	—	306	247	73	—	2,366	2,275	34	57	145	104	52	52	157
1954		7,088	4,038	1,695	1,656	—	306	298	82	—	2,636	2,531	39	67	144	108	57	51	162
1955		7,652	4,297	1,684	1,860	—	319	344	91	—	2,945	2,831	43	71	137	109	56	53	163
1956		9,425	5,010	1,890	2,318	—	318	384	100	—	4,000	3,883	49	68	132	122	68	54	162
1957		11,422	6,171	2,108	3,209	—	298	445	111	—	4,815	4,695	54	66	128	147	95	52	161
1958		12,745	6,913	2,384	3,577	—	303	511	139	—	5,374	5,254	55	65	126	169	116	53	163
1959		13,435	7,450	2,635	3,716	—	354	551	194	—	5,510	5,384	57	69	128	178	123	55	169
1960		13,813	7,803	2,769	3,754	—	419	579	282	—	5,525	5,390	59	77	130	180	126	54	174
1961		13,917	8,070	2,977	3,619	—	461	646	368	—	5,325	5,192	58	76	132	212	156	56	178
1962		16,260	9,226	3,116	4,446	—	521	715	429	—	6,467	6,324	59	84	134	255	198	57	178
1963		16,802	9,759	3,517	4,378	—	554	809	500	—	6,448	6,304	61	83	141	272	213	59	183
1964		17,965	10,512	4,055	4,190	231	608	870	557	—	6,823	6,684	58	81	160	276	201	75	194
1965		18,406	10,749	4,178	4,172	208	738	864	589	—	6,955	6,812	55	88	177	330	219	111	195
1966		19,082	10,791	4,137	4,031	278	850	871	623	—	7,531	7,375	57	98	198	370	233	137	192
1967		19,238	10,968	4,238	3,899	337	942	893	658	—	7,495	7,334	61	99	214	381	238	143	181
1968		19,548	10,702	4,226	3,635	346	949	838	707	—	8,080	7,913	61	106	209	382	236	146	175
1969		19,773	10,601	4,455	3,335	348	930	772	761	—	8,409	8,235	58	116	195	393	239	154	174
1970		19,744	10,618	4,590	3,276	282	962	733	774	—	8,357	8,183	60	114	192	401	241	160	176
1971		19,178	10,193	4,440	2,972	285	1,003	706	788	—	8,170	7,998	61	111	219	396	242	154	198
1972		19,323	10,196	4,506	2,656	341	1,227	704	762	—	8,226	8,052	64	110	257	410	248	162	233
1973		19,822	10,221	4,546	2,628	342	1,338	603	765	—	8,613	8,429	77	107	297	430	247	183	261
1974		20,081	9,950	4,512	2,471	354	1,301	520	792	—	9,102	8,910	86	106	322	444	249	195	262
1975		20,248	10,340	4,776	2,476	382	1,373	547	787	—	8,794	8,594	96	104	351	479	249	230	283
1976		21,274	10,606	4,890	2,442	448	1,408	621	798	—	9,459	9,248	105	106	391	517	259	258	301
1977		21,475	10,416	4,621	2,472	484	1,389	660	789	—	9,796	9,576	113	107	431	534	267	268	299
1978		22,202	10,541	4,648	2,478	495	1,401	672	848	—	10,330	10,097	125	107	481	537	273	264	314
1979		23,164	10,734	4,622	2,498	490	1,517	689	919	—	11,094	10,852	137	106	504	523	276	247	309
1980		24,108	10,998	4,463	2,849	492	1,599	738	857	—	11,742	11,483	155	104	540	523	277	246	304
1981		26,308	11,199	4,379	3,274	505	1,527	677	836	—	13,677	13,402	173	102	581	532	277	255	319
1982		27,610	11,717	4,229	3,914	572	1,519	653	830	—	14,419	14,133	183	104	607	554	285	268	313
1983		29,625	12,843	4,343	4,685	649	1,629	687	849	—	15,245	14,933	205	107	643	582	300	282	312
1984		31,531	13,402	4,145	5,147	795	1,716	768	831	—	16,500	16,155	235	111	688	614	317	297	328
1985		34,482	14,844	4,254	6,401	855	1,759	786	789	—	17,900	17,517	268	115	743	640	336	304	355
1986		36,193	13,845	4,254	5,376	833	1,849	735	797	—	20,451	20,027	304	121	824	677	359	318	396
1987		35,901	13,831	4,338	5,204	722	2,118	685	764	—	19,993	19,532	335	126	912	736	381	356	429
1988		36,814	13,401	4,191	4,795	463	2,440	682	746	82	21,117	20,610	377	131	1,020	807	402	405	470
1989		38,765	14,117	4,283	5,193	453	2,546	724	834	84	22,160	21,608	417	135	1,121	867	423	445	501
1990		40,351	15,843	4,222	6,897	460	2,473	796	901	94	21,881	21,306	436	139	1,192	911	444	467	523
1991		43,105	15,945	4,566	6,232	504	2,487	1,033	1,027	96	24,476	23,896	437	144	1,216	945	467	478	522
1992		41,284	14,885	4,722	4,874	532	2,627	1,024	1,016	89	23,668	23,066	451	150	1,219	991	497	495	521

## U.S. inflation-adjusted applied research expenditures, by source of funds and performing sector: 1953–2002

(Millions of constant 1996 dollars)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:		Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>
1993	.....	39,656	14,980	5,144	4,567	481	2,700	1,023	957	109	21,847	21,219	471	157	1,256	1,047	528	518	527
1994	.....	38,145	14,378	5,192	3,766	532	2,750	1,022	999	116	20,826	20,177	484	165	1,308	1,093	563	530	539
1995	.....	41,647	13,724	5,048	3,225	468	2,829	1,070	952	131	24,891	24,215	503	173	1,337	1,126	600	526	569
1996	.....	43,160	13,949	4,872	3,640	227	2,859	1,270	960	122	26,076	25,370	524	182	1,390	1,162	640	522	584
1997	.....	45,656	12,641	4,901	2,597	213	2,500	1,312	992	126	29,920	29,212	507	201	1,357	1,197	697	501	540
1998	.....	44,926	12,461	4,986	2,550	234	2,215	1,329	1,027	119	29,377	28,659	502	216	1,333	1,247	752	495	508
1999	.....	49,559	13,695	5,284	2,971	260	2,618	1,196	1,243	124	32,583	31,829	517	236	1,402	1,358	833	525	522
2000	.....	52,868	14,756	5,712	2,515	246	3,127	1,243	1,718	195	34,589	33,801	527	261	1,499	1,482	919	562	542
2001 preliminary	.....	58,135	17,113	6,548	3,293	244	3,387	1,347	2,019	276	37,248	36,451	540	257	1,627	1,582	984	598	566
2002 preliminary	.....	58,583	18,539	7,307	3,293	275	3,711	1,487	2,220	245	36,010	35,209	552	248	1,759	1,692	1,058	633	583

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>d</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

<sup>e</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Appendix table 4-15

## U.S. development expenditures, by performing sector and source of funds: 1953–2002

(Millions of current dollars)

(Page 1 of 2)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:	Total	Federal	Total	Federal <sup>b</sup>	Industry <sup>c</sup>	Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry	U&C	Non-profits	Federal <sup>e</sup>	Total	Federal <sup>b</sup>	Industry	Non-profits	Federal <sup>b</sup>
1953		3,412	567	2,753	1,123	1,630	—	16	9	3	1	3	1	48	29	17	6	6	—
1954		3,734	537	3,090	1,405	1,685	—	17	9	3	1	3	1	59	32	18	7	7	—
1955		4,189	543	3,523	1,785	1,738	—	21	12	4	2	3	1	69	34	19	8	7	—
1956		5,855	631	5,084	2,817	2,267	—	25	14	4	2	4	2	81	35	20	8	7	—
1957		6,681	728	5,790	3,616	2,174	—	26	12	5	3	4	2	101	37	21	8	8	—
1958		7,214	842	6,183	3,942	2,241	—	28	13	6	3	4	2	120	42	25	8	9	—
1959		8,463	940	7,307	4,750	2,557	—	31	16	6	3	5	2	134	51	32	9	10	—
1960		9,360	1,003	8,104	5,169	2,935	—	35	19	6	3	5	2	151	69	49	10	10	—
1961		9,930	1,090	8,536	5,347	3,189	—	38	22	7	2	5	2	170	97	73	10	14	—
1962		10,116	1,227	8,527	5,281	3,246	—	40	23	8	2	6	2	190	132	103	11	18	—
1963		11,540	1,465	9,651	6,116	3,535	—	40	22	8	2	6	2	219	165	134	11	20	—
1964		12,476	1,680	10,004	6,156	3,848	329	49	30	8	2	7	3	227	188	159	11	18	—
1965		13,202	1,789	10,637	6,218	4,419	285	71	48	9	2	8	4	207	215	183	12	20	—
1966		14,505	1,886	11,810	6,849	4,961	287	87	61	9	2	10	5	200	236	199	14	23	—
1967		15,327	1,943	12,539	6,795	5,744	298	93	66	9	3	10	7	208	247	208	15	24	—
1968		16,173	1,904	13,370	7,044	6,326	313	102	72	8	4	9	9	226	259	217	16	26	—
1969		17,055	2,016	14,071	6,944	7,127	336	110	80	7	5	8	10	246	277	231	18	28	—
1970		16,950	2,258	13,698	6,232	7,466	366	112	84	6	5	7	10	249	268	220	18	30	—
1971		17,404	2,473	13,924	6,167	7,757	397	98	69	8	4	9	9	267	246	194	19	33	—
1972		18,742	2,639	15,043	6,533	8,510	401	101	63	12	4	14	9	291	267	213	19	35	—
1973		20,237	2,657	16,394	6,621	9,773	439	126	71	18	5	20	13	296	326	268	20	38	—
1974		21,532	2,765	17,421	6,553	10,868	507	141	75	20	7	25	15	321	377	314	22	42	—
1975		22,765	2,890	18,352	6,783	11,569	595	156	83	22	8	27	16	373	400	330	23	47	—
1976		25,096	2,972	20,412	7,522	12,890	665	182	100	24	12	31	16	447	418	341	25	52	—
1977		27,687	3,188	22,603	8,275	14,328	695	254	153	28	15	40	19	503	444	359	27	58	—
1978		31,070	3,676	25,216	8,756	16,460	767	373	254	32	15	49	24	542	496	403	30	64	—
1979		35,463	3,944	29,033	9,888	19,145	828	469	336	34	16	56	28	603	586	483	32	71	—
1980		40,695	4,072	33,848	10,957	22,891	899	518	362	38	19	68	31	719	639	525	35	79	—
1981		46,057	4,530	38,547	12,791	25,756	960	568	386	44	24	80	35	778	674	549	37	88	—
1982		51,696	5,178	43,434	14,215	29,219	1,005	597	397	46	27	88	39	745	737	599	40	98	—
1983		57,540	6,106	48,064	15,522	32,542	1,055	617	399	47	31	97	43	832	867	715	44	109	—
1984		66,273	7,078	55,371	17,640	37,731	1,068	677	435	51	37	108	47	986	1,093	925	47	120	—
1985		74,428	8,011	62,020	20,258	41,762	1,113	756	486	57	43	120	49	1,244	1,285	1,100	51	134	—
1986		75,775	8,275	62,871	21,517	41,354	1,166	818	513	65	50	136	53	1,504	1,141	938	55	149	—
1987		79,850	8,176	66,789	24,122	42,667	1,276	945	599	73	57	155	61	1,670	996	771	60	165	—
1988		84,569	8,864	70,353	23,719	46,634	1,416	1,098	698	83	66	180	71	1,762	655	407	65	183	420
1989		87,727	9,355	72,725	21,049	51,676	1,427	1,207	773	92	76	205	81	1,782	780	507	70	203	430
1990		94,053	9,700	78,376	18,966	59,410	1,424	1,407	909	99	83	226	89	1,735	920	619	75	226	490
1991		95,101	8,778	80,286	17,256	63,030	1,380	1,533	1,011	103	86	239	94	1,537	1,054	722	82	251	533
1992		99,726	9,098	84,569	17,181	67,388	1,289	1,595	1,054	105	91	246	100	1,452	1,125	758	88	279	599

## U.S. development expenditures, by performing sector and source of funds: 1953–2002

(Millions of current dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:			Total	Federal <sup>b</sup>	Industry <sup>c</sup>		Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry		U&C	Non-profits	Federal <sup>b</sup>		Total	Federal <sup>b</sup>
1993 .....		99,744	9,071	84,757	16,083	68,674	1,078	1,698	1,126	109	97	259	107	1,374	1,191	787	95	309	574
1994 .....		102,939	8,823	87,890	16,209	71,681	1,199	1,815	1,212	114	102	276	112	1,378	1,261	815	103	343	573
1995 .....		113,115	9,262	97,342	17,824	79,518	1,246	1,810	1,178	123	108	288	113	1,616	1,236	744	111	381	603
1996 .....		121,359	9,033	105,863	17,066	88,797	1,342	1,790	1,127	128	115	305	115	1,520	1,241	698	120	423	571
1997 .....		128,671	9,077	113,184	18,121	95,063	1,289	1,705	1,055	121	113	304	112	1,454	1,378	687	155	536	585
1998 .....		144,689	9,214	129,041	18,452	110,589	1,257	1,628	985	115	114	302	112	1,527	1,515	760	168	586	507
1999 .....		152,943	8,974	137,724	16,219	121,505	1,180	1,392	711	120	119	322	121	1,636	1,570	726	187	658	467
2000 .....		165,847	8,047	151,826	13,552	138,274	1,143	1,186	451	127	124	352	132	1,539	1,466	513	211	742	640
2001 preliminary .....		163,233	9,567	147,108	12,542	134,566	1,160	1,299	499	136	130	391	144	1,571	1,606	581	212	813	922
2002 preliminary .....		161,816	11,088	144,088	12,680	131,409	1,320	1,334	477	142	134	427	154	1,452	1,699	608	207	884	835

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

<sup>d</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>e</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.



Appendix table 4-16

## U.S. inflation-adjusted development expenditures, by performing sector and source of funds: 1953–2002

(Millions of constant 1996 dollars)

(Page 1 of 2)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:			Total	Federal <sup>b</sup>	Industry <sup>c</sup>		Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry		U&C	Non-profits	Federal <sup>e</sup>		Total	Federal <sup>b</sup>
1953		17,722	2,943	14,301	5,834	8,468	—	83	44	15	5	14	5	247	148	86	31	31	—
1954		19,208	2,762	15,895	7,227	8,668	—	87	44	18	5	16	5	301	162	90	36	36	—
1955		21,178	2,743	17,811	9,024	8,787	—	106	58	19	8	16	5	349	169	94	40	35	—
1956		28,628	3,083	24,861	13,775	11,086	—	122	66	22	10	18	7	394	169	95	39	34	—
1957		31,619	3,443	27,402	17,113	10,289	—	123	57	25	12	20	9	478	173	97	38	38	—
1958		33,334	3,889	28,572	18,216	10,356	—	127	58	26	14	20	9	555	192	113	37	42	—
1959		38,679	4,296	33,396	21,709	11,686	—	142	71	27	14	21	9	612	233	146	41	46	—
1960		42,181	4,518	36,521	23,294	13,227	—	155	86	28	11	21	9	678	309	219	45	45	—
1961		44,249	4,855	38,039	23,828	14,211	—	167	96	31	9	23	9	755	432	325	45	62	—
1962		44,483	5,396	37,498	23,223	14,274	—	176	99	34	9	25	9	836	578	451	48	79	—
1963		50,172	6,370	41,961	26,591	15,370	—	174	96	34	9	26	9	950	717	583	48	87	—
1964		53,451	7,198	42,862	26,375	16,487	1,407	208	126	34	9	28	11	970	805	681	47	77	—
1965		55,515	7,521	44,731	26,148	18,583	1,196	296	202	36	8	33	17	868	902	767	50	84	—
1966		59,301	7,711	48,283	28,001	20,282	1,171	356	249	38	8	39	20	818	963	812	57	94	—
1967		60,797	7,707	49,738	26,954	22,785	1,180	369	260	34	10	40	26	825	978	823	60	95	—
1968		61,494	7,240	50,837	26,783	24,053	1,188	386	272	29	15	35	34	859	985	825	61	99	—
1969		61,815	7,306	51,000	25,169	25,832	1,218	397	288	26	18	29	36	892	1,002	835	65	101	—
1970		58,329	7,770	47,137	21,445	25,692	1,258	385	287	22	17	24	34	857	922	757	62	103	—
1971		57,025	8,101	45,623	20,206	25,416	1,299	321	226	26	13	28	28	875	806	636	62	108	—
1972		58,899	8,294	47,275	20,531	26,744	1,259	317	196	39	11	43	28	915	839	669	60	110	—
1973		60,228	7,908	48,792	19,705	29,086	1,307	374	210	52	15	59	37	879	969	796	60	113	—
1974		58,799	7,552	47,572	17,895	29,678	1,384	384	203	55	18	67	41	877	1,030	856	59	115	—
1975		56,870	7,219	45,846	16,945	28,901	1,485	390	206	55	20	69	40	931	1,000	824	58	117	—
1976		59,328	7,025	48,255	17,783	30,473	1,571	430	235	57	27	74	38	1,057	989	806	60	123	—
1977		61,499	7,081	50,207	18,381	31,826	1,543	564	340	62	32	89	41	1,118	987	797	61	128	—
1978		64,421	7,622	52,283	18,155	34,128	1,591	773	526	66	30	102	49	1,123	1,029	835	61	133	—
1979		67,873	7,548	55,566	18,924	36,641	1,585	899	644	65	30	107	53	1,155	1,121	923	61	137	—
1980		71,344	7,140	59,341	19,209	40,131	1,576	908	634	67	34	119	54	1,260	1,120	920	61	139	—
1981		73,844	7,264	61,804	20,508	41,295	1,539	910	619	70	38	128	56	1,247	1,081	880	60	141	—
1982		78,031	7,816	65,561	21,457	44,104	1,517	901	600	69	40	133	59	1,124	1,112	904	61	147	—
1983		83,537	8,864	69,779	22,535	47,244	1,531	896	580	69	45	141	62	1,207	1,259	1,038	63	158	—
1984		92,767	9,908	77,507	24,692	52,815	1,494	948	609	72	52	151	65	1,380	1,530	1,295	66	169	—
1985		101,002	10,871	84,163	27,491	56,673	1,510	1,026	660	78	59	163	67	1,688	1,744	1,493	69	182	—
1986		100,617	10,988	83,483	28,571	54,912	1,549	1,086	682	87	67	181	70	1,997	1,516	1,245	73	197	—
1987		102,926	10,538	86,090	31,093	54,997	1,645	1,218	772	94	74	200	78	2,152	1,283	994	77	213	—
1988		105,434	11,051	87,711	29,571	58,140	1,766	1,369	870	103	83	224	89	2,197	817	508	80	228	524
1989		105,352	11,235	87,336	25,278	62,058	1,713	1,473	928	110	91	246	98	2,140	937	609	84	244	517
1990		108,719	11,213	90,598	21,923	68,674	1,646	1,626	1,051	115	96	262	103	2,006	1,064	716	87	261	567
1991		106,069	9,790	89,545	19,246	70,299	1,539	1,710	1,128	115	96	267	105	1,714	1,176	805	91	280	594
1992		108,587	9,906	92,083	18,708	73,375	1,403	1,737	1,148	114	99	268	109	1,581	1,225	825	96	303	653

## U.S. inflation-adjusted development expenditures, by performing sector and source of funds: 1953–2002

(Millions of constant 1996 dollars)

Year	Performing sector:	Total	Federal	Industry			Industry FFRDCs	U&C <sup>a</sup>					U&C FFRDCs	Other nonprofit institutions			Nonprofit FFRDCs		
	Funding sector:	Total	Federal	Total	Federal <sup>b</sup>	Industry <sup>c</sup>	Federal <sup>b</sup>	Total	Federal	Non-Federal <sup>d</sup>	Industry	U&C	Non-profits	Federal <sup>b</sup>	Total	Federal <sup>b</sup>	Industry	Non-profits	Federal <sup>b</sup>
1993 .....		106,054	9,645	90,119	17,100	73,019	1,146	1,806	1,197	116	103	276	114	1,461	1,267	836	101	329	611
1994 .....		107,217	9,190	91,543	16,883	74,660	1,249	1,890	1,262	118	106	287	116	1,436	1,314	849	107	358	596
1995 .....		115,305	9,441	99,227	18,169	81,058	1,270	1,845	1,201	125	110	293	115	1,647	1,260	758	113	389	615
1996 .....		121,359	9,033	105,863	17,066	88,797	1,342	1,790	1,127	128	115	305	115	1,520	1,241	698	120	423	571
1997 .....		126,210	8,903	111,019	17,774	93,245	1,264	1,672	1,035	119	111	298	110	1,426	1,351	673	152	526	573
1998 .....		140,203	8,928	125,040	17,880	107,160	1,218	1,578	955	112	110	293	109	1,480	1,468	736	163	568	491
1999 .....		146,148	8,575	131,604	15,498	116,106	1,128	1,330	679	115	114	308	115	1,563	1,501	693	178	629	446
2000 .....		155,158	7,529	142,041	12,679	129,362	1,069	1,109	422	119	116	329	123	1,440	1,371	480	197	694	599
2001 preliminary .....		149,187	8,744	134,449	11,463	122,986	1,061	1,187	456	124	118	357	131	1,436	1,468	531	194	743	843
2002 preliminary .....		146,285	10,024	130,259	11,463	118,796	1,193	1,206	431	128	121	386	139	1,313	1,536	549	187	799	755

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

<sup>d</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>e</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Appendix table 4-17

## U.S. development expenditures, by source of funds and performing sector: 1953–2002

(Millions of current dollars)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:	Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1953		3,412	1,762	567	1,123	—	9	48	17	—	1,637	1,630	1	6	3	7	6	1	3
1954		3,734	2,027	537	1,405	—	9	59	18	—	1,693	1,685	1	7	3	8	7	1	3
1955		4,189	2,427	543	1,785	—	12	69	19	—	1,748	1,738	2	8	3	8	7	1	4
1956		5,855	3,561	631	2,817	—	14	81	20	—	2,277	2,267	2	8	4	9	7	2	4
1957		6,681	4,477	728	3,616	—	12	101	21	—	2,185	2,174	3	8	4	10	8	2	5
1958		7,214	4,941	842	3,942	—	13	120	25	—	2,252	2,241	3	8	4	11	9	2	6
1959		8,463	5,872	940	4,750	—	16	134	32	—	2,569	2,557	3	9	5	12	10	2	6
1960		9,360	6,390	1,003	5,169	—	19	151	49	—	2,948	2,935	3	10	5	12	10	2	6
1961		9,930	6,701	1,090	5,347	—	22	170	73	—	3,201	3,189	2	10	5	16	14	2	7
1962		10,116	6,823	1,227	5,281	—	23	190	103	—	3,259	3,246	2	11	6	20	18	2	8
1963		11,540	7,956	1,465	6,116	—	22	219	134	—	3,548	3,535	2	11	6	22	20	2	8
1964		12,476	8,580	1,680	6,156	329	30	227	159	—	3,861	3,848	2	11	7	21	18	3	8
1965		13,202	8,728	1,789	6,218	285	48	207	183	—	4,433	4,419	2	12	8	24	20	4	9
1966		14,505	9,481	1,886	6,849	287	61	200	199	—	4,977	4,961	2	14	10	28	23	5	9
1967		15,327	9,517	1,943	6,795	298	66	208	208	—	5,762	5,744	3	15	10	31	24	7	9
1968		16,173	9,775	1,904	7,044	313	72	226	217	—	6,346	6,326	4	16	9	35	26	9	8
1969		17,055	9,852	2,016	6,944	336	80	246	231	—	7,150	7,127	5	18	8	38	28	10	7
1970		16,950	9,408	2,258	6,232	366	84	249	220	—	7,489	7,466	5	18	7	40	30	10	6
1971		17,404	9,566	2,473	6,167	397	69	267	194	—	7,780	7,757	4	19	9	42	33	9	8
1972		18,742	10,139	2,639	6,533	401	63	291	213	—	8,533	8,510	4	19	14	44	35	9	12
1973		20,237	10,351	2,657	6,621	439	71	296	268	—	9,798	9,773	5	20	20	51	38	13	18
1974		21,532	10,534	2,765	6,553	507	75	321	314	—	10,896	10,868	7	22	25	57	42	15	20
1975		22,765	11,052	2,890	6,783	595	83	373	330	—	11,600	11,569	8	23	27	63	47	16	22
1976		25,096	12,046	2,972	7,522	665	100	447	341	—	12,927	12,890	12	25	31	68	52	16	24
1977		27,687	13,173	3,188	8,275	695	153	503	359	—	14,370	14,328	15	27	40	76	58	19	28
1978		31,070	14,397	3,676	8,756	767	254	542	403	—	16,504	16,460	15	30	49	88	64	24	32
1979		35,463	16,082	3,944	9,888	828	336	603	483	—	19,193	19,145	16	32	56	99	71	28	34
1980		40,695	17,534	4,072	10,957	899	362	719	525	—	22,945	22,891	19	35	68	110	79	31	38
1981		46,057	19,994	4,530	12,791	960	386	778	549	—	25,817	25,756	24	37	80	123	88	35	44
1982		51,696	22,139	5,178	14,215	1,005	397	745	599	—	29,286	29,219	27	40	88	137	98	39	46
1983		57,540	24,628	6,106	15,522	1,055	399	832	715	—	32,617	32,542	31	44	97	151	109	43	47
1984		66,273	28,131	7,078	17,640	1,068	435	986	925	—	37,815	37,731	37	47	108	167	120	47	51
1985		74,428	32,211	8,011	20,258	1,113	486	1,244	1,100	—	41,857	41,762	43	51	120	183	134	49	57
1986		75,775	33,913	8,275	21,517	1,166	513	1,504	938	—	41,460	41,354	50	55	136	201	149	53	65
1987		79,850	36,613	8,176	24,122	1,276	599	1,670	771	—	42,784	42,667	57	60	155	226	165	61	73
1988		84,569	37,287	8,864	23,719	1,416	698	1,762	407	420	46,765	46,634	66	65	180	255	183	71	83
1989		87,727	35,323	9,355	21,049	1,427	773	1,782	507	430	51,822	51,676	76	70	205	285	203	81	92
1990		94,053	33,844	9,700	18,966	1,424	909	1,735	619	490	59,568	59,410	83	75	226	315	226	89	99
1991		95,101	31,217	8,778	17,256	1,380	1,011	1,537	722	533	63,197	63,030	86	82	239	345	251	94	103
1992		99,726	31,430	9,098	17,181	1,289	1,054	1,452	758	599	67,567	67,388	91	88	246	378	279	100	105

## U.S. development expenditures, by source of funds and performing sector: 1953–2002

(Millions of current dollars)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:		Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1993 .....		99,744	30,093	9,071	16,083	1,078	1,126	1,374	787	574	68,866	68,674	97	95	259	416	309	107	109
1994 .....		102,939	30,209	8,823	16,209	1,199	1,212	1,378	815	573	71,886	71,681	102	103	276	455	343	112	114
1995 .....		113,115	32,472	9,262	17,824	1,246	1,178	1,616	744	603	79,738	79,518	108	111	288	495	381	113	123
1996 .....		121,359	31,355	9,033	17,066	1,342	1,127	1,520	698	571	89,032	88,797	115	120	305	538	423	115	128
1997 .....		128,671	32,267	9,077	18,121	1,289	1,055	1,454	687	585	95,331	95,063	113	155	304	648	536	112	121
1998 .....		144,689	32,703	9,214	18,452	1,257	985	1,527	760	507	110,871	110,589	114	168	302	698	586	112	115
1999 .....		152,943	29,912	8,974	16,219	1,180	711	1,636	726	467	121,810	121,505	119	187	322	779	658	121	120
2000 .....		165,847	25,886	8,047	13,552	1,143	451	1,539	513	640	138,608	138,274	124	211	352	874	742	132	127
2001 preliminary .....		163,233	26,842	9,567	12,542	1,160	499	1,571	581	922	134,908	134,566	130	212	391	956	813	144	136
2002 preliminary .....		161,816	28,459	11,088	12,680	1,320	477	1,452	608	835	131,750	131,409	134	207	427	1,038	884	154	142

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>d</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

<sup>e</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

Appendix table 4-18

## U.S. inflation-adjusted development expenditures, by source of funds and performing sector: 1953–2002

(Millions of constant 1996 dollars)

(Page 1 of 2)

Year	Funding sector:	Total																	
	Performing sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
		Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1953		17,722	9,153	2,943	5,834	—	44	247	86	—	8,504	8,468	5	31	14	36	31	5	15
1954		19,208	10,424	2,762	7,227	—	44	301	90	—	8,709	8,668	5	36	16	41	36	5	18
1955		21,178	12,267	2,743	9,024	—	58	349	94	—	8,835	8,787	8	40	16	40	35	5	19
1956		28,628	17,413	3,083	13,775	—	66	394	95	—	11,134	11,086	10	39	18	42	34	7	22
1957		31,619	21,188	3,443	17,113	—	57	478	97	—	10,338	10,289	12	38	20	47	38	9	25
1958		33,334	22,830	3,889	18,216	—	58	555	113	—	10,407	10,356	14	37	20	51	42	9	26
1959		38,679	26,835	4,296	21,709	—	71	612	146	—	11,741	11,686	14	41	21	55	46	9	27
1960		42,181	28,795	4,518	23,294	—	86	678	219	—	13,283	13,227	11	45	21	54	45	9	28
1961		44,249	29,860	4,855	23,828	—	96	755	325	—	14,265	14,211	9	45	23	71	62	9	31
1962		44,483	30,004	5,396	23,223	—	99	836	451	—	14,332	14,274	9	48	25	88	79	9	34
1963		50,172	34,589	6,370	26,591	—	96	950	583	—	15,426	15,370	9	48	26	96	87	9	34
1964		53,451	36,759	7,198	26,375	1,407	126	970	681	—	16,542	16,487	9	47	28	88	77	11	34
1965		55,515	36,703	7,521	26,148	1,196	202	868	767	—	18,642	18,583	8	50	33	101	84	17	36
1966		59,301	38,761	7,711	28,001	1,171	249	818	812	—	20,348	20,282	8	57	39	114	94	20	38
1967		60,797	37,749	7,707	26,954	1,180	260	825	823	—	22,854	22,785	10	60	40	121	95	26	34
1968		61,494	37,167	7,240	26,783	1,188	272	859	825	—	24,129	24,053	15	61	35	133	99	34	29
1969		61,815	35,708	7,306	25,169	1,218	288	892	835	—	25,915	25,832	18	65	29	138	101	36	26
1970		58,329	32,374	7,770	21,445	1,258	287	857	757	—	25,771	25,692	17	62	24	138	103	34	22
1971		57,025	31,344	8,101	20,206	1,299	226	875	636	—	25,491	25,416	13	62	28	136	108	28	26
1972		58,899	31,864	8,294	20,531	1,259	196	915	669	—	26,815	26,744	11	60	43	138	110	28	39
1973		60,228	30,806	7,908	19,705	1,307	210	879	796	—	29,161	29,086	15	60	59	150	113	37	52
1974		58,799	28,767	7,552	17,895	1,384	203	877	856	—	29,755	29,678	18	59	67	156	115	41	55
1975		56,870	27,610	7,219	16,945	1,485	206	931	824	—	28,979	28,901	20	58	69	157	117	40	55
1976		59,328	28,477	7,025	17,783	1,571	235	1,057	806	—	30,560	30,473	27	60	74	161	123	38	57
1977		61,499	29,260	7,081	18,381	1,543	340	1,118	797	—	31,919	31,826	32	61	89	170	128	41	62
1978		64,421	29,852	7,622	18,155	1,591	526	1,123	835	—	34,220	34,128	30	61	102	182	133	49	66
1979		67,873	30,779	7,548	18,924	1,585	644	1,155	923	—	36,732	36,641	30	61	107	189	137	53	65
1980		71,344	30,740	7,140	19,209	1,576	634	1,260	920	—	40,226	40,131	34	61	119	193	139	54	67
1981		73,844	32,056	7,264	20,508	1,539	619	1,247	880	—	41,393	41,295	38	60	128	197	141	56	70
1982		78,031	33,418	7,816	21,457	1,517	600	1,124	904	—	44,205	44,104	40	61	133	206	147	59	69
1983		83,537	35,755	8,864	22,535	1,531	580	1,207	1,038	—	47,353	47,244	45	63	141	219	158	62	69
1984		92,767	39,378	9,908	24,692	1,494	609	1,380	1,295	—	52,933	52,815	52	66	151	234	169	65	72
1985		101,002	43,712	10,871	27,491	1,510	660	1,688	1,493	—	56,801	56,673	59	69	163	248	182	67	78
1986		100,617	45,031	10,988	28,571	1,549	682	1,997	1,245	—	55,052	54,912	67	73	181	267	197	70	87
1987		102,926	47,193	10,538	31,093	1,645	772	2,152	994	—	55,148	54,997	74	77	200	291	213	78	94
1988		105,434	46,487	11,051	29,571	1,766	870	2,197	508	524	58,303	58,140	83	80	224	317	228	89	103
1989		105,352	42,420	11,235	25,278	1,713	928	2,140	609	517	62,234	62,058	91	84	246	342	244	98	110
1990		108,719	39,122	11,213	21,923	1,646	1,051	2,006	716	567	68,857	68,674	96	87	262	364	261	103	115
1991		106,069	34,817	9,790	19,246	1,539	1,128	1,714	805	594	70,486	70,299	96	91	267	385	280	105	115
1992		108,587	34,223	9,906	18,708	1,403	1,148	1,581	825	653	73,570	73,375	99	96	268	412	303	109	114

## U.S. inflation-adjusted development expenditures, by source of funds and performing sector: 1953–2002

(Millions of constant 1996 dollars)

Year	Funding sector:	Total	Federal Government							Industry				U&C	Nonprofits			Non-Federal <sup>a</sup>	
	Performing sector:	Total	Total	Federal	Industry <sup>b</sup>	Industry FFRDCs <sup>b</sup>	U&C <sup>c</sup>	U&C FFRDCs <sup>d</sup>	Non-profits <sup>b</sup>	Nonprofit FFRDCs <sup>b</sup>	Total	Industry <sup>e</sup>	U&C <sup>c</sup>	Non-profits	U&C <sup>c</sup>	Total	Non-profits	U&C <sup>c</sup>	U&C <sup>c</sup>
1993 .....		106,054	31,997	9,645	17,100	1,146	1,197	1,461	836	611	73,223	73,019	103	101	276	443	329	114	116
1994 .....		107,217	31,464	9,190	16,883	1,249	1,262	1,436	849	596	74,873	74,660	106	107	287	474	358	116	118
1995 .....		115,305	33,101	9,441	18,169	1,270	1,201	1,647	758	615	81,282	81,058	110	113	293	504	389	115	125
1996 .....		121,359	31,355	9,033	17,066	1,342	1,127	1,520	698	571	89,032	88,797	115	120	305	538	423	115	128
1997 .....		126,210	31,650	8,903	17,774	1,264	1,035	1,426	673	573	93,508	93,245	111	152	298	636	526	110	119
1998 .....		140,203	31,689	8,928	17,880	1,218	955	1,480	736	491	107,433	107,160	110	163	293	677	568	109	112
1999 .....		146,148	28,583	8,575	15,498	1,128	679	1,563	693	446	116,398	116,106	114	178	308	744	629	115	115
2000 .....		155,158	24,217	7,529	12,679	1,069	422	1,440	480	599	129,675	129,362	116	197	329	817	694	123	119
2001 preliminary .....		149,187	24,533	8,744	11,463	1,061	456	1,436	531	843	123,298	122,986	118	194	357	874	743	131	124
2002 preliminary .....		146,285	25,728	10,024	11,463	1,193	431	1,313	549	755	119,105	118,796	121	187	386	938	799	139	128

FFRDC federally funded research and development center

U&amp;C universities and colleges

<sup>a</sup>Because of limitations in survey information, data on non-Federal Government funding to other performers are not available and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal Government support to nonprofits is included in nonprofits' support for their own R&D.

<sup>b</sup>Expenditures of industry FFRDCs for 1953–63 were not separated from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–87.

<sup>c</sup>Adjustments have been made to university R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. The character-of-work estimation procedure for university and college R&D also was revised for 1998 and later years; hence, these data are not directly comparable with data for 1997 and earlier years.

<sup>d</sup>Includes all R&D expenditures of FFRDCs administered by academic institutions.

<sup>e</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

NOTES: Expenditure levels for academic and Federal Government performers are also in reference to calendar years. These levels are approximations based on FY data. For Federal Government expenditures starting in 1977, the calendar-year approximation is 75 percent of the amount reported in the same FY plus 25 percent of the amount reported in the subsequent FY. Academic expenditures in all years and Federal Government expenditures prior to 1977 are 50 and 50 percent, respectively, because those FYs (for most academic institutions and the Federal Government before 1977) began on July 1 instead of October 1. Because of changes in estimation procedures, character-of-work data before 1998 for industry and for U&C are not comparable with data for later years. Technical notes explaining methodological issues of measurement will be provided in NSF, *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (Arlington, VA, forthcoming). Data are based on annual reports by performers except for the nonprofit sector. Data are preliminary for 2001 and 2002. For trend comparisons, use only the historical data reported here. Do not use data published earlier.

SOURCES: Data were derived from National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources*, annual series.

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Appendix table 4-19

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**Total (Federal plus company and other) funds for industrial R&D performance in United States, by industry and size of company: 1999–2001**

(Millions of dollars)

Industry and size of company	NAICS codes	Funds		
		1999 <sup>a</sup>	2000	2001 <sup>b</sup>
All industries.....	21–23, 31–33, 42, 44–81	182,711	199,539	198,505
Manufacturing.....	31–33	116,921	124,078	120,705
Food.....	311	1,132	D	1,819
Beverage and tobacco products.....	312	D	417	152
Textiles, apparel, and leather.....	313–16	334	D	D
Wood products.....	321	70	105	182
Paper, printing, and support activities.....	322, 323	D	D	D
Petroleum and coal products.....	324	615	D	D
Chemicals.....	325	20,246	20,918	17,892
Basic chemicals.....	3251	2,746	2,080	1,876
Resin, synthetic rubber, fibers, and filament.....	3252	D	2,852	D
Pharmaceuticals and medicines.....	3254	D	D	10,137
Other chemicals.....	325 minus (3251–52, 3254)	D	D	D
Plastics and rubber products.....	326	1,785	D	D
Nonmetallic mineral products.....	327	D	846	990
Primary metals.....	331	470	624	485
Fabricated metal products.....	332	1,655	1,672	1,599
Machinery.....	333	6,057	6,580	6,404
Computer and electronic products.....	334	35,932	45,097	47,079
Computers and peripheral equipment.....	3341	D	5,162	D
Communications equipment.....	3342	6,003	11,616	15,507
Semiconductor and other electronic components.....	3344	10,701	12,894	14,358
Navigational, measuring, electromedical, and control instruments.....	3345	14,337	15,116	12,947
Other computer and electronic products.....	334 minus (3341–42, 3344–45)	D	310	D
Electrical equipment, appliances, and components.....	335	D	D	4,980
Transportation equipment.....	336	33,965	30,085	25,965
Motor vehicles, trailers, and parts.....	3361–63	D	D	D
Aerospace products and parts.....	3364	14,425	10,319	7,868
Other transportation equipment.....	336 minus (3361–64)	D	D	D
Furniture and related products.....	337	248	284	301
Miscellaneous manufacturing.....	339	3,851	4,206	6,606
Medical equipment and supplies.....	3391	D	D	D
Other miscellaneous manufacturing.....	339 minus (3391)	D	D	D
Other manufacturing.....	31–33 minus (311–16, 321–27, 331–37, 339)	—	—	—
Nonmanufacturing.....	21–23, 42, 44–81	65,790	75,461	77,799
Mining, extraction, and support activities.....	21	D	823	D
Utilities.....	22	142	D	133
Construction.....	23	691	D	320
Trade.....	42, 44, 45	19,616	24,959	24,372
Transportation and warehousing.....	48, 49	460	D	1,848
Information.....	51	15,389	16,830	D
Publishing.....	511	11,302	13,004	13,760
Newspaper, periodical, book, and database.....	5111	371	365	649
Software.....	5112	10,931	12,639	13,111
Broadcasting and telecommunications.....	513	D	1,407 S	D
Radio and television broadcasting.....	5131	D	D	D
Telecommunications.....	5133	D	D	D
Other broadcasting and telecommunications.....	513 minus (5131, 5133)	31	59	D
Other information.....	51 minus (511, 513)	D	2,420	D
Finance, insurance, and real estate.....	52, 53	D	4,025	D
Professional, scientific, and technical services.....	54	18,994	22,577	27,704
Architectural, engineering, and related services.....	5413	3,580	3,381	3,386
Computer systems design and related services.....	5415	D	5,169	9,154
Scientific R&D services.....	5417	10,470	12,892	14,244
Other professional, scientific, and technical services.....	54 minus (5413, 5415, 5417)	D	1,135	920

Appendix table 4-19

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**Total (Federal plus company and other) funds for industrial R&D performance in United States, by industry and size of company: 1999–2001**

(Millions of dollars)

Industry and size of company	NAICS codes	Funds		
		1999 <sup>a</sup>	2000	2001 <sup>b</sup>
Management of companies and enterprises.....	55	D	49	381
Health care services.....	621–23	642	536	1,149
Other nonmanufacturing.....	56, 61, 624, 71, 72, 81	D	731	1,259
<b>Company size (employees)</b>				
All companies.....	na	182,711	199,539	198,505
5–24.....	na	7,004	6,862	4,828
25–49.....	na	4,750	5,008	3,750
50–99.....	na	7,225	7,259	8,202
100–249.....	na	7,213	9,020	12,916
250–499.....	na	7,892	7,479	8,702
500–999.....	na	7,032	9,074	10,564
1,000–4,999.....	na	24,840	30,636	26,748
5,000–9,999.....	na	16,376	16,768	17,487
10,000–24,999.....	na	24,922	28,653	27,065
25,000 or more.....	na	75,457	78,779	78,244

— data not collected; D data have been withheld to avoid disclosing operations of individual companies; NAICS North American Industry Classification System; S imputation of more than 50 percent  
na not applicable

<sup>a</sup>Some statistics for 1999 have been revised since originally published.

<sup>b</sup>Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: R&D in this table is the industrial R&D performed within company facilities funded from all sources. Funds are the company's own; funds from outside organizations, such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments; and funds from the Federal Government. Excluded from this table are R&D not performed within the company (e.g., R&D contracted out to other organizations) and R&D not performed in the United States (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

For 1999, 2000, and 2001, the frame from which statistical samples were selected was divided into two partitions based on total company employment. In the manufacturing sector, companies with 50 or more employees were included in the large company partition. In the nonmanufacturing sector, companies with 15 or more employees were included in the large company partition. Companies in the respective sectors with employment below these values but with at least 5 employees were included in the small company partition. The purpose of partitioning the sample in this way was to reduce variability in industry estimates largely attributed to random year-to-year selection of small companies by industry and high sampling weights that sometimes were assigned to them. Because of this, in prior reports detailed industry statistics were published from only the large company partition. Statistics from the small company partition were included in the manufacturing, nonmanufacturing, and all industries totals but were aggregated into "small manufacturing" and "small nonmanufacturing" classifications instead of being included in their respective industry classifications. For this chapter, this practice was evaluated and discontinued because it was determined that data for small companies are more useful if they are included in their respective industries even given sampling concerns described above. Consequently, the "small manufacturing" and "small nonmanufacturing" entries are no longer used. For 1999 and 2000, statistics previously published for firms in the small company classifications are not shown separately but are included in the manufacturing, nonmanufacturing, and all industries totals. For more information, see the technical notes in National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development Methodology: 2001, <http://www.nsf.gov/sbe/srs/sird/start.htm>.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Research and Development in Industry: 2001* (Arlington, VA, forthcoming).



Appendix table 4-20

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## Company and other non-Federal funds for industrial R&amp;D performance in United States, by industry and size of company: 1999–2001

(Millions of dollars)

Industry and size of company	NAICS codes	Funds		
		1999 <sup>a</sup>	2000	2001
All industries.....	21–23, 31–33, 42, 44–81	160,176	180,421	181,606
Manufacturing.....	31–33	99,865	110,750	109,221
Food.....	311	1,132	1,145	1,818
Beverage and tobacco products.....	312	D	417	152
Textiles, apparel, and leather.....	313–16	334	266	255
Wood products.....	321	70	105	181
Paper, printing, and support activities.....	322, 323	2,474	2,700	2,664
Petroleum and coal products.....	324	D	1,172	1,057
Chemicals.....	325	20,051	20,768	17,713
Basic chemicals.....	3251	2,648	2,050	1,835
Resin, synthetic rubber, fibers, and filament.....	3252	2,216	2,842	2,745
Pharmaceuticals and medicines.....	3254	12,236	12,793	10,137
Other chemicals.....	325 minus (3251–52, 3254)	2,951	3,084	2,996
Plastics and rubber products.....	326	1,785	1,675	2,245
Nonmetallic mineral products.....	327	595	845	978
Primary metals.....	331	457	598	479
Fabricated metal products.....	332	1,608	1,631	1,545
Machinery.....	333	5,658	6,539	6,337
Computer and electronic products.....	334	29,939	39,553	41,232
Computers and peripheral equipment.....	3341	4,126	5,162	3,165
Communications equipment.....	3342	5,797	11,183	15,209
Semiconductor and other electronic components.....	3344	10,624	12,787	14,210
Navigational, measuring, electromedical, and control instruments.....	3345	8,632	10,114	7,565
Other computer and electronic products.....	334 minus (3341–42, 3344–45)	760	307	1,083
Electrical equipment, appliances, and components.....	335	3,820	3,390	4,680
Transportation equipment.....	336	23,928	22,917	21,004
Motor vehicles, trailers, and parts.....	3361–63	17,987	18,306	16,089
Aerospace products and parts.....	3364	5,309	3,895	4,083
Other transportation equipment.....	336 minus (3361–64)	632	716	825
Furniture and related products.....	337	248	284	301
Miscellaneous manufacturing.....	339	3,825	4,195	6,581
Medical equipment and supplies.....	3391	3,251	3,741	5,903
Other miscellaneous manufacturing.....	339 minus (3391)	574	453	678
Other manufacturing.....	31–33 minus (311–16, 321–27, 331–37, 339)	—	—	—
Nonmanufacturing.....	21–23, 42, 44–81	60,311	69,671	72,384
Mining, extraction, and support activities.....	21	2,352	822	846
Utilities.....	22	126	136	114
Construction.....	23	690	222	320
Trade.....	42, 44, 45	19,521	24,929	24,284
Transportation and warehousing.....	48, 49	460	277	1,776
Information.....	51	14,892	16,290	17,259
Publishing.....	511	11,253	12,926	13,716
Newspaper, periodical, book, and database.....	5111	371	365	649
Software.....	5112	10,882	12,561	13,067
Broadcasting and telecommunications.....	513	1,393	1,025	1,270
Radio and television broadcasting.....	5131	D	D	D
Telecommunications.....	5133	D	D	1,101
Other broadcasting and telecommunications.....	513 minus (5131, 5133)	18	59	D
Other information.....	51 minus (511, 513)	2,246	2,339	2,273
Finance, insurance, and real estate.....	52, 53	1,570	4,024	2,424
Professional, scientific, and technical services.....	54	14,379	17,949	22,640
Architectural, engineering, and related services.....	5413	2,402	2,232	2,365
Computer systems design and related services.....	5415	3,989	4,943	8,656
Scientific R&D services.....	5417	7,413	9,715	10,893
Other professional, scientific, and technical services.....	54 minus (5413, 5415, 5417)	575	1,059	726

Appendix table 4-20

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**Company and other non-Federal funds for industrial R&D performance in United States, by industry and size of company: 1999–2001**

(Millions of dollars)

Industry and size of company	NAICS codes	Funds		
		1999 <sup>a</sup>	2000	2001
Management of companies and enterprises .....	55	72	49	381
Health care services .....	621–23	631	477	1,120
Other nonmanufacturing .....	56, 61, 624, 71, 72, 81	640	713	1,221
<b>Company size (employees)</b>				
All companies .....	na	160,176	180,421	181,606
5–24 .....	na	6,393	5,940	4,175
25–49 .....	na	4,382	4,786	3,548
50–99 .....	na	6,623	6,745	7,654
100–249 .....	na	6,540	8,351	12,012
250–499 .....	na	7,407	6,819	8,143
500–999 .....	na	6,441	8,580	9,936
1,000–4,999 .....	na	23,944	29,860	26,140
5,000–9,999 .....	na	14,182	15,143	15,836
10,000–24,999 .....	na	24,525	27,976	26,161
25,000 or more .....	na	59,740	66,221	68,001

— data not collected; D data have been withheld to avoid disclosing operations of individual companies; NAICS North American Industry Classification System; S imputation of more than 50 percent  
na not applicable

<sup>a</sup>Some statistics for 1999 have been revised since originally published.

NOTES: R&D in this table is the industrial R&D performed within company facilities funded from all sources except the Federal Government. Funds predominantly are the company's own but also include funds from outside organizations, such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed in the United States (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

For 1999, 2000, and 2001, the frame from which statistical samples were selected was divided into two partitions based on total company employment. In the manufacturing sector, companies with 50 or more employees were included in the large company partition. In the nonmanufacturing sector, companies with 15 or more employees were included in the large company partition. Companies in the respective sectors with employment below these values but with at least 5 employees were included in the small company partition. The purpose of partitioning the sample in this way was to reduce variability in industry estimates largely attributed to random year-to-year selection of small companies by industry and high sampling weights that sometimes were assigned to them. Because of this, in prior reports detailed industry statistics were published from only the large company partition. Statistics from the small company partition were included in the manufacturing, nonmanufacturing, and all industries totals but were aggregated into "small manufacturing" and "small nonmanufacturing" classifications instead of being included in their respective industry classifications. For this report, this practice was evaluated and discontinued because it was determined that data for small companies are more useful if they are included in their respective industries even given sampling concerns described above. Consequently, the "small manufacturing" and "small nonmanufacturing" stublines are no longer used. For 1999 and 2000, statistics previously published for firms in the small company classifications are not shown separately in this table but are included in the manufacturing, nonmanufacturing, and all industries totals. For more information, see the technical notes in National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development Methodology: 2001, <http://www.nsf.gov/sbe/srs/sird/start.htm>.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Research and Development in Industry: 2001* (Arlington, VA, forthcoming).

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**Federal funds for industrial R&D performance in United States, by industry and size of company: 1999–2001**

(Millions of dollars)

Industry and size of company	NAICS codes	Funds		
		1999 <sup>a</sup>	2000	2001 <sup>b</sup>
All industries.....	21–23, 31–33, 42, 44–81	22,535	19,118	16,899
Manufacturing.....	31–33	17,055	13,328	11,484
Food.....	311	0	D	0
Beverage and tobacco products.....	312	0	0	0
Textiles, apparel, and leather.....	313–16	0	D	D
Wood products.....	321	0	0	0
Paper, printing, and support activities.....	322, 323	D	D	D
Petroleum and coal products.....	324	D	D	D
Chemicals.....	325	194	150	180
Basic chemicals.....	3251	98	31	42
Resin, synthetic rubber, fibers, and filament.....	3252	D	11	D
Pharmaceuticals and medicines.....	3254	D	D	0
Other chemicals.....	325 minus (3251–52, 3254)	D	D	D
Plastics and rubber products.....	326	0	D	D
Nonmetallic mineral products.....	327	D	1	11
Primary metals.....	331	12	26 S	6
Fabricated metal products.....	332	46	41	54
Machinery.....	333	399 S	41	67
Computer and electronic products.....	334	5,993	5,544	5,848
Computers and peripheral equipment.....	3341	D	0	D
Communications equipment.....	3342	206	432	298
Semiconductor and other electronic components.....	3344	77	107	148
Navigational, measuring, electromedical, and control instruments.....	3345	5,705	5,002	5,382
Other computer and electronic products.....	334 minus (3341–42, 3344–45)	D	3	D
Electrical equipment, appliances, and components.....	335	D	D	301S
Transportation equipment.....	336	10,037	7,168	4,961
Motor vehicles, trailers, and parts.....	3361–63	D	D	D
Aerospace products and parts.....	3364	9,117	6,424	3,785
Other transportation equipment.....	336 minus (3361–64)	D	D	D
Furniture and related products.....	337	0	0	0
Miscellaneous manufacturing.....	339	26	12	25
Medical equipment and supplies.....	3391	D	D	D
Other miscellaneous manufacturing.....	339 minus (3391)	D	D	D
Other manufacturing.....	31–33 minus (311–16, 321–27, 331–37, 339)	—	—	—
Nonmanufacturing.....	21–23, 42, 44–81	5,479	5,790	5,415
Mining, extraction, and support activities.....	21	D	1	D
Utilities.....	22	17	D	19
Construction.....	23	2	D	1
Trade.....	42, 44, 45	95	30	88
Transportation and warehousing.....	48, 49	0	D	72
Information.....	51	497	540 S	D
Publishing.....	511	49	78	44
Newspaper, periodical, book, and database.....	5111	0	0	0
Software.....	5112	49	78	44
Broadcasting and telecommunications.....	513	D	382 S	D
Radio and television broadcasting.....	5131	D	D	0
Telecommunications.....	5133	D	D	D
Other broadcasting and telecommunications.....	513 minus (5131, 5133)	13	0	0
Other information.....	51 minus (511, 513)	D	81	D
Finance, insurance, and real estate.....	52, 53	D	0	D
Professional, scientific, and technical services.....	54	4,615	4,628	5,065
Architectural, engineering, and related services.....	5413	1,177	1,149	1,021
Computer systems design and related services.....	5415	D	226	498
Scientific R&D services.....	5417	3,057	3,177	3,352
Other professional, scientific, and technical services.....	54 minus (5413, 5415, 5417)	D	77	194

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**Federal funds for industrial R&D performance in United States, by industry and size of company: 1999–2001**

(Millions of dollars)

Industry and size of company	NAICS codes	Funds		
		1999 <sup>a</sup>	2000	2001 <sup>b</sup>
Management of companies and enterprises .....	55	D	0	0
Health care services .....	621–23	10	59	29
Other nonmanufacturing.....	56, 61, 624, 71, 72, 81	D	18	38
Company size(employees)				
All companies.....	na	22,535	19,118	16,899
5 to 24 .....	na	611	922	653
25 to 49 .....	na	368	222	201
50 to 99 .....	na	603	514	548
100 to 249 .....	na	674	669	903
250 to 499 .....	na	485	660	560
500 to 999 .....	na	591	495	627
1,000 to 4,999 .....	na	896	775	608
5,000 to 9,999 .....	na	2,194	1,625	1,651
10,000 to 24,999 .....	na	397	678	904
25,000 or more .....	na	15,717	12,559	10,243

— data not collected; D data have been withheld to avoid disclosing operations of individual companies; NAICS North American Industry Classification System; S imputation of more than 50 percent  
na not applicable

<sup>a</sup>Some statistics for 1999 have been revised since originally published.

<sup>b</sup>Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: R&D in this table is the industrial R&D performed within company facilities funded by the Federal Government. Excluded from this table are R&D not performed within the company (e.g., R&D contracted out to other organizations) and R&D not performed in the United States (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

For 1999, 2000, and 2001, the frame from which statistical samples were selected was divided into two partitions based on total company employment. In the manufacturing sector, companies with 50 or more employees were included in the large company partition. In the nonmanufacturing sector, companies with 15 or more employees were included in the large company partition. Companies in the respective sectors with employment below these values but with at least 5 employees were included in the small company partition. The purpose of partitioning the sample in this way was to reduce variability in industry estimates largely attributed to random year-to-year selection of small companies by industry and high sampling weights that sometimes were assigned to them. Because of this, in prior reports detailed industry statistics were published from only the large company partition. Statistics from the small company partition were included in the manufacturing, nonmanufacturing, and all industries totals but were aggregated into into "small manufacturing" and "small nonmanufacturing" classifications instead of being included in their respective industry classifications. For this report, this practice was evaluated and discontinued because it was determined that data for small companies are more useful if they are included in their respective industries even given sampling concerns described above. Consequently, the "small manufacturing" and "small nonmanufacturing" stublines are no longer used. For 1999 and 2000, statistics previously published for firms in the small company classifications are not shown separately in this table but are included in the manufacturing, nonmanufacturing, and all industries totals. For more information, see the technical notes in National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development Methodology: 2001 <http://www.nsf.gov/sbe/srs/sird/start.htm>.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Research and Development in Industry: 2001* (Arlington, VA, forthcoming).

*Science & Engineering Indicators – 2004*

Appendix table 4-22  
**R&D investment of U.S. corporations, by major and detailed sector: 1994–2000**  
 (Millions of current dollars)

Major sector and industry	1994	1995	1996	1997	1998	1999	2000
Total .....	93,600	105,504	116,448	126,918	137,320	146,299	164,453
Aerospace.....	4,319	3,948	4,383	4,803	4,972	5,077	4,950
Basic industries and materials .....	8,510	8,564	8,961	9,182	9,274	8,878	8,628
Agriculture, forestry, fishing, and hunting.....	214	229	244	253	316	99	93
Fabricated metal product manufacture.....	611	633	762	797	846	793	729
Food, beverage, and tobacco manufacture .....	1,313	1,362	1,373	1,271	1,294	1,394	1,306
Furniture and laboratory apparatus manufacture.....	107	204	212	236	273	282	300
Oil and gas extraction, support industry, and mining.....	883	839	910	1,032	1,119	936	927
Other basic industries activity.....	751	848	921	984	995	1,049	969
Paper and wood manufacture.....	1,719	1,581	1,686	1,730	1,748	1,733	1,784
Petroleum and coal products manufacture .....	1,699	1,532	1,465	1,496	1,247	1,059	982
Plastics and rubber products manufacture .....	586	657	668	681	769	876	892
Primary metal manufacture.....	497	528	551	496	456	404	403
Textile, apparel, leather, and allied product manufacture.....	129	151	168	207	211	253	243
Chemical manufacture.....	7,526	7,452	7,606	7,549	7,777	8,115	8,883
All other chemical product manufacture .....	1,502	1,588	1,682	1,606	1,415	1,345	1,896
Basic chemical manufacture .....	901	949	1,079	1,081	998	1,036	927
Paint, coatings, adhesives, cleaning, surface agent manufacture .....	1,879	2,127	2,089	2,168	2,471	2,644	2,765
Resin, synthetic rubber, and fibers manufacture .....	—	—	—	—	—	—	—
Information and electronics manufacture and services.....	35,347	40,087	45,193	53,094	59,208	64,573	77,766
Audio-video and other							
communications equipment manufacture.....	154	202	241	277	311	313	351
Broadcasting and telecommunications .....	4,347	1,362	1,335	1,144	1,065	969	763
Computer peripheral equipment and terminal manufacture .....	6,134	6,806	7,836	8,590	8,121	7,437	9,250
Computer storage device manufacture.....	1,260	1,647	1,915	2,264	2,607	2,670	2,895
Computer systems design and related services.....	4,724	4,813	5,193	6,342	6,650	6,818	6,927
Data processing and miscellaneous information services .....	324	387	463	592	666	730	775
Electrical equipment, appliance and component manufacture ...	1,777	1,975	2,090	2,302	2,203	2,220	2,719
Electronic computer manufacture.....	2,482	2,641	2,829	3,024	3,357	4,068	4,410
Instrument manufacture.....	2,200	2,193	2,634	3,080	3,636	4,062	4,712
Online information services.....	219	186	292	408	567	1,007	1,959
Other electronic components manufacture .....	662	933	882	908	1,070	694	893
Motion picture and sound recording industries .....	10	18	66	72	109	304	339
Radio, TV broadcasting, and wireless communications equipment manufacture .....	2,495	3,198	3,584	4,215	4,723	5,055	6,891
Semiconductor and related device manufacture.....	3,612	4,636	5,704	7,064	8,208	9,414	12,900
Software publishers .....	4,190	5,338	6,976	8,407	10,772	12,580	15,609
Telephone apparatus manufacture .....	754	3,753	3,149	4,406	5,142	6,231	6,374
Machinery manufacture .....	3,682	4,485	5,405	5,970	6,522	6,174	6,908
Agricultural, construction, and mining machinery manufacture..	918	1,077	1,214	1,446	1,649	1,419	1,542
Commercial and service industry machinery manufacture.....	539	622	731	867	941	856	758
Engine, turbine, and power transmission equipment manufacture .....	336	411	419	433	410	437	298
Other industrial machinery manufacture.....	1,427	1,578	1,860	1,873	1,810	1,869	2,041
Semiconductor industrial machinery manufacture.....	462	796	1,181	1,350	1,712	1,592	2,269
Medical substances and devices.....	16,715	20,220	22,620	24,511	27,557	30,308	32,485
Invitro diagnostic substance manufacture .....	250	334	473	525	723	764	886
Medical instruments, equipment, and supplies manufacture.....	2,191	2,562	2,943	3,308	3,473	3,435	3,590
Nondiagnostic biological product manufacture .....	1,397	1,785	2,063	2,497	2,865	3,148	3,443
Pharmaceutical and medicine manufacture.....	12,877	15,539	17,141	18,181	20,496	22,962	24,567
Surface transport equipment manufacture .....	15,302	18,323	19,526	18,798	18,623	19,139	19,775
Unclassifiable and conglomerates.....	1,415	1,527	1,653	1,750	1,791	1,952	2,203
Various services.....	785	897	1,101	1,261	1,596	2,084	2,855
Administration, support, waste management, and remediation services .....	56	84	165	189	236	210	350
Electronic shopping and mail-order .....	6	4	17	25	87	348	495
Finance, insurance, real estate, and leasing.....	130	145	231	324	214	217	202
Other services.....	86	113	98	84	100	127	162
Professional, scientific, and technical services except computer..	276	318	326	322	520	650	980
Wholesale and retail, transport, and warehousing.....	231	232	265	317	439	532	667

NOTE: Data represent publicly held corporations with R&D expenses headquartered in the United States.

SOURCES: U.S. Department of Commerce, *U.S. Corporate R&D Investment, 1994–2000 Final Estimates* (Washington, DC, 2002); Standard & Poor's COMPUSTAT database (Englewood, CO); and corporate financial statements submitted to U.S. Securities and Exchange Commission.

Appendix table 4-23

## R&amp;D expenditure, by state, performing sector, and source of funds: 2000

(Thousands of current dollars)

State	Performing sector:		Industry					U&C					U&C	Other	Nonprofit	
	Funding sector:	Rank	All R&D	Federal	Total <sup>a</sup>	Federal <sup>b</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	FFRDCs	nonprofit institutions	FFRDCs
U.S. total.....	na		264,616,008	17,468,589	199,539,000	19,118,000	180,421,000	30,973,891	17,974,978	2,256,997	2,200,926	6,209,611	2,331,379	5,801,229	4,379,922	1,464,947
Alabama.....	27		1,730,117	664,981	607,000	184,000	423,000	428,122	275,912	6,052	19,581	88,167	38,410	0	30,014	0
Alaska.....	47		196,448	75,446	9,000	D	D	107,417	49,241	3,469	20,073	34,328	306	0	4,585	0
Arizona.....	19		3,107,291	145,601	2,445,000	153,000	2,292,000	465,777	244,938	15,221	28,519	158,810	18,289	36,409	14,504	0
Arkansas.....	42		454,401	45,489	273,000	D	D	130,894	58,302	35,076	8,121	22,110	7,285	0	5,018	0
California.....	1		55,092,936	1,655,628	45,769,000	4,229,000	41,540,000	4,053,042	2,335,093	235,796	294,990	820,953	366,210	2,812,134	660,758	142,374
Colorado.....	17		4,229,501	241,771	3,140,000	D	D	544,204	427,495	24,000	24,031	53,711	14,967	115,510	64,970	123,046
Connecticut.....	14		4,888,469	19,373	4,371,000	127,000	4,244,000	468,435	304,155	15,539	28,327	74,534	45,880	0	29,661	0
Delaware.....	28		1,532,130	7,598	1,444,000	7,000	1,437,000	78,126	40,768	4,142	3,878	19,562	9,776	0	2,406	0
District of Columbia.....	24		2,296,233	1,722,640	112,000	46,000	67,000	245,828	186,632	3,826	16,286	15,480	23,604	0	210,844	4,921
Florida.....	15		4,662,727	573,140	3,212,000	498,000	2,714,000	851,932	408,826	103,167	78,906	220,827	40,206	0	25,655	0
Georgia.....	21		2,796,192	273,713	1,579,000	83,000	1,496,000	926,749	417,664	76,857	94,341	299,214	38,673	0	16,730	0
Hawaii.....	46		291,409	58,658	44,000	17,000	27,000	161,300	95,419	35,474	11,158	19,249	0	0	27,451	0
Idaho.....	30		1,433,567	21,722	1,338,000	D	D	73,726	28,888	18,545	5,338	17,505	3,450	0	119	0
Illinois.....	6		12,767,496	85,344	10,661,000	37,000	10,624,000	1,170,625	681,006	73,042	56,085	279,759	80,733	759,002	91,525	0
Indiana.....	18		3,252,494	71,630	2,668,000	75,000	2,593,000	509,141	228,768	34,377	42,343	178,613	25,040	0	3,723	0
Iowa.....	34		1,017,300	34,586	538,000	D	D	418,263	203,437	56,351	32,473	104,472	21,530	23,281	3,170	0
Kansas.....	31		1,420,089	20,162	1,140,000	D	D	258,336	105,610	44,396	23,410	69,872	15,048	0	1,591	0
Kentucky.....	35		866,052	7,500	582,000	1,000	581,000	274,238	96,288	21,849	17,932	121,232	16,937	0	2,314	0
Louisiana.....	38		626,793	99,196	126,000	1,000	125,000	399,411	169,895	75,626	25,670	95,601	32,619	0	2,186	0
Maine.....	45		318,726	4,755	201,000	53,000	148,000	57,753	25,309	6,445	2,994	20,555	2,450	0	55,218	0
Maryland.....	10		8,633,558	4,869,668	2,032,000	428,000	1,604,000	1,507,549	1,090,445	82,069	50,154	181,039	103,842	0	224,341	0
Massachusetts.....	5		13,004,427	259,172	9,863,000	1,831,000	8,032,000	1,485,792	1,064,468	40,305	138,667	94,322	148,030	348,339	967,591	80,533
Michigan.....	2		18,892,070	239,543	17,640,000	80,000	17,559,000	995,756	553,119	63,226	66,955	242,336	70,120	0	16,771	0
Minnesota.....	16		4,298,967	32,014	3,722,000	173,000	3,550,000	416,411	233,018	52,659	26,859	71,236	32,639	0	128,542	0
Mississippi.....	39		512,789	186,799	101,000	19,000	83,000	217,064	117,168	38,833	10,973	47,025	3,065	0	7,926	0
Missouri.....	23		2,583,036	43,851	1,893,000	18,000	1,876,000	614,101	371,713	26,387	33,535	130,288	52,178	0	32,084	0
Montana.....	48		169,856	35,344	28,000	D	D	99,069	51,686	17,873	10,298	15,658	3,554	0	7,443	0
Nebraska.....	43		438,996	25,082	199,000	D	D	208,480	65,702	7,243	17,636	101,159	16,740	0	6,434	0
Nevada.....	44		377,412	20,696	248,000	D	D	106,340	60,005	7,032	5,532	29,227	4,544	0	2,376	0
New Hampshire.....	36		775,004	35,717	586,000	D	D	150,982	95,290	9,747	9,197	22,924	13,824	0	2,305	0
New Jersey.....	4		13,133,222	417,685	12,062,000	253,000	11,809,000	567,666	257,445	46,071	29,817	160,412	73,921	65,305	20,566	0
New Mexico.....	20		3,085,199	320,838	1,158,000	D	D	246,258	175,028	11,965	11,692	41,740	5,833	1,333,194	26,909	0
New York.....	3		13,555,586	176,034	10,539,000	1,773,000	8,766,000	2,290,812	1,475,423	102,684	100,995	374,797	236,913	0	300,685	249,055
North Carolina.....	13		5,045,250	262,003	3,672,000	30,000	3,641,000	1,040,017	577,437	113,764	169,979	147,364	31,473	0	71,230	0
North Dakota.....	49		145,671	25,842	51,000	D	D	67,406	29,343	2,417	4,400	28,651	2,595	0	1,423	0
Ohio.....	11		7,661,540	615,458	5,962,000	539,000	5,423,000	918,500	498,967	83,520	87,570	179,722	68,721	0	165,582	0
Oklahoma.....	37		659,684	58,619	333,000	3,000	331,000	252,419	93,434	42,396	16,789	88,152	11,648	0	15,646	0
Oregon.....	25		2,116,232	88,618	1,651,000	7,000	1,644,000	346,149	246,684	35,485	14,775	32,568	16,637	0	30,465	0
Pennsylvania.....	9		9,841,912	151,955	7,873,000	460,000	7,412,000	1,549,050	1,032,963	44,433	159,669	202,535	109,450	55,955	211,952	0

**R&D expenditure, by state, performing sector, and source of funds: 2000**

(Thousands of current dollars)

State	Performing sector:		All R&D	Federal	Industry			U&C						U&C	Other	Nonprofit
	Funding sector:	Rank			Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	FFRDCs	nonprofit institutions	Nonprofit FFRDCs
														Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
Rhode Island.....	29		1,500,828	240,862	1,090,000	D	D	129,697	88,510	4,564	2,735	30,289	3,599	0	40,269	0
South Carolina.....	33		1,126,164	45,754	781,000	D	D	294,184	131,043	31,743	15,478	102,793	13,127	0	5,226	0
South Dakota.....	50		84,801	13,232	44,000	16000	28,000	27,269	13,659	6,525	361	3,825	2,899	0	300	0
Tennessee.....	26		2,057,293	88,947	1,215,000	D	D	405,013	240,337	39,258	18,520	67,634	39,264	0	35,888	312,445
Texas.....	7		11,552,437	464,699	8,961,000	230,000	8,731,000	2,039,642	1,101,463	229,255	165,151	322,234	221,539	0	87,096	0
Utah.....	32		1,360,644	69,871	979,000	D	D	308,059	192,100	20,365	17,853	43,818	33,923	0	3,714	0
Vermont.....	40		465,349	3,599	396,000	D	D	64,762	41,232	3,262	5,713	10,239	4,316	0	988	0
Virginia.....	12		5,069,481	1,449,209	2,718,000	800,000	1,918,000	587,718	321,690	70,328	53,380	103,522	38,798	79,342	67,066	168,146
Washington.....	8		10,516,331	258,718	9,265,000	D	D	642,934	443,223	15,266	62,087	101,445	20,913	0	198,734	150,945
West Virginia.....	41		457,128	102,958	235,000	D	D	73,420	33,972	2,963	7,510	24,299	4,676	35,536	10,214	0
Wisconsin.....	22		2,692,876	37,816	1,981,000	18,000	1,963,000	661,470	348,779	45,576	21,554	176,467	69,094	0	12,590	0
Wyoming.....	51		60,969	7,298	7,000	0	7,000	43,094	16,556	1,470	2,941	20,103	2,024	0	3,577	0
Other and unknown.....	na		12,130,343	42,207	11,994,000	1,094,000	10,900,000	81,969	47,925	16,329	5,021	12,114	580	11,268	899	0
Adjustment.....	na		7,630,582	949,548	1,000	NA	NA	911,520	481,505	52,734	22,674	285,120	69,487	125,954	420,648	233,482

D data withheld to avoid disclosing operations of individual companies; FFRDC federally funded research and development center; NA not available; na not applicable; U&amp;C universities and colleges

<sup>a</sup>Includes performance at industry FFRDCs.<sup>b</sup>Industry sources of industry R&D expenditures include all nonfederal sources of industry R&D expenditures.<sup>c</sup>Includes total R&D expenditures of FFRDCs administered by academic institutions.<sup>d</sup>Other sources of support for nonprofit institutions were unavailable by state. For 2000, total nonprofit performance is estimated at \$9,368 million. Industry provided an estimated \$1,103 million to the nonprofit sector, and nonprofit institutions provided an estimated \$3,886 million. These non-Federal support amounts are included in the all R&D column for U.S. total and other and unknown. For these two columns, the amounts under all R&D are greater than the sum of the components to the right, because those components do not include non-Federal support to nonprofit organizations.

NOTES: Industry R&amp;D data by state refer to calendar years; other R&amp;D data by state refer to fiscal years but may serve as approximations to calendar-year data. The "other and unknown" category is the difference between the national aggregates and the sum of the individual state data that are reported here. Therefore, part of the other and unknown totals reflects the difference between state totals reported on an FY basis and the U.S. totals that have been adjusted to calendar-year estimates. For industry, the other and unknown totals include the survey data that were not assigned to individual states plus the amounts that were reported for individual states but are suppressed here to protect confidentiality of surveyed companies.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources: 2002 Data Update*, NSF 03-313 (Arlington, VA, 2003).

Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

(Page 1 of 13)

State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
Alabama															
1987		2,349,977	584,230	1,592,000	900,000	692,000	152,925	85,382	16,449	10,916	29,919	10,259	0	20,822	0
1989		1,232,429	568,243	428,000	213,000	215,000	215,836	119,693	18,339	16,242	45,106	16,456	0	20,350	0
1991		1,510,827	700,617	521,000	221,000	300,000	252,998	132,063	27,267	20,348	52,667	20,653	0	36,212	0
1993		1,967,533	833,137	833,000	406,000	427,000	281,209	161,331	26,991	23,729	48,358	20,800	0	20,187	0
1995		1,680,828	642,257	686,000	273,000	413,000	334,689	190,330	6,991	29,164	86,664	21,540	0	17,882	0
1997		1,636,645	660,047	589,000	189,000	399,000	368,602	230,894	5,251	29,685	84,747	18,025	0	18,996	0
1998		1,926,127	752,619	707,000	180,000	527,000	442,196	282,113	7,238	30,279	82,308	40,258	0	24,312	0
1999		1,761,474	771,923	556,000	190,000	365,000	416,594	261,752	8,923	22,287	79,251	44,381	0	16,957	0
2000		1,730,117	664,981	607,000	184,000	423,000	428,122	275,912	6,052	19,581	88,167	38,410	0	30,014	0
Alaska															
1987		90,429	32,840	10,000	D	D	47,432	21,523	2,999	3,024	17,960	1,926	0	157	0
1989		117,914	51,178	9,000	D	D	56,701	26,659	2,101	3,039	21,869	3,033	0	1,035	0
1991		146,091	58,705	18,000	D	D	67,432	34,335	1,926	1,547	28,246	1,378	0	1,954	0
1993		129,211	47,833	14,000	D	D	66,796	41,616	3,012	4,751	17,412	5	0	582	0
1995		163,396	60,545	30,000	D	D	72,216	37,285	5,607	5,470	23,850	4	0	635	0
1997		135,745	38,381	24,000	D	D	70,943	28,127	3,964	12,769	26,082	1	0	2,421	0
1998		NA	44,010	D	D	9,000	75,854	31,632	3,691	16,116	24,382	33	0	3,707	0
1999		151,979	53,287	D	D	3,000	93,687	37,241	4,109	19,720	32,299	318	0	2,005	0
2000		196,448	75,446	9,000	D	D	107,417	49,241	3,469	20,073	34,328	306	0	4,585	0
Arizona															
1987		1,144,281	83,236	845,000	178,000	667,000	181,263	80,955	8,965	17,456	61,644	12,243	26,000	8,782	0
1989		1,293,340	118,284	917,000	220,000	697,000	223,834	105,367	7,949	12,500	86,076	11,942	27,600	6,622	0
1991		1,398,709	132,341	944,000	199,000	745,000	284,128	131,627	7,945	19,519	109,028	16,009	27,400	10,840	0
1993		1,607,378	206,067	1,042,000	298,000	744,000	310,721	149,803	6,333	18,889	112,596	23,100	40,000	8,590	0
1995		1,957,119	169,700	1,356,000	620,000	736,000	380,216	210,475	8,080	23,238	126,380	12,043	45,005	6,198	0
1997		2,409,843	143,601	1,854,000	677,000	1,177,000	376,818	198,097	10,266	18,584	137,165	12,706	29,058	6,366	0
1998		2,317,552	138,493	1,727,000	490,000	1,237,000	405,999	210,170	11,812	22,125	146,586	15,306	38,283	7,777	0
1999		5,090,944	170,099	4,434,000	224,000	4,210,000	439,286	239,142	11,753	22,242	150,366	15,783	37,308	10,251	0
2000		3,107,291	145,601	2,445,000	153,000	2,292,000	465,777	244,938	15,221	28,519	158,810	18,289	36,409	14,504	0
Arkansas															
1987		195,660	24,196	135,000	D	D	35,529	12,257	9,352	2,829	8,028	3,063	0	935	0
1989		120,875	25,071	51,000	D	D	43,676	14,213	12,186	4,123	9,521	3,633	0	1,128	0
1991		198,271	35,180	106,000	D	D	55,081	20,178	13,958	4,514	12,945	3,486	0	2,010	0
1993		301,143	40,657	185,000	D	D	74,011	25,362	23,666	6,767	14,774	3,442	0	1,475	0
1995		329,500	57,563	181,000	D	D	87,799	33,348	23,779	7,693	19,717	3,262	0	3,138	0
1997		271,703	49,469	118,000	D	D	102,204	35,021	29,227	7,570	23,985	6,401	0	2,030	0
1998		283,161	45,895	118,000	D	D	116,778	41,204	33,154	8,246	26,994	7,180	0	2,488	0
1999		378,033	46,122	216,000	3,000	213,000	111,999	45,587	32,543	10,286	16,437	7,146	0	3,912	0
2000		454,401	45,489	273,000	D	D	130,894	58,302	35,076	8,121	22,110	7,285	0	5,018	0



Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

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State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
California															
1987		25,520,939	2,011,033	19,475,000	10,963,000	8,512,000	1,554,787	1,066,099	36,570	72,260	289,604	90,254	2,097,000	383,119	0
1989		30,885,676	2,478,100	23,675,000	12,857,000	10,818,000	1,850,062	1,285,165	43,546	83,218	321,615	116,518	2,385,300	252,148	245,066
1991		28,346,287	1,885,275	21,279,000	8,911,000	12,368,000	2,146,235	1,436,542	84,176	86,265	389,156	150,096	2,562,800	326,127	146,850
1993		33,721,294	1,785,138	26,541,000	7,463,000	19,078,000	2,380,144	1,629,545	112,454	99,291	367,857	170,997	2,499,000	338,161	177,851
1995		36,035,609	1,843,729	28,710,000	6,925,000	21,785,000	2,594,280	1,796,691	107,055	120,080	372,941	197,513	2,377,815	361,960	147,825
1997		41,669,723	1,454,133	34,011,000	5,977,000	28,034,000	2,978,575	2,028,296	128,617	160,304	439,942	221,416	2,549,108	473,915	202,992
1998		43,919,295	1,595,270	35,568,000	3,803,000	31,764,000	3,344,740	2,008,924	146,021	213,137	702,175	274,483	2,770,950	519,452	120,883
1999		47,965,435	1,749,647	39,047,000	4,042,000	35,006,000	3,658,622	2,179,077	185,716	249,043	729,128	315,658	2,800,035	577,895	132,236
2000		55,092,936	1,655,628	45,769,000	4,229,000	41,540,000	4,053,042	2,335,093	235,796	294,990	820,953	366,210	2,812,134	660,758	142,374
Colorado															
1987		1,704,333	132,807	1,261,000	282,000	979,000	185,699	136,003	8,771	8,728	17,682	14,515	52,000	72,827	0
1989		1,648,885	116,787	1,162,000	251,000	911,000	226,555	167,043	10,679	14,381	17,735	16,717	63,300	29,354	50,889
1991		NA	275,312	D	D	1,751,000	260,587	187,819	12,905	16,481	23,078	20,304	78,300	33,718	72,558
1993		2,864,058	169,821	2,111,000	252,000	1,859,000	331,081	222,107	18,026	23,651	41,797	25,500	99,000	41,852	111,304
1995		2,700,684	167,869	1,865,000	274,000	1,591,000	393,809	260,247	21,998	24,470	51,690	35,404	125,310	46,418	102,278
1997		3,205,211	195,364	2,248,000	525,000	1,723,000	427,435	289,514	26,833	23,756	50,422	36,910	135,980	50,078	148,354
1998		4,565,357	202,224	3,565,000	1,237,000	2,329,000	489,419	332,402	26,136	26,818	68,164	35,899	130,865	54,822	123,027
1999		4,209,085	238,003	3,136,000	D	D	507,673	361,598	24,992	27,226	60,743	33,114	132,587	61,389	133,433
2000		4,229,501	241,771	3,140,000	D	D	544,204	427,495	24,000	24,031	53,711	14,967	115,510	64,970	123,046
Connecticut															
1987		2,471,219	17,719	2,216,000	632,000	1,584,000	230,790	155,717	2,495	9,298	39,761	23,519	0	6,710	0
1989		2,744,751	37,810	2,410,000	680,000	1,730,000	284,410	187,212	5,430	11,630	56,999	23,139	0	12,531	0
1991		1,917,105	46,602	1,535,000	504,000	1,031,000	320,935	197,120	5,996	16,121	73,778	27,920	0	14,568	0
1993		2,808,827	52,905	2,373,000	419,000	1,954,000	364,708	220,562	10,067	18,351	80,829	34,899	0	18,214	0
1995		4,310,652	17,690	3,906,000	389,000	3,517,000	377,225	227,915	18,732	20,327	78,243	32,008	0	9,737	0
1997		3,454,151	32,731	3,014,000	307,000	2,707,000	392,668	242,385	13,730	25,387	76,391	34,775	0	14,752	0
1998		3,558,775	18,257	3,113,000	179,000	2,935,000	403,961	262,488	13,289	25,926	67,005	35,253	0	23,557	0
1999		4,436,224	17,883	3,984,000	207,000	3,777,000	418,122	273,787	10,827	26,026	66,997	40,485	0	16,219	0
2000		4,888,469	19,373	4,371,000	127,000	4,244,000	468,435	304,155	15,539	28,327	74,534	45,880	0	29,661	0
Delaware															
1987		NA	2,874	D	D	D	31,681	13,662	1,995	3,659	10,117	2,248	0	2,647	0
1989		NA	3,133	D	D	D	37,194	17,083	2,603	4,073	11,125	2,310	0	2,110	0
1991		NA	8,605	D	D	D	44,696	20,053	4,024	4,732	12,724	3,163	0	2,883	0
1993		1,248,672	12,053	1,181,000	24,000	1,157,000	52,627	26,170	3,710	4,857	13,937	3,953	0	2,992	0
1995		1,148,632	15,477	1,077,000	12,000	1,065,000	53,161	27,352	2,144	3,681	14,560	5,424	0	2,994	0
1997		1,088,697	10,207	1,009,000	8,000	1,001,000	65,095	32,031	2,977	3,361	20,125	6,601	0	4,395	0
1998		2,555,543	3,722	2,476,000	13,000	2,463,000	72,779	36,422	4,701	3,867	19,244	8,545	0	3,042	0
1999		1,342,913	2,747	1,261,000	9,000	1,252,000	76,286	36,683	5,401	4,246	19,715	10,241	0	2,880	0
2000		1,532,130	7,598	1,444,000	7,000	1,437,000	78,126	40,768	4,142	3,878	19,562	9,776	0	2,406	0

Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

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State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
District of Columbia															
1987	NA	1,208,569		D	D	D	85,470	62,968	484	4,192	11,642	6,184	0	100,959	0
1989	NA	1,521,715		D	D	23,000	111,325	84,274	480	7,924	13,022	5,625	0	136,744	0
1991	1,736,670	1,432,998	40,000	16,000	24,000	118,398	86,793	463	7,279	12,718	11,145	0	145,274	0	
1993	2,543,172	1,712,811	540,000	21,000	519,000	145,218	100,345	1,038	10,313	18,346	15,176	0	144,543	600	
1995	3,128,187	2,106,208	672,000	17,000	656,000	181,461	132,770	814	13,297	19,937	14,643	0	168,518	0	
1997	2,767,902	1,732,539	645,000		D	214,019	153,846	1,267	18,381	24,092	16,433	0	175,954	390	
1998	2,606,128	1,717,704	503,000	90,000	413,000	232,922	165,715	2,042	19,481	26,442	19,242	0	150,383	2,119	
1999	2,509,737	1,912,131	171,000	52,000	119,000	223,786	173,466	3,117	14,349	13,110	19,744	0	202,661	159	
2000	2,296,233	1,722,640	112,000	46,000	67,000	245,828	186,632	3,826	16,286	15,480	23,604	0	210,844	4,921	
Florida															
1987	3,136,347	719,058	2,133,000	892,000	1,241,000	278,847	129,474	13,889	20,334	98,188	16,962	0	5,442	0	
1989	3,374,947	642,074	2,341,000	1,167,000	1,174,000	385,556	200,742	25,655	20,660	112,906	25,593	0	6,317	0	
1991	3,699,966	657,605	2,599,000	934,000	1,665,000	438,054	220,683	36,736	35,690	116,339	28,606	0	5,307	0	
1993	3,525,284	607,692	2,425,000	970,000	1,455,000	488,551	267,717	31,641	40,565	119,937	28,691	0	4,041	0	
1995	5,222,709	554,440	4,101,000	1,634,000	2,467,000	559,104	317,081	41,466	36,382	135,110	29,065	0	8,165	0	
1997	4,783,893	649,376	3,442,000	1,461,000	1,981,000	681,508	333,828	89,003	48,304	176,142	34,231	0	11,009	0	
1998	4,773,060	749,648	3,300,000	889,000	2,411,000	712,704	355,892	80,720	51,772	184,475	39,845	0	10,708	0	
1999	4,265,345	763,344	2,697,000	706,000	1,991,000	788,743	396,395	91,371	63,637	198,479	38,861	0	16,258	0	
2000	4,662,727	573,140	3,212,000	498,000	2,714,000	851,932	408,826	103,167	78,906	220,827	40,206	0	25,655	0	
Georgia															
1987	1,430,455	96,266	1,001,000		D	D	331,000	151,367	39,621	34,196	95,827	9,989	0	2,189	0
1989	1,309,760	157,925	719,000		D	D	424,424	210,248	40,141	35,635	126,231	12,169	0	8,411	0
1991	1,478,861	121,008	868,000	89,000	779,000	484,019	238,664	43,222	40,010	149,645	12,478	0	5,834	0	
1993	1,577,360	159,002	860,000	63,000	797,000	546,960	273,079	39,325	51,968	167,509	15,079	0	11,398	0	
1995	2,112,474	272,178	1,175,000	142,000	1,031,000	657,530	302,390	53,611	55,018	221,785	24,726	0	7,766	0	
1997	2,271,517	225,150	1,273,000	212,000	1,062,000	766,346	347,407	68,844	73,284	252,398	24,413	0	7,021	0	
1998	2,491,906	235,596	1,444,000	86,000	1,358,000	802,023	369,764	70,019	86,040	246,086	30,114	0	10,287	0	
1999	2,959,809	278,552	1,827,000	178,000	1,649,000	839,715	380,202	74,085	90,747	258,402	36,279	0	14,542	0	
2000	2,796,192	273,713	1,579,000	83,000	1,496,000	926,749	417,664	76,857	94,341	299,214	38,673	0	16,730	0	
Hawaii															
1987	158,274	23,218	73,000	54,000	19,000	57,345	34,472	19,317	261	2,591	704	0	4,711	0	
1989	123,204	36,400	9,000	2,000	7,000	70,733	40,574	24,759	799	3,686	915	0	7,071	0	
1991	144,656	44,537	11,000		D	D	78,166	44,857	27,321	856	3,391	0	10,953	0	
1993	380,150	41,703	255,000		D	D	73,961	41,362	27,099	151	3,109	0	9,486	0	
1995	169,252	62,303	14,000		D	D	78,429	44,238	26,789	299	3,738	0	14,520	0	
1997	274,632	54,318	87,000	55,000	32,000	120,107	72,421	28,440	5,944	13,297	5	0	13,207	0	
1998	241,560	54,776	17,000		D	D	148,007	86,886	37,002	10,949	13,170	0	21,777	0	
1999	270,239	64,534	27,000	1,000	26,000	156,810	93,418	35,111	13,021	15,260	0	0	21,895	0	
2000	291,409	58,658	44,000	17,000	27,000	161,300	95,419	35,474	11,158	19,249	0	0	27,451	0	

Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	FFRDCs	nonprofit institutions	FFRDCs
Idaho															
1987		528,396	15,342	488,000	386,000	102,000	24,779	8,988	8,314	2,899	4,436	142	0	275	0
1989		NA	18,785	D	D	161,000	33,191	12,585	8,112	4,199	8,148	147	0	531	0
1991		NA	36,666	D	D	D	41,437	15,681	8,604	5,050	11,697	405	0	777	0
1993		477,563	37,396	391,000	D	D	48,774	17,026	12,550	7,286	11,068	844	0	393	0
1995		913,961	27,792	827,000	D	D	58,621	19,710	13,615	7,408	16,350	1,538	0	548	0
1997		1,269,685	24,092	1,181,000	D	D	64,278	18,103	21,752	9,151	14,802	470	0	315	0
1998		1,126,774	25,042	1,028,000	D	D	72,395	25,444	21,760	8,059	16,334	798	0	1,337	0
1999		1,309,401	27,448	1,210,000	D	D	71,674	28,116	15,718	3,962	16,877	7,001	0	279	0
2000		1,433,567	21,722	1,338,000	D	D	73,726	28,888	18,545	5,338	17,505	3,450	0	119	0
Illinois															
1987		5,337,890	72,532	4,284,000	940,000	3,344,000	498,221	293,929	30,610	23,791	117,826	32,065	444,000	39,137	0
1989		5,305,752	59,321	4,050,000	D	D	602,558	338,082	33,881	38,990	150,694	40,911	528,400	65,473	0
1991		6,413,236	68,151	5,027,000	190,000	4,837,000	697,565	361,461	52,573	49,583	177,424	56,524	573,500	47,020	0
1993		6,777,207	83,136	5,242,000	236,000	5,006,000	757,508	424,745	45,716	44,745	178,026	64,276	649,000	45,563	0
1995		7,482,753	80,626	5,776,000	146,000	5,630,000	817,640	467,952	46,903	43,048	195,052	64,685	767,071	41,416	0
1997		8,033,737	77,224	6,248,000	163,000	6,085,000	929,639	529,803	53,968	50,156	220,259	75,453	724,565	54,309	0
1998		8,830,457	71,946	6,892,000	136,000	6,755,000	1,045,800	586,627	56,752	59,665	262,243	80,513	759,182	61,529	0
1999		9,719,210	77,055	7,715,000	41,000	7,674,000	1,101,056	626,648	62,687	56,748	272,193	82,780	758,090	68,009	0
2000		12,767,496	85,344	10,661,000	37,000	10,624,000	1,170,625	681,006	73,042	56,085	279,759	80,733	759,002	91,525	0
Indiana															
1987		2,197,318	64,245	1,944,000	353,000	1,591,000	188,086	111,413	15,772	17,203	37,627	6,071	0	987	0
1989		2,120,117	74,520	1,815,000	D	D	227,266	136,040	18,911	18,419	43,658	10,238	0	3,331	0
1991		2,346,791	92,036	1,988,000	226,000	1,762,000	262,508	143,761	20,347	19,726	61,425	17,249	0	4,247	0
1993		2,560,252	77,330	2,177,000	D	D	302,811	167,743	20,552	22,535	65,991	25,990	0	3,111	0
1995		3,162,376	62,061	2,721,000	382,000	2,339,000	375,719	197,095	22,463	34,542	101,283	20,336	0	3,596	0
1997		3,149,259	68,272	2,677,000	D	D	400,399	209,227	23,826	33,321	113,903	20,122	0	3,588	0
1998		3,088,634	38,023	2,622,000	D	D	425,293	213,547	25,517	40,336	126,410	19,483	0	3,318	0
1999		2,763,351	54,903	2,246,000	D	D	460,418	224,035	27,877	41,727	149,209	17,570	0	2,030	0
2000		3,252,494	71,630	2,668,000	75,000	2,593,000	509,141	228,768	34,377	42,343	178,613	25,040	0	3,723	0
Iowa															
1987		540,156	20,217	343,000	D	D	157,539	76,915	16,653	6,212	49,668	8,091	19,000	400	0
1989		616,408	20,447	363,000	D	D	209,394	103,360	24,839	14,711	60,863	5,621	21,800	1,767	0
1991		777,130	26,977	461,000	D	D	259,437	123,858	34,147	14,372	74,471	12,589	26,400	3,316	0
1993		902,050	30,424	533,000	D	D	298,745	145,006	38,218	17,907	80,919	16,695	37,000	2,881	0
1995		1,391,005	37,257	998,000	D	D	322,769	163,620	47,279	19,391	77,793	14,686	31,925	1,054	0
1997		979,747	29,043	578,000	D	D	341,772	162,060	52,713	24,226	83,880	18,893	27,680	3,252	0
1998		1,053,690	32,701	634,000	D	D	358,259	167,123	52,945	31,066	88,665	18,460	24,637	4,093	0
1999		1,002,839	39,213	559,000	6,000	553,000	375,300	177,847	53,415	35,940	91,684	16,414	25,438	3,888	0
2000		1,017,300	34,586	538,000	D	D	418,263	203,437	56,351	32,473	104,472	21,530	23,281	3,170	0

Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

(Page 5 of 13)

State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
Kansas															
1987		1,282,752	9,073	1,179,000	D	D	93,931	37,386	20,031	5,433	27,607	3,474	0	748	0
1989		522,687	9,034	404,000	94,000	310,000	107,856	44,292	24,159	5,187	30,204	4,014	0	1,797	0
1991		NA	11,961	D	D	D	124,174	43,913	28,967	7,292	39,897	4,105	0	5,219	0
1993		463,570	12,198	292,000	47,000	245,000	154,103	59,635	36,640	7,527	44,215	6,086	0	5,269	0
1995		763,702	12,296	569,000	D	D	181,496	70,026	39,353	11,434	52,517	8,166	0	910	0
1997		1,350,536	15,622	1,136,000	D	D	197,586	75,116	45,002	11,907	56,752	8,809	0	1,328	0
1998		1,518,063	24,757	1,279,000	D	D	213,096	80,443	47,089	12,385	56,215	16,964	0	1,210	0
1999		1,555,578	35,743	1,284,000	D	D	234,501	88,728	50,445	19,525	58,212	17,591	0	1,334	0
2000		1,420,089	20,162	1,140,000	D	D	258,336	105,610	44,396	23,410	69,872	15,048	0	1,591	0
Kentucky															
1987		353,868	26,692	249,000	D	D	78,008	30,778	10,841	6,715	26,545	3,129	0	168	0
1989		343,099	31,159	226,000	D	226,000	83,998	32,963	7,113	7,516	30,593	5,813	0	1,942	0
1991		316,616	62,279	154,000	D	D	97,989	38,386	6,122	10,569	38,008	4,904	0	2,348	0
1993		428,684	15,728	289,000	7,000	282,000	122,409	55,698	6,198	13,575	42,013	4,925	0	1,547	0
1995		593,797	5,911	452,000	4,000	448,000	134,784	59,811	9,589	16,627	43,883	4,874	0	1,102	0
1997		525,613	7,289	359,000	3,000	356,000	158,238	75,649	7,394	20,016	53,122	2,057	0	1,086	0
1998		645,079	6,591	427,000	D	D	209,780	80,390	15,049	19,176	86,057	9,108	0	1,708	0
1999		967,676	9,146	684,000	1,000	683,000	273,903	92,572	42,066	21,714	108,568	8,983	0	627	0
2000		866,052	7,500	582,000	1,000	581,000	274,238	96,288	21,849	17,932	121,232	16,937	0	2,314	0
Louisiana															
1987		317,932	34,619	134,000	D	D	148,563	54,367	31,850	7,154	42,639	12,553	0	750	0
1989		385,930	36,410	168,000	D	D	180,032	69,219	40,758	8,193	47,129	14,733	0	1,488	0
1991		453,098	43,104	172,000	16,000	156,000	235,726	98,860	62,167	15,678	44,184	14,837	0	2,268	0
1993		469,705	42,557	170,000	D	D	255,171	95,891	64,306	16,508	61,267	17,199	0	1,977	0
1995		422,967	45,108	61,000	D	D	314,996	135,838	71,898	21,317	66,446	19,497	0	1,863	0
1997		554,255	47,910	172,000	D	D	330,131	128,017	74,861	32,231	78,094	16,928	0	4,214	0
1998		542,408	84,315	102,000	14,000	87,000	351,976	144,039	78,128	23,406	86,840	19,563	0	4,117	0
1999		626,132	58,976	187,000	53,000	134,000	376,098	154,341	79,834	32,879	89,100	19,944	0	4,058	0
2000		626,793	99,196	126,000	1,000	125,000	399,411	169,895	75,626	25,670	95,601	32,619	0	2,186	0
Maine															
1987		76,367	5,493	41,000	D	41,000	16,952	7,787	315	2,051	5,740	1,059	0	12,922	0
1989		72,733	4,394	33,000	D	33,000	19,974	8,288	584	4,002	6,567	533	0	15,365	0
1991		NA	13,862	D	D	D	27,082	10,062	2,197	4,719	9,504	600	0	16,456	0
1993		113,937	13,003	59,000	D	D	24,879	8,959	1,711	4,117	9,674	418	0	17,055	0
1995		345,449	4,238	286,000	D	D	31,901	15,789	2,005	4,158	9,357	592	0	23,310	0
1997		148,620	5,685	83,000	D	D	33,144	15,066	1,551	5,609	10,526	392	0	26,791	0
1998		159,268	10,953	82,000	D	D	35,265	13,981	1,809	7,252	11,194	1,029	0	31,050	0
1999		224,584	4,975	140,000	52,000	88,000	44,437	20,137	1,964	2,476	17,293	2,567	0	35,172	0
2000		318,726	4,755	201,000	53,000	148,000	57,753	25,309	6,445	2,994	20,555	2,450	0	55,218	0

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
Maryland															
1987		4,623,170	2,507,828	1,350,000	608,000	742,000	723,915	576,698	50,425	25,803	59,733	11,256	0	41,427	0
1989		4,972,713	2,915,588	1,088,000	552,000	536,000	900,007	705,292	61,216	35,556	74,426	23,517	0	68,533	585
1991		5,736,048	3,332,276	1,203,000	666,000	537,000	1,050,023	787,317	79,047	39,832	113,214	30,613	0	149,107	1,642
1993		7,530,401	4,116,718	2,076,000	1,287,000	789,000	1,128,066	842,053	90,237	47,604	115,976	32,196	0	204,180	5,437
1995		6,865,287	4,472,415	1,075,000	287,000	788,000	1,159,866	894,585	75,759	55,111	84,508	49,903	0	156,442	1,564
1997		7,395,409	4,569,181	1,425,000	456,000	970,000	1,242,151	927,015	81,381	40,098	114,075	79,582	0	154,995	4,082
1998		8,018,944	4,766,005	1,744,000	655,000	1,089,000	1,330,170	1,014,239	62,950	41,752	142,710	68,519	0	178,769	0
1999		8,087,315	4,814,517	1,700,000	455,000	1,246,000	1,387,262	1,058,128	76,138	33,777	151,053	68,166	0	184,657	879
2000		8,633,558	4,869,668	2,032,000	428,000	1,604,000	1,507,549	1,090,445	82,069	50,154	181,039	103,842	0	224,341	0
Massachusetts															
1987		7,773,057	575,855	5,492,000	1,468,000	4,024,000	719,581	536,999	18,390	64,806	37,790	61,596	354,000	631,621	0
1989		7,948,303	401,091	5,825,000	1,691,000	4,134,000	867,521	621,789	18,529	78,727	58,681	89,795	364,100	419,725	70,866
1991		8,565,279	277,787	6,335,000	1,480,000	4,855,000	953,708	680,168	13,090	90,390	71,025	99,035	389,000	433,698	176,086
1993		9,497,975	383,885	6,952,000	1,878,000	5,074,000	1,105,791	771,864	15,462	98,270	91,877	128,318	355,000	525,805	175,494
1995		9,969,508	315,749	7,416,000	1,458,000	5,958,000	1,147,150	824,826	13,240	89,409	92,116	127,559	344,657	587,363	158,589
1997		11,096,958	361,118	8,300,000	1,397,000	6,903,000	1,268,356	915,187	29,248	102,848	124,784	96,289	352,591	652,158	162,735
1998		13,382,495	301,193	10,604,000	2,419,000	8,185,000	1,342,712	987,319	31,704	107,368	98,737	117,584	364,783	706,800	63,007
1999		12,189,891	240,059	9,314,000	2,374,000	6,940,000	1,402,522	1,018,574	32,905	125,874	88,441	136,728	353,321	804,838	75,151
2000		13,004,427	259,172	9,863,000	1,831,000	8,032,000	1,485,792	1,064,468	40,305	138,667	94,322	148,030	348,339	967,591	80,533
Michigan															
1987		7,919,304	87,364	7,415,000	115,000	7,300,000	396,580	207,729	30,320	25,146	103,830	29,555	0	20,360	0
1989		9,058,245	71,349	8,468,000	99,000	8,369,000	487,192	263,506	35,983	36,310	116,135	35,258	0	31,704	0
1991		8,850,565	91,833	8,116,000	89,000	8,027,000	601,189	309,592	42,539	43,684	152,841	52,533	0	41,543	0
1993		10,777,535	95,717	9,924,000	153,000	9,771,000	699,957	377,278	39,541	47,390	172,114	63,634	0	57,861	0
1995		13,274,875	82,008	12,388,000	148,000	12,240,000	755,089	417,755	48,961	50,629	180,866	56,878	0	49,778	0
1997		13,990,795	107,749	13,009,000	121,000	12,888,000	842,303	453,776	50,749	57,149	205,580	75,049	0	31,743	0
1998		13,655,250	111,457	12,648,000	D	D	877,804	472,416	56,146	59,400	221,186	68,656	0	17,989	0
1999		18,798,557	149,473	17,714,000	134,000	17,580,000	919,390	508,080	58,472	60,451	229,644	62,743	0	15,694	0
2000		18,892,070	239,543	17,640,000	80,000	17,559,000	995,756	553,119	63,226	66,955	242,336	70,120	0	16,771	0
Minnesota															
1987		2,529,453	26,388	2,242,000	D	D	222,381	109,003	37,287	11,056	39,371	25,664	0	38,684	0
1989		2,398,568	31,036	2,066,000	D	D	258,614	132,880	42,542	12,389	43,713	27,090	0	42,918	0
1991		2,227,672	40,468	1,810,000	150,000	1,660,000	331,471	164,887	53,614	19,270	60,904	32,796	0	45,733	0
1993		2,922,121	40,129	2,458,000	378,000	2,080,000	332,033	174,716	49,861	21,524	64,840	21,092	0	91,959	0
1995		3,087,438	30,139	2,636,000	315,000	2,321,000	336,524	194,819	49,543	23,427	46,235	22,500	0	84,775	0
1997		3,605,451	34,573	3,116,000	362,000	2,754,000	363,095	200,149	50,539	24,196	53,731	34,480	0	91,783	0
1998		3,817,731	38,437	3,321,000	334,000	2,986,000	364,503	206,258	47,696	25,173	55,925	29,451	0	93,791	0
1999		3,904,779	37,878	3,379,000	242,000	3,137,000	375,919	210,235	49,447	24,323	62,310	29,604	0	111,982	0
2000		4,298,967	32,014	3,722,000	173,000	3,550,000	416,411	233,018	52,659	26,859	71,236	32,639	0	128,542	0

Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

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State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
Mississippi															
1987		236,427	127,489	44,000	D	D	59,882	24,532	16,775	4,282	8,897	5,396	0	5,056	0
1989		268,090	130,448	56,000	D	D	78,922	35,747	20,493	5,439	9,670	7,573	0	2,720	0
1991		302,380	157,156	41,000	D	D	100,383	52,853	20,886	8,892	12,132	5,620	0	3,841	0
1993		324,189	162,622	52,000	D	D	105,739	54,715	21,836	9,824	10,960	8,404	0	3,828	0
1995		314,710	132,616	66,000	D	D	112,789	62,597	23,778	8,912	11,211	6,291	0	3,305	0
1997		369,557	165,297	73,000	D	D	124,601	62,350	29,324	9,169	13,623	10,135	0	6,659	0
1998		366,465	132,896	73,000	17,000	57,000	152,683	79,772	29,455	10,399	31,126	1,931	0	7,886	0
1999		476,292	196,245	114,000	43,000	71,000	160,287	85,128	31,138	9,570	33,732	719	0	5,760	0
2000		512,789	186,799	101,000	19,000	83,000	217,064	117,168	38,833	10,973	47,025	3,065	0	7,926	0
Missouri															
1987		2,171,482	46,007	1,905,000	D	D	205,597	113,146	11,753	19,325	49,579	11,794	0	14,878	0
1989		2,709,978	58,176	2,380,000	D	D	255,009	139,677	14,509	25,151	59,615	16,057	0	16,793	0
1991		NA	71,220	D	D	D	305,780	165,099	19,061	30,195	67,335	24,090	0	22,217	0
1993		1,788,896	51,288	1,375,000	D	D	344,566	190,959	18,959	31,492	78,490	24,666	0	18,042	0
1995		2,498,360	55,445	2,028,000	584,000	1,443,000	397,192	212,750	21,486	36,639	92,974	33,343	0	17,723	0
1997		1,826,338	50,526	1,290,000	30,000	1,260,000	464,809	260,668	24,101	36,669	111,305	32,066	0	21,003	0
1998		1,867,905	48,544	1,313,000	D	D	484,159	277,894	24,473	29,605	109,470	42,717	0	22,202	0
1999		2,009,472	48,097	1,387,000	21,000	1,367,000	549,876	321,115	25,591	30,380	127,617	45,173	0	24,499	0
2000		2,583,036	43,851	1,893,000	18,000	1,876,000	614,101	371,713	26,387	33,535	130,288	52,178	0	32,084	0
Montana															
1987		54,381	17,763	7,000	0	7,000	29,425	11,299	7,325	3,197	7,604	0	0	193	0
1989		NA	20,877	D	D	5,000	32,450	11,552	7,919	3,242	9,534	203	0	1,077	0
1991		NA	26,133	D	D	D	38,149	13,801	8,884	4,406	10,820	238	0	1,340	0
1993		90,438	27,075	14,000	D	D	48,080	21,399	9,029	3,234	14,011	407	0	1,283	0
1995		119,109	33,553	17,000	D	D	66,879	27,382	12,914	5,825	20,172	586	0	1,677	0
1997		199,351	33,199	92,000	D	D	70,591	31,261	14,368	8,470	15,684	808	0	3,561	0
1998		190,675	33,101	82,000	D	D	72,425	35,730	13,784	8,437	13,435	1,039	0	3,149	0
1999		168,611	42,816	33,000	D	D	84,460	43,872	14,639	8,967	15,566	1,416	0	8,335	0
2000		169,856	35,344	28,000	D	D	99,069	51,686	17,873	10,298	15,658	3,554	0	7,443	0
Nebraska															
1987		160,209	21,899	62,000	D	D	74,468	33,275	16,123	6,664	14,893	3,513	0	1,842	0
1989		181,706	22,074	64,000	D	D	93,506	36,761	22,926	9,098	20,676	4,045	0	2,126	0
1991		210,756	21,920	59,000	7,000	52,000	123,711	40,597	35,817	7,845	34,780	4,672	0	6,125	0
1993		294,531	24,730	128,000	14,000	114,000	135,737	38,023	39,576	8,891	36,406	12,841	0	6,064	0
1995		335,930	23,132	150,000	D	D	157,044	54,746	42,331	10,933	45,536	3,498	0	5,754	0
1997		275,359	23,741	71,000	D	D	175,592	60,388	47,089	13,686	49,290	5,139	0	5,026	0
1998		314,645	28,873	93,000	D	D	186,200	62,578	46,602	16,749	55,018	5,253	0	6,572	0
1999		417,342	28,769	178,000	6,000	172,000	205,363	61,226	10,648	17,231	102,726	13,532	0	5,210	0
2000		438,996	25,082	199,000	D	D	208,480	65,702	7,243	17,636	101,159	16,740	0	6,434	0

Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

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State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
Nevada															
1987		167,996	76,509	57,000	D	D	34,254	18,563	1,973	3,983	8,805	930	0	233	0
1989		152,642	77,198	29,000	D	D	45,555	26,587	2,682	4,296	10,396	1,594	0	889	0
1991		261,232	108,614	83,000	63,000	20,000	66,742	38,221	2,608	5,323	19,675	915	0	2,876	0
1993		218,503	71,044	67,000	D	D	79,124	43,196	4,361	5,245	25,193	1,129	0	1,335	0
1995		445,028	34,669	322,000	D	D	86,902	47,708	6,460	6,941	24,798	995	0	1,457	0
1997		516,544	46,025	380,000	D	D	88,331	43,934	4,411	5,464	30,749	3,773	0	2,188	0
1998		570,509	48,514	434,000	D	D	83,888	45,496	4,533	5,355	24,314	4,190	0	4,107	0
1999		457,765	27,843	337,000	D	D	91,485	51,387	5,442	5,196	25,484	3,976	0	1,437	0
2000		377,412	20,696	248,000	D	D	106,340	60,005	7,032	5,532	29,227	4,544	0	2,376	0
New Hampshire															
1987		164,130	19,006	94,000	D	D	50,928	34,633	2,045	2,081	8,114	4,055	0	196	0
1989		NA	21,510	D	D	95,000	62,172	41,816	2,646	2,951	9,333	5,426	0	97	0
1991		NA	88,342	D	D	102,000	78,975	52,833	4,375	3,997	10,225	7,545	0	330	0
1993		438,620	88,839	248,000	D	D	99,475	67,727	5,846	4,842	11,768	9,292	0	2,306	0
1995		597,697	30,902	472,000	36,000	436,000	93,073	60,131	3,963	3,919	12,948	12,112	0	1,722	0
1997		798,601	36,861	652,000	D	D	107,505	67,282	7,990	4,880	15,058	12,295	0	2,235	0
1998		1,339,951	33,959	1,187,000	D	D	117,323	70,966	8,300	6,209	17,439	14,409	0	1,669	0
1999		1,256,206	28,353	1,099,000	D	D	127,135	77,327	8,961	8,939	18,102	13,806	0	1,718	0
2000		775,004	35,717	586,000	D	D	150,982	95,290	9,747	9,197	22,924	13,824	0	2,305	0
New Jersey															
1987		6,724,917	255,275	6,141,000	457,000	5,684,000	214,696	95,294	37,489	11,780	55,142	14,991	107,000	6,946	0
1989		7,228,887	429,755	6,381,000	601,000	5,780,000	283,897	119,237	45,150	16,428	82,798	20,284	112,600	21,635	0
1991		8,777,671	512,928	7,810,000	855,000	6,955,000	352,310	150,044	43,361	19,502	114,157	25,246	90,800	11,528	105
1993		9,180,997	509,310	8,162,000	378,000	7,784,000	373,816	166,835	36,361	26,115	116,307	28,198	116,000	11,876	7,995
1995		9,128,185	343,667	8,200,000	197,000	8,002,000	443,371	208,934	39,535	25,861	135,607	33,434	125,685	11,332	4,130
1997		12,067,086	459,286	11,069,000	117,000	10,952,000	462,052	224,084	37,274	26,186	139,540	34,968	59,146	15,641	1,961
1998		11,368,389	392,554	10,415,000	134,000	10,282,000	484,642	227,954	39,773	27,236	150,483	39,196	53,005	17,106	6,082
1999		10,535,662	486,722	9,453,000	126,000	9,327,000	520,957	239,880	45,013	30,402	162,468	43,194	53,693	15,666	5,624
2000		13,133,222	417,685	12,062,000	253,000	11,809,000	567,666	257,445	46,071	29,817	160,412	73,921	65,305	20,566	0
New Mexico															
1987		2,392,370	420,821	993,000	906,000	87,000	132,145	75,923	17,908	20,123	14,187	4,004	835,000	11,404	0
1989		2,679,324	593,878	1,034,000	D	D	136,189	76,777	14,612	16,433	17,860	10,507	902,400	4,857	8,000
1991		2,589,385	392,967	1,064,000	1,001,000	63,000	170,139	94,309	15,467	19,530	28,762	12,071	947,600	7,241	7,438
1993		2,751,608	503,783	962,000	D	D	186,750	113,060	13,998	18,743	28,507	12,442	1,084,000	6,762	8,313
1995		3,295,475	481,047	1,461,000	1,380,000	81,000	230,393	156,554	17,298	10,696	38,562	7,283	1,109,400	6,218	7,417
1997		3,027,688	366,253	1,310,000	D	D	219,150	144,639	14,954	9,915	42,442	7,200	1,121,670	10,362	253
1998		3,031,678	395,908	1,205,000	D	D	228,623	152,137	12,667	12,559	45,780	5,480	1,187,000	15,147	0
1999		3,278,714	409,886	1,342,000	D	D	224,500	155,218	12,302	12,866	39,260	4,854	1,278,901	23,427	0
2000		3,085,199	320,838	1,158,000	D	D	246,258	175,028	11,965	11,692	41,740	5,833	1,333,194	26,909	0

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
New York															
1987		8,185,452	160,073	6,559,000	3,426,000	13,904,000	1,108,478	758,040	53,349	62,173	126,931	107,985	221,000	136,901	0
1989		9,877,995	89,334	8,071,000	1,480,000	6,591,000	1,311,643	854,137	68,474	70,598	170,970	147,464	255,200	150,818	0
1991		10,315,493	173,988	8,268,000	1,558,000	6,710,000	1,419,765	918,063	75,490	85,282	190,624	150,306	283,900	169,570	270
1993		10,973,876	131,440	8,820,000	1,392,000	7,428,000	1,544,702	1,052,171	75,571	87,804	180,217	148,939	293,000	184,734	0
1995		10,954,561	117,250	8,651,000	1,821,000	6,831,000	1,702,414	1,107,468	95,941	98,200	206,258	194,547	281,148	202,749	0
1997		12,306,752	136,215	9,939,000	2,078,000	7,861,000	1,783,810	1,151,542	80,142	95,778	245,093	211,255	239,052	208,675	0
1998		13,730,588	191,988	11,176,000	2,216,000	8,960,000	1,924,667	1,223,705	82,308	96,367	286,449	235,838	0	221,286	216,647
1999		14,110,375	132,848	11,388,000	2,105,000	9,284,000	2,065,882	1,334,210	84,437	101,656	322,852	222,727	0	274,887	248,758
2000		13,555,586	176,034	10,539,000	1,773,000	8,766,000	2,290,812	1,475,423	102,684	100,995	374,797	236,913	0	300,685	249,055
North Carolina															
1987		2,212,322	129,508	1,741,000	5,000	1,736,000	313,819	195,177	54,897	23,825	25,757	14,163	0	27,995	0
1989		1,820,827	59,738	1,305,000	5,000	1,300,000	419,848	261,896	61,259	41,375	41,222	14,096	0	36,241	0
1991		1,965,076	150,956	1,285,000	4,000	1,281,000	501,841	303,921	71,990	55,079	51,758	19,093	0	27,279	0
1993		2,745,087	174,294	1,929,000	16,000	1,913,000	604,581	377,983	74,041	69,950	63,862	18,745	0	37,212	0
1995		3,191,790	220,179	2,226,000	15,000	2,212,000	686,609	431,682	97,647	74,086	61,857	21,337	0	59,002	0
1997		4,667,017	229,610	3,590,000	111,000	3,478,000	785,980	439,124	115,804	96,116	105,767	29,169	0	61,427	0
1998		4,559,996	235,873	3,362,000	12,000	3,350,000	898,513	516,489	128,976	120,934	96,259	35,855	0	63,610	0
1999		5,268,108	230,780	3,953,000	19,000	3,934,000	1,012,576	538,102	121,787	179,830	145,060	27,797	0	71,752	0
2000		5,045,250	262,003	3,672,000	30,000	3,641,000	1,040,017	577,437	113,764	169,979	147,364	31,473	0	71,230	0
North Dakota															
1987		116,487	20,343	60,000	D	D	35,912	15,385	13,731	3,578	2,391	827	0	232	0
1989		75,833	20,217	27,000	D	27,000	27,951	19,396	918	2,521	4,113	1,003	0	665	0
1991		NA	23,938	D	D	D	48,930	21,570	1,327	2,308	22,336	1,389	0	1,231	0
1993		91,534	27,220	9,000	D	D	54,175	25,223	1,532	2,173	23,595	1,652	0	1,139	0
1995		97,606	25,042	12,000	D	D	59,617	27,841	1,534	3,346	25,043	1,853	0	947	0
1997		115,946	26,401	33,000	0	33,000	56,096	24,207	1,070	3,439	25,554	1,826	0	449	0
1998		119,450	27,360	34,000	0	34,000	56,945	23,191	1,123	3,806	26,091	3,806	0	1,145	0
1999		168,176	30,561	75,000	0	75,000	61,695	25,923	1,965	3,608	27,782	2,417	0	920	0
2000		145,671	25,842	51,000	D	D	67,406	29,343	2,417	4,400	28,651	2,595	0	1,423	0
Ohio															
1987		4,934,310	991,290	3,569,000	2,206,000	2,807,000	329,344	193,615	35,038	22,265	47,189	31,237	0	44,676	0
1989		5,474,881	1,055,523	3,946,000	681,000	3,265,000	427,345	242,559	48,072	37,591	62,068	37,055	0	46,013	0
1991		5,975,241	688,926	4,726,000	778,000	3,948,000	503,725	284,791	53,079	37,948	73,765	54,142	0	56,590	0
1993		6,397,650	583,033	5,144,000	1,030,000	4,114,000	593,542	348,166	46,038	47,781	89,146	62,411	0	77,075	0
1995		5,314,554	599,044	4,001,000	574,000	3,428,000	642,596	375,061	47,690	54,316	106,701	58,828	0	71,914	0
1997		7,144,779	681,170	5,608,000	604,000	5,004,000	763,827	417,921	70,078	82,653	143,890	49,285	0	91,782	0
1998		6,969,763	698,173	5,338,000	605,000	4,732,000	808,210	444,316	74,449	88,340	151,611	49,494	0	125,380	0
1999		8,082,147	604,957	6,514,000	1,148,000	5,366,000	830,701	475,054	68,051	80,705	149,023	57,868	0	132,489	0
2000		7,661,540	615,458	5,962,000	539,000	5,423,000	918,500	498,967	83,520	87,570	179,722	68,721	0	165,582	0



Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987-2000

(Thousands of current dollars)

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State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
Oklahoma															
1987		534,354	33,729	384,000	D	D	99,363	25,880	3,463	7,078	57,472	5,470	0	17,262	0
1989		507,700	46,083	332,000	D	D	113,279	33,067	5,062	5,667	60,063	9,420	0	16,338	0
1991		604,019	40,970	392,000	2,000	390,000	152,624	42,806	13,593	8,559	74,265	13,401	0	18,425	0
1993		533,398	34,311	311,000	2,000	309,000	172,968	56,475	22,399	10,320	67,338	16,436	0	15,119	0
1995		528,764	45,104	288,000	38,000	249,000	186,371	59,504	19,699	11,453	79,107	16,608	0	9,289	0
1997		643,755	44,238	428,000	45,000	383,000	162,871	71,421	18,944	14,036	45,309	13,161	0	8,646	0
1998		512,899	51,038	245,000	2,000	243,000	208,873	83,785	37,415	13,320	59,574	14,779	0	7,988	0
1999		664,408	45,912	365,000	2,000	363,000	238,799	88,507	41,736	14,802	76,192	17,562	0	14,697	0
2000		659,684	58,619	333,000	3,000	331,000	252,419	93,434	42,396	16,789	88,152	11,648	0	15,646	0
Oregon															
1987		475,890	31,517	294,000	D	D	135,326	81,932	18,645	4,059	16,007	14,683	0	15,047	0
1989		578,941	42,199	355,000	30,000	325,000	161,215	99,141	20,860	4,857	16,717	19,640	0	20,527	0
1991		600,175	47,486	349,000	21,000	321,000	179,384	108,849	25,727	6,850	21,519	16,439	0	24,305	0
1993		773,855	50,795	471,000	32,000	439,000	225,750	134,956	29,762	8,578	34,209	18,245	0	26,310	0
1995		1,088,654	55,959	741,000	35,000	706,000	258,575	158,076	30,312	11,693	37,453	21,041	0	33,120	0
1997		1,519,732	90,017	1,102,000	28,000	1,075,000	290,603	195,030	32,335	9,647	35,824	17,767	0	37,112	0
1998		1,910,443	87,846	1,492,000	26,000	1,467,000	309,748	203,119	32,963	10,201	38,121	25,344	0	20,849	0
1999		1,974,067	89,369	1,540,000	3,000	1,537,000	319,700	210,667	33,975	10,473	48,269	16,316	0	24,998	0
2000		2,116,232	88,618	1,651,000	7,000	1,644,000	346,149	246,684	35,485	14,775	32,568	16,637	0	30,465	0
Pennsylvania															
1987		5,633,446	284,237	4,630,000	1,380,000	3,250,000	611,935	385,912	23,559	66,246	85,399	50,819	14,000	93,274	0
1989		5,790,920	274,016	4,632,000	1,907,000	2,725,000	761,337	468,993	32,466	91,733	109,498	58,647	20,900	102,667	0
1991		7,620,947	315,003	6,262,000	2,060,000	4,202,000	878,826	552,239	26,532	100,210	141,865	57,980	27,100	137,865	153
1993		8,277,907	353,951	6,711,000	1,142,000	5,569,000	1,019,006	676,963	20,177	111,569	149,296	61,001	35,000	158,950	0
1995		6,918,955	227,520	5,331,000	376,000	4,955,000	1,139,531	754,444	34,954	120,303	164,296	65,534	31,525	189,379	0
1997		8,209,081	151,216	6,609,000	672,000	5,937,000	1,241,180	807,553	41,685	139,325	182,835	69,782	32,229	175,456	0
1998		8,761,617	132,927	7,083,000	485,000	6,598,000	1,341,607	872,722	43,633	156,179	199,139	69,934	30,113	173,970	0
1999		10,695,077	168,382	8,932,000	441,000	8,491,000	1,400,286	905,775	52,510	154,203	202,126	85,672	31,821	162,588	0
2000		9,841,912	151,955	7,873,000	460,000	7,412,000	1,549,050	1,032,963	44,433	159,669	202,535	109,450	55,955	211,952	0
Rhode Island															
1987		553,281	239,969	234,000	D	D	65,516	51,313	2,136	5,380	5,293	1,394	0	13,796	0
1989		428,168	195,920	139,000	D	D	79,801	56,446	3,276	6,305	11,646	2,128	0	13,447	0
1991		484,693	226,367	152,000	11,000	141,000	88,448	59,616	5,278	3,709	17,520	2,325	0	17,878	0
1993		484,236	184,784	176,000	12,000	164,000	103,194	71,515	2,812	3,212	23,481	2,174	0	20,258	0
1995		896,570	254,302	520,000	D	D	105,501	72,461	3,225	2,479	25,644	1,692	0	16,767	0
1997		1,040,290	202,192	704,000	D	D	111,977	79,417	1,161	1,995	26,545	2,859	0	22,121	0
1998		1,677,063	222,106	1,320,000	D	D	111,979	77,737	2,857	2,074	26,130	3,181	0	22,978	0
1999		1,651,139	232,701	1,264,000	D	D	120,868	81,512	4,485	2,901	28,474	3,496	0	33,570	0
2000		1,500,828	240,862	1,090,000	D	D	129,697	88,510	4,564	2,735	30,289	3,599	0	40,269	0

Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

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State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
South Carolina															
1987		640,738	11,527	523,000	D	D	95,811	34,350	14,061	6,184	37,110	4,106	0	10,400	0
1989		575,597	59,660	386,000	D	D	120,137	41,627	17,421	7,906	44,864	8,319	0	9,800	0
1991		594,444	13,955	419,000	D	D	151,204	54,045	16,858	15,903	54,011	10,387	0	10,285	0
1993		713,450	38,208	495,000	D	D	178,174	73,020	16,057	14,242	52,850	22,005	0	2,068	0
1995		996,261	34,441	739,000	D	D	220,088	109,443	17,899	19,364	53,994	19,388	0	2,732	0
1997		1,039,818	34,019	783,000	83,000	700,000	219,000	102,887	20,697	8,682	65,914	20,820	0	3,799	0
1998		989,452	44,872	695,000	D	D	246,305	112,845	27,166	11,407	83,416	11,471	0	2,583	692
1999		979,065	45,050	665,000	D	D	267,549	111,092	26,670	12,826	101,890	15,071	0	1,461	5
2000		1,126,164	45,754	781,000	D	D	294,184	131,043	31,743	15,478	102,793	13,127	0	5,226	0
South Dakota															
1987		21,311	5,685	4,000	0	4,000	11,395	5,129	4,789	472	739	266	0	231	0
1989		22,274	5,563	4,000	0	4,000	12,449	6,166	4,905	316	840	222	0	262	0
1991		32,297	9,470	5,000	0	5,000	15,959	6,917	6,539	310	1,520	673	0	1,868	0
1993		58,634	13,236	22,000	D	D	22,196	9,100	9,686	486	2,140	784	0	1,202	0
1995		54,667	13,428	19,000	0	19,000	21,392	10,623	6,772	469	2,341	1,187	0	847	0
1997		71,365	19,307	26,000	0	26,000	24,558	10,879	8,341	811	3,043	1,484	0	1,500	0
1998		59,766	27,501	5,000	0	5,000	25,140	11,702	8,355	495	2,647	1,941	0	2,125	0
1999		59,601	20,709	13,000	0	13,000	25,522	12,759	7,798	306	2,397	2,262	0	370	0
2000		84,801	13,232	44,000	16,000	28,000	27,269	13,659	6,525	361	3,825	2,899	0	300	0
Tennessee															
1987		950,871	125,890	649,000	D	D	155,163	84,030	28,035	11,757	24,124	7,217	9,000	11,818	0
1989		1,294,796	135,383	930,000	D	D	207,471	127,627	31,365	10,367	28,221	9,891	7,800	14,142	0
1991		1,142,486	123,708	737,000	D	D	243,763	150,274	32,927	12,359	34,772	13,431	10,400	27,515	100
1993		1,212,807	86,547	792,000	D	D	277,686	180,177	31,255	15,743	34,150	16,361	11,000	45,574	0
1995		1,394,231	62,100	1,003,000	D	D	308,155	191,797	35,395	16,345	45,116	19,502	1,101	19,875	0
1997		1,566,151	77,836	1,089,000	D	D	329,710	198,805	37,911	17,430	52,844	22,720	44,022	25,583	0
1998		2,502,826	37,925	2,040,000	D	D	346,466	207,822	36,615	19,995	54,066	27,968	50,750	27,685	0
1999		2,290,201	64,783	1,768,000	D	D	371,439	217,970	39,045	21,530	59,489	33,405	51,943	34,036	0
2000		2,057,293	88,947	1,215,000	D	D	405,013	240,337	39,258	18,520	67,634	39,264	0	35,888	312,445
Texas															
1987		5,454,724	340,803	4,261,000	1,784,000	2,477,000	809,781	403,285	92,020	46,903	168,648	98,925	0	43,140	0
1989		6,581,710	464,111	5,028,000	1,848,000	3,180,000	1,014,305	488,137	123,805	63,575	210,128	128,660	0	75,294	0
1991		6,635,249	405,267	4,755,000	D	D	1,215,548	550,558	139,019	79,964	283,850	162,157	2,300	257,134	0
1993		6,965,939	467,760	4,882,000	640,000	4,242,000	1,387,088	682,785	157,954	89,554	292,807	163,988	5,000	224,091	0
1995		8,384,534	537,508	6,211,000	912,000	5,298,000	1,472,165	747,687	158,886	102,486	296,606	166,500	0	163,001	860
1997		9,487,282	559,634	7,265,000	784,000	6,481,000	1,581,200	844,746	170,457	132,352	269,793	163,852	0	80,394	1,054
1998		10,774,067	596,978	8,408,000	223,000	8,185,000	1,698,363	909,528	179,491	140,196	289,879	179,269	0	69,230	1,496
1999		12,429,172	584,149	9,935,000	118,000	9,817,000	1,829,967	975,753	183,149	160,032	301,326	209,707	0	77,689	2,367
2000		11,552,437	464,699	8,961,000	230,000	8,731,000	2,039,642	1,101,463	229,255	165,151	322,234	221,539	0	87,096	0

Appendix Tables

Appendix table 4-24

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

(Page 12 of 13)

State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
Utah															
1987		1,031,253	99,166	809,000	D	D	120,878	81,355	13,412	5,734	16,178	4,199	0	2,209	0
1989		620,604	66,414	387,000	D	D	164,828	109,053	17,183	5,503	27,822	5,267	0	2,362	0
1991		664,474	103,269	356,000	51,000	305,000	201,470	137,613	16,756	6,880	33,779	6,442	0	3,735	0
1993		751,165	140,556	411,000	51,000	360,000	194,685	136,630	13,075	9,303	27,825	7,852	0	4,924	0
1995		1,144,080	131,138	803,000	178,000	625,000	202,212	140,600	15,431	9,456	28,065	8,660	0	7,730	0
1997		1,381,073	117,231	1,027,000	199,000	829,000	234,151	158,237	17,876	14,452	35,822	7,764	0	2,691	0
1998		1,494,808	135,365	1,109,000	181,000	928,000	249,147	165,319	17,556	13,502	42,561	10,209	0	1,296	0
1999		1,474,191	74,129	1,123,000	D	D	273,192	177,563	19,852	15,730	46,220	13,827	0	3,870	0
2000		1,360,644	69,871	979,000	D	D	308,059	192,100	20,365	17,853	43,818	33,923	0	3,714	0
Vermont															
1987		282,584	3,710	247,000	0	247,000	31,547	22,289	1,805	2,877	3,330	1,246	0	327	0
1989		NA	4,404	D	D	D	42,743	28,535	2,500	3,486	5,485	2,737	0	2,639	0
1991		NA	5,122	D	D	D	46,541	30,860	2,859	4,181	6,395	2,246	0	4,543	0
1993		342,809	5,601	284,000	D	D	49,839	31,530	2,666	4,573	8,253	2,817	0	3,369	0
1995		308,180	4,702	248,000	D	D	54,065	32,932	2,454	5,467	9,519	3,693	0	1,413	0
1997		313,881	7,400	246,000	D	D	59,526	34,042	2,683	5,399	11,465	5,937	0	955	0
1998		175,486	4,171	112,000	32,000	80,000	57,832	31,460	2,648	5,513	11,920	6,291	0	1,483	0
1999		388,598	4,065	318,000	D	D	64,791	36,773	2,718	7,112	11,896	6,292	0	1,742	0
2000		465,349	3,599	396,000	D	D	64,762	41,232	3,262	5,713	10,239	4,316	0	988	0
Virginia															
1987		2,558,458	883,844	1,342,000	1,068,000	274,000	207,934	116,137	36,400	15,895	29,841	9,661	0	124,680	0
1989		2,555,475	1,017,754	1,126,000	687,000	439,000	278,065	146,712	49,501	21,953	45,348	14,551	13,200	45,489	74,967
1991		2,775,919	1,107,423	1,115,000	679,000	436,000	342,476	183,798	51,474	31,899	52,857	22,448	28,600	42,826	139,594
1993		2,938,617	1,226,598	1,087,000	595,000	492,000	403,201	226,130	46,108	35,822	69,479	25,662	35,000	53,272	133,546
1995		3,897,444	1,580,530	1,577,000	743,000	834,000	446,776	261,604	46,814	45,897	64,379	28,082	74,015	41,651	177,472
1997		4,136,004	1,654,696	1,767,000	851,000	916,000	454,525	269,821	46,804	39,826	73,777	24,297	79,647	36,922	143,214
1998		4,933,647	1,480,464	2,707,000	1,614,000	1,093,000	490,695	288,634	49,343	46,173	76,938	29,607	75,963	43,793	135,732
1999		5,100,161	1,793,639	2,488,000	1,096,000	1,391,000	531,286	303,018	55,121	49,589	90,982	32,576	74,604	54,641	157,991
2000		5,069,481	1,449,209	2,718,000	800,000	1,918,000	587,718	321,690	70,328	53,380	103,522	38,798	79,342	67,066	168,146
Washington															
1987		3,520,818	122,468	3,071,000	D	D	235,927	166,458	5,561	21,183	33,623	9,102	0	91,423	0
1989		3,224,988	111,220	2,716,000	D	D	276,885	205,150	6,063	21,393	36,126	8,153	0	60,549	60,334
1991		3,889,660	132,503	3,215,000	D	D	349,667	253,381	11,351	28,107	45,229	11,599	0	72,156	120,334
1993		5,421,959	113,263	4,689,000	891,000	3,798,000	427,763	312,497	13,693	33,506	52,301	15,766	0	75,104	116,829
1995		5,240,679	159,837	4,294,000	D	D	485,970	340,327	13,761	39,429	77,212	15,241	0	95,900	204,972
1997		7,543,329	167,356	6,610,000	D	D	507,659	365,814	14,845	40,882	69,433	16,685	0	114,787	143,527
1998		8,465,553	183,685	7,476,000	D	D	534,410	384,074	13,119	41,838	76,678	18,701	0	121,688	149,770
1999		8,336,432	191,104	7,231,000	D	D	588,075	417,330	16,340	54,656	78,902	20,847	0	175,105	151,148
2000		10,516,331	258,718	9,265,000	D	D	642,934	443,223	15,266	62,087	101,445	20,913	0	198,734	150,945

## R&amp;D expenditure, by state, performing sector, and source of funds: 1987–2000

(Thousands of current dollars)

State	Performing sector:		Industry				U&C						U&C	Other	Nonprofit
	Funding sector:	Total R&D	Federal	Total <sup>a</sup>	Federal <sup>a</sup>	Industry <sup>b</sup>	Total	Federal	Non-Federal	Industry	U&Cs	Nonprofit	Federal <sup>c</sup>	Federal <sup>d</sup>	Federal <sup>d</sup>
West Virginia															
1987		187,642	56,605	87,000	D	D	26,704	13,011	871	884	10,736	1,202	17,000	333	0
1989	NA		63,239	D	D	80,000	39,368	17,339	1,255	3,963	15,081	1,730	18,400	2,098	0
1991	NA		76,078	D	D	69,000	50,772	20,479	1,564	11,170	13,191	4,368	21,900	4,985	0
1993		279,583	93,059	100,000	D	D	55,021	31,662	2,004	3,973	14,132	3,250	28,000	3,503	0
1995		475,040	139,595	243,000	D	D	53,399	30,464	2,023	3,160	13,470	4,282	33,047	5,999	0
1997		427,415	86,663	233,000	D	D	63,638	29,623	2,413	3,719	23,190	4,693	33,172	10,942	0
1998		420,704	96,682	225,000	D	D	63,446	25,301	3,053	4,547	26,525	4,020	34,708	868	0
1999		438,558	116,330	216,000	D	D	64,340	26,589	3,204	5,532	24,752	4,263	37,162	4,726	0
2000		457,128	102,958	235,000	D	D	73,420	33,972	2,963	7,510	24,299	4,676	35,536	10,214	0
Wisconsin															
1987		1,538,985	21,745	1,217,000	36,000	1,181,000	297,411	170,235	49,800	11,446	42,017	23,913	0	2,829	0
1989		1,398,630	26,945	1,030,000	32,000	998,000	336,815	197,818	55,372	16,268	43,304	24,053	0	4,870	0
1991		1,573,365	32,321	1,140,000	24,000	1,116,000	387,621	217,590	64,386	18,715	52,522	34,408	0	13,423	0
1993		1,851,751	38,190	1,343,000	D	D	444,192	255,195	68,410	18,698	53,725	48,164	0	26,369	0
1995		2,226,046	40,344	1,706,000	33,000	1,673,000	472,982	270,622	42,549	16,873	92,115	50,823	0	6,720	0
1997		2,255,616	42,606	1,707,000	29,000	1,678,000	497,289	283,701	41,073	19,075	97,873	55,567	0	8,721	0
1998		2,501,029	38,021	1,919,000	D	D	535,775	300,185	44,177	20,210	110,606	60,597	0	8,233	0
1999		2,565,541	41,110	1,949,000	72,000	1,877,000	560,648	313,140	44,989	19,771	116,601	66,147	0	14,783	0
2000		2,692,876	37,816	1,981,000	18,000	1,963,000	661,470	348,779	45,576	21,554	176,467	69,094	0	12,590	0
Wyoming															
1987		35,803	8,146	4,000	0	4,000	17,316	8,701	1,129	1,216	6,176	94	0	6,341	0
1989	NA		8,519	D	D	D	23,310	13,804	1,539	1,535	6,226	206	0	20,858	0
1991		41,037	9,339	2,000	0	2,000	23,009	12,782	1,848	2,000	6,140	239	0	6,689	0
1993		62,907	10,068	15,000	D	D	32,556	14,575	4,111	2,268	10,637	965	0	5,283	0
1995		86,767	8,669	25,000	D	D	40,470	15,373	3,125	1,930	17,454	2,588	0	12,628	0
1997		86,942	8,720	28,000	0	28,000	47,753	15,003	5,990	2,226	23,743	791	0	2,469	0
1998		65,318	11,991	2,000	0	2,000	48,500	17,806	5,366	3,114	21,275	939	0	2,827	0
1999		65,923	15,508	D	0	D	47,197	19,109	2,730	3,206	20,648	1,504	0	3,218	0
2000		60,969	7,298	7,000	0	7,000	43,094	16,556	1,470	2,941	20,103	2,024	0	3,577	0

FFRDC federally funded research and development center; U&amp;C universities and colleges; NA not available; D data withheld to avoid disclosing operations of individual companies or because of imputations of more than 50 percent

<sup>a</sup>Includes performance at industry FFRDCs.<sup>b</sup>Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.<sup>c</sup>Includes total R&D expenditures of FFRDCs administered by academic institutions.<sup>d</sup>Other sources of support for nonprofit institutions were unavailable by state. For 1987, Federal R&D support to "other nonprofit institutions" and "nonprofit FFRDCs" are combined in the "other nonprofit institutions" totals.

NOTE: Industry R&amp;D data refer to calendar years; other R&amp;D data refer to fiscal years but may serve as approximations to calendar-year data.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources: 2000 Data Update*, NSF 01–309 (Arlington, VA, 2001).

Appendix table 4-25  
Total R&D and GSP, by state: 2000

State rank	R&D (millions of current dollars)	GSP (millions of current dollars)	R&D/GSP (percent)	Rank in R&D/GSP	U.S. R&D (percent)	Cumulative percent
1 California.....	55,093	1,344,623	4.10	8	22.50	22.5
2 Michigan.....	18,892	325,384	5.81	1	7.72	30.2
3 New York.....	13,556	799,202	1.70	24	5.54	35.8
4 New Jersey.....	13,133	363,089	3.62	11	5.36	41.1
5 Massachusetts.....	13,004	284,934	4.56	5	5.31	46.4
6 Illinois.....	12,767	467,284	2.73	13	5.21	51.6
7 Texas.....	11,552	742,274	1.56	28	4.72	56.4
8 Washington.....	10,516	219,937	4.78	3	4.29	60.7
9 Pennsylvania.....	9,842	403,985	2.44	16	4.02	64.7
10 Maryland.....	8,634	186,108	4.64	4	3.53	68.2
11 Ohio.....	7,662	372,640	2.06	18	3.13	71.3
12 Virginia.....	5,069	261,355	1.94	21	2.07	73.4
13 North Carolina.....	5,045	281,741	1.79	22	2.06	75.5
14 Connecticut.....	4,888	159,288	3.07	12	2.00	77.5
15 Florida.....	4,663	472,105	0.99	36	1.90	79.4
16 Minnesota.....	4,299	184,766	2.33	17	1.76	81.1
17 Colorado.....	4,230	167,918	2.52	15	1.73	82.9
18 Indiana.....	3,252	192,195	1.69	25	1.33	84.2
19 Arizona.....	3,107	156,303	1.99	19	1.27	85.5
20 New Mexico.....	3,085	54,364	5.68	2	1.26	86.7
21 Georgia.....	2,796	296,142	0.94	37	1.14	87.9
22 Wisconsin.....	2,693	173,478	1.55	29	1.10	89.0
23 Missouri.....	2,583	178,845	1.44	30	1.05	90.0
24 District of Columbia.....	2,296	59,397	3.87	10	0.94	90.9
25 Oregon.....	2,116	118,637	1.78	23	0.86	91.8
26 Tennessee.....	2,057	178,362	1.15	32	0.84	92.6
27 Alabama.....	1,730	119,921	1.44	31	0.71	93.4
28 Delaware.....	1,532	36,336	4.22	6	0.63	94.0
29 Rhode Island.....	1,501	36,453	4.12	7	0.61	94.6
30 Idaho.....	1,434	37,031	3.87	9	0.59	95.2
31 Kansas.....	1,420	85,063	1.67	26	0.58	95.8
32 Utah.....	1,361	68,549	1.98	20	0.56	96.3
33 South Carolina.....	1,126	113,377	0.99	35	0.46	96.8
34 Iowa.....	1,017	89,600	1.14	33	0.42	97.2
35 Kentucky.....	866	118,508	0.73	43	0.35	97.6
36 New Hampshire.....	775	47,708	1.62	27	0.32	97.9
37 Oklahoma.....	660	91,773	0.72	44	0.27	98.1
38 Louisiana.....	627	137,700	0.46	49	0.26	98.4
39 Mississippi.....	513	67,315	0.76	42	0.21	98.6
40 Vermont.....	465	18,411	2.53	14	0.19	98.8
41 West Virginia.....	457	42,271	1.08	34	0.19	99.0
42 Arkansas.....	454	67,724	0.67	47	0.19	99.2
43 Nebraska.....	439	56,072	0.78	40	0.18	99.4
44 Nevada.....	377	74,745	0.50	48	0.15	99.5
45 Maine.....	319	35,981	0.89	38	0.13	99.6
46 Hawaii.....	291	42,364	0.69	46	0.12	99.8
47 Alaska.....	196	27,747	0.71	45	0.08	99.8
48 Montana.....	170	21,777	0.78	41	0.07	99.9
49 North Dakota.....	146	18,283	0.80	39	0.06	100.0
50 South Dakota.....	85	23,192	0.37	50	0.03	100.0
51 Wyoming.....	61	19,294	0.32	51	0.02	100.0
na Other and unknown.....	19,761	NA	NA	NA	NA	NA

GSP: gross state product; NA: not available; na: not applicable

NOTES: U.S. R&D total attributable to states equals \$244,852. "Other and unknown" includes R&D performed in the 50 states or District of Columbia, but the specific location of such performance was not provided by survey respondents. It also includes R&D conducted by organizations in the United States, but actual performance does not take place in a particular state or the District of Columbia (e.g., research conducted on marine vessels and research in Puerto Rico). Finally, it includes a small accounting difference because the total for the United States is based on calendar-year data, whereas data by state pertain to the fiscal year for nonindustrial performance. The U.S. total attributable to states excludes the other and unknown component. When state R&D is taken as a percentage of U.S. R&D, the denominator is U.S. total attributable to states.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), Survey of Industrial Research and Development, various years; NSF/SRS, Survey of Research and Development Expenditures at Universities and Colleges, various years; NSF/SRS, Survey of Federal Funds for Research and Development, various years; and NSF/SRS, Survey of Research and Development Funding and Performance by Nonprofit Organizations, various years. GSP data are from U.S. Bureau of Economic Analysis, [www.bea.gov/bea/newsrel/gspnewsrelease.htm](http://www.bea.gov/bea/newsrel/gspnewsrelease.htm), 2001.

FFRDC	Total	Federal	Administrator	Sponsoring agency	Location
All FFRDCs.....	9,997,231	9,615,716			
University-administered FFRDCs .....	5,944,110	5,771,399			
Ames Laboratory .....	22,916	22,916	Iowa State University of Science and Technology	Department of Energy	Ames, IA
Argonne National Laboratory .....	478,391	452,860	University of Chicago	Department of Energy	Argonne, IL
Ernest Orlando Lawrence Berkeley National Laboratory .....	408,487	337,757	University of California	Department of Energy	Berkeley, CA
Fermi National Accelerator Laboratory .....	310,928	310,928	Universities Research Association, Inc.	Department of Energy	Batavia, IL
Jet Propulsion Laboratory .....	1,355,461	1,355,461	California Institute of Technology	National Aeronautics and Space Administration	Pasadena, CA
Lawrence Livermore National Laboratory .....	1,090,875	1,049,675	University of California	Department of Energy	Livermore, CA
Lincoln Laboratory .....	380,200	370,616	Massachusetts Institute of Technology	DOD, Department of the Air Force	Lexington, MA
Los Alamos National Laboratory .....	1,333,194	1,312,974	University of California	Department of Energy	Los Alamos, NM
National Astronomy and Ionosphere Center .....	10,986	10,979	Cornell University	National Science Foundation	Arecibo, PR
National Center for Atmospheric Research .....	119,846	116,553	University Corporation of Atmospheric Research	National Science Foundation	Boulder, CO
National Optical Astronomy Observatory .....	37,364	37,364	Association of Universities for Research in Astronomy, Inc.	National Science Foundation	Tucson, AZ
National Radio Astronomy Observatory .....	34,208	34,043	Associated Universities, Inc.	National Science Foundation	Green Bank, WV
Princeton Plasma Physics Laboratory .....	76,021	75,387	Princeton University	Department of Energy	Princeton, NJ
Software Engineering Institute .....	37,052	37,052	Carnegie Mellon University	DOD, Office of the Secretary of Defense	Pittsburgh, PA
Stanford Linear Accel Center .....	145,979	145,979	Leland Stanford, Jr., University	Department of Energy	Stanford, CA
Thomas Jefferson National Accelerator Facility .....	102,202	100,855	Southeastern Universities Research Association, Inc.	Department of Energy	Newport News, VA
Industry-administered FFRDCs .....	1,887,833	1,805,952			
Idaho National Engineering and Environmental Laboratory .....	14,547	13,610	Bechtel BWXT Idaho, LLC	Department of Energy	Idaho Falls, ID
National Cancer Institute at Frederick .....	187,222	183,478	SAIC; Charles River Laboratories, Inc.; Data Management Services, Inc.	Department of Health and Human Services, National Institutes of Health	Frederick, MD
Sandia National Laboratory .....	1,598,900	1,521,700	Sandia Corporation, a subsidiary of Lockheed Martin Corporation	Department of Energy	Albuquerque, NM
Savannah River Technology .....	87,164	87,164	Westinghouse Savannah River Co.	Department of Energy	Aiken, SC
Nonprofit-administered FFRDC .....	2,165,288	2,038,365			
Aerospace FFRDC .....	17,600	5,600	Aerospace Corporation	DOD, Department of the Air Force	El Segundo, CA
Arroyo Center .....	24,317	24,317	RAND Corporation	DOD, Department of the Army	Santa Monica, CA
Brookhaven National Laboratory .....	454,500	435,400	Brookhaven Science Associates, Inc.	Department of Energy	Upton, NY
C3I FFRDC .....	29,458	29,458	MITRE Corporation	DOD, Office of the Secretary of Defense	Bedford, MA, and McLean, VA
Center for Advanced Aviation System Development .....	5,683	5,683	MITRE Corporation	Department of Transportation, Federal Aviation Administration	McLean, VA
Center for Naval Analyses .....	69,102	66,616	The CNA Corporation	DOD, Department of the Navy	Alexandria, VA
Center for Nuclear Waste Regulatory Analyses .....	14,977	14,135	Southwest Research Institute	Nuclear Regulatory Commission	San Antonio, TX
Institute for Defense Analyses Communications and Computing .....	43,100	43,100	Institute for Defense Analysis	National Security Agency	Alexandria, VA

Appendix table 4-26

**FFRDC R&D expenditures: FY 2001**

(Thousands of dollars)

(Page 2 of 2)

FFRDC	Total	Federal	Administrator	Sponsoring agency	Location
Institute for Defense Analysis Studies .....	92,930	92,930	Institute for Defense Analysis	DOD, Office of the Secretary of Defense	Alexandria, VA
Internal Revenue Service (IRS) FFRDC .....	1,161	1,161	MITRE Corporation	Department of Treasury, Internal Revenue Service	McLean, VA
National Defense Research Institute .....	25,512	25,512	RAND Corporation	DOD, Office of the Secretary of Defense	Santa Monica, CA
National Renewable Energy Laboratory .....	207,230	205,665	Midwest Research Institute	Department of Energy	Golden, CO
Oak Ridge National Laboratory .....	581,046	540,116	UT-Battelle, LLC	Department of Energy	Oak Ridge, TN
Pacific Northwest National Laboratory .....	562,000	512,000	Battelle Memorial Institute	Department of Energy	Richland, WA
Project Air Force .....	29,361	29,361	RAND Corporation	DOD, Department of the Air Force	Santa Monica, CA
Science and Technology Policy Institute .....	7,311	7,311	RAND Corporation	National Science Foundation	Washington, DC

DOD Department of Defense

FFRDC federally funded research and development center

NOTE: More information about the 36 FFRDCs can be found on the National Science Foundation website (<http://www.nsf.gov/sbe/srs/ffrdc/start.htm>).SOURCE: National Science Foundation, Division of Science Resources Statistics, *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003).*Science & Engineering Indicators – 2004*

Appendix table 4-27  
**Trends in Federal and non-Federal R&D expenditure shares: 1953–2002**  
 (Percent)

Year	Non-Federal	Total	Federal		
			Defense related	Space related	Civilian related
1953 .....	46.1	53.9	48.0	1.0	4.9
1954 .....	44.8	55.2	49.0	1.0	5.2
1955 .....	41.9	58.1	49.3	1.0	7.8
1956 .....	41.3	58.7	49.8	0.9	8.1
1957 .....	37.3	62.7	52.6	1.0	9.1
1958 .....	35.9	64.1	53.2	1.8	9.0
1959 .....	34.5	65.5	53.6	2.9	8.9
1960 .....	34.9	65.1	51.5	4.4	9.2
1961 .....	35.0	65.0	48.0	7.3	9.7
1962 .....	35.2	64.8	49.1	6.6	9.1
1963 .....	33.5	66.5	41.9	13.6	11.0
1964 .....	33.3	66.7	36.9	18.9	10.9
1965 .....	34.9	65.1	33.2	20.8	11.1
1966 .....	35.8	64.2	32.4	19.6	12.2
1967 .....	37.6	62.4	35.3	14.4	12.7
1968 .....	39.3	60.7	34.8	13.6	12.4
1969 .....	41.4	58.6	34.7	11.5	12.4
1970 .....	42.9	57.1	33.4	10.3	13.3
1971 .....	43.5	56.5	32.8	9.6	14.1
1972 .....	44.2	55.8	33.0	7.9	14.9
1973 .....	46.3	53.7	32.1	6.7	14.9
1974 .....	48.1	51.9	29.3	6.9	15.7
1975 .....	47.9	52.1	27.7	7.5	16.8
1976 .....	48.5	51.5	27.0	7.7	16.9
1977 .....	49.0	51.0	27.1	6.6	17.2
1978 .....	49.9	50.1	25.9	6.2	18.0
1979 .....	50.8	49.2	24.8	5.6	18.8
1980 .....	52.6	47.4	24.3	5.3	17.9
1981 .....	53.3	46.7	24.4	5.2	17.0
1982 .....	54.0	46.0	26.1	4.9	15.0
1983 .....	53.9	46.1	27.7	4.2	14.2
1984 .....	54.5	45.5	28.7	3.0	13.7
1985 .....	54.1	45.9	29.9	3.1	12.9
1986 .....	54.6	45.4	31.4	3.0	11.0
1987 .....	53.7	46.3	31.7	3.2	11.4
1988 .....	55.1	44.9	30.2	3.5	11.2
1989 .....	57.4	42.6	27.6	3.9	11.1
1990 .....	59.5	40.5	25.1	4.3	11.1
1991 .....	62.2	37.8	22.4	4.5	10.9
1992 .....	63.2	36.8	21.6	4.3	10.9
1993 .....	63.5	36.5	21.2	4.4	10.9
1994 .....	64.1	35.9	19.7	4.5	11.7
1995 .....	65.7	34.3	18.6	4.5	11.2
1996 .....	67.9	32.1	17.6	4.1	10.4
1998 .....	70.7	29.3	15.8	3.8	9.7
2000 .....	74.9	25.1	13.5	2.4	9.2
2001 .....	73.5	26.5	13.9	2.4	10.2
2002 .....	71.7	28.3	14.9	2.5	11.0

NOTE: Data are preliminary for 2001 and 2002.

SOURCE: National Science Foundation, Division of Science Resources Statistics, special tabulations (Arlington, VA, 2003).



## Federal R&amp;D budget authority, by budget function: FY 1980–2003

Year	Total	Total defense	Total nondefense	Health	Space research/technology	Energy	General science	Natural resources/environment	Transportation	Agriculture	Education, training, employment, and social services	International affairs	Veterans benefits/services	Commerce/housing credit	Community/regional development	Administration of justice	Income security	General government
Millions of current dollars																		
1980	29,739	14,946	14,792	3,694	2,738	3,603	1,233	999	887	585	468	125	126	101	119	45	47	22
1981	33,735	18,413	15,322	3,871	3,111	3,501	1,340	1,061	869	659	298	160	143	106	104	34	43	22
1982	36,115	22,070	14,045	3,869	2,584	3,012	1,359	965	791	693	228	165	139	104	63	31	32	10
1983	38,768	24,936	13,834	4,298	2,134	2,578	1,502	952	876	745	189	177	157	107	44	37	32	6
1984	44,214	29,287	14,925	4,779	2,300	2,581	1,676	963	1,040	762	200	192	218	110	46	24	26	8
1985	49,887	33,698	16,191	5,418	2,725	2,389	1,862	1,059	1,030	836	220	210	193	114	50	47	21	17
1986	53,249	36,926	16,322	5,565	2,894	2,286	1,873	1,062	917	815	248	211	183	111	88	41	14	14
1987	57,069	39,152	17,917	6,556	3,398	2,053	2,042	1,133	908	822	267	223	215	110	99	49	25	17
1988	59,106	40,099	19,008	7,076	3,683	2,126	2,160	1,160	896	882	285	224	195	122	108	51	23	17
1989	62,115	40,665	21,473	7,773	4,555	2,419	2,373	1,255	1,064	907	347	279	212	128	74	45	27	15
1990	63,781	39,925	23,856	8,308	5,765	2,726	2,410	1,386	1,045	950	374	375	216	140	67	44	33	17
1991	65,898	39,328	26,570	9,226	6,511	2,953	2,635	1,582	1,231	1,052	433	378	219	178	88	51	30	4
1992	68,398	40,061	28,337	10,055	6,744	3,153	2,659	1,688	1,523	1,155	365	371	245	192	95	51	37	4
1993	69,884	41,249	28,635	10,280	6,988	2,677	2,691	1,802	1,703	1,152	348	382	250	220	57	49	36	0
1994	68,331	37,764	30,566	10,993	7,414	2,873	2,712	2,062	1,888	1,193	373	254	265	380	68	46	45	0
1995	68,791	37,204	31,587	11,407	7,916	2,844	2,794	1,988	1,833	1,194	369	287	257	525	70	59	43	1
1996	69,049	37,801	31,248	11,867	7,844	2,521	2,846	1,802	1,795	1,176	331	252	259	432	50	56	16	2
1997	71,653	39,591	32,062	12,670	7,844	2,372	2,944	1,886	1,785	1,203	373	190	267	409	48	59	9	2
1998	73,569	39,823	33,746	13,576	8,198	948	4,360	1,855	1,833	1,249	444	163	587	398	42	72	18	2
1999	77,637	41,306	36,332	15,553	8,245	1,131	4,690	1,842	1,725	1,288	403	190	644	432	59	88	38	3
2000	78,664	42,580	36,084	17,869	5,363	996	4,977	1,999	1,636	1,426	418	200	645	406	46	73	25	6
2001	86,756	45,713	41,043	20,758	6,126	1,314	5,468	2,096	1,640	1,657	411	252	719	429	54	88	30	3
2002	98,029	52,922	45,107	23,654	6,556	1,547	5,717	2,159	1,696	1,703	417	268	761	444	48	98	37	3
2003	107,057	58,259	48,798	26,615	7,435	1,408	5,890	2,136	1,554	1,703	484	182	810	387	48	114	30	3
Millions of constant U.S. dollars																		
1980	53,115	26,694	26,419	6,598	4,890	6,435	2,202	1,784	1,584	1,045	836	223	225	180	213	80	84	39
1981	54,925	29,979	24,946	6,303	5,065	5,700	2,182	1,727	1,415	1,073	485	261	233	173	169	55	70	36
1982	54,953	33,582	21,371	5,887	3,932	4,583	2,068	1,468	1,204	1,054	347	251	212	158	96	47	49	15
1983	56,505	36,345	20,163	6,264	3,110	3,757	2,189	1,388	1,277	1,086	275	258	229	156	64	54	47	9
1984	62,151	41,168	20,980	6,718	3,233	3,628	2,356	1,354	1,462	1,071	281	270	306	155	65	34	37	11
1985	67,883	45,854	22,032	7,372	3,708	3,251	2,534	1,441	1,402	1,138	299	286	263	155	68	64	29	23
1986	70,753	49,065	21,687	7,394	3,845	3,037	2,489	1,411	1,218	1,083	330	280	243	147	117	54	19	19
1987	73,799	50,630	23,170	8,478	4,394	2,655	2,641	1,465	1,174	1,063	345	288	278	142	128	63	32	22
1988	74,012	50,212	23,802	8,861	4,612	2,662	2,705	1,453	1,122	1,104	357	280	244	153	135	64	29	21
1989	74,901	49,035	25,893	9,373	5,493	2,917	2,861	1,513	1,283	1,094	418	336	256	154	89	54	33	18
1990	74,121	46,397	27,723	9,655	6,700	3,168	2,801	1,611	1,214	1,104	435	436	251	163	78	51	38	20
1991	73,711	43,991	29,720	10,320	7,282	3,303	2,947	1,769	1,377	1,177	484	423	245	200	99	57	33	4
1992	74,556	43,668	30,888	10,960	7,351	3,437	2,898	1,840	1,660	1,259	398	404	267	209	104	55	40	4
1993	74,400	43,915	30,486	10,944	7,440	2,850	2,864	1,918	1,813	1,226	371	407	267	234	61	52	39	0
1994	71,207	39,354	31,853	11,456	7,726	2,994	2,826	2,149	1,968	1,244	389	265	276	396	70	48	47	0
1995	70,166	37,948	32,219	11,635	8,074	2,901	2,849	2,028	1,870	1,218	376	293	262	536	71	60	44	1

## Federal R&amp;D budget authority, by budget function: FY 1980–2003

Year	Total	Total defense	Total nondefense	Health	Space research/technology	Energy	General science	Natural resources/environment	Transportation	Agriculture	Education, training, employment, and social services	International affairs	Veterans benefits/services	Commerce/housing credit	Community/regional development	Administration of justice	Income security	General government
Millions of constant U.S. dollars																		
1996 .....	69,049	37,801	31,248	11,867	7,844	2,521	2,846	1,802	1,795	1,176	331	252	259	432	50	56	16	2
1997 .....	70,283	38,834	31,449	12,428	7,694	2,326	2,888	1,850	1,751	1,180	366	186	262	401	47	58	9	2
1998 .....	71,157	38,517	32,639	13,131	7,929	917	4,217	1,794	1,773	1,208	429	158	568	385	41	70	17	2
1999 .....	74,124	39,436	34,687	14,849	7,872	1,080	4,477	1,758	1,647	1,230	385	181	615	412	56	84	36	3
2000 .....	73,586	39,832	33,755	16,715	5,017	931	4,655	1,870	1,531	1,334	391	187	603	380	43	68	23	6
2001 .....	79,323	41,796	37,527	18,980	5,601	1,201	4,999	1,916	1,499	1,515	376	230	657	392	49	80	27	3
2002 .....	87,706	47,349	40,357	21,163	5,865	1,384	5,115	1,932	1,517	1,524	373	240	681	397	43	88	33	3
2003 .....	94,091	51,203	42,888	23,392	6,534	1,237	5,177	1,877	1,365	1,497	425	160	712	340	42	100	26	3

NOTES: Data for 1980–2001 are actual budget authority, data for 2002 are preliminary estimates, and data for 2003 are proposed based on FY 2003 budget. See appendix table 4-1 for FY gross domestic product implicit price deflators used to convert current dollars to constant 1996 dollars. Beginning in FY 1998, a number of Department of Energy programs were reclassified from energy to general science. In FY 2000, NASA reclassified the Space Station as an R&D plant; this explains part of the drop in space research and technology in that year.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Federal R&D Funding by Budget Function: Fiscal Years 2001–2003*, NSF 02-330 (Arlington, VA, 2002).

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Appendix table 4-29

## Federal basic research budget authority, by budget function: FY 1996–2003

Budget function	1996	1997	1998	1999	2000	2001	2002	2003
Millions of current dollars								
Total .....	14,442	14,961	15,523	17,433	19,470	21,376	23,635	25,499
Health.....	6,395	6,852	7,356	8,634	10,099	11,642	13,193	14,379
General science.....	2,662	2,753	4,121	4,464	4,722	5,187	5,398	5,649
Space research and technology.....	1,685	1,653	1,610	1,667	1,616	1,695	1,967	2,361
Energy.....	1,182	1,288	34	36	36	40	68	57
National defense.....	1,165	1,090	1,067	1,110	1,184	1,303	1,392	1,383
Agriculture.....	547	548	571	602	651	749	808	831
Transportation .....	456	420	411	358	542	17	13	25
Natural resources and environment .....	147	153	145	142	146	215	220	208
Education, training, employment, and social services .....	140	142	133	99	107	112	115	117
Commerce and housing credit .....	37	34	35	41	39	50	52	73
Veterans benefits and services .....	13	14	23	263	266	289	329	351
Administration of justice .....	12	13	16	18	20	27	27	25
International affairs.....	2	2	1	0	42	50	53	39
Community and regional development.....	0	0	0	0	0	0	0	0
General government .....	0	0	0	0	0	0	0	0
Income security.....	0	0	0	0	0	0	0	0
Millions of constant FY 1996 dollars								
Total .....	14,442	14,675	15,014	16,644	18,213	19,544	21,146	22,411
Health.....	6,395	6,721	7,115	8,244	9,447	10,644	11,804	12,637
General science.....	2,662	2,700	3,985	4,262	4,417	4,743	4,830	4,965
Space research and technology.....	1,685	1,621	1,557	1,591	1,512	1,550	1,760	2,075
Energy.....	1,182	1,263	33	34	34	36	61	50
National defense.....	1,165	1,069	1,032	1,059	1,107	1,191	1,246	1,215
Agriculture.....	547	537	552	575	609	685	723	730
Transportation .....	456	412	398	342	507	16	12	22
Natural resources and environment .....	147	150	141	136	137	197	197	183
Education, training, employment, and social services .....	140	139	129	95	100	102	103	103
Commerce and housing credit .....	37	33	34	39	36	46	47	64
Veterans benefits and services .....	13	14	23	251	249	264	294	309
Administration of justice .....	12	13	15	17	19	25	24	22
International affairs.....	2	2	1	0	39	46	47	34
Community and regional development.....	0	0	0	0	0	0	0	0
General government .....	0	0	0	0	0	0	0	0
Income security.....	0	0	0	0	0	0	0	0

NOTES: Data for 1996–2001 are actual budget authority, data for 2002 are preliminary estimates, and data for 2003 are proposed based on FY 2003 budget. See appendix table 4-1 for FY gross domestic product implicit price deflators used to convert current dollars to constant 1996 dollars. Beginning in FY 1998, several Department of Energy programs were reclassified from energy to general science. Beginning FY 1999, the increase in the Department of Veterans Affairs basic research total was a result of data reclassification.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Federal Research and Development Funding by Budget Function: Fiscal Years 2001–03*, NSF 02-330 (Arlington, VA, 2002).

Appendix table 4-30  
Trends in R&D and Federal outlays: FY 1970, 1980, 1990, 2000, 2002, and 2004

Composition of Federal outlays	1970	1980	1990	2000	2002	2004 (proposed)
Billions of current dollars						
Federal outlays .....	195.6	590.9	1,253.1	1,788.7	2,011.0	2,229.4
Mandatory programs <sup>a</sup> .....	60.8	262.1	568.2	951.0	1,105.7	1,234.2
Net interest .....	14.4	52.5	184.3	223.0	171.0	176.4
Total discretionary .....	120.3	276.3	500.6	614.8	734.4	818.8
Defense .....	81.9	134.6	300.1	295.0	348.9	389.7
R&D .....	8.0	14.6	41.1	41.1	48.2	62.9
International .....	4.0	12.8	19.1	21.3	26.2	28.1
R&D .....	NA	NA	NA	NA	NA	NA
Domestic .....	34.4	128.9	181.4	298.5	359.3	401.0
R&D .....	7.1	15.6	22.7	32.9	39.7	49.2
Total Federal R&D outlays .....	15.1	30.2	63.8	74.0	87.9	112.1
Percent						
Federal outlays .....	100	100	100	100	100	100
Mandatory programs <sup>a</sup> .....	31.1	44.4	45.3	53.2	55.0	55.4
Net interest .....	7.4	8.9	14.7	12.5	8.5	7.9
Total discretionary .....	61.5	46.8	39.9	34.4	36.5	36.7
Defense .....	41.9	22.8	23.9	16.5	17.3	17.5
R&D .....	4.1	2.5	3.3	2.3	2.4	2.8
International .....	2.0	2.2	1.5	1.2	1.3	1.3
R&D .....	NA	NA	NA	NA	NA	NA
Domestic .....	17.6	21.8	14.5	16.7	17.9	18.0
R&D .....	3.6	2.6	1.8	1.8	2.0	2.2
Total Federal R&D outlays .....	7.7	5.1	5.1	4.1	4.4	5.0
Federal R&D outlays as proportion of corresponding discretionary outlays (percent)						
Total Federal R&D/total discretionary outlays .....	12.6	10.9	12.7	12.0	12.0	13.7
Defense .....	9.8	10.8	13.7	13.9	13.8	16.1
Domestic .....	20.6	12.1	12.5	11.0	11.0	12.3

NA not available

<sup>a</sup>Includes Social Security, Medicare, Medicaid, and other programs.

SOURCE: U.S. Office of Management and Budget, *Historical Tables, Budget of the United States Government: Fiscal Year 2004*, (Washington, DC, 2003).

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Appendix table 4-31  
**Discrepancy between Federal R&D support, as reported by performers and Federal agencies: 1980–2001**  
 (Billions of dollars)

Year	All performers			Industrial performers <sup>a</sup>		
	Performer reported	Agency reported	Difference	Performer reported	Agency reported	Difference
1980 .....	30.0	29.8	0.2	12.8	13.0	-0.2
1981 .....	33.7	33.1	0.6	15.0	14.9	0.1
1982 .....	37.2	36.4	0.8	17.1	17.2	-0.1
1983 .....	41.5	38.7	2.8	19.1	17.0	2.1
1984 .....	46.5	42.2	4.3	21.7	18.6	3.1
1985 .....	52.7	48.4	4.3	25.3	21.7	3.6
1986 .....	54.7	51.4	3.3	26.0	24.2	1.8
1987 .....	58.5	55.3	3.2	28.8	26.8	2.0
1988 .....	60.1	56.8	3.3	28.2	26.7	1.5
1989 .....	60.5	61.4	-0.9	26.4	28.5	-2.1
1990 .....	61.6	63.6	-2.0	25.8	29.4	-3.6
1991 .....	60.8	61.3	-0.5	24.1	26.4	-2.3
1992 .....	60.8	65.6	-4.8	22.4	29.7	-7.3
1993 .....	60.6	67.3	-6.7	20.8	30.2	-9.4
1994 .....	60.8	67.2	-6.4	20.3	30.5	-10.2
1995 .....	63.0	68.2	-5.2	21.2	30.2	-9.0
1996 .....	63.3	67.7	-4.4	21.4	30.4	-9.0
1997 .....	64.5	69.8	-5.3	21.8	31.4	-9.6
1998 .....	66.3	72.1	-5.8	22.1	32.0	-9.9
1999 .....	67.0	75.3	-8.3	20.5	31.9	-11.4
2000 .....	66.4	72.9	-6.5	17.2	27.7	-10.5
2001 .....	72.6	79.9	-7.3	16.9	27.0	-10.1

<sup>a</sup>Excludes industry-administered federally funded research and development centers.

NOTES: Performer-reported data are expenditures; agency-reported data are obligations.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), unpublished tabulations (Arlington, VA, 2003); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 2001, 2002, and 2003* (Arlington, VA, forthcoming).

Appendix table 4-32

Estimated Federal obligations for R&D and R&D plant, by selected agency, performer, and character of work: FY 2003

(Millions of current dollars)

Agency	Total	Federal intramural	Industrial firms	FFRDCs administered by industry	U&C	FFRDCs administered by U&C	Other nonprofits	FFRDCs administered by nonprofits	State and local government	Foreign
<b>Total R&amp;D and R&amp;D plant</b>										
All agencies .....	103,114	25,346	38,669	1,587	23,425	5,391	6,307	1,567	396	426
Department of Agriculture .....	2,136	1,519	19	0	575	0	16	0	3	4
Department of Commerce .....	1,120	893	120	1	84	2	13	0	6	0
Department of Defense .....	45,187	12,423	29,519	125	1,846	319	278	408	0	269
Department of Energy .....	8,538	765	1,375	1,154	759	3,328	78	1,073	2	2
Department of Health and Human Services .....	28,277	5,668	1,425	281	15,735	76	4,764	47	185	96
Department of the Interior .....	596	535	9	0	43	0	1	0	6	1
Department of Transportation .....	641	192	223	7	30	14	19	4	151	1
Environmental Protection Agency .....	648	305	94	0	172	0	67	0	10	1
National Aeronautics and Space Administration .....	10,705	2,180	5,540	0	942	1,419	555	17	9	43
National Science Foundation .....	3,651	25	189	0	2,963	225	228	5	9	6
All other agencies .....	1,615	841	154	18	275	9	289	12	15	2
<b>R&amp;D</b>										
All agencies .....	98,608	24,558	36,411	1,478	23,055	4,835	6,261	1,222	393	396
Department of Agriculture .....	1,984	1,367	19	0	575	0	16	0	3	4
Department of Commerce .....	1,065	838	120	1	84	2	13	0	6	0
Department of Defense .....	45,012	12,409	29,360	125	1,845	319	278	407	0	269
Department of Energy .....	7,541	764	1,335	1,045	749	2,826	78	738	2	2
Department of Health and Human Services .....	27,551	5,162	1,425	281	15,549	76	4,733	47	182	96
Department of the Interior .....	594	535	8	0	43	0	1	0	6	1
Department of Transportation .....	622	192	204	7	30	14	19	4	151	1
Environmental Protection Agency .....	627	284	94	0	172	0	67	0	10	1
National Aeronautics and Space Administration .....	8,598	2,150	3,536	0	942	1,397	543	8	9	13
National Science Foundation .....	3,404	19	156	0	2,790	192	225	5	9	6
All other agencies .....	1,611	837	154	18	275	9	289	12	15	2
<b>Basic research</b>										
All agencies .....	25,977	4,411	1,446	220	14,024	1,984	3,153	571	90	78
Department of Agriculture .....	955	663	6	0	277	0	6	0	1	2
Department of Commerce .....	97	83	2	0	12	0	0	0	0	0
Department of Defense .....	1,737	661	173	1	814	20	54	4	0	11
Department of Energy .....	2,543	53	133	52	570	1,185	18	530	2	1
Department of Health and Human Services .....	14,456	1,908	441	167	9,060	45	2,681	28	69	57
Department of the Interior .....	58	52	0	0	5	0	0	0	0	0
Department of Transportation .....	26	6	9	0	1	1	7	0	2	0
Environmental Protection Agency .....	116	64	10	0	28	0	12	0	2	0
National Aeronautics and Space Administration .....	2,459	615	555	0	584	540	155	4	5	1
National Science Foundation .....	3,205	19	106	0	2,652	192	216	5	9	6
All other agencies .....	325	288	13	0	21	0	2	0	1	0

Appendix table 4-32  
**Estimated Federal obligations for R&D and R&D plant, by selected agency, performer, and character of work: FY 2003**  
 (Millions of current dollars)

Agency	Total	Federal intramural	Industrial firms	FFRDCs administered by industry	U&C	FFRDCs administered by U&C	Other nonprofits	FFRDCs administered by nonprofits	State and local government	Foreign
<b>Applied research</b>										
All agencies .....	27,400	8,799	5,119	762	8,205	1,494	2,598	171	193	59
Department of Agriculture .....	861	545	13	0	290	0	9	0	2	2
Department of Commerce .....	866	714	61	1	72	2	10	0	6	0
Department of Defense .....	4,773	1,968	2,043	15	531	71	96	37	0	13
Department of Energy .....	2,833	399	271	608	137	1,295	25	98	0	0
Department of Health and Human Services .....	12,333	3,234	441	114	6,425	31	1,960	19	69	40
Department of the Interior .....	496	444	8	0	37	0	1	0	5	1
Department of Transportation .....	376	135	102	7	20	10	7	4	91	1
Environmental Protection Agency .....	415	173	76	0	117	0	43	0	7	0
National Aeronautics and Space Administration .....	3,310	828	1,965	0	228	76	209	0	3	1
National Science Foundation .....	199	0	50	0	139	0	9	0	0	0
All other agencies .....	938	360	90	18	210	9	228	12	10	2
<b>Development</b>										
All agencies .....	45,231	11,347	29,846	495	826	1,356	510	481	111	259
Department of Agriculture .....	169	159	0	0	8	0	1	0	0	0
Department of Commerce .....	101	41	58	0	0	0	2	0	0	0
Department of Defense .....	38,501	9,780	27,144	109	500	228	128	366	0	246
Department of Energy .....	2,165	312	931	386	43	346	35	110	0	1
Department of Health and Human Services .....	762	20	543	0	63	0	91	0	44	0
Department of the Interior .....	40	38	0	0	1	0	0	0	0	0
Department of Transportation .....	220	52	93	0	9	2	5	0	59	0
Environmental Protection Agency .....	96	47	9	0	27	0	12	0	2	0
National Aeronautics and Space Administration .....	2,829	707	1,016	0	130	780	179	4	1	11
National Science Foundation .....	0	0	0	0	0	0	0	0	0	0
All other agencies .....	348	189	51	1	44	0	58	0	4	0
<b>R&amp;D plant</b>										
All agencies .....	4,506	788	2,258	109	370	556	46	345	3	30
Department of Agriculture .....	152	152	0	0	0	0	0	0	0	0
Department of Commerce .....	55	55	0	0	0	0	0	0	0	0
Department of Defense .....	175	14	159	0	1	0	0	1	0	0
Department of Energy .....	997	1	40	109	10	502	0	335	0	0
Department of Health and Human Services .....	726	506	0	0	186	0	31	0	3	0
Department of the Interior .....	2	0	1	0	0	0	0	0	0	0
Department of Transportation .....	19	0	19	0	0	0	0	0	0	0
Environmental Protection Agency .....	21	21	0	0	0	0	0	0	0	0
National Aeronautics and Space Administration .....	2,107	30	2,004	0	0	22	12	9	0	30
National Science Foundation .....	247	6	33	0	173	33	3	0	0	0
All other agencies .....	4	4	0	0	0	0	0	0	0	0

FFRDC federally funded research and development center

U&C universities and colleges

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2001, 2002, and 2003* (Arlington, VA, forthcoming).

## Appendix table 4-33

## Estimated Federal obligations for research, by agency and S&amp;E field: FY 2003

(Thousands of current dollars)

Agency	Total	Life sciences	Psychology	Physical sciences	Environmental sciences	Math/computer sciences	Engineering	Social sciences	Other sciences NEC
All agencies .....	53,376,884	28,672,784	955,171	5,200,445	3,878,793	2,866,091	9,160,639	1,050,327	1,592,634
Appalachian Regional .....	675	0	0	0	0	0	0	675	0
Department of Agriculture.....	1,815,760	1,469,228	433	107,272	11,819	15,538	70,196	137,914	3,360
Department of Commerce.....	963,529	159,356	0	142,213	391,361	73,526	190,002	7,071	0
Department of Defense.....	6,510,444	861,910	80,819	573,426	272,500	1,083,064	3,257,074	16,138	365,513
Department of Education .....	218,426	16,073	2,856	0	0	0	19,370	180,127	0
Department of Energy.....	5,375,579	345,820	0	2,049,034	319,650	837,429	1,817,905	0	5,741
Department of Health and Human Services.....	26,788,878	24,036,813	759,941	432,672	412,321	72,905	225,043	287,625	561,558
Department of Housing and Urban Development.....	16,711	0	0	0	1,156	594	3,068	11,010	883
Department of Justice .....	50,813	0	500	0	0	500	0	36,400	13,413
Department of Labor.....	51,999	102	0	0	0	1,694	1,420	48,783	0
Department of State .....	2,549	0	0	0	0	0	0	2,549	0
Department of the Interior.....	554,102	163,000	0	20	364,408	9,227	12,300	5,147	0
Department of the Treasury .....	72,338	0	1,004	6,133	0	0	0	168	65,033
Department of Transportation .....	401,524	12,990	21,806	1,006	37,530	10,356	174,438	13,915	129,483
Department of Veterans Affairs .....	356,665	279,560	55,140	0	0	0	21,965	0	0
Environmental Protection Agency.....	531,006	234,990	0	16,115	175,129	16,193	45,257	8,968	34,354
Federal Communications Commission .....	2,193	0	0	630	0	50	715	798	0
Federal Trade Commission.....	1,381	0	0	0	0	0	0	1,381	0
International Development Cooperation Agency .....	258,775	155,000	0	0	7,855	0	0	95,000	920
Library of Congress .....	1,743	0	0	146	0	1500	0	0	97
National Aeronautics and Space Administration .....	5,769,460	379,960	28,055	1,179,469	1,292,650	107,213	2,656,812	571	124,730
National Archives and Records Administration .....	120	0	0	120	0	0	0	0	0
National Science Foundation.....	3,403,614	513,071	4,617	643,877	587,916	636,302	596,974	134,224	286,633
Nuclear Regulatory Commission .....	68,000	0	0	0	0	0	68,000	0	0
Smithsonian Institution .....	115,000	44,911	0	48,312	4,498	0	0	16,363	916
Social Security Administration .....	45,500	0	0	0	0	0	0	45,500	0

NEC not elsewhere classified

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2001, 2002, and 2003* (Arlington, VA, forthcoming).

Science &amp; Engineering Indicators – 2004



## Federal obligations for total research, by detailed S&amp;E field: FY 1982–2003

Field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	Millions of constant 1996 dollars											
All fields .....	19,814.7	20,774.7	21,055.4	21,953.2	21,926.9	23,199.9	23,353.5	25,039.8	25,127.7	26,810.3	26,695.7	28,628.2
Life sciences, total .....	7,220.8	7,546.9	7,922.3	8,657.6	8,589.3	9,493.6	9,672.6	10,243.7	10,261.2	10,762.9	10,802.8	11,468.2
Biology and agricultural, total .....	4,278.5	4,466.4	4,673.9	5,109.9	5,130.6	5,636.2	5,726.8	6,053.3	6,017.9	6,261.6	6,140.8	6,450.9
Biology (excluding environmental) .....	3,163.9	3,360.3	3,602.9	3,926.7	3,977.4	4,528.6	4,610.2	4,803.1	4,816.5	4,986.4	4,834.4	5,099.4
Environmental biology .....	279.2	282.2	351.4	354.2	350.9	374.5	376.9	443.5	397.8	514.2	557.0	592.5
Agricultural .....	835.4	823.8	719.7	829.1	802.3	733.1	739.7	806.7	803.5	761.0	749.4	759.0
Medical sciences, total .....	2,697.8	2,809.4	2,969.9	3,222.9	3,136.3	3,446.0	3,682.7	3,885.8	3,930.7	3,870.6	4,261.9	4,689.0
Life sciences, NEC .....	244.5	271.2	278.5	324.8	322.3	411.5	263.1	304.6	312.7	630.6	400.0	328.2
Psychology, total .....	332.3	351.1	374.9	445.1	443.8	477.8	488.1	508.5	521.3	539.6	324.9	586.3
Biological aspects .....	90.7	92.1	113.6	124.1	119.7	127.1	131.9	146.9	151.8	156.8	37.7	39.6
Social aspects .....	149.3	152.6	151.5	194.4	190.7	199.8	187.1	180.8	206.3	220.9	110.0	143.4
Psychological sciences, NEC .....	92.4	106.4	109.8	126.7	133.4	150.9	169.3	180.8	163.3	162.0	177.2	403.2
Physical sciences, total .....	3,804.6	4,214.3	4,173.5	4,144.8	4,078.0	4,206.1	4,153.9	4,467.9	4,426.1	4,737.5	4,838.9	4,713.1
Astronomy .....	419.7	520.9	537.4	564.3	622.1	675.3	589.5	653.4	694.0	706.6	805.6	730.7
Chemistry .....	732.2	758.3	852.4	885.0	880.1	879.7	880.4	943.7	885.2	926.6	976.9	897.7
Physics .....	2,450.5	2,703.1	2,581.4	2,471.1	2,399.5	2,397.0	2,473.5	2,641.7	2,620.5	2,752.7	2,810.3	2,808.9
Physical sciences, NEC .....	202.2	232.0	202.3	224.2	176.2	254.2	210.5	229.0	226.6	351.6	246.0	276.0
Environmental sciences, total .....	1,747.3	1,823.6	1,793.5	1,910.1	1,968.8	1,954.7	2,012.3	2,138.2	2,526.6	2,404.7	2,406.4	2,777.1
Atmospheric sciences .....	647.9	671.5	610.2	661.3	692.7	715.0	736.0	709.0	898.8	897.9	836.4	1,047.7
Geological sciences .....	544.1	486.1	504.6	583.8	589.8	571.2	553.0	654.5	768.3	815.1	801.9	849.5
Oceanography .....	397.6	500.7	511.0	542.3	571.0	552.7	576.5	593.2	604.4	445.9	500.2	497.6
Environmental sciences, NEC .....	157.6	165.4	167.7	122.7	115.3	115.7	146.6	181.5	255.1	245.9	267.9	382.4
Mathematics and computer sciences, total .....	532.7	611.3	618.9	782.3	817.7	828.4	805.0	886.8	977.0	1,010.9	1,264.8	1,304.6
Mathematics .....	194.9	194.6	212.3	249.8	245.2	264.5	272.9	284.7	280.4	254.6	347.4	309.6
Computer sciences .....	260.0	312.8	301.5	381.4	401.8	385.1	366.5	439.6	653.2	654.3	841.3	879.5
Mathematics and computer sciences, NEC .....	77.6	104.1	105.1	151.0	170.7	178.8	165.7	162.5	43.3	101.9	76.2	115.5
Engineering, total .....	5,152.9	5,126.1	5,094.3	4,922.6	4,968.0	5,051.5	4,954.2	5,356.6	4,911.8	5,530.8	5,425.1	5,854.8
Aeronautical .....	1,127.8	1,196.0	1,209.4	1,004.2	1,030.6	1,048.0	1,004.0	1,189.9	1,077.4	1,136.7	953.3	1,270.1
Astronautical .....	442.3	468.6	557.8	577.9	700.1	807.7	720.5	816.8	675.0	730.5	687.2	525.9
Chemical .....	144.7	211.3	203.1	346.0	326.6	279.1	323.2	171.5	281.1	340.4	324.3	261.4
Civil .....	307.2	274.7	285.1	294.7	269.6	264.3	269.1	277.1	369.2	341.2	359.9	268.3
Electrical .....	931.5	896.2	885.6	852.9	896.1	1,016.8	915.5	1,016.6	743.8	816.4	827.3	938.5
Mechanical .....	306.1	388.3	267.8	363.3	314.2	302.0	301.5	310.4	311.8	375.3	367.6	497.1
Metallurgy and materials .....	470.3	484.6	479.5	597.6	591.3	468.1	571.9	628.2	644.4	795.0	792.7	740.7
Engineering, NEC .....	1,422.9	1,206.2	1,206.1	885.8	839.4	865.5	848.7	946.0	809.2	995.3	1,112.7	1,353.0
Social sciences, total .....	587.2	634.5	613.3	625.9	552.1	620.7	608.3	664.4	732.1	813.5	751.8	718.5
Anthropology .....	22.2	18.7	26.1	24.5	18.1	19.7	17.9	16.8	16.7	17.9	15.4	14.6
Economics .....	239.0	241.4	207.1	217.3	174.5	192.0	199.7	201.1	229.2	209.6	230.7	217.9
Political science .....	11.4	16.2	15.2	19.9	15.4	14.6	15.3	16.3	15.2	19.0	24.6	31.1
Sociology .....	79.1	98.8	98.7	90.5	89.0	95.7	102.4	113.5	135.0	205.8	88.0	81.7
Social sciences, NEC .....	235.4	259.4	266.4	273.9	255.1	298.7	273.0	316.9	336.0	361.2	393.3	373.2
Other sciences, NEC .....	436.7	467.0	464.6	464.8	509.3	566.8	659.3	773.7	771.3	1,010.5	881.1	1,205.7

## Federal obligations for total research, by detailed S&amp;E field: FY 1982–2003

Field	1994	1995	1996	1997	1998	1999	2000	2001	2002 (preliminary)	2003 (preliminary)	Average growth rate	
											1982–2003	1982–2001
Millions of constant 1996 dollars											Percent	
All fields .....	28,565.2	29,002.9	28,259.8	28,803.6	29,908.4	31,979.3	36,001.6	40,844.9	45,161.2	47,782.1	4.3	3.9
Life sciences, total .....	11,759.4	12,047.1	12,064.3	12,419.1	13,113.1	14,710.3	16,811.7	21,062.3	23,454.6	25,667.4	6.2	5.8
Biology and agricultural, total .....	6,359.9	6,530.5	6,629.9	6,418.8	6,841.9	7,676.1	11,580.8	12,895.0	NA	NA	NA	6.0
Biology (excluding environmental) .....	4,945.6	5,023.9	5,309.9	5,218.4	5,519.5	6,178.5	10,050.7	11,308.8	NA	NA	NA	6.9
Environmental biology .....	656.4	823.0	704.0	571.4	584.7	687.3	692.5	665.7	NA	NA	NA	4.7
Agricultural .....	757.8	683.7	616.0	629.0	737.8	810.2	837.6	920.5	NA	NA	NA	0.5
Medical sciences, total .....	5,066.8	5,071.6	4,973.4	5,426.9	5,799.7	6,487.1	4,177.3	6,015.4	NA	NA	NA	4.3
Life sciences, NEC .....	332.7	445.0	461.1	573.4	471.4	547.1	1,053.6	2,151.9	NA	NA	NA	12.1
Psychology, total .....	571.5	635.0	525.0	535.0	571.6	603.4	1,522.3	677.7	760.4	855.1	4.6	3.8
Biological aspects .....	50.1	60.0	62.8	56.7	40.2	17.2	7.7	12.4	NA	NA	NA	9.9
Social aspects .....	121.7	159.4	83.4	94.9	94.3	63.5	52.4	54.6	NA	NA	NA	-5.2
Psychological sciences, NEC .....	399.5	415.6	378.8	383.4	437.1	522.6	1,462.2	610.7	NA	NA	NA	10.5
Physical sciences, total .....	4,432.6	4,363.8	3,923.0	4,069.8	4,071.7	3,878.4	4,480.7	4,202.7	4,665.1	4,655.3	1.0	0.5
Astronomy .....	779.1	779.8	729.0	759.9	708.2	722.9	823.8	693.5	NA	NA	NA	2.7
Chemistry .....	911.2	880.8	881.1	829.6	792.1	777.3	1,146.9	936.2	NA	NA	NA	1.3
Physics .....	2,546.0	2,500.2	1,991.3	2,028.1	2,061.9	2,119.3	2,251.0	2,248.7	NA	NA	NA	-0.5
Physical sciences, NEC .....	196.2	203.2	321.6	452.2	509.4	258.9	258.9	324.2	NA	NA	NA	2.5
Environmental sciences, total .....	2,957.7	2,911.5	3,019.7	2,987.4	2,961.6	2,952.4	3,115.2	2,970.3	3,325.3	3,472.2	3.3	2.8
Atmospheric sciences .....	1,141.1	1,158.3	1,085.7	1,142.0	1,135.9	1,122.2	1,033.4	1,017.2	NA	NA	NA	2.4
Geological sciences .....	873.3	865.3	784.3	678.6	583.5	629.7	598.2	615.5	NA	NA	NA	0.7
Oceanography .....	517.7	415.4	574.3	586.3	541.4	626.3	629.8	622.2	NA	NA	NA	2.4
Environmental sciences, NEC .....	425.7	472.6	575.4	580.5	700.6	574.2	853.7	715.5	NA	NA	NA	8.3
Mathematics and computer sciences, total .....	1,356.4	1,610.7	1,571.6	1,639.8	1,776.6	1,889.1	2,064.0	2,384.7	2,494.6	2,565.7	7.8	8.2
Mathematics .....	356.7	263.8	254.5	295.8	323.1	329.4	405.1	362.1	NA	NA	NA	3.3
Computer sciences .....	865.2	1,034.2	1,119.8	1,240.5	1,352.8	1,446.1	1,553.1	1,847.8	NA	NA	NA	10.9
Mathematics and computer sciences, NEC .....	134.5	312.7	197.3	103.5	100.6	113.7	105.8	174.8	NA	NA	NA	4.4
Engineering, total .....	5,710.1	5,822.5	5,680.9	5,581.5	5,702.1	5,974.2	5,939.1	7,487.8	8,116.2	8,200.4	2.2	2.0
Aeronautical .....	1,274.2	1,273.3	1,249.4	1,326.8	1,544.1	1,535.4	1,369.9	2,219.8	NA	NA	NA	3.6
Astronautical .....	520.1	557.4	526.6	584.9	610.4	591.9	481.9	687.6	NA	NA	NA	2.3
Chemical .....	248.2	251.0	215.1	230.5	183.9	193.8	183.9	181.8	NA	NA	NA	1.2
Civil .....	289.6	346.2	300.2	270.3	236.1	313.3	223.8	263.4	NA	NA	NA	-0.8
Electrical .....	773.0	771.4	669.7	610.3	618.3	666.4	697.0	812.7	NA	NA	NA	-0.7
Mechanical .....	394.0	420.7	294.0	249.7	241.4	229.3	270.7	291.6	NA	NA	NA	-0.3
Metallurgy and materials .....	887.2	831.6	989.0	844.2	763.2	751.6	859.2	987.3	NA	NA	NA	4.0
Engineering, NEC .....	1,323.7	1,370.9	1,437.0	1,464.6	1,504.6	1,692.4	1,852.6	2,043.4	NA	NA	NA	1.9
Social sciences, total .....	674.7	692.3	654.6	683.0	779.7	815.4	983.0	921.3	931.4	940.2	2.3	2.4
Anthropology .....	16.9	22.1	18.3	20.6	17.6	17.5	14.9	14.3	NA	NA	NA	-2.3
Economics .....	201.4	210.6	194.2	201.3	222.9	206.6	233.5	213.8	NA	NA	NA	-0.6
Political science .....	26.5	22.7	16.7	13.8	19.5	19.3	21.1	17.8	NA	NA	NA	2.4
Sociology .....	71.0	48.8	41.2	25.4	97.5	79.9	84.8	87.2	NA	NA	NA	0.5
Social sciences, NEC .....	358.9	387.9	384.2	422.0	422.1	492.2	628.7	588.3	NA	NA	NA	4.9
Other sciences, NEC .....	1,103.0	919.8	820.7	888.0	932.1	1,156.1	1,085.7	1,138.0	1,413.7	1,425.7	5.8	5.2

NA not available

NEC not elsewhere classified

NOTE: Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2001, 2002, and 2003* (Arlington, VA, forthcoming).

Appendix table 4-35

**Budgetary impact of the Federal research and experimentation tax credit: FY 1981–2000**

(Millions of dollars)

Year	Outlay equivalent cost of credit (current dollars)	Total Federal R&D outlays (current dollars)	Ratio of credit outlays/R&D outlays (percent)	Outlay equivalent cost of credit (constant 1996 dollars) <sup>a</sup>
1981 .....	205	34,168	0.6	334
1982 .....	640	34,660	1.8	974
1983 .....	1,010	35,900	2.8	1,472
1984 .....	3,360	40,986	8.2	4,723
1985 .....	2,430	47,216	5.1	3,307
1986 .....	2,295	52,141	4.4	3,049
1987 .....	2,715	53,256	5.1	3,511
1988 .....	1,240	56,100	2.2	1,553
1989 .....	1,590	60,760	2.6	1,917
1990 .....	1,625	63,810	2.5	1,888
1991 .....	1,070	62,183	1.7	1,197
1992 .....	1,850	64,728	2.9	2,017
1993 .....	1,900	68,378	2.8	2,023
1994 .....	2,110	66,453	3.2	2,199
1995 .....	1,820	68,432	2.7	1,856
1996 .....	1,245	68,439	1.8	1,245
1997 .....	1,360	71,073	1.9	1,334
1998 .....	3,270	72,803	4.5	3,163
1999 .....	2,625	74,136	3.5	2,504
2000 .....	2,510	73,947	3.4	2,349

<sup>a</sup>Figures in constant dollars were obtained using FY gross domestic product implicit price deflators (1996 = 100). See appendix table 4-1.

NOTES: Outlay equivalent estimates are comparable to taxable outlay figures reported in the budget. This allows for a comparison of resource cost of the tax credit with cost of direct Federal R&D expenditure support. Tax expenditure estimates are prepared by the U.S. Treasury Department, based on income tax law enacted as of December 31 of the year for which expenditures are reported.

SOURCES: U.S. Office of Management and Budget, *Analytical Perspectives, Budget of the United States Government* (Washington, DC, annual series) and U.S. Office of Management and Budget, *Historical Tables, Budget of the United States Government, Fiscal Year 2004* (Washington, DC, 2003).

Appendix table 4-36  
**Company-funded R&D expenditures within companies and contract R&D expenditures in United States,  
 selected historical data: 1993–2001**

Sector	R&D within companies	Contract R&D	Ratio of contract R&D to R&D within companies
	Millions of current dollars		Percent
<b>All industries</b>			
1993 .....	94,591	3,462	3.7
1994 .....	97,131	3,618	3.7
1995 .....	108,652	5,177	4.8
1996 .....	121,015	5,833	4.8
1997 .....	133,611	6,000	4.5
1998 .....	145,016	6,710	4.6
1999 .....	160,176	9,240	5.8
2000 .....	180,421	14,785	8.2
2001 .....	181,606	8,723	4.8
<b>Manufacturing</b>			
1993 .....	69,901	2,339	3.3
1994 .....	73,375	2,450	3.3
1995 .....	81,236	3,812	4.7
1996 .....	91,845	4,293	4.7
1997 .....	101,202	4,143	4.1
1998 .....	102,211	4,641	4.5
1999 .....	99,865	4,080	4.1
2000 .....	110,750	4,794	4.3
2001 .....	109,221	3,957	3.6

NOTES: Data are company and other non-Federal funds for industrial R&D performance in the United States within the company and contracted to external organizations. Starting with the 1999 survey, estimates are based on North American Industry Classification System. In prior years, estimates were based on the Standard Industrial Classification System.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development, annual series, <http://www.nsf.gov/sbe/srs/indus/start.htm>.

Appendix table 4-37  
**Contract R&D expenditures in United States, by selected NAICS industry: 1999–2001**

Industry/sector	NAICS code	1999	2000	2001	Ratio of contract R&D to R&D within companies		
					1999	2000	2001
		Millions of current dollars			Percent		
All industries.....	na	9,240	14,785	8,723	5.8	8.2	4.8
Manufacturing.....	31–33	4,080	4,794	3,957	4.1	4.3	3.6
Chemicals.....	325	2,386	2,783	2,065	11.9	13.4	11.7
Machinery.....	333	151	355	115	2.7	5.4	1.8
Computer and electronic products.....	334	101	168	565	0.3	0.4	1.4
Electrical equipment and components.....	335	D	84	60	D	2.5	1.3
Transportation equipment.....	336	812	771	708	3.4	3.4	3.4
Information.....	51	504	597	577	3.4	3.7	3.3
Professional, technical, and scientific services.....	54	957	1,200	1,676	6.7	6.7	7.4
Scientific R&D services.....	5417	832	907	1,310	11.2	9.3	12.0

D data withheld to avoid disclosing operations of individual companies

NAICS North American Industry Classification System

na not applicable

NOTE: Data are company and other non-Federal funds for contract R&D expenditures.

Source: National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development, annual series, <http://www.nsf.gov/sbe/srs/indus/start.htm>.

## Federal technology transfer indicators, by selected U.S. agencies: FY 1987–2001

Agency	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Invention disclosures and patenting															
All 10 agencies															
Inventions disclosed .....	2,662	3,047	3,168	3,772	4,213	3,901	3,538	3,753	4,001	4,153	3,842	3,503	3,646	3,564	3,909
Patent applications filed .....	848	1,131	1,466	1,727	1,940	1,867	1,838	1,724	1,803	1,723	1,850	1,894	2,089	2,083	2,172
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,265	1,466	1,448	1,391	1,608
USDA															
Inventions disclosed .....	83	144	127	158	127	83	110	111	133	129	260	208	162	109	118
Patent applications filed .....	44	50	71	76	110	70	68	40	80	91	56	64	84	78	83
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	45	75	74	64	64
DOC															
Inventions disclosed .....	43	31	49	46	30	55	66	51	65	71	58	40	35	32	26
Patent applications filed .....	8	15	28	28	18	53	43	41	35	60	49	66	27	18	12
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23	19	26	14	22
DOD															
Inventions disclosed .....	953	1,147	1,153	1,383	1,524	1,283	1,189	1,172	1,168	1,115	1,150	1,028	1,060	991	1,005
Patent applications filed .....	343	447	616	807	919	850	835	732	759	716	735	755	703	774	809
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	554	579	547	553	619
DOE															
Inventions disclosed .....	857	1,003	1,053	1,335	1,666	1,698	1,443	1,588	1,758	1,886	1,500	1,313	1,474	1,371	1,527
Patent applications filed .....	252	336	382	366	397	432	497	543	571	564	705	751	850	788	792
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	384	512	525	515	605
EPA															
Inventions disclosed .....	0	0	0	12	20	9	22	19	15	20	9	14	5	11	17
Patent applications filed .....	4	5	5	6	8	12	15	15	24	18	13	11	15	10	7
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12	1	8	6	12
HHS															
Inventions disclosed .....	194	226	209	215	215	311	282	307	307	305	268	287	328	375	434
Patent applications filed .....	98	145	225	239	261	224	193	171	166	147	148	132	241	263	255
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	152	171	180	132	119
DOI															
Inventions disclosed .....	3	6	3	26	26	1	2	2	2	2	5	5	8	16	6
Patent applications filed .....	5	4	11	15	21	1	2	2	2	2	2	5	3	5	22
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	3	1	4	4
NASA															
Inventions disclosed .....	496	462	532	538	570	416	384	457	517	550	550	554	525	574	696
Patent applications filed .....	94	129	125	181	205	225	185	179	164	123	140	105	129	109	151
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	94	105	87	99	159
DOT															
Inventions disclosed .....	0	0	0	1	2	1	1	1	0	4	2	4	1	0	2
Patent applications filed .....	0	0	0	1	1	0	0	1	2	2	1	3	0	3	3
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	1	0	3	0
VA															
Inventions disclosed .....	33	28	42	58	33	44	39	45	36	71	40	50	48	85	78
Patent applications filed .....	NA	NA	3	8	NA	0	0	0	0	0	1	2	37	35	38
Patents issued .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	1	4

## Federal technology transfer indicators, by selected U.S. agencies: FY 1987–2001

Agency	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Invention licences															
All 10 agencies															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,736	3,009	3,142
New invention licences .....	128	129	150	164	206	239	260	337	408	462	487	492	596	511	578
USDA															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	218	225	255
New invention licences .....	30	24	23	33	29	31	28	9	21	26	22	23	29	24	32
DOC															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	41	41	39
New invention licences .....	0	0	1	0	2	5	3	3	4	10	11	17	7	4	5
DOD															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	177	189	283
New invention licences .....	10	10	14	15	25	19	20	28	34	41	34	34	61	67	49
DOE															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	981	1,094	1,162
New invention licences .....	37	43	57	62	75	81	96	118	140	154	175	162	202	169	226
EPA															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17	18	19
New invention licences .....	0	0	0	1	2	2	2	9	1	2	1	0	2	3	4
HHS															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,041	1,222	1,007
New invention licences .....	35	42	48	47	69	96	99	151	176	193	208	215	208	192	212
DOI															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12	6	8
New invention licences .....	3	3	0	0	0	NA	NA	8	3	NA	0	0	0	2	2
NASA															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	249	214	292
New invention licences .....	13	7	7	6	4	5	12	11	29	36	36	40	40	47	42
DOT															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	1
New invention licences .....	0	0	0	0	0	NA	NA	NA	NA	NA	0	1	0	0	1
VA															
Active invention licences .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76
New invention licences .....	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	47	3	5

## Federal technology transfer indicators, by selected U.S. agencies: FY 1987–2001

Agency	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Cooperative research and development agreements (CRADAs)															
All 10 agencies															
Total active CRADAs .....	34	98	271	460	731	1,078	1,628	2,471	3,121	3,530	3,078	3,038	3,227	3,133	3,603
New CRADAs.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,058	1,034	1,023	874	926
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	231	194	555
New nontraditional CRADAs.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	43	121	106	78	75	166
USDA															
Total active CRADAs .....	9	51	98	128	177	172	172	208	229	244	273	288	298	257	219
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	93	102	101	69	49
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
DOC															
Total active CRADAs .....	0	9	44	82	115	177	292	368	407	406	377	337	275	221	188
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	90	77	67	46	26
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
DOD															
Total active CRADAs .....	3	10	36	113	193	277	365	563	845	1,086	1,360	1,424	1,350	1,364	1,965
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	408	399	449	425	459
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	330
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	82
DOE															
Total active CRADAs .....	0	0	0	1	43	250	582	1,094	1,392	1,677	963	868	715	687	558
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	274	266	240	151	204
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
EPA															
Total active CRADAs .....	0	0	2	11	31	30	28	35	30	35	34	37	38	44	48
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11	12	13	10	19
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
HHS															
Total active CRADAs .....	22	28	89	110	144	146	149	147	152	NA	NA	NA	468	438	490
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	87	153	149	136	125	137
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	231	194	209
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	43	121	106	78	75	76
DOI															
Total active CRADAs .....	0	0	1	12	11	1	3	9	15	22	23	30	30	40	50
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9	7	10	8	21
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7



## Federal technology transfer indicators, by selected U.S. agencies: FY 1987–2001

Agency	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
NASA															
Total active CRADAs .....	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	1	0	0
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
DOT															
Total active CRADAs .....	0	0	0	1	9	17	30	38	37	43	36	39	51	79	82
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14	13	5	38	11
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
VA															
Total active CRADAs .....	0	0	1	2	8	8	7	9	14	17	12	15	1	2	2
New CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	9	1	2	0
Nontraditional CRADAs, active .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
New nontraditional CRADAs .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0

NA data not requested or not available; CRADA Cooperative Research and Development Agreement; DOC Department of Commerce; DOD Department of Defense; DOE Department of Energy; DOI Department of the Interior; DOT Department of Transportation; EPA Environmental Protection Agency; HHS Department of Health and Human Services; NASA National Aeronautics and Space Administration; USDA Department of Agriculture; VA Department of Veterans Affairs

NOTE: Data for CRADAs are for agreements established under the authority of 15 U.S.C. Sec. 3710a. Nontraditional CRADAs are agreements for special purposes, such as material transfer or technical assistance. Before 1999, NASA performed all of its technology transfer activities under the authority of the 1958 Space Act.

SOURCE: U.S. Department of Commerce, Office of the Secretary, *Summary Report on Federal Laboratory Technology Transfer: 2002 Report to the President and the Congress Under the Technology Transfer and Commercialization Act* (Washington, DC, 2002).

*Science & Engineering Indicators – 2004*

Appendix table 4-39

**Small business innovation research award funding, by type of award and Federal agency: FY 1983–2001**

(Millions of current dollars)

FY	All agencies			DOD	HHS	NASA	DOE	NSF	USDA	DOT	EPA	ED	DOC
	Total	Phase I	Phase II										
1983	45	45	0	20	7	5	5	5	1	—	—	—	0
1984	108	48	60	45	23	13	16	7	2	2	1	1	0
1985	199	69	130	78	45	29	26	10	3	3	2	1	0
1986	298	99	199	151	57	36	29	15	4	4	3	2	1
1987	351	110	241	194	67	32	28	17	4	3	3	2	2
1988	389	102	285	208	73	47	30	17	4	3	3	2	1
1989	432	108	322	233	79	52	33	19	4	4	3	2	1
1990	461	118	342	241	84	62	39	20	4	4	3	2	1
1991	483	128	336	241	93	69	39	22	5	6	4	3	1
1992	508	128	371	242	102	79	43	23	6	3	4	2	2
1993	698	154	491	385	126	86	50	29	7	4	5	3	2
1994	718	220	474	354	133	116	53	34	7	7	5	3	4
1995	835	232	602	414	181	118	70	42	9	10	7	3	8
1996	916	229	646	479	189	114	62	41	9	7	5	3	6
1997	1,107	278	789	569	252	121	75	54	10	8	6	4	7
1998	1,067	262	804	540	267	96	76	53	13	6	5	5	7
1999	1,097	300	797	514	314	89	81	60	13	6	5	5	7
2000	1,190	302	888	549	355	93	86	65	15	6	8	6	7
2001	1,294	317	977	576	412	106	87	72	16	6	6	7	7

— less than \$500,000; DOC Department of Commerce; DOD Department of Defense; DOE Department of Energy; DOT Department of Transportation; ED Department of Education; EPA Environmental Protection Agency; HHS Department of Health and Human Services; NASA National Aeronautics and Space Administration; NSF National Science Foundation; USDA Department of Agriculture

NOTES: Data are agency obligations. Data do not necessarily contain subsequent year revisions and may not add to totals. Phase I awards are initial grants up to \$100,000. Phase II awards are subsequent grants for up to \$750,000.

SOURCE: U.S. Small Business Administration, *Small Business Innovation Research Program Annual Report* (Washington, DC, annual series).

*Science & Engineering Indicators – 2004*

Appendix table 4-40

**Small business technology transfer program award funding, by type of award and Federal agency: FY 1994–2001**

(Millions of current dollars)

FY	All agencies			DOD	HHS	NASA	DOE	NSF
	Total	Phase I	Phase II					
1994 .....	19	19	0	9	5	2	2	1
1995 .....	33	23	10	15	9	3	5	2
1996 .....	65	23	42	29	18	9	5	3
1997 .....	69	24	45	37	13	12	4	3
1998 .....	65	20	45	33	17	6	5	3
1999 .....	65	24	41	31	20	6	5	3
2000 .....	70	24	46	33	22	6	5	5
2001 .....	71	25	46	27	25	6	5	8

DOD: Department of Defense; DOE: Department of Energy; HHS: Department of Health and Human Services; NASA: National Aeronautics and Space Administration; NSF: National Science Foundation

NOTES: Data are agency obligations. Data do not necessarily contain subsequent year revisions and may not add to totals. Phase I awards are initial grants up to \$100,000. Phase II awards are subsequent grants for up to \$500,000.

SOURCE: U.S. Small Business Administration, *Small Business Technology Transfer Program Annual Report* (Washington, DC, annual series).

Appendix table 4-41  
**Advanced Technology Program projects, number of participants, and funding: FY 1990–2002**

Year	Projects	SA	JV	Participants	Total project funding	ATP share			Industry share		
						Total	To JV	To SA	Total	From JV	From SA
					Number						
					Millions of current dollars						
1990 .....	11	6	5	35	98	46	38	8	52	45	7
1991 .....	28	18	10	83	202	93	65	28	109	83	26
1992 .....	21	18	3	32	97	48	19	29	49	19	30
1993 .....	29	24	5	50	118	60	19	41	58	20	38
1994 .....	88	50	38	211	640	309	216	93	331	233	98
1995 .....	103	62	41	318	827	414	304	110	413	340	73
1996 .....	8	6	2	12	37	19	9	10	18	10	8
1997 .....	64	49	15	101	304	162	75	87	142	81	61
1998 .....	79	52	27	168	460	235	143	92	225	157	68
1999 .....	37	26	11	57	212	110	61	49	102	64	38
2000 .....	54	39	15	95	274	144	70	74	130	74	56
2001 .....	59	46	13	88	286	164	79	85	122	81	41
2002 .....	61	51	10	79	289	156	59	97	133	61	72

ATP Advanced Technology Program; SA single applicants; JV joint ventures

NOTES: For multiyear projects, total funding is attributed to the year the award was made. Participants include single applicants, joint venture leaders, and joint venture members; exclude subcontractors and informal collaborators.

SOURCE: Advanced Technology Program, National Institute of Standards and Technology, U.S. Department of Commerce, special tabulations.

## International technology alliances, by regional ownership category, technology, and type (equity/nonequity): 1980–2001

International technology alliances	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>Total</b>																						
All technologies .....	185	189	249	246	330	415	466	467	516	525	394	339	480	527	564	674	615	559	545	504	483	602
Equity.....	81	102	108	117	113	160	151	155	194	274	107	74	102	134	77	81	86	69	57	70	50	57
Nonequity.....	104	87	141	129	217	255	315	312	322	251	287	265	378	393	487	593	529	490	488	434	433	545
Information technology.....	47	53	85	98	145	153	173	171	192	186	197	184	223	214	240	306	270	223	256	218	169	168
Equity.....	19	27	39	42	47	46	57	51	48	68	28	33	28	33	17	18	30	18	19	23	16	22
Nonequity.....	28	26	46	56	98	107	116	120	144	118	169	151	195	181	223	288	240	205	237	195	153	146
Biotechnology <sup>a</sup> .....	31	38	53	42	65	111	103	110	98	66	45	36	98	124	161	164	177	182	147	190	200	350
Equity.....	4	11	9	12	12	34	14	24	16	17	20	8	18	25	22	13	18	18	10	16	12	13
Nonequity.....	27	27	44	30	53	77	89	86	82	49	25	28	80	99	139	151	159	164	137	174	188	337
New materials.....	8	23	24	32	28	50	87	62	61	46	35	21	35	59	33	43	37	29	36	23	22	23
Equity.....	6	17	19	17	15	19	37	17	30	25	19	8	16	28	3	11	8	5	3	7	2	7
Nonequity.....	2	6	5	15	13	31	50	45	31	21	16	13	19	31	30	32	29	24	33	16	20	16
Aerospace/defense.....	23	6	11	9	30	14	27	25	26	42	55	41	52	34	38	51	46	42	38	12	13	26
Equity.....	1	0	4	2	4	1	3	1	4	14	16	8	14	6	13	17	9	9	9	2	1	4
Nonequity.....	22	6	7	7	26	13	24	24	22	28	39	33	38	28	25	34	37	33	29	10	12	22
Automotive.....	15	7	9	8	8	20	22	22	45	49	12	3	4	15	25	25	37	43	32	39	50	22
Equity.....	6	1	5	5	2	10	11	14	32	38	6	1	0	2	4	4	12	11	14	14	10	12
Nonequity.....	9	6	4	3	6	10	11	8	13	11	6	2	4	13	21	21	25	32	18	25	40	10
Chemistry <sup>b</sup> .....	34	25	24	27	25	35	18	33	48	64	44	35	38	63	46	60	29	59	73	35	40	24
Equity.....	31	21	14	23	20	31	14	30	38	55	22	13	21	28	17	15	10	11	7	8	7	3
Nonequity.....	3	4	10	4	5	4	4	3	10	9	22	22	17	35	29	45	19	48	66	27	33	21
<b>U.S.-owned worldwide</b>																						
All technologies .....	118	120	177	160	226	224	268	302	351	329	282	271	367	413	449	526	488	448	444	413	386	441
Equity.....	52	70	78	85	77	86	93	91	121	137	57	56	63	79	45	33	51	45	33	42	38	26
Nonequity.....	66	50	99	75	149	138	175	211	230	192	225	215	304	334	404	493	437	403	411	371	348	415
Information technology.....	29	34	62	68	97	86	100	128	140	130	156	152	181	184	214	269	229	183	222	183	133	117
Equity.....	13	17	30	34	29	26	32	34	27	37	17	26	17	21	11	8	19	15	14	11	10	5
Nonequity.....	16	17	32	34	68	60	68	94	113	93	139	126	164	163	203	261	210	168	208	172	123	112
Biotechnology <sup>a</sup> .....	24	27	45	27	51	64	75	78	64	46	28	33	77	108	125	127	141	162	120	165	165	268
Equity.....	2	9	7	7	8	17	9	16	12	7	8	7	13	18	16	6	10	13	5	11	10	7
Nonequity.....	22	18	38	20	43	47	66	62	52	39	20	26	64	90	109	121	131	149	115	154	155	261
New materials.....	4	14	14	18	14	17	38	30	37	27	27	16	25	40	27	31	27	22	22	17	18	14
Equity.....	4	12	12	12	11	10	23	9	20	13	13	6	11	15	3	7	4	3	2	4	2	2
Nonequity.....	0	2	2	6	3	7	15	21	17	14	14	10	14	25	24	24	23	19	20	13	16	12
Aerospace/defense.....	15	3	8	4	19	7	10	14	18	23	36	25	34	17	16	28	30	21	29	10	9	18
Equity.....	0	0	3	1	2	0	2	1	2	6	8	5	7	2	4	6	5	1	3	1	0	2
Nonequity.....	15	3	5	3	17	7	8	13	16	17	28	20	27	15	12	22	25	20	26	9	9	16
Automotive.....	6	3	4	5	4	11	12	16	35	32	8	2	1	10	17	15	25	29	19	22	38	16
Equity.....	4	1	3	3	1	7	8	11	27	22	4	1	0	1	3	2	7	8	7	10	6	7
Nonequity.....	2	2	1	2	3	4	4	5	8	10	4	1	1	9	14	13	18	21	12	12	32	9
Chemistry <sup>b</sup> .....	21	17	14	15	17	19	9	12	26	37	24	26	24	46	32	42	15	51	55	24	30	17
Equity.....	20	16	8	14	13	16	7	10	18	29	10	9	13	17	9	5	4	8	5	4	7	1
Nonequity.....	1	1	6	1	4	3	2	2	8	8	14	17	11	29	23	37	11	43	50	20	23	16

## International technology alliances, by regional ownership category, technology, and type (equity/nonequity): 1980–2001

International technology alliances	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Europe-owned worldwide																						
All technologies.....	95	89	126	107	161	227	229	232	249	289	185	153	226	224	255	302	250	233	252	194	231	284
Equity.....	42	47	58	46	55	80	83	93	107	169	68	39	61	84	51	52	45	40	39	42	26	37
Nonequity.....	53	42	68	61	106	147	146	139	142	120	117	114	165	140	204	250	205	193	213	152	205	247
Information technology.....	18	27	50	31	70	89	95	81	86	90	72	65	84	67	64	89	70	83	87	59	79	68
Equity.....	8	15	23	11	25	23	33	32	32	40	16	14	15	17	8	11	13	9	11	10	5	13
Nonequity.....	10	12	27	20	45	66	62	49	54	50	56	51	69	50	56	78	57	74	76	49	74	55
Biotechnology <sup>a</sup> .....	15	14	15	21	25	61	35	52	51	36	26	18	61	53	95	94	101	73	81	80	91	171
Equity.....	3	5	4	6	4	20	6	10	7	12	13	5	13	15	14	7	12	12	7	11	5	11
Nonequity.....	12	9	11	15	21	41	29	42	44	24	13	13	48	38	81	87	89	61	74	69	86	160
New materials.....	8	13	15	20	15	20	34	22	23	28	21	8	14	37	14	23	13	14	22	8	7	12
Equity.....	6	9	13	12	7	10	21	11	15	18	11	4	8	22	0	7	3	2	3	2	0	4
Nonequity.....	2	4	2	8	8	10	13	11	8	10	10	4	6	15	14	16	10	12	19	6	7	8
Aerospace/defense.....	13	2	7	6	19	10	18	15	15	28	31	26	30	20	29	31	23	28	23	5	5	17
Equity.....	1	0	2	1	4	1	1	0	3	9	12	6	10	4	12	11	6	6	6	1	0	2
Nonequity.....	12	2	5	5	15	9	17	15	12	19	19	20	20	16	17	20	17	22	17	4	5	15
Automotive.....	12	5	6	4	6	10	12	8	16	20	4	0	0	5	13	13	18	19	17	28	27	12
Equity.....	4	0	2	2	2	3	5	4	10	15	2	0	0	2	2	3	6	6	8	11	7	9
Nonequity.....	8	5	4	2	4	7	7	4	6	5	2	0	0	3	11	10	12	13	9	17	20	3
Chemistry <sup>b</sup> .....	16	12	14	13	12	18	12	23	29	36	29	23	21	33	26	43	23	29	47	22	30	10
Equity.....	13	8	10	11	9	14	9	22	23	32	15	8	11	19	13	11	9	7	7	5	5	1
Nonequity.....	3	4	4	2	3	4	3	1	6	4	14	15	10	14	13	32	14	22	40	17	25	9
Japan-owned worldwide																						
All technologies.....	42	61	79	81	91	121	145	121	100	105	67	70	69	80	72	86	90	54	59	72	54	73
Equity.....	20	37	31	37	31	56	55	46	44	78	27	18	19	17	6	9	14	5	6	16	10	16
Nonequity.....	22	24	48	44	60	65	90	75	56	27	40	52	50	63	66	77	76	49	53	56	44	57
Information technology.....	15	15	29	37	48	31	43	31	31	31	35	46	34	43	40	44	47	28	32	43	31	42
Equity.....	7	8	8	13	12	16	19	10	7	19	9	11	5	6	4	3	5	3	1	10	6	10
Nonequity.....	8	7	21	24	36	15	24	21	24	12	26	35	29	37	36	41	42	25	31	33	25	32
Biotechnology <sup>a</sup> .....	7	11	16	10	11	29	31	25	10	11	6	3	8	15	11	15	20	13	11	18	9	16
Equity.....	1	1	1	4	2	6	6	8	1	4	3	0	4	4	0	0	2	1	0	2	2	0
Nonequity.....	6	10	15	6	9	23	25	17	9	7	3	3	4	11	11	15	18	12	11	16	7	16
New materials.....	0	6	6	11	14	30	45	32	22	12	9	6	8	6	5	10	6	4	10	6	6	6
Equity.....	0	5	5	6	7	9	17	6	9	7	7	2	4	2	0	2	3	0	1	3	0	3
Nonequity.....	0	1	1	5	7	21	28	26	13	5	2	4	4	4	5	8	3	4	9	3	6	3
Aerospace/defense.....	6	1	0	1	1	0	4	1	0	2	3	6	0	0	0	1	2	2	1	1	3	2
Equity.....	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Nonequity.....	6	1	0	1	1	0	3	1	0	2	3	6	0	0	0	1	2	2	1	1	2	1
Automotive.....	2	3	3	3	2	10	10	11	18	24	2	2	3	7	6	5	7	2	6	5	9	4
Equity.....	1	1	3	2	0	5	5	8	13	23	1	1	0	1	1	1	3	0	3	2	2	4
Nonequity.....	1	2	0	1	2	5	5	3	5	1	1	1	3	6	5	4	4	2	3	3	7	0
Chemistry <sup>b</sup> .....	8	8	9	12	8	14	5	14	11	15	11	5	9	8	5	6	6	8	4	3	2	5
Equity.....	8	7	5	9	7	14	5	12	8	15	6	3	5	4	0	3	3	1	0	1	0	2
Nonequity.....	0	1	4	3	1	0	0	2	3	0	5	2	4	4	5	3	3	7	4	2	2	3

## International technology alliances, by regional ownership category, technology, and type (equity/nonequity): 1980–2001

International technology alliances	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
NT-owned worldwide																						
All technologies.....	19	26	24	20	25	40	30	43	77	98	43	14	47	69	58	77	82	70	39	56	72	85
Equity.....	12	20	12	16	17	33	18	32	51	79	19	5	23	29	19	17	22	12	10	7	6	10
Nonequity.....	7	6	12	4	8	7	12	11	26	19	24	9	24	40	39	60	60	58	29	49	66	75
Information technology.....	1	3	9	7	8	10	11	9	24	30	16	6	15	17	19	35	42	30	19	26	27	32
Equity.....	0	3	6	6	5	6	6	6	13	23	3	1	7	6	5	4	11	1	2	2	3	4
Nonequity.....	1	0	3	1	3	4	5	3	11	7	13	5	8	11	14	31	31	29	17	24	24	28
Biotechnology <sup>a</sup> .....	3	5	4	1	3	6	2	7	9	5	11	1	11	9	12	12	20	14	6	18	22	46
Equity.....	0	3	0	0	3	6	0	3	3	2	7	1	3	4	4	1	7	2	2	1	2	2
Nonequity.....	3	2	4	1	0	0	2	4	6	3	4	0	8	5	8	11	13	12	4	17	20	44
New materials.....	0	5	3	0	1	2	4	5	11	4	4	2	4	8	3	3	6	2	3	2	4	3
Equity.....	0	4	2	0	0	2	2	4	6	3	2	1	4	5	2	2	2	2	0	0	0	1
Nonequity.....	0	1	1	0	1	0	2	1	5	1	2	1	0	3	1	1	4	0	3	2	4	2
Aerospace/defense.....	1	1	1	1	1	3	2	1	2	5	2	5	11	19	12	15	9	12	6	1	2	5
Equity.....	0	0	0	0	0	0	0	0	0	3	1	0	5	5	4	6	2	3	1	1	0	2
Nonequity.....	1	1	1	1	1	3	2	1	2	2	1	5	6	14	8	9	7	9	5	0	2	3
Automotive.....	1	0	1	1	1	3	1	2	10	12	0	0	0	1	3	2	3	7	5	3	9	3
Equity.....	1	0	1	1	0	3	1	2	9	12	0	0	0	0	0	1	1	1	4	1	0	3
Nonequity.....	0	0	0	0	1	0	0	0	1	0	0	0	0	1	3	1	2	6	1	2	9	0
Chemistry <sup>b</sup> .....	10	9	3	4	5	10	1	9	15	19	6	3	7	11	8	7	2	3	3	7	4	0
Equity.....	10	8	1	4	4	10	1	9	14	18	5	3	5	7	6	5	1	2	1	2	1	0
Nonequity.....	0	1	2	0	1	0	0	0	1	1	1	0	2	4	2	2	1	1	2	5	3	0
U.S.-only owned																						
All technologies.....	43	39	45	59	84	77	108	124	146	118	139	124	175	211	224	263	242	244	231	207	167	209
Equity.....	16	14	17	25	25	22	18	20	24	21	17	21	21	25	14	16	21	19	11	11	12	8
Nonequity.....	27	25	28	34	59	55	90	104	122	97	122	103	154	186	210	247	221	225	220	196	155	201
Information technology.....	18	16	8	30	34	35	43	58	68	59	86	78	102	104	130	156	134	99	133	98	49	50
Equity.....	6	6	6	14	10	8	6	7	4	5	5	10	7	8	4	3	8	5	7	4	4	3
Nonequity.....	12	10	2	16	24	27	37	51	64	54	81	68	95	96	126	153	126	94	126	94	45	47
Biotechnology <sup>a</sup> .....	6	11	21	11	27	25	38	33	34	20	11	16	27	53	52	55	51	87	56	82	87	133
Equity.....	0	4	4	2	4	8	2	6	5	3	3	3	2	3	4	5	2	4	2	3	4	2
Nonequity.....	6	7	17	9	23	17	36	27	29	17	8	13	25	50	48	50	49	83	54	79	83	131
New materials.....	0	2	4	4	4	4	12	10	12	7	7	7	13	17	11	13	14	12	10	8	8	5
Equity.....	0	1	2	0	4	2	4	1	4	2	4	3	4	4	1	3	2	3	0	2	2	0
Nonequity.....	0	1	2	4	0	2	8	9	8	5	3	4	9	13	10	10	12	9	10	6	6	5
Aerospace/defense.....	4	2	3	1	9	4	5	9	11	9	19	7	13	6	5	10	13	8	10	5	4	4
Equity.....	0	0	2	1	0	0	1	1	1	3	3	2	1	0	1	2	1	1	2	0	0	0
Nonequity.....	4	2	1	0	9	4	4	8	10	6	16	5	12	6	4	8	12	7	8	5	4	4
Automotive.....	1	1	0	1	0	1	3	5	6	6	6	1	1	4	8	6	12	18	9	6	12	8
Equity.....	1	0	0	0	0	0	2	3	3	1	3	0	0	0	2	0	3	4	2	1	2	1
Nonequity.....	0	1	0	1	0	1	1	2	3	5	3	1	1	4	6	6	9	14	7	5	10	7
Chemistry <sup>b</sup> .....	4	1	1	4	6	2	4	3	5	11	9	9	10	21	14	13	3	23	24	9	9	11
Equity.....	4	1	0	3	5	2	3	2	4	6	3	3	6	4	1	2	0	3	0	1	1	1
Nonequity.....	0	0	1	1	1	0	1	1	1	5	6	6	4	17	13	11	3	20	24	8	8	10

## International technology alliances, by regional ownership category, technology, and type (equity/nonequity): 1980–2001

International technology alliances	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
U.S.-Europe owned																						
All technologies.....	38	35	67	44	78	82	100	114	111	115	87	92	125	129	158	174	151	135	165	132	151	150
Equity.....	16	21	31	20	27	25	43	41	45	51	23	22	26	34	22	9	17	18	19	25	18	14
Nonequity.....	22	14	36	24	51	57	57	73	66	64	64	70	99	95	136	165	134	117	146	107	133	136
Information technology.....	5	12	31	12	31	29	37	46	43	39	38	38	48	45	49	60	39	49	62	40	51	35
Equity.....	3	7	16	4	11	6	16	18	16	13	6	8	6	8	5	3	5	6	7	4	2	2
Nonequity.....	2	5	15	8	20	23	21	28	27	26	32	30	42	37	44	57	34	43	55	36	49	33
Biotechnology <sup>a</sup> .....	9	6	10	9	15	22	23	31	20	16	11	15	40	38	60	60	71	54	55	61	60	95
Equity.....	1	3	2	2	2	6	4	6	3	2	2	4	8	9	8	0	4	7	3	7	4	5
Nonequity.....	8	3	8	7	13	16	19	25	17	14	9	11	32	29	52	60	67	47	52	54	56	90
New materials.....	4	5	6	8	5	6	14	10	9	11	13	4	5	19	10	14	7	7	10	6	5	6
Equity.....	4	4	6	7	3	3	12	4	7	6	5	2	4	9	0	4	1	0	2	1	0	2
Nonequity.....	0	1	0	1	2	3	2	6	2	5	8	2	1	10	10	10	6	7	8	5	5	4
Aerospace/defense.....	6	1	4	3	9	3	4	5	7	9	15	11	14	6	8	10	9	10	14	4	2	10
Equity.....	0	0	1	0	2	0	0	0	1	1	5	3	4	0	3	1	3	0	0	1	0	1
Nonequity.....	6	1	3	3	7	3	4	5	6	8	10	8	10	6	5	9	6	10	14	3	2	9
Automotive.....	3	1	1	2	3	6	5	4	9	8	1	0	0	3	7	6	9	7	7	12	16	6
Equity.....	2	0	0	1	1	3	3	3	6	4	1	0	0	1	1	1	2	3	3	7	3	4
Nonequity.....	1	1	1	1	2	3	2	1	3	4	0	0	0	2	6	5	7	4	4	5	13	2
Chemistry <sup>b</sup> .....	4	5	6	3	6	7	3	3	10	13	10	14	7	18	13	25	10	21	29	12	20	5
Equity.....	3	4	4	3	4	4	2	3	6	10	4	4	3	9	5	1	3	4	5	2	5	0
Nonequity.....	1	1	2	0	2	3	1	0	4	3	6	10	4	9	8	24	7	17	24	10	15	5
U.S.-Japan owned																						
All technologies.....	25	31	51	47	51	51	49	50	60	66	35	46	41	45	40	47	50	38	31	41	27	33
Equity.....	12	21	22	30	16	28	24	20	30	45	10	9	7	7	1	2	2	5	0	3	4	1
Nonequity.....	13	10	29	17	35	23	25	30	30	21	25	37	34	38	39	45	48	33	31	38	23	32
Information technology.....	6	5	18	22	30	17	18	20	19	22	23	32	22	29	23	29	31	19	17	26	15	16
Equity.....	4	3	5	12	7	10	9	6	2	13	5	7	2	4	0	0	1	3	0	2	2	0
Nonequity.....	2	2	13	10	23	7	9	14	17	9	18	25	20	25	23	29	30	16	17	24	13	16
Biotechnology <sup>a</sup> .....	6	8	12	7	7	15	14	10	6	6	2	2	5	10	7	6	12	13	7	12	7	12
Equity.....	1	1	1	3	0	1	3	3	1	0	1	0	2	3	0	0	0	1	0	0	1	0
Nonequity.....	5	7	11	4	7	14	11	7	5	6	1	2	3	7	7	6	12	12	7	12	6	12
New materials.....	0	3	2	6	4	6	9	8	9	8	4	3	6	1	3	4	1	3	2	2	3	2
Equity.....	0	3	2	5	4	4	6	2	6	5	2	0	2	0	0	0	0	0	0	1	0	0
Nonequity.....	0	0	0	1	0	2	3	6	3	3	2	3	4	1	3	4	1	3	2	1	3	2
Aerospace/defense.....	5	0	0	0	0	0	1	0	0	2	1	5	0	0	0	1	1	1	1	1	2	1
Equity.....	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nonequity.....	5	0	0	0	0	0	0	0	0	2	1	5	0	0	0	1	1	1	1	1	2	1
Automotive.....	1	1	2	1	1	2	4	7	13	16	1	1	0	2	2	2	3	0	1	2	4	0
Equity.....	0	1	2	1	0	2	3	5	12	15	0	1	0	0	0	1	1	0	0	1	1	0
Nonequity.....	1	0	0	0	1	0	1	2	1	1	1	0	0	2	2	1	2	0	1	1	3	0
Chemistry <sup>b</sup> .....	7	5	5	6	4	7	2	5	7	8	4	1	2	2	0	3	1	6	2	2	0	1
Equity.....	7	5	3	6	3	7	2	4	5	8	2	0	0	0	0	1	0	1	0	1	0	0
Nonequity.....	0	0	2	0	1	0	0	1	2	0	2	1	2	2	0	2	1	5	2	1	0	1



## International technology alliances, by regional ownership category, technology, and type (equity/nonequity): 1980–2001

International technology alliances	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
U.S.-NT owned																						
All technologies.....	12	15	14	10	13	14	11	14	34	30	21	9	26	28	27	42	45	31	17	33	41	49
Equity.....	8	14	8	10	9	11	8	10	22	20	7	4	9	13	8	6	11	3	3	3	4	3
Nonequity.....	4	1	6	0	4	3	3	4	12	10	14	5	17	15	19	36	34	28	14	30	37	46
Information technology.....	0	1	5	4	2	5	2	4	10	10	9	4	9	6	12	24	25	16	10	19	18	16
Equity.....	0	1	3	4	1	2	1	3	5	6	1	1	2	1	2	2	5	1	0	1	2	0
Nonequity.....	0	0	2	0	1	3	1	1	5	4	8	3	7	5	10	22	20	15	10	18	16	16
Biotechnology <sup>a</sup> .....	3	2	2	0	2	2	0	4	4	4	4	0	5	7	6	6	7	8	2	10	11	28
Equity.....	0	1	0	0	2	2	0	1	3	2	2	0	1	3	4	1	4	1	0	1	1	0
Nonequity.....	3	1	2	0	0	0	0	3	1	2	2	0	4	4	2	5	3	7	2	9	10	28
New materials.....	0	4	2	0	1	1	3	2	7	1	3	2	1	3	3	0	5	0	0	1	2	1
Equity.....	0	4	2	0	0	1	1	2	3	0	2	1	1	2	2	0	1	0	0	0	0	0
Nonequity.....	0	0	0	0	1	0	2	0	4	1	1	1	0	1	1	0	4	0	0	1	2	1
Aerospace/defense.....	0	0	1	0	1	0	0	0	0	3	1	2	7	5	3	7	7	2	4	0	1	3
Equity.....	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0	3	1	0	1	0	0	1
Nonequity.....	0	0	1	0	1	0	0	0	0	1	1	2	5	3	3	4	6	2	3	0	1	2
Automotive.....	1	0	1	1	0	2	0	0	7	2	0	0	0	1	0	1	1	4	2	2	6	2
Equity.....	1	0	1	1	0	2	0	0	6	2	0	0	0	0	0	0	1	1	2	1	0	2
Nonequity.....	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	3	0	1	6	0
Chemistry <sup>b</sup> .....	6	6	2	2	1	3	0	1	4	5	1	2	5	5	5	1	1	1	0	1	1	0
Equity.....	6	6	1	2	1	3	0	1	3	5	1	2	4	4	3	1	1	0	0	0	1	0
Nonequity.....	0	0	1	0	0	0	0	0	1	0	0	0	1	1	2	0	0	1	0	1	0	0
Europe-only owned																						
All technologies.....	44	30	36	42	55	97	87	72	86	104	59	40	66	43	58	79	60	60	55	42	45	89
Equity.....	17	12	18	19	16	26	20	22	32	60	21	8	15	30	18	31	13	15	13	11	5	10
Nonequity.....	27	18	18	23	39	71	67	50	54	44	38	32	51	13	40	48	47	45	42	31	40	79
Information technology.....	9	8	9	12	25	48	40	27	27	29	22	17	25	8	6	14	12	20	11	13	15	13
Equity.....	3	4	4	5	10	10	11	10	8	10	5	3	4	5	1	6	1	3	2	3	2	4
Nonequity.....	6	4	5	7	15	38	29	17	19	19	17	14	21	3	5	8	11	17	9	10	13	9
Biotechnology <sup>a</sup> .....	6	5	3	11	10	29	10	17	26	14	7	1	12	9	26	24	17	14	19	13	22	60
Equity.....	2	0	2	4	2	8	2	3	4	6	5	0	1	5	6	7	3	4	3	3	0	4
Nonequity.....	4	5	1	7	8	21	8	14	22	8	2	1	11	4	20	17	14	10	16	10	22	56
New materials.....	4	5	5	9	4	8	13	5	7	12	2	2	6	9	4	3	5	4	4	2	0	4
Equity.....	2	3	4	4	1	3	3	2	4	7	1	0	1	8	0	0	1	0	0	1	0	2
Nonequity.....	2	2	1	5	3	5	10	3	3	5	1	2	5	1	4	3	4	4	4	1	0	2
Aerospace/defense.....	6	1	3	3	10	4	12	9	6	17	16	13	14	3	13	15	13	10	7	1	2	5
Equity.....	1	0	1	1	2	1	1	0	2	7	7	3	4	1	5	8	3	5	6	0	0	0
Nonequity.....	5	1	2	2	8	3	11	9	4	10	9	10	10	2	8	7	10	5	1	1	2	5
Automotive.....	8	2	4	1	2	1	3	2	3	4	3	0	0	0	3	6	7	10	8	13	5	1
Equity.....	1	0	1	1	1	0	0	0	2	3	1	0	0	0	0	1	3	3	4	3	3	0
Nonequity.....	7	2	3	0	1	1	3	2	1	1	2	0	0	0	3	5	4	7	4	10	2	1
Chemistry <sup>b</sup> .....	8	3	5	4	1	3	5	5	8	9	8	4	5	7	6	9	8	4	13	4	5	3
Equity.....	6	2	4	4	1	2	3	5	7	9	4	0	2	5	5	4	3	1	1	2	0	0
Nonequity.....	2	1	1	0	0	1	2	0	1	0	4	4	3	2	1	5	5	3	12	2	5	3

## International technology alliances, by regional ownership category, technology, and type (equity/nonequity): 1980–2001

International technology alliances	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Europe-Japan owned																						
All technologies.....	9	17	17	17	19	29	31	25	18	21	20	17	19	23	16	23	18	9	19	10	15	23
Equity.....	6	10	8	3	7	14	14	14	6	17	13	8	9	8	2	3	6	0	4	4	2	8
Nonequity.....	3	7	9	14	12	15	17	11	12	4	7	9	10	15	14	20	12	9	15	6	13	15
Information technology.....	4	6	8	5	9	7	14	4	7	6	6	9	7	9	7	8	7	4	9	4	8	14
Equity.....	2	3	2	0	1	3	3	1	2	3	3	3	1	2	1	1	1	0	1	2	1	5
Nonequity.....	2	3	6	5	8	4	11	3	5	3	3	6	6	7	6	7	6	4	8	2	7	9
Biotechnology <sup>a</sup> .....	0	1	1	1	0	7	1	4	1	5	2	1	3	4	3	6	6	0	4	2	1	2
Equity.....	0	0	0	0	0	3	0	1	0	4	1	0	2	0	0	0	2	0	0	1	0	0
Nonequity.....	0	1	1	1	0	4	1	3	1	1	1	1	1	4	3	6	4	0	4	1	1	2
New materials.....	0	2	3	3	6	5	7	4	3	2	5	2	1	4	0	3	1	1	6	0	1	1
Equity.....	0	2	3	1	3	3	6	3	1	2	5	2	1	2	0	1	1	0	1	0	0	0
Nonequity.....	0	0	0	2	3	2	1	1	2	0	0	0	0	2	0	2	0	1	5	0	1	1
Aerospace/defense.....	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Equity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nonequity.....	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Automotive.....	1	2	1	1	0	3	3	2	2	3	0	0	0	2	2	0	1	1	2	3	4	4
Equity.....	1	0	1	0	0	0	1	1	0	3	0	0	0	0	1	1	0	1	0	1	1	4
Nonequity.....	0	2	0	1	0	3	2	1	2	0	0	0	0	1	1	0	0	1	1	2	3	0
Chemistry <sup>b</sup> .....	1	2	2	4	2	5	3	8	2	4	6	4	7	4	4	3	5	2	2	1	2	2
Equity.....	1	1	2	2	2	5	3	7	1	4	3	3	5	3	0	2	3	0	0	0	0	1
Nonequity.....	0	1	0	2	0	0	0	1	1	0	3	1	2	1	4	1	2	2	2	1	2	1
Europe-NT owned																						
All technologies.....	4	7	6	4	9	19	11	21	34	49	19	4	16	29	23	26	21	29	13	10	20	22
Equity.....	3	4	1	4	5	15	6	16	24	41	11	1	11	12	9	9	9	7	3	2	1	5
Nonequity.....	1	3	5	0	4	4	5	5	10	8	8	3	5	17	14	17	12	22	10	8	19	17
Information technology.....	0	1	2	2	5	5	4	4	9	16	6	1	4	5	2	7	12	10	5	2	5	6
Equity.....	0	1	1	2	3	4	3	3	6	14	2	0	4	2	1	1	6	0	1	1	0	2
Nonequity.....	0	0	1	0	2	1	1	1	3	2	4	1	0	3	1	6	6	10	4	1	5	4
Biotechnology <sup>a</sup> .....	0	2	1	0	0	3	1	0	4	1	6	1	6	2	6	4	7	5	3	4	8	14
Equity.....	0	2	0	0	0	3	0	0	0	0	5	1	2	1	0	0	3	1	1	0	1	2
Nonequity.....	0	0	1	0	0	0	1	0	4	1	1	0	4	1	6	4	4	4	2	4	7	12
New materials.....	0	1	1	0	0	1	0	3	4	3	1	0	2	5	0	3	0	2	2	0	1	1
Equity.....	0	0	0	0	0	1	0	2	3	3	0	0	2	3	0	2	0	2	0	0	0	0
Nonequity.....	0	1	1	0	0	0	0	1	1	0	1	0	0	2	0	1	0	0	2	0	1	1
Aerospace/defense.....	0	0	0	0	0	3	2	1	2	2	0	2	2	11	8	6	1	7	2	0	1	2
Equity.....	0	0	0	0	0	0	0	0	0	1	0	0	2	3	4	2	0	1	0	0	0	1
Nonequity.....	0	0	0	0	0	3	2	1	2	1	0	2	0	8	4	4	1	6	2	0	1	1
Automotive.....	0	0	0	0	1	0	1	0	2	5	0	0	0	0	1	1	1	1	0	0	2	1
Equity.....	0	0	0	0	0	0	1	0	2	5	0	0	0	0	0	1	0	0	0	0	0	1
Nonequity.....	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	2	0
Chemistry <sup>b</sup> .....	3	2	1	2	3	3	1	7	9	10	5	1	2	4	3	6	0	2	3	5	3	0
Equity.....	3	1	0	2	2	3	1	7	9	9	4	1	1	2	3	4	0	2	1	1	0	0
Nonequity.....	0	1	1	0	1	0	0	0	0	1	1	0	1	2	0	2	0	0	2	4	3	0

## International technology alliances, by regional ownership category, technology, and type (equity/nonequity): 1980–2001

International technology alliances	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Japan-only owned																						
All technologies.....	7	11	9	17	18	39	61	39	18	3	11	6	7	7	10	11	12	3	5	16	6	13
Equity.....	2	4	0	4	5	12	14	6	6	1	4	1	1	1	1	3	5	0	0	9	3	6
Nonequity.....	5	7	9	13	13	27	47	33	12	2	7	5	6	6	9	8	7	3	5	7	3	7
Information technology.....	4	3	2	10	8	7	10	7	4	1	6	4	4	2	6	4	5	2	5	11	4	8
Equity.....	1	1	0	1	3	3	6	3	3	1	1	1	1	0	1	1	3	0	0	6	2	4
Nonequity.....	3	2	2	9	5	4	4	4	1	0	5	3	3	2	5	3	2	2	5	5	2	4
Biotechnology <sup>a</sup> .....	1	2	2	2	3	7	15	8	2	0	1	0	0	1	1	1	0	0	0	2	1	2
Equity.....	0	0	0	1	1	2	3	2	0	0	1	0	0	1	0	0	0	0	0	1	1	0
Nonequity.....	1	2	2	1	2	5	12	6	2	0	0	0	0	0	1	1	0	0	0	1	0	2
New materials.....	0	1	1	2	4	19	28	20	10	2	0	1	0	1	2	3	3	0	1	3	1	2
Equity.....	0	0	0	0	0	2	4	1	2	0	0	0	0	0	0	1	1	0	0	2	0	2
Nonequity.....	0	1	1	2	4	17	24	19	8	2	0	1	0	1	2	2	2	0	1	1	1	0
Aerospace/defense.....	0	1	0	1	1	0	3	1	0	0	2	0	0	0	0	0	1	0	0	0	1	1
Equity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Nonequity.....	0	1	0	1	1	0	3	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0
Automotive.....	0	0	0	1	1	4	3	0	2	0	1	1	3	3	0	3	2	0	0	0	0	0
Equity.....	0	0	0	1	0	2	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Nonequity.....	0	0	0	0	1	2	2	0	2	0	0	1	3	3	0	3	1	0	0	0	0	0
Chemistry <sup>b</sup> .....	0	0	2	2	1	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
Equity.....	0	0	0	1	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
Nonequity.....	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Japan-NT owned																						
All technologies.....	1	2	2	0	3	2	4	7	4	15	1	1	2	5	6	5	10	4	4	5	6	4
Equity.....	0	2	1	0	3	2	3	6	2	15	0	0	2	1	2	1	1	0	2	0	1	1
Nonequity.....	1	0	1	0	0	0	1	1	2	0	1	1	0	4	4	4	9	4	2	5	5	3
Information technology.....	1	1	1	0	1	0	1	0	1	2	0	1	1	3	4	3	4	3	1	2	4	4
Equity.....	0	1	1	0	1	0	1	0	0	2	0	0	1	0	2	1	0	0	0	1	1	
Nonequity.....	1	0	0	0	0	0	0	0	1	0	0	1	0	3	2	2	4	3	1	2	3	
Biotechnology <sup>a</sup> .....	0	0	1	0	1	0	1	3	1	0	1	0	0	0	0	2	2	0	0	2	0	0
Equity.....	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nonequity.....	0	0	1	0	0	0	1	1	1	0	1	0	0	0	0	2	2	0	0	2	0	
New materials.....	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	1	
Equity.....	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	1	
Nonequity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	
Aerospace/defense.....	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Equity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nonequity.....	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Automotive.....	0	0	0	0	0	1	0	2	1	5	0	0	0	0	2	0	1	1	3	0	1	
Equity.....	0	0	0	0	0	1	0	2	1	5	0	0	0	0	0	0	0	0	2	0	0	
Nonequity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0	1	0	
Chemistry <sup>b</sup> .....	0	1	0	0	1	1	0	1	1	3	0	0	0	2	0	0	0	0	0	0	0	
Equity.....	0	1	0	0	1	1	0	1	1	3	0	0	0	1	0	0	0	0	0	0	0	
Nonequity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	

## International technology alliances, by regional ownership category, technology, and type (equity/nonequity): 1980–2001

International technology alliances	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	
NT-only owned																							
All technologies.....	2	2	2	6	0	5	4	1	5	4	2	0	3	7	2	4	6	6	5	8	5	10	
Equity.....	1	0	2	2	0	5	1	0	3	3	1	0	1	3	0	1	1	2	2	2	0	1	
Nonequity.....	1	2	0	4	0	0	3	1	2	1	1	0	2	4	2	3	5	4	3	6	5	9	
Information technology.....	0	0	1	1	0	0	4	1	4	2	1	0	1	3	1	1	1	1	1	3	3	0	6
Equity.....	0	0	1	0	0	0	1	0	2	1	0	0	0	3	0	0	0	0	0	1	0	0	1
Nonequity.....	0	0	0	1	0	0	3	1	2	1	1	0	1	0	1	1	1	1	2	3	0	5	
Biotechnology <sup>a</sup> .....	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	4	1	1	2	3	4	
Equity.....	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
Nonequity.....	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	2	3	4	
New materials.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Equity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nonequity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Aerospace/defense.....	1	1	0	1	0	0	0	0	0	0	1	0	2	3	1	2	1	3	0	1	0	0	
Equity.....	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	2	0	1	0	0	
Nonequity.....	1	1	0	1	0	0	0	0	0	0	0	0	1	3	1	1	0	1	0	0	0	0	
Automotive.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	
Equity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nonequity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	
Chemistry <sup>b</sup> .....	1	0	0	0	0	3	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	
Equity.....	1	0	0	0	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	
Nonequity.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	

NT non-Triad (country or region other than United States, Europe, or Japan)

<sup>a</sup>Includes biotechnology pharmaceuticals.

<sup>b</sup>Excludes biotechnology; includes nonbiotechnological pharmaceuticals.

NOTES: Data are annual counts of new technology alliances formed by domestic and multinational corporations worldwide. Alliances may be classified in more than one technology. Total number of alliances at the top of the table is the sum of the following exclusive ownership categories: U.S.-only, U.S.-Europe, U.S.-Japan, U.S.-NT, Europe-only, Europe-Japan, Europe-NT, Japan-only, Japan-NT, and NT-only. The country assignment is based on the headquarters of the ultimate parent company of the alliance members, not on the location of the members. Data were revised from previous editions to include exclusively joint research or development agreements, contract R&D, equity joint ventures, and research corporations. Previous counts included cross holdings (where two companies take a minority interest in each other), mutual second sourcing, and cross-licensing agreements. This change, however, had little effect on overall trends. The data now provide detail on the structure of the alliances in terms of equity versus nonequity alliances.

SOURCE: Maastricht Economic Research Institute on Innovation and Technology, Cooperative Agreements and Technology Indicators database, special tabulations.

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Appendix table 4-43

(Page 1 of 2)

## International R&amp;D expenditures and R&amp;D as percentage of GDP, by selected country and for all OECD countries: 1981–2001

Year	United States	Japan <sup>a</sup>	Germany <sup>b</sup>	France	United Kingdom	Italy	Canada	Russian Federation	Total OECD
Billions of constant 1995 U.S. dollars <sup>c</sup>									
1981 .....	114.5	39.7	27.8	17.4	18.2	7.7	6.0	NA	254.9
1982 .....	120.5	42.6	28.4	18.7	NA	7.9	6.6	NA	267.4
1983 .....	129.1	46.0	28.8	19.4	17.8	8.5	6.6	NA	281.9
1984 .....	141.6	49.4	29.7	20.6	NA	9.2	7.2	NA	303.6
1985 .....	153.7	54.6	32.5	21.5	19.2	10.5	7.8	NA	329.7
1986 .....	157.3	55.6	33.5	21.9	20.1	10.9	8.2	NA	339.6
1987 .....	160.2	59.6	35.3	22.8	20.5	11.8	8.2	NA	351.9
1988 .....	164.2	64.1	36.5	23.8	21.0	12.5	8.5	NA	365.7
1989 .....	167.6	70.1	37.9	25.4	21.5	13.1	9.1	NA	381.3
1990 .....	172.9	75.9	38.3	27.0	21.7	13.9	9.5	28.4	397.6
1991 .....	176.6	77.6	42.0	27.2	20.6	13.4	9.7	20.5	415.7
1992 .....	177.1	76.8	40.9	27.7	20.2	13.1	10.1	8.6	417.1
1993 .....	173.3	74.7	39.5	27.8	21.0	12.3	10.7	7.8	412.7
1994 .....	173.3	74.0	38.8	27.6	21.5	11.8	11.6	7.4	415.7
1995 .....	184.1	78.7	39.5	27.7	21.5	11.5	11.7	6.6	439.7
1996 .....	194.0	84.0	39.7	27.9	21.2	11.7	11.6	7.4	459.4
1997 .....	204.6	87.5	40.9	27.4	21.1	12.5	12.2	8.0	480.1
1998 .....	215.5	89.7	42.1	27.7	21.6	12.9	13.3	7.2	497.9
1999 .....	228.6	90.2	45.3	28.8	23.1	12.8	14.0	8.3	522.8
2000 .....	243.3	93.7	47.7	29.9	23.4	13.5	15.0	9.4	553.5
2001 .....	252.9	NA	48.6	30.7	NA	NA	16.2	10.9	NA
Percent of GDP									
1981 .....	2.34	2.11	2.43	1.93	2.38	0.88	1.24	NA	1.95
1982 .....	2.52	2.19	2.50	2.02	NA	0.90	1.39	NA	2.05
1983 .....	2.59	2.32	2.50	2.06	2.20	0.95	1.36	NA	2.10
1984 .....	2.64	2.40	2.50	2.16	NA	1.01	1.40	NA	2.16
1985 .....	2.76	2.54	2.68	2.22	2.24	1.12	1.44	NA	2.26
1986 .....	2.73	2.51	2.70	2.21	2.26	1.13	1.48	NA	2.26
1987 .....	2.69	2.57	2.80	2.24	2.20	1.19	1.43	NA	2.26
1988 .....	2.65	2.60	2.79	2.24	2.14	1.22	1.40	NA	2.25
1989 .....	2.62	2.70	2.79	2.29	2.15	1.24	1.47	NA	2.26
1990 .....	2.65	2.78	2.67	2.37	2.15	1.29	1.53	2.03	2.29
1991 .....	2.72	2.75	2.53	2.37	2.07	1.23	1.60	1.43	2.23
1992 .....	2.65	2.70	2.41	2.38	2.02	1.18	1.66	0.74	2.19
1993 .....	2.52	2.62	2.35	2.40	2.05	1.13	1.71	0.77	2.14
1994 .....	2.43	2.57	2.26	2.34	2.01	1.05	1.76	0.84	2.09
1995 .....	2.51	2.69	2.26	2.31	1.95	1.00	1.73	0.79	2.10
1996 .....	2.55	2.77	2.26	2.30	1.88	1.01	1.69	0.90	2.13
1997 .....	2.58	2.83	2.29	2.22	1.81	1.05	1.71	0.97	2.15
1998 .....	2.60	2.94	2.31	2.17	1.80	1.07	1.79	0.92	2.17
1999 .....	2.65	2.94	2.44	2.18	1.88	1.04	1.79	1.01	2.20
2000 .....	2.72	2.98	2.49	2.18	1.85	1.07	1.82	1.05	2.24
2001 .....	2.82	NA	2.53	2.20	NA	NA	1.94	1.16	NA
Billions of constant 1995 units of national currency <sup>d</sup>									
1981 .....	114.5	6,739	28.6	17.1	11.9	6.1	7.1	NA	NA
1982 .....	120.5	7,237	29.3	18.4	NA	6.4	7.7	NA	NA
1983 .....	129.1	7,818	29.7	19.1	11.6	6.8	7.8	NA	NA
1984 .....	141.6	8,387	30.6	20.3	NA	7.4	8.5	NA	NA
1985 .....	153.7	9,281	33.5	21.2	12.6	8.4	9.2	NA	NA
1986 .....	157.3	9,450	34.6	21.6	13.2	8.7	9.6	NA	NA
1987 .....	160.2	10,121	36.4	22.5	13.4	9.4	9.7	NA	NA
1988 .....	164.2	10,897	37.6	23.5	13.7	10.0	10.0	NA	NA
1989 .....	167.6	11,918	39.0	25.0	14.1	10.5	10.8	NA	NA
1990 .....	172.9	12,899	39.5	26.6	14.2	11.2	11.2	51.9	NA
1991 .....	176.6	13,186	43.3	26.8	13.5	10.8	11.5	37.5	NA
1992 .....	177.1	13,045	42.1	27.3	13.2	10.5	12.0	15.8	NA
1993 .....	173.3	12,703	40.7	27.4	13.7	9.9	12.6	14.3	NA

Appendix table 4-43

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## International R&amp;D expenditures and R&amp;D as percentage of GDP, by selected country and for all OECD countries: 1981–2001

Year	United States	Japan <sup>a</sup>	Germany <sup>b</sup>	France	United Kingdom	Italy	Canada	Russian Federation	Total OECD
Billions of constant 1995 units of national currency <sup>d</sup>									
1994 .....	173.3	12,581	40.0	27.2	14.0	9.4	13.7	13.5	NA
1995 .....	184.1	13,369	40.7	27.3	14.0	9.2	13.8	12.1	NA
1996 .....	194.0	14,272	40.9	27.4	13.9	9.4	13.7	13.4	NA
1997 .....	204.6	14,863	42.1	27.0	13.8	10.0	14.4	14.6	NA
1998 .....	215.5	15,248	43.4	27.3	14.1	10.3	15.8	13.1	NA
1999 .....	228.6	15,331	46.6	28.3	15.1	10.2	16.6	15.2	NA
2000 .....	243.3	15,924	49.1	29.5	15.3	10.8	17.7	17.1	NA
2001 .....	252.9	NA	50.1	30.2	NA	NA	19.1	19.9	NA

GDP gross domestic product

NA not available or not applicable

OECD Organisation for Economic Co-operation and Development

<sup>a</sup>Data on Japanese R&D in 1996 and later years may not be consistent with data in earlier years because of changes in methodology.<sup>b</sup>Data for 1981–90 are for West Germany.<sup>c</sup>Conversions of foreign currencies to U.S. dollars are calculated with each country's GDP implicit price deflator and with OECD purchasing power parity exchange rates.<sup>d</sup>Constant foreign currencies are based on deflation with each country's GDP implicit price deflator. Figures for Germany, France, and Italy are in euros.SOURCE: OECD, *Main Science and Technology Indicators* (Paris, 2002).

Appendix table 4-44

## International nondefense R&amp;D expenditures and nondefense R&amp;D as percentage of GDP, by selected country: 1981–2001

Year	United States	Japan <sup>a</sup>	Germany <sup>b</sup>	France	United Kingdom	Italy	Canada
Total nondefense expenditures							
Billions of constant 1995 U.S. dollars <sup>c</sup>							
1981	85	39	27	14	14	7	6
1982	86	42	27	15	NA	8	6
1983	90	46	28	16	14	8	6
1984	99	49	29	17	NA	9	7
1985	106	54	31	18	16	10	7
1986	108	55	32	18	16	10	8
1987	109	59	34	19	17	12	8
1988	114	64	35	19	18	12	8
1989	120	70	36	21	17	13	9
1990	128	75	37	22	17	14	9
1991	136	77	41	22	17	13	9
1992	138	76	39	23	17	13	10
1993	136	74	38	24	18	12	10
1994	138	73	37	23	18	12	11
1995	150	84	38	24	18	11	12
1996	160	83	38	24	18	12	11
1997	170	87	40	25	18	13	12
1998	182	89	41	25	18	13	13
1999	195	89	44	26	20	13	14
2000	210	93	47	28	20	14	NA
2001	218	NA	48	28	NA	NA	NA
Nondefense R&D expenditures							
Percent of GDP							
1981	1.7	2.1	2.3	1.6	1.9	0.9	1.2
1982	1.8	2.2	2.4	1.6	NA	0.9	1.3
1983	1.8	2.3	2.4	1.7	1.7	0.9	1.3
1984	1.8	2.4	2.4	1.8	NA	1.0	1.3
1985	1.9	2.5	2.6	1.8	1.8	1.1	1.4
1986	1.9	2.5	2.6	1.8	1.8	1.1	1.4
1987	1.8	2.6	2.7	1.8	1.8	1.2	1.4
1988	1.8	2.6	2.7	1.8	1.8	1.2	1.3
1989	1.9	2.7	2.7	1.9	1.7	1.2	1.4
1990	2.0	2.8	2.5	1.9	1.7	1.3	1.5
1991	2.1	2.7	2.4	1.9	1.7	1.2	1.6
1992	2.1	2.7	2.3	2.0	1.7	1.2	1.6
1993	2.0	2.6	2.3	2.0	1.7	1.1	1.7
1994	1.9	2.5	2.2	2.0	1.7	1.0	1.7
1995	2.0	2.8	2.2	2.0	1.7	1.0	1.7
1996	2.1	2.7	2.2	2.0	1.6	1.0	1.7
1997	2.1	2.8	2.2	2.0	1.5	1.1	1.7
1998	2.2	2.9	2.3	2.0	1.5	1.1	1.8
1999	2.3	2.9	2.4	2.0	1.6	1.0	1.8
2000	2.4	3.0	2.4	2.0	1.6	1.1	NA
2001	2.4	NA	2.5	2.0	NA	NA	NA

GDP gross domestic product

NA not available

<sup>a</sup>Data on Japanese R&D in 1996 and later years may not be consistent with data in earlier years because of changes in methodology.<sup>b</sup>Data for 1981–90 are for West Germany.<sup>c</sup>Nondefense R&D data are estimates. Nondefense R&D/GDP ratios are obtained directly from Organisation for Economic Co-operation and Development (OECD) reports or, for the following countries and years, are estimated by the National Science Foundation from OECD data: United States for all years; Japan for 1995 and later years; Germany for 1990 and earlier years; United Kingdom for 1981–84 and 1986–88; Italy for 1986 and earlier years; and Canada for 1990 and later years. Conversions of foreign currencies to U.S. dollars are calculated with OECD purchasing power parity exchange rates.

NOTE: The nondefense R&amp;D/GDP ratio for the Russian Federation was 1.2 in 1990, 0.6 in 1995, and 0.9 in 2001.

SOURCES: OECD, *Main Science and Technology Indicators* (Paris, 2002); and National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources* (Arlington, VA, annual series).

Appendix table 4-45

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## International R&amp;D expenditures for selected countries, by performing sector and source of funds: 2000 or 2001

Country and R&D performer	Source of R&D funds						Percent distribution, performers
	Total	Industry	Government	Higher education	Private nonprofit	Abroad	
Billions of yen							
Japan (2000) .....	15,304	11,083	2,997	1,049	111	64	100.0
Industry .....	10,860	10,606	184	—	8	62	71.0
Government .....	1,514	15	1,498	—	—	—	9.9
Higher education .....	2,224	56	1,115	1,048	4	1	14.5
Private nonprofit .....	707	407	199	—	99	2	4.6
Percent distribution, sources.....	100.0	72.4	19.6	6.9	0.7	0.4	na
Millions of euros							
Germany (2001) .....	51,539	34,011	16,250	0	212	1,066	100.0
Industry .....	36,350	32,924	2,570	—	74	781	70.5
Government .....	6,923	152	6,492	—	138	142	13.4
Higher education .....	8,266	935	7,188	—	—	143	16.0
Private nonprofit .....	—	—	—	—	—	—	0.0
Percent distribution, sources.....	100.0	66.0	31.5	0.0	0.4	2.1	na
France (2000) .....	30,954	16,255	11,967	237	270	2,224	100.00
Industry .....	19,348	15,671	1,918	4	6	1,749	62.50
Government .....	5,361	359	4,673	10	9	311	17.30
Higher education .....	5,804	157	5,311	199	17	120	18.80
Private nonprofit .....	439	69	65	24	239	44	1.40
Percent distribution, sources.....	100.0	52.5	38.7	0.8	0.9	7.2	na
Italy (2000) .....	12,460	—	—	—	—	—	100.0
Industry .....	6,239	5,023	686	5	16	510	50.1
Government .....	2,356	40	2,199	3	25	91	18.9
Higher education .....	3,865	—	—	—	—	—	31.0
Private nonprofit .....	0	—	—	—	—	—	0.0
Percent distribution, sources.....	100.0	—	—	—	—	—	na
Millions of pounds							
United Kingdom (2000) .....	17,544	8,648	5,069	158	815	2,854	100.00
Industry .....	11,510	8,023	1,014	—	3	2,470	65.60
Government .....	2,134	322	1,656	9	69	80	12.20
Higher education .....	3,645	259	2,358	147	598	283	20.80
Private nonprofit .....	255	44	42	2	146	21	1.50
Percent distribution, sources.....	100.0	49.3	28.9	0.9	4.6	16.3	na
Millions of Canadian dollars							
Canada (2001) .....	20,828	8,726	6,513	1,386	489	3,714	100.0
Industry .....	11,973	8,030	291	—	—	3,652	57.5
Government .....	2,474	75	2,393	—	—	6	11.9
Higher education .....	6,313	609	3,803	1,386	460	55	30.3
Private nonprofit .....	68	12	26	—	29	1	0.3
Percent distribution, sources.....	100.0	41.9	31.3	6.7	2.3	17.8	na



Appendix table 4-45

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## International R&amp;D expenditures for selected countries, by performing sector and source of funds: 2000 or 2001

Country and R&D performer	Source of R&D funds						Percent distribution, performers
	Total	Industry	Government	Higher education	Private nonprofit	Abroad	
Billions of rubles							
Russian Federation (2001) .....	105,261	35,394	60,229	360	206	9,072	100.0
Industry .....	73,976	30,729	36,275	46	149	6,777	70.3
Government .....	25,580	3,167	20,398	17	8	1991	24.3
Higher education .....	5,488	1,454	3,444	297	8	285	5.2
Private nonprofit .....	217	44	112	—	40	20	0.2
Percent distribution, sources .....	100.0	33.6	57.2	0.3	0.2	8.6	na
Billions of won							
Korea (2001) .....	16,111	11,673	4,023	278	61	76	100.0
Industry .....	12,274	11,196	989	3	17	69	76.2
Government .....	1,991	160	1,819	1	9	2	12.4
Higher education .....	1,677	239	1,148	273	12	5	10.4
Private nonprofit .....	169	78	67	—	24	—	1.0
Percent distribution, sources .....	100.0	72.5	25.0	1.7	0.4	0.5	na
Millions of U.S. dollars							
United States (2001) .....	273,565	184,978	75,012	6,819	6,756	—	100.0
Industry .....	198,505	181,606	16,899	—	—	—	72.6
Government .....	31,099	—	31,099	—	—	—	11.4
Higher education .....	33,295	2,263	21,707	6,819	2,507	—	12.2
Private nonprofit .....	10,667	1110	5,309	—	4,248	—	3.9
Percent distribution, sources .....	100.0	67.6	27.4	2.5	2.5	—	na

— assumed negligible or not available

na not applicable

SOURCES: Organisation for Economic Co-operation and Development, special tabulations (Paris, 2003); and National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources* (Arlington, VA, annual series).

Appendix table 4-46

**Proportion of industry R&D expenditures financed by foreign sources, by selected country or region: 1981–2001**

(Percent)

Year	Canada	France	Germany <sup>a</sup>	Italy	United Kingdom	Japan	Russian Federation	European Union
1981 .....	7.4	7.1	1.2	4.3	8.7	0.1	NA	4.7
1982 .....	10.7	4.8	1.3	4.7	NA	0.1	NA	NA
1983 .....	16.6	4.6	1.4	4.3	6.8	0.1	NA	3.7
1984 .....	17.1	6.5	1.5	6.2	NA	0.1	NA	NA
1985 .....	14.3	6.9	1.4	6.1	11.1	0.1	NA	5.1
1986 .....	13.6	8.0	1.4	7.3	12.2	0.1	NA	5.6
1987 .....	16.8	8.7	1.5	6.9	12.0	0.1	NA	5.6
1988 .....	18.0	9.2	2.1	6.6	12.0	0.1	NA	5.9
1989 .....	17.1	10.9	2.7	6.5	13.4	0.1	NA	6.9
1990 .....	17.9	11.1	2.7	7.3	15.5	0.1	NA	7.6
1991 .....	18.5	11.4	2.6	9.6	16.0	0.1	NA	7.6
1992 .....	17.8	12.0	2.5	6.3	14.9	0.1	NA	7.5
1993 .....	17.7	11.3	1.9	6.9	15.4	0.1	NA	7.6
1994 .....	19.4	11.2	2.0	9.5	16.0	0.1	1.9	8.2
1995 .....	19.4	11.1	2.2	8.2	19.1	0.1	5.1	8.7
1996 .....	20.7	11.4	2.2	9.6	21.7	0.1	6.1	9.2
1997 .....	19.9	10.6	2.8	9.0	18.8	0.4	8.5	9.1
1998 .....	26.0	9.4	2.7	8.1	22.1	0.4	11.1	9.1
1999 .....	27.0	8.8	2.1	8.1	22.7	0.5	19.8	8.9
2000 .....	27.0	9.0	2.1	8.2	21.5	0.6	13.6	8.4
2001 .....	27.0	NA	2.1	7.4	NA	NA	9.2	NA

NA not available

<sup>a</sup>Data for 1981–90 are for West Germany.SOURCES: Organisation for Economic Co-operation and Development, *Main Science and Technology Indicators* (Paris, 2002).

Appendix table 4-47

**Sources of total and industry R&D expenditures for OECD countries combined: 1981–2000**

(Percent distribution)

Year	Industry R&D			Total R&D	
	Government	Industry	Other	Government	All other sources
1981 .....	44.4	51.4	4.2	22.6	77.4
1982 .....	43.9	52.0	4.1	22.8	77.2
1983 .....	43.4	52.6	4.0	22.4	77.6
1984 .....	42.4	53.4	4.2	22.0	78.0
1985 .....	41.7	54.1	4.2	22.1	77.9
1986 .....	41.3	54.3	4.4	21.8	78.2
1987 .....	41.2	54.2	4.6	21.9	78.1
1988 .....	39.6	55.5	4.9	20.1	79.9
1989 .....	38.0	56.9	5.1	17.9	82.1
1990 .....	36.9	57.7	5.4	16.7	83.3
1991 .....	35.6	58.8	5.6	14.8	85.2
1992 .....	34.9	59.3	5.8	13.3	86.7
1993 .....	35.1	58.8	6.1	12.6	87.4
1994 .....	34.4	59.1	6.5	11.9	88.1
1995 .....	33.8	59.7	6.5	11.5	88.5
1996 .....	32.1	61.0	6.9	10.7	89.3
1997 .....	31.1	62.0	6.9	10.1	89.9
1998 .....	30.7	62.1	7.2	9.8	90.2
1999 .....	29.7	62.9	7.4	8.9	91.1
2000 .....	28.5	64.2	7.3	7.5	92.5

OECD Organisation for Economic Co-operation and Development

SOURCES: OECD, *Main Science and Technology Indicators* (Paris, 2002).

Appendix table 4-48

**Distribution of government R&D budget appropriations in selected countries, by socioeconomic objective: 2000 or 2001**

(Percent)

Socioeconomic objective	United States (2001)	Japan (2001)	Germany (2001)	France (2000)	United Kingdom (2000)	Italy (2001)	Russian Federation (2001)	Canada (2000)	South Korea (2001)
Total (millions of U.S. dollars) .....	86,756	23,153	17,946	14,605	10,030	10,694	5,889	4,652	6,195
Exploration and exploitation of the Earth .....	1.2	1.9	1.8	0.8	1.3	1.9	1.5	4.5	1.5
Infrastructure and general planning of land use .....	2.0	4.4	1.7	0.6	1.2	0.4	1.2	3.0	4.2
Control and care of the environment .....	0.7	0.8	3.1	2.9	1.6	2.3	1.6	4.5	4.5
Protection and improvement of human health .....	24.8	3.9	4.0	5.8	14.6	7.0	2.0	11.3	7.1
Production, distribution, and rational use of energy .....	1.5	17.4	3.4	3.9	0.5	3.6	2.0	4.5	4.7
Agricultural production and technology .....	2.5	3.5	2.4	2.1	4.1	1.9	9.9	10.3	8.4
Industrial production and technology .....	0.5	7.5	12.1	6.3	1.7	10.2	11.4	12.1	29.5
Social structures and relationships .....	0.9	0.9	4.5	0.8	4.1	4.4	2.0	2.8	2.6
Exploration and exploitation of space .....	7.1	6.7	4.7	9.8	2.2	7.3	10.1	6.6	3.2
Research financed from GUF <sup>a</sup> .....	NA	34.8	39.0	21.6	19.6	43.7	NA	28.5	NA
Nonoriented research .....	6.3	13.8	16.1	19.8	12.1	13.3	14.0	6.0	18.5
Other civil research .....	0.0	0.0	0.1	2.3	0.3	0.0	0.9	1.2	0.0
Defense .....	52.7	4.3	7.1	23.2	36.6	4.0	43.5	4.8	15.8

GUF general university funds

NA not available separately

<sup>a</sup>United States, Russian Federation, and Korea do not have a category equivalent to GUF.

NOTES: Conversions of foreign currencies to U.S. dollars are calculated with Organisation for Economic Co-operation and Development (OECD) purchasing power parity exchange rates. Percents may not sum to 100 because of rounding. U.S. data are based on budget authority. Because of GUF and slight differences in accounting practices, the distribution of government budgets among socioeconomic objectives may not completely reflect actual distribution of government-funded research in particular objectives. Japanese data are based on science and technology budget data, which include items other than R&D. Such items are a small proportion of the budget; therefore, data may still be used as an approximate indicator of relative government emphasis on R&D by objective.

SOURCES: OECD, unpublished tabulations (Paris, 2003); and OECD, *Main Science and Technology Indicators* (Paris, 2002).*Science & Engineering Indicators – 2004*

Appendix table 4-49

**R&D expenditures by majority-owned affiliates of foreign companies in United States, by region/country of ultimate beneficial owner: 1980 and 1987–2000**

(Millions of current U.S. dollars)

R&D expenditures	1980	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total .....	1,517	4,497	5,485	6,720	8,511	9,127	10,745	11,262	12,671	14,846	15,641	17,216	22,375	24,027	26,089
Manufacturing .....	1,245	3,809	4,773	5,915	7,282	7,839	9,056	9,560	10,855	12,828	13,090	14,270	18,788	19,991	20,554
Total expenditures by region/country															
Canada .....	113	D	D	D	D	D	D	D	D	1,337	1,452	1,668	2,352	2,385	3,664
Europe .....	1,217	3,458	4,241	5,414	6,762	7,275	8,325	8,628	9,487	11,442	11,535	12,327	16,425	18,055	18,610
France .....	39	332	402	510	766	913	1,230	1,190	1,383	1,529	1,680	1,783	1,881	2,434	2,135
Germany .....	281	824	963	1,216	1,435	1,596	1,855	2,003	2,147	3,563	2,747	2,923	5,381	6,135	5,610
Italy .....	D	D	73	93	151	143	91	132	157	172	D	D	D	294	D
Netherlands .....	D	540	615	690	757	642	685	674	719	786	937	990	964	1,296	1,366
Sweden .....	D	124	160	205	271	225	322	180	263	D	D	687	713	428	374
Switzerland .....	329	D	D	1,060	1,455	1,637	1,873	2,117	2,127	2,490	2,699	2,369	3,076	3,008	3,013
United Kingdom .....	247	790	1,085	1,568	1,809	1,987	2,090	2,139	2,428	2,316	2,575	2,984	3,720	3,678	5,018
Asia and Pacific .....	D	179	345	412	796	834	1,080	1,232	1,397	1,611	2,116	2,642	2,961	2,820	2,840
Japan .....	D	133	282	369	709	741	938	1,112	1,200	1,259	1,531	2,036	2,584	2,535	2,617
Other Asian and Pacific countries .....	D	46	63	43	87	93	142	120	197	352	585	606	377	285	223
Latin America and other															
Western Hemisphere .....	155	329	302	352	314	330	534	D	610	317	364	373	396	564	735
Middle East .....	2	14	9	10	9	9	20	38	62	72	100	103	132	D	D
Africa .....	D	D	D	D	D	D	4	5	2	D	D	D	D	D	D

D data withheld to avoid disclosing operations of individual companies

NOTES: Data are for majority-owned (more than 50 percent) nonbank U.S. affiliates of foreign parent companies. Data for 1980 and 1987–96 are for R&D funded by affiliates; 1997 to latest data are for R&D performed by affiliates. Manufacturing data exclude petroleum manufacturing before 1997. Estimates for 2000 are preliminary. Total R&D funded is based on R&D spending according to the funding source. Total R&D performed refers to R&D expenditures according to who conducts the R&D activity, whether for the performer itself or for others under contract, and excludes R&D expenditures conducted by others under contract. Ultimate beneficial owner (UBO) refers to the person proceeding up the U.S. affiliate's ownership chain beginning with and including the foreign parent that is not owned more than 50 percent by another person.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Foreign Direct Investment in the United States, annual series, <http://www.bea.gov/bea/di/di1fdiop.htm>.

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Appendix table 4-50

**R&D performed by majority-owned affiliates of foreign companies in United States, by NAICS industry of affiliate: 1997–2000**

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1997	1998	1999	2000
Total .....		17,216	22,375	24,027	26,089
Manufacturing .....	31–33	14,270	18,788	19,991	20,554
Food .....	311	239	224	205	203
Printing and related support activities .....	323	34	42	76	52
Petroleum and coal products .....	324	272	479	D	D
Chemicals .....	325	6,754	7,770	7,679	7,023
Basic chemicals .....	3251	617	623	832	688
Pharmaceuticals and medicines .....	3254	5,304	6,381	6,191	5,646
Other chemicals .....	325 (minus 3251, 3254)	833	766	656	689
Plastics and rubber products .....	326	331	349	372	305
Nonmetallic mineral products .....	327	214	146	172	195
Primary metals .....	331	60	65	61	67
Fabricated metal products .....	332	203	181	149	207
Machinery .....	333	721	677	898	868
Agriculture, construction, and mining machinery .....	3331	103	69	290	243
Industrial machinery .....	3332	83	90	D	132
Other machinery .....	333 (minus 3331, 3332)	535	518	D	494
Computer and electronic products .....	334	3,413	4,487	5,031	6,182
Computers and peripheral equipment .....	3341	120	324	D	D
Communications equipment .....	3342	2,243	3,045	3,431	4,617
Semiconductors and other electronic components .....	3344	586	635	917	1,004
Other electronic products .....	334 (minus 3341, 3342, 3344)	464	483	D	D
Electrical equipment, appliances, and components .....	335	781	885	1,195	1,714
Transportation equipment .....	336	641	2,762	3,204	3,206
Motor vehicles, bodies, and trailers .....	3361, 3362, 3363	500	2,555	D	2,959
Other transportation equipment .....	336 (minus 3361, 3362, 3363)	141	207	D	247
Other manufacturing .....		607	721	D	D
Wholesale trade .....	42	D	D	D	D
Information .....	51	260	329	548	790
Publishing industries .....	511	D	D	D	D
Motion picture and sound recording industries ...	512	5	1	—	—
Broadcasting and telecommunications .....	513	7	6	D	D
Information services and data processing services .....	514	D	D	D	D
Finance and insurance (except depository institutions) .....	52	12	D	D	D
Professional, scientific, and technical services .....	54	597	685	836	818
Architectural, engineering, and related services .....	5413	12	13	36	22
Computer systems design and related services .....	5415	281	333	315	297
Management, scientific, and technical consulting .....	5416	—	—	0	0
Other professional, scientific, and technical services .....	54 (minus 5413, 5415, 5416)	303	339	485	498

— less than \$500,000

D data withheld to avoid disclosing operations of individual companies

NAICS North American Industry Classification System

NOTES: Data are for majority-owned (more than 50 percent ownership) nonbank U.S. affiliates of foreign parent companies. Data exclude expenditures for R&amp;D conducted by others under contract. Estimates for 2000 are preliminary.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Foreign Direct Investment in the United States, annual series, <http://www.bea.gov/bea/di/di1fdiop.htm>.

Appendix table 4-51

## R&amp;D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by region/country: 1982, 1989, and 1994–2000

(Millions of current U.S. dollars)

	1982	1989	1994	1995	1996	1997	1998	1999	2000
Total .....	3,851	7,922	11,877	12,582	14,039	14,593	14,664	18,144	19,758
Manufacturing .....	3,247	6,446	10,053	10,791	12,205	12,505	12,819	16,388	17,822
Total expenditures by region/country									
Canada .....	505	975	836	1,068	1,563	1,823	1,750	1,681	1,874
Europe .....	2,892	5,475	8,676	9,144	9,662	10,003	10,387	12,217	12,938
Belgium .....	223	313	469	292	356	310	320	375	410
France .....	332	521	1,372	1,271	1,315	1,281	1,328	1,452	1,445
Germany .....	1,079	1,726	2,849	3,068	3,073	2,940	3,022	3,377	3,105
Ireland .....	9	156	396	171	193	320	363	251	518
Italy .....	150	393	365	346	554	569	584	504	575
Netherlands .....	65	367	415	495	547	480	384	374	369
Spain .....	40	58	D	288	327	181	184	D	196
Sweden .....	28	31	72	691	443	405	445	1,036	1,335
Switzerland .....	60	59	191	242	190	230	223	231	220
United Kingdom .....	824	1,718	2,158	1,935	2,139	2,843	3,065	4,000	D
Other European countries .....	82	133	D	345	525	444	469	D	D
Asia and Pacific .....	238	1,272	1,775	1,865	2,076	1,869	1,603	3,226	3,727
Japan .....	112	1,000	1,130	1,286	1,333	1,089	962	1,523	1,433
Australia .....	114	190	230	287	409	369	290	294	330
Singapore .....	D	24	167	63	88	73	62	426	548
Other Asian and Pacific countries .....	D	58	248	229	246	338	289	983	1,416
Latin America and other									
Western Hemisphere .....	169	155	477	389	546	663	748	613	665
Brazil .....	97	92	238	249	346	437	446	288	250
Mexico .....	30	37	183	58	121	126	191	238	305
Other .....	42	26	56	82	79	100	111	87	110
Middle East .....	11	33	98	97	170	208	141	389	527
Israel .....	11	29	96	97	169	208	141	389	527
Other .....	—	4	2	—	1	—	—	0	0
Africa .....	25	11	15	19	21	26	35	18	27
South Africa .....	23	9	14	17	18	22	30	14	22
Other .....	2	2	1	2	3	4	5	4	5

— less than \$500,000

D data withheld to avoid disclosing operations of individual companies

NOTES: Data are for majority-owned (more than 50 percent ownership) nonbank foreign affiliates of nonbank U.S. parents. Data include R&D expenditures made by affiliates, whether for themselves or for others, under contract. Data exclude R&D expenditures made by others for affiliates under contract. Manufacturing data exclude petroleum manufacturing before 1999. Estimates for 2000 are preliminary.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad, annual series, <http://www.bea.gov/bea/di/di1usdop.htm>.

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Appendix table 4-52  
**R&D expenditures in United States by U.S. MNC-parent companies: 1994–2000**  
 (Millions of current U.S. dollars)

Type of R&D expenditure and sector	1994	1995	1996	1997	1998	1999	2000
<b>All industries</b>							
Performed .....	91,574	97,667	100,551	106,800	113,777	126,291	131,576
For themselves.....	75,673	NA	NA	NA	NA	111,008	NA
For Federal Government .....	13,267	NA	NA	NA	NA	7,810	NA
For others.....	2,633	NA	NA	NA	NA	7,473	NA
Funded.....	81,234	NA	NA	NA	NA	121,352	NA
Performed by themselves .....	75,673	NA	NA	NA	NA	NA	NA
Performed by others.....	5,561	NA	NA	NA	NA	NA	NA
<b>Manufacturing</b>							
Performed .....	79,035	86,414	89,973	94,791	100,770	104,842	107,189
For themselves.....	64,762	NA	NA	NA	NA	91,575	NA
For Federal Government ....	12,039	NA	NA	NA	NA	7,658	NA
For others.....	2,233	NA	NA	NA	NA	5,609	NA
Funded.....	69,552	NA	NA	NA	NA	101,085	NA
Performed by themselves..	64,762	NA	NA	NA	NA	NA	NA
Performed by others.....	4,790	NA	NA	NA	NA	NA	NA

NA not available

MNC multinational corporation

NOTES: A U.S. MNC-parent company is a company, resident in the United States, that owns or controls at least 10 percent of the voting securities, or equivalent, of a foreign business enterprise. Funded R&D is based on R&D funded by the MNC-parent company itself, regardless of the performer. R&D performed includes R&D performed by U.S. MNC-parent companies, regardless of funding source, whether for the performer itself or for others, including R&D performed for the Federal Government; excludes R&D conducted by others under contract. Estimates for 2000 are preliminary. Estimates for 1999 forward are based on the North American Industry Classification System, and data for manufacturing include the petroleum industry. In prior years, estimates were based on the Standard Industrial Classification System, and manufacturing data excluded the petroleum industry. Full methodology notes are available at the original source (see below).

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad, annual series, <http://www.bea.gov/beat/di/di1usdop.htm>.

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Appendix table 4-53

(Page 1 of 2)

**R&D performed in United States by U.S. MNC-parent companies, by NAICS industry: 1999–2000**

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1999	2000
All industries.....	na	126,291	131,576
Mining.....	21	212	297
Oil and gas extraction.....	211	53	49
Other mining.....	na	159	248
Utilities.....	22	81	121
Manufacturing.....	31–33	104,842	107,189
Food.....	311	934	911
Beverages and tobacco products.....	312	501	520
Textiles, apparel, and leather products.....	313	275	266
Wood products.....	321	31	D
Paper.....	322	1,478	1,519
Printing and related support activities.....	323	129	147
Petroleum and coal products.....	324	990	1,206
Chemicals.....	325	28,198	28,480
Basic chemicals.....	3251	1,627	1,524
Resins and synthetic rubber, fibers and filaments.....	3252	2,784	2,940
Pharmaceuticals and medicines.....	3254	18,382	19,961
Soap, cleaning compounds, and toilet preparations.....	3256	1,957	2,239
Other chemicals.....	na	3,449	1,816
Plastics and rubber products.....	326	1,031	939
Nonmetallic mineral products.....	327	371	415
Primary and fabricated metals.....	na	1,320	1,334
Primary metals.....	331	760	816
Fabricated metal products.....	332	560	517
Machinery.....	333	5,252	5,839
Agriculture, construction, and mining machinery.....	3331	1,340	1,318
Industrial machinery.....	3332	1,250	1,589
Other machinery.....	na	2,662	2,932
Computers and electronic products.....	334	30,298	34,104
Computers and peripheral equipment.....	3341	5,659	5,766
Communications equipment.....	3342	13,276	14,314
Audio and video equipment.....	3343	407	579
Semiconductors and other electronic components.....	3344	8,997	9,788
Navigational, measuring, and other instruments.....	3345	1,579	3,201
Magnetic and optical media.....	3346	381	455
Electrical equipment, appliances, and components.....	335	2,958	2,517
Transportation equipment.....	336	29,162	26,714
Motor vehicles, bodies and trailers, and parts.....	3361, 3362, 3363	17,513	16,219
Other transportation equipment.....	na	11,649	10,495
Furniture and related products.....	337	90	D
Miscellaneous manufacturing.....	339	1,826	2,124
Wholesale trade: durable and nondurable goods.....	42	4,000	4,100
Professional and commercial equipment and supplies.....	4214	2,635	D
Other durable goods wholesalers.....	na	774	586
Petroleum and petroleum products.....	4227	D	27
Other nondurable goods wholesalers.....	na	D	D
Information.....	51	6,763	8,114
Publishing industries.....	511	4,050	4,989
Motion picture and sound recording industries.....	512	D	12
Broadcasting and telecommunications.....	513	869	1,191
Broadcasting, cable networks, and program distribution.....	5131, 5132	D	12
Telecommunications.....	5133	D	1,179
Information services and data processing services.....	514	D	1,921

Appendix table 4-53

(Page 2 of 2)

**R&D performed in United States by U.S. MNC-parent companies, by NAICS industry: 1999–2000**

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1999	2000
Finance (except depository institutions) and insurance .....	52	315	264
Finance (except depository institutions) .....	na	240	217
Securities, commodity contracts, and other intermediation and related activities .....	523	D	16
Other finance (except depository institutions) .....	na	D	201
Insurance carriers and related activities .....	524	75	47
Professional, scientific, and technical services .....	54	8,522	9,934
Architectural, engineering, and related services .....	5413	49	29
Computer systems design and related services .....	5415	7,453	8,268
Management, scientific, and technical consulting .....	5416	D	D
Advertising and related services .....	5418	D	D
Other professional, scientific, and technical services .....	na	716	853
Other industries .....	na	1,556	1,557
Agriculture, forestry, fishing and hunting .....	11	2	2
Construction .....	23	D	D
Retail trade .....	44-45	D	D
Transportation and warehousing .....	48-49	26	23
Real estate and rental and leasing .....	53	D	6
Real estate .....	531	0	0
Rental and leasing (except real estate) .....	532	D	6
Management of companies and enterprises (except bank companies) .....	55	0	0
Administration, support, and waste management .....	56	6	5
Health care and social assistance .....	62	D	26
Accommodation and food services .....	72	25	31
Accommodation .....	721	0	0
Food services and drinking places .....	722	25	31
Miscellaneous services .....	na	15	14

D data withheld to avoid disclosing operations of individual companies

MNC multinational corporation

NAICS North American Industry Classification System

na not applicable

NOTES: A U.S. MNC-parent company is a company, resident in the United States, that owns or controls at least 10 percent of the voting securities, or equivalent, of a foreign business enterprise. Data include R&D performed by U.S. MNC-parent companies, regardless of funding source, whether for the performer itself or for others, including R&D performed for the Federal Government; data exclude R&D conducted by others under contract. Estimates for 2000 are preliminary.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad, annual series, <http://www.bea.gov/bea/di/di1usdop.htm>.

Appendix table 4-54

**Company and other non-Federal funds for industrial R&D performed abroad: 1985–2001**

(Millions of current U.S. dollars)

Year	Total	Manufacturing	Nonmanufacturing
1985 .....	3,650	3,632	18
1986 .....	4,624	4,597	27
1987 .....	5,226	5,162	64
1988 .....	6,208	6,062	146
1989 .....	6,706	6,450	256
1990 .....	7,952	7,537	415
1991 .....	9,147	8,369	778
1992 .....	10,063	9,228	835
1993 .....	9,565	7,795	1,770
1994 .....	9,395	7,895	1,500
1995 .....	13,052	10,846	2,206
1996 .....	14,050	11,540	2,510
1997 .....	13,107	11,743	1,364
1998 .....	16,008	12,658	3,350
1999 .....	16,765	12,354	4,411
2000 .....	17,463	12,252	5,211
2001 .....	17,869	10,998	6,871

NAICS North American Industry Classification System

NOTES: Data are for industrial R&D performed outside the United States by a company's foreign subsidiaries or other organizations funded from all sources except the Federal Government. Starting with the 1999 survey, estimates are based on NAICS. In prior years, estimates were based on the Standard Industrial Classification System.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development, annual series, <http://www.nsf.gov/sbe/srs/indus/start.htm>.

Appendix table 4-55

**Company and other non-Federal funds for industrial R&D performed abroad, by NAICS industry: 1999–2001**

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1999	2000	2001
Total .....	na	16,765	17,463	17,869
Manufacturing .....	31–33	12,354	12,252	10,998
Food .....	311	87	95	210
Petroleum and coal products .....	324	D	9	D
Chemicals .....	325	3,243	3,578	2,328
Pharmaceuticals and medicines .....	3254	2,832	3,030	1,720
Other chemicals .....	na	411	548	608
Plastics and rubber products .....	326	172	168	181
Nonmetallic mineral products .....	327	40	40	15
Primary metals .....	331	7	D	12
Fabricated metal products .....	332	75	65	61
Machinery .....	333	707	736	527
Computer and electronic products .....	334	1,902	1,705	2,562
Computers and peripheral equipment .....	3341	289	D	478
Communications equipment .....	3342	D	377	633
Semiconductors and other electronic components .....	3344	302	327	852
Navigation, measuring, electromedical, and control instruments .....	3345	1,112	679	586
Electrical equipment, appliances, and components .....	335	433	455	418
Transportation equipment .....	336	3,933	3,640	2,832
Information .....	51	1,379	1,564	1,672
Professional, scientific, and technical services .....	54	523	904	881
Architectural, engineering, and related services .....	5413	D	371	78
Computer systems design and related services .....	5415	146	D	302
Scientific R&D services .....	5417	287	292	488
Other professional, scientific, and technical services .....	na	D	D	12

D data withheld to avoid disclosing operations of individual companies

NAICS North American Industry Classification System

na not applicable

NOTES: Data are for industrial R&D performed outside the United States by a company's foreign subsidiaries or other organizations funded from all sources except the Federal Government. Starting with the 1999 survey, estimates are based on NAICS. In prior years, estimates were based on the Standard Industrial Classification System.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development, annual series, <http://www.nsf.gov/sbe/srs/indus/start.htm>.

Appendix table 5-1

**Academic R&D expenditures directed to basic research, applied research, and development: 1970–2002**

(Percent distribution)

Year	All academic R&D	Basic research	Applied research	Development
1970	100.0	76.7	18.7	4.6
1971	100.0	76.7	19.5	3.8
1972	100.0	73.9	22.5	3.7
1973	100.0	71.2	24.6	4.3
1974	100.0	71.0	24.7	4.4
1975	100.0	69.5	26.2	4.4
1976	100.0	68.6	26.7	4.7
1977	100.0	68.3	25.9	5.8
1978	100.0	67.6	25.0	7.5
1979	100.0	67.0	24.8	8.2
1980	100.0	66.8	25.1	8.0
1981	100.0	66.9	25.1	8.0
1982	100.0	67.0	25.2	7.9
1983	100.0	66.9	25.6	7.5
1984	100.0	67.1	25.5	7.4
1985	100.0	68.1	24.5	7.3
1986	100.0	68.8	24.1	7.1
1987	100.0	67.5	25.1	7.4
1988	100.0	65.7	26.6	7.7
1989	100.0	65.4	26.8	7.8
1990	100.0	65.7	26.0	8.3
1991	100.0	66.3	25.3	8.4
1992	100.0	66.6	25.2	8.2
1993	100.0	66.6	25.1	8.3
1994	100.0	66.6	24.9	8.4
1995	100.0	67.0	25.0	8.0
1996	100.0	67.6	24.8	7.6
1997	100.0	71.0	22.2	6.9
1998	100.0	73.8	19.9	6.2
1999	100.0	74.3	20.8	4.9
2000	100.0	74.3	21.8	3.9
2001	100.0	74.0	22.1	3.9
2002	100.0	74.1	22.2	3.7

NOTES: Data for 2001 and 2002 are preliminary. Expenditure levels for academic R&D are also in reference to calendar years. These levels are approximations based on FY data. Because of changes in estimation procedures, the character of work data before FY 1998 is not comparable with that of later years. For details of methodological issues of measurement, see *The Methodology Underlying the Measurement of R&D Expenditures: 2002* (NSF/SRS, Arlington, VA, forthcoming). Data are based on annual reports by performers. See appendix tables 4-3, 4-7, 4-11, and 4-15.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *National Patterns of R&D Resources* (Arlington, VA, annual series).

Appendix table 5-2

(Page 1 of 2)

## Support for academic R&amp;D, by sector: 1972–2001

Year	All sources	Federal Government	State/local government	Industry	Academic institutions	All other sources
Millions of current dollars						
1972 .....	2,630	1,795	270	74	305	187
1973 .....	2,884	1,985	295	84	318	202
1974 .....	3,023	2,032	307	96	370	218
1975 .....	3,409	2,288	332	113	417	259
1976 .....	3,729	2,512	364	123	446	285
1977 .....	4,067	2,726	374	139	514	314
1978 .....	4,625	3,059	414	170	623	359
1979 .....	5,366	3,598	472	193	735	368
1980 .....	6,063	4,098	491	236	835	403
1981 .....	6,847	4,571	546	291	1,004	435
1982 .....	7,324	4,768	616	337	1,111	491
1983 .....	7,882	4,989	626	389	1,302	576
1984 .....	8,620	5,431	690	475	1,411	613
1985 .....	9,687	6,064	752	560	1,617	694
1986 .....	10,928	6,712	915	700	1,869	732
1987 .....	12,153	7,343	1,023	790	2,168	828
1988 .....	13,463	8,193	1,106	872	2,356	935
1989 .....	14,977	8,991	1,224	994	2,698	1,071
1990 .....	16,286	9,638	1,324	1,127	3,006	1,191
1991 .....	17,585	10,234	1,474	1,204	3,367	1,307
1992 .....	18,818	11,093	1,491	1,279	3,547	1,409
1993 .....	19,951	11,957	1,559	1,360	3,589	1,486
1994 .....	21,023	12,646	1,554	1,422	3,827	1,574
1995 .....	22,165	13,328	1,689	1,489	4,047	1,613
1996 .....	23,040	13,836	1,811	1,605	4,170	1,618
1997 .....	24,363	14,309	1,909	1,737	4,697	1,711
1998 .....	25,848	15,145	1,944	1,888	5,002	1,869
1999 .....	27,505	16,071	2,019	2,028	5,395	1,992
2000 .....	30,042	17,508	2,196	2,152	5,933	2,253
2001 .....	32,723	19,191	2,315	2,234	6,553	2,430
Millions of constant 1996 dollars						
1972 .....	8,399	5,731	861	238	973	596
1973 .....	8,817	6,070	901	257	973	617
1974 .....	8,626	5,800	876	274	1,055	622
1975 .....	8,815	5,917	858	292	1,079	669
1976 .....	9,007	6,067	879	297	1,076	688
1977 .....	9,137	6,125	840	312	1,155	705
1978 .....	9,724	6,431	871	357	1,309	755
1979 .....	10,436	6,998	918	376	1,430	715
1980 .....	10,828	7,319	877	421	1,492	719
1981 .....	11,148	7,443	889	475	1,634	708
1982 .....	11,144	7,255	938	513	1,690	747
1983 .....	11,488	7,272	912	566	1,897	840
1984 .....	12,118	7,634	971	668	1,983	862
1985 .....	13,182	8,252	1,023	762	2,200	944
1986 .....	14,520	8,918	1,216	930	2,483	973
1987 .....	15,715	9,496	1,323	1,022	2,804	1,070
1988 .....	16,858	10,259	1,385	1,092	2,950	1,171
1989 .....	18,059	10,841	1,475	1,198	3,253	1,291
1990 .....	18,926	11,200	1,539	1,310	3,493	1,384
1991 .....	19,671	11,448	1,648	1,347	3,766	1,462
1992 .....	20,512	12,091	1,625	1,394	3,867	1,535
1993 .....	21,240	12,729	1,659	1,448	3,821	1,582
1994 .....	21,908	13,179	1,619	1,482	3,988	1,640
1995 .....	22,608	13,594	1,723	1,519	4,128	1,645
1996 .....	23,040	13,836	1,811	1,605	4,170	1,618
1997 .....	23,897	14,036	1,872	1,703	4,607	1,679
1998 .....	25,000	14,648	1,880	1,826	4,838	1,808
1999 .....	26,235	15,329	1,926	1,934	5,146	1,900
2000 .....	28,114	16,385	2,055	2,014	5,552	2,108
2001 .....	29,892	17,530	2,115	2,040	5,986	2,220

Appendix table 5-2

(Page 2 of 2)

**Support for academic R&D, by sector: 1972–2001**

Year	All sources	Federal Government	State/local government	Industry	Academic institutions	All other sources
Percent distribution						
1972 .....	100.0	68.2	10.2	2.8	11.6	7.1
1973 .....	100.0	68.8	10.2	2.9	11.0	7.0
1974 .....	100.0	67.2	10.2	3.2	12.2	7.2
1975 .....	100.0	67.1	9.7	3.3	12.2	7.6
1976 .....	100.0	67.4	9.8	3.3	11.9	7.6
1977 .....	100.0	67.0	9.2	3.4	12.6	7.7
1978 .....	100.0	66.1	9.0	3.7	13.5	7.8
1979 .....	100.0	67.1	8.8	3.6	13.7	6.9
1980 .....	100.0	67.6	8.1	3.9	13.8	6.6
1981 .....	100.0	66.8	8.0	4.3	14.7	6.4
1982 .....	100.0	65.1	8.4	4.6	15.2	6.7
1983 .....	100.0	63.3	7.9	4.9	16.5	7.3
1984 .....	100.0	63.0	8.0	5.5	16.4	7.1
1985 .....	100.0	62.6	7.8	5.8	16.7	7.2
1986 .....	100.0	61.4	8.4	6.4	17.1	6.7
1987 .....	100.0	60.4	8.4	6.5	17.8	6.8
1988 .....	100.0	60.9	8.2	6.5	17.5	6.9
1989 .....	100.0	60.0	8.2	6.6	18.0	7.1
1990 .....	100.0	59.2	8.1	6.9	18.5	7.3
1991 .....	100.0	58.2	8.4	6.8	19.1	7.4
1992 .....	100.0	58.9	7.9	6.8	18.9	7.5
1993 .....	100.0	59.9	7.8	6.8	18.0	7.4
1994 .....	100.0	60.2	7.4	6.8	18.2	7.5
1995 .....	100.0	60.1	7.6	6.7	18.3	7.3
1996 .....	100.0	60.1	7.9	7.0	18.1	7.0
1997 .....	100.0	58.7	7.8	7.1	19.3	7.0
1998 .....	100.0	58.6	7.5	7.3	19.4	7.2
1999 .....	100.0	58.4	7.3	7.4	19.6	7.2
2000 .....	100.0	58.3	7.3	7.2	19.7	7.5
2001 .....	100.0	58.6	7.1	6.8	20.0	7.4

NOTE: See appendix table 4-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1996 dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 5-3  
Sources of R&D funds at private and public institutions: 1981, 1991, and 2001

Source of funds	All institutions		Private institutions		Public institutions	
	Millions of current dollars	Percent distribution	Millions of current dollars	Percent distribution	Millions of current dollars	Percent distribution
1981						
All sources.....	6,847	100.0	2,457	100.0	4,390	100.0
Federal Government .....	4,571	66.8	1,941	79.0	2,630	59.9
State/local government.....	546	8.0	47	1.9	499	11.4
Industry.....	291	4.3	111	4.5	180	4.1
Academic institutions .....	1,004	14.7	182	7.4	821	18.7
Other sources.....	435	6.4	176	7.1	259	5.9
1991						
All sources.....	17,585	100.0	5,846	100.0	11,740	100.0
Federal Government .....	10,234	58.2	4,182	71.5	6,053	51.6
State/local government.....	1,474	8.4	142	2.4	1,331	11.3
Industry.....	1,204	6.8	415	7.1	789	6.7
Academic institutions .....	3,367	19.1	582	10.0	2,785	23.7
Other sources.....	1,307	7.4	524	9.0	782	6.7
2001						
All sources.....	32,723	100.0	10,382	100.0	22,341	100.0
Federal Government .....	19,191	58.6	7,496	72.2	11,695	52.3
State/local government.....	2,315	7.1	236	2.3	2,080	9.3
Industry.....	2,234	6.8	744	7.2	1,489	6.7
Academic institutions .....	6,553	20.0	1,011	9.7	5,542	24.8
Other sources.....	2,430	7.4	895	8.6	1,535	6.9

NOTE: Details may not add to totals and percents may not sum to 100 because of rounding.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.



Appendix table 5-4

(Page 1 of 2)

**Top 100 academic institutions in R&D expenditures, by source of funds: 2001**

(Millions of current dollars)

Rank and academic institution	All sources	Federal government	State/local government	Industry	Academic institutions	All other sources
All institutions	32,723	19,191	2,315	2,234	6,553	2,430
1 University of California—Los Angeles (public)	694	313	59	33	190	99
2 University of Wisconsin—Madison (public)	604	304	35	17	188	60
3 University of Michigan, all campuses (public)	601	396	5	34	121	44
4 University of Washington—Seattle (public)	590	435	12	43	88	11
5 University of California—San Diego (public)	557	343	21	37	102	54
6 University of California—San Francisco (public)	525	277	22	36	111	79
7 Johns Hopkins University <sup>a</sup> (private)	517	417	1	16	35	48
8 Stanford University (private)	483	384	5	35	31	27
9 Johns Hopkins University Applied Physics Laboratory <sup>a</sup> (private)	482	463	—	2	16	—
10 University of Pennsylvania (private)	470	352	2	28	44	44
Total, top 10	5,522	3,685	164	282	924	467
11 University of Minnesota, all campuses (public)	462	264	58	26	80	33
12 Pennsylvania State University, all campuses (public)	458	246	24	68	112	9
13 University of California—Berkeley (public)	446	208	30	27	128	53
14 Cornell University, all campuses (private)	444	240	63	22	80	38
15 Massachusetts Institute of Technology	435	304	—	97	6	28
16 University of California—Davis (public)	432	155	50	17	171	39
17 Texas A&M University, all campuses (public)	407	149	100	35	116	6
18 Washington University (private)	407	285	7	25	59	32
19 University of Illinois at Urbana-Champaign (public)	391	195	49	11	120	16
20 Ohio State University, all campuses (public)	391	161	55	55	86	34
Total, top 20	9,795	5,894	598	665	1,883	754
21 Baylor College of Medicine (private)	381	234	4	18	56	69
22 Duke University (private)	375	218	8	104	19	26
23 Harvard University (private)	372	300	2	14	0	56
24 University of Arizona (public)	367	199	8	23	119	17
25 University of Colorado, all campuses (public)	365	309	3	9	30	15
26 University of Florida (public)	359	140	74	36	99	10
27 Columbia University in the City of New York (private)	354	318	1	3	13	19
28 University of Pittsburgh, all campuses (public)	349	269	5	15	32	28
29 University of Southern California (private)	341	246	16	23	56	0
30 Yale University (private)	322	251	—	14	18	38
Total, top 30	13,381	8,378	719	925	2,327	1,032
31 Georgia Institute of Technology, all campuses (public)	307	144	11	60	92	0
32 University of North Carolina at Chapel Hill (public)	304	222	16	7	59	0
33 North Carolina State University at Raleigh (public)	299	96	92	38	66	8
34 University of Texas at Austin (public)	295	195	20	30	36	13
35 University of Georgia (public)	272	67	53	14	137	1
36 Louisiana State University, all campuses (public)	269	95	74	17	65	19
37 University of Maryland at College Park (public)	267	146	22	7	80	13
38 Michigan State University (public)	266	112	46	11	88	8
39 Indiana University, all campuses (public)	260	117	6	6	103	29
40 Northwestern University (private)	258	158	4	14	60	22
Total, top 40	16,178	9,729	1,062	1,129	3,112	1,144
41 University of Iowa (public)	255	155	7	21	53	19
42 Purdue University, all campuses (public)	255	98	36	30	90	—
43 University of Maryland at Baltimore (public)	239	99	27	41	34	38
44 Emory University (private)	237	170	4	8	20	35
45 Rutgers the State University of New Jersey, all campuses (public)	237	77	28	11	90	31
46 University of Rochester (private)	234	167	10	24	20	14
47 University of Illinois at Chicago (public)	233	125	10	11	71	17
48 University of Alabama at Birmingham (public)	232	195	—	8	14	14
49 University of Texas Southwestern Medical Center Dallas (public)	222	132	10	13	6	62
50 Virginia Polytechnic Institute and State University (public)	216	77	58	18	53	10
Total, top 50	18,539	11,025	1,252	1,315	3,563	1,383
51 California Institute of Technology (private)	215	194	1	10	10	0
52 University of Texas M.D. Anderson Cancer Center (public)	213	94	0	27	59	33
53 University of Kentucky, all campuses (public)	212	86	38	13	61	14
54 Case Western Reserve University (private)	198	159	4	6	12	18
55 University of Utah (public)	198	127	2	6	35	27

Appendix table 5-4

(Page 2 of 2)

**Top 100 academic institutions in R&D expenditures, by source of funds: 2001**

(Millions of current dollars)

Rank and academic institution	All sources	Federal government	State/local government	Industry	Academic institutions	All other sources
56 University of Chicago (private).....	194	156	4	2	14	18
57 University of Cincinnati, all campuses (public).....	193	128	4	6	41	14
58 New York University (private).....	191	130	3	7	26	26
59 SUNY at Buffalo, all campuses (public).....	187	97	5	12	50	23
60 Vanderbilt University (private).....	187	146	—	3	21	16
Total, top 60.....	20,525	12,341	1,313	1,406	3,892	1,572
61 University of California—Irvine (public).....	180	102	8	16	31	23
62 Iowa State University (public).....	179	62	52	13	49	3
63 Mount Sinai School of Medicine (private).....	177	109	3	18	17	30
64 Wayne State University (public).....	176	79	12	11	55	18
65 University of Missouri, Columbia (public).....	175	68	16	5	79	7
66 Boston University (private).....	172	151	—	8	0	12
67 University of South Florida (public).....	172	59	9	11	76	17
68 SUNY at Stony Brook, all campuses (public).....	168	93	3	7	54	11
69 University of Connecticut, all campuses (public).....	164	70	14	10	55	16
70 University of Medicine and Dentistry of New Jersey (public).....	162	86	9	13	38	15
Total, top 70.....	22,251	13,221	1,440	1,519	4,346	1,723
71 University of Tennessee system (public).....	162	79	34	15	18	16
72 Colorado State University (public).....	161	101	16	9	26	9
73 University of Nebraska at Lincoln (public).....	158	44	4	6	101	3
74 University of Hawaii at Manoa (public).....	157	98	33	7	19	0
75 University of New Mexico, all campuses (public).....	157	110	2	2	37	6
76 University of Kansas, all campuses (public).....	156	74	7	4	52	18
77 Oregon State University (public).....	154	85	37	—	27	5
78 University of Miami (private).....	154	112	2	18	8	14
79 University of Virginia, all campuses (public).....	150	123	—	8	12	7
80 Princeton University (private).....	149	79	3	8	42	17
Total, top 80.....	23,808	14,125	1,578	1,596	4,688	1,819
81 University of Oklahoma, all campuses (public).....	149	60	14	10	52	11
82 Yeshiva University (private).....	148	108	0	0	40	0
83 Mississippi State University (public).....	147	65	32	7	42	0
84 Rockefeller University (private).....	146	55	6	3	52	29
85 Carnegie Mellon University (private).....	145	97	3	23	0	21
86 Oregon Health Sciences University (public).....	137	112	3	12	0	11
87 University of Texas Health Science Center Houston (public).....	125	89	4	11	8	14
88 Clemson University (public).....	124	49	21	12	42	—
89 Utah State University (public).....	121	74	18	7	17	6
90 Arizona State University (public).....	119	57	4	6	49	4
Total, top 90.....	25,168	14,891	1,684	1,686	4,991	1,914
91 Medical University of South Carolina (public).....	117	61	1	7	46	1
92 University of California—Santa Barbara (public).....	116	77	3	6	19	11
93 University of Texas Health Science Center San Antonio (public).....	115	71	6	10	21	7
94 Florida State University (public).....	114	57	7	—	45	4
95 University of Massachusetts at Worcester (public).....	111	79	22	3	0	6
96 University of Alaska Fairbanks, all campuses (public).....	110	55	3	28	24	0
97 University of South Carolina, all campuses (public).....	110	52	7	4	42	5
98 Dartmouth College (private).....	109	70	4	4	24	8
99 Washington State University (public).....	108	49	5	4	38	11
100 Auburn University, all campuses (public).....	106	40	1	5	56	4
Total, top 100.....	26,285	15,501	1,744	1,758	5,307	1,971

— less than \$1 million

\*Although not officially classified as a federally funded research and development center, the Johns Hopkins University Applied Physics Laboratory functions as one and performs almost as much R&D as the university. It is included as a separate entry to provide a better measure of distribution of academic R&D dollars and ranking of individual institutions.

NOTE: Public and private refer to institutional control.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 5-5

## Federal and non-Federal R&amp;D expenditures at academic institutions, by field and source of funds: 2001

Field	All R&D expenditures		Federal expenditures		Non-Federal expenditures	
	Millions of dollars	Percent distribution	Millions of dollars	Percent	Millions of dollars	Percent
All fields .....	32,723.1	100.0	19,190.9	58.6	13,532.2	41.4
Sciences.....	27,723.4	84.7	16,347.1	59.0	11,376.3	41.0
Physical sciences .....	2,800.4	8.6	1,971.5	70.4	828.9	29.6
Astronomy.....	378.0	1.2	259.7	68.7	118.3	31.3
Chemistry .....	1,007.1	3.1	660.3	65.6	346.8	34.4
Physics .....	1,236.5	3.8	925.6	74.9	310.9	25.1
Other.....	178.7	0.5	125.9	70.5	52.8	29.5
Mathematics .....	357.3	1.1	241.3	67.5	115.9	32.5
Computer sciences.....	953.8	2.9	643.2	67.4	310.6	32.6
Earth, atmospheric, and ocean sciences .....	1,826.8	5.6	1,182.6	64.7	644.2	35.3
Atmospheric sciences .....	300.4	0.9	232.1	77.3	68.3	22.7
Earth sciences.....	552.5	1.7	328.1	59.4	224.4	40.6
Ocean sciences.....	674.4	2.1	447.9	66.4	226.5	33.6
Other.....	299.5	0.9	174.5	58.3	125.0	41.7
Life sciences .....	19,189.1	58.6	11,178.7	58.3	8,010.4	41.7
Agricultural sciences .....	2,318.1	7.1	613.4	26.5	1,704.7	73.5
Biological sciences.....	5,943.6	18.2	3,872.2	65.1	2,071.4	34.9
Medical sciences.....	10,176.7	31.1	6,248.7	61.4	3,928.1	38.6
Other.....	750.7	2.3	444.5	59.2	306.2	40.8
Psychology .....	581.9	1.8	398.1	68.4	183.8	31.6
Social sciences .....	1,435.5	4.4	544.5	37.9	891.1	62.1
Economics .....	270.9	0.8	89.9	33.2	181.0	66.8
Political science .....	252.2	0.8	71.9	28.5	180.3	71.5
Sociology .....	327.2	1.0	148.2	45.3	179.0	54.7
Other.....	585.2	1.8	234.4	40.1	350.8	59.9
Other sciences .....	578.7	1.8	187.1	32.3	391.5	67.7
Engineering .....	4,999.6	15.3	2,843.8	56.9	2,155.9	43.1
Aeronautical/astronautical .....	338.6	1.0	254.5	75.2	84.1	24.8
Bioengineering/biomedical .....	211.3	0.6	120.7	57.1	90.6	42.9
Chemical .....	413.5	1.3	214.8	51.9	198.7	48.1
Civil.....	666.7	2.0	270.6	40.6	396.1	59.4
Electrical/electronic .....	1,160.4	3.5	725.2	62.5	435.2	37.5
Mechanical.....	685.4	2.1	415.8	60.7	269.6	39.3
Materials .....	450.9	1.4	240.3	53.3	210.7	46.7
Other.....	1,072.7	3.3	601.9	56.1	470.9	43.9

NOTES: Details may not add to totals because of rounding. See appendix table 5-2 for detail on non-Federal sources.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 5-6

**Academic R&D funds provided by Federal Government, by field: Selected years, 1975–2001**

(Percent)

Field	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All fields .....	67.1	67.6	62.6	59.2	58.2	58.9	59.9	60.2	60.1	60.1	58.7	58.6	58.4	58.3	58.6
Sciences.....	67.0	67.4	62.9	59.5	58.6	59.3	60.1	60.3	60.2	60.0	58.7	58.7	58.6	58.6	59.0
Physical sciences .....	81.4	81.9	77.5	72.8	71.4	71.8	71.0	71.8	72.6	72.2	71.0	71.0	71.4	70.6	70.4
Astronomy.....	73.4	75.6	67.0	66.1	64.4	66.5	63.8	67.7	68.2	66.1	63.7	62.2	70.9	71.8	68.7
Chemistry .....	76.8	77.7	74.2	68.7	67.3	68.1	68.2	68.2	69.1	69.1	67.2	67.0	67.1	65.6	65.6
Physics .....	86.4	86.8	82.2	77.5	77.1	76.9	75.3	76.0	77.0	76.7	75.9	75.8	75.5	74.7	74.9
Other.....	77.7	78.7	75.1	71.8	66.4	67.7	70.3	70.8	70.8	71.0	71.0	74.7	68.7	66.9	70.5
Mathematics .....	78.6	78.4	75.9	72.6	74.1	74.0	74.6	72.8	73.5	72.2	69.8	69.0	66.8	67.2	67.5
Computer sciences.....	74.3	70.4	69.7	66.5	67.0	68.4	69.7	71.5	70.9	72.7	71.4	68.8	67.7	66.5	67.4
Earth, atmospheric, and ocean sciences.....	70.8	73.1	67.2	63.7	62.7	63.7	66.0	67.6	67.1	67.6	66.0	66.3	65.1	64.2	64.7
Atmospheric sciences .....	NA	84.1	79.8	75.7	74.1	72.1	76.3	79.4	78.6	78.4	76.0	77.8	77.3	77.2	77.3
Earth sciences.....	NA	69.7	60.7	57.7	56.7	57.7	58.5	59.5	59.9	60.0	59.8	60.7	58.9	58.9	59.4
Ocean sciences.....	NA	77.6	72.7	69.6	67.7	71.7	72.0	71.0	70.0	69.6	66.2	66.4	67.1	66.7	66.4
Other.....	70.8	59.1	53.9	50.8	52.7	51.5	58.4	66.6	65.3	67.1	66.9	65.1	60.1	55.8	58.3
Life sciences .....	65.1	64.9	60.4	58.3	57.2	58.0	58.9	58.8	58.4	58.2	57.1	57.1	57.3	57.6	58.3
Agricultural sciences.....	29.4	30.9	29.4	26.2	25.9	27.6	28.9	29.7	29.3	29.3	27.9	26.7	26.8	26.5	26.5
Biological sciences.....	72.5	74.0	67.9	64.5	63.7	64.7	65.3	65.7	64.9	64.7	64.2	64.1	63.9	65.0	65.1
Medical sciences.....	75.6	74.4	68.0	64.3	62.7	62.7	63.3	62.7	63.0	63.0	61.2	61.0	60.8	60.6	61.4
Other.....	71.8	67.3	60.0	59.1	60.0	58.2	59.3	58.8	56.7	58.0	56.9	55.5	58.2	56.9	59.2
Psychology.....	76.8	73.3	66.9	64.8	65.8	65.4	67.0	67.1	67.2	67.7	68.5	67.2	66.6	67.9	68.4
Social sciences .....	55.2	53.8	40.1	32.2	33.7	34.5	37.7	37.6	38.1	38.6	36.3	37.6	37.7	37.8	37.9
Economics .....	48.2	48.8	37.0	27.1	28.6	29.8	33.4	31.4	32.0	33.4	34.4	35.3	33.8	35.0	33.2
Political science .....	41.8	43.4	33.1	22.0	22.8	24.7	28.3	31.0	34.5	34.6	29.5	30.3	27.0	27.3	28.5
Sociology .....	65.5	65.0	53.5	45.5	46.3	50.1	49.7	49.1	48.5	51.6	46.9	47.1	44.9	45.4	45.3
Other.....	55.9	54.1	38.5	33.9	35.5	34.2	38.4	38.4	37.8	36.4	33.9	36.4	40.1	39.3	40.1
Other sciences .....	57.2	53.6	49.3	41.2	33.8	32.4	35.1	37.0	44.9	41.6	40.7	38.5	34.5	34.4	32.3
Engineering .....	68.1	68.6	61.2	57.4	56.4	57.2	58.9	59.4	59.8	60.2	58.8	57.8	57.3	56.6	56.9
Aeronautical/astronautical .....	NA	79.5	76.4	77.7	76.4	76.7	75.2	76.1	76.2	73.5	74.2	68.4	70.3	70.6	75.2
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	61.9	55.5	52.8	52.8	57.1
Chemical .....	NA	64.4	55.6	50.6	48.4	48.4	52.2	54.0	54.2	54.8	52.4	51.8	51.2	52.0	51.9
Civil.....	NA	64.0	51.5	41.1	39.2	42.3	41.6	40.6	43.2	43.5	42.5	39.8	40.9	39.4	40.6
Electrical/electronic.....	NA	75.7	67.7	65.1	64.2	63.9	65.7	65.8	66.4	67.6	66.3	66.4	63.9	62.6	62.5
Mechanical.....	NA	67.0	64.6	61.0	59.7	59.7	64.2	65.3	65.2	64.5	62.3	61.8	62.0	60.6	60.7
Materials.....	NA	NA	NA	50.9	50.4	48.7	50.3	50.2	53.2	54.5	57.2	56.6	56.6	56.6	53.3
Other.....	68.1	65.7	57.3	54.6	54.8	57.6	58.9	60.1	58.4	59.7	55.8	55.4	55.8	56.3	56.1

NA not available

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Science &amp; Engineering Indicators – 2004

## Expenditures for academic R&amp;D, by field: Selected years, 1975–2001

Field	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of current dollars														
All fields .....	3,409	6,063	9,687	16,286	17,585	18,818	19,951	21,023	22,165	23,040	24,363	25,848	27,505	30,042	32,723
Sciences.....	3,028	5,201	8,269	13,630	14,679	15,756	16,795	17,668	18,650	19,333	20,524	21,779	23,245	25,495	27,723
Physical sciences .....	350	677	1,148	1,807	1,939	2,055	2,130	2,177	2,255	2,257	2,370	2,482	2,604	2,708	2,800
Astronomy.....	27	59	96	170	211	238	259	267	304	276	287	302	384	385	378
Chemistry .....	121	244	422	648	671	705	740	759	771	801	820	876	918	960	1,007
Physics .....	174	323	551	842	881	921	940	957	989	987	1,058	1,078	1,149	1,206	1,237
Other.....	29	52	80	147	176	191	191	193	191	193	204	226	152	158	179
Mathematics .....	40	78	128	222	230	248	272	282	279	288	289	310	313	341	357
Computer sciences.....	46	124	281	515	554	555	608	646	682	690	709	746	861	875	954
Earth, atmospheric, and ocean sciences....	255	508	705	1,069	1,119	1,242	1,319	1,396	1,433	1,488	1,532	1,624	1,691	1,763	1,827
Atmospheric sciences .....	NA	76	108	173	175	194	210	203	208	224	245	269	288	287	300
Earth sciences.....	NA	188	254	355	384	413	417	455	456	445	449	513	545	562	553
Ocean sciences.....	NA	176	258	377	389	427	458	455	473	533	537	546	604	633	674
Other.....	255	68	86	164	171	207	234	283	295	285	301	296	254	281	299
Life sciences .....	1,901	3,218	5,279	8,725	9,472	10,196	10,851	11,466	12,186	12,713	13,588	14,593	15,610	17,460	19,189
Agricultural sciences .....	384	676	999	1,349	1,458	1,512	1,558	1,661	1,814	1,910	1,966	1,995	2,035	2,175	2,318
Biological sciences.....	630	1,028	1,781	2,859	3,064	3,304	3,536	3,709	3,834	3,909	4,180	4,581	5,029	5,613	5,944
Medical sciences.....	811	1,423	2,318	4,154	4,546	4,964	5,324	5,639	6,070	6,391	6,908	7,472	7,994	8,986	10,177
Other.....	75	91	181	363	404	417	433	457	468	503	534	545	552	686	751
Psychology .....	80	110	158	253	283	329	350	358	370	381	396	444	464	516	582
Social sciences .....	256	339	383	703	750	815	896	954	1,019	1,096	1,125	1,131	1,251	1,297	1,436
Economics .....	56	91	118	201	209	222	231	243	250	271	261	261	266	255	271
Political science .....	29	54	59	115	125	142	151	161	173	180	175	176	200	230	252
Sociology .....	69	87	75	132	156	163	183	196	215	231	257	253	271	301	327
Other.....	102	107	131	255	260	288	331	354	380	415	432	442	513	512	585
Other sciences .....	100	146	186	336	332	315	369	389	426	418	514	448	451	534	579
Engineering .....	381	862	1,418	2,656	2,907	3,062	3,156	3,355	3,515	3,707	3,839	4,069	4,260	4,547	5,000
Aeronautical/astronautical .....	NA	53	81	164	180	197	213	217	241	233	247	250	260	256	339
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77	102	137	172	211
Chemical.....	NA	61	116	218	244	261	274	279	297	317	317	327	349	375	414
Civil.....	NA	83	153	284	315	340	371	403	431	455	472	495	529	600	667
Electrical/electronic.....	NA	183	337	663	679	704	698	745	819	888	942	1,042	1,017	1,116	1,160
Mechanical.....	NA	140	208	391	421	451	483	502	521	519	518	568	625	632	685
Materials.....	NA	NA	NA	274	304	294	299	310	330	349	389	391	384	399	451
Other.....	381	341	523	663	764	817	818	899	877	946	878	894	959	997	1,073
	Millions of constant 1996 dollars														
All fields .....	8,815	10,828	13,182	18,926	19,671	20,512	21,240	21,908	22,608	23,040	23,897	25,000	26,235	28,114	29,892
Sciences.....	7,830	9,289	11,252	15,839	16,419	17,174	17,880	18,412	19,023	19,333	20,132	21,065	22,171	23,859	25,325
Physical sciences .....	906	1,210	1,563	2,100	2,169	2,240	2,268	2,269	2,300	2,257	2,325	2,401	2,484	2,534	2,558
Astronomy.....	69	105	131	198	236	259	275	278	310	276	282	292	367	361	345
Chemistry .....	312	436	574	753	750	768	788	791	787	801	805	847	876	898	920
Physics .....	449	576	750	978	986	1,004	1,001	997	1,009	987	1,038	1,043	1,096	1,128	1,130
Other.....	76	93	109	171	196	209	203	201	195	193	200	218	145	147	163

## Expenditures for academic R&amp;D, by field: Selected years, 1975–2001

Field	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant 1996 dollars														
Mathematics .....	103	140	174	258	257	270	290	294	284	288	284	300	299	319	326
Computer sciences.....	118	222	382	598	620	605	647	673	696	690	696	722	821	819	871
Earth, atmospheric, and ocean sciences.....	660	907	960	1,242	1,252	1,354	1,404	1,455	1,462	1,488	1,503	1,570	1,613	1,650	1,669
Atmospheric sciences .....	NA	135	147	201	195	212	224	212	212	224	241	260	275	269	274
Earth sciences.....	NA	336	345	412	430	450	444	474	465	445	440	496	520	526	505
Ocean sciences.....	NA	314	350	438	436	466	488	474	483	533	526	528	576	592	616
Other.....	660	122	117	191	191	226	249	295	301	285	295	286	242	263	274
Life sciences .....	4,916	5,747	7,184	10,140	10,595	11,114	11,553	11,949	12,429	12,713	13,328	14,114	14,889	16,340	17,529
Agricultural sciences.....	993	1,207	1,360	1,567	1,631	1,648	1,659	1,731	1,851	1,910	1,928	1,930	1,941	2,036	2,118
Biological sciences.....	1,630	1,836	2,424	3,323	3,427	3,602	3,765	3,865	3,910	3,909	4,100	4,431	4,797	5,253	5,429
Medical sciences.....	2,098	2,541	3,154	4,828	5,086	5,411	5,668	5,876	6,191	6,391	6,776	7,227	7,625	8,409	9,296
Other.....	195	163	246	422	451	454	461	477	477	503	524	527	526	642	686
Psychology.....	208	196	215	294	317	358	372	373	378	381	388	430	443	483	532
Social sciences .....	662	606	522	817	839	889	954	994	1,039	1,096	1,104	1,094	1,194	1,214	1,311
Economics .....	145	162	161	233	234	242	246	253	255	271	256	253	254	238	247
Political science .....	76	97	81	134	140	155	161	167	176	180	172	170	191	215	230
Sociology .....	178	156	102	153	174	178	195	204	219	231	252	244	259	281	299
Other.....	264	191	178	297	291	314	352	369	388	415	423	427	490	479	535
Other sciences .....	258	261	254	390	371	344	392	405	435	418	504	434	430	500	529
Engineering .....	985	1,539	1,929	3,087	3,251	3,338	3,360	3,496	3,585	3,707	3,765	3,935	4,063	4,255	4,567
Aeronautical/astronautical .....	NA	95	110	190	202	214	226	227	246	233	242	241	248	240	309
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75	99	130	161	193
Chemical.....	NA	109	158	254	273	284	291	290	303	317	311	316	333	351	378
Civil.....	NA	149	208	330	352	370	395	420	439	455	463	479	505	561	609
Electrical/electronic.....	NA	327	459	770	760	767	743	776	835	888	924	1,008	970	1,044	1,060
Mechanical.....	NA	251	283	454	471	491	514	523	531	519	508	549	596	591	626
Materials.....	NA	NA	NA	318	340	320	318	323	336	349	381	379	366	373	412
Other.....	985	610	711	771	854	891	871	937	895	946	861	865	915	933	980
	Percent distribution														
All fields .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sciences.....	88.8	85.8	85.4	83.7	83.5	83.7	84.2	84.0	84.1	83.9	84.2	84.3	84.5	84.9	84.7
Physical sciences .....	10.3	11.2	11.9	11.1	11.0	10.9	10.7	10.4	10.2	9.8	9.7	9.6	9.5	9.0	8.6
Astronomy.....	0.8	1.0	1.0	1.0	1.2	1.3	1.3	1.3	1.4	1.2	1.2	1.2	1.4	1.3	1.2
Chemistry .....	3.5	4.0	4.4	4.0	3.8	3.7	3.7	3.6	3.5	3.5	3.4	3.4	3.3	3.2	3.1
Physics.....	5.1	5.3	5.7	5.2	5.0	4.9	4.7	4.6	4.5	4.3	4.3	4.2	4.2	4.0	3.8
Other.....	0.9	0.9	0.8	0.9	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.9	0.6	0.5	0.5
Mathematics .....	1.2	1.3	1.3	1.4	1.3	1.3	1.4	1.3	1.3	1.3	1.2	1.2	1.1	1.1	1.1
Computer sciences.....	1.3	2.0	2.9	3.2	3.2	3.0	3.0	3.1	3.1	3.0	2.9	2.9	3.1	2.9	2.9
Earth, atmospheric, and ocean sciences..	7.5	8.4	7.3	6.6	6.4	6.6	6.6	6.6	6.5	6.5	6.3	6.3	6.1	5.9	5.6
Atmospheric sciences .....	NA	1.3	1.1	1.1	1.0	1.0	1.1	1.0	0.9	1.0	1.0	1.0	1.0	1.0	0.9
Earth sciences.....	NA	3.1	2.6	2.2	2.2	2.2	2.1	2.2	2.1	1.9	1.8	2.0	2.0	1.9	1.7
Ocean sciences.....	NA	2.9	2.7	2.3	2.2	2.3	2.3	2.2	2.1	2.3	2.2	2.1	2.2	2.1	2.1
Other.....	7.5	1.1	0.9	1.0	1.0	1.1	1.2	1.3	1.3	1.2	1.2	1.1	0.9	0.9	0.9

## Expenditures for academic R&amp;D, by field: Selected years, 1975–2001

Field	1975	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Percent distribution														
Life sciences .....	55.8	53.1	54.5	53.6	53.9	54.2	54.4	54.5	55.0	55.2	55.8	56.5	56.8	58.1	58.6
Agricultural sciences .....	11.3	11.1	10.3	8.3	8.3	8.0	7.8	7.9	8.2	8.3	8.1	7.7	7.4	7.2	7.1
Biological sciences.....	18.5	17.0	18.4	17.6	17.4	17.6	17.7	17.6	17.3	17.0	17.2	17.7	18.3	18.7	18.2
Medical sciences.....	23.8	23.5	23.9	25.5	25.9	26.4	26.7	26.8	27.4	27.7	28.4	28.9	29.1	29.9	31.1
Other.....	2.2	1.5	1.9	2.2	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.0	2.3	2.3
Psychology.....	2.4	1.8	1.6	1.6	1.6	1.7	1.8	1.7	1.7	1.7	1.6	1.7	1.7	1.7	1.8
Social sciences .....	7.5	5.6	4.0	4.3	4.3	4.3	4.5	4.5	4.6	4.8	4.6	4.4	4.5	4.3	4.4
Economics .....	1.6	1.5	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.2	1.1	1.0	1.0	0.8	0.8
Political science .....	0.9	0.9	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.8	0.8
Sociology .....	2.0	1.4	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.1	1.0	1.0	1.0	1.0
Other.....	3.0	1.8	1.4	1.6	1.5	1.5	1.7	1.7	1.7	1.8	1.8	1.7	1.9	1.7	1.8
Other sciences .....	2.9	2.4	1.9	2.1	1.9	1.7	1.8	1.9	1.9	1.8	2.1	1.7	1.6	1.8	1.8
Engineering .....	11.2	14.2	14.6	16.3	16.5	16.3	15.8	16.0	15.9	16.1	15.8	15.7	15.5	15.1	15.3
Aeronautical/astronautical.....	NA	0.9	0.8	1.0	1.0	1.0	1.1	1.0	1.1	1.0	1.0	1.0	0.9	0.9	1.0
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3	0.4	0.5	0.6	0.6
Chemical.....	NA	1.0	1.2	1.3	1.4	1.4	1.4	1.3	1.3	1.4	1.3	1.3	1.3	1.2	1.3
Civil.....	NA	1.4	1.6	1.7	1.8	1.8	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0
Electrical/electronic .....	NA	3.0	3.5	4.1	3.9	3.7	3.5	3.5	3.7	3.9	3.9	4.0	3.7	3.7	3.5
Mechanical.....	NA	2.3	2.1	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.1	2.2	2.3	2.1	2.1
Materials.....	NA	NA	NA	1.7	1.7	1.6	1.5	1.5	1.5	1.5	1.6	1.5	1.4	1.3	1.4
Other.....	11.2	5.6	5.4	4.1	4.3	4.3	4.1	4.3	4.0	4.1	3.6	3.5	3.5	3.3	3.3

NA not available

NOTES: Details may not add to totals because of rounding. See appendix table 4-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1996 dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 5-8

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## Federal obligations for academic R&amp;D, by agency: 1970–2003

Year	All agencies	National Institutes of Health <sup>a</sup>	National Science Foundation	Department of Defense	National	Department of Energy <sup>b</sup>	Department of Agriculture	All other agencies
					Aeronautics and Space Administration			
Millions of current dollars								
1970 .....	1,476	518	228	216	131	100	65	217
1971 .....	1,645	603	267	211	134	94	72	264
1972 .....	1,904	756	362	217	119	85	87	277
1973 .....	1,917	761	374	204	111	83	94	289
1974 .....	2,214	1,027	389	197	99	94	95	312
1975 .....	2,411	1,077	435	203	108	132	108	348
1976 .....	2,552	1,185	437	240	119	145	120	307
1977 .....	2,905	1,311	511	273	118	188	140	364
1978 .....	3,375	1,493	537	383	127	240	186	408
1979 .....	3,889	1,880	617	438	139	260	200	355
1980 .....	4,263	2,012	685	495	158	285	216	412
1981 .....	4,466	2,101	702	573	171	300	243	376
1982 .....	4,605	2,140	715	664	186	277	255	369
1983 .....	4,966	2,392	783	724	189	297	275	306
1984 .....	5,547	2,715	880	830	204	321	261	335
1985 .....	6,340	3,158	1,002	940	237	357	293	352
1986 .....	6,559	3,243	992	1,098	254	345	274	355
1987 .....	7,337	3,903	1,096	1,017	294	386	280	361
1988 .....	7,828	4,199	1,143	1,071	338	406	305	366
1989 .....	8,672	4,565	1,254	1,189	434	454	328	449
1990 .....	9,138	4,779	1,321	1,213	471	500	348	505
1991 .....	10,169	5,521	1,436	1,152	534	621	386	520
1992 .....	10,271	5,064	1,540	1,403	586	640	438	600
1993 .....	11,208	5,848	1,562	1,616	614	583	433	553
1994 .....	11,797	6,191	1,680	1,703	641	565	439	577
1995 .....	11,928	6,271	1,734	1,589	708	594	435	597
1996 .....	11,978	6,620	1,740	1,447	665	601	376	529
1997 .....	12,559	7,057	1,819	1,345	719	583	441	595
1998 .....	13,366	7,565	1,875	1,422	787	623	415	679
1999 .....	14,959	8,762	2,076	1,474	787	630	492	739
2000 .....	16,815	10,087	2,265	1,606	845	668	554	790
2001 .....	19,588	11,528	2,498	2,285	942	743	652	939
2002 (estimated) .....	21,344	13,119	2,664	2,207	942	746	639	1,027
2003 (estimated) .....	23,055	15,229	2,790	1,845	942	749	575	925
Millions of constant 1996 dollars								
1970 .....	5,179	1,817	800	759	461	352	227	762
1971 .....	5,497	2,017	891	705	448	314	240	882
1972 .....	6,078	2,414	1,157	692	380	270	279	885
1973 .....	5,859	2,327	1,145	623	340	253	288	883
1974 .....	6,318	2,931	1,111	563	282	268	270	892
1975 .....	6,236	2,784	1,125	526	279	341	280	901
1976 .....	6,164	2,861	1,055	581	287	351	289	741
1977 .....	6,528	2,946	1,148	614	264	423	315	818
1978 .....	7,096	3,139	1,129	806	267	505	392	857
1979 .....	7,563	3,657	1,199	852	270	506	389	691
1980 .....	7,615	3,593	1,223	885	282	509	387	736
1981 .....	7,271	3,420	1,143	933	279	489	395	611
1982 .....	7,008	3,256	1,088	1,010	282	422	388	562
1983 .....	7,239	3,486	1,141	1,055	276	433	401	447
1984 .....	7,797	3,817	1,237	1,167	287	451	367	472
1985 .....	8,627	4,297	1,363	1,279	323	486	399	480
1986 .....	8,715	4,308	1,318	1,459	338	458	363	471
1987 .....	9,488	5,048	1,418	1,315	380	500	362	467
1988 .....	9,802	5,258	1,432	1,341	423	508	382	458
1989 .....	10,457	5,505	1,512	1,433	523	547	395	541
1990 .....	10,619	5,554	1,535	1,410	547	582	405	587
1991 .....	11,374	6,176	1,606	1,288	597	694	432	581





Appendix table 5-9

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## Federal obligations for academic research, by agency: 1970–2003

Year	All agencies	National Institutes of Health <sup>a</sup>	National Science Foundation	Department of Defense	National	Department of Energy <sup>b</sup>	Department of Agriculture	All other agencies
					Aeronautics and Space Administration			
Millions of current dollars								
1970 .....	1,276	480	223	173	65	97	65	174
1971 .....	1,430	551	254	184	70	90	72	210
1972 .....	1,643	677	346	177	48	81	87	226
1973 .....	1,691	749	370	161	80	79	94	158
1974 .....	1,958	1,004	369	167	85	86	94	153
1975 .....	2,079	1,036	420	165	91	112	108	148
1976 .....	2,250	1,138	429	192	98	116	119	158
1977 .....	2,584	1,269	505	221	105	134	139	211
1978 .....	2,928	1,437	534	243	116	175	181	241
1979 .....	3,333	1,657	612	271	125	204	198	266
1980 .....	3,699	1,835	680	313	146	224	214	287
1981 .....	3,920	1,929	698	363	157	248	240	284
1982 .....	4,045	1,995	713	413	156	236	253	280
1983 .....	4,468	2,246	783	472	170	273	273	250
1984 .....	5,030	2,573	880	539	177	311	260	290
1985 .....	5,726	2,990	1,002	587	213	336	292	305
1986 .....	5,883	3,054	992	707	225	334	273	298
1987 .....	6,640	3,651	1,096	681	263	372	279	298
1988 .....	7,023	3,856	1,143	729	310	384	304	297
1989 .....	7,793	4,167	1,254	840	387	437	326	382
1990 .....	8,137	4,349	1,321	795	422	479	346	426
1991 .....	8,868	4,729	1,436	794	474	596	384	456
1992 .....	9,061	4,517	1,540	912	512	605	436	538
1993 .....	9,892	5,253	1,562	1,090	539	547	429	472
1994 .....	10,292	5,517	1,680	1,079	555	529	436	496
1995 .....	10,354	5,481	1,734	1,047	588	558	431	516
1996 .....	10,707	5,924	1,740	1,071	560	566	373	471
1997 .....	11,173	6,309	1,819	945	596	552	437	515
1998 .....	11,741	6,716	1,875	965	648	564	408	566
1999 .....	13,204	7,733	2,076	989	745	562	482	617
2000 .....	16,016	10,087	2,265	1,113	721	619	547	665
2001 .....	18,657	11,528	2,498	1,697	812	695	643	785
2002 (estimated) .....	20,331	13,119	2,664	1,559	812	698	629	850
2003 (estimated) .....	22,229	15,229	2,790	1,345	812	707	567	780
Millions of constant 1996 dollars								
1970 .....	4,480	1,686	784	606	230	339	227	609
1971 .....	4,780	1,840	848	615	235	300	240	703
1972 .....	5,245	2,162	1,105	564	154	259	279	722
1973 .....	5,170	2,289	1,132	491	246	241	288	483
1974 .....	5,589	2,866	1,053	477	242	244	269	437
1975 .....	5,376	2,678	1,086	427	235	290	278	383
1976 .....	5,434	2,749	1,036	463	236	281	288	382
1977 .....	5,804	2,850	1,134	496	236	301	312	475
1978 .....	6,157	3,022	1,123	510	245	367	381	508
1979 .....	6,483	3,223	1,191	527	244	396	385	517
1980 .....	6,607	3,277	1,215	558	261	400	383	512
1981 .....	6,383	3,141	1,136	591	256	404	391	463
1982 .....	6,156	3,035	1,085	628	237	359	385	427
1983 .....	6,512	3,274	1,141	688	247	398	398	365
1984 .....	7,070	3,617	1,237	757	249	438	365	408
1985 .....	7,792	4,069	1,363	799	290	457	398	416
1986 .....	7,817	4,058	1,318	940	299	444	363	397
1987 .....	8,587	4,721	1,418	881	340	481	361	386
1988 .....	8,794	4,829	1,432	913	388	481	381	371
1989 .....	9,397	5,024	1,512	1,013	467	527	393	461
1990 .....	9,456	5,054	1,535	924	490	557	402	495
1991 .....	9,919	5,290	1,606	888	531	666	429	510
1992 .....	9,876	4,924	1,679	994	558	660	475	586

Appendix table 5-9

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## Federal obligations for academic research, by agency: 1970–2003

Year	All agencies	National Institutes of Health <sup>a</sup>	National Science Foundation	Department of Defense	National Aeronautics and Space Administration	Department of Energy <sup>b</sup>	Department of Agriculture	All other agencies
Millions of constant 1996 dollars								
1993 .....	10,532	5,592	1,663	1,161	574	583	457	503
1994 .....	10,725	5,750	1,751	1,124	579	551	454	517
1995 .....	10,561	5,590	1,768	1,068	599	569	440	526
1996 .....	10,707	5,924	1,740	1,071	560	566	373	471
1997 .....	10,960	6,188	1,784	927	585	542	428	505
1998 .....	11,356	6,496	1,813	933	626	545	395	548
1999 .....	12,594	7,376	1,980	943	710	536	459	589
2000 .....	14,988	9,439	2,120	1,041	675	579	512	622
2001 .....	17,043	10,531	2,282	1,550	742	635	587	717
2002 (estimated) .....	18,433	11,894	2,415	1,414	736	633	571	770
2003 (estimated) .....	19,899	13,633	2,498	1,204	727	632	508	698
Percent distribution								
1970 .....	100.0	37.6	17.5	13.5	5.1	7.6	5.1	13.6
1971 .....	100.0	38.5	17.7	12.9	4.9	6.3	5.0	14.7
1972 .....	100.0	41.2	21.1	10.8	2.9	4.9	5.3	13.8
1973 .....	100.0	44.3	21.9	9.5	4.8	4.7	5.6	9.3
1974 .....	100.0	51.3	18.8	8.5	4.3	4.4	4.8	7.8
1975 .....	100.0	49.8	20.2	7.9	4.4	5.4	5.2	7.1
1976 .....	100.0	50.6	19.1	8.5	4.3	5.2	5.3	7.0
1977 .....	100.0	49.1	19.5	8.6	4.1	5.2	5.4	8.2
1978 .....	100.0	49.1	18.2	8.3	4.0	6.0	6.2	8.2
1979 .....	100.0	49.7	18.4	8.1	3.8	6.1	5.9	8.0
1980 .....	100.0	49.6	18.4	8.5	3.9	6.1	5.8	7.8
1981 .....	100.0	49.2	17.8	9.3	4.0	6.3	6.1	7.3
1982 .....	100.0	49.3	17.6	10.2	3.9	5.8	6.3	6.9
1983 .....	100.0	50.3	17.5	10.6	3.8	6.1	6.1	5.6
1984 .....	100.0	51.2	17.5	10.7	3.5	6.2	5.2	5.8
1985 .....	100.0	52.2	17.5	10.3	3.7	5.9	5.1	5.3
1986 .....	100.0	51.9	16.9	12.0	3.8	5.7	4.6	5.1
1987 .....	100.0	55.0	16.5	10.3	4.0	5.6	4.2	4.5
1988 .....	100.0	54.9	16.3	10.4	4.4	5.5	4.3	4.2
1989 .....	100.0	53.5	16.1	10.8	5.0	5.6	4.2	4.9
1990 .....	100.0	53.4	16.2	9.8	5.2	5.9	4.2	5.2
1991 .....	100.0	53.3	16.2	9.0	5.4	6.7	4.3	5.1
1992 .....	100.0	49.9	17.0	10.1	5.6	6.7	4.8	5.9
1993 .....	100.0	53.1	15.8	11.0	5.4	5.5	4.3	4.8
1994 .....	100.0	53.6	16.3	10.5	5.4	5.1	4.2	4.8
1995 .....	100.0	52.9	16.7	10.1	5.7	5.4	4.2	5.0
1996 .....	100.0	55.3	16.3	10.0	5.2	5.3	3.5	4.4
1997 .....	100.0	56.5	16.3	8.5	5.3	4.9	3.9	4.6
1998 .....	100.0	57.2	16.0	8.2	5.5	4.8	3.5	4.8
1999 .....	100.0	58.6	15.7	7.5	5.6	4.3	3.6	4.7
2000 .....	100.0	63.0	14.1	6.9	4.5	3.9	3.4	4.1
2001 .....	100.0	61.8	13.4	9.1	4.4	3.7	3.4	4.2
2002 (estimated) .....	100.0	64.5	13.1	7.7	4.0	3.4	3.1	4.2
2003 (estimated) .....	100.0	68.5	12.6	6.0	3.7	3.2	2.6	3.5

<sup>a</sup>Includes Alcohol, Drug Abuse, and Mental Health Administration.

<sup>b</sup>Data for 1970–73 are for Atomic Energy Commission; data for 1974–76 are for Energy Research and Development Administration; data for 1977 and thereafter are for U.S. Department of Energy.

NOTES: Academic research includes basic and applied research. Percents may not sum to 100 because of rounding. See appendix table 4-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1996 dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 2001, 2002, and 2003* (Arlington, VA, forthcoming); and NSF/SRS, *Federal Funds for Research and Development: Detailed Historical Tables: Fiscal Years 1951–2001*, NSF 01-334 (Arlington, VA, 2001), <http://www.nsf.gov/sbe/srs/nsf01334/start.htm>.

Appendix table 5-10

**Federal agencies' academic research obligations, by field: FY 2001**

(Percent distribution)

Field	Department of Health and Human Services	National Science Foundation	Department of Defense	National Aeronautics and Space Administration	Department of Energy	Department of Agriculture
All fields .....	100.0	100.0	100.0	100.0	100.0	100.0
Sciences.....	99.1	81.9	64.8	85.1	89.4	95.7
Physical sciences .....	1.7	18.7	8.1	37.5	56.0	4.4
Astronomy.....	0.0	2.1	0.0	26.6	0.0	0.0
Chemistry .....	1.5	6.1	3.1	1.2	9.4	4.4
Physics .....	0.0	6.6	4.4	6.1	41.6	0.0
Other.....	0.2	3.9	0.7	3.6	5.0	0.0
Mathematics .....	0.2	4.2	1.5	0.1	2.1	0.1
Computer sciences.....	0.0	17.3	17.1	4.1	1.7	0.0
Earth, atmospheric, and ocean sciences .....	1.5	14.6	6.2	21.3	12.5	0.5
Atmospheric sciences .....	0.0	3.2	0.8	8.1	3.7	0.5
Earth sciences.....	0.0	4.2	0.4	1.4	4.0	0.0
Oceanography.....	0.0	6.6	4.6	1.6	0.5	0.0
Other.....	1.5	0.6	0.3	10.2	4.4	0.0
Life sciences .....	89.9	15.9	31.0	6.6	17.1	80.4
Agricultural sciences .....	0.0	0.0	0.0	0.1	0.0	44.1
Biological sciences (excluding environmental) .....	78.9	12.0	5.1	2.5	9.6	18.1
Environmental biology .....	0.0	3.9	0.5	0.6	0.0	16.7
Medical sciences.....	9.6	0.0	23.4	1.0	7.6	1.6
Other.....	1.4	0.0	2.0	2.4	0.0	0.0
Psychology .....	2.8	0.2	0.7	0.5	0.0	0.0
Biological aspects .....	0.0	0.0	0.6	0.1	0.0	0.0
Social aspects.....	0.0	0.2	0.0	0.2	0.0	0.0
Other.....	2.8	0.0	0.0	0.3	0.0	0.0
Social sciences .....	0.9	4.1	0.0	0.0	0.0	10.4
Anthropology.....	0.0	0.5	0.0	0.0	0.0	0.0
Economics .....	0.0	0.7	0.0	0.0	0.0	8.5
Political science .....	0.0	0.3	0.0	0.0	0.0	0.0
Sociology .....	0.0	0.2	0.0	0.0	0.0	1.9
Other.....	0.9	2.5	0.0	0.0	0.0	0.0
Other sciences .....	2.0	6.8	0.3	14.9	0.0	0.0
Engineering .....	0.9	18.1	35.2	14.9	10.6	4.3
Aeronautical .....	0.0	0.0	2.0	3.9	0.0	0.0
Astronautical .....	0.0	0.0	0.2	2.6	0.0	0.0
Chemical.....	0.0	1.9	0.4	0.3	2.1	0.0
Civil.....	0.0	1.7	0.2	0.0	0.7	0.0
Electrical .....	0.0	2.2	9.9	1.4	0.4	0.0
Mechanical.....	0.0	0.2	4.4	1.1	1.6	0.0
Materials.....	0.3	4.9	8.6	2.0	2.2	0.0
Other.....	0.6	7.1	9.5	3.6	3.6	4.2

NOTES: Academic research includes both basic and applied research. The agencies shown are the only ones that report research obligations to academia by S&E field; they represent approximately 97 percent of academic research obligations. Percents may not sum to 100 because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2001, 2002, and 2003* (Arlington, VA, forthcoming).

Appendix table 5-11

**Federal academic research obligations provided by major agencies, by field: FY 2001**

(Percent distribution)

Field	All agencies	Department of Health and Human Services	National Science Foundation	Department of Defense	National Aeronautics and Space Administration	Department of Energy	Department of Agriculture
All fields .....	100.0	65.0	13.8	9.4	4.5	3.8	3.5
Sciences .....	100.0	69.7	12.2	6.6	4.1	3.7	3.7
Physical sciences .....	100.0	13.1	30.6	9.1	20.0	25.5	1.8
Astronomy.....	100.0	0.0	19.5	0.0	80.5	0.0	0.0
Chemistry .....	100.0	36.6	31.4	10.7	2.0	13.5	5.7
Physics .....	100.0	0.0	28.4	12.8	8.6	50.2	0.0
Other.....	100.0	10.7	50.2	6.2	15.2	17.8	0.0
Mathematics .....	100.0	16.0	60.4	14.4	0.6	8.4	0.2
Computer sciences.....	100.0	0.0	56.3	37.8	4.3	1.5	0.0
Earth, atmospheric, and ocean sciences.....	100.0	19.8	39.9	11.5	18.9	9.5	0.3
Atmospheric sciences .....	100.0	0.0	42.6	7.5	34.8	13.4	1.6
Earth sciences.....	100.0	0.2	69.0	4.8	7.7	18.3	0.0
Ocean sciences.....	100.0	0.0	63.5	30.3	4.9	1.2	0.0
Other.....	100.0	57.6	4.8	1.6	26.4	9.7	0.0
Life sciences .....	100.0	86.8	3.3	4.3	0.4	1.0	4.2
Agricultural sciences .....	100.0	0.0	0.0	0.2	0.4	0.0	99.4
Biological sciences (excluding environmental) .....	100.0	94.0	3.0	0.9	0.2	0.7	1.2
Environmental biology .....	100.0	0.0	44.9	3.7	2.1	0.0	49.3
Medical sciences.....	100.0	70.9	0.0	24.7	0.5	3.3	0.6
Other.....	100.0	75.6	0.0	15.3	9.0	0.0	0.0
Psychology.....	100.0	94.5	1.1	3.1	1.2	0.0	0.0
Biological aspects .....	100.0	0.0	0.0	93.8	6.2	0.0	0.0
Social aspects.....	100.0	1.4	62.4	10.4	25.8	0.0	0.0
Other.....	100.0	99.4	0.0	0.0	0.6	0.0	0.0
Social sciences .....	100.0	39.1	36.9	0.0	0.1	0.0	23.9
Anthropology.....	100.0	0.0	99.8	0.1	0.0	0.0	0.2
Economics .....	100.0	2.8	23.4	0.0	0.0	0.0	73.9
Political science .....	100.0	0.0	96.7	0.0	3.3	0.0	0.0
Sociology .....	100.0	2.3	27.2	0.0	0.0	0.0	70.5
Other.....	100.0	62.8	37.1	0.0	0.1	0.0	0.0
Other sciences .....	100.0	44.5	32.0	0.8	22.6	0.0	0.0
Engineering .....	100.0	7.5	32.9	43.4	8.8	5.3	2.0
Aeronautical .....	100.0	0.0	0.0	51.4	48.6	0.0	0.0
Astronautical .....	100.0	0.0	0.0	13.5	86.5	0.0	0.0
Chemical .....	100.0	0.0	66.4	9.7	3.3	20.2	0.4
Civil.....	100.0	0.0	85.4	5.1	0.3	9.0	0.2
Electrical .....	100.0	0.0	23.5	70.5	4.6	1.3	0.0
Mechanical.....	100.0	0.0	5.8	74.1	8.9	11.1	0.1
Materials.....	100.0	11.0	36.2	43.6	4.7	4.5	0.0
Other.....	100.0	13.5	36.7	33.0	6.1	5.1	5.6

NOTES: Academic research includes both basic and applied research. The agencies shown are the only ones that report research obligations to academia by S&E field; they represent approximately 97 percent of academic research obligations.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2001, 2002, and 2003* (Arlington, VA, forthcoming).

Appendix table 5-12  
**Academic institutions receiving Federal R&D support, by selected Carnegie classification: 1972–2000**

Year	All academic institutions	Carnegie research and doctorate-granting institutions	Other Carnegie institutions
1972 .....	617	223	394
1973 .....	534	219	315
1974 .....	547	217	330
1975 .....	558	221	337
1976 .....	572	222	350
1977 .....	617	220	397
1978 .....	674	221	453
1979 .....	663	223	440
1980 .....	683	223	460
1981 .....	619	225	394
1982 .....	586	223	363
1983 .....	600	226	374
1984 .....	602	225	377
1985 .....	646	226	420
1986 .....	650	225	425
1987 .....	764	228	536
1988 .....	685	228	457
1989 .....	716	229	487
1990 .....	748	228	520
1991 .....	777	227	550
1992 .....	839	228	611
1993 .....	891	227	664
1994 .....	907	227	680
1995 .....	901	228	673
1996 .....	843	228	615
1997 .....	844	228	616
1998 .....	794	230	564
1999 .....	791	228	563
2000 .....	814	227	587

NOTE: See chapter 2, "Classification of Academic Institutions," for information on the institutional categories used by the Carnegie Foundation for the Advancement of Teaching.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions: Fiscal Year 2001* (Arlington, VA, forthcoming); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 5-13

**Academic research space, by field: 1988–2001**

(Millions of net assignable square feet)

S&E field	1988	1990	1992	1994	1996	1998	1999	2001
All fields .....	112	116	122	127	136	143	150	155
Physical sciences .....	16	16	16	17	18	18	19	19
Mathematics .....	1	1	1	1	1	1	1	1
Computer sciences .....	1	1	2	2	2	2	2	2
Earth, atmospheric, and ocean sciences .....	6	6	7	7	7	8	8	8
Agricultural sciences .....	18	21	20	20	22	25	25	27
Biological sciences .....	24	27	28	28	30	31	32	33
Universities and colleges .....	16	18	17	17	19	19	20	20
Medical schools .....	8	9	11	11	11	12	13	13
Medical sciences .....	19	20	22	23	25	25	27	28
Universities and colleges .....	5	5	6	6	7	7	8	8
Medical schools .....	14	15	16	17	18	18	19	20
Psychology .....	3	3	3	3	3	3	4	4
Social sciences .....	3	3	3	3	4	5	5	5
Other sciences .....	4	2	2	2	2	3	3	3
Engineering .....	16	17	18	21	22	23	25	26

NOTES: Total R&D space is current actual space reported at the time of the survey. Square footage refers to net assignable square feet (the sum of all areas on all floors of a building assigned to, or available to be assigned to, an occupant for specific use, such as instruction or research). Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, *Scientific and Engineering Research Facilities: 2001*, NSF 02-307 (Arlington, VA, 2001).

Science & Engineering Indicators – 2004

## Current expenditures for research equipment at academic institutions, by field: Selected years, 1983–2001

Field	1983	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of current dollars															
All fields .....	450	672	837	986	1,013	1,025	1,034	1,042	1,107	1,238	1,213	1,288	1,294	1,318	1,421	1,490
Sciences .....	371	547	659	784	793	791	809	824	856	966	928	987	996	1,032	1,115	1,157
Physical sciences .....	81	142	166	181	191	190	198	207	207	239	233	243	253	248	249	240
Astronomy.....	4	7	7	10	13	14	14	17	20	22	21	26	25	29	25	15
Chemistry .....	32	54	66	76	73	69	70	75	78	81	88	89	91	102	103	100
Physics .....	37	71	82	83	91	88	94	90	90	114	105	108	122	106	110	113
Other .....	8	10	12	12	14	18	20	26	19	22	19	19	16	11	12	13
Mathematics .....	4	6	10	10	10	11	10	15	15	14	13	15	14	12	10	12
Computer sciences.....	20	35	43	43	48	59	45	54	59	77	67	71	63	63	56	65
Earth, atmospheric, and ocean sciences.....	31	48	55	68	72	70	78	77	83	83	88	93	102	100	100	89
Atmospheric sciences .....	5	8	11	13	11	10	11	15	12	14	14	15	15	15	13	13
Earth sciences.....	12	18	20	26	27	29	30	27	30	27	31	35	37	35	37	29
Ocean sciences.....	11	16	17	18	20	19	28	24	27	28	29	31	33	37	34	35
Other.....	3	5	7	11	13	12	9	11	15	15	14	13	17	13	17	11
Life sciences .....	209	283	335	431	420	412	430	418	434	464	444	478	495	547	614	665
Agricultural sciences .....	41	52	49	59	54	53	59	53	68	63	63	69	76	72	76	81
Biological sciences.....	74	105	130	175	171	168	174	171	175	191	180	196	190	243	268	282
Medical sciences.....	87	114	142	177	177	169	176	178	173	187	183	198	213	213	248	281
Other.....	7	12	14	20	19	22	21	16	18	23	18	15	16	19	21	20
Psychology.....	7	9	11	11	11	11	11	15	13	12	12	13	13	12	14	14
Social sciences .....	9	10	12	14	15	14	18	19	21	27	25	24	22	18	19	17
Economics .....	2	3	3	4	4	5	5	5	6	7	6	5	4	4	3	2
Political science .....	1	1	1	2	1	2	2	3	3	3	3	3	3	2	2	2
Sociology .....	1	2	2	3	3	3	3	4	4	4	4	4	4	3	3	3
Other .....	5	4	5	6	7	5	7	8	9	12	11	11	11	9	11	9
Other sciences .....	10	15	27	26	25	25	18	18	23	51	45	48	33	32	51	55
Engineering .....	80	124	178	202	220	234	225	218	251	272	285	301	298	286	306	334
Aeronautical/astronautical .....	3	7	9	11	13	17	12	13	19	16	16	19	20	22	20	24
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	6	8	14	15
Chemical .....	6	11	15	19	18	20	20	22	19	22	24	23	28	27	26	31
Civil .....	7	10	12	16	20	18	16	18	19	22	26	28	21	23	29	32
Electrical/electronic.....	23	33	44	49	58	52	57	56	66	68	75	83	83	70	72	79
Mechanical .....	11	17	25	29	32	34	31	35	37	42	43	46	51	51	55	49
Materials.....	NA	NA	NA	NA	27	33	29	23	25	28	32	36	29	28	30	49
Other .....	29	46	75	78	51	59	61	51	66	73	69	62	60	57	61	55



## Current expenditures for research equipment at academic institutions, by field: Selected years, 1983–2001

Field	1983	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant 1996 dollars															
All fields .....	657	914	1,082	1,189	1,177	1,147	1,127	1,109	1,153	1,263	1,213	1,263	1,252	1,257	1,330	1,361
Sciences .....	541	745	852	946	921	885	882	877	892	986	928	968	963	984	1,043	1,057
Physical sciences .....	118	193	215	218	222	212	216	221	216	244	233	238	245	236	233	219
Astronomy.....	6	10	8	12	15	16	15	18	21	23	21	26	24	27	23	13
Chemistry .....	47	73	85	91	85	77	77	80	81	83	88	88	88	97	96	91
Physics .....	53	97	106	100	106	98	102	95	93	117	105	106	118	101	103	103
Other .....	11	13	16	15	16	20	22	28	20	22	19	19	15	11	12	12
Mathematics .....	5	8	13	12	12	12	11	16	16	15	13	15	14	11	9	11
Computer sciences.....	29	48	55	52	56	65	49	57	62	78	67	70	61	60	53	59
Earth, atmospheric, and ocean sciences ...	45	65	72	81	84	78	85	82	87	85	88	92	98	95	94	81
Atmospheric sciences .....	8	11	15	15	13	12	12	15	12	14	14	15	14	14	12	12
Earth sciences.....	17	25	26	31	32	32	33	29	31	27	31	34	36	33	35	27
Ocean sciences.....	17	22	22	22	23	21	30	26	28	28	29	30	32	36	32	32
Other.....	4	7	9	14	16	13	10	12	15	15	14	12	16	13	15	10
Life sciences .....	305	385	434	520	488	461	469	445	453	473	444	469	478	522	575	607
Agricultural sciences.....	60	70	64	71	62	59	64	57	71	65	63	68	73	69	72	74
Biological sciences.....	108	143	168	211	199	188	190	182	182	195	180	192	184	232	251	258
Medical sciences.....	127	156	184	213	206	189	191	189	181	190	183	194	206	203	233	257
Other.....	10	16	19	24	22	24	23	17	19	23	18	15	15	18	20	18
Psychology.....	10	12	14	13	12	12	12	16	13	12	12	13	13	11	13	13
Social sciences .....	14	14	15	17	17	16	19	20	22	27	25	24	21	17	18	15
Economics .....	3	4	4	5	5	5	5	5	6	7	6	5	4	4	3	2
Political science .....	1	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2
Sociology .....	2	3	3	4	3	3	4	4	4	4	4	4	4	3	3	3
Other .....	7	6	7	7	8	5	7	8	9	12	11	11	11	8	11	9
Other sciences .....	15	20	35	32	29	28	20	19	24	52	45	48	32	31	48	50
Engineering .....	116	169	231	243	256	262	245	232	261	277	285	295	289	273	286	305
Aeronautical/astronautical .....	5	9	11	14	15	19	13	14	20	17	16	19	19	21	19	22
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	6	7	13	14
Chemical .....	9	15	19	23	21	22	22	23	20	22	24	23	28	26	24	28
Civil .....	11	14	15	19	23	20	17	20	20	23	26	27	21	22	27	29
Electrical/electronic.....	33	45	56	59	68	58	62	59	68	70	75	81	80	67	67	72
Mechanical .....	16	24	33	35	38	38	34	37	39	43	43	45	49	48	51	45
Materials.....	NA	NA	NA	NA	31	37	31	25	26	28	32	35	28	27	28	45
Other .....	42	62	97	94	60	66	66	54	69	75	69	61	58	54	57	50

## Current expenditures for research equipment at academic institutions, by field: Selected years, 1983–2001

Field	1983	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Percent distribution															
All fields .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sciences .....	82.3	81.5	78.7	79.5	78.3	77.2	78.2	79.1	77.4	78.0	76.5	76.6	76.9	78.3	78.5	77.6
Physical sciences .....	17.9	21.1	19.9	18.3	18.9	18.5	19.2	19.9	18.7	19.3	19.2	18.9	19.6	18.8	17.6	16.1
Astronomy.....	0.9	1.0	0.8	1.0	1.3	1.4	1.4	1.6	1.8	1.8	1.7	2.0	2.0	2.2	1.7	1.0
Chemistry .....	7.2	8.0	7.9	7.7	7.2	6.8	6.8	7.2	7.1	6.5	7.2	6.9	7.0	7.7	7.2	6.7
Physics .....	8.1	10.6	9.7	8.4	9.0	8.6	9.1	8.6	8.1	9.2	8.7	8.4	9.4	8.1	7.7	7.6
Other .....	1.7	1.4	1.5	1.2	1.4	1.8	1.9	2.5	1.8	1.7	1.6	1.5	1.2	0.9	0.9	0.9
Mathematics .....	0.8	0.9	1.2	1.0	1.0	1.0	1.0	1.5	1.3	1.2	1.1	1.2	1.1	0.9	0.7	0.8
Computer sciences.....	4.4	5.3	5.1	4.4	4.7	5.7	4.4	5.1	5.3	6.2	5.5	5.5	4.9	4.8	4.0	4.4
Earth, atmospheric, and ocean sciences ...	6.9	7.1	6.6	6.8	7.1	6.8	7.5	7.4	7.5	6.7	7.3	7.3	7.9	7.6	7.1	6.0
Atmospheric sciences .....	1.2	1.2	1.3	1.3	1.1	1.0	1.1	1.4	1.0	1.1	1.1	1.2	1.1	1.1	0.9	0.9
Earth sciences.....	2.6	2.7	2.4	2.6	2.7	2.8	2.9	2.6	2.7	2.2	2.6	2.7	2.9	2.6	2.6	2.0
Ocean sciences.....	2.5	2.4	2.0	1.8	2.0	1.9	2.7	2.3	2.5	2.2	2.4	2.4	2.5	2.8	2.4	2.3
Other.....	0.7	0.8	0.8	1.2	1.3	1.2	0.9	1.1	1.3	1.2	1.2	1.0	1.3	1.0	1.2	0.8
Life sciences .....	46.4	42.1	40.1	43.7	41.5	40.2	41.6	40.1	39.2	37.4	36.6	37.1	38.2	41.5	43.2	44.6
Agricultural sciences .....	9.1	7.7	5.9	6.0	5.3	5.2	5.7	5.1	6.1	5.1	5.2	5.4	5.9	5.5	5.4	5.4
Biological sciences.....	16.4	15.6	15.5	17.8	16.9	16.4	16.9	16.4	15.8	15.4	14.9	15.2	14.7	18.5	18.9	19.0
Medical sciences.....	19.4	17.0	17.0	17.9	17.5	16.5	17.0	17.1	15.7	15.1	15.1	15.4	16.4	16.2	17.5	18.9
Other.....	1.6	1.7	1.7	2.1	1.9	2.1	2.0	1.5	1.6	1.8	1.5	1.2	1.2	1.4	1.5	1.4
Psychology .....	1.4	1.3	1.3	1.1	1.1	1.1	1.1	1.5	1.1	1.0	1.0	1.0	1.0	0.9	1.0	0.9
Social sciences .....	2.1	1.5	1.4	1.5	1.5	1.4	1.7	1.8	1.9	2.1	2.1	1.9	1.7	1.4	1.4	1.1
Economics .....	0.5	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.6	0.5	0.4	0.3	0.3	0.2	0.2
Political science .....	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1
Sociology .....	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2
Other .....	1.1	0.6	0.7	0.6	0.7	0.5	0.7	0.8	0.8	1.0	0.9	0.9	0.8	0.7	0.8	0.6
Other sciences .....	2.3	2.2	3.2	2.7	2.5	2.5	1.8	1.7	2.1	4.1	3.7	3.8	2.5	2.4	3.6	3.7
Engineering .....	17.7	18.5	21.3	20.5	21.7	22.8	21.8	20.9	22.6	22.0	23.5	23.4	23.1	21.7	21.5	22.4
Aeronautical/astronautical .....	0.8	1.0	1.0	1.1	1.2	1.7	1.1	1.3	1.7	1.3	1.3	1.5	1.5	1.7	1.4	1.6
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3	0.5	0.6	1.0	1.0
Chemical .....	1.3	1.7	1.8	2.0	1.8	1.9	1.9	2.1	1.7	1.8	2.0	1.8	2.2	2.1	1.8	2.1
Civil .....	1.6	1.6	1.4	1.6	2.0	1.7	1.5	1.8	1.7	1.8	2.1	2.1	1.7	1.8	2.0	2.2
Electrical/electronic.....	5.0	4.9	5.2	4.9	5.8	5.1	5.5	5.4	5.9	5.5	6.2	6.4	6.4	5.3	5.0	5.3
Mechanical .....	2.5	2.6	3.0	3.0	3.2	3.3	3.0	3.3	3.4	3.4	3.5	3.6	3.9	3.8	3.9	3.3
Materials.....	NA	NA	NA	NA	2.7	3.2	2.8	2.2	2.3	2.3	2.6	2.8	2.2	2.1	2.1	3.3
Other .....	6.5	6.8	8.9	7.9	5.1	5.8	5.9	4.9	6.0	5.9	5.7	4.8	4.7	4.3	4.3	3.7

NA not available

NOTES: Details may not add to totals because of rounding. See appendix table 4-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1996 dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Appendix table 5-15

## Federal share of current funding for research equipment at academic institutions, by field: Selected years, 1983–2001

(Percent)

Field	1983	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All fields .....	62.3	64.4	62.9	60.4	59.9	59.6	59.8	61.2	60.6	59.3	59.5	58.6	59.8	58.1	56.1	55.2
Sciences .....	61.6	64.7	63.9	61.0	60.1	60.1	60.8	61.9	60.6	59.0	59.0	59.4	59.8	58.0	56.4	55.7
Physical sciences .....	78.8	79.8	78.5	73.6	75.3	73.5	76.4	74.1	72.8	74.6	73.0	70.9	73.9	74.9	70.1	67.0
Astronomy.....	84.0	69.3	75.1	69.2	63.1	61.6	68.9	65.6	63.9	61.6	70.9	65.2	81.8	86.7	83.6	83.6
Chemistry .....	71.7	76.6	74.1	70.2	71.4	68.1	71.9	70.4	68.5	70.1	68.7	65.5	67.1	67.3	61.5	57.8
Physics .....	83.4	84.5	82.2	78.3	81.1	79.0	80.8	75.8	79.0	81.7	77.2	76.2	76.4	79.7	76.9	72.1
Other .....	84.4	70.9	80.1	66.6	69.5	76.8	76.9	84.5	70.8	67.6	72.3	73.8	81.5	67.6	55.6	76.3
Mathematics .....	66.4	82.1	77.6	67.5	65.8	62.7	68.3	75.1	73.5	65.6	74.7	59.3	70.7	64.7	67.6	52.7
Computer sciences.....	72.7	83.0	79.3	71.9	65.8	74.6	65.7	69.9	68.9	63.5	70.8	68.9	70.4	69.1	60.6	64.4
Earth, atmospheric, and ocean sciences.....	61.7	67.7	65.0	66.1	65.9	61.4	67.4	70.8	72.9	69.9	69.9	73.1	67.9	67.6	64.2	62.0
Atmospheric sciences .....	71.3	84.2	79.8	65.1	76.8	75.8	78.2	78.1	81.6	71.5	64.1	74.6	81.5	79.6	80.3	76.2
Earth sciences.....	54.9	56.4	51.8	63.0	56.8	53.2	58.2	61.5	66.9	62.8	65.4	70.0	66.4	59.2	50.8	55.4
Ocean sciences.....	63.7	74.2	75.1	74.8	75.1	71.7	76.6	79.9	80.3	76.5	81.7	76.3	70.8	72.2	74.5	63.8
Other.....	63.5	60.7	55.4	60.6	61.4	52.4	56.0	64.5	64.8	68.6	61.2	72.3	53.8	63.1	61.1	56.8
Life sciences .....	54.9	55.6	56.0	55.2	53.2	53.6	53.8	54.3	52.5	48.6	50.2	50.2	50.9	49.4	52.1	51.6
Agricultural sciences.....	26.8	29.1	31.8	30.8	28.3	30.6	36.5	36.7	35.3	31.9	30.3	31.4	31.8	33.0	27.7	27.7
Biological sciences.....	66.0	67.3	64.5	62.9	60.2	60.5	61.1	60.8	61.0	56.0	58.8	55.7	56.5	56.9	60.2	58.7
Medical sciences.....	58.5	57.4	57.5	55.4	54.3	54.4	53.4	54.1	51.9	48.3	49.9	51.4	53.2	47.1	51.4	51.5
Other.....	58.2	49.1	47.6	56.8	50.6	50.8	44.3	45.6	41.5	34.6	36.6	48.8	43.5	41.4	44.2	49.5
Psychology.....	69.7	71.5	76.6	65.3	63.8	64.6	63.8	68.6	59.9	63.5	62.6	62.7	62.6	65.6	64.3	63.9
Social sciences .....	32.9	40.1	29.0	33.5	32.4	36.6	43.1	40.1	41.5	39.5	40.1	37.2	40.1	38.7	33.2	38.2
Economics .....	40.4	35.6	28.9	25.8	27.2	33.8	48.4	39.3	43.5	38.9	40.2	31.2	34.5	37.7	54.8	40.9
Political science .....	36.9	32.1	26.8	23.0	24.4	32.0	45.8	30.6	49.0	36.8	33.8	36.0	47.3	33.2	39.0	39.0
Sociology .....	59.6	53.5	37.6	38.0	43.2	52.6	52.2	52.9	46.0	46.7	48.4	43.3	47.9	43.4	46.1	38.1
Other .....	21.4	39.1	26.2	39.7	32.8	32.3	33.8	38.0	36.1	38.1	38.8	38.0	37.0	38.6	22.6	37.3
Other sciences .....	59.8	46.1	51.1	49.6	46.1	38.3	28.4	41.3	45.6	63.9	39.9	63.4	47.3	26.8	25.6	39.5
Engineering .....	65.3	62.9	59.1	57.9	58.9	57.9	56.3	58.8	60.6	60.4	61.1	56.0	59.7	58.6	55.2	53.6
Aeronautical/astronautical .....	76.7	75.0	74.7	76.8	81.1	83.8	75.1	81.3	76.9	77.4	71.3	70.2	69.1	70.8	64.1	71.7
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53.1	42.3	46.8	43.2	47.4
Chemical .....	58.1	58.7	53.6	52.2	46.1	49.0	50.5	46.7	58.0	58.8	56.7	55.0	55.6	49.2	52.3	51.7
Civil .....	51.5	58.5	57.6	55.5	58.7	46.7	44.9	44.5	44.6	44.2	44.3	43.7	43.2	49.2	35.3	39.2
Electrical/electronic.....	71.1	68.5	69.0	60.8	61.8	58.2	59.4	65.9	66.8	61.8	68.7	61.6	66.8	65.5	61.7	58.7
Mechanical .....	68.5	65.1	63.9	57.2	56.8	51.8	60.1	64.5	65.8	63.7	63.2	62.7	64.3	63.8	65.0	59.4
Materials.....	NA	NA	NA	NA	66.5	59.7	48.8	51.0	48.6	50.5	53.3	51.4	59.5	61.0	60.9	45.2
Other.....	63.2	58.5	51.1	55.6	52.2	59.0	56.4	55.1	56.8	62.7	60.6	47.8	52.6	49.4	46.3	52.1

NA not available

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

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Appendix table 5-16

**Expenditures of current funds for research equipment at academic institutions as percentage of total academic R&D expenditures, by field: Selected years, 1983–2001**

(Percent)

Field	1983	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All fields .....	5.7	6.9	6.9	6.6	6.2	5.8	5.5	5.2	5.3	5.6	5.3	5.3	5.0	4.8	4.7	4.6
Sciences .....	5.5	6.6	6.4	6.2	5.8	5.4	5.1	4.9	4.8	5.2	4.8	4.8	4.6	4.4	4.4	4.2
Physical sciences .....	9.0	12.4	11.9	11.0	10.6	9.8	9.6	9.7	9.5	10.6	10.3	10.3	10.2	9.5	9.2	8.6
Astronomy .....	5.7	7.3	6.0	7.3	7.8	6.8	5.9	6.5	7.5	7.4	7.7	9.2	8.3	7.5	6.4	3.9
Chemistry .....	9.7	12.8	12.8	12.5	11.3	10.3	10.0	10.1	10.3	10.5	10.9	10.9	10.4	11.1	10.7	9.9
Physics .....	8.8	12.9	12.1	10.6	10.8	10.0	10.2	9.5	9.4	11.6	10.6	10.2	11.3	9.3	9.1	9.1
Other .....	10.1	12.0	11.8	10.4	9.5	10.2	10.4	13.6	10.0	11.3	10.1	9.3	6.9	7.4	7.9	7.1
Mathematics .....	3.5	4.7	5.5	4.8	4.6	4.6	4.2	5.6	5.3	5.2	4.6	5.3	4.6	3.7	3.0	3.3
Computer sciences .....	10.7	12.6	11.5	9.1	9.3	10.6	8.1	8.8	9.1	11.2	9.7	10.1	8.5	7.3	6.4	6.8
Earth, atmospheric, and ocean sciences .....	5.0	6.8	6.6	6.7	6.8	6.3	6.3	5.9	6.0	5.8	5.9	6.1	6.3	5.9	5.7	4.9
Atmospheric sciences .....	5.3	7.7	8.5	7.6	6.6	5.9	5.7	6.9	5.7	6.6	6.0	6.1	5.4	5.1	4.4	4.4
Earth sciences .....	5.3	7.2	7.2	7.9	7.7	7.5	7.3	6.5	6.6	5.9	7.0	7.8	7.3	6.3	6.6	5.3
Ocean sciences .....	5.1	6.3	5.6	5.0	5.3	4.9	6.5	5.3	6.0	5.8	5.5	5.7	6.0	6.2	5.4	5.2
Other .....	3.8	6.0	5.7	7.3	8.1	7.0	4.4	4.9	5.2	5.0	4.9	4.2	5.7	5.2	5.9	3.8
Life sciences .....	4.9	5.4	5.1	5.3	4.8	4.4	4.2	3.9	3.8	3.8	3.5	3.5	3.4	3.5	3.5	3.5
Agricultural sciences .....	4.4	5.2	4.4	4.6	4.0	3.6	3.9	3.4	4.1	3.5	3.3	3.5	3.8	3.5	3.5	3.5
Biological sciences .....	5.2	5.9	6.1	6.6	6.0	5.5	5.3	4.8	4.7	5.0	4.6	4.7	4.2	4.8	4.8	4.8
Medical sciences .....	4.8	4.9	4.7	4.6	4.3	3.7	3.5	3.3	3.1	3.1	2.9	2.9	2.8	2.7	2.8	2.8
Other .....	5.4	6.5	5.5	6.3	5.2	5.4	5.0	3.6	3.9	4.8	3.6	2.9	2.9	3.4	3.1	2.7
Psychology .....	4.8	5.5	5.6	4.6	4.2	3.9	3.4	4.4	3.5	3.3	3.2	3.3	3.0	2.5	2.8	2.4
Social sciences .....	2.7	2.6	2.3	2.3	2.1	1.9	2.2	2.1	2.2	2.6	2.3	2.1	2.0	1.4	1.5	1.2
Economics .....	2.2	2.3	1.9	2.2	2.0	2.2	2.3	2.0	2.3	2.9	2.4	2.0	1.5	1.5	1.2	0.9
Political science .....	1.6	2.0	1.6	1.6	1.3	1.6	1.7	1.9	1.8	1.8	1.9	1.9	1.9	1.0	0.7	0.8
Sociology .....	1.8	2.6	2.2	2.5	2.2	1.7	2.1	2.0	1.9	1.9	1.8	1.7	1.6	1.2	1.1	0.9
Other .....	4.4	3.2	3.1	2.6	2.6	1.9	2.4	2.4	2.6	3.1	2.6	2.6	2.5	1.7	2.2	1.6
Other sciences .....	6.3	7.9	10.5	8.3	7.5	7.6	5.8	4.9	6.0	11.9	10.8	9.4	7.3	7.1	9.5	9.5
Engineering .....	7.1	8.8	9.4	8.4	8.3	8.1	7.4	6.9	7.5	7.7	7.7	7.8	7.3	6.7	6.7	6.7
Aeronautical/astronautical .....	5.0	8.2	7.9	7.5	7.7	9.7	5.9	6.2	8.7	6.8	6.9	7.8	7.8	8.4	7.9	7.0
Bioengineering/biomedical .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.8	6.1	5.6	7.9	7.1
Chemical .....	6.3	9.8	9.9	10.0	8.3	8.2	7.6	7.9	6.7	7.4	7.6	7.4	8.7	7.8	6.9	7.5
Civil .....	5.7	6.8	6.1	6.4	7.1	5.7	4.6	5.0	4.7	5.2	5.7	5.9	4.3	4.4	4.8	4.8
Electrical/electronic .....	8.6	9.7	9.7	8.2	8.8	7.7	8.1	8.0	8.8	8.3	8.5	8.8	7.9	6.9	6.4	6.8
Mechanical .....	7.5	8.4	9.2	8.5	8.3	8.1	6.9	7.2	7.5	8.0	8.2	8.9	9.0	8.1	8.7	7.1
Materials .....	NA	NA	NA	NA	9.9	10.9	9.7	7.8	8.0	8.5	9.1	9.3	7.4	7.4	7.6	10.9
Other .....	6.9	8.8	10.4	9.0	7.7	7.8	7.4	6.2	7.3	8.4	7.3	7.1	6.7	5.9	6.1	5.1

NA not available

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 2001*, NSF 03-316 (Arlington, VA, 2003); and NSF/SRS, WebCASPAR database system, <http://caspar.nsf.gov>.

Science &amp; Engineering Indicators – 2004

Appendix table 5-17

**S&E doctorate holders employed in research universities and other academic institutions, by type of position and primary work activity: 1975–2001**

(Thousands)

Institution type, position, and primary work activity	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All academic institutions</b>														
All positions.....	134.1	145.4	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5	240.2	245.5
Teaching.....	83.8	82.2	83.8	95.9	97.7	101.0	99.3	100.9	103.4	98.3	100.2	105.4	108.6	109.0
Research.....	30.8	37.0	41.3	46.5	48.9	55.9	66.5	72.2	73.9	80.2	83.0	88.6	91.4	93.8
Other work.....	19.4	26.2	30.2	24.7	29.6	33.3	30.1	33.5	33.2	35.2	34.3	38.6	40.2	42.8
Full-time faculty.....	116.4	125.6	131.2	141.9	148.4	156.9	164.4	169.8	173.1	172.4	171.4	178.4	184.0	187.4
Teaching.....	80.2	78.4	79.7	92.1	91.9	94.9	93.6	93.9	96.7	91.4	91.9	95.4	98.6	97.9
Research.....	21.4	25.8	28.1	31.8	33.6	39.5	48.6	51.6	53.8	56.9	56.6	58.0	60.4	62.8
Other work.....	14.8	21.3	23.4	18.0	22.9	22.5	22.2	24.2	22.6	24.1	22.9	24.9	25.0	26.8
Postdocs.....	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9	18.5	17.5
Teaching.....	0.1	0.1	0.2	0.1	0.4	0.2	0.2	0.4	0.1	0.0	0.6	0.6	0.4	0.5
Research.....	5.7	6.8	6.9	7.7	7.1	7.5	8.4	10.3	9.2	12.7	15.1	16.7	16.6	15.6
Other work.....	0.4	0.7	1.0	0.7	0.7	0.9	0.7	0.8	0.6	0.7	1.1	1.5	1.5	1.4
All other types of positions.....	11.5	12.2	15.9	16.6	19.4	24.6	22.1	25.4	27.6	28.1	29.4	35.3	37.5	40.7
Teaching.....	3.5	3.6	3.9	3.7	5.4	5.9	5.5	6.6	6.6	6.9	7.7	9.4	9.5	10.6
Research.....	3.8	4.3	6.2	6.9	8.1	9.0	9.6	10.3	10.9	10.7	11.4	13.8	14.3	15.4
Other work.....	4.2	4.2	5.8	6.0	5.9	9.8	7.1	8.6	10.1	10.4	10.3	12.1	13.7	14.6
<b>Research universities</b>														
All positions.....	73.4	78.2	83.5	91.0	89.9	102.8	106.9	112.5	111.6	113.0	112.8	113.6	117.2	119.6
Teaching.....	36.5	33.4	34.0	39.3	36.8	38.3	36.0	35.8	34.5	32.8	31.7	33.4	33.3	31.9
Research.....	25.5	29.5	32.1	37.5	37.4	45.4	53.7	58.1	57.9	60.6	62.4	60.6	64.3	66.9
Other work.....	11.4	15.4	17.4	14.3	15.6	19.1	17.2	18.7	19.2	19.5	18.7	19.6	19.7	20.8
Full-time faculty.....	61.5	64.7	67.1	73.8	72.2	80.6	84.2	86.6	85.8	84.4	81.6	81.5	84.1	84.8
Teaching.....	35.1	32.1	32.5	37.9	34.9	35.9	33.6	32.9	32.2	30.5	29.1	29.9	30.2	28.0
Research.....	17.4	20.0	21.1	25.1	25.2	31.5	38.4	40.7	41.1	41.5	41.0	39.5	42.2	44.2
Other work.....	8.9	12.6	13.5	10.7	12.1	13.3	12.2	13.0	12.5	12.4	11.5	12.1	11.8	12.6
Postdocs.....	5.3	6.5	6.8	7.0	6.7	7.4	8.1	9.7	8.3	11.3	13.6	13.9	14.1	13.8
Teaching.....	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.1	0.0	0.3	0.4	0.3	0.4
Research.....	4.9	5.9	5.8	6.5	6.1	6.5	7.3	8.9	7.8	10.8	12.4	12.3	12.6	12.4
Other work.....	0.3	0.6	0.9	0.5	0.4	0.7	0.6	0.6	0.4	0.6	0.9	1.2	1.2	1.0
All other types of positions.....	6.6	7.1	9.6	10.2	11.0	14.8	14.5	16.2	17.5	17.3	17.5	18.2	19.0	21.0
Teaching.....	1.3	1.2	1.4	1.3	1.8	2.3	2.2	2.6	2.2	2.4	2.3	3.1	2.8	3.5
Research.....	3.3	3.6	5.2	5.9	6.0	7.5	7.9	8.4	9.0	8.3	8.9	8.8	9.5	10.2
Other work.....	2.2	2.2	3.0	3.1	3.1	5.0	4.4	5.1	6.4	6.6	6.2	6.4	6.8	7.3
<b>Other U&amp;C</b>														
All positions.....	60.7	67.2	71.8	76.0	86.2	87.4	89.0	94.1	99.0	100.8	104.8	118.9	122.9	126.0
Teaching.....	47.3	48.8	49.8	56.7	60.8	62.7	63.3	65.1	69.0	65.5	68.5	72.0	75.3	77.1
Research.....	5.3	7.5	9.2	9.0	11.4	10.6	12.8	14.1	16.0	19.6	20.7	27.9	27.1	26.9
Other work.....	8.1	10.9	12.8	10.4	13.9	14.2	12.9	14.9	14.0	15.7	15.6	19.0	20.5	21.9
Full-time faculty.....	54.9	61.0	64.1	68.2	76.2	76.2	80.2	83.2	87.3	88.1	89.7	96.8	99.9	102.6
Teaching.....	45.1	46.4	47.3	54.1	57.0	59.0	60.0	61.1	64.5	61.0	62.8	65.5	68.4	69.9
Research.....	3.9	5.8	7.0	6.7	8.4	8.0	10.1	10.9	12.7	15.3	15.5	18.5	18.3	18.6
Other work.....	5.9	8.8	9.9	7.4	10.8	9.2	10.0	11.2	10.2	11.7	11.3	12.8	13.2	14.2
Postdocs.....	0.9	1.1	1.3	1.5	1.6	1.3	1.2	1.8	1.5	2.0	3.2	5.0	4.5	3.7
Teaching.....	0.1	0.0	0.1	0.1	0.3	0.0	0.0	0.2	0.1	0.0	0.3	0.2	0.1	0.1
Research.....	0.8	0.9	1.1	1.2	1.1	1.1	1.0	1.4	1.3	1.9	2.7	4.4	4.0	3.1
Other work.....	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.3	0.4
All other types of positions.....	4.8	5.2	6.3	6.4	8.5	9.9	7.6	9.1	10.1	10.8	11.8	17.0	18.5	19.6
Teaching.....	2.1	2.5	2.5	2.4	3.6	3.7	3.2	3.8	4.4	4.6	5.3	6.3	6.7	7.1
Research.....	0.6	0.7	1.0	1.1	2.1	1.5	1.6	1.9	2.0	2.4	2.4	4.9	4.9	5.2
Other work.....	2.0	2.0	2.8	2.9	2.8	4.7	2.7	3.4	3.7	3.9	4.1	5.8	6.9	7.3

U&amp;C universities and colleges

NOTES: See chapter 2, "Classification of Academic Institutions," for information on the institutional categories used by the Carnegie Foundation for the Advancement of Teaching. Full-time faculty includes full, associate, and assistant professors plus instructors. Other types of positions include full-time nonfaculty positions such as research associates, adjunct positions, lecturers, administrative positions, and part-time positions of all kinds. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-18

(Page 1 of 3)

**S&E doctorate holders employed in academia, by type of position, Carnegie institution type, and administrative control of institution: 1975–2001**

(Thousands)

Institution control, institution type, and position	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All U&amp;C</b>														
All academic institutions														
All positions.....	134.1	145.4	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5	240.2	245.5
Full-time senior faculty.....	84.3	90.7	97.2	107.3	115.6	119.7	127.3	131.0	133.0	128.6	127.3	131.9	136.7	136.9
Full-time junior faculty .....	32.1	34.9	34.0	34.6	32.8	37.2	37.2	38.7	40.1	43.8	44.0	46.4	47.4	50.5
Full-time nonfaculty .....	8.3	8.8	11.4	12.6	13.4	18.1	16.4	19.2	20.2	22.2	23.9	26.4	29.3	31.7
Postdocs .....	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9	18.5	17.5
Part-time positions.....	3.2	3.4	4.5	4.0	6.0	6.5	5.7	6.2	7.4	5.9	5.5	8.9	8.2	9.0
Research universities														
All positions .....	73.4	78.2	83.5	91.0	89.9	102.8	106.9	112.5	111.6	113.0	112.8	113.6	117.2	119.6
Full-time senior faculty ....	45.6	48.0	50.0	55.6	56.2	61.0	65.0	66.4	65.6	62.6	61.1	61.5	64.2	63.1
Full-time junior faculty .....	15.9	16.7	17.1	18.1	16.0	19.7	19.3	20.2	20.2	21.8	20.5	20.0	20.0	21.7
Full-time nonfaculty .....	5.1	5.6	7.5	8.1	8.1	11.7	11.5	13.2	13.9	14.6	15.7	15.1	16.4	18.3
Postdocs .....	5.3	6.5	6.8	7.0	6.7	7.4	8.1	9.7	8.3	11.3	13.6	13.9	14.1	13.8
Part-time positions.....	1.5	1.5	2.1	2.1	2.9	3.1	3.0	3.0	3.6	2.7	1.8	3.1	2.6	2.8
Doctorate-granting institutions														
All positions .....	15.9	17.2	17.2	18.8	19.5	21.2	22.2	23.5	24.9	24.2	25.0	25.8	26.3	26.3
Full-time senior faculty ....	10.9	11.6	11.6	13.4	14.5	15.0	16.4	16.4	17.0	16.2	16.0	16.9	17.4	17.4
Full-time junior faculty .....	3.8	4.4	4.2	3.9	3.5	3.6	3.9	4.4	5.1	5.4	5.6	5.1	5.4	5.5
Full-time nonfaculty .....	0.6	0.5	0.8	0.8	0.7	1.6	1.1	1.3	1.7	1.7	1.9	1.9	2.0	1.9
Postdocs .....	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.5	0.3	0.5	0.8	0.9	0.8	0.7
Part-time positions.....	0.4	0.4	0.4	0.3	0.5	0.6	0.6	0.9	0.8	0.5	0.7	1.0	0.7	0.8
Comprehensive institutions														
All positions .....	24.8	26.5	26.9	30.5	31.6	35.6	36.0	38.4	39.5	39.5	41.5	42.0	43.6	44.8
Full-time senior faculty ....	17.0	18.9	19.5	22.5	24.0	26.3	27.5	28.7	29.8	29.0	29.1	28.4	29.6	29.9
Full-time junior faculty .....	6.1	6.3	5.6	6.3	5.2	6.0	6.3	6.5	6.8	7.4	8.2	9.2	9.9	10.6
Full-time nonfaculty .....	1.0	0.6	0.9	1.1	1.1	2.0	1.3	1.9	1.5	1.9	2.2	2.0	2.2	2.3
Postdocs .....	0.1	0.1	0.2	0.1	0.3	0.0	0.0	0.1	0.2	0.1	0.4	0.6	0.1	0.1
Part-time positions.....	0.5	0.6	0.8	0.6	1.0	1.2	0.9	1.2	1.2	1.0	1.6	1.7	1.8	1.9
Freestanding medical schools														
All positions .....	4.3	4.9	5.9	7.2	7.0	8.3	9.0	9.7	9.6	10.8	11.2	9.8	11.9	12.6
Full-time senior faculty ....	2.0	2.2	2.6	3.6	3.8	4.0	4.6	4.8	4.7	5.3	5.1	4.3	5.7	6.2
Full-time junior faculty .....	1.6	1.9	2.1	2.0	1.9	2.5	2.6	2.9	3.1	3.2	3.3	3.1	3.1	3.2
Full-time nonfaculty .....	0.2	0.2	0.4	0.4	0.6	0.7	0.7	1.0	0.7	1.1	1.2	0.8	1.0	1.3
Postdocs .....	0.4	0.5	0.6	1.1	0.6	0.8	0.8	0.9	0.8	1.1	1.4	1.4	1.7	1.6
Part-time positions.....	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.2	0.3	0.1	0.2	0.2	0.4	0.3
Liberal arts colleges														
All positions .....	10.4	10.8	11.3	12.0	12.6	14.0	14.6	15.3	15.8	16.0	15.8	17.3	18.5	18.6
Full-time senior faculty ....	6.3	6.6	7.2	8.1	8.4	9.3	10.3	10.8	11.2	10.9	10.7	11.1	12.3	12.1
Full-time junior faculty .....	3.1	3.3	2.9	2.7	2.9	3.2	3.1	3.1	2.9	3.7	3.9	4.4	4.5	4.3
Full-time nonfaculty .....	0.6	0.5	0.7	0.8	0.7	0.9	0.7	0.8	1.0	0.9	0.8	0.9	0.9	1.0
Postdocs .....	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.1
Part-time positions.....	0.3	0.3	0.5	0.4	0.6	0.6	0.5	0.4	0.8	0.4	0.3	0.7	0.6	1.1
<b>Public U&amp;C</b>														
All academic institutions														
All positions.....	93.0	100.4	104.3	113.9	115.9	130.2	135.3	141.2	142.6	144.6	145.7	148.7	153.1	156.4
Full-time senior faculty.....	60.2	65.2	66.9	76.2	79.7	85.0	90.7	92.6	93.7	90.6	88.7	89.8	92.5	91.9
Full-time junior faculty .....	22.1	23.7	22.4	22.7	20.2	24.1	25.0	25.4	25.8	27.9	28.3	28.2	29.4	31.7
Full-time nonfaculty .....	5.2	5.1	7.4	8.0	7.8	11.9	10.2	12.5	13.4	14.1	15.3	15.4	16.5	18.3
Postdocs .....	3.6	4.4	4.8	4.8	4.6	4.7	5.3	6.4	5.3	8.2	9.9	9.8	9.9	8.9
Part-time positions.....	2.0	2.1	2.8	2.3	3.7	4.4	4.1	4.2	4.4	3.9	3.5	5.6	4.9	5.5
Research universities														
All positions .....	54.8	58.6	62.9	66.7	66.6	75.3	79.0	81.7	80.8	81.9	80.8	82.9	83.6	84.3
Full-time senior faculty ....	35.4	37.7	39.2	43.3	44.3	47.2	50.7	51.5	50.8	48.5	47.1	48.3	48.7	47.4
Full-time junior faculty .....	11.8	12.4	12.8	12.5	11.2	13.9	14.0	14.2	13.7	14.9	14.0	13.7	13.8	15.2
Full-time nonfaculty .....	3.3	3.7	5.1	5.4	5.4	7.9	7.3	8.5	9.4	9.4	10.2	10.7	11.5	12.6
Postdocs .....	3.1	3.8	4.1	3.9	3.7	4.0	4.5	5.3	4.3	7.0	8.1	8.0	7.9	7.1
Part-time positions.....	1.1	1.1	1.6	1.5	2.0	2.3	2.5	2.3	2.6	2.0	1.4	2.3	1.7	2.0

Appendix table 5-18

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**S&E doctorate holders employed in academia, by type of position, Carnegie institution type, and administrative control of institution: 1975–2001**

(Thousands)

Institution control, institution type, and position	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Doctorate-granting institutions</b>														
All positions .....	11.4	12.2	11.8	13.3	13.7	15.0	15.3	16.5	17.3	16.9	17.7	18.4	18.5	18.4
Full-time senior faculty ....	8.1	8.5	8.1	9.7	10.4	10.6	11.6	11.6	12.1	11.6	11.6	12.3	12.5	12.4
Full-time junior faculty .....	2.6	2.9	2.8	2.7	2.3	2.5	2.6	3.1	3.5	3.6	3.8	3.7	3.7	3.7
Full-time nonfaculty .....	0.4	0.3	0.6	0.6	0.5	1.3	0.7	0.9	1.1	1.0	1.3	1.4	1.3	1.4
Postdocs .....	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.3	0.2	0.4	0.5	0.5	0.6	0.5
Part-time positions .....	0.2	0.2	0.2	0.2	0.4	0.4	0.3	0.6	0.4	0.2	0.4	0.5	0.3	0.4
<b>Comprehensive institutions</b>														
All positions .....	18.8	20.4	19.9	22.4	23.6	26.2	26.8	28.2	28.4	28.9	30.2	31.0	31.5	32.5
Full-time senior faculty ....	12.9	14.6	14.7	17.0	18.2	19.8	20.5	21.3	21.9	21.5	21.4	21.0	21.6	22.0
Full-time junior faculty .....	4.9	4.9	3.8	4.2	3.7	4.1	4.5	4.6	4.6	5.2	6.0	6.6	7.1	7.4
Full-time nonfaculty .....	0.7	0.4	0.8	0.9	0.9	1.4	1.0	1.4	1.3	1.4	1.7	1.6	1.6	1.9
Postdocs .....	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.1	0.3	0.5	0.1	0.1
Part-time positions .....	0.3	0.4	0.5	0.3	0.7	0.9	0.7	0.8	0.5	0.6	0.9	1.3	1.2	1.1
<b>Freestanding medical schools</b>														
All positions .....	3.1	3.6	4.3	5.4	5.2	5.9	6.1	6.6	6.8	7.4	7.7	6.4	8.2	9.0
Full-time senior faculty ....	1.4	1.6	1.9	2.7	2.9	3.0	3.3	3.3	3.5	3.8	3.7	3.0	4.0	4.5
Full-time junior faculty .....	1.2	1.4	1.4	1.5	1.3	1.6	1.6	1.8	2.0	2.1	2.4	1.9	2.0	2.2
Full-time nonfaculty .....	0.1	0.2	0.4	0.3	0.4	0.4	0.4	0.7	0.5	0.8	0.8	0.5	0.6	0.9
Postdocs .....	0.3	0.3	0.5	0.8	0.4	0.6	0.5	0.6	0.5	0.7	0.8	0.8	1.2	1.1
Part-time positions .....	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.3	0.2
<b>Liberal arts colleges</b>														
All positions .....	1.3	1.5	1.5	1.7	1.9	2.2	2.5	2.7	2.6	2.6	2.4	3.0	2.7	2.9
Full-time senior faculty ....	0.7	0.9	1.0	1.2	1.3	1.5	1.8	1.8	2.0	2.0	1.6	2.0	1.9	1.8
Full-time junior faculty .....	0.4	0.4	0.3	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.7
Full-time nonfaculty .....	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2
Postdocs .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Part-time positions .....	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2
<b>Private U&amp;C</b>														
<b>All academic institutions</b>														
All positions .....	40.0	42.2	45.0	51.0	50.3	58.3	60.2	65.1	67.0	67.1	68.7	68.8	74.8	76.7
Full-time senior faculty .....	23.6	24.3	26.2	29.8	30.2	34.0	36.4	38.3	39.1	37.2	37.3	36.6	41.3	41.9
Full-time junior faculty .....	9.8	10.8	10.7	11.7	10.6	12.6	12.0	13.2	14.1	15.5	15.1	15.7	16.1	16.4
Full-time nonfaculty .....	2.9	2.9	3.4	4.3	4.2	5.9	6.1	6.6	6.6	7.7	7.8	6.6	7.4	8.0
Postdocs .....	2.5	3.2	3.2	3.7	3.3	3.8	4.0	5.0	4.5	4.9	6.6	7.4	7.1	7.4
Part-time positions .....	1.2	1.1	1.5	1.6	2.0	1.9	1.6	1.9	2.8	1.8	1.8	2.6	2.8	3.0
<b>Research universities</b>														
All positions .....	18.6	19.6	20.6	24.4	23.2	27.5	27.9	30.8	30.8	31.1	32.0	30.7	33.6	35.3
Full-time senior faculty ....	10.1	10.3	10.7	12.4	11.9	13.7	14.2	14.9	14.8	14.1	14.1	13.3	15.5	15.7
Full-time junior faculty .....	4.1	4.2	4.3	5.6	4.8	5.8	5.3	6.1	6.5	6.9	6.5	6.3	6.1	6.5
Full-time nonfaculty .....	1.8	1.9	2.4	2.7	2.7	3.8	4.3	4.7	4.5	5.2	5.5	4.4	4.9	5.6
Postdocs .....	2.1	2.8	2.7	3.1	2.9	3.4	3.6	4.4	4.0	4.3	5.5	5.9	6.2	6.6
Part-time positions .....	0.4	0.4	0.5	0.6	0.9	0.8	0.5	0.8	1.0	0.6	0.4	0.9	0.9	0.8
<b>Doctorate-granting institutions</b>														
All positions .....	4.5	5.0	5.4	5.5	5.8	6.2	6.9	7.1	7.5	7.3	7.3	7.4	7.9	7.9
Full-time senior faculty ....	2.8	3.1	3.4	3.7	4.1	4.4	4.8	4.8	4.9	4.6	4.4	4.5	4.9	5.0
Full-time junior faculty .....	1.3	1.5	1.4	1.2	1.2	1.1	1.3	1.3	1.6	1.7	1.7	1.4	1.7	1.8
Full-time nonfaculty .....	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.6	0.7	0.6	0.5	0.6	0.5
Postdocs .....	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.5	0.2	0.2
Part-time positions .....	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.5	0.4	0.3
<b>Comprehensive institutions</b>														
All positions .....	5.9	6.2	7.0	8.2	8.0	9.4	9.2	10.1	11.1	10.6	11.2	11.0	12.1	12.3
Full-time senior faculty ....	4.1	4.3	4.8	5.5	5.8	6.5	7.0	7.4	8.0	7.5	7.7	7.4	8.0	8.0
Full-time junior faculty .....	1.3	1.4	1.8	2.1	1.5	1.9	1.8	1.9	2.2	2.2	2.2	2.6	2.9	3.2
Full-time nonfaculty .....	0.3	0.2	0.2	0.2	0.3	0.7	0.2	0.5	0.2	0.5	0.5	0.5	0.6	0.4
Postdocs .....	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Part-time positions .....	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.4	0.7	0.4	0.7	0.5	0.6	0.7

Appendix table 5-18

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**S&E doctorate holders employed in academia, by type of position, Carnegie institution type, and administrative control of institution: 1975–2001**

(Thousands)

Institution control, institution type, and position	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Freestanding medical schools</b>														
All positions .....	1.2	1.3	1.5	1.8	1.8	2.3	2.9	3.1	2.8	3.4	3.4	3.5	3.7	3.6
Full-time senior faculty .....	0.5	0.6	0.7	0.9	0.9	1.0	1.3	1.4	1.3	1.5	1.5	1.2	1.6	1.7
Full-time junior faculty .....	0.4	0.5	0.6	0.5	0.5	0.8	1.0	1.1	1.0	1.1	1.0	1.2	1.1	0.9
Full-time nonfaculty .....	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.4	0.3	0.4	0.4
Postdocs .....	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.7	0.5	0.5
Part-time positions.....	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
<b>Liberal arts colleges</b>														
All positions .....	9.1	9.3	9.8	10.4	10.6	11.8	12.1	12.6	13.2	13.4	13.4	14.3	15.8	15.7
Full-time senior faculty .....	5.6	5.6	6.1	6.9	7.1	7.8	8.5	9.0	9.2	8.9	9.1	9.1	10.4	10.3
Full-time junior faculty .....	2.7	2.9	2.6	2.3	2.4	2.8	2.5	2.6	2.4	3.2	3.4	3.8	3.9	3.6
Full-time nonfaculty .....	0.5	0.4	0.6	0.7	0.6	0.7	0.6	0.6	0.9	0.8	0.6	0.6	0.7	0.9
Postdocs .....	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.1
Part-time positions.....	0.3	0.2	0.4	0.4	0.5	0.4	0.4	0.4	0.6	0.4	0.2	0.6	0.5	0.9

U&amp;C universities and colleges

NOTES: Employment at institutions without a Carnegie code or with unknown administrative control is included only in total. Freestanding schools of engineering and technology are included under comprehensive institutions. Senior faculty includes full and associate professors; junior faculty includes assistant professors and instructors; and full-time nonfaculty includes positions such as research associates, adjunct appointments, lecturers, and administrative positions. See chapter 2, "Classification of Academic Institutions," for information on the institutional categories used by the Carnegie Foundation for the Advancement of Teaching. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

*Science & Engineering Indicators – 2004*



Appendix table 5-19

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**S&E doctorate holders employed in academia, by type of position and degree field: 1975–2001**

(Thousands)

Position and field	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All positions</b>														
All fields .....	134.1	145.4	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5	240.2	245.5
All sciences .....	120.7	130.7	139.5	151.0	158.1	170.4	174.8	183.9	187.8	190.6	193.7	205.9	214.7	218.9
Physical sciences .....	23.6	25.0	24.6	25.4	25.1	27.0	27.2	27.7	27.7	28.6	29.3	30.2	30.9	30.4
Mathematics .....	11.0	11.7	12.2	12.4	12.9	13.6	13.8	14.5	15.2	15.5	14.6	15.6	15.2	14.9
Computer sciences .....	NA	NA	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.1	3.3	3.7	3.8
Earth, atmospheric, and ocean sciences .....	3.9	4.2	4.2	4.6	4.8	5.2	5.6	5.9	6.0	6.4	6.4	7.3	7.8	8.2
Life sciences .....	39.4	42.6	47.0	51.3	54.9	58.7	61.3	64.8	66.9	68.2	71.6	77.3	81.9	84.3
Psychology .....	14.8	16.2	17.7	20.1	21.0	23.1	23.7	25.0	25.2	25.0	26.1	27.3	29.0	30.4
Social sciences .....	28.0	31.1	33.6	36.9	38.9	42.0	42.2	44.5	44.8	44.4	42.5	44.9	46.2	46.9
Engineering .....	13.4	14.8	15.8	16.1	18.1	19.9	21.2	22.9	22.8	23.1	23.8	26.6	25.5	26.6
<b>All full-time faculty</b>														
All fields .....	116.4	125.6	131.2	141.9	148.4	156.9	164.4	169.8	173.1	172.4	171.4	178.4	184.0	187.4
All sciences .....	104.2	112.2	116.9	127.3	132.0	139.0	145.2	149.6	153.1	152.3	151.3	156.8	163.0	165.5
Physical sciences .....	18.9	20.0	20.0	20.5	20.2	21.2	22.0	21.5	21.7	21.3	20.9	21.4	21.7	21.6
Mathematics .....	10.4	10.9	11.4	11.7	12.3	12.7	12.9	13.5	14.2	14.7	13.0	13.6	13.1	12.6
Computer sciences .....	NA	NA	0.1	0.3	0.4	0.7	0.9	1.3	1.8	2.3	2.8	3.0	3.3	3.3
Earth, atmospheric, and ocean sciences .....	3.4	3.6	3.5	3.8	4.0	4.2	4.4	4.7	4.5	4.5	4.7	5.1	5.6	5.9
Life sciences .....	33.1	34.9	37.3	40.9	43.5	45.6	48.1	49.3	51.1	50.8	52.8	55.2	58.1	60.4
Psychology .....	12.8	13.9	14.3	16.4	17.3	18.5	19.2	20.2	20.7	19.5	20.1	20.8	21.9	22.6
Social sciences .....	25.5	28.8	30.4	33.7	34.4	36.1	37.7	39.0	39.0	39.2	37.1	37.7	39.2	39.2
Engineering .....	12.2	13.5	14.3	14.7	16.4	17.9	19.3	20.2	20.1	20.1	20.0	21.5	21.1	21.9
<b>Full-time professors</b>														
All fields .....	47.9	51.0	57.5	64.4	69.9	72.8	79.1	83.1	82.5	80.0	77.7	80.9	83.1	84.8
All sciences .....	42.4	44.7	50.1	56.4	60.9	63.7	68.7	72.5	72.6	69.7	68.6	70.2	72.4	74.1
Physical sciences .....	8.6	9.2	10.0	11.2	11.9	12.6	13.5	13.2	12.8	12.1	11.6	11.4	11.6	11.2
Mathematics .....	3.5	3.9	4.4	5.0	5.6	6.1	6.5	6.9	6.7	7.1	6.6	6.9	6.6	6.6
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.7	0.8
Earth, atmospheric, and ocean sciences .....	1.4	1.6	1.7	1.9	2.0	2.0	2.0	2.3	2.0	2.1	2.3	2.4	2.6	2.8
Life sciences .....	13.6	13.9	15.5	17.0	19.3	19.6	21.7	22.5	22.9	21.2	22.5	22.5	23.3	24.5
Psychology .....	4.6	4.8	5.6	6.5	7.0	7.6	8.3	9.1	9.5	8.7	8.7	9.5	9.4	9.9
Social sciences .....	10.6	11.3	12.9	14.7	15.1	15.9	16.8	18.5	18.6	18.4	16.6	17.1	18.2	18.2
Engineering .....	5.6	6.4	7.4	8.0	9.0	9.2	10.4	10.6	9.9	10.3	9.1	10.7	10.6	10.7
<b>Full-time associate professors</b>														
All fields .....	36.3	39.7	39.7	42.9	45.7	46.9	48.2	47.9	50.5	48.6	49.6	51.0	53.6	52.2
All sciences .....	32.2	35.3	35.5	38.5	40.9	42.2	43.3	42.6	44.7	43.3	43.5	45.2	47.6	46.1
Physical sciences .....	6.0	6.1	6.0	5.6	5.2	5.1	4.9	4.5	4.7	4.8	4.8	5.2	5.1	5.3
Mathematics .....	3.4	3.7	3.9	4.0	4.1	4.0	4.1	4.0	5.1	4.4	4.0	3.9	4.1	3.6
Computer sciences .....	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.4	0.8	0.7	1.4	1.4	1.4	1.6
Earth, atmospheric, and ocean sciences .....	1.1	1.1	1.1	1.0	1.1	1.2	1.2	1.3	1.6	1.6	1.3	1.3	1.5	1.4
Life sciences .....	9.8	10.7	11.5	12.5	13.4	14.1	14.1	14.0	14.6	14.6	14.7	15.8	17.3	16.7
Psychology .....	4.1	4.3	4.3	5.2	5.9	5.9	6.0	5.9	5.9	5.6	5.8	5.8	6.2	6.0
Social sciences .....	7.9	9.4	8.8	10.2	11.2	11.8	12.7	12.6	12.0	11.6	11.5	11.7	11.9	11.4
Engineering .....	4.2	4.4	4.2	4.4	4.7	4.7	4.9	5.3	5.9	5.3	6.2	5.8	6.0	6.1
<b>Full-time junior faculty</b>														
All fields .....	32.1	34.9	34.0	34.6	32.8	37.2	37.2	38.7	40.1	43.8	44.0	46.4	47.4	50.5
All sciences .....	29.6	32.2	31.3	32.3	30.2	33.1	33.2	34.4	35.8	39.3	39.3	41.5	42.9	45.4
Physical sciences .....	4.3	4.8	4.0	3.7	3.1	3.5	3.6	3.7	4.1	4.3	4.5	4.8	5.1	5.0
Mathematics .....	3.5	3.3	3.1	2.6	2.5	2.7	2.4	2.6	2.4	3.2	2.4	2.8	2.4	2.3
Computer sciences .....	NA	NA	0.1	0.2	0.3	0.6	0.6	0.9	1.0	1.4	1.2	1.3	1.2	0.9
Earth, atmospheric, and ocean sciences .....	0.9	0.9	0.7	0.9	0.9	1.1	1.1	1.1	0.9	0.9	1.1	1.3	1.5	1.7
Life sciences .....	9.7	10.3	10.3	11.3	10.8	11.9	12.3	12.8	13.7	15.0	15.6	16.9	17.5	19.2
Psychology .....	4.2	4.8	4.4	4.8	4.5	5.0	4.9	5.2	5.4	5.2	5.5	5.5	6.2	6.6
Social sciences .....	7.1	8.2	8.6	8.8	8.1	8.4	8.2	7.9	8.4	9.3	9.0	8.9	9.1	9.6
Engineering .....	2.5	2.7	2.8	2.3	2.7	4.0	4.0	4.3	4.3	4.5	4.8	5.0	4.5	5.1

Appendix table 5-19

(Page 2 of 2)

**S&E doctorate holders employed in academia, by type of position and degree field: 1975–2001**

(Thousands)

Position and field	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All other full-time positions</b>														
All fields .....	8.3	8.8	11.4	12.6	13.4	18.1	16.4	19.2	20.2	22.2	23.9	26.4	29.3	31.7
All sciences.....	7.4	8.0	10.5	11.5	12.3	16.6	15.3	17.7	18.4	20.7	21.7	23.3	26.4	28.3
Physical sciences.....	1.9	2.1	2.0	2.4	2.5	3.0	2.6	3.3	3.2	3.7	3.8	4.6	5.6	5.5
Mathematics.....	0.3	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.6	0.5	0.6	0.8	0.8	1.0
Computer sciences .....	NA	NA	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
Earth, atmospheric, and ocean sciences.....	0.3	0.3	0.5	0.5	0.5	0.7	0.8	0.7	0.9	1.1	1.1	1.4	1.4	1.6
Life sciences.....	2.4	2.8	3.9	4.0	4.6	6.2	6.0	6.7	7.2	7.7	8.4	8.4	9.5	10.5
Psychology .....	1.0	1.2	1.8	2.2	2.2	2.9	2.8	2.9	2.8	3.9	3.9	4.0	4.6	4.9
Social sciences .....	1.5	1.2	1.9	2.0	2.2	3.2	2.6	3.5	3.5	3.7	3.6	3.9	4.3	4.5
Engineering.....	0.9	0.8	0.9	1.1	1.1	1.5	1.1	1.5	1.8	1.5	2.1	3.1	3.0	3.4
<b>Postdocs</b>														
All fields .....	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9	18.5	17.5
All sciences.....	5.9	7.2	7.8	8.4	8.0	8.5	8.8	10.9	9.4	12.3	15.6	17.2	17.5	16.6
Physical sciences.....	2.1	2.2	1.9	1.9	1.4	1.9	2.0	2.4	1.9	3.0	3.9	3.2	2.9	2.6
Mathematics.....	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.5	0.5	0.6	0.8
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Earth, atmospheric, and ocean sciences.....	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.6	0.5	0.4
Life sciences.....	3.0	4.0	4.7	5.2	5.1	5.2	5.6	6.8	6.4	8.2	9.2	10.8	11.7	11.0
Psychology .....	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.5	0.4	1.1	1.3	1.2	1.2
Social sciences .....	0.2	0.3	0.3	0.3	0.6	0.3	0.1	0.4	0.3	0.2	0.4	0.7	0.5	0.6
Engineering.....	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.6	0.5	1.0	1.2	1.7	1.1	0.9
<b>Part-time positions</b>														
All fields .....	3.2	3.4	4.5	4.0	6.0	6.5	5.7	6.2	7.4	5.9	5.5	8.9	8.2	9.0
All sciences.....	3.1	3.2	4.3	3.9	5.7	6.2	5.4	5.6	6.9	5.4	5.1	8.6	7.9	8.5
Physical sciences.....	0.6	0.6	0.7	0.6	1.0	0.9	0.6	0.5	0.9	0.7	0.7	1.0	0.7	0.7
Mathematics.....	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.7	0.7	0.6
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Earth, atmospheric, and ocean sciences.....	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3
Life sciences.....	0.9	1.0	1.2	1.2	1.7	1.7	1.6	1.9	2.3	1.6	1.2	2.9	2.6	2.4
Psychology .....	0.5	0.6	1.0	0.8	1.0	1.0	1.0	1.0	1.2	1.2	1.1	1.1	1.3	1.8
Social sciences .....	0.8	0.8	1.0	1.0	1.6	2.2	1.8	1.7	2.0	1.3	1.3	2.6	2.2	2.7
Engineering.....	0.1	0.1	0.3	0.2	0.4	0.3	0.3	0.5	0.5	0.5	0.4	0.3	0.4	0.4

NA not available

NOTES: Faculty are defined by position: professors and associate professors are senior faculty; junior faculty are assistant professors or instructors; other full-time positions include nonfaculty positions such as research associates, adjunct appointments, lecturers, and administrative positions. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-20

(Page 1 of 2)

**Recent S&E doctorate holders employed in academia, by years since doctorate, Carnegie institution type, type of position, and tenure status: 1975–2001**

(Percent distribution)

Years since doctorate and institution type	Position				Tenure status			
	Total	Full-time faculty	Postdocs	Other	On tenure track			Not on tenure track
					Total	Tenured	Untenured	
<b>1–3 years since doctorate</b>								
All U&C								
1975 .....	100.0	70.4	18.3	11.3	NA	NA	NA	NA
1977 .....	100.0	64.8	22.9	12.3	NA	NA	NA	NA
1979 .....	100.0	59.2	25.0	15.8	45.1	7.4	37.7	54.9
1981 .....	100.0	56.9	28.4	14.7	45.0	5.2	39.8	55.0
1983 .....	100.0	56.5	27.9	15.7	66.2	8.4	57.8	33.8
1985 .....	100.0	54.7	27.4	17.9	49.0	4.2	44.8	51.0
1987 .....	100.0	51.8	29.8	18.5	48.6	3.8	44.8	51.4
1989 .....	100.0	47.6	33.5	19.0	44.1	3.7	40.4	55.9
1991 .....	100.0	55.1	27.4	17.5	65.2	4.6	60.6	34.8
1993 .....	100.0	47.6	33.4	19.0	36.3	1.9	34.4	63.7
1995 .....	100.0	41.4	39.6	19.0	31.2	2.6	28.6	68.8
1997 .....	100.0	40.6	41.4	18.0	32.0	2.6	29.5	68.0
1999 .....	100.0	37.3	43.1	19.5	28.8	2.0	26.8	71.2
2001 .....	100.0	43.6	39.1	17.3	33.7	2.7	31.0	66.3
Research universities								
1975 .....	100.0	56.6	29.0	14.4	NA	NA	NA	NA
1977 .....	100.0	50.5	36.0	13.5	NA	NA	NA	NA
1979 .....	100.0	47.7	35.6	16.6	34.8	1.6	33.2	65.2
1981 .....	100.0	45.6	38.8	15.6	36.3	1.1	35.2	63.7
1983 .....	100.0	43.3	40.5	16.2	56.9	2.6	54.3	43.1
1985 .....	100.0	43.5	37.2	19.3	39.6	0.6	39.1	60.4
1987 .....	100.0	40.0	40.3	19.7	39.2	1.3	37.9	60.8
1989 .....	100.0	36.3	44.2	19.5	36.0	1.2	34.8	64.0
1991 .....	100.0	41.9	38.4	19.7	57.3	2.4	55.0	42.7
1993 .....	100.0	33.4	46.3	20.3	23.7	0.7	23.0	76.3
1995 .....	100.0	26.7	54.4	18.8	19.6	0.4	19.2	80.4
1997 .....	100.0	26.8	56.4	16.9	19.5	0.6	18.9	80.5
1999 .....	100.0	24.1	57.9	18.0	18.9	0.7	18.2	81.1
2001 .....	100.0	29.8	52.8	17.5	22.3	1.1	21.2	77.7
Other U&C								
1975 .....	100.0	86.5	5.9	7.6	NA	NA	NA	NA
1977 .....	100.0	82.0	7.2	10.8	NA	NA	NA	NA
1979 .....	100.0	75.6	9.9	14.5	59.5	15.6	43.9	40.5
1981 .....	100.0	75.7	11.1	13.1	59.4	12.1	47.4	40.6
1983 .....	100.0	75.2	9.9	14.9	76.9	15.1	61.8	23.1
1985 .....	100.0	73.5	10.8	15.7	63.5	9.9	53.6	36.5
1987 .....	100.0	73.2	10.6	16.1	64.4	8.1	56.4	35.6
1989 .....	100.0	67.9	14.2	17.9	56.9	7.5	49.4	43.1
1991 .....	100.0	75.0	10.7	14.3	73.0	6.7	66.2	27.0
1993 .....	100.0	69.9	13.2	16.9	56.1	3.8	52.3	43.9
1995 .....	100.0	63.3	17.5	19.2	48.6	5.9	42.7	51.4
1997 .....	100.0	57.9	22.7	19.4	47.6	4.9	42.6	52.4
1999 .....	100.0	55.0	23.4	21.6	42.1	3.7	38.4	57.9
2001 .....	100.0	62.3	20.7	17.0	49.1	4.8	44.3	50.9
<b>4–7 years since doctorate</b>								
All U&C								
1975 .....	100.0	87.1	4.3	8.3	NA	NA	NA	NA
1977 .....	100.0	85.0	5.3	9.7	NA	NA	NA	NA
1979 .....	100.0	81.2	6.1	12.9	65.7	26.3	39.4	32.8
1981 .....	100.0	80.8	6.3	13.2	70.3	24.9	45.3	28.4
1983 .....	100.0	76.8	5.7	17.2	65.7	23.8	42.0	26.1
1985 .....	100.0	76.9	6.9	16.4	65.2	19.4	45.8	29.0
1987 .....	100.0	75.0	7.6	17.2	60.4	16.6	43.8	28.9
1989 .....	100.0	73.2	9.1	17.8	59.5	12.6	46.9	30.1
1991 .....	100.0	75.0	7.1	17.6	65.1	21.2	43.9	24.7

Appendix table 5-20

(Page 2 of 2)

**Recent S&E doctorate holders employed in academia, by years since doctorate, Carnegie institution type, type of position, and tenure status: 1975–2001**

(Percent distribution)

Years since doctorate and institution type	Position				Tenure status			
	Total	Full-time faculty	Postdocs	Other	On tenure track			Not on tenure track
					Total	Tenured	Untenured	
1993 .....	100.0	72.1	11.1	16.7	60.4	12.4	48.0	39.6
1995 .....	100.0	70.3	12.9	16.8	59.3	12.4	46.9	40.7
1997 .....	100.0	66.3	14.8	19.0	54.1	11.6	42.5	45.9
1999 .....	100.0	65.4	14.1	20.5	52.4	10.4	42.0	47.6
2001 .....	100.0	63.1	13.2	23.7	49.6	9.0	40.6	50.4
Research universities								
1975 .....	100.0	82.1	7.7	9.8	NA	NA	NA	NA
1977 .....	100.0	77.8	9.4	13.3	NA	NA	NA	NA
1979 .....	100.0	74.0	9.8	16.7	60.0	20.2	39.8	38.5
1981 .....	100.0	74.4	8.9	16.8	61.6	16.2	45.4	36.8
1983 .....	100.0	70.5	8.7	21.2	60.2	14.4	45.8	31.9
1985 .....	100.0	69.1	10.9	20.0	58.7	11.9	46.8	35.0
1987 .....	100.0	67.0	11.4	21.9	53.1	12.2	40.9	35.1
1989 .....	100.0	65.1	13.7	20.9	52.3	7.5	44.8	35.9
1991 .....	100.0	65.9	11.6	22.8	56.9	16.2	40.7	28.2
1993 .....	100.0	64.5	17.5	18.6	52.4	6.9	45.5	47.6
1995 .....	100.0	59.9	19.8	19.9	49.0	7.6	41.3	51.0
1997 .....	100.0	55.2	21.3	23.1	43.5	5.9	37.7	56.5
1999 .....	100.0	54.8	21.0	24.3	41.8	5.8	36.0	58.2
2001 .....	100.0	50.0	22.1	28.0	37.9	4.9	33.0	62.1
Other U&C								
1975 .....	100.0	91.8	1.1	6.8	NA	NA	NA	NA
1977 .....	100.0	92.1	1.6	6.5	NA	NA	NA	NA
1979 .....	100.0	89.2	1.9	8.7	71.9	32.9	39.0	26.5
1981 .....	100.0	87.9	3.4	9.3	80.1	34.8	45.3	18.9
1983 .....	100.0	84.4	2.7	13.4	71.3	33.3	38.1	20.3
1985 .....	100.0	86.2	2.2	12.1	73.0	28.5	44.5	21.9
1987 .....	100.0	87.4	2.4	10.9	70.4	22.6	47.7	20.4
1989 .....	100.0	84.6	2.4	13.3	69.7	19.9	49.8	22.0
1991 .....	100.0	86.3	2.2	11.2	75.2	27.4	47.9	20.3
1993 .....	100.0	82.6	3.4	14.6	70.2	19.1	51.1	29.8
1995 .....	100.0	81.6	5.1	13.2	71.2	17.9	53.3	28.8
1997 .....	100.0	77.5	7.7	14.9	64.6	17.3	47.3	35.4
1999 .....	100.0	75.3	7.6	16.9	62.3	14.7	47.7	37.7
2001 .....	100.0	76.1	4.5	19.4	61.1	13.0	48.1	38.9

NA not available

U&amp;C universities and colleges

NOTES: See chapter 2, "Classification of Academic Institutions," for information on the institutional categories used by the Carnegie Foundation for the Advancement of Teaching. Recent doctorate-holders are defined as having earned their doctorate within 3 years or within 4–7 years, respectively, preceding the survey year. Full-time faculty includes full, associate, and assistant professors plus instructors. Other types of positions include full-time nonfaculty appointments such as research associates, adjunct appointments, lecturers, administrative positions, and part-time appointments of all kinds. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-21  
**Age distribution of S&E doctorate holders employed in academia, by type of position: 1975–2001**

Position	Age (years)		Age distribution (percent)					65 or older
	Mean	Median	Total	Younger than 35	35–44	45–54	55–64	
<b>All positions</b>								
1975 .....	42.4	39.9	100.0	25.9	36.8	23.7	11.7	2.0
1977 .....	42.7	40.0	100.0	22.9	38.9	23.8	12.4	2.0
1979 .....	43.3	40.7	100.0	20.1	40.3	23.8	13.6	2.2
1981 .....	44.0	41.5	100.0	18.3	40.5	23.7	14.5	2.9
1983 .....	44.8	42.5	100.0	14.9	40.8	25.2	15.7	3.4
1985 .....	45.2	43.2	100.0	14.2	39.2	26.8	15.9	3.8
1987 .....	45.6	44.2	100.0	12.9	36.5	30.6	16.5	3.5
1989 .....	46.1	45.0	100.0	12.1	34.7	32.2	16.9	4.1
1991 .....	46.3	45.3	100.0	11.5	33.7	34.2	16.9	3.8
1993 .....	45.8	45.0	100.0	13.3	33.3	34.4	16.1	3.0
1995 .....	46.2	45.3	100.0	12.7	32.9	33.6	17.4	3.5
1997 .....	46.6	45.8	100.0	13.3	30.7	32.8	19.6	3.6
1999 .....	47.0	46.3	100.0	12.2	30.5	31.0	22.5	3.8
2001 .....	47.4	46.9	100.0	12.0	29.1	31.8	23.1	4.0
<b>Full-time faculty</b>								
1975 .....	42.8	40.6	100.0	22.9	38.2	25.1	12.0	1.8
1977 .....	43.3	40.9	100.0	19.2	40.1	25.7	13.3	1.7
1979 .....	44.0	41.6	100.0	16.2	41.1	25.9	14.7	2.0
1981 .....	44.7	42.4	100.0	14.7	41.2	25.8	15.7	2.7
1983 .....	45.5	43.4	100.0	11.3	41.2	27.5	17.2	2.8
1985 .....	45.8	43.9	100.0	10.8	39.6	29.0	17.0	3.5
1987 .....	46.6	45.1	100.0	9.2	35.9	33.2	18.1	3.5
1989 .....	47.1	46.0	100.0	8.3	33.8	35.4	18.8	3.8
1991 .....	47.0	46.4	100.0	8.8	32.7	36.8	18.3	3.4
1993 .....	46.9	46.0	100.0	9.3	32.4	36.9	18.0	3.3
1995 .....	47.5	46.9	100.0	8.0	31.9	36.6	19.8	3.8
1997 .....	48.0	47.5	100.0	8.2	29.9	35.6	22.2	4.0
1999 .....	48.5	48.0	100.0	7.3	29.4	33.3	25.7	4.3
2001 .....	48.8	48.3	100.0	7.6	28.0	34.1	25.9	4.4
<b>Postdocs</b>								
1975 .....	32.7	31.2	100.0	78.0	18.7	2.0	1.1	0.2
1977 .....	32.9	31.1	100.0	75.3	21.7	2.4	0.6	0.0
1979 .....	33.1	31.6	100.0	71.7	25.5	2.1	0.7	0.0
1981 .....	33.1	31.6	100.0	71.9	24.6	2.6	0.6	0.3
1983 .....	33.7	31.7	100.0	68.4	27.0	3.5	1.0	0.2
1985 .....	33.3	31.9	100.0	70.6	27.2	2.1	0.1	0.0
1987 .....	33.8	32.0	100.0	68.4	28.3	2.4	0.5	0.4
1989 .....	34.6	32.6	100.0	63.9	29.9	4.5	1.0	0.7
1991 .....	34.7	33.1	100.0	57.2	39.0	2.8	1.0	0.0
1993 .....	33.9	32.7	100.0	62.3	34.7	2.5	0.5	0.0
1995 .....	35.0	33.0	100.0	56.6	35.9	5.8	1.6	0.1
1997 .....	35.0	33.0	100.0	60.7	32.3	4.6	2.1	0.3
1999 .....	34.5	33.0	100.0	57.6	36.8	5.3	0.3	0.0
2001 .....	34.6	33.0	100.0	59.9	34.6	4.5	0.8	0.1
<b>Other positions</b>								
1975 .....	43.3	40.0	100.0	27.5	32.0	21.8	13.4	5.4
1977 .....	42.5	38.3	100.0	28.4	37.4	17.5	10.6	6.1
1979 .....	42.5	38.6	100.0	25.2	41.6	17.0	10.9	5.2
1981 .....	43.3	39.6	100.0	21.8	43.6	17.0	11.1	6.4
1983 .....	44.1	39.9	100.0	19.3	43.6	17.5	10.6	8.9
1985 .....	45.3	42.5	100.0	15.9	41.0	21.6	14.7	6.8
1987 .....	43.9	41.1	100.0	16.9	43.9	23.3	10.9	5.0
1989 .....	44.9	42.2	100.0	14.2	43.3	23.5	11.2	7.8
1991 .....	46.1	44.0	100.0	11.6	38.2	28.7	14.2	7.3
1993 .....	44.6	43.2	100.0	14.2	37.9	33.9	11.3	2.7
1995 .....	44.8	43.5	100.0	15.0	37.0	31.7	12.4	3.8
1997 .....	45.8	44.7	100.0	13.4	33.9	33.5	15.7	3.4
1999 .....	46.0	45.0	100.0	13.6	33.1	32.4	17.9	3.1
2001 .....	46.8	45.6	100.0	11.5	31.8	32.6	20.2	3.9

NOTES: Faculty positions include full, associate, and assistant professors and instructors. Other positions include full-time nonfaculty positions such as research associates, adjunct positions, lecturers, administrative positions, and part-time positions of all kinds. Details may not add to totals and percents may not sum to 100 because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-22

**Age distribution of S&E doctorate holders in full-time faculty positions at research universities and other academic institutions: 1975–2001**

Age and institution type	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
	Thousands													
All U&C .....	116.4	125.6	131.2	141.9	148.4	156.9	164.4	169.8	173.1	172.4	171.4	178.4	184.0	187.4
Research universities .....	61.5	64.7	67.1	73.8	72.2	80.6	84.2	86.6	85.8	84.4	81.6	81.5	84.1	84.8
Other U&C .....	54.9	61.0	64.1	68.2	76.2	76.2	80.2	83.2	87.3	88.1	89.7	96.8	99.9	102.6
	Percent distribution													
All U&C														
All ages (years).....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Younger than 30 .....	2.9	2.3	1.7	1.5	1.1	1.0	0.7	0.5	0.8	1.1	0.7	0.8	0.8	0.9
30–34 .....	20.1	16.9	14.5	13.2	10.2	9.9	8.5	7.8	8.1	8.3	7.3	7.5	6.5	6.7
35–39 .....	21.6	23.7	23.3	20.7	18.6	18.2	15.9	15.1	14.9	15.3	14.9	13.1	13.2	12.4
40–44 .....	16.6	16.4	17.8	20.5	22.6	21.4	20.0	18.6	17.8	17.1	17.0	16.7	16.2	15.6
45–49 .....	13.8	14.3	14.1	13.8	15.1	17.0	20.1	20.8	19.4	18.4	17.9	17.2	16.8	16.8
50–54 .....	11.3	11.4	11.8	12.0	12.4	12.0	13.1	14.6	17.4	18.5	18.7	18.5	16.5	17.4
55–59 .....	7.5	8.4	9.3	9.4	10.3	9.7	10.5	11.1	11.0	10.6	12.4	14.5	16.7	15.5
60–64 .....	4.6	4.8	5.4	6.3	7.0	7.3	7.6	7.7	7.2	7.5	7.4	7.7	9.0	10.3
65 or older .....	1.8	1.7	2.0	2.7	2.8	3.5	3.5	3.8	3.4	3.3	3.8	4.0	4.3	4.4
Research universities														
All ages (years).....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Younger than 30 .....	3.0	2.5	2.2	2.1	1.4	1.2	1.0	0.6	0.8	1.2	0.9	0.9	0.7	1.1
30–34 .....	18.8	16.4	14.9	14.1	11.2	11.4	9.8	9.3	9.1	9.4	7.3	7.0	6.3	6.6
35–39 .....	20.3	21.0	21.7	19.8	18.0	17.9	16.6	17.1	16.6	16.6	16.4	14.0	13.8	12.2
40–44 .....	16.3	16.2	17.2	18.8	20.2	20.0	18.7	17.2	17.5	17.6	18.4	17.6	17.3	16.5
45–49 .....	14.2	14.7	13.9	12.6	14.9	15.4	17.8	18.4	17.8	16.9	16.9	17.3	16.5	16.9
50–54 .....	12.2	12.3	12.1	12.1	12.1	12.0	12.9	13.8	15.6	16.0	16.5	17.3	15.9	16.3
55–59 .....	8.3	9.3	10.0	10.4	10.8	9.8	10.3	10.9	10.7	11.0	11.8	13.5	15.2	14.3
60–64 .....	5.0	5.4	5.8	6.8	8.0	8.2	8.5	8.0	7.7	7.8	7.5	7.8	9.3	10.7
65 or older .....	1.9	2.2	2.3	3.2	3.5	4.1	4.3	4.8	4.2	3.7	4.2	4.7	4.9	5.3
Other U&C														
All ages (years).....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Younger than 30 .....	2.8	2.1	1.2	0.9	0.8	0.8	0.4	0.4	0.8	0.9	0.6	0.7	0.8	0.8
30–34 .....	21.4	17.5	14.1	12.2	9.4	8.2	7.1	6.3	7.1	7.3	7.2	7.9	6.7	6.7
35–39 .....	23.0	26.5	25.1	21.6	19.1	18.5	15.2	13.1	13.1	14.1	13.5	12.5	12.6	12.5
40–44 .....	17.0	16.6	18.4	22.3	24.9	22.8	21.3	20.1	18.1	16.7	15.7	16.0	15.3	14.8
45–49 .....	13.3	13.9	14.3	15.0	15.2	18.8	22.5	23.4	20.9	19.9	18.8	17.1	17.0	16.7
50–54 .....	10.3	10.4	11.6	11.8	12.7	12.0	13.4	15.4	19.2	20.8	20.6	19.5	17.1	18.2
55–59 .....	6.5	7.5	8.5	8.4	9.8	9.6	10.8	11.2	11.3	10.2	12.9	15.4	17.9	16.5
60–64 .....	4.2	4.2	5.1	5.8	5.9	6.3	6.6	7.4	6.8	7.1	7.2	7.5	8.7	10.1
65 or older .....	1.6	1.2	1.7	2.0	2.2	2.9	2.6	2.7	2.7	3.0	3.3	3.5	3.8	3.6

U&amp;C universities and colleges

NOTES: Faculty positions include full, associate, and assistant professors and instructors. See chapter 2, "Classification of Academic Institutions," for information on the institutional categories used by the Carnegie Foundation for the Advancement of Teaching. Details may not add to totals and percents may not sum to 100 because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-23

(Page 1 of 4)

**S&E doctorate holders employed in academia, by type of position, sex, and degree field: 1975–2001**

(Thousands)

Position, sex, and field	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All positions</b>														
Both sexes, all fields .....	134.1	145.5	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5	240.2	245.5
All sciences .....	120.7	130.7	139.5	151.0	158.1	170.4	174.8	183.9	187.8	190.6	193.7	205.9	214.7	218.9
Physical sciences .....	23.6	25.0	24.6	25.4	25.1	27.0	27.2	27.7	27.7	28.6	29.3	30.2	30.9	30.4
Mathematics .....	11.0	11.7	12.2	12.4	12.9	13.6	13.8	14.5	15.2	15.5	14.6	15.6	15.2	14.9
Computer sciences .....	NA	NA	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.1	3.3	3.7	3.8
Earth, atmospheric, and ocean sciences .....	3.9	4.2	4.2	4.6	4.8	5.2	5.6	5.9	6.0	6.4	6.4	7.3	7.8	8.2
Life sciences .....	39.4	42.6	47.0	51.3	54.9	58.7	61.3	64.8	66.9	68.2	71.6	77.3	81.9	84.3
Psychology .....	14.8	16.2	17.7	20.1	21.0	23.1	23.7	25.0	25.2	25.0	26.1	27.3	29.0	30.4
Social sciences .....	28.0	31.1	33.6	36.9	38.9	42.0	42.2	44.5	44.8	44.4	42.5	44.9	46.2	46.9
Engineering .....	13.4	14.8	15.8	16.1	18.1	19.9	21.2	22.9	22.8	23.1	23.8	26.6	25.5	26.6
Male, all fields .....	120.3	129.0	136.0	144.0	149.8	159.2	162.0	168.0	168.7	166.9	165.1	173.3	175.8	175.0
All sciences .....	106.9	114.3	120.3	128.1	132.0	139.7	141.4	145.8	146.9	144.8	142.9	148.4	152.4	150.7
Physical sciences .....	22.1	23.3	22.9	23.5	23.2	24.9	24.9	25.2	25.4	25.7	25.9	26.2	27.0	26.2
Mathematics .....	10.3	10.8	11.3	11.3	11.8	12.3	12.5	13.0	13.9	13.7	12.8	13.5	12.9	12.6
Computer sciences .....	NA	NA	0.1	0.3	0.4	0.7	0.9	1.3	1.6	2.1	2.5	2.6	2.9	2.9
Earth, atmospheric, and ocean sciences .....	3.8	4.1	4.0	4.3	4.5	4.9	5.1	5.3	5.4	5.7	5.5	6.2	6.4	6.6
Life sciences .....	34.3	36.6	40.1	42.9	44.5	46.7	47.9	49.5	50.1	49.4	50.1	52.6	55.1	54.9
Psychology .....	11.8	12.6	13.5	14.9	15.1	16.0	16.2	16.5	16.0	14.7	14.7	15.4	15.6	15.7
Social sciences .....	24.7	26.9	28.5	30.9	32.3	34.3	33.9	35.1	34.6	33.4	31.3	31.9	32.4	31.7
Engineering .....	13.3	14.7	15.7	15.9	17.8	19.5	20.6	22.2	21.8	22.1	22.3	24.8	23.4	24.3
Female, all fields .....	13.8	16.5	19.4	23.1	26.5	31.1	34.0	38.7	41.9	46.9	52.4	59.2	64.4	70.5
All sciences .....	13.8	16.4	19.2	22.9	26.1	30.7	33.5	38.0	40.9	45.8	50.9	57.5	62.3	68.2
Physical sciences .....	1.5	1.6	1.7	1.9	1.9	2.1	2.3	2.5	2.3	2.9	3.5	4.0	3.9	4.2
Mathematics .....	0.8	0.9	0.9	1.1	1.1	1.3	1.4	1.5	1.4	1.7	1.8	2.1	2.2	2.3
Computer sciences .....	NA	NA	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.5	0.6	0.7	0.8	0.8
Earth, atmospheric, and ocean sciences .....	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.9	1.1	1.4	1.6
Life sciences .....	5.1	6.0	6.9	8.4	10.3	12.1	13.3	15.3	16.8	18.8	21.5	24.7	26.7	29.4
Psychology .....	3.0	3.6	4.3	5.2	5.9	7.1	7.6	8.5	9.2	10.3	11.5	11.9	13.4	14.7
Social sciences .....	3.3	4.2	5.2	6.0	6.5	7.7	8.3	9.4	10.2	10.9	11.2	13.0	13.8	15.2
Engineering .....	0.1	0.1	0.2	0.2	0.3	0.4	0.6	0.7	1.0	1.1	1.5	1.7	2.1	2.3
<b>Full-time senior faculty</b>														
Both sexes, all fields .....	84.3	90.7	97.2	107.3	115.6	119.7	127.3	131.0	133.0	128.6	127.3	131.9	136.7	136.9
All sciences .....	74.5	80.0	85.6	94.9	101.8	105.8	112.0	115.2	117.2	113.0	112.1	115.4	120.1	120.2
Physical sciences .....	14.6	15.3	16.0	16.8	17.1	17.7	18.3	17.8	17.6	16.9	16.4	16.7	16.6	16.5
Mathematics .....	6.9	7.6	8.3	9.1	9.7	10.0	10.5	10.9	11.8	11.5	10.6	10.8	10.8	10.2
Computer sciences .....	NA	NA	0.0	0.0	0.1	0.1	0.3	0.4	0.9	0.9	1.7	1.7	2.1	2.4
Earth, atmospheric, and ocean sciences .....	2.5	2.7	2.8	2.9	3.1	3.1	3.2	3.6	3.6	3.7	3.6	3.8	4.1	4.2
Life sciences .....	23.4	24.6	27.0	29.6	32.6	33.7	35.8	36.4	37.4	35.8	37.2	38.3	40.6	41.2
Psychology .....	8.7	9.1	9.9	11.7	12.8	13.5	14.3	15.0	15.3	14.3	14.5	15.3	15.6	15.9
Social sciences .....	18.5	20.7	21.7	24.9	26.3	27.7	29.5	31.1	30.6	29.9	28.1	28.8	30.1	29.6
Engineering .....	9.7	10.7	11.6	12.4	13.7	13.9	15.3	15.9	15.8	15.7	15.3	16.6	16.6	16.8
Male, all fields .....	78.9	84.7	90.2	98.7	104.9	107.4	113.2	115.2	115.5	110.3	107.0	109.4	110.6	108.3
All sciences .....	69.2	74.0	78.7	86.4	91.3	93.7	98.2	99.6	100.1	95.0	92.2	93.3	94.8	92.4
Physical sciences .....	14.1	14.7	15.4	16.2	16.4	17.0	17.5	16.9	16.9	16.0	15.4	15.6	15.4	15.0
Mathematics .....	6.5	7.2	7.9	8.6	9.1	9.3	9.8	10.0	10.8	10.5	9.8	10.0	9.7	9.1
Computer sciences .....	NA	NA	0.0	0.0	0.1	0.1	0.3	0.4	0.8	0.8	1.4	1.3	1.6	2.0
Earth, atmospheric, and ocean sciences .....	2.5	2.7	2.7	2.8	3.0	3.0	3.1	3.4	3.4	3.5	3.4	3.3	3.6	3.6
Life sciences .....	21.6	22.7	24.8	26.9	29.1	29.4	31.0	31.0	31.4	29.3	29.3	30.0	31.1	30.4
Psychology .....	7.6	7.8	8.4	9.7	10.5	10.8	11.2	11.5	11.3	10.2	10.1	10.7	10.3	10.3
Social sciences .....	16.9	18.8	19.5	22.3	23.2	24.1	25.3	26.4	25.5	24.7	22.8	22.4	23.2	21.9
Engineering .....	9.7	10.7	11.5	12.2	13.6	13.7	15.1	15.7	15.4	15.3	14.8	16.1	15.8	15.9

Appendix table 5-23

(Page 2 of 4)

**S&E doctorate holders employed in academia, by type of position, sex, and degree field: 1975–2001**

(Thousands)

Position, sex, and field	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
Female, all fields .....	5.4	6.0	7.0	8.6	10.7	12.4	14.0	15.8	17.6	18.3	20.3	22.5	26.1	28.6
All sciences.....	5.4	6.0	6.9	8.5	10.5	12.2	13.8	15.6	17.1	18.0	19.8	22.0	25.3	27.8
Physical sciences.....	0.5	0.6	0.6	0.6	0.7	0.8	0.9	0.9	0.7	0.9	1.0	1.1	1.3	1.5
Mathematics.....	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0	0.8	0.8	1.1	1.1
Computer sciences.....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.5	0.4
Earth, atmospheric, and ocean sciences.....	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.6	0.6
Life sciences.....	1.8	1.9	2.2	2.7	3.5	4.3	4.8	5.4	6.1	6.5	7.8	8.3	9.5	10.8
Psychology .....	1.1	1.2	1.4	2.0	2.4	2.7	3.1	3.5	4.0	4.1	4.4	4.6	5.4	5.6
Social sciences.....	1.5	1.8	2.2	2.6	3.1	3.6	4.1	4.7	5.1	5.2	5.3	6.4	7.0	7.7
Engineering.....	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.3	0.5	0.5	0.8	0.9
Full-time junior faculty														
Both sexes, all fields .....	32.1	34.9	34.0	34.6	32.8	37.2	37.2	38.7	40.1	43.8	44.0	46.4	47.4	50.5
All sciences.....	29.6	32.2	31.3	32.3	30.2	33.1	33.2	34.4	35.8	39.3	39.3	41.5	42.9	45.4
Physical sciences.....	4.3	4.8	4.0	3.7	3.1	3.5	3.6	3.7	4.1	4.3	4.5	4.8	5.1	5.0
Mathematics.....	3.5	3.3	3.1	2.6	2.5	2.7	2.4	2.6	2.4	3.2	2.4	2.8	2.4	2.3
Computer sciences.....	NA	NA	0.1	0.2	0.3	0.6	0.6	0.9	1.0	1.4	1.2	1.3	1.2	0.9
Earth, atmospheric, and ocean sciences.....	0.9	0.9	0.7	0.9	0.9	1.1	1.1	1.1	0.9	0.9	1.1	1.3	1.5	1.7
Life sciences.....	9.7	10.3	10.3	11.3	10.8	11.9	12.3	12.8	13.7	15.0	15.6	16.9	17.5	19.2
Psychology.....	4.2	4.8	4.4	4.8	4.5	5.0	4.9	5.2	5.4	5.2	5.5	5.5	6.2	6.6
Social sciences.....	7.1	8.2	8.6	8.8	8.1	8.4	8.2	7.9	8.4	9.3	9.0	8.9	9.1	9.6
Engineering.....	2.5	2.7	2.8	2.3	2.7	4.0	4.0	4.3	4.3	4.5	4.8	5.0	4.5	5.1
Male, all fields .....	27.5	28.9	27.3	27.1	25.2	27.8	27.2	27.6	28.1	29.7	28.5	29.5	30.1	31.0
All sciences.....	25.1	26.3	24.6	24.9	22.6	23.9	23.4	23.5	24.2	25.7	24.4	25.1	26.2	26.7
Physical sciences.....	4.0	4.4	3.6	3.2	2.7	3.0	3.2	3.2	3.4	3.5	3.4	3.5	4.0	3.9
Mathematics.....	3.2	2.9	2.7	2.2	2.2	2.3	2.0	2.2	2.2	2.7	2.0	2.2	1.7	1.7
Computer sciences.....	NA	NA	0.1	0.2	0.3	0.5	0.5	0.8	0.8	1.1	1.0	1.0	0.9	0.7
Earth, atmospheric, and ocean sciences.....	0.9	0.8	0.7	0.9	0.8	0.9	0.9	0.9	0.7	0.7	0.7	1.0	1.1	1.2
Life sciences.....	8.1	8.4	8.1	8.9	8.1	8.5	8.5	8.4	8.8	9.5	9.5	9.8	10.4	11.0
Psychology .....	3.0	3.3	2.8	3.0	2.6	2.7	2.7	2.9	3.0	2.3	2.4	2.1	2.7	2.7
Social sciences.....	5.9	6.5	6.6	6.5	5.9	6.0	5.6	5.2	5.3	5.9	5.5	5.5	5.4	5.5
Engineering.....	2.4	2.7	2.7	2.2	2.6	3.8	3.8	4.0	3.9	4.0	4.1	4.4	3.9	4.3
Female, all fields .....	4.6	6.0	6.8	7.5	7.7	9.4	10.0	11.2	12.0	14.1	15.6	17.0	17.3	19.4
All sciences.....	4.6	5.9	6.7	7.4	7.6	9.2	9.7	10.8	11.6	13.6	14.9	16.4	16.7	18.7
Physical sciences.....	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.7	0.9	1.1	1.3	1.1	1.1
Mathematics.....	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.5	0.5	0.6	0.7	0.6
Computer sciences.....	NA	NA	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.2
Earth, atmospheric, and ocean sciences.....	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.3	0.4	0.5
Life sciences.....	1.6	1.9	2.2	2.4	2.7	3.4	3.8	4.5	4.9	5.5	6.1	7.1	7.1	8.1
Psychology .....	1.2	1.5	1.6	1.8	1.9	2.3	2.2	2.3	2.4	2.9	3.1	3.4	3.5	3.9
Social sciences.....	1.2	1.7	2.1	2.3	2.1	2.4	2.6	2.7	3.0	3.4	3.5	3.5	3.7	4.1
Engineering.....	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.7	0.6	0.5	0.8
All other full-time positions														
Both sexes, all fields .....	8.3	8.8	11.4	12.6	13.4	18.1	16.4	19.2	20.2	22.2	23.9	26.4	29.3	31.7
All sciences.....	7.4	8.0	10.5	11.5	12.4	16.6	15.3	17.7	18.4	20.8	21.6	23.3	26.4	28.3
Physical sciences.....	1.9	2.1	2.0	2.4	2.5	3.0	2.6	3.3	3.2	3.7	3.8	4.6	5.6	5.5
Mathematics.....	0.3	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.7	0.5	0.6	0.8	0.8	1.0
Computer sciences.....	NA	NA	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
Earth, atmospheric, and ocean sciences.....	0.3	0.3	0.5	0.5	0.5	0.7	0.8	0.7	0.9	1.1	1.1	1.4	1.4	1.6
Life sciences.....	2.4	2.8	3.9	4.0	4.6	6.2	6.0	6.7	7.2	7.7	8.4	8.4	9.5	10.5
Psychology.....	1.0	1.2	1.8	2.2	2.2	2.9	2.8	2.9	2.8	3.9	3.9	4.0	4.6	4.9
Social sciences.....	1.5	1.2	1.9	2.0	2.2	3.2	2.6	3.5	3.5	3.7	3.6	3.9	4.3	4.5
Engineering.....	0.9	0.8	0.9	1.1	1.1	1.5	1.1	1.5	1.8	1.5	2.1	3.1	3.0	3.4



Appendix table 5-23

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**S&E doctorate holders employed in academia, by type of position, sex, and degree field: 1975–2001**

(Thousands)

Position, sex, and field	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Male, all fields</b> .....	7.2	7.4	9.4	10.0	10.3	14.3	12.0	13.9	14.4	15.4	16.1	18.0	20.5	21.4
All sciences.....	6.4	6.6	8.6	8.9	9.3	12.8	10.9	12.5	12.8	13.9	14.2	15.3	17.9	18.3
Physical sciences.....	1.8	1.9	1.8	2.1	2.2	2.7	2.2	2.9	2.9	3.3	3.2	4.0	4.9	4.8
Mathematics.....	0.3	0.4	0.3	0.3	0.2	0.4	0.4	0.4	0.6	0.4	0.5	0.7	0.7	0.8
Computer sciences .....	NA	NA	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2
Earth, atmospheric, and ocean sciences.....	0.3	0.3	0.5	0.5	0.5	0.7	0.7	0.6	0.7	0.9	0.9	1.2	1.1	1.3
Life sciences.....	1.9	2.2	3.0	3.0	3.2	4.6	4.1	4.6	4.9	5.1	5.6	5.3	6.2	6.5
Psychology .....	0.8	0.9	1.4	1.4	1.4	1.8	1.6	1.5	1.2	1.9	1.7	1.8	2.1	2.0
Social sciences .....	1.3	0.9	1.6	1.6	1.7	2.5	1.8	2.4	2.4	2.2	2.1	2.2	2.6	2.7
Engineering.....	0.9	0.8	0.9	1.1	1.0	1.5	1.0	1.4	1.7	1.5	2.0	2.7	2.6	3.1
<b>Female, all fields</b> .....	1.0	1.4	2.0	2.6	3.1	3.8	4.5	5.3	5.8	6.7	7.7	8.4	8.8	10.4
All sciences.....	1.0	1.4	1.9	2.6	3.0	3.8	4.5	5.2	5.6	6.7	7.5	8.2	8.5	10.0
Physical sciences.....	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.6	0.7	0.6	0.7
Mathematics.....	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.1
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Earth, atmospheric, and ocean sciences.....	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
Life sciences.....	0.5	0.6	0.9	1.0	1.3	1.6	1.8	2.1	2.4	2.6	2.8	3.1	3.3	4.0
Psychology .....	0.2	0.3	0.5	0.8	0.8	1.1	1.3	1.4	1.6	2.0	2.2	2.2	2.5	2.9
Social sciences .....	0.2	0.2	0.3	0.4	0.5	0.7	0.8	1.1	1.1	1.5	1.5	1.7	1.7	1.8
Engineering.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.4
<b>Postdocs</b>														
<b>Both sexes, all fields</b> .....	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9	18.5	17.5
All sciences.....	5.9	7.2	7.8	8.4	8.0	8.5	8.8	10.9	9.4	12.3	15.6	17.2	17.5	16.6
Physical sciences.....	2.1	2.2	1.9	1.9	1.4	1.9	2.0	2.4	1.9	3.0	3.9	3.2	2.9	2.6
Mathematics.....	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.5	0.5	0.6	0.8
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Earth, atmospheric, and ocean sciences.....	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.6	0.5	0.4
Life sciences.....	3.0	4.0	4.7	5.2	5.1	5.2	5.6	6.8	6.4	8.2	9.2	10.8	11.7	11.0
Psychology .....	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.5	0.4	1.1	1.3	1.2	1.2
Social sciences .....	0.2	0.3	0.3	0.3	0.6	0.3	0.1	0.4	0.3	0.2	0.4	0.7	0.5	0.6
Engineering.....	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.6	0.5	1.0	1.2	1.7	1.1	0.9
<b>Male, all fields</b> .....	4.9	6.1	6.3	6.3	5.8	6.0	6.8	8.2	6.8	9.2	11.1	12.1	11.2	10.5
All sciences.....	4.7	5.7	6.0	6.1	5.5	5.9	6.3	7.6	6.4	8.3	10.1	10.6	10.3	9.9
Physical sciences.....	1.9	1.9	1.7	1.6	1.2	1.6	1.7	2.0	1.5	2.5	3.3	2.5	2.3	2.0
Mathematics.....	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.3	0.3	0.5	0.6
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Earth, atmospheric, and ocean sciences.....	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.4	0.3
Life sciences.....	2.2	2.9	3.5	3.6	3.3	3.4	3.8	4.7	4.1	5.2	5.5	6.2	6.6	6.2
Psychology .....	0.2	0.4	0.4	0.5	0.3	0.4	0.3	0.3	0.2	0.1	0.4	0.5	0.3	0.4
Social sciences .....	0.1	0.2	0.2	0.1	0.4	0.2	0.1	0.2	0.2	0.1	0.2	0.5	0.3	0.3
Engineering.....	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.5	0.4	0.9	1.0	1.4	0.9	0.7
<b>Female, all fields</b> .....	1.3	1.6	1.8	2.2	2.5	2.6	2.6	3.3	3.0	4.1	5.7	6.8	7.3	6.9
All sciences.....	1.3	1.6	1.8	2.2	2.5	2.6	2.6	3.3	3.0	4.0	5.5	6.6	7.1	6.7
Physical sciences.....	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.6	0.6	0.6	0.6	0.6
Mathematics.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth, atmospheric, and ocean sciences.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1
Life sciences.....	0.8	1.1	1.2	1.6	1.8	1.8	1.8	2.2	2.3	3.0	3.7	4.6	5.1	4.7
Psychology .....	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.3	0.3	0.7	0.8	0.9	0.8
Social sciences .....	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3
Engineering.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2

Appendix table 5-23

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**S&E doctorate holders employed in academia, by type of position, sex, and degree field: 1975–2001**

(Thousands)

Position, sex, and field	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Part-time positions</b>														
Both sexes, all fields .....	3.2	3.4	4.5	4.0	6.0	6.5	5.7	6.2	7.4	5.9	5.5	8.9	8.2	9.0
All sciences .....	3.1	3.2	4.3	3.9	5.7	6.2	5.4	5.6	6.9	5.4	5.1	8.6	7.9	8.5
Physical sciences .....	0.6	0.6	0.7	0.6	1.0	0.9	0.6	0.5	0.9	0.7	0.7	1.0	0.7	0.7
Mathematics .....	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.7	0.7	0.6
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Earth, atmospheric, and ocean sciences .....	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3
Life sciences .....	0.9	1.0	1.2	1.2	1.7	1.7	1.6	1.9	2.3	1.6	1.2	2.9	2.6	2.4
Psychology .....	0.5	0.6	1.0	0.8	1.0	1.0	1.0	1.0	1.2	1.2	1.1	1.1	1.3	1.8
Social sciences .....	0.8	0.8	1.0	1.0	1.6	2.2	1.8	1.7	2.0	1.3	1.3	2.6	2.2	2.7
Engineering .....	0.1	0.1	0.3	0.2	0.4	0.3	0.3	0.5	0.5	0.5	0.4	0.3	0.4	0.4
Male, all fields .....	1.8	1.8	2.7	1.9	3.5	3.6	2.7	3.1	3.8	2.3	2.4	4.4	3.4	3.8
All sciences .....	1.7	1.6	2.4	1.7	3.2	3.3	2.5	2.6	3.4	1.9	2.0	4.1	3.2	3.5
Physical sciences .....	0.3	0.4	0.5	0.3	0.8	0.6	0.4	0.3	0.6	0.5	0.5	0.7	0.5	0.4
Mathematics .....	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.4	0.3
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Earth, atmospheric, and ocean sciences .....	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2
Life sciences .....	0.5	0.4	0.5	0.4	0.7	0.7	0.5	0.8	1.0	0.4	0.3	1.3	0.8	0.7
Psychology .....	0.2	0.2	0.5	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.3	0.3	0.3
Social sciences .....	0.5	0.4	0.6	0.5	1.1	1.4	1.0	0.8	1.2	0.5	0.7	1.4	1.0	1.4
Engineering .....	0.1	0.1	0.3	0.2	0.3	0.3	0.3	0.5	0.5	0.4	0.3	0.2	0.2	0.4
Female, all fields .....	1.5	1.6	1.9	2.1	2.5	2.9	3.0	3.1	3.5	3.6	3.1	4.5	4.9	5.1
All sciences .....	1.5	1.6	1.9	2.1	2.5	2.9	2.9	3.1	3.5	3.5	3.1	4.4	4.7	5.1
Physical sciences .....	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.2
Mathematics .....	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.3
Computer sciences .....	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Earth, atmospheric, and ocean sciences .....	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Life sciences .....	0.5	0.6	0.6	0.7	0.9	1.0	1.1	1.1	1.3	1.2	0.9	1.6	1.8	1.7
Psychology .....	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.9	1.1	1.0	0.8	1.0	1.5
Social sciences .....	0.3	0.3	0.4	0.5	0.5	0.9	0.8	0.8	0.8	0.8	0.7	1.2	1.2	1.3
Engineering .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1

NA not available

NOTES: Faculty is defined by position. Senior faculty includes full and associate professors; junior faculty members are either assistant professors or instructors. Other types of full-time positions include nonfaculty positions such as research associates, adjunct appointments, lecturers, and administrative positions. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-24

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**S&E doctorate holders employed in academia, by type of position, degree field, and race/ethnicity: 1975–2001**

(Thousands)

Position, field, and race/ethnicity	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
All positions .....	134.1	145.4	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5	240.2	245.5
Science .....	120.6	130.7	139.5	150.9	157.9	170.3	174.7	183.8	187.8	190.6	193.7	205.9	214.7	218.9
Physical sciences .....	23.6	25.0	24.6	25.3	25.1	27.0	27.2	27.7	27.7	28.6	29.4	30.2	30.9	30.4
Mathematics .....	11.0	11.7	12.2	12.4	12.9	13.6	13.8	14.5	15.2	15.5	14.6	15.6	15.2	14.9
Computer sciences.....	0.0	0.0	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.1	3.3	3.7	3.8
Earth, atmospheric, and ocean sciences.....	3.9	4.2	4.2	4.6	4.8	5.2	5.6	5.9	6.1	6.4	6.4	7.3	7.8	8.2
Life sciences .....	39.4	42.6	47.0	51.3	54.8	58.7	61.2	64.8	66.9	68.2	71.6	77.3	81.9	84.3
Psychology.....	14.8	16.2	17.7	20.1	21.0	23.1	23.7	25.0	25.2	25.0	26.1	27.3	29.0	30.4
Social sciences .....	28.0	31.1	33.6	36.9	38.8	41.9	42.1	44.5	44.8	44.4	42.5	44.9	46.2	46.9
Engineering .....	13.4	14.8	15.8	16.1	18.1	19.9	21.2	22.8	22.8	23.1	23.8	26.6	25.5	26.6
White.....	121.6	131.4	140.0	149.9	157.2	168.4	172.8	181.0	183.5	181.8	182.6	193.2	198.2	201.0
Science .....	109.9	118.8	126.5	135.9	142.0	152.0	155.7	163.0	165.3	164.3	165.0	173.0	178.8	180.8
Physical sciences.....	21.1	22.1	21.9	22.3	21.9	23.4	23.3	23.7	23.8	23.4	23.8	24.4	25.3	24.7
Mathematics.....	10.0	10.6	10.8	11.0	11.5	11.9	12.2	12.6	13.0	12.9	12.0	12.6	12.3	12.1
Computer sciences.....	0.0	0.0	0.1	0.2	0.4	0.6	0.9	1.1	1.4	1.6	2.1	2.2	2.7	2.7
Earth, atmospheric, and ocean sciences...	3.7	4.0	4.0	4.3	4.5	4.9	5.2	5.5	5.7	5.9	5.7	6.6	7.0	7.3
Life sciences.....	35.8	38.8	42.4	46.1	49.3	52.7	54.6	57.6	59.2	59.1	61.3	64.9	67.2	68.4
Psychology.....	13.9	15.2	16.8	18.8	19.6	21.3	22.0	23.2	23.2	22.9	23.6	24.4	25.5	26.6
Social sciences .....	25.3	28.2	30.5	33.1	34.7	37.2	37.5	39.4	39.1	38.6	36.5	38.0	38.9	39.0
Engineering.....	11.6	12.6	13.5	14.0	15.2	16.4	17.2	18.1	18.2	17.5	17.6	20.2	19.4	20.2
Asian/Pacific Islander .....	6.1	6.7	9.8	10.8	11.8	14.0	15.0	16.3	16.8	20.9	22.4	25.4	26.3	27.6
Science .....	5.0	5.4	7.8	9.1	9.4	11.1	11.5	12.2	13.1	16.2	17.5	20.3	21.7	22.8
Physical sciences.....	1.3	1.4	1.8	2.0	2.2	2.6	2.9	2.8	2.6	3.8	4.1	4.1	4.0	3.9
Mathematics.....	0.5	0.5	0.9	0.9	1.0	1.1	1.1	1.3	1.6	1.9	1.8	2.2	2.1	2.0
Computer sciences.....	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.5	0.7	0.9	0.9	0.9	0.9
Earth, atmospheric, and ocean sciences...	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.4	0.5	0.5	0.6	0.6
Life sciences.....	1.8	2.0	3.1	3.6	3.6	4.0	4.4	4.7	5.1	6.3	6.8	8.5	9.9	11.0
Psychology.....	0.1	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.7	0.8	0.9
Social sciences .....	1.1	1.2	1.6	2.0	2.0	2.5	2.2	2.4	2.6	2.7	2.8	3.2	3.5	3.6
Engineering.....	1.1	1.3	1.9	1.8	2.4	3.0	3.5	4.1	3.7	4.7	4.9	5.2	4.6	4.8
Underrepresented minorities.....	3.2	3.7	4.9	5.8	6.5	7.2	7.8	9.0	9.9	10.7	12.4	13.7	15.6	16.8
Science .....	2.9	3.4	4.5	5.5	6.0	6.7	7.2	8.3	9.0	9.8	11.2	12.6	14.1	15.2
Physical sciences.....	0.5	0.5	0.7	0.9	0.9	0.9	1.0	1.1	1.2	1.4	1.4	1.7	1.6	1.7
Mathematics.....	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.7	0.8	0.7	0.8	0.8
Computer sciences.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.2
Earth, atmospheric, and ocean sciences...	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3
Life sciences.....	1.1	1.2	1.3	1.5	1.7	1.8	2.1	2.4	2.6	2.7	3.5	3.9	4.7	4.9
Psychology.....	0.4	0.6	0.5	0.8	1.0	1.2	1.2	1.3	1.5	1.6	2.0	2.3	2.7	2.9
Social sciences .....	0.8	0.8	1.5	1.8	2.0	2.1	2.3	2.8	3.0	3.1	3.2	3.6	3.9	4.3
Engineering.....	0.2	0.3	0.4	0.3	0.5	0.5	0.5	0.7	0.9	0.9	1.2	1.2	1.5	1.6
Black.....	1.7	1.7	1.9	2.6	3.1	3.3	3.5	3.8	4.6	4.8	5.8	6.6	7.3	8.2
Science.....	1.6	1.7	1.9	2.5	2.9	3.2	3.3	3.5	4.2	4.5	5.4	6.1	6.6	7.4
Physical sciences.....	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.5	0.5	0.7	0.6	0.8
Mathematics.....	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Earth, atmospheric, and ocean sciences.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Life sciences.....	0.6	0.6	0.6	0.6	0.8	0.9	0.9	1.0	1.2	1.3	1.7	1.9	2.1	2.2
Psychology .....	0.2	0.3	0.3	0.4	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.2	1.4	1.6
Social sciences .....	0.5	0.5	0.7	1.0	1.1	1.3	1.2	1.2	1.6	1.6	1.7	2.0	2.0	2.3
Engineering.....	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.4	0.3	0.5	0.5	0.7	0.7

Appendix table 5-24

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**S&E doctorate holders employed in academia, by type of position, degree field, and race/ethnicity: 1975–2001**

(Thousands)

Position, field, and race/ethnicity	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
Hispanic.....	1.2	1.6	2.4	2.5	2.6	3.1	3.4	4.3	4.5	5.0	5.7	6.2	7.3	7.8
Science.....	1.1	1.4	2.1	2.4	2.4	2.8	3.1	3.9	4.1	4.4	5.0	5.6	6.6	7.0
Physical sciences.....	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.8	0.8	0.8	0.9	0.8	0.8
Mathematics.....	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.5
Computer sciences.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Earth, atmospheric, and ocean sciences.....	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Life sciences.....	0.4	0.5	0.7	0.8	0.8	0.8	1.0	1.2	1.2	1.3	1.6	1.8	2.3	2.5
Psychology.....	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.8	1.0	1.1	1.2
Social sciences.....	0.2	0.2	0.6	0.5	0.6	0.7	0.8	1.1	1.1	1.2	1.1	1.3	1.6	1.7
Engineering.....	0.1	0.2	0.3	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.7	0.6	0.7	0.8
American Indian/Alaskan Native.....	0.3	0.4	0.6	0.7	0.7	0.8	0.8	1.0	0.8	0.9	0.9	0.9	1.0	0.9
Science.....	0.3	0.3	0.6	0.7	0.7	0.7	0.8	0.9	0.8	0.9	0.8	0.8	0.9	0.8
Physical sciences.....	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1
Mathematics.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth, atmospheric, and ocean sciences.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences.....	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Psychology.....	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Social sciences.....	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.5	0.3	0.4	0.3	0.3	0.3	0.3
Engineering.....	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Full-time faculty.....	116.4	125.6	131.2	141.9	148.4	156.9	164.4	169.8	173.1	172.4	171.4	178.4	184.0	187.4
Science.....	104.2	112.2	116.9	127.2	132.0	139.0	145.1	149.5	153.1	152.2	151.3	156.8	163.0	165.5
Physical sciences.....	18.9	20.0	20.0	20.5	20.2	21.2	22.0	21.5	21.7	21.3	20.9	21.4	21.7	21.6
Mathematics.....	10.4	10.9	11.4	11.7	12.3	12.7	12.9	13.5	14.2	14.7	13.0	13.6	13.1	12.6
Computer sciences.....	0.0	0.0	0.1	0.3	0.4	0.7	0.9	1.3	1.8	2.3	2.8	3.0	3.3	3.3
Earth, atmospheric, and ocean sciences.....	3.4	3.6	3.5	3.8	4.0	4.2	4.4	4.7	4.5	4.5	4.7	5.1	5.6	5.9
Life sciences.....	33.1	34.9	37.3	40.9	43.5	45.6	48.1	49.3	51.1	50.8	52.8	55.2	58.1	60.4
Psychology.....	12.8	13.9	14.3	16.4	17.3	18.5	19.2	20.2	20.7	19.5	20.1	20.8	21.9	22.6
Social sciences.....	25.5	28.8	30.3	33.7	34.4	36.1	37.6	39.0	39.0	39.2	37.1	37.7	39.2	39.2
Engineering.....	12.2	13.5	14.3	14.7	16.4	17.9	19.3	20.2	20.1	20.1	20.0	21.5	21.1	21.9
White.....	106.2	114.3	118.7	128.1	133.4	139.7	146.2	149.8	151.8	148.7	147.1	151.1	155.4	156.3
Science.....	95.6	102.6	106.5	115.4	119.4	124.9	130.3	133.6	135.7	133.1	131.7	134.5	139.3	139.8
Physical sciences.....	17.2	18.0	18.0	18.5	17.8	18.8	19.3	18.9	18.9	18.0	17.8	17.9	18.3	17.9
Mathematics.....	9.5	9.9	10.1	10.3	10.9	11.1	11.4	11.7	12.2	12.3	10.7	11.0	10.7	10.1
Computer sciences.....	0.0	0.0	0.0	0.2	0.3	0.5	0.7	1.0	1.3	1.5	1.9	2.0	2.4	2.3
Earth, atmospheric, and ocean sciences.....	3.3	3.5	3.3	3.6	3.8	4.0	4.1	4.4	4.3	4.2	4.3	4.7	5.1	5.3
Life sciences.....	30.4	32.1	33.9	37.2	39.7	41.3	43.3	44.4	46.0	45.1	46.7	48.3	50.2	51.4
Psychology.....	12.1	13.0	13.6	15.4	16.2	17.1	17.9	18.8	19.2	18.0	18.4	18.8	19.6	20.1
Social sciences.....	23.2	26.1	27.5	30.1	30.7	32.2	33.5	34.4	33.8	34.1	31.9	31.8	33.0	32.8
Engineering.....	10.6	11.6	12.2	12.7	14.0	14.8	15.9	16.2	16.2	15.6	15.3	16.7	16.1	16.5
Asian/Pacific Islander.....	4.7	5.0	7.8	8.4	9.1	10.9	11.7	12.3	12.6	14.8	14.5	16.5	17.0	18.4
Science.....	3.7	3.9	6.0	6.7	7.2	8.2	8.7	8.9	9.5	11.1	10.9	12.7	13.2	14.4
Physical sciences.....	0.8	0.9	1.3	1.2	1.5	1.6	1.8	1.7	1.7	2.2	2.0	2.2	2.2	2.3
Mathematics.....	0.5	0.5	0.8	0.9	1.0	1.1	1.1	1.3	1.5	1.7	1.6	2.0	1.7	1.7
Computer sciences.....	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.5	0.7	0.8	0.8	0.8	0.8
Earth, atmospheric, and ocean sciences.....	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.3	0.3
Life sciences.....	1.2	1.2	2.1	2.3	2.4	2.8	3.1	3.0	3.0	3.7	3.5	4.1	4.9	5.7
Psychology.....	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
Social sciences.....	1.1	1.1	1.5	1.9	1.9	2.1	2.1	2.1	2.4	2.3	2.4	2.8	2.9	3.1
Engineering.....	1.0	1.1	1.8	1.7	1.9	2.7	3.0	3.4	3.1	3.7	3.6	3.8	3.8	4.0

Appendix table 5-24

**S&E doctorate holders employed in academia, by type of position, degree field, and race/ethnicity: 1975–2001**

(Thousands)

Position, field, and race/ethnicity	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
Underrepresented minorities .....	2.7	3.2	4.2	5.0	5.4	5.8	6.3	7.4	8.4	8.6	9.8	10.6	11.6	12.5
Science .....	2.5	2.9	3.9	4.8	5.0	5.4	5.9	6.8	7.6	7.8	8.7	9.6	10.4	11.2
Physical sciences .....	0.4	0.4	0.6	0.8	0.8	0.7	0.8	0.8	1.0	1.1	1.0	1.3	1.3	1.4
Mathematics .....	0.2	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.6	0.7	0.7
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Earth, atmospheric, and ocean sciences .....	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Life sciences .....	0.9	1.0	1.1	1.3	1.3	1.4	1.6	1.8	2.0	2.0	2.6	2.7	3.1	3.3
Psychology .....	0.3	0.5	0.4	0.6	0.7	0.9	0.9	1.0	1.1	1.1	1.3	1.5	1.8	2.0
Social sciences .....	0.6	0.8	1.4	1.6	1.7	1.8	2.0	2.5	2.8	2.8	2.8	3.1	3.3	3.4
Engineering .....	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.8	0.8	1.1	1.0	1.1	1.4
Black .....	1.4	1.5	1.7	2.3	2.5	2.7	2.8	3.2	4.0	3.8	4.6	5.0	5.5	5.9
Science .....	1.3	1.5	1.6	2.1	2.3	2.6	2.6	3.0	3.6	3.5	4.2	4.5	4.9	5.2
Physical sciences .....	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.3	0.3	0.3	0.4	0.6	0.5	0.6
Mathematics .....	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Earth, atmospheric, and ocean sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Life sciences .....	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.8	1.0	1.0	1.3	1.3	1.4	1.4
Psychology .....	0.2	0.3	0.2	0.4	0.4	0.5	0.5	0.6	0.7	0.6	0.6	0.7	1.0	1.1
Social sciences .....	0.4	0.4	0.6	0.9	0.9	1.1	1.0	1.1	1.5	1.4	1.5	1.7	1.7	1.7
Engineering .....	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.5	0.4	0.6	0.7
Hispanic .....	1.0	1.3	2.0	2.1	2.2	2.4	2.7	3.3	3.7	3.9	4.4	4.8	5.2	5.9
Science .....	0.9	1.2	1.7	2.0	2.0	2.2	2.5	3.0	3.3	3.5	3.8	4.3	4.7	5.3
Physical sciences .....	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.4	0.6	0.6	0.5	0.7	0.7	0.7
Mathematics .....	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.5	0.5
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Earth, atmospheric, and ocean sciences .....	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Life sciences .....	0.4	0.4	0.5	0.7	0.6	0.6	0.8	0.9	0.9	0.9	1.2	1.3	1.5	1.7
Psychology .....	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.7	0.7	0.8
Social sciences .....	0.2	0.2	0.5	0.5	0.5	0.5	0.7	0.9	1.0	1.0	1.0	1.1	1.3	1.4
Engineering .....	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.6	0.5	0.5	0.6
American Indian/Alaskan Native .....	0.3	0.4	0.6	0.6	0.7	0.7	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.7
Science .....	0.3	0.3	0.6	0.6	0.6	0.6	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7
Physical sciences .....	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mathematics .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth, atmospheric, and ocean sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences .....	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Psychology .....	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Social sciences .....	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3
Engineering .....	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Postdocs .....	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9	18.5	17.5
Science .....	5.9	7.2	7.8	8.4	8.0	8.5	8.8	10.9	9.4	12.3	15.6	17.2	17.5	16.6
Physical sciences .....	2.1	2.2	1.9	1.9	1.4	1.9	2.0	2.4	1.9	3.0	3.9	3.2	2.9	2.6
Mathematics .....	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.5	0.5	0.6	0.8
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Earth, atmospheric, and ocean sciences .....	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.6	0.5	0.4
Life sciences .....	3.0	4.0	4.7	5.2	5.1	5.2	5.6	6.8	6.4	8.2	9.2	10.8	11.7	11.0
Psychology .....	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.5	0.4	1.1	1.3	1.2	1.2
Social sciences .....	0.2	0.3	0.3	0.3	0.6	0.3	0.1	0.4	0.3	0.2	0.4	0.7	0.5	0.6
Engineering .....	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.6	0.5	1.0	1.2	1.7	1.1	0.9





Appendix table 5-24

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**S&E doctorate holders employed in academia, by type of position, degree field, and race/ethnicity: 1975–2001**

(Thousands)

Position, field, and race/ethnicity	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
Black .....	0.2	0.2	0.2	0.3	0.5	0.4	0.6	0.4	0.5	0.7	0.9	1.2	1.2	1.8
Science.....	0.2	0.2	0.2	0.3	0.5	0.4	0.6	0.4	0.5	0.7	0.9	1.1	1.2	1.7
Physical sciences .....	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2
Mathematics.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth, atmospheric, and ocean sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences.....	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.4	0.5
Psychology.....	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.4	0.4	0.3	0.5
Social sciences.....	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.5
Engineering .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hispanic.....	0.1	0.2	0.2	0.3	0.3	0.5	0.5	0.6	0.5	0.7	0.7	0.8	1.2	1.2
Science.....	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.8	1.1	1.1
Physical sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mathematics.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth, atmospheric, and ocean sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences.....	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.4
Psychology.....	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3
Social sciences.....	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Engineering .....	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1
American Indian/Alaskan Native .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Science.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Physical sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mathematics.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth, atmospheric, and ocean sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA
Life sciences.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Psychology.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social sciences .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NA not available

NOTES: Faculty positions include full, associate, and assistant professors and instructors. Other types of full-time positions include nonfaculty positions such as research associates, adjunct appointments, lecturers, and administrative positions. Underrepresented minorities are black, Hispanic, and American Indian/Alaskan Native respondents. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.



Appendix table 5-25

(Page 1 of 4)

## U.S. S&amp;E doctorate holders employed at academic institutions, by type of position, degree field, and place of birth: 1975–2001

Field, position, and place of birth	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All positions</b>														
All fields.....	134,100	145,400	155,300	167,100	176,100	190,200	195,900	206,600	210,600	213,800	217,500	232,500	240,200	245,500
United States.....	116,800	127,200	132,500	142,400	149,200	159,500	164,300	171,800	174,100	173,300	175,800	186,000	191,200	194,100
Foreign.....	15,300	16,400	21,700	23,600	25,700	29,700	30,800	34,000	36,300	40,500	41,800	46,500	49,000	51,500
Percent foreign.....	12	11	14	14	15	16	16	17	17	19	19	20	20	21
Physical sciences.....	23,600	25,000	24,600	25,300	25,100	27,000	27,200	27,700	27,700	28,600	29,400	30,200	30,900	30,400
United States.....	20,200	21,300	20,600	21,200	21,000	22,200	22,000	22,300	22,400	22,000	22,800	23,300	24,000	23,400
Foreign.....	3,000	3,200	3,800	4,000	4,000	4,700	5,000	5,300	5,300	6,600	6,500	6,900	7,000	7,000
Percent foreign.....	13	13	16	16	16	17	18	19	19	23	22	23	23	23
Mathematics.....	11,000	11,700	12,200	12,400	12,900	13,600	13,800	14,500	15,200	15,500	14,600	15,600	15,200	14,900
United States.....	9,600	10,300	10,200	10,200	10,500	10,900	11,200	11,300	11,600	11,500	10,900	11,300	11,000	10,700
Foreign.....	1,300	1,200	1,900	2,000	2,300	2,600	2,600	3,100	3,600	4,000	3,700	4,200	4,200	4,200
Percent foreign.....	11	10	15	16	18	19	19	21	24	26	26	27	28	28
Computer sciences.....	NA	NA	100	300	500	800	1,100	1,500	2,000	2,500	3,100	3,300	3,700	3,800
United States.....	NA	NA	—	200	300	500	800	900	1,100	1,500	1,800	1,900	2,300	2,300
Foreign.....	NA	NA	—	100	100	300	300	600	900	1,100	1,300	1,400	1,400	1,500
Percent foreign.....	NA	NA	—	30	30	32	29	38	44	42	42	44	37	39
<b>Earth, atmospheric, and</b>														
ocean sciences.....	3,900	4,200	4,200	4,600	4,800	5,200	5,600	5,900	6,100	6,400	6,400	7,300	7,800	8,200
United States.....	3,500	3,700	3,700	4,000	4,200	4,500	4,900	5,000	5,300	5,400	5,300	5,900	6,600	6,800
Foreign.....	400	400	500	500	600	700	700	800	800	1,000	1,100	1,400	1,200	1,400
Percent foreign.....	10	11	11	12	13	14	12	14	13	16	17	19	16	17
Life sciences.....	39,400	42,600	47,000	51,300	54,800	58,700	61,200	64,800	66,900	68,200	71,600	77,300	81,900	84,300
United States.....	34,800	37,800	40,700	44,400	47,700	51,000	53,100	56,000	57,800	57,800	60,500	64,000	66,400	67,400
Foreign.....	3,900	4,300	5,900	6,500	6,600	7,300	7,800	8,400	9,100	10,400	11,100	13,300	15,500	16,800
Percent foreign.....	10	10	13	13	12	12	13	13	14	15	16	17	19	20
Psychology.....	14,800	16,200	17,700	20,100	21,000	23,100	23,700	25,000	25,200	25,000	26,100	27,300	29,000	30,400
United States.....	13,700	15,100	16,500	18,600	19,500	21,300	22,100	23,200	23,400	23,200	24,400	25,200	26,800	28,000
Foreign.....	900	900	1,100	1,500	1,400	1,700	1,600	1,700	1,700	1,700	1,800	2,100	2,200	2,400
Percent foreign.....	6	6	6	7	7	7	7	7	7	7	7	8	8	8
Social sciences.....	28,000	31,100	33,600	36,900	38,800	41,900	42,100	44,500	44,800	44,400	42,500	44,900	46,200	46,900
United States.....	24,100	27,100	28,600	31,300	32,800	35,200	35,900	37,700	37,500	37,100	35,300	36,800	37,500	38,100
Foreign.....	3,500	3,700	4,700	5,400	5,800	6,600	6,100	6,700	7,200	7,300	7,200	8,100	8,700	8,800
Percent foreign.....	12	12	14	15	15	16	15	15	16	17	17	18	19	19
Engineering.....	13,400	14,800	15,800	16,100	18,100	19,900	21,200	22,800	22,800	23,100	23,800	26,600	25,500	26,600
United States.....	11,000	11,900	12,100	12,500	13,200	13,900	14,400	15,300	15,100	14,800	14,800	17,500	16,700	17,200
Foreign.....	2,300	2,700	3,700	3,600	4,900	6,000	6,700	7,500	7,700	8,400	9,000	9,100	8,800	9,400
Percent foreign.....	17	18	23	23	27	30	32	33	34	36	38	34	35	35
<b>Full-time senior faculty</b>														
All fields.....	84,300	90,700	97,200	107,300	115,600	119,700	127,300	131,000	133,000	128,600	127,300	131,900	136,700	136,900
United States.....	73,100	79,300	83,000	91,500	98,400	101,300	108,300	110,900	113,500	108,400	107,400	109,900	113,200	112,400
Foreign.....	9,600	9,900	13,300	14,900	16,300	17,900	18,500	19,600	19,500	20,200	19,900	22,000	23,400	24,500
Percent foreign.....	12	11	14	14	14	15	15	15	15	16	16	17	17	18
Physical sciences.....	14,600	15,300	16,000	16,800	17,100	17,700	18,300	17,800	17,600	16,900	16,400	16,700	16,600	16,500
United States.....	12,500	13,000	13,600	14,300	14,400	14,900	15,300	14,800	14,900	14,100	13,900	14,000	13,900	13,400
Foreign.....	1,800	1,900	2,200	2,400	2,500	2,700	2,900	2,800	2,600	2,900	2,500	2,700	2,800	3,100
Percent foreign.....	12	12	14	14	15	16	16	16	15	17	16	16	17	19
Mathematics.....	6,900	7,600	8,300	9,100	9,700	10,000	10,500	10,900	11,800	11,500	10,600	10,800	10,800	10,200
United States.....	6,000	6,700	7,000	7,500	8,000	8,100	8,800	8,900	9,600	9,100	8,400	8,200	8,100	7,700
Foreign.....	800	800	1,200	1,400	1,600	1,800	1,700	1,900	2,200	2,400	2,200	2,600	2,700	2,500
Percent foreign.....	12	11	14	16	16	18	16	18	19	21	21	24	25	25
Computer sciences.....	NA	NA	—	—	100	100	300	400	900	900	1,700	1,700	2,100	2,400
United States.....	NA	NA	—	—	100	—	200	300	500	600	1,100	900	1,300	1,400
Foreign.....	NA	NA	—	—	—	100	100	100	400	300	600	700	900	1,000
Percent foreign.....	NA	NA	—	—	—	—	26	24	46	35	37	45	40	42

Appendix table 5-25

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**U.S. S&E doctorate holders employed at academic institutions, by type of position, degree field, and place of birth: 1975–2001**

Field, position, and place of birth	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Earth, atmospheric, and</b>														
ocean sciences.....	2,500	2,700	2,800	2,900	3,100	3,100	3,200	3,600	3,600	3,700	3,600	3,800	4,100	4,200
United States.....	2,200	2,400	2,400	2,500	2,600	2,700	2,900	3,100	3,300	3,300	3,200	3,200	3,600	3,500
Foreign.....	200	300	300	300	400	400	300	500	300	400	400	600	500	700
Percent foreign.....	8	10	11	12	13	12	11	13	9	12	12	15	13	17
Life sciences.....	23,400	24,600	27,000	29,600	32,600	33,700	35,800	36,400	37,400	35,800	37,200	38,300	40,600	41,200
United States.....	20,900	22,000	23,800	26,000	28,700	29,500	31,500	32,100	33,400	31,700	33,200	33,900	35,800	36,200
Foreign.....	2,000	2,100	2,900	3,200	3,700	4,000	4,100	4,200	4,000	4,100	4,000	4,400	4,800	5,000
Percent foreign.....	8	9	11	11	11	12	12	11	11	12	11	12	12	12
Psychology.....	8,700	9,100	9,900	11,700	12,800	13,500	14,300	15,000	15,300	14,300	14,500	15,300	15,600	15,900
United States.....	7,900	8,400	9,200	10,700	11,900	12,400	13,200	13,900	14,400	13,400	13,700	14,200	14,500	14,800
Foreign.....	600	500	600	900	900	1,000	1,000	1,000	900	800	900	1,100	1,100	1,100
Percent foreign.....	7	6	6	8	7	8	7	7	6	6	6	7	7	7
Social sciences.....	18,500	20,700	21,700	24,900	26,300	27,700	29,500	31,100	30,600	29,900	28,100	28,800	30,100	29,600
United States.....	15,700	17,900	18,100	20,900	22,200	23,300	25,200	26,400	26,200	25,400	23,900	24,100	25,100	24,400
Foreign.....	2,500	2,500	3,400	3,800	4,000	4,300	4,200	4,600	4,400	4,500	4,200	4,700	5,100	5,200
Percent foreign.....	13	12	16	15	15	16	14	15	14	15	15	16	17	18
Engineering.....	9,700	10,700	11,600	12,400	13,700	13,900	15,300	15,900	15,800	15,700	15,300	16,600	16,600	16,800
United States.....	7,900	8,800	8,800	9,600	10,500	10,300	11,200	11,400	11,200	10,900	10,200	11,300	11,100	11,000
Foreign.....	1,700	1,800	2,700	2,800	3,200	3,600	4,100	4,500	4,600	4,800	5,100	5,300	5,500	5,800
Percent foreign.....	18	17	24	22	23	26	27	28	29	31	33	32	33	35
<b>Full-time junior faculty</b>														
All fields.....	32,100	34,900	34,000	34,600	32,800	37,200	37,200	38,700	40,100	43,800	44,000	46,400	47,400	50,500
United States.....	28,800	31,400	29,300	29,900	27,700	30,600	30,700	31,000	30,800	33,500	34,300	35,600	36,700	38,700
Foreign.....	3,200	3,400	4,700	4,600	5,000	6,400	6,400	7,600	9,200	10,300	9,700	10,900	10,600	11,700
Percent foreign.....	10	10	14	13	15	17	17	20	23	24	22	23	23	23
Physical sciences.....	4,300	4,800	4,000	3,700	3,100	3,500	3,600	3,700	4,100	4,300	4,500	4,800	5,100	5,000
United States.....	3,900	4,200	3,300	3,100	2,600	2,900	3,100	3,000	3,100	3,200	3,500	3,500	3,700	3,700
Foreign.....	500	500	700	500	400	600	600	700	1,000	1,200	1,000	1,300	1,300	1,300
Percent foreign.....	11	11	17	14	15	18	15	19	26	27	22	26	26	26
Mathematics.....	3,500	3,300	3,100	2,600	2,500	2,700	2,400	2,600	2,400	3,200	2,400	2,800	2,400	2,300
United States.....	3,100	3,000	2,600	2,100	1,900	2,100	1,900	1,700	1,300	1,700	1,500	1,800	1,700	1,600
Foreign.....	300	300	500	500	600	700	500	1,000	1,100	1,500	900	1,000	700	700
Percent foreign.....	10	8	17	20	24	24	22	36	45	46	38	35	28	30
Computer sciences.....	NA	NA	100	200	300	600	600	900	1,000	1,400	1,200	1,300	1,200	900
United States.....	NA	NA	—	200	300	400	400	500	500	700	600	700	800	600
Foreign.....	NA	NA	—	100	100	200	200	400	500	700	600	600	400	300
Percent foreign.....	NA	NA	—	28	25	29	33	48	47	48	50	47	36	33
<b>Earth, atmospheric, and</b>														
ocean sciences.....	900	900	700	900	900	1,100	1,100	1,100	900	900	1,100	1,300	1,500	1,700
United States.....	800	800	600	800	800	900	1,000	900	800	600	900	1,100	1,300	1,500
Foreign.....	100	100	100	100	100	100	100	200	200	200	200	200	200	200
Percent foreign.....	12	10	11	10	9	14	13	16	17	28	18	19	13	12
Life sciences.....	9,700	10,300	10,300	11,300	10,800	11,900	12,300	12,800	13,700	15,000	15,600	16,900	17,500	19,200
United States.....	8,700	9,500	8,800	9,900	9,700	10,600	10,700	11,300	11,600	12,700	13,200	13,900	13,900	14,800
Foreign.....	900	800	1,500	1,300	1,100	1,300	1,500	1,500	2,000	2,300	2,400	3,000	3,600	4,400
Percent foreign.....	10	8	14	12	10	11	12	12	15	15	15	18	21	23
Psychology.....	4,200	4,800	4,400	4,800	4,500	5,000	4,900	5,200	5,400	5,200	5,500	5,500	6,200	6,600
United States.....	4,000	4,500	4,100	4,500	4,200	4,600	4,600	4,800	5,000	4,800	5,100	5,000	5,700	6,100
Foreign.....	200	300	300	200	200	300	300	400	300	400	400	500	500	600
Percent foreign.....	4	6	7	5	5	6	6	8	6	8	8	9	9	9
Social sciences.....	7,100	8,200	8,600	8,800	8,100	8,400	8,200	7,900	8,400	9,300	9,000	8,900	9,100	9,600
United States.....	6,300	7,100	7,600	7,500	6,800	7,000	6,900	6,600	6,300	7,300	6,800	6,600	6,900	7,500
Foreign.....	800	1,000	1,000	1,200	1,300	1,300	1,300	1,400	2,100	2,000	2,200	2,300	2,200	2,200
Percent foreign.....	11	12	12	14	16	16	16	17	25	21	24	26	24	23
Engineering.....	2,500	2,700	2,800	2,300	2,700	4,000	4,000	4,300	4,300	4,500	4,800	5,000	4,500	5,100
United States.....	2,100	2,200	2,100	1,700	1,500	2,100	2,200	2,300	2,300	2,400	2,800	3,000	2,800	3,000
Foreign.....	400	500	600	600	1,200	1,900	1,800	2,100	2,000	2,100	2,000	2,000	1,700	2,000
Percent foreign.....	16	18	23	27	44	47	46	47	46	47	42	40	38	39

Appendix table 5-25

**U.S. S&E doctorate holders employed at academic institutions, by type of position, degree field, and place of birth: 1975–2001**

Field, position, and place of birth	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Full-time other</b>														
All fields.....	8,300	8,800	11,400	12,600	13,400	18,100	16,400	19,200	20,200	22,200	23,900	26,400	29,300	31,700
United States.....	7,300	7,600	9,900	10,800	11,000	15,400	13,700	16,000	16,700	18,600	19,000	21,800	23,700	25,400
Foreign.....	900	1,200	1,500	1,700	2,300	2,700	2,700	3,100	3,500	3,600	4,800	4,600	5,600	6,300
Percent foreign.....	11	13	13	14	18	15	16	16	17	16	20	17	19	20
Physical sciences.....	1,900	2,100	2,000	2,400	2,500	3,000	2,600	3,300	3,200	3,700	3,800	4,600	5,600	5,500
United States.....	1,700	1,900	1,700	2,000	2,000	2,600	2,100	2,600	2,600	2,800	2,900	3,600	4,400	4,300
Foreign.....	200	200	300	400	500	400	600	700	600	900	900	1,000	1,100	1,200
Percent foreign.....	12	12	15	15	22	14	21	20	19	25	23	22	20	22
Mathematics.....	300	400	400	400	300	500	400	500	600	500	600	800	800	1,000
United States.....	300	400	300	300	300	500	300	400	400	300	400	700	500	700
Foreign.....	100	100	100	—	—	—	100	100	300	100	200	200	300	300
Percent foreign.....	16	16	22	—	—	—	33	17	43	25	31	19	34	30
Computer sciences.....	NA	NA	—	—	100	100	100	100	100	200	200	200	300	300
United States.....	NA	NA	—	—	—	100	100	100	100	100	100	100	200	200
Foreign.....	NA	NA	—	—	—	—	—	—	—	—	100	—	100	100
Percent foreign.....	NA	NA	—	—	—	—	—	—	—	—	38	—	31	33
<b>Earth, atmospheric, and</b>														
ocean sciences.....	300	300	500	500	500	700	800	700	900	1,100	1,100	1,400	1,400	1,600
United States.....	300	300	400	500	400	600	600	600	800	1,000	800	1,200	1,000	1,200
Foreign.....	—	—	100	—	100	100	100	100	100	100	300	300	300	400
Percent foreign.....	—	—	14	—	15	18	18	13	9	9	24	19	25	25
Life sciences.....	2,400	2,800	3,900	4,000	4,600	6,200	6,000	6,700	7,200	7,700	8,400	8,400	9,500	10,500
United States.....	2,000	2,200	3,100	3,200	3,600	5,200	5,000	5,500	6,000	6,500	6,900	7,000	7,500	8,200
Foreign.....	300	500	700	800	900	900	1,000	1,200	1,200	1,200	1,600	1,400	2,000	2,300
Percent foreign.....	12	18	19	20	20	15	16	17	17	16	19	16	21	22
Psychology.....	1,000	1,200	1,800	2,200	2,200	2,900	2,800	2,900	2,800	3,900	3,900	4,000	4,600	4,900
United States.....	1,000	1,200	1,700	2,100	2,000	2,700	2,600	2,800	2,600	3,600	3,600	3,700	4,300	4,500
Foreign.....	—	—	100	200	200	200	200	200	200	300	400	300	300	400
Percent foreign.....	—	—	6	7	9	7	8	6	9	9	9	8	7	8
Social sciences.....	1,500	1,200	1,900	2,000	2,200	3,200	2,600	3,500	3,500	3,700	3,600	3,900	4,300	4,500
United States.....	1,300	1,000	1,800	1,800	1,900	2,600	2,300	3,000	3,200	3,300	3,100	3,300	3,600	3,800
Foreign.....	100	100	100	200	300	600	300	500	400	400	500	600	800	700
Percent foreign.....	9	11	5	11	12	18	12	13	10	11	15	15	18	16
Engineering.....	900	800	900	1,100	1,100	1,500	1,100	1,500	1,800	1,500	2,100	3,100	3,000	3,400
United States.....	800	600	800	1,000	800	1,100	700	1,000	1,100	1,000	1,200	2,300	2,200	2,600
Foreign.....	100	100	100	100	300	400	300	500	700	500	900	800	800	900
Percent foreign.....	11	19	13	7	28	25	32	32	38	35	43	26	27	26
<b>Postdocs</b>														
All fields.....	6,200	7,600	8,100	8,500	8,300	8,700	9,300	11,500	9,900	13,300	16,800	18,900	18,500	17,500
United States.....	4,800	6,000	6,500	6,600	6,700	6,800	6,700	8,300	6,600	8,100	10,400	11,400	11,200	10,300
Foreign.....	1,300	1,600	1,700	1,900	1,500	1,800	2,600	3,100	3,200	5,200	6,400	7,500	7,400	7,100
Percent foreign.....	21	21	20	22	18	21	28	27	33	39	38	40	40	41
Physical sciences.....	2,100	2,200	1,900	1,900	1,400	1,900	2,000	2,400	1,900	3,000	3,900	3,200	2,900	2,600
United States.....	1,700	1,700	1,400	1,300	1,100	1,200	1,100	1,400	1,000	1,600	2,100	1,600	1,500	1,600
Foreign.....	500	500	500	600	300	700	900	1,000	900	1,400	1,800	1,600	1,400	1,100
Percent foreign.....	22	23	27	32	23	36	46	43	47	47	47	50	48	42
Mathematics.....	100	100	100	100	100	100	300	200	100	—	500	500	600	800
United States.....	100	100	100	100	100	100	100	100	—	—	200	200	300	400
Foreign.....	—	—	—	—	—	—	200	100	100	—	300	200	300	400
Percent foreign.....	—	—	—	—	—	—	64	49	—	—	62	54	57	50
Computer sciences.....	NA	NA	—	—	—	—	—	—	—	—	100	100	100	—
United States.....	NA	NA	—	—	—	—	—	—	—	—	—	—	100	—
Foreign.....	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
Percent foreign.....	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
<b>Earth, atmospheric, and</b>														
ocean sciences.....	100	200	100	200	200	200	300	300	300	500	500	600	500	400
United States.....	100	100	100	100	100	100	200	200	200	300	300	400	400	300
Foreign.....	—	—	—	—	—	—	—	—	200	200	200	200	100	100
Percent foreign.....	—	—	—	—	—	—	—	—	44	36	40	39	15	25

Appendix table 5-25

(Page 4 of 4)

## U.S. S&amp;E doctorate holders employed at academic institutions, by type of position, degree field, and place of birth: 1975–2001

Field, position, and place of birth	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
Life sciences .....	3,000	4,000	4,700	5,200	5,100	5,200	5,600	6,800	6,400	8,200	9,200	10,800	11,700	11,000
United States .....	2,400	3,200	3,900	4,300	4,300	4,300	4,500	5,400	4,700	5,500	6,200	6,700	7,000	6,300
Foreign.....	700	700	800	1,000	800	900	1,100	1,400	1,700	2,700	3,000	4,100	4,700	4,700
Percent foreign .....	22	19	17	19	16	18	19	20	26	33	33	38	40	43
Psychology .....	400	500	600	600	600	700	700	800	500	400	1,100	1,300	1,200	1,200
United States .....	400	500	600	600	500	700	600	800	400	300	1,000	1,100	1,000	1,100
Foreign.....	—	—	—	—	—	—	—	—	100	100	100	200	100	100
Percent foreign .....	—	—	—	—	—	—	—	—	13	16	8	16	11	8
Social sciences .....	200	300	300	300	600	300	100	400	300	200	400	700	500	600
United States .....	200	300	200	300	500	300	100	200	200	100	300	600	400	400
Foreign.....	100	—	100	—	100	—	—	100	100	100	100	100	100	200
Percent foreign .....	22	—	42	—	19	—	—	32	30	51	23	17	23	33
Engineering .....	300	400	300	200	300	200	500	600	500	1,000	1,200	1,700	1,100	900
United States .....	200	200	200	—	100	—	100	200	100	200	300	700	400	300
Foreign.....	100	200	200	100	200	100	400	400	300	800	900	900	700	500
Percent foreign .....	41	55	51	—	65	—	76	66	68	76	72	56	60	56
Part-time														
All fields.....	3,200	3,400	4,500	4,000	6,000	6,500	5,700	6,200	7,400	5,900	5,500	8,900	8,200	9,000
United States.....	2,800	3,000	3,900	3,400	5,400	5,400	4,900	5,500	6,500	4,700	4,600	7,300	6,400	7,200
Foreign.....	300	400	500	500	500	1,000	700	600	900	1,100	900	1,600	1,900	1,800
Percent foreign.....	10	11	12	13	9	15	13	10	12	19	17	18	23	20
Physical sciences.....	600	600	700	600	1,000	900	600	500	900	700	700	1,000	700	700
United States .....	500	500	600	500	900	600	500	400	800	400	500	600	400	500
Foreign.....	100	100	100	100	100	200	100	100	100	300	300	300	300	200
Percent foreign .....	12	9	18	18	9	25	16	16	14	39	35	33	40	29
Mathematics .....	200	200	300	200	200	200	200	300	300	300	500	700	700	600
United States .....	200	200	200	200	200	200	100	200	300	200	400	500	400	400
Foreign.....	—	—	100	—	—	100	—	—	—	100	100	200	300	200
Percent foreign .....	—	—	21	—	—	23	—	—	—	34	24	31	40	33
Computer sciences .....	NA	NA	—	—	—	—	—	—	—	—	—	100	100	100
United States .....	NA	NA	—	—	—	—	—	—	—	—	—	100	100	100
Foreign.....	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
Percent foreign .....	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
Earth, atmospheric, and ocean sciences .....	100	100	100	100	100	200	200	200	300	300	200	200	300	300
United States .....	100	100	100	100	100	200	200	200	200	200	200	200	200	300
Foreign.....	—	—	—	—	—	—	—	—	100	—	—	100	100	—
Percent foreign .....	—	—	—	—	—	—	—	—	22	—	—	29	25	—
Life sciences .....	900	1,000	1,200	1,200	1,700	1,700	1,600	1,900	2,300	1,600	1,200	2,900	2,600	2,400
United States .....	800	900	1,000	1,000	1,500	1,400	1,400	1,800	2,100	1,400	1,100	2,500	2,100	2,000
Foreign.....	100	100	100	100	200	200	200	200	200	200	100	400	400	400
Percent foreign .....	9	11	9	11	10	13	12	9	7	10	11	15	17	17
Psychology .....	500	600	1,000	800	1,000	1,000	1,000	1,000	1,100	1,200	1,100	1,100	1,300	1,800
United States .....	500	500	900	700	900	900	1,000	900	1,000	1,100	1,100	1,100	1,300	1,600
Foreign.....	—	—	100	100	100	100	—	100	100	100	—	—	100	200
Percent foreign .....	—	—	10	12	9	14	—	8	11	5	—	—	5	11
Social sciences .....	800	800	1,000	1,000	1,600	2,200	1,800	1,700	2,000	1,300	1,300	2,600	2,200	2,700
United States .....	700	700	900	800	1,400	1,900	1,500	1,500	1,700	1,000	1,200	2,200	1,700	2,100
Foreign.....	100	100	100	100	100	300	200	200	300	300	200	500	600	500
Percent foreign .....	8	9	9	13	8	13	14	10	15	23	14	17	25	19
Engineering .....	100	100	300	200	400	300	300	500	500	500	400	300	400	400
United States .....	100	100	200	100	300	300	200	500	400	300	200	200	200	200
Foreign.....	—	—	100	—	—	—	100	100	100	200	200	100	200	200
Percent foreign .....	—	—	18	—	—	—	28	13	20	40	42	46	53	50

— sample too small

NA not available

NOTES: Numbers are rounded to nearest hundred. Percent foreign is based on actual rather than rounded numbers and is reported to the nearest whole number. Small number of unknowns through 1987 not shown. Senior faculty includes full and associate professors. Junior faculty includes assistant professors and instructors. Other types of full-time positions include nonfaculty positions such as research associates, adjunct appointments, lecturers, and administrative positions. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-26

(Page 1 of 2)

**S&E doctorate holders employed in academia, by degree field, type of position, and primary work activity: 1975–2001**

(Thousands)

Field, position, and work activity	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All fields</b>														
All positions.....	134.1	145.4	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5	240.2	245.5
Research.....	30.8	37.0	41.3	46.5	48.9	55.9	66.5	72.2	73.9	80.2	83.0	88.6	91.4	93.8
Teaching.....	83.8	82.2	83.8	95.9	97.7	101.0	99.3	100.9	103.4	98.3	100.2	105.4	108.6	109.0
Other.....	19.4	26.2	30.2	24.7	29.6	33.3	30.1	33.5	33.2	35.2	34.3	38.6	40.2	42.8
Full-time faculty.....	116.4	125.6	131.2	141.9	148.4	156.9	164.4	169.8	173.1	172.4	171.4	178.4	184.0	187.4
Research.....	21.4	25.8	28.1	31.8	33.6	39.5	48.6	51.6	53.8	56.8	56.6	58.0	60.4	62.8
Teaching.....	80.2	78.4	79.7	92.1	91.9	94.9	93.6	93.9	96.7	91.4	91.9	95.4	98.6	97.9
Other.....	14.8	21.3	23.4	18.0	22.9	22.5	22.2	24.2	22.6	24.1	22.9	24.9	25.0	26.8
<b>Physical sciences</b>														
All positions.....	23.6	25.0	24.6	25.3	25.1	27.0	27.2	27.7	27.7	28.6	29.4	30.2	30.9	30.4
Research.....	6.4	7.9	7.5	8.0	7.7	9.4	10.2	10.9	10.6	12.0	12.6	12.7	12.2	11.9
Teaching.....	14.6	13.8	13.4	14.7	14.0	14.4	14.0	13.7	13.8	12.8	12.9	13.5	14.0	13.8
Other.....	2.6	3.3	3.7	2.6	3.3	3.2	2.9	3.1	3.3	3.8	3.8	4.0	4.7	4.7
Full-time faculty.....	18.9	20.0	20.0	20.5	20.2	21.2	22.0	21.5	21.7	21.3	20.9	21.4	21.7	21.6
Research.....	3.4	4.4	4.4	4.6	4.5	5.6	6.5	6.5	6.7	7.1	6.9	6.8	6.7	6.6
Teaching.....	13.9	13.1	12.7	14.1	13.1	13.6	13.4	12.8	12.8	11.8	11.6	12.2	12.7	12.6
Other.....	1.7	2.5	2.8	1.8	2.6	2.0	2.0	2.2	2.1	2.3	2.3	2.4	2.3	2.4
<b>Mathematics</b>														
All positions.....	11.0	11.7	12.2	12.4	12.9	13.6	13.8	14.5	15.2	15.5	14.6	15.6	15.2	14.9
Research.....	1.5	1.8	2.1	1.9	2.0	2.7	3.2	3.5	3.5	3.4	3.3	3.5	2.9	3.3
Teaching.....	8.5	8.5	8.6	9.1	9.4	9.3	9.2	9.5	10.1	10.3	9.8	10.2	10.5	10.2
Other.....	1.0	1.4	1.6	1.3	1.6	1.6	1.4	1.5	1.6	1.8	1.5	1.8	1.7	1.4
Full-time faculty.....	10.4	10.9	11.4	11.7	12.3	12.7	12.9	13.5	14.2	14.7	13.0	13.6	13.1	12.6
Research.....	1.3	1.6	1.8	1.8	1.8	2.5	2.7	3.2	3.2	3.1	2.7	2.8	2.3	2.3
Teaching.....	8.2	8.1	8.3	8.8	9.0	8.9	9.0	9.0	9.6	10.0	9.0	9.3	9.4	9.2
Other.....	0.9	1.2	1.3	1.1	1.4	1.3	1.2	1.3	1.4	1.6	1.3	1.5	1.4	1.1
<b>Computer sciences</b>														
All positions.....	NA	NA	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.1	3.3	3.7	3.8
Research.....	NA	NA	0.0	0.1	0.2	0.4	0.7	0.8	1.1	0.9	1.0	1.1	1.1	1.3
Teaching.....	NA	NA	0.1	0.2	0.3	0.3	0.3	0.6	0.7	1.4	1.8	1.8	2.1	1.9
Other.....	NA	NA	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.5	0.5
Full-time faculty.....	NA	NA	0.1	0.3	0.4	0.7	0.9	1.3	1.8	2.3	2.8	3.0	3.3	3.3
Research.....	NA	NA	0.0	0.1	0.1	0.3	0.5	0.7	1.0	0.7	0.9	1.0	0.9	1.1
Teaching.....	NA	NA	0.1	0.2	0.3	0.3	0.3	0.5	0.7	1.3	1.7	1.7	2.0	1.8
Other.....	NA	NA	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4
<b>Earth, atmospheric, and ocean sciences</b>														
All positions.....	3.9	4.2	4.2	4.6	4.8	5.2	5.6	5.9	6.0	6.4	6.4	7.3	7.8	8.2
Research.....	0.8	1.0	1.0	1.4	1.5	1.6	2.1	2.4	2.5	2.7	2.6	2.9	2.9	3.1
Teaching.....	2.7	2.7	2.5	2.8	2.8	3.0	2.9	3.0	3.0	2.9	3.0	3.2	3.8	4.1
Other.....	0.4	0.5	0.7	0.4	0.5	0.6	0.6	0.5	0.5	0.8	0.8	1.2	1.1	1.1
Full-time faculty.....	3.4	3.6	3.5	3.8	4.0	4.2	4.4	4.7	4.5	4.5	4.7	5.1	5.6	5.9
Research.....	0.5	0.6	0.6	0.8	0.9	0.9	1.3	1.5	1.5	1.6	1.5	1.6	1.5	1.7
Teaching.....	2.6	2.6	2.4	2.8	2.7	2.9	2.8	2.8	2.8	2.5	2.8	2.9	3.4	3.6
Other.....	0.3	0.4	0.5	0.2	0.4	0.4	0.4	0.3	0.2	0.4	0.4	0.6	0.7	0.6

Appendix table 5-26

(Page 2 of 2)

**S&E doctorate holders employed in academia, by degree field, type of position, and primary work activity: 1975–2001**

(Thousands)

Field, position, and work activity	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>Life sciences</b>														
All positions.....	39.4	42.6	47.0	51.3	54.9	58.7	61.3	64.8	66.9	68.2	71.6	77.3	81.9	84.3
Research.....	14.5	16.6	19.7	23.2	24.3	27.1	31.5	33.8	34.5	36.0	37.7	40.5	43.2	43.7
Teaching.....	19.0	18.1	18.1	20.5	21.1	20.9	20.1	20.3	20.9	20.2	21.8	23.4	25.1	25.7
Other.....	5.9	8.0	9.3	7.6	9.4	10.6	9.7	10.7	11.5	12.0	12.2	13.4	13.6	14.8
Full-time faculty.....	33.1	34.9	37.3	40.9	43.5	45.6	48.1	49.3	51.1	50.8	52.8	55.2	58.1	60.4
Research.....	10.3	11.4	13.1	15.5	16.5	18.6	22.3	22.6	23.8	24.1	24.7	25.7	27.0	27.7
Teaching.....	18.1	17.1	17.1	19.6	19.6	19.5	18.7	18.7	19.1	18.4	19.8	20.7	22.5	22.8
Other.....	4.7	6.4	7.1	5.8	7.4	7.4	7.2	7.9	8.2	8.3	8.3	8.7	8.6	9.9
<b>Psychology</b>														
All positions.....	14.8	16.2	17.7	20.1	21.0	23.1	23.7	25.0	25.2	25.0	26.1	27.3	29.0	30.4
Research.....	2.2	2.8	3.4	4.1	4.4	4.6	5.2	5.9	6.2	6.7	7.4	8.0	8.6	8.7
Teaching.....	9.7	9.4	9.5	11.7	11.6	12.3	13.0	12.8	12.8	11.6	11.9	12.4	13.0	13.3
Other.....	2.9	4.0	4.8	4.4	5.0	6.2	5.6	6.3	6.2	6.7	6.9	7.0	7.3	8.4
Full-time faculty.....	12.8	13.9	14.3	16.4	17.3	18.5	19.2	20.2	20.7	19.5	20.1	20.8	21.9	22.6
Research.....	1.5	2.0	2.2	2.5	2.9	3.3	3.9	4.5	5.0	5.3	5.4	5.9	6.1	6.3
Teaching.....	9.2	8.9	8.9	11.0	10.9	11.6	12.1	11.9	12.2	10.5	10.9	11.3	11.9	11.9
Other.....	2.1	3.0	3.2	2.9	3.5	3.6	3.3	3.8	3.6	3.7	3.8	3.6	3.9	4.3
<b>Social sciences</b>														
All positions.....	28.0	31.1	33.6	36.9	38.9	42.0	42.2	44.5	44.8	44.4	42.5	44.9	46.2	46.9
Research.....	3.2	4.1	4.2	4.5	4.9	5.7	7.5	8.2	8.4	10.7	9.8	9.8	11.1	11.7
Teaching.....	20.5	21.0	22.6	26.8	27.7	29.1	28.5	28.8	29.8	27.6	26.9	28.3	28.0	28.0
Other.....	4.3	6.0	6.8	5.6	6.1	7.1	6.1	7.6	6.6	6.1	5.8	6.8	7.2	7.2
Full-time faculty.....	25.5	28.8	30.4	33.7	34.4	36.1	37.7	39.0	39.0	39.2	37.1	37.7	39.2	39.2
Research.....	2.7	3.6	3.4	3.8	3.8	4.6	6.3	7.1	7.1	8.9	8.3	7.6	9.2	9.7
Teaching.....	19.5	20.1	21.4	25.7	25.9	26.8	26.5	26.4	27.6	25.9	24.6	25.3	24.9	24.9
Other.....	3.3	5.2	5.5	4.2	4.7	4.7	4.8	5.4	4.3	4.5	4.2	4.8	5.1	4.7
<b>Engineering</b>														
All positions.....	13.4	14.8	15.8	16.1	18.1	19.9	21.2	22.8	22.8	23.1	23.8	26.6	25.5	26.6
Research.....	2.3	2.9	3.4	3.3	3.9	4.4	6.2	6.9	7.2	7.9	8.7	10.1	9.4	10.1
Teaching.....	8.9	8.7	9.1	10.1	10.8	11.7	11.3	12.2	12.2	11.6	12.1	12.6	12.1	11.9
Other.....	2.3	3.1	3.3	2.7	3.5	3.8	3.7	3.7	3.4	3.7	3.0	3.8	4.0	4.7
Full-time faculty.....	12.2	13.5	14.3	14.7	16.4	17.9	19.3	20.2	20.1	20.1	20.0	21.5	21.1	21.9
Research.....	1.7	2.3	2.6	2.7	3.0	3.7	5.0	5.4	5.5	6.0	6.3	6.7	6.7	7.4
Teaching.....	8.7	8.5	8.9	10.0	10.4	11.2	11.0	11.7	11.8	11.0	11.5	12.0	11.7	11.2
Other.....	1.8	2.7	2.8	2.0	2.9	2.9	3.3	3.1	2.7	3.1	2.2	2.8	2.7	3.3

NA not available

NOTES: Faculty positions include full, associate, and assistant professors and instructors. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-27

**S&E doctorate holders employed in academia whose primary or secondary work activity was teaching or research, by type of position and degree field:**  
**1975–2001**

(Thousands)

Position, work activity, and field	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All positions</b>														
<b>Teaching</b>														
All fields .....	110.4	110.8	115.2	125.2	131.3	138.5	151.4	155.8	160.8	145.2	147.1	153.5	158.7	160.6
Physical sciences .....	18.9	18.6	18.4	18.9	18.6	19.6	20.9	20.4	20.9	18.5	19.2	18.8	20.2	19.2
Mathematics .....	10.3	10.6	10.9	11.0	11.5	12.2	12.8	13.3	14.0	13.5	12.8	13.3	13.3	12.9
Computer sciences .....	0.0	0.0	0.1	0.3	0.4	0.6	0.8	1.3	1.8	2.0	2.5	2.6	2.9	2.9
Earth, atmospheric, and ocean sciences .....	3.2	3.2	3.1	3.5	3.8	3.8	4.3	4.5	4.7	4.1	4.3	4.6	5.0	5.4
Life sciences .....	29.6	28.3	29.8	32.9	34.6	35.0	40.5	41.4	43.3	36.5	38.6	41.6	43.6	44.4
Psychology .....	12.3	12.4	13.2	15.0	15.3	16.5	18.2	18.6	18.8	17.3	17.8	18.0	19.0	19.7
Social sciences .....	24.7	25.9	27.6	31.0	32.8	35.2	36.7	37.6	39.0	36.5	35.2	36.6	37.2	37.9
Engineering .....	11.4	11.7	12.1	12.7	14.3	15.6	17.2	18.6	18.3	16.8	16.8	18.0	17.5	18.3
<b>Research</b>														
All fields .....	90.6	85.0	90.0	100.7	104.7	115.2	144.0	151.6	156.6	150.1	153.5	164.7	168.1	172.5
Physical sciences .....	16.9	16.3	15.4	16.3	16.1	17.7	20.3	20.8	20.8	20.0	20.6	21.8	21.6	21.0
Mathematics .....	7.5	6.8	6.9	6.8	7.2	7.6	9.7	10.2	10.7	9.5	9.4	10.1	9.9	9.8
Computer sciences .....	0.0	0.0	0.1	0.3	0.4	0.6	1.0	1.3	1.7	2.0	2.4	2.4	2.6	2.6
Earth, atmospheric, and ocean sciences .....	2.8	2.9	2.7	3.2	3.3	3.7	4.6	4.9	5.1	5.0	5.1	5.6	5.7	6.3
Life sciences .....	29.0	28.7	32.1	37.1	38.3	41.4	48.8	51.8	53.3	51.8	53.8	57.9	60.8	63.1
Psychology .....	8.5	7.7	8.3	9.9	10.5	10.7	14.3	14.3	15.7	14.9	15.6	16.1	17.2	18.2
Social sciences .....	16.9	13.8	14.7	17.6	17.8	20.9	28.5	30.5	31.1	29.3	28.1	29.8	30.9	31.4
Engineering .....	9.0	8.9	9.8	9.5	11.2	12.5	16.8	17.6	18.2	17.5	18.5	20.9	19.4	20.2
<b>Full-time faculty</b>														
<b>Teaching</b>														
All fields .....	103.4	104.7	107.9	117.7	122.3	127.9	141.0	143.6	148.1	134.0	134.0	138.1	143.1	144.2
Physical sciences .....	17.4	17.3	17.2	17.6	17.3	18.1	19.5	18.9	19.2	17.0	17.2	17.2	18.2	17.6
Mathematics .....	9.9	10.1	10.5	10.6	11.1	11.7	12.3	12.7	13.3	13.1	11.8	12.0	11.8	11.4
Computer sciences .....	0.0	0.0	0.1	0.3	0.3	0.6	0.8	1.3	1.7	1.9	2.4	2.4	2.9	2.7
Earth, atmospheric, and ocean sciences .....	3.1	3.1	3.0	3.3	3.6	3.7	4.0	4.2	4.2	3.6	3.9	4.1	4.5	4.7
Life sciences .....	27.3	26.4	27.5	30.6	31.6	31.9	36.9	37.3	38.7	32.8	34.4	36.4	38.5	39.4
Psychology .....	11.4	11.6	12.0	13.7	14.1	15.1	16.7	16.9	17.5	15.4	16.0	16.1	16.9	17.4
Social sciences .....	23.3	24.7	26.1	29.5	30.6	32.1	34.3	34.7	36.0	34.1	32.3	32.9	33.5	33.9
Engineering .....	10.9	11.4	11.5	12.2	13.7	14.8	16.5	17.6	17.5	16.1	16.0	16.9	16.8	17.1
<b>Research</b>														
All fields .....	78.9	71.6	74.1	83.8	86.9	95.1	121.4	125.8	131.4	121.7	121.7	127.0	129.2	133.3
Physical sciences .....	13.4	12.4	11.7	12.5	12.5	13.4	16.1	16.0	16.4	14.4	14.2	14.9	14.7	14.5
Mathematics .....	7.1	6.4	6.4	6.5	6.9	7.3	9.1	9.8	10.2	9.1	8.4	8.9	8.5	8.3
Computer sciences .....	0.0	0.0	0.0	0.2	0.3	0.5	0.8	1.2	1.6	1.8	2.2	2.2	2.4	2.3
Earth, atmospheric, and ocean sciences .....	2.5	2.5	2.2	2.6	2.6	2.9	3.6	4.0	3.8	3.6	3.7	3.9	4.0	4.6
Life sciences .....	24.1	22.9	24.7	28.7	29.6	31.9	38.3	39.0	41.0	38.4	39.5	41.2	42.5	44.6
Psychology .....	7.5	6.7	6.6	8.0	8.8	9.0	12.1	12.2	13.9	12.6	12.9	13.3	13.9	14.6
Social sciences .....	15.9	12.9	13.5	16.5	16.0	18.8	26.1	27.9	28.3	26.6	25.3	25.8	27.2	27.8
Engineering .....	8.3	8.0	8.9	8.8	10.2	11.4	15.2	15.7	16.2	15.1	15.5	16.7	15.9	16.6

NOTES: Faculty includes full, associate, and assistant professors and instructors. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-28

**Estimates of academic S&E doctoral researchers and graduate research assistants, by degree field: 1975–2001**

(Thousands)

Field	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
<b>All doctoral researchers and graduate research assistants</b>														
All fields .....	130.6	128.7	139.0	153.4	159.6	176.2	214.2	230.7	241.8	240.3	243.4	252.7	259.4	272.3
Physical sciences .....	23.3	23.1	23.2	24.9	25.2	28.0	31.9	33.2	33.0	32.3	32.4	33.1	32.9	32.8
Mathematics .....	8.1	7.6	7.7	7.6	8.0	8.6	10.8	11.5	12.1	10.9	10.9	11.5	11.2	11.2
Computer sciences.....	0.7	0.7	0.9	1.4	1.8	2.7	3.8	4.6	5.3	5.8	6.3	6.4	7.5	6.7
Earth, atmospheric, and ocean sciences .....	5.6	6.1	6.3	6.7	6.8	7.4	8.2	9.1	9.5	9.7	9.8	9.9	10.0	12.8
Life sciences .....	40.3	41.8	47.5	53.4	54.8	59.3	69.0	75.0	79.1	79.8	83.1	86.5	89.8	94.0
Psychology .....	10.7	10.0	10.8	12.8	13.5	13.8	17.5	18.1	19.9	19.5	20.2	20.9	22.0	23.1
Social sciences .....	21.7	18.7	19.9	22.8	22.8	26.0	34.0	36.7	37.9	36.7	35.3	36.5	38.1	39.2
Engineering.....	20.0	20.7	22.6	23.9	26.7	30.4	39.0	42.2	45.0	45.4	45.5	47.8	48.1	52.4
<b>Doctoral researchers</b>														
All fields .....	90.6	85.0	90.0	100.7	104.7	115.2	144.0	151.6	156.6	150.1	153.5	164.7	168.1	172.5
Physical sciences.....	16.9	16.3	15.4	16.3	16.1	17.7	20.3	20.8	20.8	20.0	20.6	21.8	21.6	21.0
Mathematics.....	7.5	6.8	6.9	6.8	7.2	7.6	9.7	10.2	10.7	9.5	9.4	10.1	9.9	9.8
Computer sciences.....	0.0	0.0	0.1	0.3	0.4	0.6	1.0	1.3	1.7	2.0	2.4	2.4	2.6	2.6
Earth, atmospheric, and ocean sciences .....	2.8	2.9	2.7	3.2	3.3	3.7	4.6	4.9	5.1	5.0	5.1	5.6	5.7	6.3
Life sciences.....	29.0	28.7	32.1	37.1	38.3	41.4	48.8	51.8	53.3	51.8	53.8	57.9	60.8	63.1
Psychology.....	8.5	7.7	8.3	9.9	10.5	10.7	14.3	14.3	15.7	14.9	15.6	16.1	17.2	18.2
Social sciences .....	16.9	13.8	14.7	17.6	17.8	20.9	28.5	30.5	31.1	29.3	28.1	29.8	30.9	31.4
Engineering.....	9.0	8.9	9.8	9.5	11.2	12.5	16.8	17.6	18.2	17.5	18.5	20.9	19.4	20.2
<b>Graduate research assistants</b>														
All fields .....	40.0	43.7	49.0	52.7	54.9	61.0	70.2	79.1	85.2	90.2	89.9	88.0	91.3	99.7
Physical sciences.....	6.4	6.8	7.8	8.6	9.1	10.3	11.6	12.4	12.2	12.3	11.8	11.3	11.3	11.8
Mathematics.....	0.6	0.8	0.8	0.8	0.8	1.0	1.1	1.3	1.4	1.4	1.5	1.4	1.3	1.4
Computer sciences.....	0.7	0.7	0.8	1.1	1.4	2.1	2.8	3.3	3.6	3.8	3.9	4.0	4.9	4.2
Earth, atmospheric, and ocean sciences .....	2.8	3.2	3.6	3.5	3.5	3.7	3.6	4.2	4.4	4.7	4.7	4.3	4.3	6.5
Life sciences.....	11.3	13.1	15.4	16.3	16.5	17.9	20.2	23.2	25.8	28.0	29.3	28.6	29.0	31.0
Psychology.....	2.2	2.3	2.5	2.9	3.0	3.1	3.2	3.8	4.2	4.6	4.6	4.8	4.8	4.9
Social sciences .....	4.8	4.9	5.2	5.2	5.0	5.1	5.5	6.2	6.8	7.4	7.2	6.7	7.2	7.8
Engineering.....	11.0	11.8	12.8	14.4	15.5	17.9	22.2	24.6	26.8	27.9	27.0	26.9	28.7	32.2

NOTES: Academic doctoral researchers are those reporting research as their primary or secondary work activity. Graduate research assistants are full-time graduate students with research assistantships as their primary mechanism of support. Details may not add to totals because of rounding.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), Survey of Doctorate Recipients; and NSF/SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering, unpublished tabulations.



Appendix table 5-29

(Page 1 of 2)

**Estimates of total academic S&E doctoral employment, S&E doctoral researchers, and S&E graduate research assistants, by Carnegie institution type and work activity: 1975–2001**

Institution type	All positions		Researchers		Research as primary activity		Research assistants	
	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution
<b>All U&amp;C</b>								
1975 .....	134.1	100.0	90.6	100.0	30.8	100.0	40.0	100.0
1977 .....	145.4	100.0	85.0	100.0	37.0	100.0	43.7	100.0
1979 .....	155.3	100.0	90.0	100.0	41.3	100.0	49.0	100.0
1981 .....	167.1	100.0	100.7	100.0	46.5	100.0	52.7	100.0
1983 .....	176.1	100.0	104.7	100.0	48.9	100.0	54.9	100.0
1985 .....	190.2	100.0	115.2	100.0	55.9	100.0	61.0	100.0
1987 .....	195.9	100.0	144.0	100.0	66.5	100.0	70.2	100.0
1989 .....	206.6	100.0	151.6	100.0	72.2	100.0	79.1	100.0
1991 .....	210.6	100.0	156.6	100.0	73.9	100.0	85.2	100.0
1993 .....	213.8	100.0	150.1	100.0	80.2	100.0	90.2	100.0
1995 .....	217.5	100.0	153.5	100.0	83.0	100.0	89.9	100.0
1997 .....	232.5	100.0	164.7	100.0	88.6	100.0	88.0	100.0
1999 .....	240.2	100.0	168.1	100.0	91.4	100.0	91.3	100.0
2001 .....	245.5	100.0	172.5	100.0	93.8	100.0	99.7	100.0
<b>Research universities</b>								
1975 .....	73.4	54.7	58.0	64.0	25.5	82.8	35.6	89.0
1977 .....	78.2	53.8	55.9	65.8	29.5	79.7	38.8	88.8
1979 .....	83.5	53.8	59.0	65.6	32.1	77.7	42.6	86.9
1981 .....	91.0	54.5	66.6	66.1	37.5	80.6	45.2	85.8
1983 .....	89.9	51.1	66.3	63.3	37.4	76.5	47.1	85.8
1985 .....	102.8	54.0	75.1	65.2	45.4	81.2	52.2	85.6
1987 .....	106.9	54.6	90.0	62.5	53.7	80.8	59.9	85.3
1989 .....	112.5	54.5	94.7	62.5	58.1	80.5	66.5	84.1
1991 .....	111.6	53.0	93.8	59.9	57.9	78.3	70.1	82.3
1993 .....	112.9	52.8	91.1	60.7	60.6	75.6	73.9	81.9
1995 .....	112.8	51.9	92.0	59.9	62.4	75.2	73.1	81.3
1997 .....	113.6	48.9	92.3	56.0	60.6	68.4	70.6	80.2
1999 .....	117.2	48.8	95.5	56.8	64.3	70.4	73.1	80.1
2001 .....	119.6	48.7	97.8	56.7	66.9	71.3	79.7	79.9
<b>Doctorate granting institutions</b>								
1975 .....	15.9	11.9	10.6	11.7	1.8	5.8	3.7	9.3
1977 .....	17.2	11.8	9.4	11.1	2.4	6.5	4.0	9.2
1979 .....	17.2	11.1	9.2	10.2	2.6	6.3	4.4	9.0
1981 .....	18.8	11.3	10.5	10.4	2.6	5.6	5.0	9.5
1983 .....	19.5	11.1	10.7	10.2	2.8	5.7	5.3	9.7
1985 .....	21.2	11.1	12.4	10.8	3.5	6.3	5.8	9.5
1987 .....	22.2	11.3	16.2	11.3	4.4	6.6	6.7	9.5
1989 .....	23.5	11.4	16.8	11.1	4.9	6.8	7.9	10.0
1991 .....	24.9	11.8	18.4	11.7	5.9	8.0	9.2	10.8
1993 .....	24.2	11.3	17.4	11.6	6.7	8.4	9.9	11.0
1995 .....	25.0	11.5	17.7	11.5	7.2	8.7	9.9	11.0
1997 .....	25.8	11.1	19.1	11.6	8.2	9.3	10.3	11.7
1999 .....	26.3	10.9	19.3	11.5	8.2	9.0	10.7	11.7
2001 .....	26.3	10.7	18.8	10.9	7.7	8.2	12.2	12.3
<b>Comprehensive institutions</b>								
1975 .....	24.8	18.5	12.5	13.8	0.8	2.7	0.4	0.9
1977 .....	26.5	18.2	10.3	12.1	1.3	3.5	0.4	1.0
1979 .....	26.9	17.3	10.3	11.5	1.7	4.1	1.4	2.9
1981 .....	30.5	18.3	12.0	11.9	1.2	2.6	1.7	3.3
1983 .....	31.6	17.9	12.8	12.2	1.4	2.9	1.9	3.5
1985 .....	35.6	18.7	14.4	12.5	1.5	2.7	1.3	2.1
1987 .....	36.0	18.4	20.1	14.0	1.8	2.7	1.6	2.2
1989 .....	38.4	18.6	21.5	14.2	2.4	3.4	2.9	3.7
1991 .....	39.5	18.8	24.0	15.3	2.8	3.9	3.8	4.5
1993 .....	39.5	18.5	21.5	14.3	4.1	5.1	4.0	4.4
1995 .....	41.5	19.1	23.0	15.0	4.3	5.2	4.5	5.0
1997 .....	42.0	18.1	23.7	14.4	4.7	5.3	4.4	5.0
1999 .....	43.6	18.2	23.5	14.0	3.9	4.2	4.8	5.2
2001 .....	44.8	18.2	26.0	15.1	4.3	4.6	4.8	4.9

Appendix table 5-29

(Page 2 of 2)

**Estimates of total academic S&E doctoral employment, S&E doctoral researchers, and S&E graduate research assistants, by Carnegie institution type and work activity: 1975–2001**

Institution type	All positions		Researchers		Research as primary activity		Research assistants	
	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution
<b>Freestanding medical schools</b>								
1975 .....	4.3	3.2	3.2	3.5	2.1	6.8	0.3	0.8
1977 .....	4.9	3.4	3.5	4.1	2.5	6.8	0.3	0.7
1979 .....	5.9	3.8	4.2	4.7	3.1	7.5	0.4	0.8
1981 .....	7.2	4.3	5.3	5.3	4.1	8.8	0.5	0.9
1983 .....	7.0	4.0	5.1	4.9	3.9	8.0	0.5	0.9
1985 .....	8.3	4.4	5.9	5.1	4.5	8.1	0.7	1.1
1987 .....	9.0	4.6	7.2	5.0	5.3	8.0	1.1	1.6
1989 .....	9.7	4.7	7.6	5.0	5.6	7.8	1.6	2.0
1991 .....	9.6	4.6	7.8	5.0	6.0	8.1	1.9	2.2
1993 .....	10.8	5.1	8.2	5.5	6.4	8.0	2.2	2.4
1995 .....	11.2	5.1	8.4	5.5	6.7	8.1	2.4	2.7
1997 .....	9.8	4.2	7.4	4.5	5.9	6.7	2.5	2.8
1999 .....	11.9	5.0	9.2	5.5	7.5	8.2	2.6	2.8
2001 .....	12.6	5.1	9.5	5.5	7.7	8.2	2.9	2.9
<b>Liberal arts colleges</b>								
1975 .....	10.4	7.8	4.6	5.1	0.2	0.8	0.0	0.1
1977 .....	10.8	7.4	3.6	4.2	0.5	1.3	0.0	0.0
1979 .....	11.3	7.3	3.5	3.9	0.4	1.0	0.1	0.1
1981 .....	12.0	7.2	4.4	4.4	0.4	0.9	0.0	0.1
1983 .....	12.6	7.2	4.1	3.9	0.3	0.6	0.0	0.1
1985 .....	14.0	7.4	5.4	4.7	0.4	0.7	0.0	0.1
1987 .....	14.6	7.5	7.7	5.4	0.6	0.9	0.0	0.0
1989 .....	15.3	7.4	8.6	5.7	0.5	0.6	0.1	0.1
1991 .....	15.8	7.5	9.0	5.7	0.4	0.5	0.0	0.1
1993 .....	16.0	7.5	8.0	5.3	1.0	1.2	0.1	0.1
1995 .....	15.8	7.3	7.9	5.2	0.7	0.9	0.1	0.1
1997 .....	17.3	7.4	9.3	5.6	1.1	1.2	0.0	0.0
1999 .....	18.5	7.7	9.1	5.4	0.9	1.0	0.1	0.1
2001 .....	18.6	7.6	9.5	5.5	0.9	1.0	0.1	0.1
<b>All others</b>								
1975 .....	5.3	4.0	1.7	1.8	0.3	1.1	0.0	0.1
1977 .....	7.8	5.4	2.4	2.8	0.9	2.3	0.1	0.1
1979 .....	10.5	6.8	3.8	4.3	1.4	3.3	0.1	0.1
1981 .....	7.6	4.5	2.0	2.0	0.7	1.5	0.2	0.4
1983 .....	15.5	8.8	5.8	5.5	3.0	6.2	0.1	0.2
1985 .....	8.3	4.4	2.0	1.8	0.7	1.3	0.9	1.5
1987 .....	7.2	3.7	2.7	1.9	0.6	1.0	0.9	1.3
1989 .....	7.2	3.5	2.5	1.6	0.7	0.9	0.1	0.1
1991 .....	9.2	4.4	3.6	2.3	0.9	1.2	0.1	0.1
1993 .....	10.4	4.9	4.0	2.6	1.4	1.8	0.1	0.1
1995 .....	11.2	5.1	4.4	2.9	1.8	2.2	0.1	0.1
1997 .....	24.0	10.3	12.9	7.9	8.1	9.2	0.1	0.1
1999 .....	22.7	9.5	11.4	6.8	6.6	7.2	0.1	0.1
2001 .....	23.6	9.6	10.9	6.3	6.3	6.7	0.1	0.1

U&amp;C universities and colleges

NOTES: Researchers are those reporting research as either primary or secondary work activity. Graduate research assistants are full-time graduate students with primary research assistantship support. Freestanding schools of engineering and technology are included under comprehensive institutions. Employment at institutions without a Carnegie code or with unknown administrative control is included under "All others." See chapter 2, "Classification of Academic Institutions," for information on the institutional categories used by the Carnegie Foundation for the Advancement of Teaching. Percents may not sum to 100 because of rounding.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), Survey of Doctorate Recipients; and NSF/SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering, unpublished tabulations.

Appendix table 5-30

## Estimates of academic S&amp;E doctoral researchers, by type of position and work activity: 1975–2001

Position	All academic employment		Researchers		Research as primary activity	
	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution
<b>All positions</b>						
1975 .....	134.1	100.0	90.6	100.0	30.8	100.0
1977 .....	145.4	100.0	85.0	100.0	37.0	100.0
1979 .....	155.3	100.0	90.0	100.0	41.3	100.0
1981 .....	167.1	100.0	100.7	100.0	46.5	100.0
1983 .....	176.1	100.0	104.7	100.0	48.9	100.0
1985 .....	190.2	100.0	115.2	100.0	55.9	100.0
1987 .....	195.9	100.0	144.0	100.0	66.5	100.0
1989 .....	206.6	100.0	151.6	100.0	72.2	100.0
1991 .....	210.6	100.0	156.6	100.0	73.9	100.0
1993 .....	213.8	100.0	150.1	100.0	80.2	100.0
1995 .....	217.5	100.0	153.5	100.0	83.0	100.0
1997 .....	232.5	100.0	164.7	100.0	88.6	100.0
1999 .....	240.2	100.0	168.1	100.0	91.4	100.0
2001 .....	245.5	100.0	172.5	100.0	93.8	100.0
<b>Full-time faculty</b>						
1975 .....	116.4	86.8	78.9	87.1	21.4	69.5
1977 .....	125.6	86.4	71.6	84.2	25.8	69.7
1979 .....	131.2	84.5	74.1	82.3	28.1	68.0
1981 .....	141.9	84.9	83.8	83.2	31.8	68.4
1983 .....	148.4	84.3	86.9	83.0	33.6	68.7
1985 .....	156.9	82.5	95.1	82.6	39.5	70.7
1987 .....	164.4	83.9	121.4	84.3	48.6	73.1
1989 .....	169.8	82.2	125.8	83.0	51.6	71.5
1991 .....	173.1	82.2	131.4	83.9	53.8	72.8
1993 .....	172.4	80.6	121.7	81.1	56.9	70.9
1995 .....	171.4	78.8	121.7	79.3	56.6	68.2
1997 .....	178.4	76.7	127.0	77.1	58.0	65.5
1999 .....	184.0	76.6	129.2	76.9	60.4	66.1
2001 .....	187.4	76.3	133.3	77.3	62.8	67.0
<b>Postdocs</b>						
1975 .....	6.2	4.6	5.9	6.5	5.7	18.5
1977 .....	7.6	5.2	7.1	8.4	6.8	18.4
1979 .....	8.1	5.2	7.4	8.2	6.9	16.7
1981 .....	8.5	5.1	8.0	7.9	7.7	16.6
1983 .....	8.3	4.7	7.4	7.1	7.1	14.5
1985 .....	8.7	4.6	7.8	6.8	7.5	13.4
1987 .....	9.3	4.7	8.9	6.2	8.4	12.6
1989 .....	11.5	5.6	10.8	7.1	10.3	14.3
1991 .....	9.9	4.7	9.4	6.0	9.2	12.4
1993 .....	13.3	6.2	13.3	8.9	12.7	15.8
1995 .....	16.8	7.7	16.1	10.5	15.1	18.2
1997 .....	18.9	8.1	18.0	10.9	16.7	18.8
1999 .....	18.5	7.7	17.9	10.6	16.6	18.2
2001 .....	17.5	7.1	16.6	9.6	15.6	16.6
<b>Other</b>						
1975 .....	11.5	8.6	5.8	6.4	3.8	12.3
1977 .....	12.2	8.4	6.3	7.4	4.4	11.8
1979 .....	16.0	10.3	8.5	9.5	6.3	15.2
1981 .....	16.6	9.9	8.9	8.8	6.9	14.9
1983 .....	19.4	11.0	10.3	9.9	8.1	16.6
1985 .....	24.6	13.0	12.2	10.6	8.9	16.0
1987 .....	22.1	11.3	13.7	9.5	9.6	14.4
1989 .....	25.4	12.3	15.0	9.9	10.3	14.3
1991 .....	27.6	13.1	15.7	10.0	11.0	14.8
1993 .....	28.0	13.1	15.1	10.0	10.7	13.3
1995 .....	29.3	13.5	15.7	10.2	11.4	13.7
1997 .....	35.3	15.2	19.8	12.0	13.8	15.6
1999 .....	37.6	15.6	21.0	12.5	14.3	15.7
2001 .....	40.7	16.6	22.6	13.1	15.4	16.5

NOTES: Researchers are those reporting research as either primary or secondary work activity. Full-time faculty includes full, associate, and assistant professors plus instructors. Other types of positions include full-time nonfaculty positions such as research associates, adjunct positions, lecturers, administrative positions, and part-time positions of all kinds. Percents may not sum to 100 because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-31

(Page 1 of 3)

**Estimates of academic S&E doctoral researchers and graduate research assistants, by degree field and work activity: 1975–2001**

Field	All academic employment		Researchers		Research as primary activity		Research assistants	
	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution
<b>All fields</b>								
1975 .....	134.1	100.0	90.6	100.0	30.8	100.0	40.0	100.0
1977 .....	145.4	100.0	85.0	100.0	37.0	100.0	43.7	100.0
1979 .....	155.3	100.0	90.0	100.0	41.3	100.0	49.0	100.0
1981 .....	167.1	100.0	100.7	100.0	46.5	100.0	52.7	100.0
1983 .....	176.1	100.0	104.7	100.0	48.9	100.0	54.9	100.0
1985 .....	190.2	100.0	115.2	100.0	55.9	100.0	61.0	100.0
1987 .....	195.9	100.0	144.0	100.0	66.5	100.0	70.2	100.0
1989 .....	206.6	100.0	151.6	100.0	72.2	100.0	79.1	100.0
1991 .....	210.6	100.0	156.6	100.0	73.9	100.0	85.2	100.0
1993 .....	213.8	100.0	150.1	100.0	80.2	100.0	90.2	100.0
1995 .....	217.5	100.0	153.5	100.0	83.0	100.0	89.9	100.0
1997 .....	232.5	100.0	164.7	100.0	88.6	100.0	88.0	100.0
1999 .....	240.2	100.0	168.1	100.0	91.4	100.0	91.3	100.0
2001 .....	245.5	100.0	172.5	100.0	93.8	100.0	99.7	100.0
<b>Physical sciences</b>								
1975 .....	23.6	17.6	16.9	18.7	6.4	20.8	6.4	16.1
1977 .....	25.0	17.2	16.3	19.2	7.9	21.3	6.8	15.6
1979 .....	24.6	15.9	15.4	17.1	7.5	18.3	7.8	15.9
1981 .....	25.3	15.2	16.3	16.2	8.0	17.1	8.6	16.3
1983 .....	25.1	14.3	16.1	15.3	7.7	15.9	9.1	16.7
1985 .....	27.0	14.2	17.7	15.4	9.4	16.8	10.3	16.9
1987 .....	27.2	13.9	20.3	14.1	10.2	15.3	11.6	16.5
1989 .....	27.7	13.4	20.8	13.7	10.9	15.1	12.4	15.7
1991 .....	27.7	13.1	20.8	13.3	10.6	14.4	12.2	14.4
1993 .....	28.6	13.4	20.0	13.3	12.0	15.0	12.3	13.6
1995 .....	29.4	13.5	20.6	13.4	12.6	15.2	11.8	13.1
1997 .....	30.2	13.0	21.8	13.2	12.7	14.4	11.3	12.8
1999 .....	30.9	12.9	21.6	12.8	12.2	13.3	11.3	12.3
2001 .....	30.4	12.4	21.0	12.2	11.9	12.7	11.8	11.8
<b>Mathematics</b>								
1975 .....	11.0	8.2	7.5	8.2	1.5	4.7	0.6	1.6
1977 .....	11.7	8.0	6.8	8.0	1.8	4.9	0.8	1.8
1979 .....	12.2	7.9	6.9	7.7	2.1	5.0	0.8	1.7
1981 .....	12.4	7.4	6.8	6.8	1.9	4.2	0.8	1.4
1983 .....	12.9	7.3	7.2	6.9	2.0	4.0	0.8	1.5
1985 .....	13.6	7.1	7.6	6.6	2.7	4.8	1.0	1.6
1987 .....	13.8	7.1	9.7	6.7	3.2	4.7	1.1	1.6
1989 .....	14.5	7.0	10.2	6.8	3.5	4.8	1.3	1.6
1991 .....	15.2	7.2	10.7	6.9	3.5	4.8	1.4	1.6
1993 .....	15.5	7.2	9.5	6.3	3.4	4.2	1.4	1.6
1995 .....	14.6	6.7	9.4	6.1	3.3	3.9	1.5	1.6
1997 .....	15.6	6.7	10.1	6.2	3.5	4.0	1.4	1.6
1999 .....	15.2	6.3	9.9	5.9	2.9	3.2	1.3	1.4
2001 .....	14.9	6.1	9.8	5.7	3.3	3.5	1.4	1.4
<b>Computer sciences</b>								
1975 .....	NA	NA	NA	NA	NA	NA	0.7	1.9
1977 .....	NA	NA	NA	NA	NA	NA	0.7	1.7
1979 .....	0.1	0.1	0.1	0.1	0.0	0.1	0.8	1.7
1981 .....	0.3	0.2	0.3	0.3	0.1	0.2	1.1	2.1
1983 .....	0.5	0.3	0.4	0.3	0.2	0.4	1.4	2.5
1985 .....	0.8	0.4	0.6	0.5	0.4	0.7	2.1	3.4
1987 .....	1.1	0.5	1.0	0.7	0.7	1.0	2.8	4.0
1989 .....	1.5	0.7	1.3	0.9	0.8	1.1	3.3	4.2
1991 .....	2.0	0.9	1.7	1.1	1.1	1.4	3.6	4.2
1993 .....	2.5	1.2	2.0	1.3	0.9	1.1	3.8	4.2
1995 .....	3.1	1.4	2.4	1.6	1.0	1.3	3.9	4.4
1997 .....	3.3	1.4	2.4	1.5	1.1	1.2	4.0	4.6
1999 .....	3.7	1.5	2.6	1.6	1.1	1.2	4.9	5.4
2001 .....	3.8	1.5	2.6	1.5	1.3	1.4	4.2	4.2

Appendix table 5-31

**Estimates of academic S&E doctoral researchers and graduate research assistants, by degree field and work activity: 1975–2001**

Field	All academic employment		Researchers		Research as primary activity		Research assistants	
	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution
<b>Earth, atmospheric, and ocean sciences</b>								
1975 .....	3.9	2.9	2.8	3.1	0.8	2.7	2.8	7.1
1977 .....	4.2	2.9	2.9	3.4	1.0	2.7	3.2	7.4
1979 .....	4.2	2.7	2.7	3.0	1.0	2.4	3.6	7.3
1981 .....	4.6	2.7	3.2	3.2	1.4	2.9	3.5	6.6
1983 .....	4.8	2.7	3.3	3.1	1.5	3.0	3.5	6.4
1985 .....	5.2	2.8	3.7	3.2	1.6	2.9	3.7	6.1
1987 .....	5.6	2.8	4.6	3.2	2.1	3.2	3.6	5.2
1989 .....	5.9	2.8	4.9	3.2	2.4	3.3	4.2	5.2
1991 .....	6.0	2.9	5.1	3.3	2.5	3.4	4.4	5.2
1993 .....	6.4	3.0	5.0	3.3	2.7	3.4	4.7	5.2
1995 .....	6.4	3.0	5.1	3.3	2.6	3.1	4.7	5.2
1997 .....	7.3	3.2	5.6	3.4	2.9	3.2	4.3	4.9
1999 .....	7.8	3.2	5.6	3.4	2.9	3.2	4.3	4.7
2001 .....	8.2	3.3	6.3	3.6	3.1	3.3	6.5	6.5
<b>Life sciences</b>								
1975 .....	39.4	29.4	29.0	32.0	14.5	47.0	11.3	28.3
1977 .....	42.6	29.3	28.7	33.7	16.6	44.7	13.1	30.0
1979 .....	47.0	30.3	32.1	35.6	19.7	47.6	15.4	31.5
1981 .....	51.3	30.7	37.1	36.8	23.2	49.9	16.3	31.0
1983 .....	54.8	31.1	38.3	36.6	24.3	49.7	16.5	30.0
1985 .....	58.7	30.8	41.4	35.9	27.1	48.4	17.9	29.3
1987 .....	61.2	31.3	48.8	33.9	31.5	47.3	20.2	28.8
1989 .....	64.8	31.3	51.8	34.1	33.8	46.7	23.2	29.3
1991 .....	66.9	31.8	53.3	34.1	34.5	46.7	25.8	30.3
1993 .....	68.2	31.9	51.8	34.5	36.0	44.9	28.0	31.1
1995 .....	71.6	32.9	53.8	35.1	37.7	45.3	29.3	32.5
1997 .....	77.3	33.2	57.9	35.2	40.5	45.7	28.6	32.5
1999 .....	81.9	34.1	60.8	36.2	43.2	47.2	29.0	31.7
2001 .....	84.3	34.3	63.1	36.6	43.7	46.6	31.0	31.0
<b>Psychology</b>								
1975 .....	14.8	11.0	8.5	9.4	2.2	7.1	2.2	5.5
1977 .....	16.2	11.1	7.7	9.1	2.8	7.5	2.3	5.3
1979 .....	17.7	11.4	8.3	9.2	3.4	8.3	2.5	5.2
1981 .....	20.1	12.0	9.9	9.8	4.1	8.8	2.9	5.5
1983 .....	21.0	11.9	10.5	10.0	4.4	8.9	3.0	5.4
1985 .....	23.1	12.1	10.7	9.3	4.6	8.2	3.1	5.0
1987 .....	23.7	12.1	14.3	9.9	5.2	7.8	3.2	4.6
1989 .....	25.0	12.1	14.3	9.5	5.9	8.2	3.8	4.9
1991 .....	25.2	12.0	15.7	10.0	6.2	8.4	4.2	5.0
1993 .....	25.0	11.7	14.9	9.9	6.7	8.3	4.6	5.1
1995 .....	26.1	12.0	15.6	10.1	7.4	8.9	4.6	5.1
1997 .....	27.3	11.7	16.1	9.8	8.0	9.0	4.8	5.4
1999 .....	29.0	12.1	17.2	10.2	8.6	9.5	4.8	5.3
2001 .....	30.4	12.4	18.2	10.5	8.7	9.3	4.9	4.9
<b>Social sciences</b>								
1975 .....	28.0	20.9	16.9	18.6	3.2	10.2	4.8	12.0
1977 .....	31.1	21.4	13.8	16.2	4.1	11.1	4.9	11.2
1979 .....	33.6	21.6	14.7	16.3	4.2	10.1	5.2	10.6
1981 .....	36.9	22.1	17.6	17.5	4.5	9.7	5.2	9.8
1983 .....	38.8	22.0	17.8	17.0	4.9	10.1	5.0	9.2
1985 .....	41.9	22.0	20.9	18.2	5.7	10.2	5.1	8.3
1987 .....	42.1	21.5	28.5	19.8	7.5	11.3	5.5	7.8
1989 .....	44.5	21.5	30.5	20.1	8.2	11.3	6.2	7.9
1991 .....	44.8	21.3	31.1	19.8	8.4	11.3	6.8	8.0
1993 .....	44.4	20.8	29.3	19.5	10.7	13.4	7.4	8.2
1995 .....	42.5	19.5	28.1	18.3	9.8	11.8	7.2	8.0
1997 .....	44.9	19.3	29.8	18.1	9.8	11.1	6.7	7.7
1999 .....	46.2	19.2	30.9	18.4	11.1	12.1	7.2	7.9
2001 .....	46.9	19.1	31.4	18.2	11.7	12.4	7.8	7.8

Appendix table 5-31

(Page 3 of 3)

**Estimates of academic S&E doctoral researchers and graduate research assistants, by degree field and work activity: 1975–2001**

Field	All academic employment		Researchers		Research as primary activity		Research assistants	
	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution	Thousands	Percent distribution
Engineering								
1975 .....	13.4	10.0	9.0	10.0	2.3	7.5	11.0	27.5
1977 .....	14.8	10.1	8.9	10.5	2.9	7.9	11.8	27.1
1979 .....	15.8	10.2	9.8	10.9	3.4	8.2	12.8	26.2
1981 .....	16.1	9.7	9.5	9.5	3.3	7.2	14.4	27.3
1983 .....	18.1	10.3	11.2	10.7	3.9	7.9	15.5	28.3
1985 .....	19.9	10.5	12.5	10.8	4.4	7.9	17.9	29.4
1987 .....	21.2	10.8	16.8	11.6	6.2	9.3	22.2	31.6
1989 .....	22.8	11.0	17.6	11.6	6.9	9.5	24.6	31.1
1991 .....	22.8	10.8	18.2	11.6	7.2	9.7	26.8	31.4
1993 .....	23.1	10.8	17.5	11.7	7.9	9.8	27.9	31.0
1995 .....	23.8	10.9	18.5	12.1	8.7	10.5	27.0	30.1
1997 .....	26.6	11.4	20.9	12.7	10.1	11.4	26.9	30.6
1999 .....	25.5	10.6	19.4	11.6	9.4	10.3	28.7	31.4
2001 .....	26.6	10.8	20.2	11.7	10.1	10.7	32.2	32.3

NA not available

NOTES: Researchers are those reporting research as either primary or secondary work activity. Graduate research assistants are full-time students with research assistantships as their primary mechanism of support. Percents may not sum to 100 because of rounding.

SOURCES: National Science Foundation, Division of Science Resources Statistics (NSF/SRS), Survey of Doctorate Recipients; and NSF/SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering, unpublished tabulations.

Appendix table 5-32

**Academic S&E doctorate holders with Federal support, by degree field, type of position, and work activity: 1975–2001**

(Percent)

Field, position, and work activity	1975	1977	1979	1981	1983	1985 <sup>a</sup>	1987	1989	1991	1993 <sup>a</sup>	1995 <sup>a</sup>	1997 <sup>a</sup>	1999	2001
All fields .....	42.2	41.6	39.9	42.8	44.3	37.4	48.2	49.4	50.3	36.7	39.4	38.6	46.1	45.4
Research as primary activity.....	79.0	75.4	75.2	80.6	79.9	73.5	79.9	79.8	80.7	67.2	69.1	66.9	73.9	73.9
Research as secondary activity.....	35.6	37.5	35.3	35.3	40.5	28.9	38.7	40.7	40.0	23.9	27.5	26.4	36.6	36.2
Full-time faculty .....	39.6	38.2	36.2	38.8	41.7	34.3	45.6	46.6	48.0	32.9	35.7	34.7	43.1	43.2
Full-time other.....	58.8	68.1	58.3	58.5	59.4	49.8	60.6	60.9	58.8	42.5	43.1	47.0	49.9	49.1
Postdocs.....	86.3	86.0	82.1	86.3	82.2	78.5	82.1	83.5	84.5	83.1	80.1	74.1	80.3	74.3
Physical sciences .....	45.2	46.2	44.1	50.4	50.9	43.2	54.6	58.2	56.6	45.5	48.2	46.3	55.7	53.2
Research as primary activity.....	82.4	79.2	79.4	88.9	84.7	79.5	86.2	87.3	88.3	75.3	77.4	75.6	83.0	83.8
Research as secondary activity.....	39.4	39.2	37.7	42.5	49.3	34.4	48.9	52.6	49.5	35.4	38.3	34.8	53.1	46.3
Full-time faculty .....	39.3	39.9	38.2	44.6	46.5	37.4	49.9	53.5	52.9	37.7	41.6	39.2	50.4	47.9
Full-time other .....	64.1	75.9	72.4	70.3	72.1	66.1	72.6	72.1	72.0	61.1	52.8	63.8	68.8	64.1
Postdocs .....	90.2	89.4	81.9	90.2	87.3	84.4	90.5	86.8	87.6	87.1	84.6	80.4	82.5	82.4
Mathematics .....	19.1	19.0	21.7	21.3	30.1	21.5	31.1	33.5	34.5	18.8	22.3	20.9	29.1	31.9
Research as primary activity.....	50.1	42.3	44.0	52.7	71.0	51.5	66.8	68.1	74.5	40.7	45.9	48.2	60.6	59.5
Research as secondary activity.....	18.2	20.4	20.8	21.6	32.6	19.8	23.8	28.4	26.3	16.5	17.0	15.5	25.4	32.9
Full-time faculty .....	18.8	18.0	20.4	21.0	29.9	21.4	30.4	32.8	34.0	18.3	21.1	19.4	28.3	30.1
Full-time other .....	33.5	46.9	54.6	30.1	43.4	29.1	47.8	52.8	67.2	40.6	34.6	43.9	38.4	48.0
Postdocs .....	35.8	55.1	43.2	56.3	66.3	48.5	34.4	53.4	80.4	—	45.3	35.6	54.7	61.9
Computer sciences.....	NA	NA	34.8	29.7	44.6	45.0	61.7	52.4	49.4	39.9	43.2	41.1	55.6	47.2
Research as primary activity.....	NA	NA	58.3	19.4	84.6	57.2	66.3	74.9	71.2	64.7	75.8	59.4	85.0	82.4
Research as secondary activity.....	NA	NA	23.3	35.8	30.1	19.7	58.7	31.4	27.7	29.0	28.6	43.3	49.5	44.1
Full-time faculty .....	NA	NA	25.0	26.6	38.1	38.0	58.1	52.8	48.2	37.7	40.7	38.8	54.1	46.8
Full-time other .....	NA	NA	—	25.0	67.9	80.6	79.7	47.1	67.7	59.1	62.9	63.1	74.9	47.2
Postdocs .....	NA	NA	57.1	100.0	100.0	0.0	88.2	100.0	—	100.0	78.0	97.2	100.0	100.0
Earth, atmospheric, and ocean sciences ....	46.0	42.7	45.4	50.2	54.5	51.1	60.2	63.8	66.2	51.2	54.3	58.0	63.3	64.1
Research as primary activity.....	82.0	82.0	78.4	89.0	86.3	85.7	88.4	90.4	89.9	81.9	85.7	84.2	79.8	84.8
Research as secondary activity.....	41.4	37.9	46.3	41.3	47.8	42.0	49.2	52.9	55.5	37.1	38.9	41.2	63.2	60.7
Full-time faculty .....	43.0	37.8	40.0	45.1	50.3	44.8	54.6	60.2	61.4	45.5	48.6	52.3	61.7	62.3
Full-time other .....	79.9	80.3	75.2	68.6	78.9	78.4	79.5	80.9	90.7	67.9	72.0	71.0	74.5	70.6
Postdocs .....	75.0	95.2	96.9	91.9	90.7	96.6	91.7	90.6	73.4	83.3	91.0	85.8	74.3	91.8
Life sciences .....	58.9	58.1	55.3	59.6	60.0	53.5	65.3	65.1	65.5	52.2	52.5	51.0	57.9	56.6
Research as primary activity.....	85.0	83.0	82.2	85.4	84.6	80.0	87.0	86.7	86.5	76.2	75.3	73.1	79.9	78.9
Research as secondary activity.....	47.4	50.1	44.2	45.9	51.4	39.2	50.6	50.9	50.8	34.8	36.4	34.8	45.1	43.7
Full-time faculty .....	56.4	54.9	51.4	55.6	57.8	50.5	63.4	62.1	63.7	48.6	49.0	47.6	55.1	55.5
Full-time other .....	70.9	72.1	64.8	68.5	68.5	58.4	71.0	74.1	67.2	45.8	46.3	46.2	49.9	47.4
Postdocs .....	87.7	88.4	84.6	86.0	82.6	78.3	82.1	86.8	84.4	84.1	81.9	77.7	82.6	77.6
Psychology .....	36.1	33.2	32.6	32.7	30.1	25.9	31.2	35.5	34.7	25.7	27.6	27.4	32.9	34.3
Research as primary activity.....	70.1	70.2	72.5	77.3	70.4	66.8	70.5	73.0	70.8	63.8	62.4	65.0	68.2	72.2
Research as secondary activity.....	34.0	29.0	24.9	23.8	26.2	22.2	23.9	29.2	27.0	15.9	19.0	16.7	24.8	26.3
Full-time faculty .....	34.1	30.6	28.3	27.5	27.3	23.6	28.3	34.0	32.9	25.2	25.1	24.9	31.5	32.9
Full-time other .....	41.6	65.4	46.3	52.3	40.3	32.7	37.1	39.6	36.3	23.8	30.7	28.3	30.4	38.2
Postdocs .....	86.4	82.5	86.8	92.0	84.2	70.8	88.1	66.3	95.8	71.7	71.4	71.8	71.8	59.2
Social sciences.....	23.7	23.3	20.4	21.8	23.7	17.2	27.2	27.7	28.4	14.2	16.1	15.2	22.9	21.5
Research as primary activity.....	61.1	51.4	53.6	53.8	55.8	44.5	50.3	49.8	51.2	33.4	37.2	30.1	44.3	43.4
Research as secondary activity.....	20.3	23.4	21.5	18.6	24.3	14.9	24.9	25.8	25.4	8.3	12.2	11.6	18.0	17.0
Full-time faculty .....	23.7	22.6	19.0	21.2	22.5	16.2	27.1	27.4	27.8	13.4	15.4	14.8	22.5	21.3
Full-time other .....	31.6	35.3	37.3	32.7	34.0	26.6	36.2	33.8	32.7	22.1	22.6	22.7	29.3	29.4
Postdocs .....	54.6	54.7	84.9	47.9	64.6	54.7	27.4	57.6	52.5	88.1	68.5	33.9	65.0	35.8
Engineering .....	50.6	51.1	49.1	51.0	54.7	43.0	57.1	56.3	63.2	42.6	49.9	49.7	56.9	56.8
Research as primary activity.....	81.4	78.0	72.4	80.2	83.9	74.5	82.0	78.1	86.5	69.4	74.5	70.8	75.7	77.2
Research as secondary activity.....	50.5	53.7	52.8	56.8	54.4	38.0	54.8	57.1	58.9	34.3	43.1	41.0	51.0	52.6
Full-time faculty .....	49.9	49.3	49.5	49.8	54.7	42.2	56.0	55.2	62.9	40.9	48.4	46.4	55.2	56.7
Full-time other .....	67.3	86.6	53.0	60.7	63.1	44.3	76.4	71.2	66.8	59.5	56.7	67.9	64.2	61.8
Postdocs .....	84.3	74.7	51.1	98.9	82.7	91.4	74.8	76.0	90.0	65.7	72.7	62.1	80.4	56.8

— too few cases

NA not available

<sup>a</sup>Not comparable to the other years and understates degree of Federal support by asking whether work performed during week of April 15 was supported by the Government. In other years, question pertains to work conducted over course of a year.

NOTES: Full-time faculty includes full, associate, and assistant professors plus instructors. Other types of full-time positions include nonfaculty appointments such as research associates, adjunct appointments, lecturers, and administrative positions.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-33

(Page 1 of 3)

**S&E doctorate holders employed in academia with Federal support, by degree field, years since doctorate, and type of position: 1975–2001**

(Percent)

Field	1–3 years since doctorate				4–7 years since doctorate			
	All positions	Full-time faculty	Other full time	Postdocs	All positions	Full-time faculty	Other full time	Postdocs
<b>All fields</b>								
1975 .....	44.2	31.1	58.3	87.8	42.5	40.0	66.2	83.2
1977 .....	44.5	28.8	61.2	87.0	42.2	37.8	71.6	85.3
1979 .....	47.2	29.6	58.9	86.6	43.0	37.4	67.3	83.1
1981 .....	51.0	30.8	63.1	87.9	46.5	41.2	64.8	86.9
1983 .....	50.2	33.7	59.0	86.1	50.1	45.3	68.1	84.8
1985 <sup>a</sup> .....	43.2	23.9	59.3	79.1	42.4	36.2	63.3	81.0
1987 .....	53.3	36.7	56.1	82.0	54.8	49.7	71.6	84.2
1989 .....	57.2	38.7	58.7	84.7	57.8	53.5	70.0	89.1
1991 .....	53.6	38.3	56.6	83.8	57.4	53.4	66.6	88.7
1993 <sup>a</sup> .....	43.5	20.8	43.7	80.7	41.1	34.0	46.8	87.3
1995 <sup>a</sup> .....	47.0	23.2	40.1	78.5	43.9	36.1	52.0	86.0
1997 <sup>a</sup> .....	45.3	21.0	42.4	74.1	41.9	33.7	49.6	78.5
1999 .....	52.8	28.8	45.5	79.5	47.4	41.4	46.6	83.3
2001 .....	48.4	29.4	45.5	73.4	46.1	39.8	50.7	78.6
<b>Physical sciences</b>								
1975 .....	64.1	27.9	60.7	93.2	43.8	36.6	77.3	85.1
1977 .....	63.2	28.9	95.7	88.5	51.6	40.5	77.5	92.4
1979 .....	59.1	25.5	73.7	84.7	52.0	39.0	72.1	91.7
1981 .....	69.3	25.2	94.3	88.1	57.9	49.4	84.5	97.9
1983 .....	70.4	33.8	82.7	88.2	66.2	56.3	85.3	84.8
1985 <sup>a</sup> .....	64.3	18.7	86.6	84.6	50.8	35.7	78.7	91.4
1987 .....	80.9	66.7	69.9	90.2	68.7	56.0	97.1	93.1
1989 .....	77.9	49.2	82.1	88.0	72.4	61.9	89.0	90.6
1991 .....	69.9	44.1	78.8	87.2	67.2	55.1	88.5	100.0
1993 <sup>a</sup> .....	63.1	21.3	64.9	84.5	58.2	43.9	70.0	94.5
1995 <sup>a</sup> .....	62.8	21.0	41.9	84.1	53.9	37.8	60.2	86.7
1997 <sup>a</sup> .....	64.2	30.0	71.4	77.7	53.4	41.2	67.9	96.5
1999 .....	68.0	39.3	69.9	80.5	57.0	46.7	65.5	89.4
2001 .....	62.2	31.0	55.4	80.9	54.1	39.4	73.9	83.7
<b>Mathematics</b>								
1975 .....	14.5	13.0	37.6	28.3	18.9	18.5	0.0	57.9
1977 .....	16.2	12.2	45.9	56.4	19.2	17.6	82.0	52.2
1979 .....	24.8	22.5	52.9	42.5	32.3	30.2	64.9	46.9
1981 .....	10.8	9.5	0.0	44.1	29.7	27.6	62.7	81.5
1983 .....	31.8	29.8	7.1	73.4	39.8	39.8	51.3	100.0
1985 <sup>a</sup> .....	14.7	14.1	—	34.6	27.0	26.8	26.7	100.0
1987 .....	15.6	7.4	81.8	37.6	34.9	35.5	7.3	10.3
1989 .....	29.1	24.9	53.8	52.4	39.0	39.1	78.6	100.0
1991 .....	39.8	35.8	54.9	80.4	28.3	28.6	40.9	—
1993 <sup>a</sup> .....	15.7	14.8	0.0	100.0	15.2	14.0	100.0	—
1995 <sup>a</sup> .....	17.7	13.4	0.0	40.0	25.6	19.6	42.4	70.6
1997 <sup>a</sup> .....	14.9	3.5	29.1	32.9	16.7	14.9	0.0	42.2
1999 .....	36.4	24.0	0.0	58.7	32.2	33.5	0.0	47.2
2001 .....	34.6	21.6	34.6	56.3	42.2	38.6	62.4	100.0
<b>Computer sciences</b>								
1975 .....	NA	NA	NA	NA	NA	NA	NA	NA
1977 .....	NA	NA	NA	NA	NA	NA	NA	NA
1979 .....	34.8	25.0	—	57.1	—	—	—	—
1981 .....	27.7	24.1	25.0	100.0	52.4	52.4	—	—
1983 .....	45.7	35.1	60.0	100.0	43.5	40.4	92.3	—
1985 <sup>a</sup> .....	54.1	46.4	77.2	0.0	36.7	31.0	100.0	—
1987 .....	47.2	46.3	42.0	100.0	73.2	66.3	100.0	0.0
1989 .....	33.0	29.3	50.0	100.0	70.8	78.0	35.7	100.0
1991 .....	23.1	23.1	25.1	—	66.2	63.9	100.0	100.0
1993 <sup>a</sup> .....	44.7	39.5	100.0	100.0	30.7	30.9	27.3	100.0
1995 <sup>a</sup> .....	38.2	31.4	61.1	75.9	38.1	38.3	23.9	—
1997 <sup>a</sup> .....	40.5	29.7	74.3	97.0	40.4	37.7	75.6	—



Appendix table 5-33

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**S&E doctorate holders employed in academia with Federal support, by degree field, years since doctorate, and type of position: 1975–2001**

(Percent)

Field	1–3 years since doctorate				4–7 years since doctorate			
	All positions	Full-time faculty	Other full time	Postdocs	All positions	Full-time faculty	Other full time	Postdocs
1999 .....	59.7	50.6	77.5	100.0	56.6	56.5	85.9	—
2001 .....	31.4	25.9	44.2	100.0	49.2	47.3	53.2	—
<b>Earth, atmospheric, and ocean sciences</b>								
1975 .....	50.7	38.4	85.3	74.2	54.0	49.8	97.0	100.0
1977 .....	44.3	22.5	60.5	94.4	46.9	38.3	82.1	100.0
1979 .....	67.2	41.3	97.3	96.7	49.6	43.1	72.3	100.0
1981 .....	66.1	43.2	79.7	100.0	57.2	53.3	72.7	0.0
1983 .....	61.8	36.7	75.7	92.8	64.5	59.5	100.0	66.7
1985 <sup>a</sup> .....	56.0	33.4	83.9	96.4	59.6	50.6	81.2	100.0
1987 .....	64.2	42.3	87.9	89.6	71.1	61.9	88.9	100.0
1989 .....	70.4	52.8	88.5	90.1	81.2	78.0	92.9	93.8
1991 .....	76.0	61.7	100.0	77.4	76.6	75.3	100.0	64.1
1993 <sup>a</sup> .....	68.2	33.0	97.8	74.2	59.9	50.2	72.6	100.0
1995 <sup>a</sup> .....	65.4	35.8	87.4	88.0	66.4	58.9	86.2	100.0
1997 <sup>a</sup> .....	67.3	35.0	74.7	94.2	57.1	49.4	70.7	69.4
1999 .....	61.7	42.9	89.7	79.8	65.3	62.7	75.6	55.5
2001 .....	80.7	64.0	84.2	90.0	54.1	48.7	69.3	95.6
<b>Life sciences</b>								
1975 .....	61.8	46.4	72.5	87.6	60.1	57.6	76.2	87.5
1977 .....	61.6	38.1	70.4	88.9	59.6	56.6	73.3	90.2
1979 .....	65.9	40.6	75.8	85.9	57.3	51.4	76.5	84.2
1981 .....	71.8	51.7	76.5	88.1	64.0	58.8	70.8	85.7
1983 .....	68.2	52.8	65.1	84.7	67.1	64.5	72.6	83.7
1985 <sup>a</sup> .....	59.6	34.1	67.2	78.9	61.1	55.6	72.3	81.7
1987 .....	70.2	53.5	73.8	82.1	71.4	68.3	81.0	83.0
1989 .....	74.5	50.2	79.3	89.1	71.9	67.5	79.1	89.3
1991 .....	68.1	49.9	60.0	83.0	70.6	66.8	79.2	86.3
1993 <sup>a</sup> .....	61.2	32.2	44.8	81.9	55.7	46.4	52.0	86.7
1995 <sup>a</sup> .....	58.5	30.3	35.3	80.3	54.0	43.9	47.4	87.4
1997 <sup>a</sup> .....	58.3	23.0	42.2	77.5	52.3	42.4	48.4	78.8
1999 .....	65.0	35.0	46.2	82.4	57.2	47.2	49.3	83.0
2001 .....	59.2	34.2	39.0	76.8	56.4	48.9	49.5	78.8
<b>Psychology</b>								
1975 .....	35.0	25.5	53.7	88.5	35.3	34.9	32.8	71.2
1977 .....	35.3	26.8	71.7	86.0	31.5	27.9	60.5	73.0
1979 .....	35.2	22.5	22.2	95.5	39.3	31.4	76.5	87.6
1981 .....	46.5	33.2	41.6	93.4	34.7	28.6	54.5	88.2
1983 .....	31.2	19.8	34.2	89.3	32.3	28.2	37.1	87.2
1985 <sup>a</sup> .....	30.6	15.6	44.5	70.1	29.2	26.2	38.7	72.5
1987 .....	37.5	28.5	28.8	82.7	33.2	25.6	40.3	97.9
1989 .....	41.7	34.6	36.1	64.9	36.1	36.7	33.1	63.1
1991 .....	35.9	23.9	24.3	100.0	38.8	38.6	24.8	86.9
1993 <sup>a</sup> .....	21.6	12.0	27.5	61.6	23.2	24.6	15.5	48.2
1995 <sup>a</sup> .....	33.5	17.5	40.6	63.5	26.1	21.8	36.0	82.1
1997 <sup>a</sup> .....	34.5	24.2	19.0	70.9	29.5	22.3	36.4	77.3
1999 .....	33.4	22.4	29.9	63.6	35.6	34.7	23.8	100.0
2001 .....	35.5	20.0	41.7	64.1	34.9	32.6	42.7	45.6
<b>Social sciences</b>								
1975 .....	23.1	22.5	29.0	61.7	26.2	26.2	42.4	39.2
1977 .....	24.8	24.2	12.3	61.4	24.6	23.2	56.3	48.0
1979 .....	26.6	22.8	37.6	97.5	20.8	19.2	52.2	70.8
1981 .....	20.4	16.3	48.7	56.0	24.3	24.3	25.2	60.0
1983 .....	28.2	23.6	49.0	77.9	28.1	23.6	57.5	93.8
1985 <sup>a</sup> .....	15.6	12.3	27.8	44.4	19.3	15.7	51.0	41.0
1987 .....	22.5	20.9	34.5	21.4	29.9	27.7	54.0	0.0
1989 .....	25.6	24.7	24.3	41.9	33.2	31.6	51.4	83.9
1991 .....	21.7	19.5	38.8	31.7	36.6	33.8	44.2	100.0
1993 <sup>a</sup> .....	11.2	7.2	25.4	88.2	14.9	14.4	21.9	100.0

Appendix table 5-33

(Page 3 of 3)

**S&E doctorate holders employed in academia with Federal support, by degree field, years since doctorate, and type of position: 1975–2001**

(Percent)

Field	1–3 years since doctorate				4–7 years since doctorate			
	All positions	Full-time faculty	Other full time	Postdocs	All positions	Full-time faculty	Other full time	Postdocs
1995 <sup>a</sup> .....	15.9	10.7	28.8	80.8	17.8	16.0	41.8	49.8
1997 <sup>a</sup> .....	14.1	10.9	26.8	33.7	17.4	15.6	26.3	57.7
1999 .....	21.1	15.2	26.1	77.1	22.8	21.7	31.3	48.1
2001 .....	20.5	21.2	24.0	41.8	21.2	20.3	28.0	63.3
<b>Engineering</b>								
1975 .....	53.7	48.9	65.8	83.8	54.4	53.1	82.3	100.0
1977 .....	55.2	47.2	84.8	72.9	52.9	52.3	64.8	64.9
1979 .....	55.5	48.5	71.9	99.4	55.1	58.8	33.8	16.9
1981 .....	54.4	43.2	100.0	100.0	65.6	61.9	83.9	100.0
1983 .....	47.1	36.7	58.2	98.3	64.3	62.2	99.0	100.0
1985 <sup>a</sup> .....	43.9	37.8	66.1	94.5	47.6	46.3	66.4	0.0
1987 .....	53.3	43.7	79.2	75.7	65.5	64.2	97.6	100.0
1989 .....	56.0	48.9	71.9	73.3	70.8	68.6	91.8	100.0
1991 .....	66.6	62.1	67.7	89.9	73.2	73.0	79.7	100.0
1993 <sup>a</sup> .....	43.4	32.1	65.1	68.7	51.2	49.4	65.9	70.3
1995 <sup>a</sup> .....	51.1	38.5	50.3	72.6	62.1	60.3	72.5	86.5
1997 <sup>a</sup> .....	50.0	35.5	66.4	66.3	51.3	48.4	62.5	60.5
1999 .....	58.5	40.0	70.9	78.1	55.5	56.4	44.8	94.2
2001 .....	54.9	49.1	77.0	57.1	58.3	59.2	54.9	74.2

— too few cases

NA not available

<sup>a</sup>Not comparable to the other years and understates degree of Federal support by asking whether work performed during the week of April 15 was supported by the Government. In other years, question pertains to work conducted over course of a year.

NOTES: Recent doctorate holders are defined as having earned their doctorate within 3 years or within 4–7 years, respectively, preceding the survey year. Full-time faculty includes full, associate, and assistant professors plus instructors. Other types of full-time positions include nonfaculty appointments such as research associates, adjunct appointments, lecturers, and administrative positions.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients, unpublished tabulations.

Appendix table 5-34

**Broad and detailed fields for S&E article output data**

<p><b>Clinical medicine</b></p> <ul style="list-style-type: none"> <li>Addictive diseases</li> <li>Allergy</li> <li>Anesthesiology</li> <li>Arthritis and rheumatism</li> <li>Cancer</li> <li>Cardiovascular system</li> <li>Dentistry</li> <li>Dermatology and venereal disease</li> <li>Endocrinology</li> <li>Environmental and occupational health</li> <li>Fertility</li> <li>Gastroenterology</li> <li>General and internal medicine</li> <li>Geriatrics</li> <li>Hematology</li> <li>Immunology</li> <li>Miscellaneous clinical</li> <li>Nephrology</li> <li>Neurology and neurosurgery</li> <li>Obstetrics and gynecology</li> <li>Ophthalmology</li> <li>Orthopedics</li> <li>Otorhinolaryngology</li> <li>Pathology</li> <li>Pediatrics</li> <li>Pharmacology</li> <li>Pharmacy</li> <li>Psychiatry</li> <li>Radiology and nuclear medicine</li> <li>Respiratory system</li> <li>Surgery</li> <li>Tropical medicine</li> <li>Urology</li> <li>Veterinary medicine</li> </ul> <p><b>Biomedical research</b></p> <ul style="list-style-type: none"> <li>Anatomy and morphology</li> <li>Biochemistry and molecular biology</li> <li>Biomedical engineering</li> <li>Biophysics</li> <li>Cell biology, cytology, and histology</li> <li>Embryology</li> <li>Genetics and heredity</li> <li>General biomedical research</li> <li>Microbiology</li> <li>Microscopy</li> <li>Miscellaneous biomedical research</li> <li>Nutrition and dietetics</li> <li>Parasitology</li> <li>Physiology</li> <li>Virology</li> </ul>	<p><b>Biology</b></p> <ul style="list-style-type: none"> <li>Agriculture and food science</li> <li>Botany</li> <li>Dairy and animal science</li> <li>Ecology</li> <li>Entomology</li> <li>General biology</li> <li>General zoology</li> <li>Marine and hydrobiology</li> <li>Miscellaneous biology</li> <li>Miscellaneous zoology</li> </ul> <p><b>Chemistry</b></p> <ul style="list-style-type: none"> <li>Analytical chemistry</li> <li>Applied chemistry</li> <li>General chemistry</li> <li>Inorganic and nuclear chemistry</li> <li>Organic chemistry</li> <li>Physical chemistry</li> <li>Polymers</li> </ul> <p><b>Physics</b></p> <ul style="list-style-type: none"> <li>Acoustics</li> <li>Applied physics</li> <li>Chemical physics</li> <li>Fluids and plasmas</li> <li>General physics</li> <li>Miscellaneous physics</li> <li>Nuclear and particle physics</li> <li>Optics</li> <li>Solid state physics</li> </ul> <p><b>Earth and space sciences</b></p> <ul style="list-style-type: none"> <li>Astronomy and astrophysics</li> <li>Earth and planetary science</li> <li>Environmental science</li> <li>Geology</li> <li>Meteorology and atmospheric sciences</li> <li>Oceanography and limnology</li> </ul> <p><b>Engineering and technology</b></p> <ul style="list-style-type: none"> <li>Aerospace technology</li> <li>Chemical engineering</li> <li>Civil engineering</li> <li>Computers</li> <li>Electrical and electronics engineering</li> <li>General engineering</li> <li>Industrial engineering</li> <li>Materials science</li> <li>Mechanical engineering</li> <li>Metals and metallurgy</li> <li>Miscellaneous engineering and technology</li> <li>Nuclear technology</li> <li>Operations research and management</li> </ul>	<p><b>Mathematics</b></p> <ul style="list-style-type: none"> <li>Applied mathematics</li> <li>General mathematics</li> <li>Miscellaneous mathematics</li> <li>Probability and statistics</li> </ul> <p><b>Psychology</b></p> <ul style="list-style-type: none"> <li>Behavioral and comparative psychology</li> <li>Clinical psychology</li> <li>Developmental and child psychology</li> <li>Experimental psychology</li> <li>General psychology</li> <li>Human factors</li> <li>Miscellaneous psychology</li> <li>Psychoanalysis</li> <li>Social psychology</li> </ul> <p><b>Social sciences</b></p> <ul style="list-style-type: none"> <li>Anthropology and archaeology</li> <li>Area studies</li> <li>Criminology</li> <li>Demography</li> <li>Economics</li> <li>General social sciences</li> <li>Geography and regional science</li> <li>International relations</li> <li>Miscellaneous social sciences</li> <li>Planning and urban studies</li> <li>Political science and public administration</li> <li>Science studies</li> <li>Sociology</li> </ul> <p><b>Health sciences</b></p> <ul style="list-style-type: none"> <li>Gerontology and aging</li> <li>Health policy and services</li> <li>Nursing</li> <li>Public health</li> <li>Rehabilitation</li> <li>Social studies of medicine</li> <li>Speech/language pathology and audiology</li> </ul> <p><b>Professional fields</b></p> <ul style="list-style-type: none"> <li>Communication</li> <li>Education</li> <li>Information and library science</li> <li>Law</li> <li>Management and business</li> <li>Miscellaneous professional fields</li> <li>Social work</li> </ul>
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SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; and CHI Research, Inc.

## S&amp;E articles, by region and country/economy: 1988–2001

Region and country/economy	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Worldwide .....	466,419	497,102	508,795	515,530	547,617	540,491	567,204	580,809	593,568	594,467	617,762	632,059	632,781	649,795
OECD.....	386,267	411,328	422,129	429,770	456,039	454,461	475,034	487,111	498,275	495,870	514,070	523,075	520,349	532,756
North America .....	199,937	210,770	215,389	218,000	224,381	222,723	225,997	229,320	228,504	222,878	223,300	224,866	222,044	226,704
Canada.....	21,391	22,501	22,792	22,903	24,180	23,824	24,565	24,532	24,583	23,077	22,796	23,417	22,873	22,626
Mexico.....	884	1,046	1,038	1,082	1,336	1,502	1,663	1,901	2,124	2,271	2,615	2,925	2,950	3,209
United States.....	177,662	187,224	191,559	194,015	198,864	197,397	199,769	202,887	201,798	197,531	197,890	198,524	196,221	200,870
Western Europe .....	143,882	155,249	159,898	163,709	178,406	178,935	193,033	199,688	207,784	210,538	221,670	226,002	225,696	229,173
Austria.....	2,241	2,675	2,690	2,756	3,047	3,051	3,177	3,477	3,618	3,880	4,172	4,210	4,259	4,526
Belgium.....	3,586	3,905	4,103	4,164	4,431	4,512	4,949	5,260	5,583	5,509	5,822	5,924	5,739	5,984
Croatia.....	na	na	na	na	17	575	508	563	614	631	589	671	704	710
Cyprus.....	15	15	17	8	22	24	24	41	54	66	61	58	60	74
Denmark.....	3,445	3,722	3,716	3,776	4,141	4,068	4,458	4,408	4,477	4,512	4,782	4,909	4,929	4,988
Finland.....	2,789	2,981	3,071	3,211	3,438	3,603	3,974	4,134	4,354	4,523	4,564	4,872	4,878	5,098
France.....	21,409	22,686	22,937	23,518	26,172	26,225	28,266	29,309	29,755	30,061	31,809	32,097	30,960	31,317
Germany.....	29,292	31,821	32,295	32,929	35,120	34,103	36,901	38,100	39,123	40,743	43,953	43,550	43,440	43,623
Greece.....	1,239	1,518	1,397	1,598	1,736	1,759	1,974	2,068	2,265	2,407	2,666	2,705	2,892	3,329
Iceland.....	69	68	89	104	105	122	137	158	149	147	177	136	154	174
Ireland.....	790	826	902	915	946	1,003	1,168	1,210	1,269	1,318	1,526	1,526	1,596	1,665
Italy.....	11,229	12,509	13,062	13,778	15,462	15,279	17,000	17,904	19,342	19,147	20,321	20,819	21,038	22,313
Macedonia.....	0	0	0	0	1	27	33	34	37	51	42	45	49	74
Netherlands.....	8,581	9,736	10,176	10,106	11,060	11,360	11,961	12,330	12,438	12,779	12,756	12,642	12,466	12,602
Norway.....	2,192	2,247	2,426	2,403	2,655	2,637	2,805	2,953	2,950	3,012	3,100	3,127	3,195	3,252
Portugal.....	429	510	587	640	712	794	914	989	1,090	1,250	1,404	1,765	1,813	2,142
Slovenia.....	na	na	na	na	10	404	459	443	478	595	625	707	901	876
Spain.....	5,432	6,116	6,837	7,269	9,267	9,759	10,534	11,343	12,234	13,040	13,786	14,860	14,776	15,570
Sweden.....	7,573	8,126	8,172	8,139	8,273	8,547	8,972	9,284	9,697	9,677	9,967	10,129	9,815	10,314
Switzerland.....	5,316	5,548	5,901	6,098	6,651	6,871	7,372	7,361	7,489	7,912	8,096	8,297	8,454	8,107
Turkey.....	507	668	750	846	1,048	1,172	1,397	1,713	2,206	2,440	2,818	3,240	3,482	4,098
United Kingdom.....	36,509	38,195	39,069	39,950	42,404	42,456	45,436	45,993	47,904	46,183	47,916	48,965	49,485	47,660
Yugoslavia.....	1,211	1,330	1,641	1,447	1,621	496	514	507	568	555	605	622	513	547
All others.....	28	48	58	57	71	89	101	104	89	103	112	126	99	129
Asia.....	51,765	56,331	59,282	61,165	68,489	68,965	74,503	78,055	83,545	86,710	95,623	102,318	104,544	113,575
Bangladesh.....	95	99	116	104	151	153	136	170	155	146	138	168	160	177
China.....	4,619	5,411	6,285	6,186	6,956	7,566	7,821	9,261	10,070	12,530	13,807	16,197	18,142	20,978
India.....	8,882	9,744	9,200	9,517	10,100	9,763	9,928	9,591	9,736	9,419	10,066	10,589	10,047	11,076
Indonesia.....	59	86	104	89	86	103	120	133	137	146	138	172	165	207
Japan.....	34,435	36,569	38,570	39,590	44,143	43,339	46,692	47,603	50,392	50,171	54,658	56,134	55,413	57,420
Malaysia.....	208	241	233	260	247	293	345	373	372	339	402	493	470	494
Pakistan.....	235	263	257	315	277	349	324	339	274	258	276	300	277	282
Philippines.....	127	149	157	148	150	148	141	151	153	174	167	187	177	158
Singapore.....	410	517	572	599	755	854	1,022	1,184	1,181	1,338	1,635	1,984	2,301	2,603
South Korea.....	771	1,035	1,170	1,361	1,759	2,184	2,931	3,806	4,728	5,636	7,075	8,386	9,386	11,037
Sri Lanka.....	107	101	106	84	82	83	85	82	78	68	75	94	104	76
Taiwan.....	1,414	1,724	2,119	2,492	3,337	3,693	4,446	4,846	5,696	5,878	6,463	6,838	7,008	8,082
Thailand.....	287	272	282	298	300	317	383	338	386	415	530	558	655	727

## S&amp;E articles, by region and country/economy: 1988–2001

Region and country/economy	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Vietnam.....	52	66	60	65	74	67	61	102	113	120	107	112	144	158
All others.....	64	55	50	58	72	54	71	76	74	74	86	106	96	101
Eastern Europe/Central Asia.....	41,597	43,697	42,836	41,218	43,214	35,976	38,199	36,390	35,074	34,259	34,680	34,421	35,844	33,686
Armenia.....	na	na	na	na	21	165	178	182	179	186	169	156	167	152
Azerbaijan.....	na	na	na	na	15	197	189	157	125	87	94	70	89	68
Belarus.....	na	na	na	na	30	708	1,021	728	597	576	598	616	576	528
Bulgaria.....	1,089	1,219	1,216	1,169	1,218	1,380	1,024	963	968	977	931	900	887	784
Czech Republic.....	2,746	2,995	3,079	2,881	3,132	3,308	2,179	1,993	2,249	2,231	2,333	2,374	2,458	2,622
Estonia.....	na	na	na	na	2	177	202	240	248	255	299	320	344	339
Georgia.....	na	na	na	na	12	158	136	148	126	135	131	129	141	110
Hungary.....	1,714	1,847	1,722	1,806	1,824	1,718	1,774	1,826	1,839	1,939	2,144	2,313	2,292	2,479
Kazakhstan.....	na	na	na	na	19	250	191	173	143	125	122	109	113	116
Latvia.....	na	na	na	na	37	180	159	154	168	152	164	173	159	157
Lithuania.....	na	na	na	na	5	149	189	179	196	209	248	284	262	272
Moldova.....	na	na	na	na	15	156	159	140	136	116	98	95	96	77
Poland.....	4,030	4,245	3,999	3,919	4,113	3,848	4,041	4,535	4,597	4,445	4,891	5,195	5,342	5,686
Romania.....	393	513	377	395	568	507	675	648	871	835	858	909	956	997
Russia.....	na	na	na	na	817	19,659	21,612	19,974	18,464	18,343	17,841	17,149	18,271	15,846
Slovakia.....	na	na	na	na	44	0	1,151	1,137	1,175	1,051	1,144	997	1,007	955
Ukraine.....	na	na	na	na	162	2,894	2,923	2,856	2,600	2,287	2,362	2,351	2,365	2,256
USSR.....	31,625	32,879	32,443	31,047	31,127	130	na	na	na	na	na	na	na	na
Uzbekistan.....	na	na	na	na	50	275	290	295	347	264	213	242	273	204
All others.....	na	na	na	na	5	116	105	63	45	46	39	38	45	39
Near East/North Africa.....	7,893	8,389	8,226	8,143	8,410	8,815	9,124	9,627	9,691	10,041	10,500	10,731	11,092	11,777
Algeria.....	66	73	98	106	120	123	125	151	156	151	165	179	204	225
Egypt.....	1,130	1,278	1,254	1,429	1,288	1,279	1,380	1,359	1,359	1,242	1,302	1,362	1,376	1,548
Iran.....	86	91	94	126	150	175	233	271	312	366	523	699	825	995
Israel.....	4,916	5,134	4,968	4,873	5,234	5,575	5,559	5,921	5,815	6,203	6,240	6,091	6,314	6,487
Jordan.....	161	174	176	148	135	130	144	153	167	193	217	245	242	240
Kuwait.....	304	326	368	209	104	112	186	166	240	210	251	298	243	257
Lebanon.....	54	61	29	47	52	54	62	56	68	96	111	129	139	202
Morocco.....	113	108	97	128	170	164	182	237	256	298	370	425	471	469
Oman.....	13	20	27	32	37	42	46	53	63	63	76	88	99	96
Saudi Arabia.....	569	577	644	613	653	713	734	781	754	682	700	637	595	580
Tunisia.....	96	107	104	121	131	91	135	147	159	206	230	269	278	344
United Arab Emirates.....	23	30	33	57	77	109	98	122	145	154	157	137	144	159
All others.....	362	411	333	256	257	247	239	210	196	177	159	171	161	174
Pacific.....	12,054	12,802	12,962	12,915	13,775	14,267	15,223	15,922	16,643	16,761	17,719	18,189	17,791	17,743
Australia.....	9,896	10,730	10,664	10,742	11,452	11,929	12,695	13,387	13,911	13,955	14,710	15,186	14,700	14,788
New Zealand.....	2,075	1,993	2,227	2,102	2,253	2,256	2,454	2,466	2,684	2,748	2,953	2,927	3,037	2,903
All others.....	83	78	70	71	70	81	74	69	49	58	57	75	55	53
Central/South America.....	4,748	5,359	5,848	5,970	6,586	6,488	6,862	7,646	8,344	9,251	10,285	11,325	11,797	13,147
Argentina.....	1,423	1,518	1,627	1,499	1,526	1,585	1,747	1,969	2,212	2,430	2,546	2,705	2,792	2,930
Brazil.....	1,766	2,117	2,374	2,640	3,107	2,885	3,073	3,471	3,830	4,362	5,202	5,950	6,195	7,205
Chile.....	682	745	830	819	835	877	798	899	928	974	987	1,062	1,100	1,203

## S&amp;E articles, by region and country/economy: 1988–2001

Region and country/economy	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Colombia.....	86	111	122	106	125	122	145	167	196	230	237	254	320	324
Costa Rica.....	55	55	54	55	62	61	66	70	72	78	73	76	82	92
Cuba.....	67	90	108	94	131	113	141	166	194	177	234	242	282	299
Peru.....	68	67	77	70	73	66	64	68	72	71	71	60	77	93
Uruguay.....	42	50	57	64	81	91	84	98	115	133	136	159	158	155
Venezuela.....	292	328	314	329	377	395	420	430	432	484	528	523	509	535
All others.....	268	278	286	294	268	292	324	307	292	313	272	293	281	310
Sub-Saharan Africa.....	4,544	4,504	4,355	4,409	4,356	4,321	4,263	4,161	3,982	4,028	3,985	4,207	3,973	3,990
Cameroon.....	35	41	46	54	58	75	84	73	60	81	77	71	76	75
Ethiopia.....	71	58	70	93	88	84	86	99	88	109	80	106	90	93
Ghana.....	37	36	40	47	72	52	67	65	77	88	67	85	95	90
Kenya.....	291	300	255	260	295	346	280	310	275	256	270	278	237	230
Nigeria.....	886	864	815	719	666	604	470	464	433	458	418	451	428	332
Senegal.....	72	80	83	77	93	100	79	77	64	65	73	71	73	62
South Africa.....	2,523	2,499	2,406	2,552	2,419	2,377	2,459	2,364	2,282	2,237	2,268	2,366	2,237	2,327
Tanzania.....	64	71	69	77	93	94	105	92	107	100	91	104	100	87
Uganda.....	21	17	29	20	29	44	39	49	43	55	59	73	78	91
Zimbabwe.....	116	123	131	103	119	124	139	109	119	123	122	102	104	113
All others.....	425	415	412	407	425	422	454	459	436	455	459	501	457	490

na not applicable

OECD Organisation for Economic Co-operation and Development

NOTES: Article counts are from a set of journals classified and covered by the Institute for Scientific Information's Science Citation and Social Sciences Citation Indexes. Article counts are based on fractional assignments; for example, an article with two authors from different countries is counted as one-half of an article for each country. Countries with article output of less than 0.01 percent of world output in 2001 are grouped in "All others." Germany's output includes articles from the former East Germany before 1992. China's output includes articles from the Hong Kong economy before 2000. Czech Republic's output includes articles from the former Czechoslovakia before 1996. Article output from the former U.S.S.R. is included. Details may not add to totals because of rounding.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

*Science & Engineering Indicators – 2004*

Appendix table 5-36

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**U.S. S&E articles, by field and sector: Selected years, 1988–2001**

(Percent distribution)

Field and sector	1988	1991	1993	1995	1997	1999	2001
All fields (number of articles).....	177,662	194,015	197,397	202,887	197,531	198,524	200,870
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	71.6	71.8	72.0	72.1	73.2	73.3	73.6
Industry.....	8.5	8.7	8.3	8.1	7.4	7.3	7.0
Federal Government .....	8.1	7.8	7.8	7.6	7.2	7.0	7.0
Nonprofit institutions .....	7.0	7.0	7.3	7.5	7.5	7.7	7.9
FFRDCs .....	2.8	2.7	2.4	2.7	2.7	2.6	2.6
State/local government.....	1.2	1.1	1.0	1.0	1.0	1.0	1.0
Joint.....	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Unknown.....	0.7	0.9	1.0	0.8	1.0	1.0	0.8
Clinical medicine (number of articles) .....	55,016	59,488	61,312	63,367	62,676	63,190	63,709
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic.....	69.1	69.1	68.4	68.9	69.4	69.1	68.8
Industry.....	4.6	5.4	5.5	6.0	5.8	5.8	5.9
Federal Government.....	9.6	8.9	8.7	8.0	7.8	7.5	7.5
Nonprofit institutions .....	13.5	13.4	14.1	14.2	14.0	14.6	15.1
FFRDCs.....	0.4	0.4	0.4	0.4	0.4	0.4	0.3
State/local government .....	2.0	1.7	1.6	1.4	1.4	1.4	1.4
Joint.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown.....	0.8	1.1	1.3	1.0	1.2	1.3	1.0
Biomedical research (number of articles).....	27,455	31,177	33,117	35,048	33,661	33,423	34,041
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic.....	75.0	74.6	74.8	74.3	75.1	75.9	76.0
Industry.....	5.6	6.4	6.4	6.6	6.0	6.2	5.7
Federal Government.....	8.9	8.4	8.4	8.0	7.5	7.2	7.3
Nonprofit institutions .....	7.6	7.6	7.7	8.4	8.5	8.2	8.6
FFRDCs.....	1.5	1.7	1.3	1.6	1.6	1.4	1.3
State/local government .....	1.0	0.9	0.9	0.8	0.7	0.7	0.7
Joint.....	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Unknown.....	0.3	0.4	0.4	0.4	0.5	0.4	0.4
Biology (number of articles).....	12,862	13,898	12,671	12,664	12,027	11,271	12,499
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic.....	76.9	75.5	75.4	74.2	75.6	74.8	74.6
Industry.....	2.9	3.4	3.5	4.3	3.4	3.4	3.8
Federal Government.....	14.1	14.7	14.3	15.1	14.1	14.3	13.7
Nonprofit institutions .....	3.2	3.4	3.5	3.4	3.6	4.1	4.3
FFRDCs.....	0.8	0.5	0.6	0.6	0.7	0.5	0.5
State/local government .....	1.6	1.6	1.7	1.8	1.9	1.9	2.3
Joint.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown.....	0.4	0.9	1.0	0.6	0.8	1.0	0.7
Chemistry (number of articles).....	13,186	14,681	15,089	14,915	14,375	14,491	14,342
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic.....	71.0	71.9	72.8	72.3	74.5	74.9	75.8
Industry.....	17.4	16.7	16.6	16.3	14.0	13.4	12.2
Federal Government.....	5.7	5.3	4.8	5.1	4.9	4.2	4.6
Nonprofit institutions .....	1.6	1.7	1.9	1.9	1.9	2.2	2.1
FFRDCs.....	3.8	3.7	3.3	4.1	4.3	4.6	4.8
State/local government .....	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Joint.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown.....	0.2	0.4	0.4	0.2	0.3	0.5	0.4
Physics (number of articles).....	18,023	20,515	19,602	19,709	18,048	18,074	17,385
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic.....	63.0	64.3	67.6	69.0	71.6	70.5	71.0
Industry.....	17.9	16.9	14.1	11.4	10.0	10.0	10.4
Federal Government.....	5.5	5.8	6.1	6.0	5.5	5.9	5.4
Nonprofit institutions .....	1.2	1.2	1.2	1.2	0.9	0.9	0.9
FFRDCs.....	12.1	11.4	10.5	11.9	11.2	11.9	11.8
State/local government .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Joint.....	0.1	0.1	0.2	0.1	0.2	0.2	0.2
Unknown.....	0.2	0.3	0.4	0.3	0.5	0.5	0.3
Earth/space sciences (number of articles).....	8,053	9,113	9,830	10,886	10,540	11,209	11,272
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic.....	64.0	62.7	64.6	64.1	65.4	65.1	65.7
Industry.....	6.8	7.9	6.8	6.5	6.3	5.8	5.9
Federal Government.....	14.8	14.4	14.0	14.2	13.7	13.5	12.8

Appendix table 5-36

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**U.S. S&E articles, by field and sector: Selected years, 1988–2001**

(Percent distribution)

Field and sector	1988	1991	1993	1995	1997	1999	2001
Nonprofit institutions .....	4.5	4.8	5.0	4.9	4.5	4.7	4.9
FFRDCs .....	6.9	6.7	6.4	7.2	6.9	7.0	7.0
State/local government .....	1.5	1.7	1.2	1.2	1.0	1.2	1.5
Joint .....	1.0	1.1	1.3	1.2	1.5	1.9	1.7
Unknown .....	0.5	0.7	0.8	0.6	0.7	0.8	0.6
Engineering/technology (number of articles) .....	11,817	12,838	13,303	13,801	12,907	13,564	13,889
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	57.4	59.4	61.4	62.9	62.2	63.7	65.5
Industry .....	26.3	25.4	23.1	21.8	20.8	20.3	19.1
Federal Government .....	6.4	6.8	6.8	7.4	7.1	6.8	6.4
Nonprofit institutions .....	2.0	1.6	1.7	1.5	1.3	1.3	1.2
FFRDCs .....	6.8	5.7	5.6	5.5	7.2	6.1	6.8
State/local government .....	0.3	0.2	0.2	0.3	0.3	0.7	0.2
Joint .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown .....	0.8	0.9	1.2	0.7	1.1	1.1	0.7
Mathematics (number of articles) .....	3,880	3,382	3,453	3,190	3,051	3,561	3,657
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	90.4	91.4	90.6	92.1	92.8	91.7	92.8
Industry .....	4.2	3.2	3.8	3.3	2.9	3.6	3.4
Federal Government .....	2.3	2.0	2.3	1.7	1.5	1.9	1.3
Nonprofit institutions .....	1.3	1.6	1.5	1.5	1.2	1.3	1.2
FFRDCs .....	1.5	1.5	1.5	1.0	1.4	1.0	0.9
State/local government .....	0.1	0.1	0.1	0.0	0.1	0.1	0.0
Joint .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown .....	0.2	0.3	0.2	0.3	0.2	0.4	0.3
Psychology (number of articles) .....	7,171	7,194	6,986	7,830	8,130	7,806	7,809
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	87.4	87.6	87.1	87.6	86.7	87.7	87.9
Industry .....	2.1	1.9	2.3	2.1	2.0	2.1	2.2
Federal Government .....	2.9	3.0	2.8	2.9	3.0	3.1	2.8
Nonprofit institutions .....	3.9	4.1	4.2	3.8	4.5	4.3	4.7
FFRDCs .....	0.1	0.1	0.1	0.1	0.1	0.0	0.0
State/local government .....	1.3	1.3	1.4	1.4	1.4	1.2	0.9
Joint .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown .....	2.3	2.0	2.1	2.0	2.3	1.7	1.5
Social sciences (number of articles) .....	8,738	9,595	9,690	9,150	9,163	9,171	9,384
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	83.5	84.3	84.0	84.3	85.3	86.8	87.9
Industry .....	3.1	2.6	2.4	2.2	2.7	2.0	1.7
Federal Government .....	5.0	4.9	5.2	5.0	4.0	3.7	3.5
Nonprofit institutions .....	6.0	6.0	6.1	6.3	5.9	5.7	5.4
FFRDCs .....	0.7	0.6	0.6	0.6	0.4	0.2	0.3
State/local government .....	0.6	0.5	0.6	0.5	0.6	0.5	0.4
Joint .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown .....	1.1	1.0	1.0	1.0	1.0	1.1	0.7
Health sciences/professional fields (number of articles) .....	11,461	12,133	12,343	12,326	12,954	12,764	12,882
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	78.6	80.8	79.9	79.1	80.7	81.6	81.6
Industry .....	8.5	7.2	7.3	7.1	6.4	5.5	5.0
Federal Government .....	3.6	3.1	3.6	3.6	3.4	3.0	4.3
Nonprofit institutions .....	5.2	5.0	5.1	6.1	5.5	6.0	6.0
FFRDCs .....	0.3	0.3	0.3	0.3	0.3	0.1	0.0
State/local government .....	1.8	1.7	1.8	1.7	1.4	1.5	1.4
Joint .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown .....	2.0	2.0	2.0	2.1	2.3	2.3	1.6

FFRDC federally funded research and development center

NOTES: Article counts are based on fractional assignments; for example, an article with two authors from different sectors is counted as one-half of an article for each sector. Articles with coauthors from more than one country are counted similarly. Articles are assigned to fields based on journal field classifications developed by CHI Research. Details may not add to totals because of rounding.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.



## Regional and country portfolio of S&amp;E articles, by field: 1988

Region and country/economy	Articles	All fields	Clinical	Biomedical	Biology	Chemistry	Physics	Earth/space	Engineering/	Mathematics	Psychology	Social	Health	Professional
			medicine	research				sciences	technology			sciences	sciences	fields
	Number		Percent distribution											
Worldwide .....	466,419	100.0	29.3	15.2	7.5	12.3	13.3	4.1	6.7	2.1	3.4	2.5	0.9	2.5
OECD.....	398,238	100.0	31.1	15.2	7.7	10.8	12.0	4.1	6.7	2.1	3.7	2.8	1.0	2.8
North America .....	199,937	100.0	30.4	15.3	8.1	7.5	9.9	4.7	6.8	2.2	4.9	4.1	1.6	4.5
Canada.....	21,391	100.0	25.9	14.3	14.6	8.1	8.0	5.8	8.1	2.3	4.6	4.4	1.3	2.6
Mexico.....	884	100.0	24.5	14.9	15.7	11.1	15.7	6.5	4.0	3.4	2.7	1.2	0.1	0.4
United States.....	177,662	100.0	31.0	15.5	7.2	7.4	10.1	4.5	6.7	2.2	4.9	4.0	1.6	4.8
Western Europe .....	143,882	100.0	34.6	15.4	6.6	13.1	13.0	3.8	5.6	2.1	2.6	1.7	0.5	1.1
Austria.....	2,241	100.0	42.1	10.6	6.3	13.8	12.4	2.5	4.4	2.4	2.8	1.4	0.3	1.0
Belgium.....	3,586	100.0	38.4	17.1	5.4	10.4	11.9	3.0	5.5	2.3	2.8	1.7	0.4	1.2
Cyprus.....	15	100.0	16.4	8.2	52.5	0.0	0.0	6.6	3.3	0.0	13.1	0.0	0.0	0.0
Denmark.....	3,445	100.0	54.6	15.9	6.0	4.8	8.6	2.6	2.3	1.7	1.7	1.1	0.2	0.6
Finland.....	2,789	100.0	51.1	14.3	7.1	6.1	7.0	3.7	4.3	1.8	1.6	1.4	0.6	1.1
France.....	21,409	100.0	29.1	16.6	5.9	15.3	17.2	4.7	4.7	3.0	1.8	1.1	0.1	0.4
Germany (East).....	3,626	100.0	23.7	13.4	8.9	25.5	14.9	2.0	6.6	1.4	0.7	1.4	0.1	1.4
Germany (West).....	25,666	100.0	29.0	15.4	6.2	15.7	16.5	3.3	6.7	2.2	1.8	2.3	0.3	0.7
Greece.....	1,239	100.0	20.4	8.1	9.3	14.7	16.3	7.9	14.7	4.3	2.4	0.6	0.2	0.9
Iceland.....	69	100.0	45.0	12.3	6.2	0.0	3.4	17.6	2.2	2.2	1.5	3.6	1.5	4.6
Ireland.....	790	100.0	35.8	11.9	11.9	9.2	8.7	4.7	3.9	4.5	5.8	1.5	0.6	1.6
Italy.....	11,229	100.0	38.0	13.4	3.8	15.4	16.2	3.6	5.2	2.3	1.0	0.8	0.1	0.3
Netherlands.....	8,581	100.0	36.6	15.5	8.2	10.8	11.9	4.1	4.3	1.5	2.7	2.7	0.6	1.0
Norway.....	2,192	100.0	40.3	13.8	12.8	8.0	4.9	6.4	4.4	2.1	3.9	2.2	0.4	0.8
Portugal.....	429	100.0	15.7	11.4	6.4	17.6	20.1	5.0	16.0	2.4	2.2	0.9	0.2	2.2
Spain.....	5,432	100.0	23.3	18.8	8.9	23.8	12.4	3.3	4.2	3.1	1.1	0.7	0.2	0.2
Sweden.....	7,573	100.0	48.2	17.2	6.9	7.5	7.5	3.2	3.9	1.2	1.8	1.2	0.8	0.6
Switzerland.....	5,316	100.0	36.3	18.5	4.1	11.9	16.5	2.7	4.2	1.6	1.7	1.7	0.3	0.6
Turkey.....	507	100.0	33.1	6.0	5.4	15.8	12.4	6.2	13.4	3.3	2.6	0.9	0.0	1.1
United Kingdom.....	36,509	100.0	36.6	14.8	7.4	9.9	9.1	4.0	6.3	1.5	4.5	2.4	1.2	2.5
Yugoslavia.....	1,211	100.0	21.3	15.0	3.3	22.1	20.7	3.4	9.2	3.0	0.9	0.4	0.2	0.5
All others.....	28	100.0	31.2	2.5	6.0	10.0	31.5	10.9	0.0	3.0	3.6	0.0	0.0	1.2
Asia.....	51,765	100.0	22.4	13.7	7.5	18.2	19.7	2.7	11.6	1.8	1.3	0.5	0.1	0.4
Bangladesh.....	95	100.0	26.3	6.5	12.8	11.4	15.1	0.5	4.2	1.4	15.8	3.2	1.6	1.1
China.....	4,001	100.0	13.8	6.7	2.9	13.0	39.1	5.1	13.0	3.9	0.1	1.7	0.1	0.5
Hong Kong.....	618	100.0	45.3	9.3	2.4	11.3	7.2	1.7	7.2	3.0	3.5	3.8	1.6	3.7
India.....	8,882	100.0	12.9	13.6	10.3	24.2	17.4	5.1	11.1	1.8	2.6	0.4	0.1	0.5
Indonesia.....	59	100.0	21.2	9.6	28.5	4.3	5.9	10.6	6.4	0.8	9.2	1.7	1.7	0.0
Japan.....	34,435	100.0	25.6	15.2	6.9	17.7	19.1	1.9	11.1	1.4	0.5	0.5	0.0	0.1
Malaysia.....	208	100.0	31.3	10.3	23.1	12.4	4.1	2.2	3.1	2.6	7.7	0.0	1.0	2.3
Pakistan.....	235	100.0	8.0	4.6	20.9	34.6	12.6	3.8	11.0	1.3	1.9	0.1	0.6	0.4
Philippines.....	127	100.0	12.8	3.9	58.0	1.6	0.8	4.7	1.8	2.4	10.2	2.6	0.5	0.8
Singapore.....	410	100.0	30.4	9.0	7.1	12.1	8.5	2.7	12.7	4.5	7.0	2.4	0.4	3.1
South Korea.....	771	100.0	10.0	4.6	3.7	30.5	18.2	1.5	24.9	2.7	2.5	0.1	0.0	1.3
Sri Lanka.....	107	100.0	27.9	15.6	21.2	12.0	3.4	6.2	3.7	0.0	5.4	0.5	2.8	1.4
Taiwan.....	1,414	100.0	19.7	8.7	9.2	12.8	16.3	0.9	25.4	2.7	3.8	0.2	0.0	0.5

## Regional and country portfolio of S&amp;E articles, by field: 1988

Region and country/economy	Articles	All fields	Clinical medicine	Biomedical research	Biology	Chemistry	Physics	Earth/space sciences	Engineering/ technology	Mathematics	Psychology	Social sciences	Health sciences	Professional fields
Thailand .....	287	100.0	42.4	19.4	12.8	3.7	2.6	4.7	4.7	0.9	6.3	0.8	0.5	1.1
Vietnam.....	52	100.0	1.9	1.6	6.8	9.0	41.3	1.0	2.6	35.8	0.0	0.0	0.0	0.0
All others.....	64	100.0	41.2	15.2	13.8	3.9	5.3	4.4	6.2	1.6	7.0	1.6	0.0	0.0
Eastern Europe/Central Asia.....	41,597	100.0	14.4	17.1	3.0	27.2	25.8	3.7	4.8	1.6	1.1	0.7	0.0	0.5
Bulgaria.....	1,089	100.0	9.0	39.2	2.2	20.6	17.7	2.2	5.4	2.8	0.2	0.3	0.0	0.3
Czechoslovakia .....	2,746	100.0	16.5	13.9	4.6	29.0	14.5	3.6	5.3	1.5	7.9	2.9	0.1	0.3
Hungary .....	1,714	100.0	21.2	19.5	3.7	27.3	12.0	1.7	4.3	6.2	2.2	0.7	0.1	1.1
Poland.....	4,030	100.0	12.4	9.3	5.3	27.1	28.4	1.9	9.1	4.4	1.0	0.6	0.1	0.6
Romania.....	393	100.0	10.0	3.7	1.3	38.3	18.2	1.5	15.1	9.6	1.3	0.8	0.0	0.3
USSR.....	31,625	100.0	14.3	17.7	2.6	27.1	27.6	4.1	4.1	0.9	0.6	0.6	0.0	0.4
Near East/North Africa .....	7,893	100.0	30.1	10.9	9.2	13.0	12.0	4.5	8.9	3.1	3.4	2.1	0.5	2.3
Algeria.....	66	100.0	17.1	7.5	7.9	17.9	23.9	9.1	2.3	4.6	6.8	2.3	0.0	0.8
Egypt.....	1,130	100.0	13.5	5.5	11.4	39.7	10.1	4.6	12.8	1.2	0.8	0.3	0.0	0.2
Iran .....	86	100.0	26.0	7.5	20.5	9.1	6.2	4.8	9.8	8.2	3.9	1.2	0.0	2.9
Israel.....	4,916	100.0	33.6	13.6	8.8	5.8	13.7	3.4	6.2	3.5	4.7	3.1	0.7	3.0
Jordan.....	161	100.0	31.6	3.7	6.3	19.4	13.2	2.8	14.0	1.9	3.4	0.6	0.6	2.5
Kuwait.....	304	100.0	38.4	12.3	4.5	7.6	3.1	9.9	16.8	2.8	1.0	0.7	0.7	2.1
Lebanon.....	54	100.0	41.8	15.4	9.9	6.2	16.0	1.8	6.5	0.0	1.8	0.0	0.6	0.0
Morocco.....	113	100.0	12.1	2.3	16.1	24.5	18.2	9.7	9.1	4.9	2.7	0.4	0.0	0.0
Oman .....	13	100.0	1.9	1.5	18.7	16.8	9.0	41.0	3.7	7.5	0.0	0.0	0.0	0.0
Saudi Arabia.....	569	100.0	39.2	8.0	6.8	11.4	5.9	4.6	16.2	3.3	1.2	0.4	1.1	1.9
Tunisia .....	96	100.0	37.5	5.9	5.5	20.7	12.8	4.1	1.0	10.7	1.6	0.0	0.0	0.0
United Arab Emirates.....	23	100.0	33.0	4.3	0.0	13.0	0.0	2.2	43.2	4.3	0.0	0.0	0.0	0.0
All others.....	362	100.0	18.4	3.4	14.3	27.3	8.2	11.0	14.7	1.0	0.3	0.0	0.0	1.4
Pacific .....	12,054	100.0	29.6	13.1	18.3	7.8	6.7	6.3	4.4	2.1	4.9	3.5	0.8	2.4
Australia .....	9,896	100.0	29.9	13.8	16.1	8.2	7.1	6.3	4.5	2.2	5.2	3.3	0.9	2.5
New Zealand .....	2,075	100.0	28.4	10.1	28.6	6.1	4.6	6.1	3.8	1.5	3.2	4.6	0.6	2.3
All others.....	83	100.0	33.8	5.5	25.1	3.8	0.6	12.4	3.6	1.2	8.0	1.2	1.2	3.6
Central/South America.....	4,748	100.0	24.3	16.6	11.6	11.4	16.2	5.0	5.3	2.2	3.6	1.7	1.3	0.6
Argentina .....	1,423	100.0	21.9	17.6	11.6	14.9	18.5	4.3	6.2	1.3	2.2	1.3	0.0	0.2
Brazil.....	1,766	100.0	20.4	15.8	9.1	9.9	22.1	5.3	5.9	3.6	2.2	2.3	3.0	0.4
Chile.....	682	100.0	38.7	19.1	9.5	11.1	5.8	6.2	3.5	2.4	2.1	1.0	0.0	0.7
Colombia.....	86	100.0	26.6	11.8	23.6	2.4	2.4	6.0	5.8	0.0	7.3	5.8	4.7	3.5
Costa Rica.....	55	100.0	19.0	9.1	36.2	4.1	9.1	1.1	2.1	0.0	14.6	2.7	0.0	1.8
Cuba .....	67	100.0	21.4	15.3	10.8	20.5	21.3	2.5	1.5	0.0	6.0	0.0	0.7	0.0
Peru .....	68	100.0	24.0	10.3	31.0	3.8	1.6	12.9	2.2	0.0	12.5	1.5	0.2	0.0
Uruguay .....	42	100.0	39.4	22.3	18.1	7.2	2.4	6.0	2.4	0.0	0.0	0.0	2.4	0.0
Venezuela.....	292	100.0	21.4	19.9	11.2	13.8	17.0	3.7	6.0	2.2	3.3	0.5	0.0	1.0
All others.....	268	100.0	27.6	11.0	20.3	5.4	1.6	4.8	2.3	0.7	18.7	3.0	1.9	2.5
Sub-Saharan Africa .....	4,544	100.0	37.6	12.1	18.7	7.1	3.6	6.0	4.1	1.8	5.0	1.0	1.0	2.1
Cameroon .....	35	100.0	15.0	18.0	25.6	9.8	0.0	2.7	2.9	14.5	4.3	0.0	7.2	0.0
Ethiopia.....	71	100.0	39.2	2.1	30.5	8.4	2.8	11.7	0.5	1.4	0.7	0.0	2.8	0.0
Ghana .....	37	100.0	32.5	9.4	27.6	2.7	0.0	6.9	1.3	0.0	11.6	2.7	0.0	5.3

## Regional and country portfolio of S&amp;E articles, by field: 1988

Region and country/economy	Articles	All fields	Clinical medicine	Biomedical research	Biology	Chemistry	Physics	Earth/space sciences	Engineering/ technology	Mathematics	Psychology	Social sciences	Health sciences	Professional fields
	Number	Percent distribution												
Kenya.....	291	100.0	56.4	12.2	19.7	1.2	0.7	1.7	0.7	0.3	4.9	1.4	0.3	0.3
Nigeria .....	886	100.0	31.6	9.0	24.7	6.7	2.0	2.9	4.2	2.1	7.4	0.6	2.6	6.2
Senegal.....	72	100.0	35.2	23.7	12.5	6.0	0.5	14.5	0.0	3.5	3.5	0.0	0.7	0.0
South Africa.....	2,523	100.0	35.0	14.4	15.7	8.8	5.3	7.6	5.3	2.0	3.0	1.1	0.4	1.2
Tanzania.....	64	100.0	38.7	5.7	28.3	0.0	0.8	4.3	3.1	0.0	12.1	0.8	0.0	6.2
Uganda.....	21	100.0	53.3	0.0	25.7	2.3	0.0	9.3	0.0	0.0	4.7	4.7	0.0	0.0
Zimbabwe .....	116	100.0	56.4	2.9	22.2	0.4	0.0	3.4	0.9	0.9	8.2	0.9	1.7	2.2
All others.....	425	100.0	48.6	8.3	18.6	4.6	1.4	3.8	1.8	0.6	10.0	0.7	0.9	0.7

OECD Organisation for Economic Co-operation and Development

NOTES: Article counts are from a set of journals classified and covered by the Institute of Scientific Information's Science Citation and Social Sciences Citation Indexes. Article counts are based on fractional assignments; for example, an article with two authors from different countries is counted as one-half of an article for each country. Countries with article output of less than 0.01 percent of world output in 2001 are grouped in "All others." Article and field data, however, are included for the former U.S.S.R. for 1988. Articles are assigned to fields based on journal field classifications developed by CHI Research, Inc.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Science &amp; Engineering Indicators – 2004

## Regional and country portfolio of S&amp;E articles, by field: 2001

Region and country/economy	Articles	All fields	Clinical	Biomedical	Biology	Chemistry	Physics	Earth/space	Engineering/	Mathematics	Psychology	Social	Health	Professional
			medicine	research				sciences	technology			sciences	sciences	fields
	Number		Percent distribution											
Worldwide .....	649,795	100.0	28.4	14.2	6.8	11.9	13.4	5.4	9.0	2.2	3.1	2.3	1.4	2.0
OECD .....	551,402	100.0	30.7	15.0	6.8	10.3	11.9	5.4	8.2	2.0	3.3	2.6	1.6	2.2
North America .....	226,704	100.0	31.3	16.7	6.7	7.2	8.6	5.8	7.0	1.8	4.6	3.9	2.5	3.7
Canada .....	22,626	100.0	29.3	15.2	10.3	7.8	6.6	7.3	7.9	1.9	4.7	4.4	2.2	2.4
Mexico .....	3,209	100.0	18.7	12.0	14.8	10.5	21.2	7.6	7.7	2.1	1.7	1.5	1.8	0.5
United States .....	200,870	100.0	31.7	16.9	6.2	7.1	8.7	5.6	6.9	1.8	4.7	3.9	2.5	3.9
Western Europe .....	229,173	100.0	32.0	14.0	6.6	11.5	12.7	5.7	8.1	2.4	2.8	1.8	1.2	1.3
Austria .....	4,526	100.0	42.5	13.0	5.6	10.0	11.3	4.6	6.1	2.7	2.2	1.2	0.3	0.6
Belgium .....	5,984	100.0	32.9	14.6	8.0	11.0	12.5	4.5	7.8	2.1	2.7	2.0	0.7	1.3
Croatia .....	710	100.0	23.4	7.5	6.2	20.5	11.3	4.6	5.0	3.1	16.4	1.3	0.3	0.3
Cyprus .....	74	100.0	7.7	5.3	4.0	12.2	8.7	2.0	24.0	9.4	13.1	1.9	0.0	11.7
Denmark .....	4,988	100.0	34.2	17.9	11.7	7.8	9.3	6.2	5.3	1.4	3.3	1.0	0.9	1.0
Finland .....	5,098	100.0	37.8	14.1	10.1	7.5	8.5	5.5	7.3	1.3	1.8	1.8	2.0	1.9
France .....	31,317	100.0	27.1	15.2	5.7	12.9	16.1	6.6	9.0	4.4	1.4	0.9	0.2	0.5
Germany .....	43,623	100.0	30.9	14.1	5.2	12.7	16.3	5.0	8.5	2.2	1.8	2.0	0.6	0.7
Greece .....	3,329	100.0	31.3	8.1	9.2	12.5	14.1	6.3	11.4	3.0	2.1	0.5	0.4	1.1
Iceland .....	174	100.0	31.9	10.2	16.2	3.3	4.6	16.2	2.9	2.1	5.8	3.9	2.3	0.7
Ireland .....	1,665	100.0	30.7	14.6	14.0	8.4	10.3	3.0	6.9	2.4	4.1	1.7	1.6	2.5
Italy .....	22,313	100.0	35.1	12.0	4.5	11.9	16.2	6.0	8.8	2.9	1.3	0.7	0.2	0.4
Macedonia .....	74	100.0	11.7	6.8	1.4	51.2	13.4	2.0	12.2	1.4	0.0	0.0	0.0	0.0
Netherlands .....	12,602	100.0	37.5	14.2	6.0	8.6	8.8	5.5	6.4	1.4	3.9	3.6	1.8	2.2
Norway .....	3,252	100.0	33.4	12.7	12.9	6.3	5.0	10.1	6.2	2.3	4.4	3.1	2.0	1.7
Portugal .....	2,142	100.0	14.5	12.5	11.0	20.5	16.8	4.7	13.1	3.5	1.4	0.9	0.1	1.0
Slovenia .....	876	100.0	19.9	13.7	4.3	16.3	16.7	2.9	17.4	3.1	3.5	0.7	0.3	1.2
Spain .....	15,570	100.0	24.7	13.9	10.7	18.5	11.7	5.7	7.8	3.3	1.7	0.9	0.4	0.6
Sweden .....	10,314	100.0	36.7	15.5	7.4	8.3	10.5	4.4	8.1	1.2	1.9	1.7	3.1	1.1
Switzerland .....	8,107	100.0	32.7	16.1	5.8	12.8	13.4	6.4	6.6	1.4	2.1	1.4	0.6	0.7
Turkey .....	4,098	100.0	44.3	6.3	5.2	14.2	8.9	4.6	11.2	1.3	1.9	1.1	0.5	0.6
United Kingdom .....	47,660	100.0	32.8	14.2	6.2	8.5	9.0	5.9	7.4	1.6	5.7	3.0	2.7	3.0
Yugoslavia .....	547	100.0	19.1	8.8	3.8	17.5	17.2	4.3	23.9	3.9	0.8	0.5	0.0	0.2
All others .....	129	100.0	34.2	8.9	5.9	12.2	4.6	6.8	11.7	1.5	6.6	0.8	2.5	4.5
Asia .....	113,575	100.0	22.2	11.9	5.5	18.2	19.8	3.6	14.5	2.0	1.0	0.4	0.2	0.6
Bangladesh .....	177	100.0	21.5	8.0	12.2	17.4	14.0	4.8	8.7	0.3	6.6	0.0	3.9	2.7
China .....	20,978	100.0	10.7	8.0	3.8	26.3	23.4	4.4	16.3	3.9	1.1	0.5	0.4	1.3
India .....	11,076	100.0	14.3	13.4	6.5	25.5	18.6	5.2	13.0	1.2	1.5	0.2	0.2	0.4
Indonesia .....	207	100.0	22.0	10.3	19.3	8.8	7.7	9.6	10.0	0.2	8.5	0.6	1.0	1.9
Japan .....	57,420	100.0	28.7	14.0	6.1	14.9	19.1	3.0	11.6	1.4	0.5	0.5	0.1	0.1
Malaysia .....	494	100.0	20.4	7.6	15.1	28.4	6.4	2.9	12.1	1.0	2.9	0.5	0.8	2.0
Pakistan .....	282	100.0	19.4	9.3	15.6	16.2	20.6	2.8	8.9	1.7	2.1	0.0	2.4	1.1
Philippines .....	158	100.0	15.8	10.6	39.5	1.3	12.0	4.0	3.2	1.9	5.3	1.9	1.4	3.3
Singapore .....	2,603	100.0	14.3	9.1	2.6	11.4	21.0	2.0	27.8	3.4	3.5	0.8	0.3	3.8
South Korea .....	11,037	100.0	17.9	11.3	3.3	17.7	22.4	3.0	20.7	1.7	1.0	0.3	0.2	0.6
Sri Lanka .....	76	100.0	27.4	9.1	31.3	11.1	9.2	3.4	2.4	0.0	2.4	0.0	0.7	3.0

## Regional and country portfolio of S&amp;E articles, by field: 2001

Region and country/economy	Articles	All fields	Clinical	Biomedical	Biology	Chemistry	Physics	Earth/space	Engineering/	Mathematics	Psychology	Social	Health	Professional
			medicine	research				sciences	technology			sciences	sciences	fields
	Number		Percent distribution											
Taiwan .....	8,082	100.0	24.1	8.5	5.1	14.0	16.0	5.0	21.8	2.1	1.2	0.5	0.5	1.2
Thailand .....	727	100.0	36.6	10.5	16.2	15.2	3.3	4.6	8.4	0.4	1.9	0.5	1.8	0.5
Vietnam.....	158	100.0	16.2	7.2	13.7	8.6	22.2	3.9	8.8	15.4	0.7	0.0	1.5	1.7
All others.....	101	100.0	31.0	6.1	18.9	4.5	3.0	15.4	2.0	1.5	10.7	1.3	2.1	3.5
Eastern Europe/Central Asia.....	33,686	100.0	8.2	8.8	4.4	26.0	30.3	5.9	10.2	3.7	1.4	0.6	0.1	0.3
Armenia .....	152	100.0	8.2	5.2	1.0	24.0	49.4	4.7	5.7	1.3	0.3	0.0	0.0	0.0
Azerbaijan .....	68	100.0	2.0	1.6	0.7	39.4	28.1	8.8	11.5	7.8	0.0	0.0	0.0	0.0
Belarus.....	528	100.0	4.2	8.5	4.1	29.0	40.2	1.2	8.4	3.3	0.3	0.8	0.0	0.2
Bulgaria.....	784	100.0	12.8	12.3	6.3	24.4	19.5	5.6	13.2	4.3	0.6	0.2	0.4	0.4
Czech Republic.....	2,622	100.0	14.5	16.0	7.7	22.9	16.2	4.5	8.2	3.9	3.1	1.5	0.0	1.3
Estonia .....	339	100.0	16.4	15.2	10.5	9.2	19.1	8.2	12.2	2.0	3.1	1.2	2.1	0.6
Georgia .....	110	100.0	6.8	3.5	4.7	21.1	36.6	7.6	7.8	9.3	2.6	0.0	0.0	0.0
Hungary .....	2,479	100.0	26.7	13.1	5.2	23.5	15.0	2.8	7.0	3.9	1.6	0.8	0.1	0.3
Kazakhstan .....	116	100.0	3.5	0.9	2.2	44.7	22.1	9.5	8.5	7.6	0.0	0.0	0.0	0.9
Latvia .....	157	100.0	10.8	11.5	5.5	27.2	25.1	2.5	14.2	1.6	0.6	0.6	0.3	0.0
Lithuania .....	272	100.0	7.2	14.3	7.5	19.4	27.7	4.4	12.5	3.3	2.9	0.4	0.4	0.0
Moldova .....	77	100.0	1.7	2.5	4.5	39.7	40.7	0.4	9.2	1.3	0.0	0.0	0.0	0.0
Poland .....	5,686	100.0	13.2	8.6	4.8	26.7	26.5	4.1	11.0	3.9	0.5	0.3	0.1	0.4
Romania.....	997	100.0	3.5	2.5	1.1	34.9	29.0	2.5	18.3	7.4	0.5	0.2	0.1	0.0
Russia .....	15,846	100.0	3.2	7.5	4.0	27.1	35.6	8.1	8.9	3.4	1.3	0.6	0.1	0.2
Slovakia .....	955	100.0	12.2	17.5	4.8	22.5	15.9	3.4	8.5	3.4	8.2	3.2	0.1	0.3
Ukraine .....	2,256	100.0	3.4	2.5	2.1	20.6	44.9	4.2	19.5	2.6	0.1	0.2	0.0	0.0
Uzbekistan .....	204	100.0	1.4	1.8	1.9	43.5	36.2	4.8	5.7	2.9	2.0	0.0	0.0	0.0
All others.....	39	100.0	4.7	2.2	8.2	18.3	21.2	19.5	5.1	12.7	3.0	2.5	2.5	0.0
Near East/North Africa .....	11,777	100.0	29.0	9.6	6.6	14.5	14.2	3.8	11.6	3.8	2.3	2.0	1.0	1.6
Algeria.....	225	100.0	5.2	2.1	3.1	16.0	34.5	5.9	27.6	5.4	0.0	0.0	0.0	0.2
Egypt.....	1,548	100.0	20.2	5.1	6.4	29.9	17.7	3.6	15.4	0.5	0.6	0.4	0.1	0.1
Iran .....	995	100.0	19.5	3.7	3.7	39.6	13.5	2.9	12.3	3.9	0.4	0.3	0.1	0.1
Israel.....	6,487	100.0	32.9	12.7	6.9	7.6	13.6	3.4	8.3	4.0	3.5	3.3	1.5	2.4
Jordan.....	240	100.0	18.7	6.6	12.1	9.6	11.6	10.9	25.0	0.4	1.9	1.2	1.5	0.4
Kuwait.....	257	100.0	35.6	10.4	6.8	10.3	3.8	3.7	21.2	3.0	0.4	0.8	1.0	2.8
Lebanon .....	202	100.0	48.2	7.5	6.5	4.3	8.5	4.8	6.9	3.0	5.6	1.1	1.5	2.0
Morocco.....	469	100.0	12.1	5.0	6.7	23.5	21.9	7.6	12.5	10.1	0.5	0.0	0.0	0.2
Oman .....	96	100.0	41.5	5.3	11.7	4.6	8.9	5.0	17.4	1.6	2.1	1.0	0.0	1.0
Saudi Arabia.....	580	100.0	40.8	5.9	4.7	12.3	10.1	2.8	17.2	4.0	0.7	0.2	0.2	1.2
Tunisia .....	344	100.0	22.9	11.3	5.3	15.2	14.1	3.7	14.5	11.9	0.8	0.0	0.0	0.2
United Arab Emirates.....	159	100.0	45.8	9.1	3.4	6.6	6.8	5.1	14.0	1.6	1.6	2.5	0.8	2.8
All others.....	174	100.0	25.4	7.3	17.3	13.3	8.9	5.6	17.5	1.1	1.4	1.0	0.2	0.9
Pacific .....	17,743	100.0	28.2	12.6	16.2	6.6	6.4	8.1	6.4	1.7	4.8	3.8	2.6	2.6
Australia .....	14,788	100.0	28.7	13.1	14.7	6.8	6.9	7.8	6.6	1.7	4.8	3.7	2.7	2.6
New Zealand .....	2,903	100.0	25.9	10.5	23.6	5.7	4.2	9.3	5.2	1.8	4.4	4.4	2.5	2.5
All others.....	53	100.0	30.9	4.6	35.5	1.9	0.0	6.4	1.4	0.0	9.6	0.9	1.5	7.2

## Regional and country portfolio of S&amp;E articles, by field: 2001

Region and country/economy	Articles	All fields	Clinical	Biomedical	Biology	Chemistry	Physics	Earth/space	Engineering/	Mathematics	Psychology	Social	Health	Professional
	Number		medicine	research				sciences	technology			sciences	sciences	fields
			Percent distribution											
Central/South America.....	13,147	100.0	22.7	14.1	12.7	13.4	17.9	5.4	7.6	2.3	1.8	0.6	1.0	0.5
Argentina.....	2,930	100.0	23.4	15.0	16.1	12.7	16.0	6.0	6.4	1.8	1.5	0.6	0.2	0.2
Brazil.....	7,205	100.0	21.4	13.8	10.3	13.5	21.6	4.3	8.8	2.4	1.6	0.5	1.4	0.3
Chile.....	1,203	100.0	26.8	11.6	12.3	17.3	8.0	11.2	5.9	3.0	2.0	0.3	0.6	1.1
Colombia.....	324	100.0	24.2	12.4	18.8	8.4	16.6	3.5	4.7	2.4	4.3	2.1	1.4	1.1
Costa Rica.....	92	100.0	21.1	14.9	37.9	10.9	4.9	4.5	1.8	0.0	2.5	0.3	0.0	1.1
Cuba.....	299	100.0	25.0	20.1	9.4	15.9	17.0	3.6	6.0	0.3	0.0	2.3	0.4	0.0
Peru.....	93	100.0	31.4	9.5	24.2	3.1	8.9	9.4	4.0	1.1	6.2	1.1	0.8	0.3
Uruguay.....	155	100.0	21.3	24.2	13.2	8.9	16.7	4.7	3.1	3.9	0.9	1.8	0.0	1.3
Venezuela.....	535	100.0	19.3	14.2	12.6	17.4	13.7	4.5	9.3	3.9	2.7	0.2	0.4	1.7
All others.....	310	100.0	29.4	13.3	26.0	6.8	4.2	6.1	3.6	0.5	5.5	1.3	1.8	1.7
Sub-Saharan Africa.....	3,990	100.0	29.8	12.0	21.2	6.6	4.4	7.7	5.0	1.5	5.7	1.8	2.3	1.9
Cameroon.....	75	100.0	34.1	9.2	26.5	4.2	5.3	6.6	2.0	3.1	6.2	0.0	1.3	1.3
Ethiopia.....	93	100.0	54.2	6.9	21.5	3.8	5.1	3.4	0.3	0.0	2.6	0.4	2.0	0.0
Ghana.....	90	100.0	40.3	9.6	16.0	5.0	2.3	4.1	2.8	0.0	13.0	1.1	1.2	4.5
Kenya.....	230	100.0	36.0	13.3	31.3	2.2	0.9	3.4	0.9	0.0	8.1	0.6	2.9	0.2
Nigeria.....	332	100.0	29.7	11.5	29.9	3.9	2.4	4.0	4.6	2.1	5.4	0.1	2.4	4.1
Senegal.....	62	100.0	33.8	9.8	30.1	2.7	5.4	4.4	1.9	1.6	6.2	0.0	2.5	1.6
South Africa.....	2,327	100.0	24.5	12.7	18.0	8.9	5.9	10.3	6.8	1.7	5.2	2.7	1.5	1.8
Tanzania.....	87	100.0	53.7	6.5	22.0	0.0	0.6	3.5	2.1	0.0	1.0	2.0	5.2	3.5
Uganda.....	91	100.0	45.6	9.4	21.8	0.0	0.0	2.3	1.1	0.0	4.4	2.1	11.7	1.6
Zimbabwe.....	113	100.0	29.5	11.4	27.5	2.3	0.0	4.0	5.3	0.4	10.2	2.2	6.3	0.9
All others.....	490	100.0	37.6	12.6	23.0	4.2	2.7	4.2	2.0	2.2	5.8	0.4	3.4	1.9

OECD Organisation for Economic Co-operation and Development

NOTES: Article counts are from a set of journals classified and covered by the Institute of Scientific Information's Science Citation and Social Sciences Citation Indexes. Article counts are based on fractional assignments; for example, an article with two authors from different countries is counted as one-half of an article for each country. Countries with article output of less than 0.01 percent of world output in 2001 are grouped in "All others." China's data include articles from the Hong Kong economy for 2001. Articles are assigned to fields based on journal field classifications developed by CHI Research, Inc.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Science & Engineering Indicators – 2004

Appendix table 5-39

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**Coauthorship of U.S. S&E articles, by field and sector: 1988**

Field and sector	Articles Number	All	U.S.	Internationally
		coauthored articles	coauthored articles	coauthored articles
		Percent		
<b>All fields</b>				
All sectors .....	187,242	47.5	37.2	10.3
Academic .....	148,506	52.2	42.1	10.1
Industry.....	20,232	50.2	42.0	8.2
Federal Government .....	22,048	67.5	57.6	9.9
Nonprofit institutions .....	19,452	71.8	62.5	9.3
FFRDCs .....	7,352	59.8	43.6	16.2
State/local government.....	3,684	75.4	70.0	5.4
<b>Clinical medicine</b>				
All sectors .....	57,384	61.0	52.0	8.0
Academic.....	46,391	65.6	57.8	7.7
Industry.....	3,885	66.0	56.4	9.6
Federal Government.....	9,035	79.8	70.3	9.5
Nonprofit institutions .....	11,734	76.8	69.8	7.0
FFRDCs.....	396	72.5	61.4	11.1
State/local government.....	2,072	84.5	79.1	5.4
<b>Biomedical research</b>				
All sectors .....	29,203	51.7	39.5	12.2
Academic.....	23,944	55.7	44.1	11.6
Industry.....	2,303	61.9	50.5	11.4
Federal Government.....	3,777	68.0	54.3	13.7
Nonprofit institutions .....	3,468	71.4	57.9	13.5
FFRDCs.....	626	60.5	47.4	13.1
State/local government.....	445	68.3	59.1	9.2
<b>Biology</b>				
All sectors .....	13,522	40.7	30.7	9.9
Academic.....	11,150	44.3	34.5	9.8
Industry.....	563	60.7	53.6	7.1
Federal Government.....	2,435	53.3	45.7	7.6
Nonprofit institutions .....	623	61.2	41.9	19.3
FFRDCs.....	145	52.4	49.0	3.4
State/local government.....	323	65.0	58.5	6.5
<b>Chemistry</b>				
All sectors .....	13,896	31.2	21.1	10.1
Academic.....	10,432	35.5	24.7	10.7
Industry.....	2,696	32.8	26.5	6.3
Federal Government.....	987	47.8	38.1	9.7
Nonprofit institutions .....	278	45.7	34.2	11.5
FFRDCs.....	701	56.9	44.4	12.6
State/local government.....	47	40.4	34.0	6.4
<b>Physics</b>				
All sectors .....	19,686	45.4	28.9	16.5
Academic.....	13,853	53.5	36.0	17.5
Industry.....	4,138	45.3	35.2	10.1
Federal Government.....	1,439	58.9	48.0	10.8
Nonprofit institutions .....	331	62.8	44.1	18.7
FFRDCs.....	3,319	61.0	40.6	20.4
State/local government.....	8	50.0	50.0	0.0
<b>Earth/space sciences</b>				
All sectors .....	8,784	49.6	32.9	16.7
Academic.....	6,413	55.1	38.4	16.7
Industry.....	884	69.6	58.9	10.6
Federal Government.....	1,771	62.9	49.3	13.6
Nonprofit institutions .....	603	68.2	43.3	24.9
FFRDCs.....	907	67.4	47.6	19.7
State/local government.....	183	60.7	56.3	4.4

Appendix table 5-39  
**Coauthorship of U.S. S&E articles, by field and sector: 1988**

(Page 2 of 2)

Field and sector	Articles	All	U.S.	Internationally
		coauthored articles	coauthored articles	coauthored articles
	Number		Percent	
<b>Engineering/technology</b>				
All sectors .....	8,784	49.6	32.9	16.7
Academic .....	6,413	55.1	38.4	16.7
Industry .....	884	69.6	58.9	10.6
Federal Government .....	1,771	62.9	49.3	13.6
Nonprofit institutions .....	603	68.2	43.3	24.9
FFRDCs .....	907	67.4	47.6	19.7
State/local government .....	183	60.7	56.3	4.4
<b>Mathematics</b>				
All sectors .....	4,301	39.7	20.3	19.5
Academic .....	4,009	41.0	21.2	19.8
Industry .....	230	57.0	43.0	13.9
Federal Government .....	126	53.2	44.4	8.7
Nonprofit institutions .....	79	65.8	45.6	20.3
FFRDCs .....	86	60.5	51.2	9.3
State/local government .....	5	80.0	80.0	0.0
<b>Psychology</b>				
All sectors .....	7,343	37.6	32.8	4.8
Academic .....	6,805	39.3	34.5	4.8
Industry .....	231	64.1	58.9	5.2
Federal Government .....	338	70.1	65.7	4.4
Nonprofit institutions .....	467	70.7	66.2	4.5
FFRDCs .....	10	70.0	70.0	0.0
State/local government .....	162	74.7	71.6	3.1
<b>Social sciences</b>				
All sectors .....	9,043	30.5	23.7	6.8
Academic .....	7,854	32.9	26.1	6.8
Industry .....	355	42.8	40.8	2.0
Federal Government .....	560	44.3	39.3	5.0
Nonprofit institutions .....	699	49.4	40.6	8.7
FFRDCs .....	76	40.8	35.5	5.3
State/local government .....	78	56.4	55.1	1.3
<b>Health sciences/professional fields</b>				
All sectors .....	11,649	34.4	31.1	3.4
Academic .....	0	38.5	34.8	3.7
Industry .....	0	37.0	35.8	1.2
Federal Government .....	546	51.6	48.7	2.9
Nonprofit institutions .....	0	52.4	49.7	2.7
FFRDCs .....	0	47.9	47.9	0.0
State/local government .....	0	57.8	56.5	1.3

FFRDC federally funded research and development center

NOTES: Coauthorship is based on author's institutional address. Article volume is on a whole-count basis, where each institutional author is credited with a whole count.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.



Appendix table 5-40

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**Coauthorship of U.S. S&E articles, by field and sector: 2001**

Field and sector	Articles Number	All	U.S.	Internationally
		coauthored articles	coauthored articles	coauthored articles
		Percent		
<b>All fields</b>				
All sectors .....	228,051	62.2	39.0	23.2
Academic .....	187,742	65.0	42.7	22.3
Industry.....	24,560	74.4	51.6	22.9
Federal Government .....	25,771	79.5	57.2	22.3
Nonprofit institutions .....	28,608	81.0	60.4	20.6
FFRDCs .....	9,974	78.3	41.6	36.7
State/local government.....	3,971	83.5	71.5	11.9
<b>Clinical medicine</b>				
All sectors .....	71,006	70.3	50.1	20.2
Academic .....	57,266	74.0	54.9	19.1
Industry.....	7,669	83.5	57.9	25.6
Federal Government .....	9,581	86.0	65.1	20.9
Nonprofit institutions .....	16,807	81.7	64.1	17.6
FFRDCs .....	417	87.8	58.3	29.5
State/local government .....	2,003	87.6	76.1	11.5
<b>Biomedical research</b>				
All sectors .....	39,009	67.4	42.3	25.1
Academic .....	32,731	70.4	46.5	24.0
Industry.....	3,427	73.3	48.1	25.2
Federal Government .....	4,606	79.0	52.2	26.8
Nonprofit institutions .....	5,508	83.4	57.1	26.3
FFRDCs .....	912	84.6	55.7	28.9
State/local government .....	504	83.9	61.7	22.2
<b>Biology</b>				
All sectors .....	14,052	57.7	36.0	21.7
Academic .....	11,629	61.0	39.8	21.3
Industry.....	869	78.4	58.3	20.0
Federal Government .....	2,719	70.6	52.3	18.3
Nonprofit institutions .....	959	74.1	45.8	28.4
FFRDCs .....	117	76.9	52.1	24.8
State/local government .....	515	78.1	69.5	8.5
<b>Chemistry</b>				
All sectors .....	16,147	48.8	27.3	21.5
Academic .....	13,098	50.4	29.1	21.3
Industry.....	2,438	58.9	39.0	19.9
Federal Government .....	1,015	67.3	48.0	19.3
Nonprofit institutions .....	453	79.0	62.3	16.8
FFRDCs .....	1,137	72.9	48.1	24.8
State/local government .....	44	75.0	59.1	15.9
<b>Physics</b>				
All sectors .....	21,801	65.3	27.2	38.0
Academic .....	17,407	69.1	30.7	38.4
Industry.....	2,982	71.4	44.6	26.8
Federal Government .....	1,691	76.2	47.7	28.6
Nonprofit institutions .....	330	86.1	48.5	37.6
FFRDCs .....	4,037	79.0	34.4	44.7
State/local government .....	11	72.7	63.6	9.1
<b>Earth/space sciences</b>				
All sectors .....	13,927	69.8	33.0	36.7
Academic .....	10,755	73.2	37.4	35.9
Industry.....	1,304	82.4	55.4	27.0
Federal Government .....	2,812	83.2	50.8	32.4
Nonprofit institutions .....	1,332	87.2	40.8	46.3
FFRDCs .....	1,708	82.8	41.0	41.8
State/local government .....	290	74.1	60.7	13.4

Appendix table 5-40

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**Coauthorship of U.S. S&E articles, by field and sector: 2001**

Field and sector	Articles	All coauthored articles	U.S. coauthored articles	Internationally coauthored articles
	Number		Percent	
<b>Engineering/technology</b>				
All sectors .....	15,943	56.5	31.6	24.9
Academic .....	11,937	60.6	36.1	24.5
Industry .....	4,126	70.5	51.0	19.5
Federal Government .....	1,466	73.3	56.8	16.4
Nonprofit institutions .....	309	72.8	51.1	21.7
FFRDCs .....	1,532	69.4	41.8	27.6
State/local government .....	48	75.0	64.6	10.4
<b>Mathematics</b>				
All sectors .....	4,459	55.8	20.5	35.2
Academic .....	4,269	56.3	20.9	35.3
Industry .....	227	79.3	52.4	26.9
Federal Government .....	79	72.2	53.2	19.0
Nonprofit institutions .....	92	81.5	56.5	25.0
FFRDCs .....	56	75.0	53.6	21.4
State/local government .....	2	100.0	100.0	0.0
<b>Psychology</b>				
All sectors .....	8,270	50.8	39.4	11.4
Academic .....	7,727	52.4	41.1	11.3
Industry .....	303	72.9	65.0	7.9
Federal Government .....	431	84.0	72.4	11.6
Nonprofit institutions .....	662	75.1	65.3	9.8
FFRDCs .....	1	100.0	100.0	0.0
State/local government .....	154	85.7	70.1	15.6
<b>Social sciences</b>				
All sectors .....	9,988	37.8	25.8	12.0
Academic .....	9,119	38.8	27.3	11.5
Industry .....	249	64.7	53.4	11.2
Federal Government .....	469	55.7	46.7	9.0
Nonprofit institutions .....	828	68.7	49.8	19.0
FFRDCs .....	46	69.6	50.0	19.6
State/local government .....	66	77.3	72.7	4.5
<b>Health sciences/professional fields</b>				
All sectors .....	13,449	46.3	37.8	8.5
Academic .....	11,804	49.1	40.6	8.5
Industry .....	966	60.1	53.6	6.5
Federal Government .....	902	68.7	60.6	8.1
Nonprofit institutions .....	1,328	72.9	65.8	7.1
FFRDCs .....	11	81.8	63.6	18.2
State/local government .....	334	77.5	74.9	2.7

FFRDC federally funded research and development center

NOTES: Coauthorship is based on author's institutional address. Article volume is on a whole-count basis, where each institutional author is credited with a whole count.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Appendix table 5-41

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**Cross-sectoral coauthorship of U.S. S&E articles, by field and sector: 1988**

Field and sector	Cross-sectoral articles	Share of cross-sectoral articles					State and local government
		Academic	Industry	Federal Government	Nonprofit institutions	FFRDCs	
	Number	Percent					
<b>All fields</b>							
All sectors .....	33,062	na	na	na	na	na	na
Academic .....	30,510	na	20.6	34.8	34.4	9.5	7.3
Industry .....	7,790	80.5	na	17.0	10.8	6.4	2.2
Federal Government .....	12,103	87.6	11.0	na	10.4	3.4	3.3
Nonprofit institutions .....	11,541	91.0	7.3	10.9	na	1.3	3.8
FFRDCs .....	3,435	84.0	14.6	11.8	4.2	na	0.3
State/local government .....	2,563	86.3	6.7	15.6	17.0	0.4	na
<b>Clinical medicine</b>							
All sectors .....	15,233	na	na	na	na	na	na
Academic .....	14,395	na	11.3	38.2	47.6	1.2	9.8
Industry .....	2,029	80.3	na	19.3	21.6	1.6	4.3
Federal Government .....	5,957	92.2	6.6	na	13.1	1.2	4.3
Nonprofit institutions .....	7,353	93.2	6.0	10.6	na	0.4	4.5
FFRDCs .....	234	73.5	14.1	30.3	12.4	na	2.1
State/local government .....	1,609	88.0	5.5	15.8	20.6	0.3	na
<b>Biomedical research</b>							
All sectors .....	5,010	na	na	na	na	na	na
Academic .....	4,625	na	19.7	36.9	41.5	5.0	5.3
Industry .....	1,122	81.1	na	18.0	16.7	3.8	1.5
Federal Government .....	1,971	86.6	10.2	na	12.2	3.7	2.0
Nonprofit institutions .....	2,109	91.0	8.9	11.4	na	1.5	2.5
FFRDCs .....	311	74.9	13.8	23.2	10.0	na	0.3
State/local government .....	275	89.1	6.2	14.2	18.9	0.4	na
<b>Biology</b>							
All sectors .....	1,689	na	na	na	na	na	na
Academic .....	1,581	na	16.2	58.7	15.7	4.0	9.7
Industry .....	300	85.3	na	25.0	4.3	2.0	4.0
Federal Government .....	1,009	92.0	7.4	na	4.0	0.9	4.6
Nonprofit institutions .....	288	86.5	4.5	13.9	na	0.3	3.5
FFRDCs .....	71	90.1	8.5	12.7	1.4	na	1.4
State/local government .....	188	81.4	6.4	24.5	5.3	0.5	na
<b>Chemistry</b>							
All sectors .....	1,219	na	na	na	na	na	na
Academic .....	1,091	na	47.4	25.7	6.5	24.8	1.1
Industry .....	622	83.1	na	14.0	3.5	6.4	0.2
Federal Government .....	363	77.1	24.0	na	3.9	4.4	0.8
Nonprofit institutions .....	100	71.0	22.0	14.0	na	3.0	1.0
FFRDCs .....	300	90.3	13.3	5.3	1.0	na	0.0
State/local government .....	13	92.3	7.7	23.1	7.7	0.0	na
<b>Physics</b>							
All sectors .....	3,259	na	na	na	na	na	na
Academic .....	2,926	na	37.0	18.5	4.6	46.7	0.1
Industry .....	1,342	80.8	na	13.1	1.5	16.8	0.1
Federal Government .....	710	76.2	24.8	na	3.1	13.7	0.1
Nonprofit institutions .....	174	77.6	11.5	12.6	na	9.8	0.0
FFRDCs .....	1,555	87.8	14.5	6.2	1.1	na	0.1
State/local government .....	4	75.0	25.0	25.0	0.0	25.0	na
<b>Earth/space sciences</b>							
All sectors .....	1,908	na	na	na	na	na	na
Academic .....	1,609	na	22.7	42.6	15.3	24.8	4.8
Industry .....	540	67.6	na	37.6	6.3	10.6	4.3
Federal Government .....	912	75.1	22.3	na	8.2	12.3	1.9
Nonprofit institutions .....	318	77.4	10.7	23.6	na	13.8	1.9
FFRDCs .....	491	81.3	11.6	22.8	9.0	na	0.6
State/local government .....	106	73.6	21.7	16.0	5.7	2.8	na

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**Cross-sectoral coauthorship of U.S. S&E articles, by field and sector: 1988**

Field and sector	Cross-sectoral articles	Share of cross-sectoral articles					
		Academic	Industry	Federal Government	Nonprofit institutions	FFRDCs	State and local government
	Number	Percent					
<b>Engineering/technology</b>							
All sectors .....	1,793	na	na	na	na	na	na
Academic .....	1,533	na	56.4	21.9	6.8	18.8	1.4
Industry .....	1,087	79.5	na	12.6	5.6	7.7	0.7
Federal Government .....	457	73.3	30.0	na	3.9	4.8	0.4
Nonprofit institutions .....	167	62.9	36.5	10.8	na	9.6	0.6
FFRDCs .....	369	78.0	22.8	6.0	4.3	na	0.0
State/local government .....	33	63.6	24.2	6.1	3.0	0.0	na
<b>Mathematics</b>							
All sectors .....	237	na	na	na	na	na	na
Academic .....	223	na	40.8	24.7	16.1	19.7	1.8
Industry .....	104	87.5	na	4.8	7.7	4.8	0.0
Federal Government .....	59	93.2	8.5	na	3.4	1.7	1.7
Nonprofit institutions .....	42	85.7	19.0	4.8	na	2.4	0.0
FFRDCs .....	48	91.7	10.4	2.1	2.1	na	0.0
State/local government .....	4	100.0	0.0	25.0	0.0	0.0	na
<b>Psychology</b>							
All sectors .....	866	na	na	na	na	na	na
Academic .....	829	na	14.1	25.8	36.1	0.7	12.9
Industry .....	137	85.4	na	8.0	7.3	0.7	3.6
Federal Government .....	225	95.1	4.9	na	4.9	0.0	4.0
Nonprofit institutions .....	315	94.9	3.2	3.5	na	0.3	3.8
FFRDCs .....	7	85.7	14.3	0.0	14.3	na	0.0
State/local government .....	117	91.5	4.3	7.7	10.3	0.0	na
<b>Social sciences</b>							
All sectors .....	676	na	na	na	na	na	na
Academic .....	632	na	19.6	28.2	40.3	3.8	5.5
Industry .....	142	87.3	na	11.3	9.2	1.4	2.8
Federal Government .....	203	87.7	7.9	na	10.3	2.5	3.0
Nonprofit institutions .....	281	90.7	4.6	7.5	na	0.7	1.1
FFRDCs .....	27	88.9	7.4	18.5	7.4	na	0.0
State/local government .....	42	83.3	9.5	14.3	7.1	0.0	na
<b>Health/professional</b>							
All sectors .....	1,172	na	na	na	na	na	na
Academic .....	1,066	na	29.6	17.7	31.4	1.9	12.9
Industry .....	365	86.6	na	6.3	8.5	1.4	3.6
Federal Government .....	237	79.7	9.7	na	14.8	0.8	9.7
Nonprofit institutions .....	394	85.0	7.9	8.9	na	0.0	4.8
FFRDCs .....	22	90.9	22.7	9.1	0.0	na	0.0
State/local government .....	172	80.2	7.6	13.4	11.0	0.0	na

FFRDC federally funded research and development center

na Not applicable

NOTES: Article counts are on a whole-count basis, where each institutional author is credited with a whole count. Sector shares may exceed 100 percent in cases of articles with multiple institutional authors. Sum of the institutional article counts exceeds the total number of cross sectoral articles because of whole counting of articles with multiple institutional authors.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

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**Cross-sectoral coauthorship of U.S. S&E articles, by field and sector: 2001**

Field and sector	Cross-sectoral articles	Share of cross-sectoral articles					
		Academic	Industry	Federal Government	Nonprofit institutions	FFRDCs	State and local government
	Number	Percent					
<b>All fields</b>							
All sectors .....	48,872	na	na	na	na	na	na
Academic .....	44,994	na	25.7	31.7	37.0	11.3	5.8
Industry .....	18,334	83.4	na	17.3	17.0	0.9	4.2
Federal Government .....	16,420	86.8	14.6	na	14.6	5.0	3.7
Nonprofit institutions .....	13,874	90.8	12.9	13.1	na	0.5	4.6
FFRDCs .....	5,875	86.2	14.8	14.0	5.4	na	1.7
State/local government .....	3,037	85.5	13.0	20.2	23.3	0.3	na
<b>Clinical medicine</b>							
All sectors .....	20,418	na	na	na	na	na	na
Academic .....	18,977	na	22.2	32.0	51.9	1.1	7.4
Industry .....	5,015	83.8	na	16.6	32.3	0.9	4.2
Federal Government .....	6,755	89.8	12.3	na	20.3	1.5	4.8
Nonprofit institutions .....	10,788	91.4	15.0	12.7	na	0.5	4.6
FFRDCs .....	297	72.7	14.8	34.3	17.8	na	1.7
State/local government .....	1,628	86.7	13.0	20.1	30.8	0.3	na
<b>Biomedical research</b>							
All sectors .....	7,991	na	na	na	na	na	na
Academic .....	7,502	na	21.5	33.5	44.8	6.6	4.3
Industry .....	1,870	86.4	na	16.0	18.8	4.2	2.1
Federal Government .....	2,797	89.9	10.7	na	13.8	3.9	2.4
Nonprofit institutions .....	3,599	93.4	9.8	10.7	na	2.5	1.8
FFRDCs .....	614	80.5	12.7	17.8	14.5	na	1.5
State/local government .....	371	86.0	10.8	17.8	17.8	2.4	na
<b>Biology</b>							
All sectors .....	2,649	na	na	na	na	na	na
Academic .....	2,424	na	18.9	54.7	19.6	2.7	11.9
Industry .....	566	80.7	na	25.8	7.6	1.1	6.2
Federal Government .....	1,493	88.8	9.8	na	6.3	1.5	7.1
Nonprofit institutions .....	544	87.3	7.9	17.3	na	1.8	5.7
FFRDCs .....	77	85.7	7.8	29.9	13.0	na	0.0
State/local government .....	357	80.7	9.8	29.7	8.7	0.0	na
<b>Chemistry</b>							
All sectors .....	1,988	na	na	na	na	na	na
Academic .....	1,799	na	41.4	21.8	9.9	31.5	1.4
Industry .....	870	85.6	na	13.6	2.9	7.2	0.3
Federal Government .....	501	78.2	23.6	na	4.8	11.6	0.6
Nonprofit institutions .....	222	80.6	11.3	10.8	na	5.9	0.9
FFRDCs .....	638	88.9	9.9	9.1	2.0	na	0.2
State/local government .....	30	83.3	10.0	10.0	6.7	3.3	na
<b>Physics</b>							
All sectors .....	4,388	na	na	na	na	na	na
Academic .....	4,026	na	31.0	19.8	4.5	53.1	0.2
Industry .....	1,529	81.6	na	16.2	1.5	20.0	0.0
Federal Government .....	1,000	79.8	24.7	na	3.0	14.0	0.1
Nonprofit institutions .....	215	83.7	10.7	14.0	na	17.7	0.0
FFRDCs .....	2,337	91.4	13.1	6.0	1.6	na	0.0
State/local government .....	8	87.5	0.0	12.5	0.0	0.0	na
<b>Earth/space sciences</b>							
All sectors .....	4,017	na	na	na	na	na	na
Academic .....	3,483	na	18.1	43.4	21.5	27.3	4.4
Industry .....	898	70.2	na	39.5	9.0	12.7	5.0
Federal Government .....	1,888	80.1	18.8	na	13.2	16.3	2.0
Nonprofit institutions .....	907	82.7	8.9	27.5	na	14.0	1.3
FFRDCs .....	1,127	84.3	10.1	27.2	11.3	na	0.4
State/local government .....	195	78.5	23.1	19.0	6.2	2.6	na

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**Cross-sectoral coauthorship of U.S. S&E articles, by field and sector: 2001**

Field and sector	Cross-sectoral articles	Share of cross-sectoral articles					
		Academic	Industry	Federal Government	Nonprofit institutions	FFRDCs	State and local government
	Number	Percent					
<b>Engineering/technology</b>							
All sectors .....	3,326	na	na	na	na	na	na
Academic .....	2,936	na	61.4	22.5	4.2	19.8	0.6
Industry .....	2,131	84.6	na	13.6	2.5	9.2	0.8
Federal Government .....	870	76.0	33.2	na	4.7	9.0	0.0
Nonprofit institutions .....	187	65.8	28.3	21.9	na	8.0	1.1
FFRDCs .....	724	80.1	27.2	10.8	2.1	na	0.0
State/local government .....	32	59.4	50.0	0.0	6.3	0.0	na
<b>Mathematics</b>							
All sectors .....	270	na	na	na	na	na	na
Academic .....	260	na	51.5	15.4	25.0	10.8	0.8
Industry .....	144	93.1	na	5.6	2.8	3.5	0.0
Federal Government .....	46	87.0	17.4	na	10.9	2.2	0.0
Nonprofit institutions .....	66	98.5	6.1	7.6	na	0.0	0.0
FFRDCs .....	31	90.3	16.1	3.2	0.0	na	0.0
State/local government .....	2	100.0	0.0	0.0	0.0	0.0	na
<b>Psychology</b>							
All sectors .....	1,072	na	na	na	na	na	na
Academic .....	1,025	na	16.7	29.6	43.0	0.1	11.6
Industry .....	202	84.7	na	13.9	19.8	0.0	2.5
Federal Government .....	321	94.4	8.7	na	10.0	0.0	2.8
Nonprofit institutions .....	468	94.2	8.5	6.8	na	0.0	5.8
FFRDCs .....	1	100.0	0.0	0.0	0.0	na	0.0
State/local government .....	122	97.5	4.1	7.4	22.1	0.0	na
<b>Social sciences</b>							
All sectors .....	834	na	na	na	na	na	na
Academic .....	788	na	15.5	24.2	54.6	1.9	5.7
Industry .....	142	85.9	na	9.9	11.3	0.7	0.7
Federal Government .....	222	86.0	6.3	na	19.4	1.8	1.8
Nonprofit institutions .....	457	94.1	3.5	9.4	na	0.4	0.4
FFRDCs .....	20	75.0	5.0	20.0	10.0	na	0.0
State/local government .....	48	93.8	2.1	8.3	4.2	0.0	na
<b>Health/professional</b>							
All sectors .....	1,919	na	na	na	na	na	na
Academic .....	1,774	na	24.6	25.6	44.7	0.5	11.7
Industry .....	507	86.0	na	12.6	20.1	0.4	3.9
Federal Government .....	527	86.1	12.1	na	22.0	0.2	11.6
Nonprofit institutions .....	881	90.0	11.6	13.2	na	0.0	7.4
FFRDCs .....	9	88.9	22.2	11.1	0.0	na	0.0
State/local government .....	244	84.8	8.2	25.0	26.6	0.0	na

FFRDC federally funded research and development center

na Not applicable

NOTES: Article counts are on a whole-count basis, where each institutional author is credited with a whole count. Sector shares may exceed 100 percent in cases of articles with multiple institutional authors. Sum of the institutional article counts exceeds the total number of cross sectoral articles because of whole counting of articles with multiple institutional authors.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Appendix table 5-43

## Breadth of international coauthorship ties for selected countries/economies: 1994 and 2001

Country/economy	Collaborating countries		Country/economy	Collaborating countries		Country/economy	Collaborating countries	
	1994	2001		1994	2001		1994	2001
United States .....	154	166	Singapore .....	36	57	Moldova .....	16	31
France .....	140	152	Slovakia .....	51	54	Bolivia .....	20	30
United Kingdom .....	143	150	Peru .....	24	53	Benin .....	7	29
Germany .....	125	130	Slovenia .....	44	53	Côte d'Ivoire .....	28	29
Netherlands .....	115	127	Yugoslavia .....	40	53	Paraguay .....	9	26
Italy .....	114	121	Nigeria .....	59	52	Oman .....	18	26
Canada .....	119	120	Croatia .....	44	52	Jamaica .....	18	25
Spain .....	88	116	Pakistan .....	37	52	Syria .....	24	25
Switzerland .....	112	116	Ghana .....	32	51	Papua New Guinea .....	12	25
Japan .....	97	114	Senegal .....	35	50	Trinidad-Tobago .....	6	24
Belgium .....	100	112	Armenia .....	38	48	Gambia .....	21	24
Australia .....	93	106	Georgia .....	29	48	Mali .....	16	24
China .....	78	103	Sri Lanka .....	24	48	Myanmar .....	5	21
Brazil .....	85	102	Cameroon .....	36	47	Barbados .....	6	20
Sweden .....	110	102	Estonia .....	29	47	Gabon .....	9	19
India .....	90	101	Lebanon .....	19	46	Sierra Leone .....	6	19
Denmark .....	83	100	Bangladesh .....	31	46	Libya .....	12	19
South Africa .....	58	95	Philippines .....	38	46	Bosnia and Herzegovina .....	9	18
Austria .....	73	93	Vietnam .....	25	46	Azerbaijan .....	11	18
Mexico .....	69	89	Ecuador .....	23	44	Honduras .....	17	17
Russia .....	89	88	Uganda .....	31	44	Guinea .....	2	17
Norway .....	64	87	Iran .....	20	44	Lesotho .....	7	17
Israel .....	71	86	Burkina Faso .....	15	43	Namibia .....	8	17
Portugal .....	51	86	Nepal .....	20	43	Yemen .....	5	17
Greece .....	68	82	Zambia .....	26	42	Kyrgyzstan .....	6	17
Finland .....	73	81	Zimbabwe .....	27	41	Mongolia .....	15	16
Turkey .....	51	79	Algeria .....	25	41	El Salvador .....	2	15
Poland .....	73	79	Kuwait .....	27	41	Swaziland .....	0	15
South Korea .....	52	78	Ethiopia .....	30	40	Malta .....	19	15
Argentina .....	58	76	Morocco .....	25	39	Tajikistan .....	12	15
Colombia .....	38	75	Lithuania .....	36	38	Laos .....	0	15
Hungary .....	64	74	Uzbekistan .....	37	38	Botswana .....	6	14
Venezuela .....	32	73	Costa Rica .....	28	37	Mozambique .....	8	14
Czech Republic .....	65	72	Dominican Republic .....	20	37	Niger .....	11	14
Ireland .....	57	71	Sudan .....	16	37	Turkmenistan .....	9	14
Cuba .....	29	70	Cyprus .....	24	37	Brunei .....	8	14
Kenya .....	50	69	Uruguay .....	23	36	Bahamas .....	1	13
Thailand .....	59	69	Iceland .....	27	36	Albania .....	8	13
Egypt .....	72	67	Jordan .....	27	34	Mauritania .....	1	12
Taiwan .....	46	66	Tunisia .....	29	34	Mauritius .....	8	12
New Zealand .....	55	66	Luxembourg .....	25	34	Cambodia .....	7	12
Chile .....	57	64	Macedonia .....	13	34	Togo .....	2	11
Saudi Arabia .....	51	63	Kazakhstan .....	25	34	Congo, Republic of the .....	25	10
Romania .....	49	61	Latvia .....	28	34	Guyana .....	0	9
Tanzania .....	43	60	Madagascar .....	12	33	Central African Republic .....	6	9
Indonesia .....	37	60	Malawi .....	15	33	Belize .....	3	8
Ukraine .....	55	59	Guatemala .....	10	32	Suriname .....	0	8
Malaysia .....	40	58	Panama .....	10	32	Qatar .....	13	8
Bulgaria .....	55	57	Nicaragua .....	7	31			

NOTES: Number of countries that have jointly authored articles (based on institutional address) with indicated country. Countries ranked by number of countries collaborating in 2001.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

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## U.S. international scientific collaboration with selected countries/economies: 1994 and 2001

Region and country/economy	1994				2001			
	S&E articles	Internationally coauthored articles	Share of internationally coauthored articles	U.S. share of internationally coauthored articles	S&E articles	Internationally coauthored articles	Share of internationally coauthored articles	U.S. share of internationally coauthored articles
	Number	Number	Percent	Percent	Number	Number	Percent	Percent
<b>North America</b>								
Canada.....	28,983	8,189	28.3	52.6	28,846	11,070	38.4	53.1
Mexico.....	2,138	836	39.1	48.7	4,393	2,066	47.0	42.2
United States.....	216,862	34,226	15.8	na	228,015	52,862	23.2	na
<b>Western Europe</b>								
Austria.....	4,112	1,640	39.9	24.9	6,476	3,291	50.8	25.5
Belgium.....	6,620	2,889	43.6	23.8	8,818	4,724	53.6	23.0
Croatia.....	678	290	42.8	26.9	934	382	40.9	27.5
Cyprus.....	46	33	71.7	33.3	139	93	66.9	41.9
Denmark.....	5,800	2,310	39.8	29.5	7,136	3,609	50.6	29.2
Finland.....	4,851	1,571	32.4	33.7	6,747	2,892	42.9	28.6
France.....	34,284	11,135	32.5	27.1	41,397	17,918	43.3	25.6
Germany.....	44,434	13,591	30.6	30.2	57,231	23,887	41.7	29.9
Greece.....	2,505	938	37.4	30.8	4,371	1,812	41.5	27.6
Iceland.....	197	97	49.2	46.4	316	219	69.3	28.8
Ireland.....	1,481	545	36.8	24.6	2,280	1,065	46.7	18.3
Italy.....	20,574	6,734	32.7	34.1	28,384	11,269	39.7	32.2
Macedonia.....	48	28	58.3	46.4	101	46	45.5	15.2
Netherlands.....	14,579	4,659	32.0	30.0	17,134	7,692	44.9	29.9
Norway.....	3,558	1,313	36.9	29.6	4,503	2,112	46.9	26.3
Portugal.....	1,236	570	46.1	22.6	3,056	1,619	53.0	18.7
Slovenia.....	598	232	38.8	25.4	1,184	524	44.3	27.9
Spain.....	12,536	3,651	29.1	26.6	19,809	7,508	37.9	26.9
Sweden.....	11,239	4,073	36.2	29.8	14,096	6,524	46.3	27.5
Switzerland.....	10,056	4,474	44.5	31.5	12,067	6,455	53.5	31.2
Turkey.....	1,613	398	24.7	37.4	4,704	1,078	22.9	41.0
United Kingdom.....	52,714	13,253	25.1	31.3	60,438	22,328	36.9	30.6
Yugoslavia.....	624	209	33.5	25.4	705	286	40.6	22.4
<b>Asia</b>								
Bangladesh.....	193	101	52.3	22.8	277	176	63.5	28.4
China.....	7,846	2,181	27.8	33.7	24,638	6,703	27.2	37.4
Hong Kong.....	1,485	568	38.2	31.3	na	na	na	na
India.....	10,757	1,516	14.1	38.8	12,561	2,685	21.4	36.9
Indonesia.....	224	178	79.5	33.7	420	347	82.6	25.6
Japan.....	50,309	6,898	13.7	49.5	64,073	12,622	19.7	42.8
Malaysia.....	437	170	38.9	18.8	673	308	45.8	13.6
Pakistan.....	406	159	39.2	23.3	389	186	47.8	30.1
Philippines.....	221	137	62.0	29.2	284	205	72.2	32.7
Singapore.....	1,208	337	27.9	32.0	3,212	1,107	34.5	30.0
South Korea.....	3,496	1,005	28.7	64.9	12,801	3,296	25.7	57.2
Sri Lanka.....	120	62	51.7	22.6	125	84	67.2	27.4
Taiwan.....	4,916	862	17.5	71.5	9,115	1,897	20.8	58.2
Thailand.....	572	339	59.3	34.8	1,096	638	58.2	35.3
Vietnam.....	102	72	70.6	4.2	300	245	81.7	16.3
<b>Eastern Europe/Central Asia</b>								
Armenia.....	232	86	37.1	24.4	261	157	60.2	28.7
Azerbaijan.....	214	46	21.5	13.0	90	35	38.9	5.7
Bulgaria.....	1,311	512	39.1	19.7	1,182	682	57.7	18.9
Belarus.....	1,127	189	16.8	6.3	743	372	50.1	13.7
Czech Republic.....	2,746	1,179	42.9	16.6	3,753	1,936	51.6	19.8
Estonia.....	290	149	51.4	18.8	506	280	55.3	20.4
Georgia.....	190	91	47.9	8.8	196	136	69.4	15.4
Hungary.....	2,460	1,198	48.7	30.8	3,624	1,987	54.8	29.0
Kazakhstan.....	236	76	32.2	11.8	160	70	43.8	27.1
Latvia.....	230	128	55.7	13.3	246	147	59.8	15.0



Appendix table 5-44

(Page 2 of 2)

## U.S. international scientific collaboration with selected countries/economies: 1994 and 2001

Region and country/economy	1994				2001			
	S&E articles	Internationally coauthored articles	Share of internationally coauthored articles	U.S. share of internationally coauthored articles	S&E articles	Internationally coauthored articles	Share of internationally coauthored articles	U.S. share of internationally coauthored articles
			Number	Percent			Number	Percent
Lithuania .....	261	121	46.4	18.2	425	257	60.5	16.7
Moldova .....	193	62	32.1	3.2	132	93	70.5	11.8
Poland .....	5,384	2,346	43.6	24.5	7,901	3,798	48.1	26.7
Romania .....	885	369	41.7	25.2	1,486	812	54.6	20.1
Russia .....	24,463	5,080	20.8	22.1	20,356	7,774	38.2	24.1
Slovakia .....	1,424	490	34.4	15.5	1,445	814	56.3	20.0
Ukraine .....	3,396	859	25.3	9.8	3,187	1,603	50.3	18.7
Uzbekistan .....	336	80	23.8	11.3	263	96	36.5	15.6
Near East/North Africa								
Algeria .....	207	140	67.6	9.3	354	231	65.3	2.6
Egypt .....	1,635	462	28.3	34.4	1,853	553	29.8	32.4
Iran .....	290	104	35.9	39.4	1,155	296	25.6	26.0
Israel .....	7,045	2,669	37.9	59.7	8,502	3,561	41.9	52.2
Jordan .....	182	67	36.8	41.8	315	137	43.5	35.8
Kuwait .....	222	66	29.7	36.4	319	107	33.5	28.0
Lebanon .....	82	35	42.7	57.1	277	131	47.3	45.8
Morocco .....	334	266	79.6	14.3	756	525	69.4	7.4
Oman .....	63	29	46.0	31.0	131	60	45.8	20.0
Saudi Arabia .....	854	218	25.5	31.2	727	248	34.1	33.9
Tunisia .....	208	123	59.1	8.1	489	265	54.2	7.2
United Arab Emirates .....	142	77	54.2	20.8	224	115	51.3	16.5
Pacific								
Australia .....	14,663	3,606	24.6	36.2	18,589	6,751	36.3	37.2
New Zealand .....	2,941	873	29.7	38.3	3,716	1,435	38.6	34.2
Central/South America								
Argentina .....	2,118	676	31.9	33.1	3,812	1,587	41.6	34.9
Brazil .....	3,989	1,624	40.7	40.1	9,078	3,369	37.1	39.0
Chile .....	1,076	475	44.1	36.2	1,780	954	53.6	39.2
Colombia .....	233	149	63.9	46.3	554	373	67.3	40.8
Costa Rica .....	118	85	72.0	58.8	182	145	79.7	48.3
Cuba .....	192	89	46.4	10.1	491	334	68.0	9.3
Peru .....	106	71	67.0	56.3	205	180	87.8	53.9
Uruguay .....	124	69	55.6	18.8	263	184	70.0	29.3
Venezuela .....	562	259	46.1	40.5	789	434	55.0	35.9
Sub-Saharan Africa								
Cameroon .....	142	98	69.0	22.4	148	114	77.0	17.5
Ethiopia .....	125	71	56.8	16.9	158	106	67.1	17.0
Ghana .....	96	50	52.1	30.0	152	105	69.1	21.9
Kenya .....	418	239	57.2	36.4	436	337	77.3	35.0
Nigeria .....	573	184	32.1	23.4	430	166	38.6	27.1
Senegal .....	130	87	66.9	23.0	126	103	81.7	7.8
South Africa .....	2,830	667	23.6	32.8	3,050	1,266	41.5	31.1
Tanzania .....	176	127	72.2	22.8	180	156	86.7	19.9
Uganda .....	62	36	58.1	50.0	160	120	75.0	47.5
Zimbabwe .....	191	95	49.7	30.5	179	114	63.7	28.9

na not applicable

NOTES: Internationally coauthored articles are those with at least one coauthor from another country. Article counts are on a whole-count basis, where each coauthor's country, including the United States, is credited with a whole count. Countries whose share of world article output is less than 0.01 percent are excluded.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

## Intraregional scientific collaboration in Western Europe: 1994 and 2001

Country	International articles	Belgium	Denmark	Finland	France	Germany	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	United Kingdom
	Number	Percent													
<b>Belgium</b>															
1994 .....	2,889	na	2.7	1.9	26.0	14.5	0.9	8.3	16.7	1.5	1.7	5.4	5.4	6.1	13.9
2001 .....	4,724	na	3.1	2.7	23.6	17.3	1.1	9.5	15.8	1.6	1.7	6.4	6.1	5.6	16.7
Change.....	1,835	na	0.4	0.8	-2.3	2.8	0.1	1.2	-0.9	0.1	0.0	1.0	0.7	-0.5	2.8
<b>Denmark</b>															
1994 .....	2,310	3.4	na	4.5	10.5	16.8	1.0	7.1	7.5	7.0	1.4	4.2	17.4	4.8	16.8
2001 .....	3,609	4.0	na	5.8	11.1	17.9	1.1	7.8	8.6	6.9	1.5	5.2	14.6	5.3	19.1
Change.....	1,299	0.6	na	1.2	0.5	1.1	0.2	0.7	1.1	-0.1	0.1	1.0	-2.8	0.5	2.2
<b>Finland</b>															
1994 .....	1,571	3.4	6.7	na	8.9	11.6	0.8	5.7	6.2	5.2	1.4	4.6	19.0	5.9	11.1
2001 .....	2,892	4.4	7.2	na	10.0	16.4	1.3	7.7	8.4	5.4	1.8	5.3	19.4	6.2	15.7
Change.....	1,321	1.0	0.5	na	1.0	4.8	0.5	2.0	2.2	0.2	0.4	0.6	0.4	0.3	4.5
<b>France</b>															
1994 .....	11,135	6.7	2.2	1.3	na	13.3	0.4	9.1	5.1	1.0	1.2	6.7	3.1	6.8	12.1
2001 .....	17,918	6.2	2.2	1.6	na	15.3	0.6	11.3	5.0	1.3	1.6	7.2	3.8	6.4	13.9
Change.....	6,783	-0.5	0.0	0.4	na	2.1	0.1	2.1	-0.1	0.3	0.3	0.5	0.7	-0.4	1.8
<b>Germany</b>															
1994 .....	13,591	3.1	2.9	1.3	10.9	na	0.5	6.9	5.9	1.2	0.6	3.5	3.8	8.4	11.3
2001 .....	23,887	3.4	2.7	2.0	11.5	na	0.5	8.0	6.6	1.2	0.8	4.4	4.3	7.6	13.0
Change.....	10,296	0.3	-0.2	0.6	0.6	na	0.1	1.1	0.8	0.0	0.2	0.9	0.5	-0.8	1.7
<b>Ireland</b>															
1994 .....	545	5.0	4.0	2.2	8.8	12.1	na	4.6	6.8	1.7	1.8	3.9	3.3	5.0	40.2
2001 .....	1,065	4.8	3.8	3.5	9.8	12.2	na	8.8	7.4	2.7	2.0	5.3	6.2	3.5	42.8
Change.....	520	-0.2	-0.2	1.3	1.0	0.1	na	4.2	0.6	1.1	0.1	1.4	2.9	-1.5	2.6
<b>Italy</b>															
1994 .....	6,734	3.5	2.4	1.3	15.1	13.8	0.4	na	5.1	1.0	0.9	6.3	3.6	8.4	15.2
2001 .....	11,269	4.0	2.5	2.0	17.9	16.9	0.8	na	6.8	1.5	1.3	8.3	4.3	7.3	17.2
Change.....	4,535	0.4	0.1	0.7	2.8	3.0	0.5	na	1.7	0.4	0.4	2.0	0.7	-1.2	2.0
<b>Netherlands</b>															
1994 .....	4,659	10.4	3.7	2.1	12.2	17.1	0.8	7.4	na	2.3	1.2	4.7	5.2	5.9	18.1
2001 .....	7,692	9.7	4.0	3.1	11.7	20.6	1.0	9.9	na	2.2	1.7	5.8	5.2	5.2	20.2
Change.....	3,033	-0.7	0.3	1.1	-0.6	3.5	0.2	2.6	na	-0.1	0.5	1.1	0.0	-0.7	2.0
<b>Norway</b>															
1994 .....	1,313	3.3	12.3	6.2	8.7	12.1	0.7	5.3	8.1	na	1.8	4.0	21.3	5.8	15.3
2001 .....	2,112	3.6	11.8	7.3	10.9	13.1	1.4	7.8	8.0	na	1.8	4.4	21.6	5.3	20.7
Change.....	799	0.3	-0.5	1.2	2.3	1.0	0.7	2.4	-0.1	na	0.0	0.4	0.3	-0.5	5.4
<b>Portugal</b>															
1994 .....	570	8.6	5.6	3.9	24.4	14.7	1.8	10.2	9.8	4.0	na	13.5	7.7	8.6	25.4
2001 .....	1,619	4.9	3.3	3.2	17.7	12.4	1.3	8.8	8.3	2.3	na	17.2	6.2	4.5	24.2
Change.....	1,049	-3.7	-2.3	-0.7	-6.7	-2.3	-0.5	-1.3	-1.5	-1.7	na	3.7	-1.5	-4.1	-1.2

## Intraregional scientific collaboration in Western Europe: 1994 and 2001

Country	International articles	Belgium	Denmark	Finland	France	Germany	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	United Kingdom
	Number	Percent													
Spain															
1994 .....	3,651	4.3	2.6	2.0	20.4	13.2	0.6	11.6	5.9	1.5	2.1	na	4.2	5.2	17.7
2001 .....	7,508	4.0	2.5	2.0	17.2	14.1	0.7	12.5	5.9	1.2	3.7	na	3.8	5.1	17.2
Change.....	3,857	-0.2	-0.2	0.0	-3.2	0.9	0.2	0.9	0.0	-0.2	1.6	na	-0.4	-0.1	-0.5
Sweden															
1994 .....	4,073	3.8	9.8	7.3	8.4	12.6	0.4	5.9	5.9	6.9	1.1	3.8	na	5.0	12.7
2001 .....	6,524	4.4	8.1	8.6	10.4	15.8	1.0	7.4	6.1	7.0	1.5	4.4	na	4.3	15.8
Change.....	2,451	0.6	-1.8	1.3	2.0	3.2	0.6	1.5	0.2	0.1	0.5	0.6	na	-0.7	3.1
Switzerland															
1994 .....	4,474	3.9	2.5	2.1	16.9	25.4	0.6	12.7	6.1	1.7	1.1	4.2	4.5	na	13.1
2001 .....	6,455	4.1	3.0	2.8	17.7	28.1	0.6	12.7	6.2	1.7	1.1	5.9	4.3	na	14.6
Change.....	1,981	0.2	0.5	0.7	0.8	2.7	0.0	0.0	0.1	0.0	0.0	1.7	-0.2	na	1.5
United Kingdom															
1994 .....	13,253	3.0	2.9	1.3	10.1	11.6	1.7	7.7	6.4	1.5	1.1	4.9	3.9	4.4	na
2001 .....	22,328	3.5	3.1	2.0	11.2	13.9	2.0	8.7	6.9	2.0	1.8	5.8	4.6	4.2	na
Change.....	9,075	0.5	0.1	0.7	1.0	2.3	0.4	1.0	0.6	0.4	0.7	0.9	0.7	-0.2	na

na not applicable

NOTES: Data are share of indicated country's articles internationally coauthored with other countries in the same region. Internationally coauthored articles are on a whole-count basis, where each coauthor's country is credited with a whole count. Because of the high degree of intra European collaboration, shares exceed 100 percent in some cases.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Science and Engineering Indicators – 2004

Appendix table 5-46  
**Intraregional scientific collaboration in Asia: 1994 and 2001**

Country/economy	International articles	China	India	Indonesia	Japan	Malaysia	Philippines	Singapore	South Korea	Taiwan	Thailand	Vietnam
	Number	Percent										
<b>China</b>												
1994 <sup>a</sup> .....	2,181	na	0.9	0.1	14.9	0.3	0.1	1.2	2.0	1.7	0.3	0.0
2001 <sup>b</sup> .....	6,703	na	1.7	0.2	17.0	0.8	0.2	3.9	3.7	3.5	0.5	0.1
Change.....	4,522	na	0.8	0.0	2.2	0.5	0.1	2.7	1.7	1.8	0.2	0.1
<b>India</b>												
1994 .....	1,516	1.3	na	0.0	7.9	0.5	0.5	0.2	0.7	0.7	0.5	0.1
2001 .....	2,685	4.2	na	0.1	10.2	1.0	0.7	1.2	2.8	3.6	0.6	0.2
Change.....	1,169	2.9	na	0.1	2.3	0.5	0.2	1.0	2.0	2.9	0.2	0.2
<b>Indonesia</b>												
1994 .....	178	1.7	0.0	na	22.5	0.6	2.2	0.6	0.0	0.0	0.6	0.0
2001 .....	347	3.2	1.2	na	26.2	2.9	1.7	1.4	0.3	1.4	2.6	1.2
Change.....	169	1.5	1.2	na	3.8	2.3	-0.5	0.9	0.3	1.4	2.0	1.2
<b>Japan</b>												
1994 .....	6,898	4.7	1.7	0.6	na	0.3	0.4	0.4	3.3	1.1	1.0	0.1
2001 .....	12,622	9.0	2.2	0.7	na	0.3	0.3	0.7	5.8	1.8	1.2	0.3
Change.....	5,724	4.3	0.4	0.1	na	0.0	-0.1	0.3	2.5	0.7	0.1	0.2
<b>Malaysia</b>												
1994 .....	170	3.5	4.1	0.6	13.5	na	0.6	3.5	0.6	1.8	1.2	0.0
2001 .....	308	16.9	8.8	3.2	14.0	na	0.6	6.8	1.6	1.6	9.1	0.3
Change.....	138	13.4	4.6	2.7	0.4	na	0.1	3.3	1.0	-0.1	7.9	0.3
<b>Philippines</b>												
1994 .....	137	2.2	5.1	2.9	20.4	0.7	na	0.0	0.7	0.0	4.4	0.0
2001 .....	205	7.8	9.3	2.9	19.0	1.0	na	1.0	2.0	2.4	6.3	1.5
Change.....	68	5.6	4.2	0.0	-1.4	0.2	na	1.0	1.2	2.4	2.0	1.5
<b>Singapore</b>												
1994 .....	337	8.0	0.9	0.3	7.4	1.8	0.0	na	0.6	3.3	0.3	0.0
2001 .....	1,107	23.7	2.9	0.5	7.7	1.9	0.2	na	1.1	3.7	0.9	0.5
Change.....	770	15.7	2.0	0.2	0.3	0.1	0.2	na	0.5	0.4	0.6	0.5
<b>South Korea</b>												
1994 .....	1,005	4.3	1.1	0.0	22.5	0.1	0.1	0.2	na	0.8	0.0	0.0
2001 .....	3,296	7.4	2.2	0.0	22.2	0.2	0.1	0.4	na	3.2	0.5	0.4
Change.....	2,291	3.2	1.2	0.0	-0.3	0.1	0.0	0.2	na	2.4	0.5	0.4
<b>Taiwan</b>												
1994 .....	862	4.2	1.2	0.0	8.9	0.3	0.0	1.3	0.9	na	0.1	0.0
2001 .....	1,897	12.2	5.1	0.3	12.0	0.3	0.3	2.2	5.5	na	0.6	0.4
Change.....	1,035	8.1	3.9	0.3	3.0	-0.1	0.3	0.9	4.6	na	0.5	0.4
<b>Thailand</b>												
1994 .....	339	1.8	2.1	0.3	20.9	0.6	1.8	0.3	0.0	0.3	na	1.2
2001 .....	638	5.2	2.7	1.4	22.9	4.4	2.0	1.6	2.4	1.7	na	1.3
Change.....	299	3.4	0.6	1.1	1.9	3.8	0.3	1.3	2.4	1.4	na	0.1
<b>Vietnam</b>												
1994 .....	72	0.0	1.4	0.0	12.5	0.0	0.0	0.0	0.0	0.0	5.6	na
2001 .....	245	3.3	2.4	1.6	15.1	0.4	1.2	2.0	5.3	3.3	3.3	na
Change.....	173	3.3	1.1	1.6	2.6	0.4	1.2	2.0	5.3	3.3	-2.3	na

na not applicable

<sup>a</sup>Excludes Hong Kong.

<sup>b</sup>Includes Hong Kong.

NOTES: Data are share of indicated country's articles internationally coauthored with other countries in the same region. Internationally coauthored articles are on a whole-count basis, where each coauthor's country is credited with a whole count.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Appendix table 5-47  
**Intraregional scientific collaboration in Central and South America: 1994 and 2001**

Country	International articles	Argentina	Brazil	Chile	Colombia	Costa Rica	Cuba	Mexico	Panama	Peru	Uruguay	Venezuela
	Number	Percent										
<b>Argentina</b>												
1994 .....	676	na	8.6	4.4	0.3	0.1	0.3	1.5	0.0	0.4	1.2	1.5
2001 .....	1,587	na	12.6	4.5	2.2	0.1	0.7	4.3	0.0	0.4	1.8	1.1
Change.....	911	na	4.0	0.0	1.9	-0.1	0.4	2.9	0.0	0.0	0.6	-0.3
<b>Brazil</b>												
1994 .....	1,624	3.6	na	2.0	0.7	0.1	0.4	1.6	0.0	0.4	0.7	0.6
2001 .....	3,369	5.9	na	1.7	1.7	0.5	1.3	3.3	0.1	0.9	1.0	1.0
Change.....	1,745	2.4	na	-0.3	0.9	0.5	0.9	1.7	0.1	0.6	0.3	0.5
<b>Chile</b>												
1994 .....	475	6.3	6.9	na	0.6	0.0	0.4	3.4	0.0	0.2	0.8	2.1
2001 .....	954	7.4	6.1	na	1.2	0.2	0.7	4.1	0.2	0.7	1.3	1.2
Change.....	479	1.1	-0.9	na	0.5	0.2	0.3	0.7	0.2	0.5	0.4	-1.0
<b>Colombia</b>												
1994 .....	149	1.3	8.1	2.0	na	1.3	0.0	12.8	1.3	2.0	0.0	1.3
2001 .....	373	9.4	15.0	2.9	na	0.8	2.7	12.3	0.3	3.8	1.6	3.5
Change.....	224	8.0	7.0	0.9	na	-0.5	2.7	-0.4	-1.1	1.7	1.6	2.1
<b>Costa Rica</b>												
1994 .....	85	1.2	1.2	0.0	2.4	na	1.2	8.2	5.9	0.0	0.0	0.0
2001 .....	145	0.7	12.4	1.4	2.1	na	0.0	4.8	2.1	1.4	0.0	0.7
Change.....	60	-0.5	11.2	1.4	-0.3	na	-1.2	-3.4	-3.8	1.4	0.0	0.7
<b>Cuba</b>												
1994 .....	89	2.2	6.7	2.2	0.0	1.1	na	15.7	0.0	0.0	0.0	3.4
2001 .....	334	3.3	12.9	2.1	3.0	0.0	na	28.1	0.6	0.0	0.6	2.1
Change.....	245	1.0	6.1	-0.2	3.0	-1.1	na	12.4	0.6	0.0	0.6	-1.3
<b>Mexico</b>												
1994 .....	836	1.2	3.1	1.9	2.3	0.8	1.7	na	0.2	0.5	0.4	0.2
2001 .....	2,066	3.3	5.3	1.9	2.2	0.3	4.5	na	0.1	0.5	0.5	1.8
Change.....	1,230	2.1	2.2	0.0	-0.1	-0.5	2.8	na	-0.1	0.0	0.1	1.6
<b>Panama</b>												
1994 .....	38	0.0	0.0	0.0	5.3	13.2	0.0	5.3	na	0.0	0.0	2.6
2001 .....	89	0.0	4.5	2.2	1.1	3.4	2.2	2.2	na	1.1	0.0	2.2
Change.....	51	0.0	4.5	2.2	-4.1	-9.8	2.2	-3.0	na	1.1	0.0	-0.4
<b>Peru</b>												
1994 .....	71	4.2	8.5	1.4	4.2	0.0	0.0	5.6	0.0	na	0.0	0.0
2001 .....	180	3.9	17.2	3.9	7.8	1.1	0.0	5.6	0.6	na	1.1	2.8
Change.....	109	-0.3	8.8	2.5	3.6	1.1	0.0	-0.1	0.6	na	1.1	2.8
<b>Uruguay</b>												
1994 .....	69	11.6	17.4	5.8	0.0	0.0	0.0	4.3	0.0	0.0	na	2.9
2001 .....	184	15.2	18.5	6.5	3.3	0.0	1.1	5.4	0.0	1.1	na	2.7
Change.....	115	3.6	1.1	0.7	3.3	0.0	1.1	1.1	0.0	1.1	na	-0.2
<b>Venezuela</b>												
1994 .....	259	3.9	3.5	3.9	0.8	0.0	1.2	0.8	0.4	0.0	0.8	na
2001 .....	434	4.1	8.1	2.5	3.0	0.2	1.6	8.5	0.5	1.2	1.2	na
Change.....	175	0.3	4.6	-1.3	2.2	0.2	0.5	7.8	0.1	1.2	0.4	na

na not applicable

NOTES: Data are share of indicated country's articles internationally coauthored with other countries in the same region. Internationally coauthored articles are on a whole-count basis, where each coauthor's country is credited with a whole count.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Appendix table 5-48

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## Citation of S&amp;E articles, by region and country/economy: 1992, 1996, and 2001

Region and country/economy	1992		1996		2001	
	Number	Percent worldwide	Number	Percent worldwide	Number	Percent worldwide
Worldwide .....	2,684,777	100.00	3,325,455	100.00	3,846,519	100.00
North America .....	1,503,880	56.02	1,770,128	53.23	1,830,781	47.60
Canada .....	111,661	4.16	141,278	4.25	144,247	3.75
Mexico .....	2,906	0.11	4,243	0.13	8,241	0.21
United States .....	1,389,314	51.75	1,624,607	48.85	1,678,293	43.63
Western Europe .....	812,461	30.26	1,082,741	32.56	1,363,912	35.46
Austria .....	11,023	0.41	16,437	0.49	23,775	0.62
Belgium .....	20,776	0.77	28,118	0.85	34,731	0.90
Croatia .....	0	0.00	871	0.03	1,510	0.04
Cyprus .....	24	0.00	60	0.00	196	0.01
Denmark .....	20,271	0.76	26,288	0.79	32,558	0.85
Finland .....	14,704	0.55	21,493	0.65	30,461	0.79
France .....	116,453	4.34	153,159	4.61	187,325	4.87
Germany .....	157,285	5.86	207,673	6.24	274,520	7.14
Greece .....	3,359	0.13	5,132	0.15	8,971	0.23
Iceland .....	314	0.01	578	0.02	868	0.02
Ireland .....	3,440	0.13	4,639	0.14	8,148	0.21
Italy .....	54,805	2.04	83,353	2.51	115,461	3.00
Macedonia .....	0	0.00	22	0.00	135	0.00
Netherlands .....	57,498	2.14	76,260	2.29	91,238	2.37
Norway .....	10,221	0.38	13,079	0.39	16,212	0.42
Portugal .....	1,460	0.05	2,793	0.08	5,807	0.15
Slovenia .....	0	0.00	871	0.03	2,317	0.06
Spain .....	22,199	0.83	42,731	1.28	68,894	1.79
Sweden .....	48,980	1.82	57,349	1.72	66,394	1.73
Switzerland .....	43,605	1.62	58,346	1.75	69,675	1.81
Turkey .....	1,134	0.04	2,519	0.08	6,565	0.17
United Kingdom .....	221,955	8.27	278,930	8.39	316,752	8.23
Yugoslavia .....	2,865	0.11	1,822	0.05	771	0.02
All others .....	89	0.00	218	0.01	630	0.02
Asia .....	209,591	7.81	279,456	8.40	392,036	10.19
Bangladesh .....	208	0.01	331	0.01	317	0.01
China .....	9,910	0.37	16,539	0.50	33,245	0.86
India .....	14,421	0.54	19,250	0.58	24,442	0.64
Indonesia .....	164	0.01	293	0.01	485	0.01
Japan .....	174,471	6.50	219,688	6.61	280,360	7.29
Malaysia .....	386	0.01	499	0.02	986	0.03
Pakistan .....	362	0.01	421	0.01	456	0.01
Philippines .....	341	0.01	467	0.01	642	0.02
Singapore .....	1,179	0.04	2,787	0.08	5,650	0.15
South Korea .....	2,260	0.08	6,563	0.20	23,551	0.61
Sri Lanka .....	184	0.01	147	0.00	201	0.01
Taiwan .....	4,763	0.18	11,150	0.34	19,422	0.50
Thailand .....	787	0.03	1,042	0.03	1,716	0.04
Vietnam .....	57	0.00	164	0.00	307	0.01
All others .....	99	0.00	117	0.00	256	0.01
Eastern Europe/Central Asia .....	52,023	1.94	60,215	1.81	76,898	2.00
Armenia .....	0	0.00	118	0.00	243	0.01
Azerbaijan .....	0	0.00	59	0.00	51	0.00
Bulgaria .....	1,522	0.06	2,110	0.06	2,193	0.06
Belarus .....	0	0.00	500	0.02	1,060	0.03
Czechoslovakia .....	5,468	0.20	6,540	0.20	7,591	0.20
Estonia .....	0	0.00	376	0.01	1,204	0.03
Georgia .....	0	0.00	88	0.00	264	0.01
Hungary .....	4,755	0.18	5,988	0.18	8,345	0.22
Kazakhstan .....	0	0.00	77	0.00	120	0.00
Latvia .....	0	0.00	224	0.01	443	0.01
Lithuania .....	0	0.00	270	0.01	710	0.02
Moldova .....	0	0.00	105	0.00	141	0.00
Poland .....	8,671	0.32	10,692	0.32	14,909	0.39
Romania .....	571	0.02	1,109	0.03	1,751	0.05

Appendix table 5-48

(Page 2 of 2)

## Citation of S&amp;E articles, by region and country/economy: 1992, 1996, and 2001

Region and country/economy	1992		1996		2001	
	Number	Percent worldwide	Number	Percent worldwide	Number	Percent worldwide
Russia .....	0	0.00	19,047	0.57	31,602	0.82
Slovakia .....	0	0.00	777	0.02	2,411	0.06
USSR.....	31,036	1.16	9,852	0.30	0	0.00
Ukraine .....	0	0.00	2,078	0.06	3,606	0.09
Uzbekistan .....	0	0.00	173	0.01	219	0.01
All others.....	0	0.00	32	0.00	35	0.00
Near East/North Africa .....	25,502	0.95	31,975	0.96	43,463	1.13
Algeria.....	127	0.00	194	0.01	282	0.01
Egypt.....	1,455	0.05	1,643	0.05	2,391	0.06
Iran .....	143	0.01	347	0.01	1,756	0.05
Israel.....	21,192	0.79	27,261	0.82	34,625	0.90
Jordan.....	218	0.01	165	0.00	382	0.01
Kuwait.....	460	0.02	154	0.00	571	0.01
Lebanon.....	62	0.00	79	0.00	273	0.01
Morocco.....	180	0.01	295	0.01	740	0.02
Oman.....	48	0.00	52	0.00	121	0.00
Saudi Arabia.....	1,078	0.04	1,104	0.03	1,291	0.03
Tunisia .....	170	0.01	199	0.01	438	0.01
United Arab Emirates.....	33	0.00	141	0.00	261	0.01
All others.....	336	0.01	341	0.01	332	0.01
Pacific .....	58,661	2.18	70,735	2.13	92,447	2.40
Australia.....	49,989	1.86	60,266	1.81	78,789	2.05
New Zealand .....	8,498	0.32	10,326	0.31	13,507	0.35
All others.....	174	0.01	143	0.00	151	0.00
Central/South America.....	12,657	0.47	19,714	0.59	34,879	0.91
Argentina .....	3,386	0.13	4,856	0.15	8,631	0.22
Brazil.....	5,132	0.19	8,630	0.26	17,365	0.45
Chile.....	1,826	0.07	2,560	0.08	3,559	0.09
Colombia.....	256	0.01	335	0.01	654	0.02
Costa Rica.....	174	0.01	197	0.01	362	0.01
Cuba .....	136	0.01	262	0.01	665	0.02
Peru .....	223	0.01	218	0.01	278	0.01
Uruguay .....	104	0.00	464	0.01	685	0.02
Venezuela.....	789	0.03	1,296	0.04	1,491	0.04
All others.....	630	0.02	896	0.03	1,189	0.03
Sub-Saharan Africa .....	10,001	0.37	10,491	0.32	12,104	0.31
Cameroon .....	87	0.00	159	0.00	238	0.01
Ethiopia.....	117	0.00	173	0.01	226	0.01
Ghana .....	50	0.00	110	0.00	164	0.00
Kenya.....	791	0.03	822	0.02	983	0.03
Nigeria .....	744	0.03	651	0.02	519	0.01
Senegal.....	358	0.01	372	0.01	279	0.01
South Africa.....	6,348	0.24	6,397	0.19	7,056	0.18
Tanzania.....	123	0.00	231	0.01	324	0.01
Uganda.....	68	0.00	121	0.00	287	0.01
Zimbabwe .....	274	0.01	239	0.01	301	0.01
All others.....	1,042	0.04	1,216	0.04	1,727	0.04

NOTES: Citation counts are based on a 3-year window with a 2-year lag. For example, citations for 1999 are references made in articles published in 1999 to articles published in 1995–97. Country/economy is determined by the cited article's institutional address. Percents may not sum to 100 because of rounding. German data for 1992 includes former East Germany. China data includes Hong Kong. Czech Republic data for 1992 and 1996 includes the former Czechoslovakia.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Appendix table 5-49  
**Relative prominence of cited S&E literature, by country/region: 1992, 1996, and 2001**  
 (Relative Citation Index)

Year	United States	Western Europe	Asia	Eastern Europe	Near East and North Africa	Pacific	Central and South America	Sub-Saharan Africa
<b>Worldwide</b>								
1992 .....	1.00	0.65	0.43	0.11	0.45	0.63	0.30	0.29
1996 .....	1.01	0.68	0.42	0.16	0.48	0.60	0.34	0.30
2001 .....	1.01	0.72	0.41	0.23	0.53	0.73	0.37	0.36
<b>United States</b>								
1992 .....	1.85	0.61	0.39	0.08	0.43	0.57	0.25	0.23
1996 .....	1.87	0.63	0.37	0.11	0.46	0.54	0.30	0.24
2001 .....	1.95	0.67	0.38	0.16	0.49	0.59	0.30	0.28
<b>Western Europe</b>								
1992 .....	1.00	1.57	0.46	0.14	0.46	0.70	0.33	0.34
1996 .....	1.01	1.49	0.45	0.20	0.51	0.67	0.37	0.35
2001 .....	1.02	1.45	0.43	0.29	0.55	0.71	0.40	0.43
<b>Asia</b>								
1992 .....	0.96	0.66	3.24	0.13	0.42	0.52	0.30	0.24
1996 .....	0.98	0.68	2.76	0.18	0.45	0.51	0.31	0.26
2001 .....	0.98	0.71	2.31	0.27	0.52	0.55	0.37	0.25
<b>Eastern Europe</b>								
1992 .....	0.78	0.86	0.66	3.57	0.51	0.50	0.41	0.22
1996 .....	0.80	0.93	0.56	3.85	0.58	0.48	0.52	0.28
2001 .....	0.78	0.96	0.59	4.50	0.67	0.55	0.56	0.32
<b>Near East and North Africa</b>								
1992 .....	1.16	0.76	0.51	0.15	11.74	0.67	0.31	0.58
1996 .....	1.13	0.82	0.45	0.22	11.63	0.71	0.45	0.48
2001 .....	1.09	0.85	0.53	0.33	10.89	0.64	0.54	0.42
<b>Pacific</b>								
1992 .....	1.01	0.82	0.40	0.08	0.38	10.00	0.33	0.58
1996 .....	1.05	0.83	0.41	0.13	0.45	8.60	0.42	0.50
2001 .....	1.06	0.84	0.40	0.17	0.49	8.02	0.40	0.68
<b>Central and South America</b>								
1992 .....	1.01	0.86	0.55	0.17	0.61	0.71	18.12	0.69
1996 .....	1.02	0.88	0.48	0.25	0.57	0.72	15.65	0.77
2001 .....	0.93	0.90	0.51	0.39	0.67	0.76	12.13	0.73
<b>Sub-Saharan Africa</b>								
1992 .....	0.87	0.86	0.45	0.10	0.69	1.39	0.82	27.84
1996 .....	0.87	0.88	0.41	0.16	0.68	1.35	0.95	29.96
2001 .....	0.85	0.93	0.41	0.24	0.67	1.26	0.76	33.44

NOTES: Relative prominence of S&E literature is based on region's relative citation index. This index measures the frequency of citation of a country or region's S&E literature, adjusted for its world share of S&E articles. An index of 1.00 would indicate that the region's share of cited literature was equal to its world share of S&E literature. An index greater or less than 1.00 would indicate that the region was cited relatively more or less frequently than indicated by its share of world S&E literature. Country/region's citations of its own literature are not included in its relative citation index.

SOURCES: Institute for Scientific Information, Science and Social Citation Indexes; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.



Appendix table 5-50

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## Relative prominence of cited S&amp;E literature, by selected field and country/economy: 1994 and 2001

Field, rank, and country/economy	1994	2001	Field, rank, and country/economy	1994	2001
All fields .....			Clinical medicine		
1 Switzerland.....	1.19	1.19	1 United States.....	0.99	0.99
2 United States.....	1.01	1.01	2 Switzerland.....	0.98	0.96
3 Netherlands.....	0.88	0.95	3 Canada.....	0.83	0.92
4 Denmark.....	0.84	0.90	4 Netherlands.....	0.84	0.90
5 Sweden.....	0.87	0.86	5 Finland.....	0.69	0.87
6 United Kingdom.....	0.83	0.85	6 Ireland.....	0.77	0.82
7 Finland.....	0.71	0.83	7 United Kingdom.....	0.80	0.81
8 Canada.....	0.72	0.82	8 Belgium.....	0.81	0.81
9 Belgium.....	0.81	0.81	9 Sweden.....	0.78	0.81
10 Germany.....	0.74	0.80	10 Denmark.....	0.69	0.80
11 Austria.....	0.70	0.78	11 New Zealand.....	0.69	0.75
12 Ireland.....	0.68	0.77	12 Norway.....	0.59	0.75
13 France.....	0.73	0.76	13 Italy.....	0.62	0.74
14 Israel.....	0.67	0.74	14 France.....	0.67	0.73
15 Italy.....	0.62	0.71	15 Australia.....	0.67	0.73
16 Norway.....	0.61	0.68	16 Germany.....	0.57	0.69
17 Australia.....	0.61	0.67	17 Austria.....	0.61	0.65
18 New Zealand.....	0.56	0.60	18 Israel.....	0.52	0.62
19 Spain.....	0.45	0.57	19 Spain.....	0.50	0.57
20 Japan.....	0.55	0.57	20 Hong Kong.....	0.50	0.57
21 Hong Kong.....	0.43	0.53	21 Hungary.....	0.44	0.55
22 Hungary.....	0.40	0.49	22 Japan.....	0.53	0.54
23 Portugal.....	0.40	0.47	23 Thailand.....	na	0.53
24 Chile.....	0.33	0.43	24 Portugal.....	na	0.53
25 Singapore.....	0.39	0.43	25 South Korea.....	0.49	0.52
26 Greece.....	0.32	0.42	26 Czech Republic.....	na	0.45
27 Slovenia.....	na	0.41	27 Greece.....	0.34	0.44
28 Argentina.....	0.33	0.39	28 Singapore.....	0.40	0.42
29 Czech Republic.....	na	0.38	29 Poland.....	0.37	0.42
30 Mexico.....	0.36	0.37	30 Mexico.....	0.42	0.42
31 South Africa.....	0.34	0.37	31 Taiwan.....	0.46	0.39
32 South Korea.....	0.34	0.37	32 Argentina.....	0.33	0.39
33 Brazil.....	0.30	0.35	33 South Africa.....	0.34	0.39
34 Poland.....	0.28	0.34	34 Brazil.....	0.31	0.38
35 Taiwan.....	0.33	0.34	35 China.....	0.27	0.31
36 Bulgaria.....	0.19	0.29	36 Egypt.....	0.21	0.30
37 Slovakia.....	na	0.28	37 Chile.....	0.17	0.30
38 Croatia.....	na	0.27	38 Saudi Arabia.....	0.29	0.29
39 Iran.....	na	0.27	39 India.....	0.19	0.25
40 Saudi Arabia.....	0.25	0.26	40 Turkey.....	0.19	0.25

Appendix table 5-50

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## Relative prominence of cited S&amp;E literature, by selected field and country/economy: 1994 and 2001

Field, rank, and country/economy	1994	2001	Field, rank, and country/economy	1994	2001
Biomedical research .....			Biology		
1 Switzerland.....	1.17	1.24	1 Switzerland .....	1.06	1.18
2 United States.....	1.14	1.13	2 Netherlands.....	0.86	1.00
3 Israel.....	0.80	0.89	3 Sweden.....	0.93	1.00
4 United Kingdom.....	0.86	0.89	4 United Kingdom.....	0.81	0.98
5 Germany.....	0.83	0.81	5 Denmark.....	0.92	0.89
6 Netherlands.....	0.73	0.80	6 Hong Kong.....	na	0.88
7 Canada.....	0.68	0.78	7 Austria.....	0.57	0.87
8 Austria.....	0.78	0.77	8 Estonia.....	na	0.86
9 Singapore.....	0.53	0.74	9 France.....	0.65	0.85
10 Finland.....	0.60	0.74	10 Finland.....	0.68	0.84
11 Sweden.....	0.70	0.74	11 Germany.....	0.73	0.82
12 France.....	0.70	0.73	12 Norway.....	0.73	0.82
13 Denmark.....	0.69	0.70	13 Belgium.....	0.72	0.82
14 Belgium.....	0.69	0.67	14 United States.....	0.79	0.80
15 Australia.....	0.57	0.66	15 Ireland.....	0.81	0.77
16 Ireland.....	0.52	0.65	16 Israel.....	0.73	0.73
17 Japan.....	0.58	0.58	17 Canada.....	0.68	0.72
18 Norway.....	0.55	0.57	18 Indonesia.....	na	0.71
19 New Zealand.....	0.46	0.55	19 Philippines.....	0.39	0.66
20 Italy.....	0.46	0.54	20 Australia.....	0.61	0.63
21 Spain.....	0.32	0.46	21 Italy.....	0.56	0.63
22 Hong Kong.....	na	0.43	22 Hungary.....	0.54	0.60
23 Chile.....	0.27	0.40	23 South Korea.....	0.63	0.60
24 Portugal.....	0.28	0.40	24 New Zealand.....	0.54	0.57
25 Hungary.....	0.33	0.39	25 Portugal.....	0.58	0.57
26 Mexico.....	0.27	0.34	26 Kenya.....	0.37	0.56
27 Greece.....	0.28	0.34	27 Czech Republic.....	na	0.56
28 Taiwan.....	0.34	0.32	28 Colombia.....	0.52	0.55
29 South Korea.....	0.27	0.32	29 Spain.....	0.38	0.55
30 Czech Republic.....	na	0.29	30 South Africa.....	0.41	0.50
31 Poland.....	0.21	0.27	31 Thailand.....	0.47	0.50
32 South Africa.....	0.22	0.26	32 Venezuela.....	0.44	0.48
33 Argentina.....	0.23	0.25	33 Japan.....	0.46	0.47
34 Brazil.....	0.16	0.22	34 Argentina.....	0.45	0.47
35 Slovakia.....	na	0.21	35 Chile.....	0.49	0.44
36 Turkey.....	na	0.18	36 Poland.....	0.38	0.44
37 China.....	0.28	0.18	37 Singapore.....	0.44	0.43
38 Bulgaria.....	0.07	0.17	38 Mexico.....	0.46	0.42
39 India.....	0.11	0.14	39 Brazil.....	0.38	0.41
40 Russia.....	na	0.12	40 Greece.....	0.40	0.40

Appendix table 5-50

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## Relative prominence of cited S&amp;E literature, by selected field and country/economy: 1994 and 2001

Field, rank, and country/economy	1994	2001	Field, rank, and country/economy	1994	2001
Chemistry			Physics		
1 Netherlands	1.07	1.19	1 Switzerland	1.29	1.27
2 Switzerland	1.17	1.16	2 Denmark	1.19	1.26
3 Denmark	0.97	1.09	3 United States	1.15	1.13
4 United States	1.13	1.06	4 New Zealand	0.89	1.08
5 Israel	0.90	1.04	5 Netherlands	1.06	1.04
6 Sweden	1.15	1.01	6 Austria	0.79	1.00
7 Canada	0.97	1.00	7 Germany	0.98	0.96
8 Hong Kong	0.68	0.99	8 Israel	0.82	0.88
9 United Kingdom	0.85	0.94	9 United Kingdom	0.80	0.87
10 Ireland	0.77	0.89	10 Ireland	0.91	0.87
11 Belgium	0.71	0.89	11 Sweden	0.80	0.85
12 Australia	0.80	0.82	12 France	0.81	0.83
13 Germany	0.74	0.79	13 Belgium	0.72	0.80
14 Austria	0.69	0.78	14 Finland	0.84	0.80
15 Italy	0.70	0.77	15 Canada	0.76	0.79
16 France	0.68	0.74	16 Italy	0.65	0.75
17 New Zealand	0.74	0.71	17 Norway	0.62	0.74
18 Finland	0.63	0.70	18 Spain	0.52	0.74
19 Spain	0.50	0.70	19 Australia	0.61	0.68
20 Singapore	0.56	0.67	20 Hong Kong	na	0.68
21 Greece	0.46	0.64	21 Slovenia	na	0.66
22 Japan	0.58	0.63	22 Hungary	0.49	0.66
23 Norway	0.66	0.63	23 Portugal	0.57	0.60
24 Portugal	0.50	0.58	24 Greece	0.51	0.58
25 Slovenia	na	0.50	25 Japan	0.55	0.56
26 Venezuela	na	0.48	26 Slovakia	na	0.55
27 Brazil	0.41	0.48	27 Czech Republic	na	0.51
28 Argentina	0.35	0.47	28 Argentina	0.43	0.49
29 Taiwan	0.49	0.47	29 South Africa	0.40	0.48
30 South Korea	0.44	0.45	30 Poland	0.39	0.48
31 South Africa	0.53	0.44	31 Bulgaria	0.28	0.45
32 Hungary	0.39	0.43	32 Iran	na	0.43
33 Czech Republic	na	0.42	33 Brazil	0.41	0.43
34 Bulgaria	0.31	0.42	34 South Korea	0.44	0.40
35 Mexico	0.38	0.40	35 Taiwan	0.32	0.39
36 Chile	0.24	0.36	36 Singapore	na	0.37
37 India	0.25	0.34	37 Lithuania	na	0.36
38 Poland	0.32	0.32	38 Mexico	0.35	0.35
39 Iran	na	0.31	39 Romania	0.27	0.35
40 Croatia	na	0.30	40 India	0.28	0.35

Appendix table 5-50

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## Relative prominence of cited S&amp;E literature, by selected field and country/economy: 1994 and 2001

Field, rank, and country/economy	1994	2001	Field, rank, and country/economy	1994	2001
Earth and space sciences .....			Engineering and technology <sup>a</sup>		
1 Chile .....	1.06	1.11	1 Switzerland .....	1.04	1.14
2 Netherlands .....	0.82	1.00	2 Denmark .....	1.23	1.10
3 United States .....	0.97	0.96	3 Netherlands .....	0.88	0.94
4 Germany .....	0.79	0.92	4 Slovenia .....	na	0.88
5 Switzerland .....	1.05	0.89	5 Austria .....	0.56	0.87
6 Israel .....	0.65	0.87	6 Germany .....	0.60	0.86
7 United Kingdom .....	0.80	0.85	7 United States .....	0.86	0.85
8 Denmark .....	0.74	0.83	8 Ireland .....	0.82	0.82
9 Italy .....	0.70	0.77	9 Sweden .....	0.81	0.80
10 France .....	0.78	0.72	10 France .....	0.73	0.76
11 Sweden .....	0.75	0.69	11 Belgium .....	0.80	0.75
12 Australia .....	0.72	0.69	12 United Kingdom .....	0.70	0.72
13 Canada .....	0.69	0.66	13 Israel .....	0.64	0.71
14 Belgium .....	0.66	0.64	14 Australia .....	0.73	0.70
15 Austria .....	0.44	0.62	15 Hong Kong .....	0.50	0.70
16 Norway .....	0.61	0.60	16 Norway .....	0.63	0.70
17 Finland .....	0.49	0.60	17 Spain .....	0.73	0.67
18 Ireland .....	0.60	0.60	18 Italy .....	0.57	0.66
19 Hong Kong .....	na	0.58	19 Czech Republic .....	na	0.66
20 Mexico .....	0.51	0.58	20 Belarus .....	na	0.65
21 Japan .....	0.53	0.56	21 Portugal .....	0.38	0.65
22 Poland .....	0.39	0.55	22 New Zealand .....	0.63	0.65
23 Spain .....	0.49	0.55	23 Canada .....	0.58	0.62
24 Brazil .....	0.42	0.51	24 Finland .....	0.78	0.62
25 Hungary .....	0.34	0.51	25 Argentina .....	0.47	0.60
26 Argentina .....	0.37	0.49	26 Hungary .....	0.54	0.60
27 Portugal .....	0.28	0.47	27 Japan .....	0.52	0.54
28 South Africa .....	0.49	0.47	28 South Korea .....	0.53	0.53
29 Czech Republic .....	na	0.45	29 Kuwait .....	0.25	0.52
30 New Zealand .....	0.42	0.42	30 Brazil .....	0.53	0.52
31 Greece .....	0.23	0.40	31 Greece .....	0.47	0.51
32 Ukraine .....	na	0.40	32 Poland .....	0.30	0.48
33 South Korea .....	0.22	0.37	33 South Africa .....	0.43	0.48
34 Slovakia .....	na	0.35	34 Malaysia .....	na	0.47
35 Bulgaria .....	0.24	0.33	35 Slovakia .....	na	0.47
36 Singapore .....	na	0.30	36 Bulgaria .....	0.34	0.45
37 Taiwan .....	0.43	0.28	37 Singapore .....	0.33	0.45
38 Turkey .....	0.27	0.28	38 Mexico .....	0.58	0.44
39 Russia .....	na	0.27	39 Jordan .....	na	0.43
40 India .....	0.18	0.27	40 India .....	0.32	0.43

Appendix table 5-50

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## Relative prominence of cited S&amp;E literature, by selected field and country/economy: 1994 and 2001

Field, rank, and country/economy	1994	2001	Field, rank, and country/economy	1994	2001
<b>Mathematics</b>			<b>Social sciences</b>		
1 Denmark .....	1.58	1.19	1 United States .....	0.85	0.80
2 Switzerland .....	0.78	1.18	2 Singapore .....	0.36	0.80
3 Hong Kong .....	0.68	1.07	3 Sweden .....	0.63	0.77
4 Singapore .....	0.48	0.95	4 Belgium .....	0.49	0.77
5 Ireland .....	0.21	0.94	5 Denmark .....	1.35	0.74
6 United Kingdom .....	0.94	0.87	6 Hong Kong .....	0.33	0.72
7 United States .....	0.86	0.86	7 South Korea .....	0.37	0.70
8 Chile .....	0.47	0.84	8 Switzerland .....	0.42	0.67
9 Sweden .....	1.10	0.81	9 United Kingdom .....	0.55	0.66
10 Norway .....	0.88	0.80	10 New Zealand .....	0.47	0.66
11 Germany .....	0.59	0.79	11 Norway .....	0.67	0.65
12 Belgium .....	0.66	0.76	12 Netherlands .....	0.50	0.65
13 Netherlands .....	0.76	0.75	13 Canada .....	0.61	0.62
14 Austria .....	0.53	0.74	14 Spain .....	0.51	0.60
15 Canada .....	0.55	0.74	15 Italy .....	0.44	0.56
16 Israel .....	0.65	0.71	16 Israel .....	0.59	0.56
17 Czech Republic .....	na	0.65	17 Mexico .....	0.42	0.54
18 Finland .....	0.69	0.61	18 Austria .....	0.39	0.51
19 Australia .....	0.70	0.60	19 Ireland .....	0.32	0.51
20 Saudi Arabia .....	0.63	0.59	20 Portugal .....	na	0.48
21 Italy .....	0.51	0.59	21 France .....	0.33	0.47
22 Argentina .....	0.73	0.58	22 Australia .....	0.42	0.43
23 France .....	0.70	0.57	23 Finland .....	0.48	0.43
24 New Zealand .....	0.83	0.56	24 Brazil .....	0.37	0.43
25 Bulgaria .....	0.51	0.55	25 China .....	0.46	0.43
26 Greece .....	0.37	0.53	26 Hungary .....	0.46	0.40
27 Vietnam .....	0.53	0.52	27 Chile .....	na	0.39
28 Belarus .....	na	0.48	28 South Africa .....	0.27	0.39
29 Mexico .....	0.44	0.47	29 Germany .....	0.24	0.39
30 Spain .....	0.52	0.46	30 Greece .....	0.38	0.36
31 Portugal .....	0.47	0.45	31 Japan .....	0.34	0.34
32 Japan .....	0.46	0.45	32 Poland .....	0.39	0.31
33 South Africa .....	0.54	0.45	33 Nigera .....	0.28	0.30
34 Slovenia .....	na	0.43	34 Turkey .....	0.31	0.29
35 Poland .....	0.36	0.43	35 Taiwan .....	0.16	0.29
36 India .....	0.34	0.42	36 Argentina .....	0.31	0.27
37 Hungary .....	0.46	0.41	37 India .....	0.15	0.22
38 Brazil .....	0.68	0.40	38 Croatia .....	na	0.13
39 South Korea .....	0.36	0.40	39 Russia .....	na	0.11
40 Slovakia .....	na	0.39	40 Czech Republic .....	na	0.08

Appendix table 5-50 (Page 6 of 6)

**Relative prominence of cited S&E literature, by selected field and country/economy: 1994 and 2001**

Field, rank, and country/economy	1994	2001
Psychology		
1 Canada.....	0.76	0.83
2 Argentina.....	0.60	0.80
3 New Zealand.....	0.60	0.77
4 United Kingdom.....	0.73	0.77
5 United States.....	0.77	0.77
6 Netherlands.....	0.73	0.75
7 Sweden.....	0.81	0.68
8 Finland.....	0.71	0.68
9 Italy.....	0.62	0.67
10 Denmark.....	0.42	0.65
11 Belgium.....	0.63	0.65
12 Australia.....	0.56	0.63
13 Israel.....	0.47	0.61
14 Hong Kong.....	0.32	0.60
15 Switzerland.....	0.51	0.59
16 Norway.....	0.55	0.58
17 Brazil.....	0.40	0.55
18 France.....	0.49	0.55
19 Poland.....	0.40	0.51
20 Spain.....	0.43	0.49
21 China.....	0.22	0.48
22 Austria.....	0.44	0.48
23 Germany.....	0.33	0.47
24 Ireland.....	0.21	0.46
25 Mexico.....	0.18	0.34
26 South Korea.....	na	0.33
27 Taiwan.....	0.23	0.29
28 Japan.....	0.26	0.29
29 Greece.....	na	0.27
30 Turkey.....	na	0.26
31 India.....	0.14	0.25
32 Hungary.....	0.26	0.22
33 South Africa.....	0.30	0.20
34 Czech Republic.....	na	0.11
35 Russia.....	na	0.05
36 Slovakia.....	na	0.05

na not applicable

<sup>a</sup>Computer sciences are included in engineering and technology.

NOTES: Relative prominence of S&E literature is measured on the basis of the relative citation index of the country. This index is the country's share of cited literature adjusted for its share of published literature. A country's citation of its own literature is excluded. An index of 1.00 would indicate that the country's share of cited literature is equal to the country's world share of S&E literature. An index greater (less) than 1.00 would indicate that the country is cited relatively more (less) than is indicated by the country's share of S&E literature. Countries with less than a 0.10 percent share of world publications in the cited field or that did not cite S&E literature over the period are excluded or are marked na. Countries ranked by descending order of relative citation index in 2001.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Citation Index, CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Appendix table 5-51  
**Citations of foreign S&E literature, by country/region: 1992, 1996, and 2001**

Citing country/region	Total	Foreign	United States	Western Europe	Asia	Eastern Europe/ Central Asia	Near East/ North Africa	Pacific	Central/ South America	Sub-Saharan Africa
	Number of citations		Percent of foreign citations							
Worldwide										
1992 .....	2,684,777	1,473,021	na	na	na	na	na	na	na	na
1996 .....	3,325,455	1,944,734	na	na	na	na	na	na	na	na
2001 .....	3,846,519	2,393,242	na	na	na	na	na	na	na	na
United States										
1992 .....	1,173,270	355,366	na	63.2	14.7	2.3	4.8	2.4	0.9	0.7
1996 .....	1,337,438	438,673	na	63.9	14.6	2.4	4.3	2.2	1.1	0.6
2001 .....	1,403,472	523,280	na	64.1	15.6	2.3	4.5	2.2	1.4	0.5
Western Europe										
1992 .....	920,630	468,446	74.6	na	10.3	2.4	3.5	1.5	0.7	0.6
1996 .....	1,229,784	617,966	72.5	na	11.5	2.8	3.5	1.6	0.9	0.5
2001 .....	1,445,547	696,234	68.2	na	13.8	3.3	4.2	1.9	1.4	0.6
Asia										
1992 .....	244,033	154,015	57.6	32.6	na	1.7	2.1	1.1	0.5	0.3
1996 .....	340,525	220,167	54.6	35.0	na	1.9	2.1	1.1	0.6	0.3
2001 .....	497,305	319,094	49.0	39.4	na	2.4	2.4	1.4	1.0	0.3
Eastern Europe/Central Asia										
1992 .....	89,194	61,577	42.6	38.6	10.9	na	1.9	1.2	0.6	0.3
1996 .....	91,519	66,811	39.6	42.4	9.9	na	1.7	1.3	0.9	0.3
2001 .....	114,418	85,656	33.4	46.0	12.1	na	2.1	1.5	1.3	0.3
Pacific										
1992 .....	64,372	47,846	51.1	34.5	6.1	0.9	na	0.8	0.5	0.7
1996 .....	87,640	67,886	49.0	35.5	6.8	1.2	na	0.9	0.6	0.5
2001 .....	102,426	78,959	44.3	38.7	8.1	1.2	na	1.1	0.9	0.6
Near East/North Africa										
1992 .....	29,132	23,444	54.4	29.3	7.2	1.7	2.1	na	0.4	0.7
1996 .....	38,151	31,427	49.5	33.5	7.5	2.0	2.2	na	0.7	0.4
2001 .....	51,504	41,976	42.9	37.2	10.0	2.2	2.2	na	1.1	0.3
Central/South America										
1992 .....	20,857	16,741	47.7	33.3	7.7	1.9	2.3	1.3	na	0.8
1996 .....	32,015	25,979	45.3	35.9	7.6	2.1	2.3	1.1	na	0.7
2001 .....	56,068	44,637	37.8	40.1	10.0	2.8	2.7	1.4	na	0.6
Sub-Saharan Africa										
1992 .....	11,745	8,788	43.7	36.0	6.8	1.2	4.8	1.5	1.2	na
1996 .....	11,522	8,826	41.1	38.3	6.8	1.5	4.6	1.4	1.5	na
2001 .....	13,789	10,734	35.1	42.8	8.2	1.7	4.6	1.5	1.6	na

na Not applicable

NOTES: Citations are references to U.S. S&E articles in journals indexed and tracked by the Institute for Scientific Information's Science Citation Index and Social Sciences Citation Index. Citation counts are based on a 3-year window with a 2-year lag. For example, citations for 1999 are references made in articles published in 1999 to articles published in 1995–97. Country/region is determined by the cited article's institutional address. Share of foreign citations do not add up to 100 percent because Canada and Mexico are not included.

SOURCE: Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Appendix table 5-52

**U.S. patent citations to S&E articles, by field and country/region: 1995-2002**

Field and region/country	1995	1996	1997	1998	1999	2000	2001	2002
	Number							
All citations.....	28,068	39,380	54,156	73,621	71,745	67,429	74,013	71,807
	Percent distribution							
All fields .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Clinical medicine .....	27.0	28.8	31.4	32.4	31.4	29.9	30.6	30.0
Biomedical research .....	33.6	38.3	41.3	44.2	43.8	42.1	41.5	39.1
Biology .....	2.6	2.6	2.2	2.3	3.0	3.0	2.9	2.5
Chemistry.....	14.8	12.8	11.6	9.4	9.7	11.5	12.3	13.5
Physics.....	12.6	9.2	7.3	5.9	6.3	6.9	6.6	8.2
Earth/space sciences.....	0.4	0.3	0.2	0.3	0.3	0.4	0.3	0.3
Engineering/technology .....	8.9	7.8	5.7	5.3	5.3	5.9	5.6	6.2
Mathematics .....	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social & behavioral sciences .....	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2
Worldwide .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
North America .....	62.6	63.4	63.7	64.0	62.7	62.1	61.3	58.8
Canada.....	3.3	3.6	3.5	3.6	3.7	3.6	3.4	3.4
Mexico .....	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1
United States.....	59.2	59.7	60.1	60.4	59.0	58.4	57.8	55.3
Western Europe .....	22.8	22.8	23.3	23.8	24.4	25.0	25.6	26.2
France.....	3.2	3.2	3.2	3.5	3.6	3.6	3.4	3.5
Germany .....	4.4	4.0	4.5	4.3	4.3	4.8	5.1	5.5
Italy.....	1.4	1.2	1.4	1.5	1.6	1.8	1.7	2.1
The Netherlands .....	1.6	1.5	1.5	1.4	1.7	1.7	1.7	1.7
Switzerland .....	1.5	1.6	1.7	1.7	1.7	1.7	1.8	1.7
United Kingdom.....	6.3	6.7	6.5	6.7	6.7	6.5	6.6	6.4
Other.....	4.5	4.5	4.6	4.8	4.7	4.9	5.4	5.3
Asia.....	11.1	10.1	9.3	8.5	9.1	9.2	9.5	11.1
Emerging East Asia.....	0.9	0.9	0.8	0.8	1.2	1.4	1.6	2.2
Japan.....	9.5	8.8	8.0	7.3	7.5	7.4	7.5	8.4
Other.....	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.5
Other.....	3.5	3.7	3.7	3.8	3.8	3.7	3.6	3.8

NOTES: Citations are references to U.S. S&E articles in journals indexed and tracked by the Institute for Scientific Information's Science Citation Index and Social Sciences Citation Index. Citation counts are based on a 6-year window with a 2-year lag. For example, citations for 2002 are references made in U.S. patents issued in 2002 to articles published in 1995-2000. 2002 patent data are preliminary and subject to change. Country/region is determined by the cited article's institutional address. Emerging East Asia consists of China, Hong Kong, Singapore, South Korea, and the Taiwan economy. Computer sciences are included in engineering and technology. Social & behavioral sciences consist of psychology, social sciences, health sciences, and professional fields.

SOURCES: U.S. Patent and Trademark Office; Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.



Appendix table 5-53

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**U.S. patent citations to S&E articles, by field and sector: 1995–2002**

(Percent distribution)

Field and sector	1995	1996	1997	1998	1999	2000	2001	2002
All fields (number of articles).....	16,105	22,780	31,570	43,339	41,232	38,360	41,475	38,392
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	58.3	59.5	59.1	59.6	60.6	61.9	61.7	60.9
Industry.....	22.7	21.2	20.1	19.8	18.9	18.7	18.1	19.1
Federal Government .....	7.2	7.4	7.6	7.8	7.7	6.6	6.5	6.2
Nonprofit institutions .....	7.6	8.5	10.0	9.7	9.6	9.4	9.9	9.8
FFRDCs .....	2.7	2.1	1.9	1.9	2.0	1.9	2.4	2.6
State/local government.....	0.8	0.7	0.7	0.6	0.7	0.9	0.7	0.6
Unknown.....	0.6	0.5	0.5	0.6	0.5	0.5	0.6	0.8
Clinical medicine (number of articles) .....	4,461	6,679	10,063	14,133	13,240	11,805	12,961	11,776
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	59.6	58.6	57.8	58.8	58.6	58.9	59.7	58.0
Industry.....	17.4	17.9	18.9	18.8	18.4	18.4	17.4	18.1
Federal Government .....	8.7	9.0	8.6	8.5	9.1	8.3	8.2	8.3
Nonprofit institutions .....	11.7	12.0	12.3	11.6	11.6	12.4	12.7	13.5
FFRDCs .....	0.9	0.8	0.9	0.8	0.9	0.6	0.6	0.6
State/local government .....	0.9	1.1	0.8	0.7	0.8	0.7	0.6	0.6
Unknown.....	0.8	0.8	0.7	0.8	0.7	0.7	0.9	1.0
Biomedical research (number of articles) .....	5,944	9,619	14,383	20,993	19,771	17,717	19,335	17,251
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	59.6	59.9	59.0	60.2	61.6	62.9	61.7	61.3
Industry.....	19.1	18.6	18.1	17.9	17.1	17.0	17.1	18.0
Federal Government .....	8.4	8.1	8.1	8.1	7.3	6.2	6.1	5.5
Nonprofit institutions .....	10.9	11.2	12.6	11.8	11.9	11.9	12.5	12.3
FFRDCs .....	1.5	1.5	1.3	1.4	1.4	1.2	1.7	2.0
State/local government .....	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3
Unknown.....	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.7
Biology (number of articles) .....	399	585	705	940	1,185	1,041	1,079	873
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	62.0	69.9	66.5	64.0	69.1	66.8	64.8	62.3
Industry.....	17.3	10.7	14.3	15.2	12.6	14.3	14.7	16.1
Federal Government .....	14.9	13.0	12.3	13.7	11.9	12.3	14.5	15.7
Nonprofit institutions .....	4.0	4.1	5.2	5.7	5.4	6.0	5.2	5.0
FFRDCs .....	0.9	1.1	0.9	0.9	0.5	0.5	0.4	0.7
State/local government .....	0.4	0.2	0.4	0.2	0.2	0.1	0.2	0.0
Unknown.....	0.4	1.0	0.5	0.2	0.3	0.0	0.3	0.2
Chemistry (number of articles).....	2,098	2,631	3,254	3,567	3,469	3,943	4,666	4,725
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	65.4	63.8	61.3	59.4	57.3	63.6	58.8	60.7
Industry.....	23.8	27.0	29.2	29.4	29.4	26.1	27.0	26.6
Federal Government .....	2.6	3.1	2.7	3.7	4.7	2.9	2.2	1.6
Nonprofit institutions .....	3.6	3.2	3.3	3.9	3.5	2.7	5.6	5.1
FFRDCs .....	3.8	2.5	3.0	3.2	4.6	4.3	5.7	5.0
State/local government .....	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.2
Unknown.....	0.7	0.3	0.3	0.2	0.3	0.4	0.6	0.6
Physics (number of articles).....	2,153	2,172	2,236	2,468	2,438	2,513	2,534	2,686
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	39.7	42.9	43.9	42.5	47.0	48.4	52.9	50.5
Industry.....	45.5	44.8	40.2	41.5	38.4	39.2	32.8	35.2
Federal Government .....	5.2	3.8	6.4	5.6	4.6	4.0	4.6	4.8
Nonprofit institutions .....	1.5	1.1	2.3	1.6	1.7	0.6	0.8	0.7
FFRDCs .....	7.8	7.1	6.9	8.5	7.9	7.5	8.8	8.5
State/local government .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown.....	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.3
Engineering/technology (number of articles) .....	1,460	1,713	1,782	2,119	1,996	2,050	2,005	2,154
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	44.1	46.2	45.6	45.1	48.0	49.1	49.9	49.3
Industry.....	46.7	44.8	45.1	44.5	42.3	41.0	39.8	40.8
Federal Government .....	3.0	3.7	2.7	3.4	2.7	3.4	3.6	4.0
Nonprofit institutions .....	1.5	1.3	1.5	1.8	1.3	1.0	1.0	1.1
FFRDCs .....	3.3	3.0	3.7	3.4	3.9	4.1	4.5	4.3
State/local government .....	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Unknown.....	1.3	1.1	1.4	1.7	1.8	1.1	1.2	0.6

Appendix table 5-53

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**U.S. patent citations to S&E articles, by field and sector: 1995–2002**

(Percent distribution)

Field and sector	1995	1996	1997	1998	1999	2000	2001	2002
Other (number of articles) .....	112	128	155	241	229	326	221	244
All sectors .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic .....	66.1	60.9	62.5	62.5	66.5	68.3	65.5	57.7
Industry .....	14.4	19.8	14.6	13.4	17.0	14.5	16.6	17.1
Federal Government .....	9.2	7.5	8.4	11.9	8.7	6.8	7.1	9.6
Nonprofit institutions .....	0.3	5.7	7.0	4.3	2.1	3.7	5.2	4.8
FFRDCs .....	7.8	3.0	3.2	2.7	1.7	2.3	2.8	5.3
State/local government .....	1.0	1.5	2.3	1.2	0.9	1.0	1.1	2.3
Unknown .....	1.1	1.7	2.0	3.9	2.9	3.4	1.7	3.2

FFRDC federally funded research and development center

NOTES: Citations are references to U.S. S&E articles in journals covered by the Institute for Scientific Information's Science Citation Index and Social Sciences Citation Index. Citation counts are based on a 6-year window with a 2-year lag. For example, citations for 2002 are references made in U.S. patents issued in 2002 to articles published in 1995–2000. 2002 patent data are preliminary and subject to change. Sector is determined by the cited article's institutional address. S&E field is determined by CHI's classification of the journal. Computer sciences are included in engineering and technology. Other includes the fields of earth and space sciences, mathematics, social sciences, psychology, health sciences, and professional field. Percents may not sum to 100 because of rounding.

SOURCES: U.S. Patent and Trademark Office; Institute for Scientific Information, Science Citation Index and Social Sciences Citation Index; CHI Research, Inc.; and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Appendix table 5-54

**U.S. patenting activity of U.S. universities and colleges: 1981–2001**

Institution and type	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Number of institutions awarded patents.....	84	78	86	105	118	125	128	128	153	151
Public.....	48	45	53	57	66	74	70	68	86	87
Private.....	33	29	29	45	46	47	51	52	58	57
Other.....	3	4	4	3	6	4	7	8	9	7
Number of patents awarded to all institutions.....	436	458	434	551	589	670	820	814	1,225	1,182
Public.....	222	244	226	259	307	356	397	408	653	672
Private.....	167	164	155	235	234	263	363	365	528	480
Other.....	47	50	53	57	48	51	60	41	44	30
Largest recipients, 1991–2001										
Top 25.....	238	238	229	281	299	340	439	459	673	657
Percent.....	54.6	52.0	52.8	51.0	50.8	50.7	53.5	56.4	54.9	55.6
Top 100.....	359	386	357	440	481	546	697	709	1,086	1,065
Percent.....	82.3	84.3	82.3	79.9	81.7	81.5	85.0	87.1	88.7	90.1
Top 100 patenting institutions, 1991–2001										
Public universities										
University of California.....	38	42	48	46	42	54	67	60	81	65
University of Texas.....	6	7	5	8	20	25	21	21	51	56
University of Wisconsin.....	26	17	13	16	17	17	12	24	29	16
University of Florida.....	4	0	6	10	7	10	13	21	33	33
State University of New York.....	2	8	2	11	5	11	18	10	25	20
University of Michigan.....	1	2	2	1	1	10	6	14	23	27
Iowa State University.....	12	15	10	14	21	9	15	15	28	30
University of Minnesota.....	12	10	5	6	11	16	28	26	40	38
Michigan State University.....	1	1	3	3	3	10	6	8	2	7
University of Washington.....	0	7	2	3	1	2	1	5	3	7
North Carolina State University.....	4	1	0	2	3	4	6	5	10	14
University of Utah.....	7	14	15	9	11	7	12	9	13	14
University of North Carolina.....	0	0	1	0	0	3	2	2	6	8
Georgia Institute of Technology.....	7	8	3	6	11	9	9	7	8	18
University of Pittsburgh.....	3	2	5	8	3	8	10	6	11	11
University of Maryland.....	0	0	1	0	0	3	2	2	1	4
Pennsylvania State University.....	0	0	0	0	0	0	0	0	1	1
Rutgers University.....	0	0	0	1	1	0	2	2	7	2
Louisiana State University.....	2	0	1	1	1	1	3	4	9	4
Ohio State University.....	4	5	8	3	10	5	12	14	13	10
Texas A&M University.....	3	3	2	3	8	3	6	9	8	9
University of Nebraska.....	5	4	0	5	1	1	1	4	0	3
University of Illinois.....	8	7	8	8	10	12	4	9	15	7
University of Alabama.....	2	3	1	1	5	3	5	3	3	6
University of Iowa.....	4	5	3	4	1	8	8	6	8	12
University of Massachusetts.....	0	0	0	1	1	0	2	1	3	3
University of Kentucky.....	4	6	6	7	5	7	4	7	6	4
Virginia Polytechnic Institute.....	0	0	0	0	0	0	0	2	7	4
University of Arkansas.....	0	0	0	0	0	1	1	1	2	3
Purdue University.....	15	11	11	14	18	9	4	2	11	15
University of Georgia.....	0	0	7	7	5	6	4	0	3	5
University of Virginia.....	3	8	4	2	1	4	3	4	8	12
University of Colorado.....	0	0	0	0	0	0	1	0	3	9
University of New Mexico.....	0	0	0	0	2	3	1	3	9	9
University of Oklahoma.....	1	0	1	1	3	2	2	6	2	4
University of South Florida.....	0	0	0	0	0	1	0	0	2	2
University of Tennessee.....	1	1	0	1	5	8	8	8	12	14
University of Akron.....	1	4	1	3	3	2	0	6	6	9
Oregon Health Sciences University.....	0	0	0	0	0	0	3	0	3	4
Wayne State University.....	0	2	1	0	1	5	6	7	16	9
University of Missouri.....	2	9	5	4	0	3	8	9	5	6
Arizona State University.....	0	0	0	1	1	1	2	0	9	9
Kansas State University.....	2	2	4	3	2	4	4	3	4	1
University of Connecticut.....	1	0	0	0	1	1	2	1	2	8
University of Cincinnati.....	0	0	0	2	2	1	8	3	8	9
City University of New York, Mt. Sinai.....	5	4	3	2	1	2	1	3	2	2
University of Central Florida.....	0	0	0	0	0	0	0	0	1	0
Florida State University.....	0	0	0	1	0	2	2	1	1	1
Temple University.....	1	2	0	2	0	1	5	7	10	9

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**U.S. patenting activity of U.S. universities and colleges: 1981–2001**

Institution and type	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Virginia Commonwealth University .....	0	0	0	0	0	0	0	0	0	1
University of Medicine and Dentistry of New Jersey .....	0	1	1	0	1	4	7	2	4	7
Oregon State University .....	1	0	1	0	2	3	0	2	1	1
Clemson University .....	0	0	0	2	2	1	3	3	6	6
University of Toledo .....	0	2	1	2	0	1	0	0	3	0
University of Hawaii .....	0	1	1	0	2	0	1	3	2	6
Indiana University .....	1	0	3	2	4	0	3	1	6	1
Washington State University .....	1	3	2	0	2	2	2	1	5	3
University of Delaware .....	12	12	6	5	9	7	5	8	8	11
University of Kansas .....	1	0	2	2	1	0	2	0	1	3
University of Houston .....	2	0	0	0	0	1	0	0	3	3
University of Arizona .....	1	1	2	1	2	2	0	0	1	2
<b>Private universities</b>										
Massachusetts Institute of Technology .....	66	51	47	47	35	45	63	64	101	109
Stanford University .....	10	4	16	36	38	33	48	54	43	36
California Institute of Technology .....	16	19	16	15	16	23	27	18	56	30
Cornell University .....	8	6	10	14	20	13	30	16	22	34
Johns Hopkins University .....	9	8	6	10	15	18	18	21	27	15
University of Pennsylvania .....	1	1	2	4	5	1	2	1	9	19
Columbia University .....	0	0	2	3	4	7	6	15	19	16
Washington University .....	1	0	1	1	3	1	7	6	12	7
Duke University .....	1	3	3	6	4	6	4	9	11	7
Harvard University .....	3	11	10	7	1	2	9	17	15	23
Rockefeller University .....	3	3	1	3	5	4	9	11	6	8
New York University .....	1	7	3	4	5	3	5	4	10	14
Thomas Jefferson University .....	2	2	4	10	5	3	3	2	7	5
Yale University .....	0	0	2	2	5	3	12	6	11	10
Princeton University .....	1	0	0	0	0	0	2	1	12	4
Northwestern University .....	1	7	3	2	2	8	10	10	7	5
Boston University .....	2	1	2	2	3	6	9	9	9	11
Baylor University .....	3	3	2	2	3	2	7	3	8	8
Emory University .....	0	0	0	0	1	1	0	0	7	3
University of Chicago .....	0	2	0	2	0	0	1	6	7	2
Carnegie-Mellon University .....	0	0	0	3	3	3	1	2	5	3
University of Southern California .....	2	5	1	7	5	5	4	7	8	6
Case Western Reserve University .....	1	0	0	1	1	6	3	1	1	2
Northeastern University .....	0	1	0	0	3	2	2	1	3	4
Vanderbilt University .....	1	2	1	0	0	5	4	4	4	5
University of Rochester .....	7	8	9	6	2	8	9	11	11	13
Brown University .....	0	0	0	1	2	2	1	3	3	3
Yeshiva University .....	0	3	0	1	4	1	6	1	5	1
Georgetown University .....	2	1	4	5	1	0	4	3	1	5
Tufts University .....	0	0	0	0	0	0	1	2	7	1
Rensselaer Polytechnic Institute .....	6	4	0	4	5	6	2	2	5	4
Tulane University .....	0	0	0	1	2	1	1	3	4	4
Wake Forest University .....	0	0	0	0	0	0	2	3	3	0
Dartmouth College .....	3	0	2	0	2	1	0	3	2	4
University of Miami .....	2	2	0	4	4	3	15	6	5	1
Brigham Young University .....	0	0	1	3	3	6	2	1	8	9
<b>Affiliated organizations</b>										
Mayo Foundation .....	0	0	0	0	3	1	1	0	3	4
Associated Universities, Inc. ....	0	0	0	0	0	0	0	1	3	7
Research Triangle Institute .....	1	2	3	0	2	2	4	2	3	6

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**U.S. patenting activity of U.S. universities and colleges: 1981–2001**

Institution and type	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of institutions awarded patents.....	162	157	163	171	166	180	181	177	186	188	190
Public.....	94	91	98	101	99	103	109	100	111	113	112
Private.....	57	55	58	60	59	69	65	69	68	69	72
Other.....	11	11	7	10	8	8	7	8	7	6	6
Number of patents awarded to all institutions.....	1,342	1,541	1,620	1,779	1,878	2,154	2,436	3,151	3,340	3,087	3,203
Public.....	792	901	936	1,069	1,197	1,344	1,517	1,842	2,038	1,893	1,907
Private.....	508	598	645	668	645	768	872	1,262	1,248	1,159	1,252
Other.....	41	42	39	42	36	41	46	47	53	35	43
Largest recipients, 1991–2001											
Top 25.....	755	811	880	990	998	1,195	1,310	1,774	1,861	1,727	1,733
Percent.....	56.3	52.6	54.3	55.6	53.1	55.5	53.8	56.3	55.7	55.9	54.1
Top 100.....	1,201	1,407	1,482	1,641	1,729	1,976	2,253	2,941	3,081	2,871	2,972
Percent.....	89.5	91.3	91.5	92.2	92.1	91.7	92.5	93.3	92.2	93.0	92.8
Top 100 patenting institutions, 1991–2001											
Public universities											
University of California.....	84	81	115	163	213	266	277	395	437	435	402
University of Texas.....	84	73	86	98	90	88	81	97	93	90	89
University of Wisconsin.....	45	43	57	50	52	65	64	85	87	66	73
University of Florida.....	38	42	34	26	31	36	43	52	50	64	51
State University of New York.....	27	34	31	38	31	37	45	51	54	54	41
University of Michigan.....	21	21	19	28	30	25	53	50	51	69	51
Iowa State University.....	39	23	29	37	37	38	36	53	45	34	29
University of Minnesota.....	32	31	28	28	25	31	32	43	49	46	38
Michigan State University.....	11	19	13	21	15	32	41	59	53	42	39
University of Washington.....	8	11	11	13	17	25	37	47	47	59	43
North Carolina State University.....	11	24	27	32	31	26	24	26	23	24	31
University of Utah.....	5	13	20	22	17	32	31	37	35	20	43
University of North Carolina.....	3	11	14	13	21	22	39	29	43	27	36
Georgia Institute of Technology.....	11	16	16	20	21	22	16	17	34	38	32
University of Pittsburgh.....	16	10	10	10	13	12	17	32	39	38	38
University of Maryland.....	4	14	21	15	21	20	18	24	37	25	33
Pennsylvania State University.....	1	0	4	11	16	20	19	26	36	37	52
Rutgers University.....	15	12	15	18	20	18	21	26	31	25	21
Louisiana State University.....	5	20	16	12	14	16	22	38	15	21	35
Ohio State University.....	15	21	10	10	17	22	27	24	22	26	20
Texas A&M University.....	12	14	22	20	16	15	14	21	23	19	25
University of Nebraska.....	4	4	10	16	21	29	24	25	23	27	18
University of Illinois.....	8	10	13	14	12	16	17	21	29	26	34
University of Alabama.....	3	7	6	7	9	13	19	27	37	26	32
University of Iowa.....	6	7	11	9	17	11	14	25	30	17	38
University of Massachusetts.....	6	5	4	5	12	14	15	24	52	21	18
University of Kentucky.....	7	7	4	3	11	14	14	21	29	25	20
Virginia Polytechnic Institute.....	11	18	12	16	6	14	17	16	21	14	9
University of Arkansas.....	10	16	8	10	5	6	8	9	30	18	28
Purdue University.....	11	5	6	11	10	12	24	22	19	11	13
University of Georgia.....	8	10	18	7	10	12	11	18	10	19	18
University of Virginia.....	11	9	7	5	10	13	13	20	15	14	18
University of Colorado.....	6	19	7	14	18	16	21	19	8	3	3
University of New Mexico.....	10	11	5	9	15	8	13	12	15	23	13
University of Oklahoma.....	3	7	13	7	11	9	16	9	15	17	20
University of South Florida.....	7	5	7	4	6	13	14	18	18	20	15
University of Tennessee.....	10	12	4	5	14	8	13	9	12	16	22
University of Akron.....	14	11	9	17	11	12	5	9	12	11	13
Oregon Health Sciences University.....	6	5	5	6	10	12	16	13	13	21	13
Wayne State University.....	8	16	12	14	9	8	8	10	10	8	12
University of Missouri.....	7	9	8	7	10	8	16	13	16	6	12
Arizona State University.....	12	6	3	6	12	19	12	6	11	7	14
Kansas State University.....	7	7	9	20	11	9	4	7	12	8	9
University of Connecticut.....	3	9	9	2	8	9	13	11	17	13	7
University of Cincinnati.....	9	7	8	7	8	7	10	5	5	16	16
City University of New York, Mt. Sinai.....	5	3	3	4	5	9	13	16	15	9	12
University of Central Florida.....	0	0	4	4	6	9	14	12	14	11	19
Florida State University.....	1	2	9	5	10	8	6	13	9	14	7
Temple University.....	3	14	9	9	11	7	9	6	5	4	6

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**U.S. patenting activity of U.S. universities and colleges: 1981–2001**

Institution and type	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Virginia Commonwealth University .....	1	3	6	4	2	4	7	6	18	18	9
University of Medicine and Dentistry of New Jersey .....	2	6	1	4	5	3	7	15	9	5	14
Oregon State University .....	6	9	5	13	6	4	7	8	3	2	8
Clemson University .....	2	10	4	10	8	7	9	8	2	4	7
University of Toledo .....	2	4	7	6	14	7	9	6	5	4	5
University of Hawaii .....	2	5	8	6	7	6	6	6	8	10	4
Indiana University .....	3	6	1	7	6	8	11	12	5	6	2
Washington State University .....	3	3	2	4	4	2	5	5	10	12	13
University of Delaware .....	10	10	5	4	5	5	4	6	2	3	5
University of Kansas .....	4	7	3	2	2	6	3	6	11	5	9
University of Houston .....	4	1	3	5	8	6	4	5	4	10	8
University of Arizona .....	1	1	3	6	4	4	9	8	7	5	3
<b>Private universities</b>											
Massachusetts Institute of Technology .....	101	125	112	99	104	119	102	138	142	113	125
Stanford University .....	57	42	50	62	54	55	64	79	83	103	84
California Institute of Technology .....	36	32	29	46	38	24	46	93	99	103	124
Cornell University .....	40	41	35	39	36	52	50	65	64	49	61
Johns Hopkins University .....	25	20	33	23	28	27	48	79	97	72	80
University of Pennsylvania .....	18	26	34	37	25	45	55	69	59	31	52
Columbia University .....	8	17	17	18	18	33	35	55	55	51	58
Washington University .....	22	18	18	19	21	18	22	41	50	36	37
Duke University .....	6	9	12	29	20	37	21	30	36	33	57
Harvard University .....	9	16	17	16	14	32	28	49	41	26	32
Rockefeller University .....	14	23	23	13	9	8	20	35	34	42	25
New York University .....	8	11	19	16	15	19	23	23	27	26	33
Thomas Jefferson University .....	7	8	9	13	14	15	25	29	26	26	36
Yale University .....	4	12	14	13	16	7	20	34	28	29	29
Princeton University .....	13	4	11	7	12	13	16	24	30	28	39
Northwestern University .....	4	8	8	12	18	10	27	35	24	17	33
Boston University .....	6	22	15	14	14	16	20	19	15	16	18
Baylor University .....	6	9	11	11	7	18	18	27	22	29	15
Emory University .....	10	6	14	5	11	12	12	35	26	20	18
University of Chicago .....	0	0	6	14	16	13	22	22	25	16	27
Carnegie-Mellon University .....	5	10	4	8	10	13	9	26	27	33	12
University of Southern California .....	5	18	13	15	6	15	18	16	13	15	20
Case Western Reserve University .....	1	9	6	8	8	6	9	15	28	18	18
Northeastern University .....	6	11	10	15	16	11	12	11	9	15	6
Vanderbilt University .....	7	4	7	6	9	6	11	16	14	21	20
University of Rochester .....	12	10	11	10	6	3	5	15	7	12	16
Brown University .....	4	5	1	4	6	6	9	18	19	12	19
Yeshiva University .....	0	1	4	3	3	11	6	14	10	17	17
Georgetown University .....	3	5	5	7	6	7	8	11	8	13	8
Tufts University .....	5	7	9	6	3	8	4	11	6	9	12
Rensselaer Polytechnic Institute .....	2	2	7	7	7	12	6	4	5	9	8
Tulane University .....	7	5	6	6	5	7	4	9	2	6	6
Wake Forest University .....	1	0	3	4	1	6	6	6	9	11	12
Dartmouth College .....	1	1	4	4	3	4	2	9	8	11	7
University of Miami .....	1	5	2	5	5	5	14	3	2	3	3
Brigham Young University .....	5	9	13	3	3	2	5	2	2	4	2
<b>Affiliated organizations</b>											
Mayo Foundation .....	4	8	9	4	6	12	17	20	28	18	27
Associated Universities, Inc. .....	7	5	5	14	12	12	13	9	1	0	0
Research Triangle Institute .....	8	4	7	7	7	2	4	6	10	10	8

NOTES: Data include institutions affiliated with academic institutions, such as university and alumni organizations, federally funded research and development centers, foundations, and university associations. Top 100 patenting institutions are determined by the sum of their patents from 1991 through 2001. Institutions are listed in declining order. Data for certain institutions are for the systemwide university and incorporate data from various campuses.

SOURCES: U.S. Patent and Trademark Office, *Technology Assessment and Forecast Report: U.S. Colleges and Universities, 1969–2001* (Washington, DC, 2001); and National Science Foundation, Division of Science Resources Statistics, special tabulations.

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of 1997 U.S. dollars														
<b>All manufacturing industries</b>															
Production all countries.....	10,340,093.0	11,910,450.8	13,593,815.1	13,839,588.6	13,759,141.4	13,849,811.4	13,919,366.0	14,502,877.3	15,549,747.5	15,847,361.3	16,815,659.7	16,914,800.0	17,586,645.5	19,015,698.6	18,783,194.6
United States .....	2,541,902.4	2,772,025.4	3,055,002.7	3,027,154.4	2,876,551.1	2,948,253.2	3,042,884.5	3,237,141.0	3,516,077.3	3,640,925.0	3,879,828.0	3,956,764.0	4,155,285.5	4,422,553.5	4,103,088.0
Canada .....	228,952.0	253,842.1	272,820.5	263,006.0	242,097.1	249,836.9	265,691.7	284,242.2	299,752.9	308,508.5	332,626.4	343,113.5	362,274.5	378,936.9	361,018.9
Mexico .....	112,319.4	155,129.8	162,137.1	173,058.5	175,444.7	179,604.3	180,595.2	185,441.7	198,592.9	220,431.2	240,660.1	259,953.5	267,710.6	289,571.2	278,230.4
European Union .....	3,207,112.8	3,584,366.6	3,959,657.0	4,030,275.4	3,995,565.9	3,971,797.8	3,928,932.5	4,177,967.4	4,517,843.2	4,414,928.0	4,608,681.5	4,744,905.2	4,869,966.3	5,303,144.3	5,318,007.0
Germany .....	1,026,689.3	1,072,366.0	1,152,376.3	1,208,230.6	1,234,325.7	1,201,259.9	1,106,964.0	1,145,450.5	1,195,691.1	1,159,679.1	1,221,532.1	1,251,707.5	1,258,260.1	1,381,034.7	1,388,816.6
France .....	511,140.1	597,047.1	673,209.0	682,637.4	687,946.5	687,706.3	643,363.9	667,269.6	711,795.4	704,253.6	740,425.5	783,289.8	821,240.1	898,115.6	932,657.2
United Kingdom .....	545,604.2	556,157.5	621,426.2	621,172.8	595,553.8	599,000.5	619,199.7	650,445.2	668,775.5	671,408.3	669,328.6	665,237.9	671,074.3	701,470.4	681,847.7
Italy .....	388,990.0	463,800.6	541,633.5	535,040.8	512,823.0	530,166.7	592,664.5	656,554.2	806,131.6	715,257.1	733,197.6	740,556.9	739,983.3	806,715.2	792,712.5
Other European Union .....	734,689.2	894,995.4	971,012.2	983,193.8	964,916.9	953,664.5	966,740.4	1,058,247.9	1,135,449.7	1,164,330.0	1,244,197.7	1,304,113.1	1,379,408.4	1,515,808.4	1,521,972.9
Brazil .....	279,120.4	342,188.7	374,954.7	289,898.8	279,343.6	441,500.4	481,313.9	490,183.7	456,655.7	447,739.8	466,813.7	459,506.1	479,430.7	509,446.6	516,358.6
Argentina .....	149,004.8	126,731.5	116,414.4	113,789.2	125,005.9	135,091.2	109,906.8	120,876.7	114,484.6	120,574.9	143,669.3	145,548.0	140,586.8	137,718.7	125,886.0
Chile .....	27,985.4	23,751.1	27,810.1	27,154.5	27,435.5	29,971.0	30,961.8	31,291.9	32,000.5	33,256.7	33,976.3	32,931.9	31,360.6	32,794.4	33,075.6
Peru .....	44,489.8	36,624.0	28,759.4	26,883.2	25,079.9	23,410.9	24,512.3	27,818.2	29,274.3	29,972.0	31,761.9	32,145.8	32,261.2	36,188.5	35,767.8
Costa Rica.....	2,877.4	4,076.7	4,395.6	4,334.7	5,585.8	6,109.3	6,584.9	6,804.2	6,999.2	6,836.0	7,577.2	8,748.3	12,501.5	12,400.1	11,948.2
Japan .....	1,916,814.6	2,142,347.5	2,344,368.0	2,501,909.3	2,609,610.7	2,505,898.7	2,386,681.4	2,369,328.7	2,504,289.1	2,634,186.0	2,808,738.4	2,608,059.4	2,509,750.7	2,598,486.7	2,466,116.4
China .....	165,183.4	279,316.0	460,603.6	469,027.4	495,688.6	606,320.6	756,889.2	890,747.3	1,013,591.2	1,081,894.4	1,251,596.1	1,379,844.8	1,545,939.8	1,777,266.9	1,982,773.4
South Korea .....	123,174.0	185,722.9	283,303.5	309,445.6	327,363.7	341,804.1	351,211.6	383,218.4	428,245.7	458,684.4	485,141.7	457,492.1	552,362.3	658,960.9	673,706.6
Australia .....	121,221.9	115,046.1	148,766.1	148,348.4	144,436.0	145,194.5	149,503.7	149,040.7	148,865.7	152,602.9	158,066.0	162,303.2	167,700.5	172,394.4	171,714.1
Taiwan .....	110,973.6	146,772.8	194,775.9	186,083.7	194,237.5	196,226.2	198,971.9	222,300.3	258,133.2	256,566.4	272,722.1	274,303.6	298,871.7	339,799.8	304,444.7
Singapore .....	21,089.0	22,785.1	37,484.4	41,041.6	43,309.0	41,093.7	45,024.6	50,798.0	55,888.4	57,535.0	60,112.4	59,772.9	70,812.7	77,057.2	70,275.1
Hong Kong .....	38,580.5	47,267.2	61,608.7	57,212.9	53,464.4	49,941.3	45,149.4	41,424.2	39,707.0	36,792.9	34,133.6	31,516.2	31,222.4	34,468.8	33,049.9
India .....	79,521.6	111,397.8	155,358.1	164,829.9	158,719.9	165,351.6	179,184.4	199,203.2	227,915.9	234,348.0	249,749.0	264,036.2	289,096.5	293,643.2	298,792.1
Malaysia .....	13,083.5	18,614.7	29,883.8	33,657.8	39,118.6	43,794.4	47,810.3	53,696.4	59,929.1	71,378.9	78,462.0	71,025.8	84,973.1	103,933.1	104,863.3
Thailand.....	25,510.6	32,413.4	56,574.5	65,399.2	73,015.0	81,356.1	90,422.5	98,884.5	110,126.9	117,739.3	118,709.2	106,017.2	117,529.4	132,591.5	135,708.2
Philippines .....	38,072.4	32,543.2	40,529.3	41,609.0	41,424.9	40,709.1	41,012.7	43,068.0	45,985.7	48,551.5	50,600.9	50,030.6	50,826.0	58,547.6	62,446.0
Indonesia .....	22,174.4	46,965.0	72,544.7	81,210.9	89,794.7	98,934.4	110,190.7	123,812.5	137,277.5	153,189.3	159,543.4	137,733.4	155,316.2	173,527.8	185,711.2
South Africa .....	80,174.5	76,027.8	84,393.3	82,496.9	78,728.4	76,146.3	76,007.8	78,087.3	85,297.9	87,641.5	90,415.9	87,941.3	88,181.7	91,160.1	93,984.1
Value added all countries .....	3,375,933.8	4,059,503.5	4,769,068.4	4,837,468.9	4,863,362.6	4,932,186.5	4,891,042.1	5,054,342.1	5,303,879.0	5,428,171.9	5,688,486.0	5,732,863.0	5,902,638.4	6,241,059.4	6,148,522.2
United States .....	818,002.1	970,871.9	1,105,433.5	1,096,199.2	1,060,444.4	1,079,052.2	1,116,729.2	1,199,307.8	1,277,659.5	1,308,798.2	1,379,609.0	1,436,382.8	1,505,534.9	1,576,692.8	1,477,584.1
Canada .....	71,000.8	80,663.3	92,284.7	88,880.7	82,436.9	83,402.2	87,659.5	94,078.9	98,707.1	99,754.9	108,352.5	114,054.1	122,699.4	127,182.5	122,093.7
Mexico .....	37,482.3	53,474.2	55,654.4	59,419.2	61,458.0	64,017.0	63,585.0	64,218.0	64,282.4	70,590.0	77,604.1	83,321.4	86,830.0	92,763.2	89,656.5
European Union .....	1,080,084.2	1,201,049.9	1,379,274.9	1,408,355.1	1,405,558.5	1,404,896.6	1,390,342.7	1,458,649.6	1,528,728.7	1,497,535.9	1,549,288.5	1,596,817.7	1,611,740.1	1,684,961.6	1,691,943.7
Germany .....	372,118.1	401,361.1	438,382.3	457,736.2	470,529.4	460,585.6	427,499.8	440,848.1	440,377.1	427,762.5	442,395.0	451,714.6	442,436.8	461,564.9	464,214.0
France .....	166,922.1	190,058.5	219,304.8	223,113.5	224,924.6	227,020.2	213,268.2	219,359.1	231,054.9	227,411.2	237,140.2	248,482.7	254,790.9	264,158.5	277,617.3
United Kingdom .....	197,751.5	201,907.3	239,305.7	239,062.0	226,839.4	226,839.7	230,018.0	240,772.2	244,440.7	246,152.0	249,328.8	251,284.1	252,016.5	257,149.8	247,555.5
Italy .....	128,056.5	147,949.5	178,542.6	177,967.7	175,213.1	180,715.7	200,052.8	214,057.7	248,945.6	227,105.6	228,773.9	233,072.8	230,730.4	241,858.1	238,912.0
Other European Union .....	215,236.0	259,773.6	303,739.4	310,475.7	308,052.0	309,735.5	319,503.9	343,612.5	363,910.3	369,104.7	391,650.6	412,263.5	431,765.4	460,230.3	463,644.9
Brazil .....	137,329.5	168,359.7	184,480.8	142,632.6	137,439.4	127,221.9	173,901.5	170,169.0	157,809.1	147,505.8	156,647.2	156,713.4	154,074.2	163,720.4	164,397.1
Argentina .....	55,601.6	47,290.3	43,440.4	42,460.8	46,646.3	50,409.7	41,012.1	44,600.3	41,405.6	44,076.9	47,589.7	48,370.7	46,721.9	45,768.7	40,539.6
Chile .....	10,224.3	6,729.1	9,204.2	9,295.1	9,791.2	10,908.7	11,700.2	12,177.8	13,095.2	13,516.1	14,267.4	14,050.7	13,380.3	13,992.1	13,974.4
Peru .....	12,891.6	12,703.3	12,831.1	12,073.4	11,263.5	10,514.0	11,008.6	12,493.3	13,147.2	13,460.6	14,264.4	14,436.8	14,488.7	16,252.4	15,997.4
Costa Rica.....	1,002.5	1,420.3	1,531.4	1,510.2	1,946.1	2,128.4	2,231.8	2,338.1	2,393.1	2,368.5	2,608.8	2,995.8	4,281.1	4,246.3	4,090.2
Japan .....	555,152.0	704,706.2	835,543.4	892,441.5	939,413.4	926,332.7	889,660.6	883,367.0	931,721.6	988,748.8	1,028,951.6	957,454.4	924,228.1	954,967.1	909,558.4
China .....	131,122.8	93,592.8	131,324.1	129,366.2	145,003.6	168,613.8	211,730.0	233,436.0	250,436.8	294,737.4	331,604.9	356,369.3	393,327.6	444,896.3	487,609.0
South Korea .....	27,821.3	45,413.8	73,953.9	80,762.5	88,459.7	93,134.5	98,139.8	108,740.3	120,983.6	129,188.9	137,674.4	127,432.6	154,243.6	178,738.4	181,983.5
Australia .....	38,471.7	39,182.2	45,046.6	43,037.9	42,513.5	44,071.4	45,940.6	46,428.1	47,023.1	48,202.0	51,864.4	51,640.7	52,401.8	52,877.2	52,623.9
Taiwan .....	27,657.9	40,405.9	57,079.7	56,594.2	60,415.8	62,866.8	64,402.0	68,195.8	72,212.9	75,645.3	80,689.2	83,389.3	88,946.9	95,446.1	89,397.7
Singapore .....	7,640.9	8,255.5	13,581.3	14,870.1	15,691.6	14,889.0	16,313.2	18,405.0	20,249.4	20,846.0	21,779.8	21,656.8	25,656.7	27,919.2	24,468.5
Hong Kong															

## World industry and trade data for selected countries or economies and industries: 1980-2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Thailand.....	9,243.0	11,744.0	20,498.0	23,695.3	26,454.6	29,476.8	32,761.7	35,827.6	39,901.0	42,659.1	43,010.5	38,411.9	42,583.0	48,040.3	49,085.5
Philippines.....	13,794.3	11,791.0	14,684.5	15,075.7	15,009.0	14,749.6	14,859.6	15,604.3	16,661.4	17,591.1	18,333.6	18,127.0	18,415.2	20,253.7	21,557.7
Indonesia.....	8,034.2	17,016.3	26,284.2	29,424.2	32,534.3	35,845.7	39,924.1	44,859.5	49,737.9	55,503.3	57,805.4	49,903.3	56,273.9	62,872.3	69,076.6
South Africa.....	25,129.0	23,829.3	26,451.3	25,856.9	24,675.7	23,866.4	23,823.0	24,458.9	26,047.0	26,407.1	27,044.9	26,603.1	26,562.6	27,459.8	28,403.2
Exports all countries.....	3,952,607.5	3,979,809.4	5,590,474.8	6,205,431.7	6,458,263.9	6,991,184.1	7,038,212.7	7,683,987.3	8,677,140.6	9,065,110.4	9,773,718.1	10,208,757.2	10,737,791.0	11,617,442.2	11,412,328.9
United States.....	580,650.0	485,034.8	746,251.3	810,870.6	867,364.8	928,571.3	939,693.4	1,028,952.4	1,128,445.0	1,222,330.9	1,368,270.2	1,395,764.6	1,439,859.0	1,570,102.3	1,525,208.1
Canada.....	141,617.2	179,879.2	206,568.1	226,511.8	224,096.5	244,457.5	259,014.3	293,859.7	328,336.3	346,836.7	369,108.9	390,952.2	439,225.2	475,795.8	455,686.0
Mexico.....	13,057.6	27,424.1	33,390.0	36,414.5	39,265.4	79,588.3	88,099.1	108,476.5	144,581.8	174,130.6	203,307.7	233,802.0	271,844.9	324,087.9	302,787.7
European Union.....	1,996,843.6	1,885,745.1	2,647,030.7	3,001,284.0	3,017,975.7	3,198,026.6	3,117,660.4	3,346,524.9	3,736,736.6	3,854,686.7	4,059,381.4	4,339,052.3	4,427,780.3	4,480,609.7	4,446,467.1
Germany.....	538,122.1	538,692.5	759,951.8	833,698.8	829,343.3	876,162.0	792,105.5	873,770.2	945,371.7	973,638.9	999,367.5	1,113,919.9	1,147,363.4	1,110,098.0	1,106,546.6
France.....	289,285.1	260,675.8	364,517.3	418,258.9	429,250.0	458,905.6	444,990.3	476,745.7	533,266.9	525,943.0	552,795.0	600,074.5	613,333.2	636,619.5	632,606.3
United Kingdom.....	301,984.2	242,248.4	327,321.8	386,601.1	384,624.2	395,295.1	391,463.2	414,521.6	468,206.5	505,255.1	547,595.9	550,849.2	540,526.7	556,183.5	548,806.0
Italy.....	224,209.4	232,597.9	315,730.3	354,441.4	355,516.5	371,667.9	390,102.2	406,529.2	465,550.4	484,873.1	475,263.9	494,043.2	486,403.2	499,897.0	497,907.8
Other European Union.....	643,242.9	611,530.4	879,509.6	1,008,284.0	1,019,241.7	1,095,994.2	1,098,999.2	1,174,958.2	1,324,341.2	1,364,976.5	1,484,359.1	1,580,165.6	1,640,153.8	1,677,811.7	1,660,600.5
Brazil.....	52,048.4	63,603.4	71,417.0	64,866.9	66,038.7	76,759.5	78,669.2	85,531.7	88,193.2	90,035.4	95,677.8	98,455.8	97,025.9	103,251.1	102,317.2
Argentina.....	20,072.0	13,049.5	17,441.5	20,744.5	20,453.2	21,292.6	22,423.1	25,073.5	32,012.5	34,636.3	39,754.5	41,160.4	39,131.3	40,271.2	39,526.4
Chile.....	10,037.4	6,707.8	11,696.8	13,306.4	14,093.3	16,426.1	15,901.1	18,029.0	21,070.3	23,187.7	25,057.5	23,955.4	25,049.8	26,065.6	26,238.6
Peru.....	5,019.8	4,804.3	4,279.4	5,205.2	6,314.9	6,417.9	6,840.5	8,335.8	9,061.7	9,499.5	11,239.2	10,746.8	11,193.3	11,765.7	11,667.6
Costa Rica.....	777.5	762.7	946.9	974.8	1,115.1	1,191.0	1,148.9	1,328.9	1,693.8	1,766.3	2,721.8	4,359.5	4,123.1	4,613.8	4,876.5
Japan.....	456,039.6	536,637.6	633,047.0	667,158.9	699,928.8	746,196.7	741,521.5	761,511.1	828,267.5	812,233.5	860,925.1	840,356.0	902,604.3	1,008,988.9	981,061.4
China.....	35,422.9	36,286.7	78,540.6	113,386.7	135,697.1	162,455.9	176,281.1	221,756.8	270,728.8	287,603.4	352,582.7	377,228.0	418,345.0	533,293.8	546,215.0
South Korea.....	48,369.1	75,613.3	121,515.2	124,615.2	139,066.8	150,238.9	155,347.8	174,123.4	221,426.3	246,367.5	275,735.1	302,610.1	330,851.7	394,146.4	378,559.1
Australia.....	29,018.1	24,312.2	47,332.5	55,471.6	58,982.6	65,419.3	65,678.8	70,323.8	62,435.2	68,812.7	70,282.2	66,426.6	70,306.4	71,550.2	76,602.8
Taiwan.....	56,183.8	83,778.4	136,158.5	145,018.1	161,985.7	176,635.8	191,078.8	204,431.3	230,513.4	242,733.0	257,881.8	264,805.1	300,552.3	363,571.0	355,654.7
Singapore.....	35,527.0	43,243.4	86,561.7	98,137.9	109,046.3	120,032.9	136,096.5	174,127.5	210,284.5	229,634.2	242,336.6	229,633.6	259,137.8	300,181.8	285,617.3
Hong Kong.....	54,998.9	78,265.6	156,149.1	174,087.7	205,677.9	247,281.5	253,052.6	282,627.7	320,811.9	329,642.9	356,138.6	332,710.5	330,419.3	387,419.2	384,681.7
India.....	16,967.4	17,270.8	27,433.1	28,803.4	30,931.3	38,885.8	42,006.6	48,918.5	57,718.4	62,768.3	64,265.8	65,025.9	76,231.7	87,747.6	87,355.8
Malaysia.....	12,589.9	17,891.1	35,356.4	43,618.2	54,383.5	67,183.5	78,003.4	97,275.4	118,882.4	134,171.2	142,779.0	149,190.8	181,193.3	210,891.3	197,458.8
Thailand.....	10,326.2	14,981.4	36,140.0	43,999.4	54,574.3	62,307.3	70,322.4	81,706.7	99,674.9	98,016.9	106,143.3	109,670.0	124,146.8	147,842.0	142,971.8
Philippines.....	8,002.0	9,983.5	13,993.8	15,275.4	16,909.1	18,796.9	21,623.6	24,506.6	31,584.6	37,663.5	49,626.6	68,216.1	81,450.4	96,999.8	90,476.1
Indonesia.....	9,871.3	16,346.7	31,504.5	35,482.9	41,761.9	51,340.2	52,453.0	55,749.8	60,280.8	67,569.9	76,336.3	82,830.6	78,136.8	97,423.9	96,380.6
South Africa.....	16,386.3	21,666.8	21,534.2	23,105.2	24,727.2	22,266.3	21,108.8	25,594.0	32,363.5	27,507.0	31,256.1	32,814.5	42,659.7	40,591.8	39,934.0
Percent															
Import penetration all countries.....	36.5	32.8	40.0	43.6	45.6	49.2	49.3	51.7	54.5	56.2	57.4	60.1	60.8	60.9	60.7
United States.....	20.0	26.8	28.4	29.8	31.3	33.7	34.7	35.9	35.8	37.0	38.9	41.7	42.9	44.3	45.1
Canada.....	62.6	70.1	81.9	89.2	94.4	95.5	94.9	101.1	111.0	112.9	110.8	113.0	121.8	134.4	134.1
Mexico.....	39.7	23.0	33.3	35.7	42.1	59.1	62.6	70.0	70.2	77.2	84.7	89.9	101.2	112.4	112.5
European Union.....	57.6	48.1	64.7	72.9	74.6	79.5	76.8	77.6	80.6	85.6	87.0	91.4	91.1	84.3	83.4
Germany.....	41.6	39.8	57.9	63.1	64.3	70.2	68.4	72.7	77.1	80.8	78.3	86.9	89.2	77.3	76.7
France.....	54.9	40.0	55.2	63.1	63.6	67.3	68.2	70.3	73.6	74.2	73.4	76.4	74.8	69.5	66.8
United Kingdom.....	50.9	42.9	54.3	61.9	63.4	65.4	62.9	63.6	68.7	74.2	82.6	85.2	83.9	81.7	81.5
Italy.....	52.5	41.9	53.5	61.8	65.2	65.8	55.8	52.2	47.6	57.3	57.4	61.0	61.5	57.8	59.2
Other European Union.....	85.1	69.0	89.5	101.4	104.1	113.0	112.1	109.7	116.4	117.8	120.2	122.2	119.8	112.8	111.2
Brazil.....	14.5	6.8	10.0	13.5	15.4	9.3	10.6	13.1	20.1	20.9	23.8	24.1	20.1	20.5	19.6
Argentina.....	16.9	6.9	8.3	8.8	14.0	21.2	29.0	31.5	32.2	35.2	36.0	37.6	33.1	32.9	34.8
Chile.....	43.8	26.4	48.8	53.2	52.8	56.9	53.5	60.4	74.5	74.8	79.6	77.3	78.9	86.7	81.7
Peru.....	16.2	12.2	14.8	19.3	23.2	28.3	30.1	34.5	39.7	39.5	42.1	40.8	36.9	35.3	35.0
Costa Rica.....	51.0	25.1	32.4	35.4	29.4	32.0	33.8	34.2	33.7	37.3	42.0	54.1	34.1	36.1	38.8
Japan.....	7.8	8.5	14.2	14.5	14.0	14.9	16.4	18.6	20.9	20.7	19.6	19.7	22.8	25.8	26.9
China.....	28.4	33.8	23.5	24.7	28.5	29.7	31.4	29.0	28.6	28.7	27.6	26.0	25.7	28.0	27.0
South Korea.....	33.0	35.5	40.5	39.9	43.0	41.3	41.5	44.9	50.7	50.8	49.6	51.2	47.0	48.7	47.4
Australia.....	37.3	39.1	45.7	46.7	47.0	49.7	48.2	54.1	54.4	57.2	56.7	53.6	55.0	54.9	53.9
Taiwan.....	44.8	44.3	63.0	72.2	79.0	87.2	96.2	89.1	85.5	91.8	92.7	95.6	97.1	102.1	118.3
Singapore.....	218.8	271.9	262.4	264.0	257.2	268.7	266.3	370.3	385.7	467.5	444.9	461.9	550.4	648.6	753.1



Appendix table 6-1  
World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Percent														
Hong Kong .....	142.1	214.5	446.9	371.4	463.5	649.3	829.5	838.6	861.2	917.9	945.7	977.3	954.5	908.4	895.4
India .....	32.9	28.5	24.5	20.7	17.4	18.9	20.8	21.7	22.9	22.7	23.3	23.2	24.2	26.3	25.9
Malaysia .....	137.7	114.2	115.3	120.0	123.3	145.1	155.9	160.6	174.0	174.6	168.2	280.7	290.9	223.4	197.0
Thailand .....	59.3	49.8	70.9	76.5	80.0	81.0	82.2	85.8	92.5	87.9	89.8	105.3	102.3	110.9	106.0
Philippines .....	40.6	28.9	43.5	44.2	44.0	53.6	61.5	66.6	74.3	86.3	98.6	128.9	170.5	155.3	118.4
Indonesia .....	93.9	45.4	42.6	47.4	49.0	51.9	46.0	42.9	43.8	42.9	45.0	67.6	38.0	45.6	41.1
South Africa .....	40.2	28.9	31.3	32.1	35.1	36.8	37.5	42.0	47.6	43.4	44.0	45.4	48.7	48.5	44.9
	Millions of 1997 U.S. dollars														
Imports all countries .....	3,640,312.6	3,753,688.0	5,408,238.7	5,994,954.3	6,227,821.8	6,737,048.0	6,812,065.5	7,454,350.6	8,427,843.8	8,822,802.9	9,501,086.2	9,947,200.5	10,525,657.1	11,402,925.9	11,210,754.4
United States .....	495,867.7	814,595.1	923,564.6	943,956.3	922,007.7	1,034,229.1	1,125,822.0	1,248,430.6	1,350,312.3	1,430,646.6	1,599,710.4	1,800,687.6	2,009,316.4	2,270,300.9	2,122,807.5
Canada .....	145,554.1	177,678.0	235,893.4	243,455.0	244,592.1	247,687.0	262,681.3	295,827.3	313,246.5	324,274.5	373,184.2	390,846.6	420,445.7	441,919.6	439,443.1
Mexico .....	55,544.6	38,342.6	66,880.1	79,060.4	98,316.8	134,406.0	137,092.9	157,348.5	134,664.3	165,142.2	206,338.8	241,526.5	274,928.9	339,556.1	336,186.2
European Union .....	1,728,943.8	1,533,527.0	2,466,654.6	2,842,013.3	2,908,823.2	3,061,862.2	2,826,738.6	3,027,119.8	3,419,559.8	3,494,902.1	3,676,664.1	4,054,880.4	4,226,298.2	4,247,299.3	4,238,570.9
Germany .....	372,122.2	325,103.3	501,475.4	624,374.9	699,435.2	731,793.5	669,357.5	712,936.2	813,406.0	799,780.7	803,503.8	883,928.6	901,487.0	896,606.0	884,614.3
France .....	268,992.3	231,570.7	390,375.3	446,692.1	449,700.5	462,275.8	427,459.0	455,553.4	502,254.9	506,947.6	516,900.5	582,813.4	610,386.4	624,617.8	627,043.9
United Kingdom .....	261,341.0	252,892.9	385,745.9	412,456.8	385,717.9	412,316.7	418,080.8	436,642.0	486,263.8	518,959.6	577,064.7	631,019.9	653,668.8	660,512.8	655,952.1
Italy .....	183,547.4	164,538.1	268,789.4	305,810.7	306,334.0	320,846.6	267,766.3	286,900.5	330,241.4	329,482.1	347,871.7	384,268.7	399,158.5	407,206.3	410,271.9
Other European Union .....	642,940.9	559,422.0	920,268.7	1,052,678.8	1,067,635.6	1,134,629.7	1,044,075.1	1,135,087.7	1,287,393.7	1,339,732.2	1,431,323.4	1,572,849.7	1,661,597.6	1,658,356.5	1,660,688.7
Brazil .....	36,947.4	17,537.7	32,502.3	34,893.8	37,453.3	35,933.1	46,333.7	60,394.6	93,626.1	95,371.9	115,968.0	116,149.4	98,624.9	104,964.3	101,171.8
Argentina .....	28,192.5	8,247.5	8,647.3	8,960.4	17,235.8	30,894.4	35,721.2	44,008.8	39,292.2	46,665.8	58,385.8	63,147.1	50,872.3	47,913.7	46,518.3
Chile .....	12,703.3	6,006.3	13,827.4	14,438.4	15,107.3	19,705.8	20,923.0	22,644.8	28,286.8	31,570.0	34,684.8	34,077.7	26,502.1	30,138.5	29,739.0
Peru .....	7,475.0	4,157.5	4,186.9	5,111.3	5,747.6	6,771.4	8,014.8	10,626.2	13,368.4	13,457.7	14,921.9	15,283.4	12,700.2	13,043.2	12,967.7
Costa Rica .....	1,619.8	1,075.7	1,605.1	1,816.0	1,901.0	2,336.0	2,804.9	2,846.7	2,682.8	3,010.9	3,512.8	5,287.1	4,545.3	4,669.4	4,857.8
Japan .....	123,863.6	144,414.2	290,019.4	316,743.4	317,913.4	319,519.4	335,794.1	381,363.7	459,499.8	480,226.9	474,996.0	430,682.3	481,050.3	560,242.4	536,958.3
China .....	47,353.5	109,746.2	114,222.9	115,337.8	142,515.6	184,557.4	260,387.5	275,247.8	297,530.5	320,349.6	342,825.2	350,121.8	387,047.8	476,968.4	517,473.2
South Korea .....	34,372.2	50,842.3	98,349.0	112,102.9	129,126.5	123,818.1	128,064.4	157,976.9	199,402.5	214,317.4	205,745.7	135,787.0	188,525.9	244,276.3	237,586.3
Australia .....	52,405.1	60,892.8	82,476.7	79,162.8	75,183.0	80,085.2	81,382.2	94,212.9	104,797.4	111,057.0	115,001.3	120,303.8	125,960.3	130,629.0	128,423.3
Taiwan .....	36,182.5	37,087.5	90,398.7	95,240.2	110,828.8	132,321.9	143,725.0	144,404.3	164,647.0	163,059.4	187,957.2	188,557.1	227,574.7	266,711.1	254,156.1
Singapore .....	46,746.5	48,463.6	88,062.0	105,264.7	117,535.5	131,825.2	150,143.0	172,962.4	210,187.5	223,566.5	235,058.7	207,618.6	220,348.6	260,413.6	247,702.4
Hong Kong .....	57,916.4	70,915.0	132,545.7	165,063.6	197,860.3	235,320.5	238,137.1	272,675.9	310,111.6	323,522.9	360,080.8	337,604.3	334,199.3	394,547.7	396,885.7
India .....	27,681.4	34,360.9	40,004.0	34,825.4	26,858.3	29,454.3	35,651.8	41,706.8	51,683.8	51,270.8	56,300.0	60,351.9	68,237.2	73,990.5	75,009.2
Malaysia .....	29,768.9	30,423.9	44,685.1	58,086.4	70,950.2	75,140.7	87,144.2	118,096.1	145,353.8	148,829.3	158,684.3	126,195.8	145,439.9	180,684.6	176,095.9
Thailand .....	20,011.6	19,313.0	48,946.3	64,056.8	69,191.1	76,155.3	84,916.6	98,007.5	124,850.9	122,572.1	110,573.6	80,019.3	93,005.5	112,216.8	112,707.6
Philippines .....	17,965.9	8,650.8	20,673.7	20,525.3	19,127.7	24,902.9	31,177.3	35,972.2	41,351.6	58,056.4	69,940.1	61,943.6	66,832.7	69,509.8	66,917.6
Indonesia .....	29,881.7	23,907.7	32,209.8	43,172.5	48,182.9	52,834.3	48,977.7	51,432.9	61,080.2	64,724.7	68,057.4	39,891.6	35,865.7	49,161.0	48,658.8
South Africa .....	40,385.3	21,992.1	28,282.8	27,566.5	29,018.8	30,961.2	32,623.3	37,861.5	46,853.5	46,760.2	46,490.1	47,861.4	45,055.9	48,397.3	46,777.2
Apparent consumption all countries .....	9,982,482.8	11,451,843.3	13,523,698.8	13,761,936.4	13,656,816.3	13,692,541.3	13,826,281.1	14,418,781.5	15,461,841.8	15,690,967.1	16,543,027.8	16,549,353.8	17,315,865.7	18,740,523.1	18,459,659.8
United States .....	2,483,012.3	3,034,995.3	3,248,026.6	3,170,324.8	2,945,572.3	3,066,143.9	3,248,805.7	3,482,325.4	3,769,089.8	3,870,130.2	4,111,268.2	4,321,615.5	4,680,941.2	5,128,203.8	4,711,763.7
Canada .....	232,422.9	253,613.9	287,920.6	272,799.6	259,133.8	259,454.7	276,914.1	292,481.5	282,244.0	287,214.1	336,701.8	345,872.4	345,109.7	328,892.8	327,689.9
Mexico .....	140,065.3	166,873.2	200,626.8	221,606.2	233,384.3	227,360.0	219,120.8	224,836.4	191,885.3	213,917.2	243,691.2	268,771.6	271,701.8	302,221.5	298,803.3
European Union .....	3,003,525.7	3,188,842.7	3,814,961.3	3,897,407.8	3,899,302.8	3,851,855.4	3,681,247.0	3,899,741.4	4,244,688.7	4,084,769.1	4,225,964.2	4,437,018.8	4,640,930.0	5,041,316.8	5,083,750.8
Germany .....	895,175.0	817,472.5	866,890.0	989,797.5	1,087,640.8	1,042,317.3	978,860.5	980,918.9	1,054,678.4	989,299.7	1,025,668.4	1,017,223.4	1,010,658.5	1,159,814.5	1,153,734.9
France .....	490,014.5	578,376.1	707,327.7	708,072.0	707,131.0	687,090.1	626,674.7	647,703.3	682,441.4	682,983.8	704,531.0	762,811.9	816,042.6	898,854.5	939,421.5
United Kingdom .....	513,218.9	588,991.4	710,849.4	666,416.5	608,901.4	630,936.6	664,613.2	686,441.1	707,613.4	699,902.1	698,797.4	740,465.7	778,803.3	808,909.5	804,834.3
Italy .....	349,748.6	392,786.9	502,039.0	494,740.0	470,094.3	487,316.4	480,080.6	549,534.3	694,231.9	574,789.2	605,805.4	629,541.6	648,642.8	704,136.6	692,871.8
Other European Union .....	755,368.7	811,215.9	1,027,855.3	1,038,381.8	1,025,535.4	1,004,195.1	931,018.0	1,035,143.9	1,105,723.5	1,137,794.3	1,191,161.9	1,286,976.2	1,386,782.8	1,469,601.7	1,492,888.3
Brazil .....	255,549.9	259,142.2	324,281.7	258,393.9	244,037.3	385,577.5	438,688.9	460,991.3	464,813.9	455,663.4	487,103.9	481,410.5	491,118.8	511,505.8	515,161.1
Argentina .....	895,729.9	119,675.0	104,329.3	102,210.1	123,176.1	145,766.2	123,296.4	139,597.3	104,678.2	132,480.1	162,300.6	168,089.9	153,810.2	145,436.3	133,778.8
Chile .....	29,034.6	22,726.9	28,327.7	27,128.8	28,629.5	34,615.2	39,116.9	37,491.1	37,975.8	42,216.6	43,603.6	44,103.9	33,575.8	34,782.4	36,399.4
Peru .....	46,272.8	33,971.9	28,241.8	26,471.5	24,732.7	23,928.6	26,594.7	30,789.0	33,642.0	34,078.3	35,444.5	37,470.3	34,460.7	36,994.4	37,049.4
Costa Rica .....	3,179.2	4,291.3	4,948.5	5,131.2	6,459.4	7,294.9	8,292.2	8,336.9	7,956.5	8,069.0	8,368.2	9,780.6	13,321.5	12,929.3	12,516.5
Japan .....	1,590,102.3	1,690,279.9	2,039,897.9	2,191,349.7	2,272,368.6	2,142,234.9	2,046,955.7	2,049,844.5	2,199,689.8	2,324,543.5	2,422,809.3	2,189,248.3	2,112,741.7	2,175,519.9	1,995,894.5
China .....	166,796.7	324,363.2	486,431.6	466,916.8	499,455.3	621,982.2	830,601.4	949,3							

Appendix table 6-1  
World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Australia .....	140,616.7	155,649.3	180,510.1	169,503.2	160,114.2	161,228.5	168,816.9	174,166.5	192,512.7	194,027.8	202,785.1	224,424.1	229,105.0	237,879.8	238,096.2
Taiwan .....	80,842.1	83,767.5	143,603.5	131,840.1	140,339.5	151,766.3	149,395.0	162,005.5	192,587.3	177,665.9	202,797.5	197,265.3	234,267.9	261,186.4	214,832.0
Singapore .....	21,368.6	17,822.6	33,558.0	39,877.0	45,692.7	49,069.9	56,388.8	46,707.4	54,493.6	47,823.7	52,834.5	44,948.0	40,037.3	40,148.8	32,890.9
Hong Kong .....	40,761.7	33,061.2	29,657.7	44,449.7	42,686.7	36,242.5	28,707.6	32,517.7	36,010.2	35,246.1	38,075.8	34,543.7	35,014.1	43,435.8	44,324.7
India .....	84,157.7	120,628.9	163,511.2	168,190.7	154,330.6	155,734.3	171,725.4	191,985.6	225,393.3	226,147.0	241,783.1	260,022.6	281,824.5	281,294.1	289,300.1
Malaysia .....	21,623.2	26,638.7	38,771.5	48,421.9	57,539.6	51,786.9	55,901.1	73,559.1	83,527.6	85,226.7	94,367.3	44,951.8	49,991.3	80,863.9	89,385.9
Thailand .....	33,741.4	38,774.6	69,008.4	83,771.0	86,493.4	94,015.5	103,368.7	114,249.8	134,911.3	139,393.2	123,139.5	76,025.0	90,912.5	101,155.1	106,352.7
Philippines .....	44,295.1	29,967.1	47,563.9	46,493.2	43,475.7	46,494.4	50,717.3	54,050.2	55,627.0	67,285.0	70,914.4	48,059.2	39,199.1	44,752.9	56,542.9
Indonesia .....	31,839.3	52,680.8	75,531.0	91,049.6	98,390.0	101,865.6	106,390.7	119,911.2	139,507.0	150,771.1	151,264.4	58,982.4	94,483.5	107,719.8	118,481.8
South Africa .....	100,415.5	76,135.0	90,398.5	85,800.2	82,720.7	84,114.7	86,946.3	90,097.4	98,540.4	107,643.1	105,649.8	105,437.7	92,508.1	99,861.2	104,190.7
High-technology industries															
Production all countries .....	794,952.2	1,108,600.7	1,365,744.8	1,413,586.7	1,470,682.6	1,474,753.2	1,498,597.5	1,581,262.7	1,772,857.0	1,934,853.6	2,234,115.9	2,382,889.7	2,624,884.9	3,011,521.3	2,960,809.2
United States .....	251,261.9	365,325.5	422,673.3	434,590.0	432,222.0	446,647.4	450,979.1	472,321.9	544,171.4	597,090.6	701,087.3	787,848.9	868,502.4	980,452.3	941,383.0
Canada .....	11,598.6	13,581.9	20,057.3	21,260.2	20,442.3	21,408.5	21,937.4	25,621.5	31,551.1	30,619.9	30,700.4	34,226.1	36,268.3	44,122.5	38,430.5
Mexico .....	7,758.9	7,988.1	10,386.6	11,542.0	10,904.6	11,369.0	12,209.9	13,893.8	20,038.9	23,883.1	30,406.5	36,576.5	39,354.8	44,617.5	42,553.6
European Union .....	232,438.6	306,573.2	352,777.4	362,504.7	376,408.4	380,567.7	376,499.0	400,733.0	434,206.8	451,808.0	494,724.3	534,623.1	584,460.0	668,617.0	675,964.7
Germany .....	86,750.4	94,750.5	93,696.7	95,150.2	104,679.0	102,712.9	91,526.7	95,590.9	94,967.2	95,897.8	104,912.1	108,761.1	117,129.4	140,336.5	148,097.7
France .....	38,170.7	58,195.7	74,319.8	76,474.7	79,885.8	81,608.7	80,837.4	83,819.1	94,017.7	96,351.2	107,441.8	120,460.7	133,100.6	150,581.5	163,385.0
United Kingdom .....	49,401.2	61,897.6	77,566.9	79,244.5	81,589.4	83,331.5	82,060.4	87,308.9	91,721.1	97,757.4	103,733.2	109,528.3	114,334.8	127,200.6	121,694.1
Italy .....	22,632.0	38,420.5	41,078.6	43,039.5	40,737.2	41,882.9	46,415.5	49,506.1	56,552.5	54,997.9	54,796.0	55,571.0	55,389.8	55,434.6	54,191.4
Other European Union .....	35,484.2	53,308.8	66,115.4	68,595.9	69,517.1	71,031.7	75,659.0	84,508.1	96,948.3	106,803.7	123,841.2	140,301.9	164,505.5	195,063.8	188,596.5
Brazil .....	48,544.9	42,059.0	55,283.6	48,084.2	47,584.9	52,918.8	52,149.0	46,676.0	44,015.7	45,153.6	49,606.0	45,327.1	41,230.6	34,766.5	34,115.4
Argentina .....	5,011.0	3,722.9	2,831.2	3,583.7	4,103.7	5,148.2	4,715.2	5,168.0	4,599.6	4,793.5	5,748.3	6,046.9	5,229.9	5,199.6	4,445.4
Chile .....	579.4	545.3	776.7	690.5	721.5	829.7	941.4	890.5	833.4	782.2	783.0	818.1	708.8	787.8	773.7
Peru .....	1,394.2	808.5	546.1	546.2	627.0	713.0	645.0	566.7	552.3	572.7	635.6	588.9	578.7	609.4	604.6
Costa Rica .....	154.1	176.9	193.1	198.0	125.7	145.9	217.9	235.0	199.9	162.2	160.1	170.5	154.5	152.4	148.4
Japan .....	139,578.9	231,351.0	290,977.3	309,022.5	336,627.4	314,244.6	305,221.6	306,094.2	345,235.5	386,368.7	451,479.8	411,056.5	396,482.7	410,984.2	381,126.0
China .....	7,348.5	17,946.4	30,143.4	30,038.2	34,415.1	41,199.0	51,384.2	61,469.0	60,380.9	84,959.7	107,219.6	132,963.5	179,581.9	226,477.6	256,836.3
South Korea .....	7,466.4	13,050.0	28,197.4	32,344.7	34,843.5	35,802.3	40,864.1	51,162.4	60,262.7	67,455.8	86,386.8	105,012.1	145,053.3	200,501.4	208,762.2
Australia .....	4,773.6	4,917.0	6,050.1	6,272.9	6,776.8	7,408.9	7,471.7	7,945.9	8,088.7	8,539.6	9,726.9	10,423.6	10,861.8	11,935.4	11,586.5
Taiwan .....	9,069.6	15,704.8	24,173.5	23,924.4	25,694.2	26,480.1	29,678.0	34,760.3	46,500.2	51,239.8	65,116.9	71,425.3	84,146.6	104,729.7	88,998.1
Singapore .....	6,472.4	9,800.1	19,218.2	21,330.5	21,369.4	23,953.7	28,218.0	35,170.6	41,237.5	42,506.3	46,847.7	48,129.4	55,297.1	64,261.0	57,995.8
Hong Kong .....	6,909.2	7,725.9	11,208.9	10,395.6	9,091.7	9,448.4	8,713.9	8,502.2	8,616.8	7,825.3	7,014.1	8,374.1	9,142.7	9,789.3	8,982.9
India .....	1,982.2	3,133.1	5,915.4	5,973.9	6,525.8	7,695.9	8,225.7	9,728.0	10,672.9	10,943.6	13,097.4	12,837.4	14,614.7	15,362.5	15,498.5
Malaysia .....	1,496.1	2,208.1	6,884.3	8,937.1	12,330.4	14,763.6	17,969.8	23,704.2	29,798.7	33,830.9	36,033.7	36,144.0	45,446.2	63,027.3	65,431.9
Thailand .....	1,201.9	1,255.9	3,356.8	5,170.2	6,868.9	7,729.4	6,591.1	4,176.3	5,584.7	6,027.3	7,598.9	7,297.7	8,981.0	11,672.2	11,703.9
Philippines .....	1,695.3	1,221.3	2,499.5	2,782.2	3,263.3	3,526.9	3,606.4	4,018.6	5,087.4	5,033.9	5,495.5	5,421.6	6,185.5	7,128.7	7,688.6
Indonesia .....	401.5	781.4	1,021.3	1,680.1	1,981.9	2,520.4	2,884.4	3,898.9	4,836.0	5,837.8	6,860.2	9,648.0	7,240.7	8,521.6	9,539.8
South Africa .....	2,972.6	2,563.8	3,168.9	3,153.0	2,902.0	2,733.1	2,711.6	2,819.2	3,009.5	3,004.7	3,109.8	2,953.7	2,942.0	3,044.1	3,131.0
Value added all countries .....	333,262.6	463,133.6	567,075.6	589,106.3	604,757.5	598,516.6	603,277.0	628,667.4	673,919.3	732,110.6	830,136.0	872,886.2	948,367.4	1,062,528.8	1,065,373.1
United States .....	103,205.7	159,802.5	190,351.7	196,998.1	197,919.9	199,281.4	197,565.7	209,487.7	233,281.4	258,093.6	298,282.6	333,829.6	362,524.7	410,062.5	411,922.1
Canada .....	5,245.7	6,547.1	8,722.3	8,923.4	8,219.9	8,696.1	9,108.9	9,404.6	10,479.5	10,380.3	11,712.2	12,310.8	14,319.8	17,250.2	15,036.2
Mexico .....	2,244.8	2,465.3	3,446.8	3,714.1	3,653.4	3,991.4	4,310.0	4,476.0	4,949.0	5,652.5	7,259.7	8,713.7	9,621.4	10,356.3	10,085.6
European Union .....	102,962.5	128,435.3	149,583.3	153,985.9	152,586.7	149,503.0	147,311.5	157,246.0	163,639.9	164,774.6	179,282.7	190,095.1	204,825.5	224,526.0	232,529.1
Germany .....	42,242.1	46,641.3	47,520.4	48,307.6	48,473.7	46,199.6	40,848.8	41,553.4	38,974.7	39,627.1	42,618.6	43,657.5	46,253.6	51,644.5	56,660.9
France .....	14,456.3	20,157.7	23,904.0	24,565.1	23,379.8	24,107.4	23,139.5	25,338.0	30,120.7	28,020.2	33,516.5	35,101.8	37,716.0	38,735.8	44,170.5
United Kingdom .....	22,219.8	26,472.9	33,620.2	35,045.2	34,838.2	32,601.1	32,256.5	34,796.0	34,852.3	35,489.1	37,456.9	39,531.0	41,177.9	44,599.7	42,684.4
Italy .....	9,159.9	13,289.1	17,130.2	17,336.8	16,534.2	16,273.0	18,436.3	19,856.6	20,721.2	19,901.8	19,381.6	20,293.9	20,928.2	21,268.2	20,889.7
Other European Union .....	14,884.3	21,874.3	27,408.5	28,731.2	29,360.9	30,321.9	32,630.4	35,701.4	38,971.1	41,736.5	46,309.3	51,511.0	58,749.8	68,277.9	68,123.6
Brazil .....	27,723.2	25,214.0	31,586.7	30,503.7	29,756.3	36,504.4	36,791.8	31,144.4	27,258.8	27,859.3	30,553.2	28,222.8	25,864.0	22,087.4	21,699.8
Argentina .....	2,519.4	2,581.4	1,667.9	1,596.6	1,833.4	2,302.0	1,676.7	1,814.8	1,626.6	1,660.5	1,995.0	2,092.6	1,808.7	1,800.0	1,533.7
Chile .....	400.9	371.4	411.2	391.3	435.0	481.3	578.7	529.1	505.4	457.2	462.6	487.1	422.9	470.6	463.1
Peru .....	539.7	297.1	257.1	296.9	272.4	279.0	268.5	242.4	241.7	247.9	274.6	252.4	249.4	262.3	260.0

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Costa Rica .....	54.1	54.4	58.8	57.9	53.2	58.9	86.8	93.2	77.6	63.9	63.6	66.0	58.7	59.3	57.8
Japan .....	52,665.8	88,594.4	113,472.7	119,943.2	128,796.1	120,226.5	116,200.0	117,396.4	128,929.7	144,935.4	162,855.6	147,075.8	144,016.5	148,668.4	138,404.3
China.....	3,191.3	6,034.4	8,200.1	8,114.0	9,365.4	11,127.3	15,296.4	15,995.0	15,406.6	21,589.0	27,730.4	34,018.0	47,309.5	59,869.1	67,855.8
South Korea.....	2,291.1	3,892.1	8,129.6	9,545.1	9,963.1	10,297.2	12,151.5	15,053.3	18,322.5	19,266.1	23,689.8	26,550.9	37,958.9	50,207.3	52,599.4
Australia.....	1,770.3	2,035.6	2,119.9	2,039.7	2,244.2	2,509.4	2,546.5	2,690.6	2,741.8	2,817.7	3,258.9	3,447.8	3,504.3	3,903.7	3,765.1
Taiwan .....	2,507.2	4,249.9	6,311.4	6,772.6	7,182.4	7,517.7	8,315.6	9,372.8	11,481.8	13,863.9	16,684.7	18,545.5	21,300.8	25,385.5	21,804.1
Singapore.....	2,294.9	3,703.0	6,136.7	6,626.0	6,861.6	7,706.4	9,006.9	10,478.2	12,336.4	13,001.6	14,107.2	14,431.5	18,016.2	20,525.8	18,857.4
Hong Kong.....	1,790.1	1,603.9	2,523.8	2,407.9	2,243.3	2,401.3	2,281.7	2,366.5	2,402.4	2,230.4	2,197.8	2,417.6	2,428.8	2,659.4	2,443.9
India.....	541.7	807.0	1,362.6	1,270.8	1,618.1	1,796.7	1,995.7	2,496.5	2,386.6	2,657.9	3,055.1	3,117.8	3,540.3	3,660.9	3,674.8
Malaysia.....	423.8	708.6	1,483.8	1,910.1	2,636.8	3,245.7	3,807.2	4,799.7	5,760.0	7,558.0	8,574.0	8,450.5	10,578.9	14,613.3	15,168.0
Thailand.....	452.1	536.7	1,059.5	2,125.4	3,928.1	4,104.7	1,338.4	1,374.6	1,832.3	1,983.0	2,489.4	2,392.4	2,924.8	3,769.3	3,786.4
Philippines.....	577.7	379.7	833.3	1,189.1	1,430.7	1,428.7	1,436.5	1,482.6	1,963.1	2,155.4	2,340.8	2,280.6	2,559.6	2,890.1	3,122.1
Indonesia.....	149.5	221.2	298.4	573.7	793.4	932.1	842.9	1,382.4	1,309.6	1,606.0	2,251.0	3,612.3	2,756.4	3,028.4	3,432.1
South Africa.....	990.4	951.2	1,027.1	1,025.1	995.2	1,047.4	1,032.2	1,077.7	1,126.7	1,122.8	1,161.4	1,089.1	1,082.7	1,116.7	1,149.6
Exports all countries.....	384,075.2	515,981.3	825,271.3	937,975.1	1,025,442.3	1,123,449.2	1,163,379.6	1,333,963.5	1,603,027.4	1,785,662.0	2,106,342.0	2,293,481.4	2,610,571.5	3,130,774.5	2,959,955.9
United States.....	114,665.8	117,725.8	194,396.3	218,236.7	235,472.6	251,566.2	249,052.7	280,962.0	318,716.7	362,385.8	428,848.2	463,723.6	505,144.0	538,819.7	511,219.9
Canada.....	8,100.9	12,213.7	15,508.9	18,471.8	21,161.9	22,238.0	21,394.1	26,004.7	32,661.3	37,659.6	43,132.5	48,078.6	53,731.3	74,801.5	65,247.1
Mexico.....	425.5	3,197.7	2,415.3	1,962.8	2,381.3	13,615.4	15,141.4	21,040.7	27,065.8	34,326.7	44,694.0	58,009.1	70,445.5	92,822.3	81,407.8
European Union.....	156,060.3	206,069.8	308,135.5	353,148.0	377,380.6	399,455.7	412,452.4	452,597.5	541,282.0	591,675.5	700,661.9	785,546.6	868,623.7	1,000,328.5	984,276.3
Germany.....	40,321.0	58,576.8	86,682.3	92,863.5	101,037.5	106,032.4	100,934.1	112,589.5	123,325.3	131,495.4	152,995.0	177,386.5	198,194.5	223,542.1	220,806.7
France.....	23,467.1	30,963.6	49,549.6	55,155.6	65,422.6	69,004.8	70,427.9	75,556.4	91,572.8	90,775.7	109,211.2	124,973.5	135,812.2	157,345.2	156,700.3
United Kingdom.....	40,297.3	48,117.1	68,384.8	80,211.1	81,180.1	81,094.1	86,720.2	93,792.4	115,952.8	131,077.4	147,067.4	156,339.9	160,102.7	184,430.7	180,583.8
Italy.....	11,541.1	17,026.5	23,979.8	28,788.1	28,709.6	31,780.4	32,756.3	33,678.5	38,668.8	40,895.1	42,043.0	47,107.4	50,166.9	58,149.9	57,734.5
Other European Union.....	40,433.8	51,386.0	79,539.0	96,129.7	101,030.8	111,543.9	121,613.9	136,980.8	171,762.4	197,431.9	249,345.3	279,732.2	324,347.4	376,860.6	368,451.1
Brazil.....	1,845.2	1,913.9	4,083.9	3,559.4	3,096.4	3,006.4	2,753.2	2,767.8	2,785.6	3,616.1	4,655.7	6,673.9	8,890.9	14,487.3	13,585.7
Argentina.....	604.2	324.9	332.9	368.5	446.4	470.0	489.1	563.7	779.7	867.9	1,074.0	1,116.2	1,212.1	1,388.7	1,383.1
Chile.....	15.7	8.2	23.8	106.1	55.8	74.5	75.8	73.9	85.1	108.9	135.3	204.4	227.6	275.5	274.8
Peru.....	17.3	16.3	17.2	14.6	12.3	21.0	18.4	36.7	39.4	66.3	63.5	105.1	82.7	94.3	83.3
Costa Rica.....	30.3	25.5	30.2	36.7	48.7	58.9	65.0	51.1	55.4	59.1	293.8	940.5	410.2	521.1	521.3
Japan.....	53,067.1	104,783.7	148,488.9	158,024.9	172,977.3	181,206.7	180,264.5	191,608.1	217,312.9	216,804.2	243,033.8	241,754.5	267,742.4	314,862.5	285,758.5
China.....	1,085.9	1,348.2	4,856.4	10,137.8	12,177.7	17,315.3	19,364.1	26,396.2	35,933.9	44,548.9	58,651.7	73,387.9	91,669.8	132,700.7	130,868.2
South Korea.....	3,930.8	8,139.9	21,481.6	23,220.0	27,173.3	30,594.0	31,188.1	38,305.9	53,867.4	59,547.1	75,558.3	84,107.9	117,705.6	162,136.6	142,933.0
Australia.....	1,886.1	1,448.2	2,532.3	2,956.8	3,639.5	3,981.9	4,347.0	5,264.4	6,462.0	7,481.6	8,200.3	7,822.6	8,637.2	9,501.9	9,414.6
Taiwan.....	5,976.4	9,305.8	21,314.6	22,808.4	25,809.1	30,057.9	33,601.9	40,265.6	53,914.0	63,426.6	78,181.1	86,508.1	113,042.2	153,464.1	138,516.7
Singapore.....	6,010.1	9,627.5	26,273.0	32,554.4	37,032.8	43,237.5	53,104.8	75,443.5	98,973.0	113,875.9	127,500.5	123,995.2	145,257.7	184,471.4	167,556.0
Hong Kong.....	9,347.7	14,268.5	28,552.9	34,291.8	38,708.7	46,206.0	49,577.6	60,361.4	75,997.5	80,425.7	92,318.4	92,281.3	102,091.6	137,300.6	133,561.3
India.....	422.8	367.4	603.5	1,113.0	1,189.7	1,346.4	1,492.7	1,817.2	2,496.0	3,116.7	3,254.6	2,968.0	3,692.2	4,275.0	4,291.2
Malaysia.....	1,899.6	4,561.2	12,227.6	17,027.3	22,167.9	27,122.3	33,745.8	45,836.6	56,532.1	65,285.0	72,113.0	72,345.4	86,546.0	105,761.6	95,559.6
Thailand.....	161.0	321.0	4,080.4	6,130.0	8,458.1	10,972.3	11,858.9	15,648.8	19,504.0	22,372.6	25,096.0	24,431.7	29,733.1	42,365.8	39,251.6
Philippines.....	164.0	427.9	2,370.1	1,132.5	1,564.3	2,096.6	2,663.7	3,428.7	4,932.4	17,549.5	27,327.5	35,757.8	40,693.4	46,313.9	43,619.5
Indonesia.....	174.3	325.0	356.6	480.2	841.6	1,885.1	2,650.3	3,950.2	4,188.1	5,611.8	5,578.3	4,841.8	5,268.6	8,430.9	8,006.1
South Africa.....	97.3	352.5	187.9	173.0	211.5	487.4	550.7	694.1	866.4	994.1	1,517.7	1,688.8	1,944.4	2,273.6	2,261.8
Percent															
Import penetration all countries.....	45.3	44.3	55.1	60.2	61.3	73.2	75.3	81.6	88.3	91.7	94.4	97.4	100.0	103.3	99.7
United States.....	22.8	32.4	39.0	42.0	45.6	50.7	51.9	56.1	56.0	58.2	59.7	59.8	60.7	59.9	56.4
Canada.....	85.3	87.5	86.7	90.0	97.5	92.4	87.0	88.7	91.7	100.5	120.3	116.4	125.8	155.3	140.3
Mexico.....	47.5	48.6	52.8	51.7	63.2	114.3	121.3	143.1	138.8	153.2	156.6	169.3	190.6	249.1	218.6
European Union.....	67.2	62.3	84.9	97.3	99.8	104.7	107.6	110.6	124.7	131.3	138.6	144.5	144.8	142.4	138.5
Germany.....	44.1	57.6	95.3	102.7	99.9	108.8	114.3	118.6	133.1	141.1	145.0	167.8	174.7	154.8	148.1
France.....	63.6	49.5	68.9	76.5	84.7	86.5	87.8	91.7	101.5	97.8	101.7	104.8	103.1	102.9	95.5
United Kingdom.....	76.3	69.6	79.1	93.6	94.4	91.0	104.0	108.4	130.2	139.2	146.5	144.9	136.6	139.5	137.0
Italy.....	54.4	44.4	63.6	74.2	79.0	81.9	71.2	69.4	70.0	80.0	81.8	90.6	96.4	104.4	103.9
Other European Union.....	103.3	83.0	104.8	124.2	126.6	137.5	138.2	140.4	159.0	166.6	179.9	179.2	176.9	173.3	173.4
Brazil.....	9.5	7.6	12.5	15.6	17.2	14.4	15.8	20.4	29.7	34.1	37.3	40.0	37.7	49.3	43.4

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Percent														
Argentina.....	36.1	25.3	30.2	32.3	44.5	53.9	60.9	64.7	65.2	69.2	67.9	70.2	78.3	84.5	84.2
Chile.....	55.3	36.7	46.5	56.5	58.9	63.9	59.0	65.8	78.9	82.3	88.8	90.3	89.3	89.6	82.4
Peru.....	20.6	24.1	40.3	44.0	49.5	54.2	51.0	66.0	81.8	81.7	81.3	78.8	66.1	64.1	59.7
Costa Rica.....	69.0	40.9	49.3	51.8	68.8	73.3	68.0	70.5	71.6	76.1	138.8	217.1	127.6	150.3	151.0
Japan.....	18.2	15.9	20.6	22.7	21.6	25.7	28.7	35.0	40.3	39.2	37.7	42.3	53.9	67.9	70.2
China.....	39.4	57.4	39.7	45.6	48.0	55.1	56.5	55.0	66.8	57.0	58.7	60.7	56.4	64.7	58.8
South Korea.....	68.7	72.5	84.3	76.1	83.3	87.9	77.9	75.1	87.2	85.5	84.0	84.4	81.7	84.0	72.7
Australia.....	68.7	71.7	86.5	88.4	88.6	83.9	79.8	90.8	99.0	107.6	94.6	84.8	89.7	79.0	71.0
Taiwan.....	100.4	64.6	92.6	98.0	100.6	110.0	112.3	112.4	110.7	120.6	123.4	121.6	133.1	159.0	165.2
Singapore.....	127.0	97.8	169.6	184.5	195.0	196.0	200.2	272.5	304.9	353.1	409.2	445.7	468.0	559.4	544.9
Hong Kong.....	180.1	266.4	373.7	384.3	390.5	356.1	447.1	639.9	577.1	610.2	679.3	617.9	722.0	752.1	699.9
India.....	116.6	66.5	61.1	58.8	37.2	36.0	44.5	41.6	45.3	47.4	45.1	48.0	47.0	58.2	56.5
Malaysia.....	193.9	227.5	214.3	210.4	187.8	211.5	225.1	200.0	194.0	208.9	215.6	221.2	221.0	182.0	156.3
Thailand.....	72.0	67.9	110.0	111.3	116.3	127.0	151.0	223.2	202.7	236.7	211.1	222.3	228.0	266.5	236.1
Philippines.....	59.1	59.7	101.3	61.8	62.3	73.4	81.7	89.5	99.1	278.6	372.4	482.0	623.5	577.2	473.2
Indonesia.....	149.2	90.4	69.8	70.1	76.2	84.9	91.2	98.2	87.8	98.7	87.4	45.1	70.1	115.3	91.6
South Africa.....	55.9	47.0	50.7	56.7	72.6	78.6	79.5	82.9	90.2	81.9	86.0	81.2	75.0	72.5	61.3
	Millions of 1997 U.S. dollars														
Imports all countries.....	364,643.8	506,275.6	821,285.2	934,802.1	1,027,633.0	1,127,062.8	1,183,549.6	1,358,988.6	1,636,114.0	1,835,693.1	2,171,193.4	2,407,850.4	2,771,445.0	3,328,292.6	3,166,288.0
United States.....	47,579.6	115,379.4	154,817.2	164,399.3	173,617.0	206,561.4	226,963.6	259,872.6	306,613.8	335,388.2	403,156.6	469,970.0	547,115.6	667,309.5	560,795.9
Canada.....	16,853.6	21,505.6	32,468.6	35,411.5	38,412.5	40,696.9	41,003.9	47,838.3	56,425.2	61,609.5	73,711.4	78,228.7	90,499.7	98,680.8	97,027.5
Mexico.....	5,670.9	5,381.6	11,076.8	12,840.2	16,318.8	21,453.5	22,428.5	26,975.2	24,460.4	30,445.8	39,547.8	50,598.5	62,940.5	74,421.2	71,949.9
European Union.....	165,404.5	196,638.2	347,931.5	407,877.7	437,749.0	447,175.9	435,679.9	477,546.3	563,613.8	626,483.9	739,518.8	857,731.2	974,801.2	1,096,162.1	1,082,441.1
Germany.....	34,525.8	43,026.5	72,328.2	93,044.4	102,692.0	106,857.3	101,687.1	113,792.7	131,342.7	137,800.1	154,871.2	178,340.2	202,738.3	229,179.0	225,453.3
France.....	26,101.2	31,444.6	60,620.7	67,426.1	81,596.3	76,219.6	72,821.1	77,233.2	85,065.8	92,884.8	108,397.9	129,086.5	140,687.5	156,442.3	155,271.4
United Kingdom.....	33,878.2	39,157.3	62,618.2	68,767.8	66,229.3	70,632.2	74,492.5	81,519.3	96,938.8	113,121.9	136,463.7	153,364.1	171,719.5	198,926.4	193,630.4
Italy.....	16,073.7	20,122.7	34,919.3	42,391.9	44,670.1	45,455.2	38,872.2	41,585.7	47,114.8	51,456.0	57,116.4	67,285.4	74,447.0	83,308.5	83,519.9
Other European Union.....	54,825.5	62,887.1	117,445.1	136,247.5	142,561.3	148,011.7	147,806.9	163,415.5	203,151.7	231,221.1	282,669.6	329,655.0	385,208.9	428,305.9	424,566.2
Brazil.....	5,117.9	3,439.9	7,535.8	8,467.1	9,895.8	8,854.4	9,809.7	11,695.5	17,599.3	21,409.8	26,704.1	26,962.6	26,567.5	29,562.2	27,969.4
Argentina.....	4,144.9	1,361.0	1,371.2	1,593.7	2,996.5	5,642.6	6,313.3	8,084.2	6,464.9	7,481.7	9,871.7	11,140.0	11,027.3	11,978.3	11,459.1
Chile.....	1,143.0	570.9	1,671.6	2,037.2	2,241.3	2,885.2	2,403.0	2,878.6	3,948.2	4,377.7	5,130.4	6,037.9	5,140.8	5,851.2	5,597.4
Peru.....	585.4	453.2	466.6	538.7	648.8	785.4	818.9	1,204.1	1,993.6	2,130.7	2,482.1	2,505.9	2,133.8	2,314.8	2,294.6
Costa Rica.....	177.3	95.8	163.6	178.6	235.3	266.2	340.8	480.2	350.6	321.1	478.8	1,374.8	1,009.1	1,034.7	1,094.2
Japan.....	16,311.2	20,754.5	39,071.1	46,954.0	48,973.4	52,514.0	58,394.7	72,521.6	99,959.3	115,543.2	125,874.1	123,484.1	152,397.4	196,200.0	187,650.6
China.....	3,216.9	15,952.7	15,110.1	16,034.1	20,328.3	28,877.1	39,683.0	46,458.3	49,133.4	54,053.1	69,029.6	87,091.1	107,129.8	151,058.5	163,028.1
South Korea.....	4,921.2	9,086.5	19,544.3	21,030.5	24,864.0	25,329.1	27,187.6	33,698.1	44,630.1	51,828.4	56,670.7	44,769.5	69,687.7	97,830.6	92,631.2
Australia.....	6,303.9	11,589.8	16,002.2	17,182.5	17,076.4	17,355.3	15,773.6	19,679.7	23,280.9	25,994.6	26,972.1	28,542.9	32,863.4	37,493.7	35,994.1
Taiwan.....	4,959.1	6,806.5	17,921.5	20,367.0	25,040.8	30,010.6	32,665.5	36,148.7	47,122.7	52,049.2	68,873.0	75,176.2	94,010.0	121,742.1	115,317.6
Singapore.....	7,842.8	11,661.1	24,353.8	30,249.3	35,132.1	40,311.1	49,947.1	64,739.6	83,105.5	96,711.5	106,735.4	100,555.5	115,278.8	145,443.4	137,476.7
Hong Kong.....	8,588.0	13,119.1	25,898.2	33,485.7	39,940.3	49,755.2	51,269.7	59,728.3	77,976.4	84,522.0	100,029.7	101,626.3	107,592.5	145,947.0	142,959.6
India.....	4,097.7	6,087.4	5,199.7	3,040.2	3,493.5	5,526.0	5,647.6	6,824.8	7,271.1	8,077.2	8,958.3	9,333.4	13,957.8	13,976.1	
Malaysia.....	3,261.1	5,724.0	11,749.5	15,936.7	19,819.3	21,736.7	26,646.8	41,576.3	55,033.2	58,441.2	67,293.0	67,813.6	80,368.6	105,002.4	100,524.2
Thailand.....	2,390.1	2,586.6	6,926.0	10,417.4	11,394.0	14,735.0	14,761.4	20,195.7	27,556.7	29,821.8	33,250.2	28,852.3	34,256.1	45,514.3	44,045.8
Philippines.....	2,471.7	1,207.6	4,038.7	3,284.4	3,373.8	4,275.5	5,983.3	6,254.2	5,820.8	20,496.9	29,848.1	34,869.0	40,805.1	43,083.0	38,213.0
Indonesia.....	2,855.5	2,234.7	2,640.2	4,125.8	5,451.3	6,415.5	6,258.3	4,101.5	5,086.2	7,710.1	8,904.1	3,811.3	3,019.0	5,520.0	5,202.8
South Africa.....	4,241.5	3,500.0	3,687.5	3,880.6	5,799.6	5,475.2	5,871.1	6,795.3	8,643.3	8,835.2	9,758.1	13,006.4	12,172.9	13,273.0	12,538.6
Apparent consumption all countries.....	805,524.2	1,141,948.2	1,489,629.8	1,552,944.3	1,676,862.8	1,539,191.8	1,572,004.2	1,664,847.8	1,852,040.7	2,001,286.4	2,299,012.9	2,473,299.5	2,770,326.1	3,220,661.1	3,176,254.1
United States.....	208,490.8	355,729.3	396,835.6	391,815.0	380,834.0	407,522.2	437,109.1	463,673.9	547,817.5	576,064.8	675,395.7	786,301.6	901,212.3	1,113,724.8	994,061.2
Canada.....	19,757.4	24,589.4	37,441.7	39,363.7	39,409.7	44,026.0	47,111.9	53,956.8	61,512.8	61,283.2	61,279.3	67,180.9	71,957.7	63,549.9	69,143.0
Mexico.....	11,936.7	11,078.8	20,987.8	24,859.3	25,807.0	18,765.5	18,497.8	18,851.4	17,621.8	19,874.0	25,260.3	29,891.0	33,029.2	39,913.3	32,910.5
European Union.....	246,300.1	315,531.1	410,019.1	419,136.7	438,488.3	427,041.0	405,072.0	431,754.3	452,022.2	477,105.9	533,581.2	593,488.0	673,149.6	769,757.4	781,452.1
Germany.....	78,220.7	74,663.0	75,879.8	90,608.5	102,782.3	98,204.5	88,989.7	95,949.3	98,707.1	97,681.1	106,788.3	106,268.5	116,034.5	148,054.7	152,270.3
France.....	41,015.2	63,481.0	88,041.8	88,152.6	96,396.3	88,107.0	82,903.6	84,246.9	83,806.3	94,995.2	106,628.5	123,158.1	136,432.7	162,633.0	162,633.0
United Kingdom.....	44,423.5	56,277.8	79,143.6	73,496.2	70,188.8	77,614.5	71,633.7	75,225.2	74,452.7	81,249.4	93,129.5	105,847.6	125,670.6	142,649.2	141,377.4

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of 1997 U.S. dollars														
Italy.....	29,561.1	45,342.3	54,895.8	57,167.4	56,515.0	55,497.9	54,562.0	59,949.3	67,322.8	64,354.3	69,869.3	74,263.1	77,253.6	79,835.6	80,369.8
Other European Union.....	53,079.6	75,767.1	112,058.2	109,712.1	112,606.0	107,617.2	106,983.2	116,383.6	127,733.2	138,825.9	157,165.5	183,950.7	217,758.3	247,129.9	244,801.7
Brazil.....	53,753.2	45,189.2	60,190.0	54,175.4	57,541.6	61,523.4	61,914.5	57,351.3	59,337.9	62,866.7	71,654.5	67,359.2	70,571.2	59,959.0	64,398.9
Argentina.....	11,496.7	5,379.1	4,546.5	4,941.8	6,730.0	10,472.2	10,375.3	12,490.2	9,917.6	10,812.6	14,546.0	15,878.7	14,081.1	14,177.7	13,604.0
Chile.....	2,065.5	1,555.6	3,593.8	3,608.6	3,806.2	4,514.1	4,072.7	4,377.5	5,006.4	5,318.1	5,778.1	6,685.0	5,757.3	6,527.2	6,790.8
Peru.....	2,842.6	1,882.4	1,159.1	1,223.7	1,310.2	1,449.6	1,605.1	1,825.2	2,437.6	2,608.0	3,054.2	3,178.6	3,230.2	3,608.9	3,845.0
Costa Rica.....	257.2	234.5	332.1	344.9	341.9	363.0	501.3	681.0	489.6	422.1	345.1	633.3	790.7	688.4	724.5
Japan.....	89,564.0	130,699.9	189,470.0	206,782.0	226,368.1	204,243.5	203,437.6	207,398.1	248,059.3	294,955.2	334,320.1	292,157.2	282,661.4	288,786.2	267,286.1
China.....	8,158.3	27,779.8	38,024.2	35,170.9	42,369.9	52,412.8	70,256.7	84,457.2	73,604.7	94,805.6	117,597.5	143,548.2	189,827.0	233,635.9	277,456.3
South Korea.....	7,163.6	12,533.5	23,195.4	27,640.3	29,856.7	28,806.1	34,888.4	44,868.7	51,164.5	60,592.8	67,499.1	53,026.1	85,342.6	116,450.9	127,365.4
Australia.....	9,175.5	16,166.2	18,496.3	19,436.4	19,284.0	20,696.9	19,764.8	21,674.1	23,508.3	24,158.8	28,498.8	33,660.1	36,646.5	47,460.6	50,669.1
Taiwan.....	4,937.8	10,543.7	19,348.2	20,775.4	24,898.4	27,283.5	29,095.6	32,149.6	42,554.4	43,151.0	55,808.8	61,841.8	70,630.2	76,581.9	69,804.1
Singapore.....	6,174.4	11,927.0	14,356.1	16,395.5	18,018.8	20,565.6	24,946.0	23,761.7	27,259.8	27,387.0	26,082.6	22,561.7	24,634.1	25,997.9	25,228.3
Hong Kong.....	4,769.2	4,925.1	6,930.2	8,713.3	10,228.7	13,973.5	11,467.2	9,334.4	13,511.5	13,850.6	14,725.4	16,448.1	14,903.0	19,405.0	20,425.5
India.....	3,517.5	4,953.9	9,969.3	8,851.0	8,174.3	9,710.8	12,428.9	13,574.4	15,077.5	15,345.5	17,919.9	18,677.0	19,853.8	23,977.1	24,747.7
Malaysia.....	1,681.6	2,516.3	5,482.4	7,573.5	10,551.4	10,276.8	11,837.9	20,789.7	28,363.2	27,972.4	31,213.7	30,651.6	36,360.4	57,705.7	64,335.3
Thailand.....	3,318.8	3,812.0	6,299.5	9,358.0	9,796.3	11,598.5	9,775.5	9,050.2	13,593.4	12,600.8	15,753.2	12,980.7	15,026.4	17,080.9	18,655.8
Philippines.....	4,180.7	2,024.3	3,987.0	5,316.8	5,419.9	5,823.6	7,321.7	6,989.7	8,596.4	7,356.8	8,016.1	7,234.0	6,544.3	7,464.2	8,075.6
Indonesia.....	1,914.6	2,472.6	3,784.5	5,886.0	7,158.5	7,553.3	6,860.9	4,178.3	5,793.0	7,808.5	10,186.0	8,442.3	4,309.4	4,788.1	5,678.8
South Africa.....	7,591.4	7,443.9	7,268.0	6,843.4	7,991.9	6,968.9	7,388.4	8,199.0	9,587.3	10,782.4	11,350.3	16,010.7	16,223.9	18,311.3	20,453.8
<b>Aerospace</b>															
Production all countries.....	141,854.3	180,072.7	227,003.6	238,704.5	242,216.2	238,013.1	220,998.9	203,832.9	208,046.6	225,204.0	251,036.4	281,177.9	294,257.7	292,353.4	320,530.4
United States.....	69,984.7	98,131.4	115,720.9	122,897.2	118,661.6	115,296.8	104,167.6	91,682.4	92,341.7	100,999.6	116,173.6	141,322.0	147,217.2	142,364.1	160,577.4
Canada.....	2,651.1	2,562.2	4,686.8	5,239.6	4,753.8	4,318.5	4,181.0	4,377.6	5,494.5	6,290.6	6,980.4	7,147.3	7,945.3	9,143.7	10,094.7
Mexico.....	35.6	38.2	274.3	111.4	95.8	145.3	148.1	127.1	529.9	260.7	171.8	194.8	421.7	370.2	397.5
European Union.....	37,034.2	48,443.3	62,768.1	65,642.4	65,875.3	67,466.1	60,839.5	61,873.6	62,886.9	66,553.3	69,798.4	76,866.7	83,739.1	90,732.6	96,873.0
Germany.....	8,407.2	9,624.4	11,660.4	12,334.4	12,194.5	12,009.4	9,675.4	9,779.0	8,564.5	10,632.5	13,085.4	13,749.3	17,733.8	17,733.8	18,488.1
France.....	10,339.3	16,966.6	21,973.6	22,747.2	23,763.0	24,405.7	23,731.5	24,447.4	26,713.7	27,209.0	26,376.9	29,803.3	34,152.4	37,302.1	43,349.4
United Kingdom.....	12,792.1	13,529.6	18,803.7	19,984.4	20,167.2	20,545.8	16,637.3	17,061.9	16,382.4	18,276.5	19,571.5	22,469.6	21,751.4	23,145.5	22,552.5
Italy.....	3,029.8	4,469.4	5,229.4	5,195.2	4,728.8	5,229.0	5,804.8	5,640.1	5,942.6	5,201.6	5,317.3	4,534.8	4,587.5	5,181.4	5,377.5
Other European Union.....	2,465.7	3,853.3	5,105.5	5,381.3	5,021.8	5,276.3	4,990.5	4,945.3	5,283.7	5,233.7	5,447.3	6,309.7	6,987.5	7,369.8	7,105.6
Brazil.....	21,183.9	14,370.1	23,107.9	22,919.5	24,589.6	27,368.5	23,878.0	20,535.2	20,427.0	21,018.7	23,707.8	19,322.0	16,780.2	9,303.3	8,896.4
Argentina.....	158.4	65.6	50.2	53.5	58.6	87.7	57.3	61.0	44.7	55.1	62.7	73.7	54.8	32.7	31.9
Chile.....	49.2	20.1	62.7	42.7	34.7	57.0	54.7	38.4	42.5	39.3	34.4	28.7	22.9	31.7	29.7
Peru.....	0.6	0.3	1.5	0.2	0.3	0.2	0.3	0.7	0.7	0.6	0.6	0.7	0.2	0.3	0.3
Costa Rica.....	6.2	5.1	10.7	9.0	11.1	12.0	9.1	11.7	14.2	17.4	17.8	9.6	9.8	7.2	6.8
Japan.....	2,550.1	4,279.3	4,849.3	4,936.2	5,079.6	5,531.9	5,822.1	6,170.7	6,397.6	6,565.7	7,464.2	7,521.3	7,319.5	7,073.9	7,338.4
China.....	1,268.0	2,645.8	3,433.3	3,899.7	4,509.4	6,314.2	8,240.6	8,235.2	9,419.9	12,566.8	14,643.1	16,098.5	18,163.4	19,076.5	20,850.6
South Korea.....	19.6	53.3	127.5	213.8	609.1	424.5	467.5	736.1	649.1	877.6	1,139.2	2,475.1	2,017.5	2,535.3	3,538.0
Australia.....	679.2	746.2	1,028.3	1,137.1	1,122.2	1,173.6	1,080.4	984.1	1,000.8	1,057.0	1,150.1	1,390.4	1,342.3	1,701.6	1,530.0
Taiwan.....	413.0	516.7	632.6	509.6	499.2	434.9	380.3	429.0	505.1	509.4	786.5	719.8	619.2	599.7	528.3
Singapore.....	229.0	595.3	562.3	666.3	672.4	939.5	971.6	1,048.4	1,053.5	1,024.1	992.4	979.8	982.5	937.7	864.8
Hong Kong.....	123.2	216.5	275.0	289.6	287.2	335.5	333.4	336.5	331.0	335.9	371.4	362.0	533.7	487.9	447.3
India.....	62.8	101.0	197.9	134.3	127.0	239.2	275.5	266.8	290.7	222.6	288.5	208.7	214.9	205.3	212.7
Malaysia.....	2.8	3.6	6.3	8.5	10.7	11.9	10.4	7.2	8.5	7.6	14.7	8.8	8.9	10.3	10.7
Thailand.....	21.1	21.7	56.5	63.7	94.1	115.5	120.8	68.9	81.0	83.6	62.2	47.5	59.5	78.0	72.6
Philippines.....	59.1	5.1	6.7	8.6	8.9	7.3	9.8	10.7	12.0	7.6	6.7	6.6	6.9	8.1	9.2
Indonesia.....	29.0	32.8	88.3	36.4	56.3	57.5	60.6	33.0	82.6	142.2	63.5	37.6	52.7	65.0	57.7
South Africa.....	439.6	330.4	549.5	498.0	481.9	451.5	446.7	462.2	562.3	575.3	555.0	512.9	547.2	613.0	630.3
<b>Value added all countries.....</b>	<b>53,578.6</b>	<b>73,380.2</b>	<b>91,392.4</b>	<b>98,449.6</b>	<b>100,839.3</b>	<b>93,567.2</b>	<b>86,242.0</b>	<b>79,696.6</b>	<b>79,425.8</b>	<b>83,713.1</b>	<b>92,683.0</b>	<b>99,510.7</b>	<b>106,688.0</b>	<b>107,391.2</b>	<b>115,968.1</b>
United States.....	24,740.1	41,439.7	48,009.6	48,781.3	49,186.8	43,980.5	39,895.2	35,746.7	35,878.8	39,986.4	42,621.4	49,380.0	55,880.6	58,501.4	63,473.3
Canada.....	1,299.5	1,421.8	2,233.7	2,543.8	2,225.0	2,385.4	2,336.7	2,390.0	2,902.3	3,092.9	3,443.6	3,229.5	3,544.6	4,079.2	4,501.3
Mexico.....	27.4	28.5	194.4	80.0	67.6	100.9	104.0	88.8	366.0	179.9	118.4	134.3	289.2	222.7	238.8

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
European Union .....	13,718.1	16,597.4	22,691.2	24,875.9	22,976.9	20,604.4	17,912.0	19,718.3	19,977.6	17,762.9	21,221.4	23,466.3	24,796.5	25,933.2	28,445.3
Germany .....	3,646.0	4,188.6	5,069.3	5,359.3	5,300.4	4,856.9	3,986.6	3,397.2	2,891.8	3,729.1	4,504.6	5,147.8	6,312.8	6,090.2	7,241.1
France .....	2,461.7	3,564.1	4,537.8	4,876.6	4,146.7	4,381.2	3,375.3	5,059.6	6,988.9	4,406.1	6,337.8	5,983.5	6,015.7	6,514.6	7,987.9
United Kingdom .....	5,626.5	5,752.4	8,975.5	10,361.6	9,682.6	7,389.6	6,370.9	7,046.0	6,023.2	5,802.2	6,332.3	7,147.3	7,310.2	7,854.8	7,631.9
Italy .....	900.9	1,437.5	2,087.7	2,068.4	1,836.9	1,706.3	2,038.1	2,178.3	2,058.2	1,743.3	1,885.6	2,439.7	2,281.9	2,588.4	2,690.1
Other European Union .....	1,083.0	1,654.8	2,020.9	2,210.1	2,010.3	2,270.5	2,141.1	2,037.2	2,015.4	2,082.1	2,161.1	2,748.0	2,876.0	2,885.2	2,894.2
Brazil .....	8,147.7	5,450.7	8,868.8	12,005.4	12,880.3	17,510.4	13,902.2	11,751.8	11,487.4	11,820.1	13,332.4	10,866.0	9,436.6	5,231.9	5,014.1
Argentina .....	65.0	38.8	26.8	29.4	29.1	43.6	12.4	12.8	8.6	11.4	11.5	14.4	11.7	5.4	5.2
Chile .....	42.0	19.3	29.9	37.6	27.5	22.4	38.5	10.9	10.7	5.6	22.7	19.0	15.1	21.0	19.7
Peru .....	0.2	0.1	0.6	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Costa Rica .....	4.2	3.3	6.8	5.7	6.4	7.1	5.4	6.6	7.5	6.9	6.7	5.1	5.2	3.8	3.6
Japan .....	1,163.4	1,955.7	1,743.6	1,738.9	1,882.0	2,163.7	2,450.7	2,439.1	2,648.8	2,781.5	2,974.1	3,132.3	3,139.3	3,047.3	3,164.9
China .....	552.0	928.3	892.3	1,023.7	1,131.9	1,622.7	2,212.7	1,952.6	2,295.9	3,083.8	3,572.5	4,128.9	4,651.2	4,884.5	5,338.1
South Korea .....	10.4	23.6	52.2	106.5	274.4	117.2	152.8	319.3	242.4	266.8	294.9	682.8	577.4	697.8	970.4
Australia .....	316.7	368.5	412.7	344.2	434.9	474.2	488.7	449.3	436.7	506.8	554.2	698.3	669.1	847.6	763.2
Taiwan .....	126.7	142.3	193.9	178.2	188.6	165.3	135.7	147.9	164.3	197.4	304.8	278.3	234.2	224.5	213.9
Singapore .....	176.8	468.5	335.7	354.3	352.2	510.9	560.7	601.1	593.6	585.9	749.1	577.7	573.5	544.8	504.4
Hong Kong .....	95.0	140.1	189.3	215.6	227.4	268.5	270.7	264.1	256.2	249.8	276.3	242.6	253.0	266.2	243.6
India .....	13.4	19.9	33.3	28.1	42.5	60.7	61.4	65.1	91.8	74.3	97.8	62.0	63.8	60.9	63.4
Malaysia .....	2.2	3.2	3.0	5.4	4.5	5.1	4.8	4.6	6.0	5.2	6.5	4.9	4.9	5.7	5.9
Thailand .....	3.8	5.9	14.2	8.9	69.9	85.9	16.7	17.1	20.4	20.6	15.0	12.1	14.1	18.3	17.0
Philippines .....	24.4	2.4	2.6	5.6	4.9	4.2	6.2	4.9	3.5	3.9	3.4	3.4	3.5	4.2	4.7
Indonesia .....	10.8	10.2	9.1	5.6	8.6	19.0	17.6	5.4	23.5	48.1	18.6	11.4	16.7	18.6	16.6
South Africa .....	136.0	77.7	143.8	125.5	127.9	138.7	137.1	141.8	172.4	176.4	170.2	157.3	167.7	187.8	193.3
Exports all countries .....	97,531.9	86,426.7	150,146.2	173,653.2	194,291.6	195,861.7	164,878.9	157,801.5	152,624.8	163,186.3	191,731.2	228,844.2	222,926.0	209,295.4	214,381.2
United States .....	53,042.4	38,968.4	67,213.7	80,020.9	88,443.3	90,750.0	74,271.2	69,742.3	57,492.2	71,307.7	87,157.2	111,017.7	103,985.3	81,879.5	82,224.6
Canada .....	3,533.1	3,421.1	5,051.4	6,973.6	8,144.1	6,123.6	5,052.0	5,318.2	6,796.6	7,764.4	8,080.5	10,452.1	11,308.2	12,849.3	14,174.0
Mexico .....	64.0	103.1	696.1	211.6	240.2	303.1	309.5	541.9	796.5	482.6	390.2	1,781.8	819.2	598.3	693.2
European Union .....	35,941.8	39,665.0	68,591.0	77,737.5	88,064.2	86,278.5	74,497.9	70,393.6	75,388.0	70,325.1	80,267.0	84,915.6	86,238.9	91,431.1	94,025.9
Germany .....	4,814.1	9,834.5	18,395.1	18,095.2	23,556.3	23,792.8	19,514.9	18,679.1	17,208.0	16,346.0	21,508.6	25,281.6	28,875.7	29,679.4	30,020.6
France .....	6,622.2	7,394.7	16,548.7	16,617.0	24,205.9	24,730.4	24,296.9	24,973.0	29,380.5	22,509.3	26,400.8	26,639.9	32,065.1	34,316.6	36,085.1
United Kingdom .....	18,412.2	15,438.7	19,823.6	24,523.0	22,513.1	18,714.7	15,545.0	13,863.7	14,117.7	18,205.1	20,065.5	18,052.8	10,663.7	11,889.7	11,950.6
Italy .....	1,820.2	3,222.8	4,884.5	7,230.7	6,431.8	6,903.5	4,697.3	4,478.7	3,601.8	3,957.7	3,478.2	5,561.6	5,696.7	6,998.7	7,295.5
Other European Union .....	4,273.1	3,774.4	8,939.1	11,271.7	11,357.1	12,137.0	10,443.8	8,399.1	11,080.0	9,307.1	8,813.8	9,379.7	8,937.8	8,546.8	8,674.2
Brazil .....	470.4	206.5	1,940.0	1,671.9	1,068.1	961.0	724.8	665.1	645.2	1,045.3	1,661.4	3,116.2	4,238.1	7,238.4	6,920.2
Argentina .....	39.8	5.5	3.9	41.8	25.2	43.6	58.3	5.6	52.7	160.2	90.2	73.3	160.1	309.9	315.9
Chile .....	5.3	1.1	6.0	73.2	5.3	14.9	12.5	6.3	10.8	22.6	21.7	62.1	71.8	95.7	95.0
Peru .....	0.0	0.8	2.0	0.6	0.1	5.0	0.4	0.0	2.7	0.2	1.5	0.2	0.9	0.5	0.5
Costa Rica .....	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	6.7	7.3	3.2	22.0	26.7
Japan .....	441.2	402.1	1,281.2	1,266.4	1,531.2	1,730.3	1,409.2	1,396.8	1,270.1	1,851.9	2,822.7	3,679.7	3,658.0	2,744.4	3,164.4
China .....	2.9	58.3	38.2	60.5	85.0	922.4	404.3	413.1	380.4	447.6	665.8	979.3	1,157.3	1,177.9	1,236.7
South Korea .....	503.6	621.9	423.1	429.8	524.5	589.8	576.4	427.1	537.1	474.0	1,501.9	2,136.2	994.7	1,321.8	1,430.2
Australia .....	735.4	342.5	712.7	685.8	846.7	917.4	913.9	832.5	1,027.6	1,018.4	1,007.6	1,019.0	915.5	722.1	772.0
Taiwan .....	2.9	4.6	28.5	7.5	73.7	14.5	33.4	15.4	24.0	57.4	69.8	126.1	106.3	95.7	99.2
Singapore .....	714.9	1,078.6	1,269.7	925.2	665.8	664.5	409.0	480.8	835.2	918.6	1,267.7	1,069.7	852.0	956.9	1,021.5
Hong Kong .....	144.7	95.7	121.8	158.4	128.9	185.8	145.6	131.0	187.8	204.7	225.1	229.2	203.7	200.0	198.5
India .....	12.8	27.0	34.4	18.6	31.6	27.4	15.4	39.2	16.6	42.1	111.9	33.5	65.7	53.7	53.7
Malaysia .....	373.5	216.5	634.8	758.7	1,307.2	1,864.5	2,112.6	3,489.5	2,723.0	2,078.9	1,792.8	2,452.8	1,614.2	731.6	742.4
Thailand .....	14.0	1.0	15.8	0.5	9.0	208.8	49.8	60.2	39.0	50.5	46.5	40.2	33.2	115.7	116.8
Philippines .....	1.1	0.7	16.8	3.2	2.2	0.4	0.0	0.4	3.8	41.3	107.8	71.5	34.8	32.2	33.6
Indonesia .....	8.7	1.5	35.8	5.3	21.6	33.8	125.6	178.8	38.1	49.7	43.6	41.6	92.8	45.0	46.1
South Africa .....	6.5	11.1	87.4	19.9	21.4	104.1	112.2	249.3	230.3	154.8	407.0	354.1	386.2	639.9	673.8

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Percent														
Import penetration all countries .....	65.2	45.4	63.0	69.5	77.2	79.1	73.4	75.1	73.3	72.5	75.8	80.9	75.9	72.7	68.1
United States.....	26.7	19.4	25.1	31.2	35.9	41.4	37.2	42.7	39.0	44.0	48.2	59.1	51.9	45.6	42.9
Canada.....	142.0	146.7	117.5	140.4	203.6	136.2	124.9	131.8	131.4	132.2	115.8	165.7	167.4	243.6	324.4
Mexico.....	221.2	184.7	163.6	127.9	139.3	145.0	152.4	179.1	375.6	259.5	192.5	969.2	178.0	155.4	186.6
European Union.....	98.9	81.9	109.2	119.4	133.5	131.2	129.1	119.1	135.6	110.3	117.9	111.9	102.5	101.6	99.6
Germany.....	62.0	131.5	240.4	159.2	295.8	289.6	331.2	312.5	398.8	198.3	248.6	510.5	401.5	452.3	441.5
France.....	66.3	45.0	76.0	77.3	97.9	99.1	102.6	108.0	137.8	83.0	100.1	89.1	93.6	94.8	86.0
United Kingdom.....	149.4	170.5	106.6	130.2	119.0	83.5	93.8	77.6	79.8	100.5	102.9	80.7	58.0	50.6	51.7
Italy.....	69.4	69.8	87.8	147.8	140.3	133.0	70.3	71.9	57.3	75.6	65.1	125.2	126.5	140.7	148.8
Other European Union.....	150.9	87.7	136.8	163.7	164.8	190.6	171.6	143.3	192.9	149.3	132.6	120.0	101.9	90.2	90.1
Brazil.....	8.5	4.5	9.7	10.8	13.9	9.4	8.3	5.0	8.1	7.9	11.1	17.3	22.9	102.8	130.3
Argentina.....	84.2	21.6	65.4	100.1	85.0	102.2	113.5	99.8	110.3	138.5	103.9	98.4	112.2	150.0	151.7
Chile.....	97.7	46.9	58.5	78.2	75.1	80.0	56.4	76.5	94.6	94.8	97.4	96.6	100.9	90.2	79.1
Peru.....	60.1	45.3	82.7	86.9	107.6	118.8	88.2	96.9	109.7	100.0	102.9	96.5	87.2	84.9	83.1
Costa Rica.....	118.5	7.4	32.9	52.3	72.4	79.3	84.5	90.3	86.5	36.6	48.4	85.1	87.7	119.8	129.1
Japan.....	76.6	51.4	70.5	78.6	79.1	82.1	75.0	74.7	62.6	57.7	68.4	73.9	79.6	71.8	67.3
China.....	56.8	56.8	42.5	38.6	41.7	54.0	51.9	47.7	26.5	28.7	36.2	39.9	27.2	23.4	22.8
South Korea.....	218.6	154.4	128.8	126.1	114.1	119.9	119.9	107.0	111.4	101.9	107.8	84.7	65.8	72.0	59.3
Australia.....	126.3	87.1	109.8	105.5	106.3	99.4	89.5	98.1	104.2	105.6	94.9	82.4	81.1	65.3	62.7
Taiwan.....	72.6	57.4	74.1	80.2	97.7	103.7	105.9	97.6	93.3	88.6	87.8	81.9	78.9	74.4	68.2
Singapore.....	105.0	96.7	101.0	92.7	86.8	83.5	80.8	80.2	91.4	94.8	104.3	101.8	95.5	101.9	104.8
Hong Kong.....	114.4	68.1	81.4	85.2	86.7	89.8	90.3	85.0	95.3	94.2	90.6	93.4	79.6	69.1	68.5
India.....	254.6	144.2	137.8	140.3	107.9	86.3	91.0	94.1	89.2	91.1	86.7	90.3	79.0	85.4	82.6
Malaysia.....	315.6	254.7	146.1	123.8	151.5	176.6	204.2	271.5	208.9	311.9	192.4	207.9	257.5	461.2	553.7
Thailand.....	140.6	95.4	105.2	112.0	112.9	117.7	108.7	116.3	119.7	116.9	99.5	85.3	89.9	86.6	81.6
Philippines.....	114.8	90.8	93.0	87.9	87.9	97.0	93.6	98.3	103.6	109.0	104.1	84.8	111.6	86.8	78.2
Indonesia.....	200.5	105.9	88.0	94.3	95.9	94.7	99.4	125.6	94.0	101.6	99.1	49.4	78.4	64.1	61.0
South Africa.....	79.6	44.3	51.0	56.8	90.9	90.0	85.9	80.6	83.6	62.9	85.7	83.6	79.2	87.2	79.9
	Millions of 1997 U.S. dollars														
Imports all countries .....	92,546.3	82,877.5	142,473.1	164,269.6	187,067.8	185,498.2	160,151.1	150,253.2	143,166.8	155,498.4	186,004.0	222,632.5	214,773.1	202,208.7	210,680.3
United States.....	11,901.0	15,525.9	19,666.0	24,484.1	24,276.6	25,857.1	22,825.5	21,642.3	23,582.8	23,860.9	27,003.0	36,419.7	38,434.3	43,449.9	51,553.7
Canada.....	5,081.4	4,452.1	6,595.5	5,778.8	6,134.4	6,075.0	3,986.1	3,454.0	4,521.3	5,307.8	8,049.4	8,422.5	8,246.5	8,103.1	8,165.8
Mexico.....	1,489.8	149.6	1,338.8	1,232.8	2,472.7	3,267.3	2,235.6	1,846.7	380.4	339.1	454.5	1,760.1	942.9	779.3	768.9
European Union.....	38,981.2	35,133.9	67,917.5	80,874.4	91,185.8	78,753.4	63,314.4	59,824.4	53,998.2	59,080.8	68,919.8	80,089.5	91,720.3	84,575.5	85,194.8
Germany.....	5,384.3	7,275.9	12,764.6	18,175.5	17,803.8	18,652.8	14,553.8	13,039.7	10,801.5	10,774.8	14,091.3	14,513.9	17,460.1	18,598.3	18,926.9
France.....	7,333.8	9,212.1	21,820.0	22,555.9	34,619.4	27,331.8	21,590.2	19,443.9	16,056.2	17,552.7	19,928.6	24,027.0	26,220.4	24,597.1	24,656.2
United Kingdom.....	14,997.4	9,510.9	11,715.1	14,734.3	12,109.4	11,605.3	10,583.8	11,069.9	9,883.1	12,025.5	17,780.4	18,036.7	14,829.0	11,326.9	11,209.3
Italy.....	2,771.3	3,142.6	3,378.1	4,818.3	5,291.1	4,466.5	3,182.0	3,519.9	3,371.1	3,741.4	3,424.7	5,159.3	5,284.2	6,445.4	6,481.0
Other European Union.....	8,494.5	5,992.3	18,239.7	20,590.3	21,362.2	16,697.2	13,404.6	12,751.1	13,886.2	14,986.5	13,694.8	18,352.7	27,926.6	23,607.8	23,921.5
Brazil.....	1,966.6	685.6	2,320.3	2,612.0	4,035.5	2,842.6	2,138.9	1,042.4	1,752.2	1,723.4	2,750.2	3,420.4	3,756.3	3,422.9	3,756.4
Argentina.....	707.6	17.6	227.7	279.1	123.5	684.7	608.8	738.5	518.0	467.0	739.4	878.1	1,108.2	879.3	845.4
Chile.....	254.8	51.0	266.1	637.1	412.2	766.8	72.9	213.4	587.3	681.5	475.0	910.9	306.9	818.8	810.7
Peru.....	56.5	72.4	135.4	144.3	118.6	115.0	75.9	94.6	137.5	58.0	32.3	86.7	66.7	58.4	58.3
Costa Rica.....	28.5	0.4	5.6	10.9	52.1	61.7	67.5	199.3	90.8	10.0	10.4	14.2	64.7	75.7	84.1
Japan.....	4,959.2	5,376.7	6,120.4	9,431.0	9,195.1	10,504.0	8,157.6	8,478.6	6,339.7	5,872.9	10,032.2	12,445.2	11,406.5	9,010.5	8,702.9
China.....	860.1	2,445.9	2,066.7	2,248.4	3,039.9	6,074.3	7,788.0	8,011.1	3,249.3	4,870.9	7,941.2	10,148.0	6,475.1	5,525.0	5,905.9
South Korea.....	1,442.9	1,669.2	3,496.3	2,953.8	4,555.8	4,724.5	4,729.4	4,672.0	5,369.1	5,587.0	5,034.9	4,188.8	2,624.7	4,893.3	4,857.5
Australia.....	1,672.0	3,220.9	4,666.7	5,732.8	5,718.0	4,518.2	1,673.8	2,554.8	2,522.7	3,532.0	2,674.7	3,586.4	3,846.4	4,361.6	4,322.3
Taiwan.....	1,051.7	1,146.1	1,343.4	1,495.4	3,365.9	3,623.4	4,838.4	4,121.7	4,793.4	3,071.3	5,154.2	6,536.1	4,671.7	3,108.3	2,915.2
Singapore.....	2,654.4	2,535.9	3,337.7	2,607.3	3,576.2	3,620.4	4,172.8	3,708.3	3,752.4	6,279.4	6,735.1	5,727.4	4,669.1	2,537.2	2,427.3
Hong Kong.....	932.5	657.6	1,031.7	1,532.4	1,701.3	1,701.6	2,044.0	1,316.8	4,080.9	3,835.1	1,417.4	4,113.6	1,906.9	1,079.0	1,069.1
India.....	2,974.5	706.3	2,004.7	1,844.3	666.1	662.2	2,657.8	2,060.2	1,433.1	1,857.9	1,155.9	1,561.7	589.5	1,118.4	1,103.5
Malaysia.....	840.0	409.8	1,905.1	3,397.0	3,273.5	4,068.3	4,090.0	5,460.9	5,547.3	3,105.1	3,703.4	3,962.6	2,401.3	929.3	910.3
Thailand.....	1,076.5	439.9	627.6	2,287.6	1,724.7	3,277.5	1,486.8	1,580.5	2,853.2	1,987.0	3,005.3	3,349.1	2,796.9	1,469.9	1,572.0

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of 1997 U.S. dollars														
Philippines.....	1,258.5	126.5	569.6	704.6	544.3	681.5	1,502.6	343.4	985.4	1,805.8	2,584.8	934.7	151.7	414.5	398.8
Indonesia.....	1,613.7	402.4	503.3	1,360.4	1,814.5	2,077.0	2,183.3	636.5	636.6	1,742.2	2,225.5	821.5	362.9	422.3	401.4
South Africa.....	1,108.7	471.4	517.1	581.9	2,201.7	1,284.3	1,231.5	678.3	1,054.1	697.6	889.5	1,702.9	1,390.9	1,617.3	1,597.1
Apparent consumption all countries.....	142,035.7	182,370.0	226,151.4	236,329.2	242,188.8	234,380.5	218,211.7	200,116.7	195,206.7	214,353.1	245,309.3	275,217.2	282,867.9	278,089.1	309,256.8
United States.....	44,629.6	80,060.6	78,363.2	78,608.9	67,618.2	62,539.5	61,376.8	50,687.3	60,468.7	54,208.6	56,019.4	61,648.0	74,129.3	95,266.9	120,156.4
Canada.....	3,578.6	3,035.2	5,615.6	4,117.0	3,013.5	4,461.0	3,191.3	2,620.0	3,441.3	4,015.0	6,949.3	5,084.3	4,927.2	3,326.8	2,517.6
Mexico.....	673.5	81.0	818.5	964.1	1,775.1	2,252.7	1,466.6	1,031.2	101.3	130.7	236.1	181.6	529.8	501.6	412.0
European Union.....	39,410.1	42,908.7	62,198.3	67,756.8	68,302.6	60,043.8	49,063.1	50,243.6	39,829.3	53,542.3	58,451.3	71,583.5	89,513.8	83,208.3	85,537.5
Germany.....	8,688.2	5,531.2	5,309.8	11,419.3	6,019.3	6,441.4	4,394.9	4,173.3	2,708.8	5,433.5	5,668.2	2,842.9	4,348.3	4,112.4	4,287.3
France.....	11,061.0	20,462.1	28,719.0	29,184.2	35,376.1	27,581.1	21,047.3	18,009.9	11,650.3	21,155.0	19,904.7	26,981.8	28,015.9	25,952.4	28,673.2
United Kingdom.....	10,037.9	5,577.5	10,989.9	11,315.1	10,174.9	13,903.2	11,283.7	14,264.3	12,389.6	11,968.1	17,286.4	22,341.8	25,567.6	22,384.7	21,669.0
Italy.....	3,995.2	4,503.4	3,848.1	3,260.2	3,770.2	3,359.0	4,524.4	4,896.3	5,881.4	4,949.0	5,263.9	4,121.2	4,177.3	4,580.3	4,355.3
Other European Union.....	5,627.8	6,834.5	13,331.5	12,578.0	12,962.1	8,759.1	7,812.9	8,899.8	7,199.2	10,036.7	10,328.3	15,295.9	27,404.7	26,178.5	26,552.7
Brazil.....	23,231.0	15,378.9	23,838.7	24,293.1	28,960.7	30,264.2	25,921.0	21,010.7	21,615.0	21,731.3	24,796.6	19,830.2	16,430.7	3,330.1	2,882.7
Argentina.....	840.6	81.6	348.2	278.7	145.3	670.2	537.2	739.9	469.7	337.3	712.0	892.7	987.8	586.4	557.2
Chile.....	260.8	108.7	454.8	814.9	549.0	958.1	129.2	279.1	621.1	719.0	487.7	943.2	304.3	908.2	1,025.1
Peru.....	94.0	159.7	163.8	166.2	110.2	96.8	86.0	97.6	125.3	58.0	31.4	89.9	76.5	68.8	70.1
Costa Rica.....	24.1	5.6	17.0	20.8	72.0	77.9	79.9	220.7	104.9	27.3	21.5	16.7	73.8	63.2	65.2
Japan.....	6,474.8	10,461.9	8,688.0	12,004.2	11,623.1	12,793.6	10,873.8	11,358.2	10,132.3	10,176.1	14,673.7	16,852.2	14,337.6	12,544.5	12,940.1
China.....	1,515.6	4,305.2	4,868.7	5,821.4	7,294.7	11,258.9	15,005.4	16,800.5	12,257.0	16,949.5	21,918.5	25,456.0	23,833.2	23,650.5	25,901.9
South Korea.....	660.0	1,081.2	2,715.5	2,343.2	3,992.2	3,941.5	3,945.1	4,366.1	4,820.2	5,483.6	4,672.2	4,948.2	3,989.0	6,799.6	8,191.5
Australia.....	1,323.7	3,697.8	4,249.3	5,435.5	5,381.7	4,544.7	1,869.8	2,604.3	2,421.5	3,343.7	2,817.2	4,350.7	4,744.9	6,684.6	6,899.2
Taiwan.....	1,449.0	1,996.2	1,813.8	1,865.1	3,445.8	3,494.5	4,567.1	4,221.6	5,137.4	3,466.2	5,870.9	7,981.9	5,922.1	4,179.3	4,274.2
Singapore.....	2,529.3	2,622.8	3,302.1	2,812.0	4,119.6	4,334.6	5,161.6	4,621.7	4,105.6	6,626.5	6,459.9	5,627.3	4,888.4	2,489.9	2,317.0
Hong Kong.....	815.0	966.4	1,268.1	1,799.3	1,961.7	1,894.0	2,263.4	1,548.4	4,282.4	4,069.6	1,563.7	4,403.8	2,395.1	1,561.9	1,561.1
India.....	1,168.4	489.8	1,455.1	1,314.4	617.1	767.2	2,921.3	2,190.2	1,606.9	2,039.5	1,332.6	1,728.8	746.2	1,310.2	1,335.5
Malaysia.....	266.2	160.9	1,304.0	2,745.1	2,161.4	2,304.1	2,003.2	2,011.3	2,656.1	995.6	1,925.3	1,906.3	932.4	201.5	164.4
Thailand.....	765.6	461.2	596.4	2,041.9	1,527.7	2,785.9	1,367.7	1,358.5	2,384.5	1,699.1	3,021.0	3,927.9	3,112.4	1,697.4	1,926.8
Philippines.....	1,096.1	139.2	612.2	801.2	619.3	702.8	1,605.3	349.5	951.2	1,656.2	2,483.8	1,102.1	135.9	477.7	509.7
Indonesia.....	804.7	380.1	572.0	1,442.8	1,892.8	2,192.8	2,196.6	507.0	677.2	1,715.0	2,245.4	1,661.9	462.9	659.3	658.1
South Africa.....	1,393.3	1,064.1	1,014.1	1,024.2	2,422.5	1,426.8	1,433.3	841.6	1,260.2	1,108.4	1,037.5	2,036.1	1,755.8	1,854.1	1,999.1
Office and computing machinery															
Production all countries.....	103,487.8	168,907.2	195,727.8	201,288.2	204,931.9	207,467.1	205,991.2	223,891.0	267,788.9	303,918.0	393,321.0	475,509.4	538,114.3	642,690.5	658,723.7
United States.....	24,729.8	41,885.8	42,806.7	41,040.2	37,036.7	41,767.1	44,113.6	51,134.1	64,266.5	75,363.2	110,867.1	153,061.9	160,660.9	174,794.0	201,161.7
Canada.....	1,627.1	2,180.9	3,337.1	3,268.5	3,361.6	3,489.0	3,853.6	6,531.3	8,959.0	7,238.8	3,712.3	4,274.3	3,817.5	5,214.8	4,909.2
Mexico.....	506.3	811.5	1,316.5	1,500.4	1,461.5	1,503.9	1,698.0	2,158.8	2,613.2	3,743.6	5,944.7	7,160.1	8,584.5	9,388.1	9,506.2
European Union.....	46,539.3	62,541.4	57,154.8	54,207.2	52,004.9	50,117.6	44,865.3	49,785.4	55,884.7	53,093.9	63,975.8	69,246.6	70,977.5	81,019.4	79,024.2
Germany.....	32,801.1	30,271.8	20,736.5	19,242.6	16,819.4	14,942.2	9,934.6	11,472.2	12,659.9	11,194.4	14,527.7	15,838.4	13,946.6	19,286.7	16,014.1
France.....	3,009.0	6,989.0	8,200.2	8,158.4	8,314.9	8,096.0	7,553.1	8,095.8	9,518.6	7,680.5	10,051.0	10,741.7	11,093.7	11,823.9	11,391.2
United Kingdom.....	4,892.3	10,077.9	14,914.5	15,240.2	15,844.8	16,007.3	16,267.5	17,652.3	18,203.3	19,538.5	22,588.7	25,387.4	27,201.8	28,436.5	31,349.7
Italy.....	2,535.1	7,707.6	5,354.7	4,231.4	3,506.2	3,419.8	3,404.7	4,009.5	4,956.0	4,165.2	4,327.2	4,546.8	4,525.9	3,762.2	3,557.9
Other European Union.....	3,301.8	7,495.1	7,948.8	7,334.6	7,519.6	7,652.4	7,705.4	8,555.6	10,546.8	10,515.3	12,481.2	12,732.3	14,209.6	17,710.1	16,711.3
Brazil.....	604.2	1,270.6	2,484.8	1,943.7	1,893.9	2,370.0	2,755.3	2,828.8	2,575.2	2,805.7	3,647.0	4,227.9	4,258.3	4,938.9	4,983.6
Argentina.....	276.2	125.4	105.4	93.5	110.3	121.8	192.6	195.4	167.9	191.2	309.7	317.1	301.9	235.8	222.4
Chile.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peru.....	9.1	10.1	10.2	11.1	30.5	5.5	5.1	10.7	12.5	11.1	17.5	27.1	21.2	25.1	24.8
Costa Rica.....	0.0	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.8	1.5	1.9	2.3	2.2	2.2
Japan.....	24,484.0	51,709.1	68,329.8	75,180.0	84,530.7	80,897.2	75,883.2	71,072.9	78,999.7	92,551.8	104,042.8	108,101.3	105,717.7	112,666.1	100,773.2
China.....	666.5	934.8	1,695.4	2,148.0	2,554.1	2,721.3	2,685.9	3,140.7	5,547.4	13,000.1	21,883.2	39,434.2	69,195.6	103,853.4	122,324.9
South Korea.....	598.6	1,085.6	2,736.8	3,082.7	3,219.9	3,667.4	4,074.3	5,573.3	7,120.8	6,925.5	12,369.0	13,574.3	26,326.8	50,823.5	50,641.8
Australia.....	144.7	103.3	135.3	216.5	240.7	442.6	481.3	617.5	637.1	606.8	924.6	967.5	925.8	1,207.7	1,141.4
Taiwan.....	911.8	2,517.9	4,733.0	5,154.0	5,702.9	6,671.9	8,145.9	9,855.4	15,017.7	17,558.3	25,467.5	28,692.3	33,118.6	34,177.6	25,531.6
Singapore.....	258.0	543.9	6,056.6	7,278.8	7,081.9	8,288.0	11,931.8	15,267.0	18,433.0	21,458.6	27,142.0	30,291.9	33,146.7	39,301.4	34,471.9



## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of 1997 U.S. dollars														
Hong Kong.....	155.1	403.2	1,369.9	2,402.2	2,506.9	2,250.7	1,942.4	1,762.0	2,500.4	2,356.8	2,352.9	3,303.1	3,150.2	4,008.5	3,675.5
India.....	22.1	41.6	457.4	421.3	603.6	659.8	417.2	811.8	833.4	807.2	1,276.6	1,367.9	1,559.4	1,560.0	1,616.9
Malaysia.....	3.1	3.0	4.0	50.5	157.5	217.5	382.0	432.6	782.9	2,063.3	3,424.6	3,726.5	5,537.0	8,124.0	8,436.8
Thailand.....	0.2	1.0	1.4	21.3	56.7	138.8	89.4	10.3	13.3	15.5	22.3	28.8	31.0	32.9	32.9
Philippines.....	4.2	8.6	59.0	7.6	13.8	22.9	190.5	248.3	471.0	399.0	550.9	653.5	1,024.4	1,202.0	1,360.9
Indonesia.....	0.4	1.2	1.9	3.1	2.1	4.9	37.8	8.4	31.6	43.2	28.9	21.6	17.9	40.6	41.4
South Africa.....	13.8	12.4	14.8	14.2	12.3	10.4	10.2	9.9	11.2	15.8	21.4	26.5	32.6	36.0	37.0
Value added all countries.....	41,437.5	59,235.4	69,278.4	69,497.7	67,093.8	64,442.9	62,271.0	66,479.6	74,969.2	85,279.3	108,625.4	138,287.1	146,339.1	166,977.7	180,901.2
United States.....	13,202.1	17,763.6	21,679.8	20,248.1	17,567.0	17,348.9	17,557.6	19,147.6	21,517.3	24,575.1	36,201.8	55,037.5	51,336.1	52,747.7	68,277.7
Canada.....	608.5	931.3	957.3	789.6	609.3	505.3	833.1	924.7	643.7	496.4	673.9	919.0	618.1	844.4	792.7
Mexico.....	204.3	331.5	539.4	619.2	629.1	705.6	734.4	872.3	1,037.0	1,499.6	2,408.0	2,862.9	2,986.7	3,078.7	3,112.0
European Union.....	19,295.9	23,137.4	21,117.5	19,765.0	18,322.0	15,993.4	14,254.4	15,684.7	16,896.8	15,902.6	18,219.6	19,795.4	18,923.4	20,506.5	20,075.5
Germany.....	13,988.2	12,930.8	8,876.7	8,240.2	7,337.7	5,307.2	3,895.4	4,269.2	4,307.9	3,728.0	4,940.3	5,033.6	4,226.2	4,616.6	3,975.9
France.....	1,390.1	3,006.8	3,216.7	3,111.7	2,883.7	3,093.1	2,550.8	2,652.3	2,846.3	2,600.9	2,980.0	3,320.3	3,064.7	2,963.5	3,049.2
United Kingdom.....	2,069.6	3,384.5	4,756.9	4,736.7	4,437.5	4,004.6	4,335.1	5,072.0	5,073.4	5,154.3	5,692.2	6,549.2	6,274.3	6,116.6	6,270.6
Italy.....	421.7	872.3	939.9	806.8	787.5	833.6	628.5	600.7	1,054.4	646.1	683.2	745.1	759.1	691.7	654.3
Other European Union.....	1,426.3	2,943.0	3,327.3	2,869.6	2,875.7	2,754.9	2,844.7	3,090.5	3,614.8	3,773.2	3,923.9	4,147.2	4,598.9	6,118.2	5,675.4
Brazil.....	363.1	753.0	1,489.9	1,281.8	1,248.9	1,677.9	1,865.5	1,712.4	1,461.0	1,591.8	2,069.1	2,398.7	2,415.9	2,802.0	2,826.2
Argentina.....	127.7	70.6	38.3	39.7	46.8	51.7	70.6	67.2	50.4	61.9	100.3	102.7	97.7	76.3	72.0
Chile.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peru.....	3.2	3.2	3.0	5.4	6.9	1.6	1.6	3.2	3.6	3.1	4.8	7.5	5.8	6.9	6.8
Costa Rica.....	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.8	1.0	1.2	1.2	1.2
Japan.....	6,063.1	13,821.7	18,000.8	20,025.9	22,157.3	20,952.3	18,559.8	18,271.3	20,963.3	24,654.7	25,451.0	26,673.8	26,967.3	28,795.6	25,750.4
China.....	299.0	337.1	510.4	620.8	723.2	770.1	813.0	881.5	1,506.1	3,471.9	6,004.2	10,360.9	18,641.3	27,952.3	32,893.6
South Korea.....	50.4	139.9	605.7	820.1	714.0	779.6	872.8	1,195.5	1,530.8	1,430.2	2,298.1	2,544.0	4,426.0	7,683.1	7,663.0
Australia.....	50.8	37.5	42.2	66.2	77.1	143.2	166.5	217.9	229.8	257.1	378.2	387.0	390.6	509.6	482.5
Taiwan.....	182.7	504.1	925.0	1,105.5	1,200.7	1,417.4	1,703.6	1,982.5	2,740.6	3,427.9	4,750.1	5,431.7	6,070.4	5,854.1	4,311.9
Singapore.....	109.0	218.0	1,871.0	2,186.1	2,073.7	2,456.1	3,297.1	3,831.4	4,426.6	5,456.7	6,690.0	7,640.2	8,758.6	10,328.1	9,047.8
Hong Kong.....	63.3	90.1	263.9	555.4	501.3	467.0	343.0	367.6	472.8	465.7	516.3	885.1	590.8	825.6	757.4
India.....	8.0	17.2	116.5	97.6	152.3	187.1	91.3	202.2	182.5	135.6	226.9	241.7	274.9	274.9	284.0
Malaysia.....	1.8	1.7	1.1	11.0	39.1	38.6	69.6	61.7	90.0	349.4	736.0	802.0	1,189.5	1,737.0	1,800.3
Thailand.....	0.1	0.4	0.3	13.7	45.2	93.1	83.0	3.0	3.9	4.5	6.5	8.3	9.0	9.5	9.5
Philippines.....	1.9	1.7	7.9	4.5	7.0	8.5	35.2	65.3	153.4	128.3	178.6	211.9	332.1	391.5	445.3
Indonesia.....	0.2	0.5	0.7	1.2	0.8	1.7	4.1	3.6	4.3	1.3	6.4	4.2	3.3	7.8	7.9
South Africa.....	6.7	5.4	5.4	5.4	5.0	4.5	4.5	4.3	4.9	6.9	9.3	11.6	14.2	15.7	16.1
Exports all countries.....	36,317.8	79,864.0	144,568.3	163,797.4	180,286.0	203,725.0	231,731.5	281,052.2	365,169.9	438,478.0	555,930.5	621,984.9	747,180.9	929,992.7	871,078.0
United States.....	11,260.9	20,705.3	34,739.4	37,498.4	40,297.8	44,468.5	47,775.9	59,194.5	75,138.6	89,039.6	108,522.0	109,593.1	119,862.0	152,699.6	141,933.4
Canada.....	1,141.4	2,098.2	3,154.7	3,673.5	4,367.2	5,081.8	5,524.0	7,722.1	10,292.4	9,781.3	10,686.2	12,229.7	12,763.4	15,290.7	13,014.4
Mexico.....	58.5	477.6	865.8	778.7	997.6	1,562.1	2,001.2	3,439.6	4,839.8	7,705.7	12,270.0	16,324.5	22,504.2	28,951.0	26,655.9
European Union.....	16,531.0	33,383.1	50,773.0	56,908.6	60,592.1	63,143.8	73,537.9	86,078.2	113,862.3	129,919.0	166,129.5	201,494.9	236,879.6	273,113.8	266,119.2
Germany.....	4,042.1	7,687.2	10,021.0	11,094.0	11,642.6	11,492.7	12,130.7	14,539.5	18,089.8	19,862.5	23,915.7	31,006.2	36,779.0	46,362.3	45,555.2
France.....	2,469.2	4,208.6	6,586.2	7,071.2	7,879.3	8,644.9	8,756.9	10,339.2	13,619.3	16,275.6	20,305.5	24,417.0	26,110.5	29,173.7	28,441.2
United Kingdom.....	3,648.6	7,854.2	13,116.0	14,701.3	15,529.8	15,809.8	19,310.9	22,748.9	30,346.6	33,439.0	42,425.2	47,023.8	55,149.3	60,509.5	58,679.4
Italy.....	2,454.6	3,513.1	5,268.2	5,517.3	5,659.6	5,485.4	6,817.2	7,163.5	8,731.6	8,103.1	7,570.3	8,156.1	8,851.3	9,085.9	8,851.8
Other European Union.....	3,916.6	10,120.0	15,781.5	18,524.9	19,880.9	21,711.0	26,522.2	31,282.2	43,075.0	52,238.8	71,912.7	90,891.9	109,989.6	127,982.3	124,591.6
Brazil.....	482.7	411.3	408.2	265.6	430.5	429.8	381.7	335.5	450.1	658.4	699.2	875.0	1,311.1	1,400.4	1,318.4
Argentina.....	215.9	206.8	179.0	166.5	194.9	168.2	122.8	133.7	115.3	82.6	63.3	85.8	77.6	115.1	98.8
Chile.....	0.7	0.5	1.5	1.1	2.1	5.4	5.3	6.5	11.3	14.9	21.6	30.5	37.2	46.4	43.4
Peru.....	0.1	1.5	1.4	0.0	0.3	0.5	0.7	0.3	1.3	3.1	4.4	7.7	8.1	10.2	9.3
Costa Rica.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	0.7	81.2	101.0	116.6	121.3
Japan.....	4,107.7	14,821.0	30,001.8	33,284.5	36,179.4	41,631.5	45,020.5	48,342.9	53,577.9	57,147.7	70,465.6	73,149.7	77,861.8	85,427.5	79,019.7
China.....	12.9	19.9	214.5	457.3	726.2	1,564.4	2,352.8	3,708.4	6,911.4	11,052.1	17,490.3	26,539.0	34,468.0	51,212.1	50,464.5
South Korea.....	127.1	829.1	3,137.1	3,298.6	3,620.8	4,032.2	4,624.7	4,949.3	7,226.7	9,509.3	12,849.2	13,242.2	29,180.2	57,182.7	49,103.6

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Australia.....	137.5	192.7	459.4	633.1	876.0	945.7	1,182.9	1,717.5	2,102.8	2,485.4	2,517.1	2,326.0	2,454.0	2,375.0	2,242.5
Taiwan .....	347.5	2,007.5	6,215.3	7,428.8	8,849.7	11,083.7	12,228.3	15,261.1	21,988.1	28,470.8	35,810.8	40,687.2	55,558.6	66,989.0	58,791.0
Singapore.....	259.7	1,709.7	7,449.0	10,318.4	11,655.8	14,672.0	20,218.1	27,540.4	36,990.7	47,503.6	56,106.9	56,145.0	66,042.4	78,818.2	69,983.8
Hong Kong.....	739.8	1,574.8	3,085.2	4,182.4	5,159.7	6,787.3	6,975.6	8,705.8	12,996.9	15,937.3	20,901.4	24,441.0	28,738.8	40,870.3	40,197.6
India.....	4.8	23.1	66.6	58.7	37.2	93.6	167.9	237.7	377.8	555.5	531.6	199.4	362.7	1,140.7	1,100.9
Malaysia.....	3.9	43.4	350.4	970.4	1,810.1	2,354.0	3,211.5	5,521.6	7,370.4	11,315.6	15,754.6	15,187.4	19,495.1	25,596.1	24,055.7
Thailand.....	6.1	91.9	1,314.0	1,661.6	2,143.7	2,816.8	3,095.2	4,450.1	6,042.9	7,875.3	8,723.9	7,882.4	10,549.2	14,741.0	14,270.1
Philippines.....	1.9	0.5	227.2	88.6	148.5	278.0	325.6	363.4	729.0	3,440.4	5,721.7	7,208.1	8,681.0	10,912.6	10,932.4
Indonesia.....	2.3	15.7	11.8	10.3	44.5	215.7	211.1	280.7	367.1	548.3	790.9	493.8	682.2	1,593.5	1,498.2
South Africa.....	10.9	31.1	21.8	33.7	31.9	72.0	81.2	83.8	122.6	204.9	296.4	326.6	537.6	419.6	401.0
Percent															
Import penetration all countries.....	32.9	44.6	69.1	77.7	82.5	95.9	107.6	118.5	130.0	137.6	135.5	126.2	131.7	133.8	121.2
United States.....	29.0	52.1	84.6	97.9	116.6	112.0	110.1	114.1	112.6	115.0	98.4	78.4	84.2	91.2	74.9
Canada.....	48.0	51.7	63.7	68.6	73.5	72.9	72.3	73.7	79.6	80.6	142.9	137.4	153.2	155.5	123.8
Mexico.....	37.0	41.5	56.9	47.7	59.0	80.9	94.9	134.2	238.7	320.3	367.3	552.6	712.8	834.7	732.9
European Union.....	37.5	48.2	78.9	94.7	101.8	110.2	129.1	134.1	157.1	176.0	173.8	189.0	204.1	190.4	181.6
Germany.....	13.4	25.9	56.3	69.7	79.1	89.9	112.8	107.5	122.3	137.8	122.0	139.6	159.5	146.9	162.2
France.....	71.7	54.0	77.7	88.7	93.9	105.8	107.5	114.2	132.3	171.5	150.8	163.8	167.3	149.0	146.7
United Kingdom.....	67.1	64.1	75.9	85.9	89.8	88.4	103.1	119.3	154.3	157.5	177.7	163.2	168.8	158.6	133.9
Italy.....	99.7	42.6	92.9	117.3	132.7	128.6	168.6	152.3	147.9	153.8	130.4	139.8	150.6	154.5	137.2
Other European Union.....	77.7	74.7	103.3	129.8	135.6	152.9	178.3	185.9	210.5	232.2	250.7	286.0	312.8	298.9	279.8
Brazil.....	54.9	35.3	25.3	31.7	35.8	39.4	41.8	51.2	68.7	73.4	65.6	55.3	39.3	39.5	30.2
Argentina.....	43.7	87.4	106.0	117.8	105.8	96.4	96.3	103.4	110.5	116.1	90.4	96.1	109.7	122.8	103.4
Chile.....	69.7	66.4	65.7	66.5	68.1	70.3	74.5	80.3	85.1	91.9	101.7	113.9	124.5	130.5	137.3
Peru.....	28.5	30.3	54.0	56.3	61.7	88.1	78.6	92.3	111.5	114.6	98.0	77.8	58.0	52.9	44.7
Costa Rica.....	1,242.1	349.2	213.4	202.8	171.8	167.7	155.6	148.1	139.1	116.9	97.9	267.1	288.2	382.3	416.5
Japan.....	6.7	7.7	14.6	15.4	14.6	18.5	25.0	36.5	47.6	47.9	51.9	49.2	60.6	71.8	77.5
China.....	26.9	111.8	55.3	47.2	55.0	75.9	107.0	124.0	128.6	81.6	74.9	63.0	45.5	46.0	39.5
South Korea.....	29.9	93.7	376.1	203.3	240.7	326.8	270.4	106.7	129.6	206.8	107.2	92.2	128.3	220.6	215.4
Australia.....	87.9	89.5	116.5	121.9	134.0	121.3	124.8	150.6	167.9	199.9	121.2	110.3	121.4	87.9	70.7
Taiwan.....	27.6	123.6	376.1	416.1	448.0	464.6	418.8	426.3	377.8	435.8	383.8	389.4	475.8	600.7	700.0
Singapore.....	89.2	530.7	358.4	415.1	481.2	520.8	503.1	544.6	605.3	665.3	614.8	550.6	578.3	571.0	558.2
Hong Kong.....	634.3	630.9	560.0	472.4	547.7	679.3	794.9	880.2	914.4	1,052.0	994.3	836.1	697.0	623.2	534.7
India.....	78.4	104.3	53.6	51.2	30.4	32.0	56.5	48.7	68.0	83.2	70.2	66.2	78.3	106.1	93.5
Malaysia.....	193.8	211.5	383.8	886.7	1,510.5	1,857.7	1,653.3	1,856.0	1,674.3	1,205.1	992.4	800.8	726.6	695.1	601.3
Thailand.....	81.7	104.6	737.6	1,096.9	1,162.0	1,117.9	1,271.8	1,516.2	1,699.9	1,872.5	1,410.1	1,052.1	1,305.6	1,223.1	999.6
Philippines.....	69.1	68.2	218.7	125.9	192.8	227.0	136.4	126.7	141.0	752.0	1,158.2	943.8	850.3	724.6	573.0
Indonesia.....	146.8	92.0	71.4	73.2	90.1	387.2	439.0	849.4	1,432.0	1,691.8	1,488.8	526.4	1,079.4	1,004.2	820.2
South Africa.....	77.3	65.0	89.7	110.7	123.7	144.5	146.1	154.3	170.3	126.9	114.8	83.2	69.9	60.5	45.8
Millions of 1997 U.S. dollars															
Imports all countries.....	35,274.5	80,344.6	151,286.4	172,810.0	191,722.6	219,579.5	252,831.9	311,174.9	406,223.3	490,978.2	620,837.3	719,374.6	880,060.4	1,072,762.1	1,020,309.0
United States.....	4,320.7	17,485.5	34,984.2	38,478.8	42,932.0	52,814.4	64,038.7	77,975.4	94,295.6	109,782.1	139,671.2	162,591.6	197,192.6	230,294.0	190,097.1
Canada.....	1,767.7	4,021.9	6,501.9	7,601.2	8,906.5	10,082.0	11,215.5	13,469.9	16,339.8	19,278.8	23,237.2	25,258.9	28,622.3	34,802.8	33,820.7
Mexico.....	462.7	729.7	1,118.5	1,462.9	1,981.7	2,385.6	3,194.9	4,354.5	4,108.7	6,007.7	8,691.7	10,182.9	13,684.8	18,791.7	17,691.7
European Union.....	20,417.0	39,998.9	73,784.6	84,365.0	89,998.3	97,428.6	105,190.0	122,780.5	161,827.7	188,701.5	240,568.7	295,547.4	348,136.3	392,652.8	386,326.1
Germany.....	4,468.1	8,264.9	15,578.2	19,231.9	22,140.8	23,803.9	24,544.1	28,999.2	36,964.3	41,294.6	52,012.3	61,970.1	75,456.7	82,478.1	80,581.2
France.....	3,505.9	6,050.3	10,424.1	11,227.5	11,412.4	12,647.6	13,928.4	17,094.1	21,282.1	24,309.3	30,442.2	36,338.5	38,637.5	45,119.2	44,819.1
United Kingdom.....	3,943.9	7,931.7	15,688.6	17,073.7	17,353.0	19,223.4	22,270.2	24,694.9	31,105.3	35,551.3	45,356.8	56,001.7	67,568.7	81,523.7	79,143.4
Italy.....	2,118.2	3,697.8	6,041.2	6,928.1	7,466.9	7,917.1	7,513.6	8,104.9	10,421.0	12,718.2	13,898.4	16,600.7	20,110.4	22,442.3	22,529.2
Other European Union.....	6,381.0	14,054.3	26,052.5	29,903.9	31,625.3	33,836.6	36,933.7	43,878.3	62,055.0	74,828.3	98,858.9	124,636.4	146,363.0	161,089.7	159,253.1
Brazil.....	325.5	471.3	668.9	689.5	772.9	1,177.1	1,575.9	2,172.6	3,086.8	4,362.9	5,627.8	5,901.6	5,127.1	7,190.5	6,492.9
Argentina.....	391.8	259.7	211.5	258.0	557.9	796.7	1,132.2	1,643.0	1,317.1	1,770.1	2,325.8	2,977.2	3,051.2	3,420.4	3,198.2
Chile.....	81.3	96.4	186.4	187.6	253.1	359.0	436.1	532.0	765.1	938.7	1,328.5	1,328.8	1,427.0	1,630.3	1,540.6
Peru.....	39.3	59.6	57.3	56.5	86.3	92.6	129.5	215.1	339.6	475.3	627.2	696.3	604.8	735.3	720.2
Costa Rica.....	5.0	9.0	11.3	15.6	12.6	17.9	24.4	19.2	21.0	28.2	38.6	107.6	114.9	124.7	122.9

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Japan .....	1,369.7	2,436.5	5,705.1	6,659.2	7,516.4	8,277.2	10,377.4	14,291.0	25,293.0	32,800.1	36,247.0	35,461.4	50,853.0	71,901.4	68,910.2
China .....	184.8	1,394.5	1,143.2	1,198.6	1,703.4	2,476.2	3,544.9	4,674.6	6,991.3	9,096.3	13,072.6	18,575.1	25,377.7	36,812.5	40,804.5
South Korea .....	216.5	740.5	2,029.4	2,314.8	2,555.6	2,321.5	2,755.7	3,922.2	5,560.2	6,984.2	7,181.2	4,221.5	10,434.2	20,112.2	20,572.9
Australia .....	788.4	2,054.3	3,308.2	3,368.1	3,421.7	3,862.7	4,360.0	5,686.4	6,902.0	7,585.5	9,110.8	9,899.7	11,188.3	12,734.2	12,081.5
Taiwan .....	194.7	577.3	2,630.5	3,168.1	3,751.5	4,452.7	4,810.8	5,942.1	7,764.0	10,755.5	13,987.7	15,998.2	24,636.0	37,094.9	37,046.0
Singapore .....	285.3	1,410.0	4,618.2	6,649.4	7,666.0	9,618.0	12,476.8	16,861.9	21,884.3	28,763.4	34,591.6	35,037.5	41,508.7	47,308.8	46,848.9
Hong Kong .....	652.5	1,419.7	2,455.7	2,884.5	3,761.4	5,557.0	5,883.2	7,886.5	11,553.6	14,809.2	20,622.5	24,177.5	29,068.1	42,148.0	41,793.0
India .....	36.3	142.4	413.1	344.3	248.7	266.4	335.7	532.0	887.3	1,076.1	1,756.4	2,061.9	2,920.1	5,024.7	5,090.4
Malaysia .....	90.8	254.8	555.6	1,001.2	1,611.3	2,046.1	2,729.2	5,115.4	6,960.4	9,861.8	13,711.7	13,586.9	17,576.2	22,843.1	21,933.9
Thailand .....	53.2	240.8	1,377.6	1,662.0	2,138.2	2,771.8	3,107.1	4,591.2	6,248.0	8,479.1	9,365.7	8,289.9	10,746.5	15,073.8	14,791.3
Philippines .....	73.1	75.8	300.0	259.6	255.3	466.8	452.8	547.6	921.3	3,542.9	5,659.4	6,826.1	8,506.3	10,016.6	9,531.4
Indonesia .....	60.8	157.3	230.8	279.7	293.2	260.4	216.7	300.2	367.3	548.4	816.9	488.3	688.4	1,686.1	1,595.4
South Africa .....	510.7	701.9	622.1	577.9	676.7	875.6	1,162.3	1,461.2	1,849.0	2,024.0	2,133.9	2,847.8	3,398.7	3,724.8	3,450.3
Apparent consumption all countries .....	107,183.8	180,349.9	219,093.5	222,489.9	232,422.5	228,864.5	235,040.0	262,708.2	312,379.0	356,739.5	458,227.9	569,948.4	668,364.2	801,531.5	842,122.7
United States .....	14,886.5	33,533.3	41,367.9	39,323.1	36,815.2	47,175.8	58,189.3	68,318.4	83,737.2	95,497.0	142,016.3	207,413.3	234,122.5	252,611.9	253,766.2
Canada .....	3,682.3	7,779.7	10,205.3	11,077.4	12,119.1	13,826.2	15,520.3	18,276.5	20,518.6	23,917.3	16,263.2	18,384.9	18,677.9	22,386.6	27,312.0
Mexico .....	1,250.3	1,760.2	1,964.6	3,068.2	3,358.2	2,949.6	3,368.1	3,245.1	1,721.6	1,875.8	2,366.4	1,842.7	1,919.9	2,251.3	2,413.8
European Union .....	54,445.2	82,999.7	93,477.2	89,057.6	88,419.9	88,452.5	81,486.9	91,590.0	102,981.0	107,211.9	138,415.0	156,347.7	170,572.9	206,263.3	212,691.8
Germany .....	33,339.2	31,915.6	27,669.3	27,583.7	27,975.2	26,473.0	21,755.4	26,982.2	30,214.4	29,961.7	42,624.3	44,400.8	47,319.3	56,140.5	49,680.7
France .....	4,890.2	11,204.9	13,419.7	12,658.4	12,157.0	11,955.1	12,959.4	14,967.2	16,084.1	14,172.6	20,187.6	22,189.6	23,091.8	30,280.7	30,557.6
United Kingdom .....	5,875.0	12,377.4	20,674.1	19,868.2	19,333.5	21,737.8	21,596.3	20,702.9	20,159.4	22,577.1	25,520.3	34,312.4	40,024.6	51,411.3	59,118.6
Italy .....	2,124.5	8,677.2	6,503.9	5,905.3	5,628.1	6,156.5	4,456.9	5,323.0	7,047.5	8,267.9	10,655.3	11,872.2	13,352.4	14,528.1	16,422.3
Other European Union .....	8,216.3	18,824.6	25,210.3	23,042.1	23,326.1	22,130.1	20,718.9	23,614.7	29,475.6	32,232.6	39,427.4	43,572.6	46,784.7	53,902.7	56,912.6
Brazil .....	592.9	1,334.3	2,645.1	2,177.7	2,158.1	2,990.6	3,771.4	4,247.0	4,494.8	5,942.9	8,575.7	10,670.6	13,054.3	18,196.8	21,514.3
Argentina .....	896.2	297.1	199.5	219.1	527.1	826.3	1,175.6	1,589.8	1,192.0	1,525.1	2,572.1	3,096.6	2,780.6	2,784.6	3,092.0
Chile .....	116.7	145.2	283.9	282.1	371.8	510.5	585.3	662.4	899.3	1,021.2	1,306.9	1,166.2	1,146.3	1,249.3	1,122.4
Peru .....	138.0	196.6	106.2	100.3	140.0	105.1	164.7	233.1	304.5	414.9	640.3	894.9	1,042.1	1,388.9	1,612.2
Costa Rica .....	0.4	2.6	5.3	7.7	7.3	10.7	15.7	13.0	15.1	24.1	39.4	40.3	39.9	32.6	29.5
Japan .....	20,383.4	31,858.3	39,013.7	43,220.8	51,476.0	44,687.3	41,441.8	39,205.6	53,123.6	68,527.2	69,824.2	72,049.8	83,894.8	100,177.0	88,966.9
China .....	686.2	1,247.6	2,067.4	2,539.9	3,095.3	3,260.9	3,314.0	3,769.7	5,436.3	11,149.2	17,465.5	29,463.4	55,782.2	80,081.8	103,295.1
South Korea .....	725.1	790.2	539.6	1,138.6	1,061.9	710.4	1,019.1	3,676.9	4,289.3	3,377.7	6,701.0	4,578.7	8,129.8	9,117.0	9,553.2
Australia .....	897.3	2,295.9	2,840.6	2,763.6	2,552.8	3,183.8	3,492.4	3,775.4	4,110.1	3,793.9	7,518.3	8,974.2	9,217.4	14,491.4	17,079.5
Taiwan .....	704.8	467.2	699.5	761.4	837.4	958.5	1,148.7	1,393.9	2,055.0	2,467.8	3,644.4	4,108.8	5,178.3	6,174.9	5,292.2
Singapore .....	320.0	265.7	1,288.7	1,602.0	1,593.2	1,846.8	2,480.2	3,096.2	3,615.5	4,323.4	5,626.7	6,363.7	7,177.6	8,285.6	8,392.5
Hong Kong .....	102.9	225.0	438.5	610.7	686.8	818.1	740.1	896.0	1,263.5	1,407.8	2,074.1	2,891.8	4,170.5	6,763.7	7,816.8
India .....	46.4	136.5	770.8	671.9	818.7	833.3	594.6	1,092.6	1,304.2	1,293.1	2,501.3	3,115.9	3,731.5	4,735.6	5,446.9
Malaysia .....	46.9	120.5	144.8	112.9	106.7	110.1	165.1	275.6	415.7	818.3	1,381.7	1,696.6	2,418.9	3,286.3	3,647.5
Thailand .....	65.1	230.3	186.8	151.5	184.0	248.0	244.3	302.8	367.6	452.8	664.2	787.9	823.2	1,232.4	1,479.7
Philippines .....	105.9	111.2	137.2	206.2	132.4	205.6	331.9	432.3	653.5	471.1	488.6	723.3	1,000.4	1,382.4	1,663.3
Indonesia .....	41.5	171.1	323.2	382.0	325.3	67.3	49.4	35.3	25.7	32.4	54.9	92.8	63.8	167.9	194.5
South Africa .....	660.9	1,080.6	693.7	522.1	546.9	606.2	795.6	946.8	1,085.9	1,594.6	1,858.9	3,423.7	4,863.7	6,159.3	7,533.9
Communication equipment															
Production all countries .....	215,875.2	338,246.1	433,095.5	452,277.3	479,601.6	474,162.1	504,443.4	572,769.1	677,391.7	751,043.2	907,251.8	925,794.4	1,052,093.4	1,286,535.7	1,178,258.3
United States .....	40,892.2	75,186.6	82,508.3	83,476.2	85,235.2	94,327.9	104,425.6	125,307.4	162,732.6	180,784.7	230,862.0	244,854.1	290,858.3	367,419.6	280,017.9
Canada .....	4,464.1	5,332.0	7,707.0	8,293.6	8,216.6	9,045.6	8,981.6	10,051.5	11,863.7	11,714.7	13,534.0	16,092.1	17,766.8	22,987.6	15,266.6
Mexico .....	5,266.3	5,006.8	5,946.4	6,834.6	6,217.4	6,319.9	6,516.5	8,176.6	13,138.3	15,617.9	19,263.6	23,270.1	23,856.5	25,548.9	25,548.9
European Union .....	49,662.9	68,040.8	82,069.6	85,932.4	90,339.9	87,618.5	93,347.1	105,699.2	118,982.8	129,502.5	151,393.5	169,280.6	196,489.6	247,262.4	242,726.5
Germany .....	14,600.4	16,632.3	19,159.4	19,545.5	25,109.6	23,474.6	22,226.0	24,128.7	24,654.8	23,788.0	24,408.3	24,647.3	31,050.1	41,863.6	51,847.6
France .....	4,800.2	8,023.1	9,772.6	9,913.3	10,319.0	10,355.6	10,962.4	12,232.5	14,048.0	16,852.8	24,436.5	30,915.4	35,672.3	46,742.9	53,527.4
United Kingdom .....	12,015.2	16,034.8	16,807.7	16,705.5	16,228.4	15,403.4	17,297.1	19,949.9	22,666.2	24,175.1	26,951.6	27,518.4	31,388.1	39,127.7	27,821.1
Italy .....	2,800.9	5,797.5	8,188.2	10,513.8	10,464.3	10,871.2	12,758.4	14,251.4	16,747.6	17,339.0	17,594.5	16,836.5	14,273.6	15,166.4	13,899.0
Other European Union .....	15,446.1	21,553.1	28,141.7	29,254.4	28,218.6	27,513.7	30,103.3	35,136.7	40,866.3	47,347.6	58,002.6	69,363.0	84,105.5	104,361.9	95,631.4
Brazil .....	7,961.2	7,721.5	9,034.7	7,506.6	6,967.3	7,379.5	8,549.7	7,278.5	6,607.4	7,023.8	7,015.7	6,374.0	5,274.9	6,022.0	5,908.3

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of 1997 U.S. dollars														
Argentina.....	1,554.2	895.4	683.1	852.9	1,077.5	1,463.7	1,158.7	1,196.6	918.8	909.2	1,121.5	1,137.6	891.8	868.4	819.4
Chile.....	82.8	46.5	103.4	30.4	29.7	36.1	33.9	31.8	48.2	55.9	46.7	40.4	33.6	36.3	36.7
Peru.....	501.3	217.2	191.9	111.9	105.1	163.6	83.6	23.5	26.2	28.2	29.6	28.3	25.5	26.1	25.8
Costa Rica.....	43.2	71.0	93.1	111.2	22.3	31.2	40.0	46.5	38.8	40.7	50.1	62.3	34.6	31.3	31.4
Japan.....	61,670.4	111,821.9	141,644.1	149,203.0	164,195.8	146,955.3	145,272.0	152,375.2	179,695.8	200,201.0	246,691.9	200,428.3	190,332.0	202,619.7	188,489.6
China.....	2,301.7	8,210.9	15,469.4	14,434.8	15,675.7	18,130.1	23,001.9	32,492.4	28,646.6	39,255.3	48,229.7	52,907.8	65,265.1	72,309.8	81,005.8
South Korea.....	3,762.7	6,715.1	16,785.8	19,478.5	20,892.2	20,691.5	23,736.4	30,709.1	37,738.5	43,423.1	55,985.5	76,658.7	100,036.1	127,422.3	133,976.6
Australia.....	1,736.4	1,735.9	2,095.7	2,071.9	1,952.3	2,236.9	2,018.3	2,449.6	2,542.5	2,822.7	2,846.3	2,859.0	3,031.5	3,591.6	3,394.5
Taiwan.....	6,467.8	10,316.6	15,658.1	15,173.5	16,248.5	15,931.6	17,980.6	20,960.6	27,303.9	29,527.4	35,088.3	38,503.5	46,737.5	66,070.1	59,353.1
Singapore.....	5,287.9	7,886.2	11,223.8	11,898.1	11,803.7	12,889.4	13,400.9	16,945.5	18,594.0	16,685.4	14,945.3	13,182.4	16,209.5	19,079.7	17,547.0
Hong Kong.....	3,921.9	3,985.1	5,668.0	4,007.2	2,809.9	3,337.5	3,397.0	3,277.4	3,055.2	3,144.1	2,638.2	3,064.4	4,004.4	3,640.7	3,336.5
India.....	337.3	881.6	2,083.6	1,955.3	2,089.7	2,574.9	2,384.8	3,180.7	3,407.2	3,253.7	4,542.8	4,357.2	5,013.0	5,991.6	6,209.9
Malaysia.....	1,395.3	2,056.0	6,522.6	8,417.7	11,406.7	13,808.5	16,750.0	22,185.8	27,639.9	30,628.4	31,416.0	31,203.1	38,631.4	53,458.8	55,517.4
Thailand.....	188.9	148.3	2,018.4	4,664.1	5,795.0	6,469.8	5,596.8	3,213.6	4,386.3	4,682.8	6,084.5	5,848.7	7,381.4	9,918.1	9,919.2
Philippines.....	712.3	633.9	1,365.8	1,799.1	2,265.1	2,419.0	2,303.1	2,712.5	3,515.0	3,336.5	3,607.3	3,538.7	3,874.1	4,687.9	4,989.5
Indonesia.....	131.4	149.8	177.3	738.8	697.9	1,477.2	1,532.8	2,175.8	3,121.2	3,852.1	5,145.1	4,957.5	5,480.2	6,509.0	6,633.7
South Africa.....	1,248.9	1,098.5	1,212.6	1,233.6	1,003.8	844.4	822.0	882.3	900.9	852.8	958.9	1,029.7	1,039.5	1,059.3	1,089.1
Value added all countries.....	92,976.3	147,906.2	183,585.2	192,057.0	196,795.8	194,472.7	203,640.9	226,202.9	256,965.2	277,553.4	335,891.3	339,600.2	380,592.3	452,697.7	421,508.0
United States.....	21,132.8	41,851.2	47,878.9	48,870.2	48,881.5	52,222.9	56,823.1	67,736.3	85,095.2	90,030.3	116,510.6	124,390.2	140,064.7	170,020.2	144,875.2
Canada.....	2,192.4	2,556.5	3,420.2	3,295.7	3,272.7	3,549.0	3,498.4	3,832.7	4,400.4	4,208.5	4,836.1	5,424.0	7,225.7	9,349.0	6,205.0
Mexico.....	1,130.6	1,069.1	1,295.3	1,506.6	1,434.1	1,506.2	1,582.8	1,786.1	1,680.6	1,884.5	2,312.1	2,826.3	3,177.5	3,563.3	3,330.4
European Union.....	25,496.8	32,781.2	39,164.2	40,250.9	36,951.0	36,266.3	37,831.0	41,918.1	42,902.7	44,748.0	51,064.3	55,082.5	62,352.6	73,752.5	75,330.4
Germany.....	9,745.6	11,196.9	12,878.8	13,174.7	11,068.7	10,350.2	9,023.5	8,763.2	8,509.1	8,010.7	9,023.4	9,335.4	10,853.7	13,625.1	18,510.5
France.....	2,090.6	3,263.3	3,793.3	3,659.7	3,384.4	3,522.7	3,724.4	3,985.0	4,546.0	5,292.5	7,302.2	8,584.9	9,838.1	10,997.6	14,106.1
United Kingdom.....	5,533.5	6,716.8	6,865.0	6,742.1	6,400.1	6,364.5	6,636.4	7,469.7	8,360.4	8,759.6	9,991.2	10,330.6	11,818.2	13,562.5	9,631.4
Italy.....	1,782.7	2,968.7	4,320.2	4,647.2	4,605.1	4,689.2	5,898.6	6,502.3	6,330.7	6,076.6	5,694.7	5,134.4	4,838.4	5,194.9	4,742.9
Other European Union.....	6,344.5	8,635.5	11,307.0	12,027.2	11,492.8	11,339.6	12,548.1	14,287.9	15,156.7	16,608.6	19,052.8	21,697.2	25,004.4	30,372.5	28,339.5
Brazil.....	4,562.8	4,364.3	5,167.0	4,950.1	4,594.5	5,265.6	6,056.3	4,508.3	3,487.3	3,707.1	3,702.8	3,364.1	2,784.0	3,178.3	3,116.5
Argentina.....	804.4	650.0	474.9	429.1	542.1	736.4	399.7	411.0	295.6	316.4	390.2	395.8	310.3	302.2	283.1
Chile.....	47.8	37.1	46.1	15.5	14.3	20.4	25.4	25.6	32.8	37.4	34.0	27.1	22.2	24.1	24.3
Peru.....	174.5	90.8	77.2	51.9	42.5	32.9	17.7	6.3	6.5	8.7	9.2	8.7	7.9	8.1	8.0
Costa Rica.....	11.9	15.9	20.4	24.4	8.2	12.2	15.6	18.1	14.9	15.8	19.5	24.4	13.7	12.3	12.4
Japan.....	22,106.1	43,217.7	56,303.0	60,029.4	65,291.4	58,500.8	57,070.0	59,544.1	67,123.1	74,905.3	90,358.9	76,333.3	73,973.0	78,785.2	73,279.6
China.....	989.0	2,824.4	4,036.4	3,721.5	3,938.6	4,546.3	6,467.6	8,004.8	6,924.8	9,021.0	11,397.0	12,419.8	15,570.3	17,238.3	19,297.2
South Korea.....	1,167.8	1,983.9	4,480.7	5,212.6	5,497.5	5,548.7	6,534.5	8,538.5	11,408.3	11,883.8	15,234.6	19,065.3	27,301.8	35,273.3	37,096.9
Australia.....	613.2	729.7	744.7	661.4	633.0	745.6	634.0	774.8	805.1	753.0	816.3	852.3	889.1	1,053.4	994.1
Taiwan.....	1,791.7	2,855.0	4,174.1	4,459.6	4,702.2	4,668.2	5,240.6	5,910.0	7,349.8	8,953.6	10,229.0	11,471.0	13,569.3	17,909.0	15,857.9
Singapore.....	1,633.1	2,486.6	3,030.9	3,116.6	3,188.7	3,466.8	3,807.3	4,733.6	5,445.2	4,889.4	4,544.0	3,928.9	5,289.9	6,249.5	5,754.5
Hong Kong.....	1,039.9	813.8	1,301.7	902.1	855.0	1,025.4	1,082.6	1,181.6	1,174.4	1,080.5	981.9	924.0	1,264.9	1,186.0	1,089.1
India.....	88.0	231.3	459.4	394.4	510.5	571.9	538.5	898.2	631.6	666.1	805.6	836.9	961.2	1,146.6	1,187.2
Malaysia.....	379.3	644.7	1,348.6	1,748.1	2,373.4	2,989.3	3,497.3	4,444.0	5,322.6	6,905.7	7,469.0	7,278.0	8,999.0	12,438.7	12,927.7
Thailand.....	85.4	73.6	542.1	1,933.0	3,332.7	3,383.2	1,177.4	993.6	1,356.3	1,447.9	1,881.3	1,804.8	2,282.3	3,066.7	3,069.8
Philippines.....	267.9	165.8	346.7	707.2	900.1	774.0	766.9	838.7	1,160.2	1,214.5	1,323.4	1,298.2	1,421.2	1,724.0	1,839.3
Indonesia.....	29.8	38.8	56.4	224.7	243.6	592.2	383.3	652.4	762.6	937.6	1,610.3	1,509.3	1,972.0	2,254.1	2,298.6
South Africa.....	600.9	397.0	331.4	355.5	329.6	329.2	319.1	351.5	345.9	327.8	366.4	391.9	395.1	401.8	414.0
Exports all countries.....	91,648.6	159,209.4	267,509.2	313,528.6	347,624.9	390,411.3	428,513.3	536,756.2	681,934.4	753,950.4	879,206.8	932,475.2	1,095,712.1	1,407,564.8	1,276,935.1
United States.....	15,307.8	22,858.7	44,018.7	50,800.8	53,727.8	59,159.1	69,037.5	89,704.8	116,746.2	125,174.2	147,339.2	152,392.1	184,506.3	192,321.7	170,829.4
Canada.....	1,529.4	3,966.1	4,295.3	5,102.5	5,860.7	7,368.7	7,260.3	8,618.9	10,786.4	14,538.6	17,672.7	17,926.2	21,366.3	35,549.4	26,702.8
Mexico.....	32.3	1,876.1	204.5	196.8	337.2	8,986.6	9,917.8	13,856.4	17,839.1	21,146.8	25,520.2	31,778.0	38,161.9	52,573.1	43,444.9
European Union.....	29,502.5	40,862.5	63,615.1	78,948.4	84,661.2	90,084.3	100,748.2	126,116.0	160,799.2	188,953.8	226,740.5	250,009.2	283,299.3	366,718.4	343,577.6
Germany.....	8,308.9	11,654.1	18,487.6	20,999.0	22,841.9	23,739.2	23,823.7	30,692.3	35,878.1	40,207.2	46,737.2	50,393.1	58,823.1	76,535.4	71,526.0
France.....	3,226.6	5,613.1	8,656.6	11,401.8	12,566.5	13,013.2	14,219.1	16,699.9	22,350.5	25,247.7	32,192.6	40,294.1	42,926.6	56,882.0	53,554.9
United Kingdom.....	3,626.7	6,362.4	11,242.0	14,562.7	15,997.2	17,571.6	21,961.7	27,005.6	37,408.9	42,840.7	42,800.8	47,690.5	50,655.7	66,572.5	62,500.1

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Italy .....	1,922.5	3,330.3	4,849.1	5,915.2	6,174.1	6,557.4	7,423.5	8,035.3	10,055.0	10,885.1	11,920.8	13,106.0	13,991.4	18,128.4	16,577.4
Other European Union.....	12,417.8	13,902.5	20,379.8	26,069.8	27,081.5	29,203.0	33,320.3	43,682.9	55,106.8	69,773.1	93,089.2	98,525.6	116,902.5	148,600.1	139,419.1
Brazil.....	381.8	698.0	1,108.2	1,063.8	947.8	958.3	924.8	968.0	920.9	1,140.3	1,381.5	1,528.9	2,011.7	4,528.2	3,983.0
Argentina.....	31.2	12.6	6.8	10.4	16.4	23.0	23.8	95.3	174.6	125.1	177.7	139.7	124.8	137.8	125.9
Chile.....	5.3	0.3	0.9	1.2	2.1	2.7	6.1	6.3	8.5	7.7	10.4	14.7	31.0	32.3	28.7
Peru .....	0.2	1.8	0.1	2.1	0.8	0.1	0.3	0.8	1.1	2.8	2.5	4.6	15.2	46.1	35.0
Costa Rica.....	3.8	0.1	0.4	0.1	0.3	1.2	1.4	0.5	1.6	3.8	159.7	663.1	115.9	108.6	83.1
Japan.....	27,275.7	58,938.3	76,744.7	83,299.0	91,952.8	94,641.0	92,566.8	99,996.8	115,656.3	110,667.5	118,939.8	116,752.9	132,727.0	167,473.6	149,547.4
China.....	99.2	210.7	2,120.8	5,000.7	6,041.4	8,044.2	9,265.3	13,382.6	17,611.8	20,664.8	25,509.6	29,582.6	38,816.7	59,671.4	57,520.3
South Korea.....	2,363.0	5,494.4	15,842.1	17,422.5	21,015.6	23,647.4	23,439.4	30,043.9	42,624.1	45,790.8	56,005.9	61,890.2	78,284.6	98,188.2	86,955.2
Australia.....	114.3	116.6	313.0	456.6	476.1	425.5	467.7	623.6	1,065.7	1,189.6	1,677.2	1,317.5	1,280.6	1,926.1	1,761.2
Taiwan.....	4,369.8	5,504.8	11,215.7	11,530.9	12,409.6	13,880.1	16,289.1	19,488.9	26,066.1	29,147.0	36,402.8	40,036.7	51,331.6	79,184.5	72,221.0
Singapore.....	3,740.0	5,255.9	14,839.0	18,091.4	20,906.8	23,715.3	27,647.5	41,449.0	53,766.5	57,785.6	61,575.6	58,737.8	68,707.8	94,502.7	86,288.5
Hong Kong.....	2,818.8	5,480.7	13,817.4	16,930.9	18,856.4	22,311.6	26,097.2	33,965.8	43,651.8	45,051.0	50,674.0	48,312.0	53,904.6	73,959.1	70,748.7
India.....	23.4	18.7	48.7	65.1	77.4	109.8	128.8	182.3	427.4	521.0	386.6	364.5	510.4	838.5	761.2
Malaysia.....	1,349.2	3,961.7	10,484.3	14,216.3	17,529.3	21,163.5	26,574.7	34,652.8	43,998.9	49,192.6	51,530.4	52,140.6	62,659.6	75,498.2	66,871.9
Thailand.....	16.3	12.4	2,226.8	3,735.5	5,147.8	6,384.2	6,887.7	9,036.0	10,990.6	11,875.3	13,835.9	14,302.7	16,875.3	24,696.3	22,076.1
Philippines.....	79.9	392.0	1,931.8	994.9	1,354.2	1,751.4	2,245.7	2,938.7	4,055.8	13,291.4	20,675.0	27,538.0	31,188.9	34,277.7	31,562.4
Indonesia.....	112.1	155.2	132.1	238.5	496.8	1,300.2	1,944.4	3,006.2	3,291.3	4,407.5	4,096.9	3,684.8	4,167.0	6,285.3	5,913.3
South Africa.....	7.0	199.4	23.1	24.6	42.1	101.5	148.6	132.7	225.2	273.6	346.2	520.3	551.5	687.5	636.8
Percent															
Import penetration all countries.....	40.3	45.8	55.1	61.4	61.3	76.9	79.7	87.9	95.2	98.0	96.9	103.7	106.2	109.8	110.9
United States.....	33.6	49.4	58.0	63.6	67.6	72.1	71.1	72.5	69.9	70.0	65.9	67.0	66.2	60.0	63.2
Canada.....	55.9	89.1	79.4	85.7	92.5	92.1	89.6	89.3	92.2	115.4	119.2	103.9	114.1	167.8	166.3
Mexico.....	20.8	44.1	43.0	44.2	52.2	135.6	152.6	170.9	147.3	148.2	138.4	141.9	166.7	227.5	189.2
European Union.....	61.1	58.1	78.7	95.3	96.6	104.8	105.3	114.5	131.1	144.1	149.3	150.3	146.2	146.6	140.8
Germany.....	63.2	72.1	104.6	114.4	98.0	109.3	108.9	123.6	141.6	164.2	185.4	190.8	181.7	161.8	125.9
France.....	78.2	67.5	95.7	125.5	129.6	133.0	134.6	139.6	165.2	155.8	135.5	138.1	123.7	123.0	99.5
United Kingdom.....	36.2	41.9	68.3	87.0	97.5	110.4	129.3	143.2	181.8	179.7	156.4	178.0	155.1	162.0	204.2
Italy.....	55.6	52.4	65.1	70.6	74.4	74.8	63.6	64.0	66.1	72.1	76.3	86.5	99.3	106.9	106.7
Other European Union.....	75.1	62.6	73.6	91.0	95.9	104.9	102.5	113.7	127.2	145.1	166.4	150.2	150.2	153.1	160.4
Brazil.....	9.9	12.1	21.3	27.1	25.8	24.2	26.5	38.7	54.3	60.0	66.8	67.7	59.6	73.5	63.9
Argentina.....	29.9	26.5	28.5	33.1	52.2	61.4	69.7	74.8	79.2	81.4	80.9	81.9	90.7	99.8	97.4
Chile.....	48.7	36.2	46.7	56.5	63.9	69.6	69.8	76.5	91.1	92.5	98.2	96.5	91.2	91.9	80.8
Peru.....	17.9	21.5	26.7	44.2	58.9	60.8	63.5	85.8	97.6	95.1	97.6	96.1	87.6	94.5	92.4
Costa Rica.....	56.6	17.9	27.9	26.5	59.5	61.7	65.4	65.3	69.5	74.5	205.0	254.7	116.5	119.8	116.9
Japan.....	7.6	8.1	12.7	14.8	13.5	17.0	21.1	27.4	33.4	31.7	26.6	35.4	50.9	70.7	72.9
China.....	29.0	50.3	34.9	42.9	46.7	53.4	57.9	53.0	70.5	59.7	60.9	66.7	69.9	89.0	81.3
South Korea.....	71.9	90.4	93.8	85.1	104.5	125.0	95.0	94.1	113.1	97.4	100.1	96.2	84.4	82.7	67.7
Australia.....	37.4	50.8	61.2	65.0	67.2	63.6	64.9	71.9	83.0	87.3	86.2	74.4	78.4	75.4	70.2
Taiwan.....	182.6	54.2	72.1	77.4	76.1	85.7	87.7	89.0	90.6	96.8	103.6	103.9	108.9	131.1	137.0
Singapore.....	213.1	72.7	189.3	194.1	211.9	201.6	206.2	303.0	331.6	469.4	685.4	847.3	837.5	967.5	943.3
Hong Kong.....	89.9	217.9	422.0	500.1	401.8	307.7	447.6	750.7	816.5	777.5	656.2	785.3	938.9	940.1	914.0
India.....	50.4	54.0	42.8	37.0	26.4	24.9	27.6	29.6	39.9	42.7	37.4	38.6	40.0	48.2	44.8
Malaysia.....	176.1	275.0	290.0	312.1	199.4	214.0	220.8	173.4	175.0	176.7	182.4	193.1	188.2	148.9	126.4
Thailand.....	52.4	69.0	101.9	79.6	84.6	92.3	115.0	206.4	179.2	200.1	190.7	247.3	211.7	231.6	204.1
Philippines.....	34.3	74.5	166.1	62.6	63.5	75.3	92.1	102.9	113.3	478.9	830.9	902.5	1,091.4	1,004.0	885.1
Indonesia.....	108.7	96.6	72.1	58.8	76.8	84.3	109.7	170.1	107.1	116.0	79.7	138.4	85.6	229.3	220.9
South Africa.....	29.7	37.3	35.3	40.4	50.6	63.3	67.7	77.4	87.3	83.1	86.2	84.6	81.2	82.0	72.1
Millions of 1997 U.S. dollars															
Imports all countries.....	84,438.9	152,897.4	260,314.9	304,162.7	338,179.1	379,892.1	420,192.8	525,324.8	667,591.9	738,234.9	861,499.6	929,723.8	1,098,514.4	1,426,196.7	1,287,476.7
United States.....	15,565.9	48,118.0	60,414.3	61,116.4	65,658.9	82,030.7	90,075.0	107,814.7	131,371.0	139,587.1	161,365.5	182,086.2	214,166.3	283,534.6	206,129.4
Canada.....	3,395.7	5,484.5	9,247.4	11,346.4	12,977.8	13,278.7	13,759.4	17,466.7	21,396.3	22,586.7	25,738.6	25,886.9	32,142.4	32,911.0	31,441.3
Mexico.....	1,385.5	2,544.8	5,443.4	6,461.6	7,219.8	10,031.1	10,860.4	14,163.4	14,743.3	17,515.4	22,552.4	29,600.0	38,247.9	42,860.9	41,167.4
European Union.....	34,121.9	44,185.6	86,439.0	107,343.5	114,420.7	115,576.8	119,058.9	140,734.3	173,852.3	193,093.3	228,221.1	259,934.5	296,562.1	376,517.3	358,519.4

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of 1997 U.S. dollars														
Germany .....	8,480.8	10,911.6	19,313.1	27,279.2	30,475.7	29,927.4	31,170.0	37,884.6	45,608.1	46,066.2	48,478.8	56,077.3	61,805.3	79,867.6	76,481.6
France .....	4,375.5	5,195.3	10,881.8	14,166.3	15,028.7	14,364.9	15,395.1	17,844.7	22,019.7	24,239.0	29,585.2	36,443.5	40,652.6	51,078.3	48,462.5
United Kingdom .....	4,789.6	8,832.9	17,530.1	18,452.9	18,215.5	19,368.3	21,391.3	25,121.7	32,075.8	39,521.1	43,969.8	48,293.1	55,813.1	70,439.0	66,282.6
Italy .....	3,497.5	4,551.3	10,081.7	12,997.1	13,765.9	13,241.4	11,054.6	13,589.6	15,401.0	15,817.9	18,272.7	21,912.6	23,287.2	28,273.0	27,113.1
Other European Union .....	12,978.5	14,694.6	28,632.4	34,448.0	36,934.9	38,674.9	40,047.8	46,293.6	58,747.7	67,449.1	87,914.5	97,208.1	115,003.9	146,859.5	140,179.7
Brazil .....	894.1	1,028.3	2,304.9	2,576.4	2,396.0	2,342.0	3,228.5	4,781.7	7,629.7	9,258.8	11,334.1	10,339.4	10,561.2	11,864.0	10,420.2
Argentina .....	1,444.4	442.3	410.4	466.7	1,259.4	2,602.5	2,784.3	3,455.9	2,579.3	2,877.0	4,006.8	4,125.0	3,893.2	4,970.8	4,648.5
Chile .....	397.6	124.0	712.7	676.8	953.2	980.9	1,046.1	1,156.3	1,543.7	1,612.0	2,016.0	2,434.0	2,138.5	2,244.2	2,050.0
Peru .....	219.2	118.0	90.0	135.2	194.7	260.8	266.2	458.1	863.5	983.1	1,119.9	938.1	770.1	880.9	848.0
Costa Rica .....	53.4	16.2	40.4	43.6	57.8	64.1	93.9	104.8	90.0	113.1	214.0	966.7	573.3	531.2	565.3
Japan .....	1,908.0	3,445.7	10,427.6	13,017.7	13,416.9	14,170.4	18,563.8	25,846.3	39,885.0	45,523.7	46,231.1	44,391.3	55,698.2	75,795.3	70,273.0
China .....	783.4	6,923.9	6,906.7	7,107.1	8,793.7	11,907.4	18,818.3	24,180.6	27,867.4	28,224.3	35,356.9	44,365.5	59,026.5	87,238.1	92,221.5
South Korea .....	1,755.3	3,699.1	8,287.0	9,715.1	11,057.6	11,827.2	12,230.4	15,687.6	21,433.0	25,956.0	31,442.4	28,214.9	45,273.2	57,949.9	51,740.0
Australia .....	1,206.4	2,434.6	3,248.0	3,259.3	3,165.3	3,630.3	4,027.3	5,256.0	7,296.0	7,787.8	7,297.3	6,844.6	9,048.1	11,437.1	10,401.1
Taiwan .....	1,925.7	2,976.4	9,764.3	11,390.2	12,773.8	15,873.3	16,661.4	19,074.5	26,288.7	28,507.6	37,770.1	39,692.9	48,419.0	60,413.4	54,926.5
Singapore .....	2,681.4	4,958.1	12,306.9	16,106.9	18,754.8	21,306.9	26,236.0	36,472.5	48,590.2	52,144.6	54,596.1	50,997.8	59,053.5	83,709.3	76,739.8
Hong Kong .....	2,481.6	4,935.6	12,163.6	16,583.6	20,708.7	26,358.0	27,728.1	33,793.2	43,663.1	46,442.9	56,672.4	53,235.7	56,727.6	79,724.6	76,832.3
India .....	269.3	835.8	1,444.6	1,037.7	722.8	825.3	918.5	1,314.3	2,074.1	2,141.5	2,480.0	2,441.0	2,886.8	4,421.5	4,140.5
Malaysia .....	1,453.0	3,657.0	7,391.2	9,168.9	11,994.7	12,688.3	16,751.4	27,027.5	37,484.6	40,732.2	44,536.3	45,978.7	55,763.2	75,348.4	71,702.8
Thailand .....	484.8	863.7	3,113.3	4,375.1	5,059.2	5,920.8	7,126.1	10,362.9	13,871.3	14,606.6	16,293.6	13,993.6	17,213.4	24,731.8	23,182.7
Philippines .....	520.4	628.8	2,267.5	1,595.9	1,876.9	2,245.8	2,932.0	4,052.7	5,128.8	13,148.6	19,402.8	25,034.2	30,067.9	30,494.0	26,030.3
Indonesia .....	464.5	622.5	886.3	1,185.8	1,922.3	2,587.9	2,427.4	1,938.9	2,546.0	3,925.7	4,114.3	1,406.1	1,070.0	2,139.2	1,902.1
South Africa .....	725.8	898.4	836.8	913.5	1,010.7	1,201.6	1,368.1	2,277.2	3,087.2	3,331.0	3,822.9	5,476.6	4,341.2	4,730.6	4,224.6
Apparent consumption all countries .....	209,762.3	333,825.6	472,467.9	495,452.6	551,954.7	493,772.9	527,260.1	597,836.6	701,029.1	753,555.4	889,544.6	896,998.3	1,034,898.6	1,298,650.1	1,160,955.7
United States .....	46,392.8	97,393.7	104,091.3	96,079.4	97,201.6	113,853.1	126,630.3	148,762.5	187,842.2	199,443.3	244,888.3	271,686.0	323,654.5	472,699.4	326,177.0
Canada .....	6,070.9	6,156.0	11,641.4	13,245.8	14,028.6	14,420.1	15,358.2	19,559.0	23,217.4	19,575.4	21,600.0	24,909.7	28,173.5	19,614.9	18,909.4
Mexico .....	6,667.9	5,769.4	12,663.0	14,623.6	13,820.9	7,396.0	7,119.4	8,288.3	10,009.5	11,822.5	16,295.9	20,865.4	22,948.4	18,837.1	21,755.6
European Union .....	55,808.8	76,098.1	109,886.4	112,632.0	118,396.2	110,305.0	113,049.0	122,901.5	132,656.2	134,031.6	152,874.1	172,990.9	202,905.6	256,765.2	254,710.2
Germany .....	13,416.1	15,131.2	18,469.1	23,848.6	31,111.3	27,393.2	28,627.2	30,640.9	32,210.1	28,056.1	26,149.9	29,394.9	34,012.5	49,368.5	60,745.6
France .....	5,598.6	7,694.6	11,366.7	11,284.4	11,595.2	10,801.1	11,438.6	12,782.5	13,329.2	15,561.1	21,829.2	26,394.6	32,858.4	41,535.7	48,715.9
United Kingdom .....	13,226.5	21,101.0	25,660.4	21,211.1	18,678.5	17,546.1	16,538.9	17,539.1	17,640.2	21,995.9	28,120.7	27,126.5	35,996.8	43,477.5	32,460.5
Italy .....	6,287.6	8,694.0	15,497.9	18,423.1	18,511.3	17,707.6	17,390.0	21,230.0	23,295.6	21,942.8	23,946.4	25,332.4	23,446.2	26,439.9	25,404.8
Other European Union .....	17,280.1	23,477.4	38,892.2	37,864.8	38,500.0	36,857.0	39,054.2	40,708.9	46,181.0	46,475.9	52,827.9	64,742.6	76,591.7	95,943.6	87,383.4
Brazil .....	9,027.8	8,489.1	10,848.3	9,513.0	9,289.1	9,678.7	12,163.3	12,368.1	14,059.9	15,414.3	16,968.3	15,276.9	17,708.2	16,136.6	16,296.0
Argentina .....	4,838.9	1,668.3	1,442.4	1,411.6	2,413.1	4,241.1	3,993.6	4,618.9	3,257.9	3,533.6	4,950.6	5,037.3	4,294.1	4,982.7	4,771.0
Chile .....	817.1	342.7	1,526.2	1,197.2	1,492.0	1,409.9	1,499.6	1,511.1	1,695.1	1,743.6	2,052.2	2,522.1	2,346.1	2,441.1	2,537.1
Peru .....	1,222.8	548.0	337.1	306.1	330.3	428.9	419.2	534.0	884.9	1,033.9	1,147.0	976.1	879.1	932.5	917.6
Costa Rica .....	94.4	90.6	144.8	164.7	97.3	103.9	143.5	160.4	129.5	151.9	104.4	379.5	492.0	443.4	483.6
Japan .....	25,124.0	42,623.2	82,422.4	88,265.3	99,070.2	83,383.2	87,794.0	94,311.6	119,445.6	143,487.3	173,983.3	125,387.5	109,330.9	107,214.4	96,411.9
China .....	2,704.7	13,757.2	19,819.1	16,564.9	18,846.4	22,284.1	32,515.4	45,643.0	39,533.7	47,283.1	58,077.0	66,524.4	84,417.5	98,001.9	113,497.2
South Korea .....	2,440.7	4,089.9	8,833.8	11,414.3	10,580.3	9,460.4	12,873.9	16,678.8	18,956.5	26,658.8	31,422.0	29,332.6	53,655.1	70,093.3	76,478.7
Australia .....	3,225.9	4,788.6	5,303.9	5,018.4	4,710.0	5,709.6	6,204.2	7,308.1	8,787.1	8,922.3	8,466.4	9,201.1	11,546.0	15,160.1	14,812.6
Taiwan .....	1,054.6	5,491.6	13,546.0	14,721.4	16,796.2	18,519.3	18,989.9	21,441.0	29,006.6	29,463.0	36,455.6	38,220.6	44,448.2	46,072.4	40,107.7
Singapore .....	1,258.6	6,818.7	6,501.8	8,300.1	8,851.2	10,569.9	12,723.9	12,037.0	14,654.8	11,107.7	7,965.8	6,019.2	7,051.0	8,651.8	8,135.5
Hong Kong .....	2,759.6	2,265.4	2,882.4	3,316.2	5,153.7	8,565.5	6,194.9	4,501.7	5,347.7	5,973.3	8,636.6	6,779.3	6,042.0	8,480.7	8,405.8
India .....	534.5	1,549.1	3,371.7	2,808.2	2,738.4	3,317.4	3,327.0	4,439.2	5,205.0	5,015.4	6,636.3	6,326.8	7,220.6	9,183.5	9,251.7
Malaysia .....	825.3	1,329.6	2,548.9	2,937.7	6,017.0	5,929.0	7,586.3	15,586.0	21,426.4	23,056.1	24,421.9	23,817.2	29,623.7	50,591.1	56,717.5
Thailand .....	925.4	1,252.6	3,055.5	5,499.4	5,982.3	6,413.8	6,197.6	5,020.0	7,741.6	7,300.6	8,542.2	5,657.5	8,131.4	10,676.8	11,361.5
Philippines .....	1,515.8	844.1	1,364.9	2,548.0	2,955.3	2,983.8	3,183.9	3,938.1	4,528.5	2,745.5	2,335.1	2,773.9	2,754.9	3,037.2	2,941.0
Indonesia .....	427.4	644.3	1,229.7	2,016.3	2,503.8	3,071.9	2,213.8	1,140.1	2,378.3	3,383.6	5,162.4	1,015.8	1,249.9	933.0	861.1
South Africa .....	2,441.0	2,409.5	2,370.0	2,261.2	1,996.4	1,897.7	2,020.9	2,943.0	3,537.3	4,009.3	4,435.6	6,473.0	5,347.3	5,766.8	5,862.1

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Drugs and medicines															
Production all countries .....	139,183.6	182,402.3	235,339.7	241,391.9	256,673.2	271,478.2	281,514.0	291,838.7	307,717.0	329,157.8	353,403.2	358,016.2	387,027.6	398,326.8	398,348.7
United States.....	27,962.0	38,233.9	55,641.9	58,324.8	63,103.6	66,685.1	68,210.7	72,627.4	76,580.6	83,141.0	91,217.6	91,345.7	101,398.5	107,929.3	100,181.6
Canada.....	1,372.4	1,987.6	2,610.9	2,847.4	2,563.3	3,118.1	3,401.2	3,191.5	3,131.3	3,261.2	4,039.5	4,166.5	4,411.4	4,239.0	5,555.9
Mexico.....	1,587.7	1,929.9	2,579.1	2,741.7	2,747.3	3,016.6	3,276.9	3,140.1	3,347.7	3,722.6	4,392.5	5,130.0	5,628.6	6,085.3	5,851.1
European Union.....	42,582.4	58,577.1	71,092.6	74,477.6	82,717.2	87,917.0	90,969.2	95,295.4	104,339.4	107,889.3	114,641.7	120,337.1	131,518.9	134,876.5	136,272.4
Germany.....	7,704.5	11,469.7	12,621.5	13,369.2	18,453.9	18,536.5	18,116.2	19,254.5	20,351.6	21,282.9	22,380.3	23,252.6	24,236.5	23,887.2	22,095.0
France.....	10,304.9	12,742.3	17,407.7	18,189.1	19,675.5	21,208.9	21,616.9	21,789.9	24,212.7	24,237.8	26,372.9	27,246.4	29,983.7	31,189.4	29,579.8
United Kingdom.....	6,789.4	8,383.5	10,553.0	10,818.4	11,896.9	13,768.0	14,238.6	15,342.7	16,646.0	17,026.6	17,754.4	18,024.8	17,918.8	19,345.1	21,891.3
Italy.....	9,547.1	13,682.7	14,677.3	15,383.7	14,112.5	14,279.9	15,575.3	16,071.7	17,538.4	17,376.3	16,952.5	18,249.8	20,519.8	19,148.2	19,547.9
Other European Union.....	8,236.6	12,299.1	15,833.2	16,717.2	18,578.4	20,123.9	21,422.2	22,836.6	25,590.8	27,965.7	31,181.7	33,563.4	38,860.1	41,306.7	43,158.4
Brazil.....	12,662.0	13,059.9	13,658.1	10,772.9	9,685.6	11,230.2	12,421.5	11,555.1	10,872.4	10,702.1	11,535.5	11,916.8	11,531.5	10,676.3	10,573.4
Argentina.....	2,618.0	2,371.5	1,793.9	2,350.0	2,593.5	3,217.4	2,849.3	3,260.5	3,073.9	3,262.3	3,722.1	4,034.6	3,595.0	3,684.4	3,014.8
Chile.....	426.2	463.2	582.7	587.9	625.8	700.8	811.3	767.8	689.8	629.0	633.4	686.3	613.8	676.7	670.4
Peru.....	774.5	516.5	282.8	376.5	450.1	497.0	507.2	449.8	472.7	500.6	556.1	503.7	507.1	534.0	530.1
Costa Rica.....	76.4	90.0	75.1	62.8	82.8	90.5	136.2	130.1	102.4	77.4	83.6	91.3	102.1	108.8	103.0
Japan.....	27,753.0	35,344.3	45,358.7	46,816.4	46,890.3	47,807.9	49,047.4	47,625.5	50,185.2	55,365.3	57,133.5	57,781.5	59,339.3	55,255.1	56,740.4
China.....	2,434.7	4,178.8	7,067.8	7,306.7	9,027.1	10,704.9	11,555.3	11,990.5	11,729.7	13,879.3	15,226.4	15,860.0	17,617.6	20,447.9	22,305.8
South Korea.....	2,267.3	3,943.7	6,497.7	7,263.8	7,391.9	8,209.1	9,350.5	10,189.4	9,700.9	11,350.7	11,865.2	9,023.8	11,097.7	13,670.5	14,754.7
Australia.....	1,206.6	1,330.7	1,592.9	1,804.4	2,266.6	2,458.7	2,618.3	2,669.8	2,762.5	2,915.2	3,482.2	3,732.9	3,925.1	3,496.3	3,688.9
Taiwan.....	457.0	800.4	1,091.6	1,113.9	1,218.1	1,436.4	1,320.4	1,506.1	1,513.4	1,624.1	1,785.0	1,616.5	1,587.0	1,348.1	1,236.6
Singapore.....	308.0	485.9	819.2	848.5	1,140.9	1,096.6	1,094.0	1,031.8	2,053.4	2,188.3	2,627.5	2,426.9	3,474.9	3,554.6	3,823.4
Hong Kong.....	102.7	96.7	129.1	115.7	136.5	146.5	176.5	189.0	213.0	229.5	214.0	171.6	188.6	171.3	165.9
India.....	1,328.8	1,775.8	2,697.4	2,788.8	3,146.8	3,615.4	4,365.9	4,610.7	5,070.4	5,634.2	6,012.5	5,679.5	6,736.4	6,462.9	6,274.7
Malaysia.....	33.6	59.6	92.5	91.8	109.0	123.4	123.7	128.6	159.5	158.4	177.7	169.9	183.2	194.6	179.6
Thailand.....	969.4	953.4	1,151.5	330.9	709.9	813.2	645.2	586.7	783.1	900.4	1,087.0	1,066.1	1,164.9	1,284.0	1,319.9
Philippines.....	904.5	549.3	1,023.9	945.2	946.0	1,041.3	1,001.9	981.0	1,013.3	1,190.8	1,223.3	1,117.4	1,165.5	1,096.3	1,176.9
Indonesia.....	236.7	583.3	714.4	868.4	1,177.9	843.5	1,141.1	1,534.6	1,380.5	1,470.9	1,314.3	1,056.0	1,215.9	1,448.1	2,339.4
South Africa.....	1,138.6	867.3	1,093.0	1,129.7	1,114.0	1,124.2	1,152.4	1,189.8	1,258.4	1,284.3	1,300.4	1,170.7	1,116.5	1,127.3	1,160.1
Value added all countries.....	64,302.2	84,514.1	108,203.5	110,319.1	117,472.4	125,697.4	133,369.2	139,790.5	142,364.8	153,998.8	161,780.1	157,667.7	174,401.0	178,341.9	187,069.8
United States.....	12,499.9	19,729.1	26,925.8	28,897.7	31,733.2	35,319.8	36,299.6	41,249.2	42,122.0	46,533.3	49,374.8	47,596.5	54,866.7	58,595.8	63,938.7
Canada.....	577.2	1,010.4	1,390.6	1,574.9	1,397.6	1,602.7	1,750.7	1,561.9	1,463.4	1,480.2	1,498.6	1,425.2	1,689.3	1,623.3	2,121.8
Mexico.....	712.2	945.8	1,322.3	1,387.5	1,386.4	1,544.8	1,703.9	1,618.0	1,728.7	1,921.5	2,247.8	2,633.3	2,910.8	3,147.1	3,026.2
European Union.....	17,287.9	22,477.4	28,594.2	29,936.3	33,736.2	35,170.9	36,703.4	38,732.2	41,963.8	43,183.2	45,266.4	47,245.1	52,889.7	53,324.6	54,235.7
Germany.....	3,058.1	4,735.2	5,700.4	5,959.2	8,459.7	8,282.7	8,156.0	8,627.2	9,022.5	9,447.2	9,171.4	9,084.6	9,825.4	9,683.7	7,842.9
France.....	4,329.8	4,424.3	5,235.3	5,775.5	5,822.8	6,074.7	6,468.1	6,663.9	7,938.9	7,906.7	8,808.3	8,996.0	10,108.1	9,651.9	9,551.3
United Kingdom.....	3,163.6	4,062.9	5,578.6	5,705.0	6,187.0	6,641.7	6,758.5	7,051.1	7,249.1	7,335.8	7,581.4	7,905.5	8,228.8	9,022.3	10,200.4
Italy.....	3,445.5	4,271.0	5,561.6	5,548.4	5,123.9	5,277.7	5,781.7	6,320.0	6,338.3	6,584.7	6,342.0	6,872.6	7,933.1	7,409.5	7,565.3
Other European Union.....	3,291.0	4,984.1	6,518.2	6,948.3	8,142.9	8,894.1	9,539.1	10,070.1	11,415.0	11,908.8	13,363.4	14,386.4	16,794.3	17,557.1	19,075.9
Brazil.....	9,943.2	10,380.3	10,702.5	8,566.2	7,701.6	8,474.8	11,327.4	9,713.0	8,368.0	8,236.9	8,878.4	9,171.8	8,875.3	8,217.1	8,136.9
Argentina.....	1,320.2	1,648.5	997.6	972.9	1,073.7	1,332.0	988.8	1,127.5	1,078.8	1,114.5	1,271.7	1,378.4	1,228.2	1,258.8	1,025.5
Chile.....	301.0	305.5	320.5	324.3	376.0	418.3	488.8	461.9	432.7	385.4	373.0	410.9	367.1	404.9	401.3
Peru.....	318.3	173.8	144.8	213.0	204.6	226.4	230.4	195.4	215.5	222.1	246.7	223.5	225.0	236.9	234.9
Costa Rica.....	27.8	30.0	24.6	20.6	34.1	33.8	51.3	46.9	35.6	28.8	32.5	32.8	35.8	39.4	38.1
Japan.....	13,667.0	17,282.3	23,192.6	23,281.6	23,141.5	24,010.1	24,867.0	24,636.1	24,891.3	28,075.6	28,010.9	24,371.8	24,907.0	23,190.9	23,778.2
China.....	961.3	1,062.7	1,817.9	1,924.4	2,612.5	3,014.9	3,830.6	3,448.8	3,229.6	4,303.7	4,964.0	5,001.7	6,058.3	7,045.5	7,700.8
South Korea.....	789.0	1,335.1	2,403.0	2,707.0	2,681.8	3,024.2	3,636.1	3,739.5	3,639.0	4,183.9	4,303.1	3,218.7	3,960.5	4,750.9	5,125.4
Australia.....	457.8	542.4	572.0	619.4	771.2	795.2	850.1	862.4	896.3	912.6	1,138.7	1,144.9	1,188.7	1,058.8	1,115.7
Taiwan.....	134.5	243.4	392.8	396.9	422.0	569.9	572.4	624.8	538.3	626.1	716.9	673.6	670.1	541.1	530.0
Singapore.....	200.2	356.5	617.4	672.5	937.9	906.0	923.7	863.6	1,345.8	1,500.6	1,557.6	1,624.8	2,602.9	2,661.1	2,862.2
Hong Kong.....	47.8	38.1	50.7	47.3	60.1	60.3	76.5	68.8	72.6	92.9	91.1	64.5	78.0	69.0	66.8
India.....	364.1	439.7	610.5	615.8	758.1	828.9	1,106.8	1,122.3	1,206.5	1,508.4	1,719.1	1,605.9	1,909.4	1,832.0	1,781.1
Malaysia.....	16.8	26.7	35.2	38.9	43.3	50.2	55.1	61.6	77.8	66.4	79.7	74.7	80.6	85.5	79.0

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Thailand .....	346.6	358.6	448.4	110.3	360.1	434.3	32.3	243.4	324.9	373.5	451.0	442.3	483.3	532.7	547.8
Philippines.....	276.2	202.2	453.0	456.5	501.3	621.5	583.6	535.7	608.5	753.7	775.9	708.7	739.3	697.0	750.0
Indonesia.....	106.7	167.2	224.3	330.0	526.0	284.2	417.0	664.3	446.3	516.4	472.4	393.6	570.4	579.8	938.0
South Africa.....	172.1	361.5	372.3	362.8	347.2	349.8	362.8	374.6	396.2	404.4	409.4	368.6	351.5	354.9	365.1
Exports all countries.....	43,209.1	46,634.2	70,690.7	82,674.0	91,006.4	106,519.8	112,956.7	120,898.7	132,769.6	142,936.5	162,803.5	185,478.5	200,337.1	201,992.1	217,946.6
United States.....	5,243.0	7,106.0	8,531.6	9,308.0	10,272.1	12,060.3	12,364.5	13,044.3	13,852.2	15,634.3	17,612.7	21,141.6	24,375.8	28,868.5	31,855.6
Canada.....	364.0	447.5	464.6	636.4	618.7	952.0	900.4	1,119.2	1,269.8	1,434.2	2,059.8	2,295.5	2,356.2	2,381.0	2,727.2
Mexico.....	212.5	123.0	299.4	278.4	303.9	544.8	507.9	635.5	840.9	1,165.2	1,352.1	1,545.1	1,602.0	1,693.1	1,830.2
European Union.....	27,997.4	29,820.9	46,986.1	54,979.1	60,069.8	70,659.2	75,788.4	80,858.5	88,743.7	94,188.2	108,852.1	124,500.3	132,584.4	131,703.9	141,323.2
Germany.....	6,953.0	7,338.1	11,843.0	13,578.8	14,620.0	16,175.5	16,818.7	18,663.7	19,077.7	20,325.2	24,308.1	30,076.9	31,143.4	26,758.0	28,676.5
France.....	4,639.0	4,857.5	7,603.9	8,746.3	9,417.8	10,985.3	11,850.9	11,978.4	13,311.9	13,998.1	16,553.3	19,700.8	20,781.8	21,364.3	22,861.9
United Kingdom.....	5,364.7	5,771.6	8,731.5	10,210.4	11,132.5	12,623.4	13,930.2	13,607.3	15,849.0	16,865.8	18,668.4	20,467.7	20,759.3	21,564.8	23,242.4
Italy.....	2,212.4	2,671.4	3,171.8	3,576.4	3,779.0	5,656.4	6,221.3	6,271.5	7,426.0	8,274.3	9,237.2	10,301.6	11,557.5	12,940.2	13,969.1
Other European Union.....	8,828.3	9,182.4	15,635.9	18,867.2	21,120.6	25,218.6	26,967.3	30,337.6	33,079.2	34,724.8	40,085.2	43,953.4	48,342.4	49,076.6	52,573.3
Brazil.....	165.2	189.9	202.3	218.5	276.6	289.1	258.1	295.4	353.3	396.6	460.6	568.4	610.4	536.7	570.5
Argentina.....	151.4	65.5	80.7	91.9	146.1	153.2	193.7	240.3	284.4	407.4	607.3	670.3	698.4	617.4	636.3
Chile.....	0.8	4.8	11.3	25.6	36.4	35.9	41.4	40.7	43.2	48.5	65.9	78.4	69.4	77.7	83.8
Peru.....	16.2	9.0	13.0	11.3	9.4	14.6	14.7	28.7	32.3	43.3	47.5	64.5	49.5	32.9	33.9
Costa Rica.....	26.0	25.3	26.2	30.3	38.6	45.8	47.9	47.5	50.3	51.5	73.4	94.9	93.8	127.8	134.1
Japan.....	1,134.0	1,263.4	2,098.7	2,412.6	2,808.1	3,407.1	3,239.5	3,114.9	3,411.1	3,693.6	4,002.3	4,123.0	4,818.4	4,999.6	5,572.2
China.....	653.6	798.9	1,389.8	1,618.5	1,902.0	2,136.8	1,979.0	2,381.5	2,941.1	2,993.1	3,177.5	3,606.9	3,490.7	3,499.9	3,968.5
South Korea.....	57.5	98.9	203.6	236.9	269.0	337.0	350.5	399.4	444.4	514.0	590.2	654.8	638.8	679.2	726.6
Australia.....	318.1	273.4	451.2	527.6	683.2	830.7	900.0	1,063.0	1,162.0	1,411.3	1,559.6	1,632.5	1,974.1	2,334.6	2,486.9
Taiwan.....	88.5	86.9	138.3	154.8	185.9	199.4	160.0	170.9	176.1	185.5	205.3	169.2	176.0	158.5	170.0
Singapore.....	465.9	352.8	431.4	477.3	513.6	571.3	788.2	988.2	1,149.9	1,193.0	1,232.6	1,244.3	2,352.6	1,841.3	1,957.2
Hong Kong.....	465.5	492.2	1,059.4	1,210.9	1,575.7	1,870.5	1,515.3	1,659.1	1,826.9	1,927.9	1,880.0	1,728.8	1,560.9	1,276.6	1,389.2
India.....	302.3	252.3	354.1	875.3	961.6	1,013.6	1,033.3	1,184.7	1,458.0	1,725.7	1,939.1	2,060.0	2,342.9	1,695.4	1,826.7
Malaysia.....	34.1	43.1	87.1	102.7	114.8	120.2	117.2	145.4	151.0	163.0	145.7	150.0	154.2	153.4	162.3
Thailand.....	60.9	31.6	57.8	74.4	92.3	148.4	295.4	190.5	255.9	208.3	218.1	210.4	220.6	235.6	250.1
Philippines.....	17.9	16.8	20.0	17.9	20.4	25.1	33.3	33.8	36.8	72.9	61.3	57.9	46.0	42.4	45.1
Indonesia.....	40.5	51.7	75.1	78.9	73.6	63.1	58.3	73.2	77.9	94.4	83.6	118.0	153.7	149.5	160.0
South Africa.....	30.3	42.5	15.5	38.4	55.2	85.9	76.1	75.9	95.7	119.2	148.8	191.9	168.0	225.2	244.2
Percent															
Import penetration all countries.....	26.5	22.3	26.0	29.5	29.5	38.4	39.8	41.5	43.1	44.0	46.5	52.2	52.4	51.7	55.7
United States.....	8.4	10.1	10.1	11.0	11.7	14.0	14.8	14.9	15.5	16.3	19.5	25.8	25.7	25.1	31.0
Canada.....	45.4	41.1	46.0	51.2	62.0	61.3	58.6	64.7	70.1	72.5	69.8	70.8	73.2	81.2	74.4
Mexico.....	23.9	16.4	18.1	20.9	24.4	27.2	29.7	35.7	29.7	35.5	35.3	36.1	36.0	38.4	42.7
European Union.....	53.2	41.9	57.5	66.6	66.4	74.9	77.7	80.2	81.8	85.6	93.4	104.5	102.6	102.5	113.5
Germany.....	83.2	59.1	95.1	103.8	73.4	82.8	90.7	98.0	94.4	95.6	116.1	169.4	171.5	130.9	176.5
France.....	26.7	22.6	30.9	37.4	38.1	43.3	45.1	47.3	48.4	52.1	55.2	66.0	65.2	63.9	76.0
United Kingdom.....	43.0	50.3	59.4	68.9	70.8	70.5	90.2	79.2	92.4	102.1	109.6	124.7	129.1	139.6	130.3
Italy.....	20.7	18.4	29.6	35.4	40.0	49.5	43.6	40.7	41.3	48.6	55.3	58.4	57.8	66.3	71.1
Other European Union.....	94.9	72.5	97.2	110.1	111.1	121.9	123.9	134.4	134.3	127.3	132.9	133.0	126.8	127.4	135.0
Brazil.....	3.3	2.6	4.3	7.3	8.6	6.8	7.9	11.5	14.2	18.5	20.2	21.6	22.7	23.7	23.8
Argentina.....	12.2	9.6	10.9	9.6	13.7	16.0	22.5	23.6	23.8	26.5	28.1	30.9	33.5	31.6	38.3
Chile.....	19.0	13.6	16.5	18.4	20.7	22.9	22.8	26.3	33.9	39.7	45.0	45.2	46.8	42.1	41.5
Peru.....	12.1	13.0	24.5	22.3	24.3	27.0	24.5	31.2	39.6	37.4	40.0	49.9	44.5	40.6	42.1
Costa Rica.....	61.3	43.8	56.4	63.1	57.3	61.9	50.3	51.8	60.4	77.8	90.8	103.2	91.7	117.8	127.4
Japan.....	9.7	8.6	12.1	12.0	12.7	14.5	15.1	16.3	15.9	13.6	13.4	12.2	14.0	14.8	14.7
China.....	2.5	6.9	11.4	15.9	17.4	15.6	14.0	14.9	17.8	16.2	15.1	16.3	14.0	11.7	12.0
South Korea.....	8.7	7.7	8.3	8.9	10.7	10.5	10.3	10.4	12.5	12.4	11.6	12.1	11.7	10.4	10.4
Australia.....	35.3	38.8	54.9	55.4	49.1	53.1	52.9	57.6	59.0	65.7	62.4	59.3	62.9	73.1	70.6
Taiwan.....	41.3	33.8	39.4	43.0	44.2	47.3	49.6	47.1	47.2	48.5	47.7	48.8	53.5	56.4	56.9
Singapore.....	354.9	75.5	53.0	55.6	43.9	51.7	71.1	94.9	53.6	52.6	47.4	46.3	50.8	42.5	41.7



## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Percent														
Hong Kong.....	216.3	200.7	376.2	326.8	382.3	487.2	342.7	320.3	288.6	340.8	336.6	304.4	315.6	318.7	340.1
India.....	17.3	17.5	15.3	19.3	16.8	18.5	13.7	15.0	17.4	14.6	17.1	19.1	15.8	16.6	19.0
Malaysia.....	142.8	113.3	96.9	102.7	100.4	103.1	101.6	104.5	99.6	102.0	96.2	89.9	89.5	87.4	89.9
Thailand.....	27.0	25.9	30.2	70.6	51.1	54.2	70.0	72.4	69.1	64.1	56.4	45.3	48.8	45.4	46.6
Philippines.....	19.2	22.6	22.8	26.5	25.9	28.6	31.9	36.9	37.6	37.5	39.1	37.8	40.2	38.4	37.3
Indonesia.....	66.4	33.7	30.5	32.5	26.5	36.5	26.6	19.6	26.4	25.1	30.9	24.7	22.3	20.6	14.6
South Africa.....	25.6	25.0	28.9	35.4	38.8	44.9	41.9	44.9	47.1	46.5	51.1	55.4	55.9	55.4	52.3
	Millions of 1997 U.S. dollars														
Imports all countries.....	38,773.5	42,897.9	68,567.5	81,552.8	91,393.6	107,913.0	113,796.9	122,039.7	132,895.7	146,449.0	165,404.6	190,686.1	208,443.5	207,338.4	223,290.2
United States.....	1,950.8	3,395.5	5,196.3	5,971.3	6,921.8	8,743.1	9,596.6	10,363.8	11,540.5	13,268.9	17,879.4	24,347.2	26,986.9	27,269.3	31,941.6
Canada.....	864.2	1,035.1	1,600.2	1,983.6	2,263.4	2,859.1	3,175.2	3,370.1	3,581.3	3,918.8	4,564.0	5,684.3	6,846.0	7,339.2	7,788.9
Mexico.....	423.1	360.2	512.5	662.0	781.6	917.3	1,123.0	1,313.8	1,091.7	1,431.4	1,657.9	2,030.4	2,219.8	2,601.4	2,751.4
European Union.....	19,177.8	19,993.4	35,000.4	43,042.4	48,173.3	57,557.4	58,035.8	62,270.5	68,034.5	75,097.4	81,919.9	95,719.5	105,694.0	103,277.8	109,816.7
Germany.....	4,118.1	4,038.1	6,457.6	7,948.6	9,816.5	10,696.0	10,036.0	11,580.2	12,470.4	13,722.3	13,933.1	17,077.8	18,271.0	16,868.9	17,741.5
France.....	2,169.9	2,308.9	4,643.4	5,998.1	6,639.1	8,076.3	8,399.8	9,114.6	10,296.1	11,138.5	12,102.1	14,542.2	16,155.8	15,825.7	16,784.6
United Kingdom.....	1,636.5	2,328.7	4,032.3	4,575.2	5,184.2	6,358.0	6,949.1	7,293.9	8,084.2	9,157.4	10,391.3	11,629.9	13,840.8	14,387.5	15,251.2
Italy.....	1,933.9	2,559.2	5,013.0	6,297.1	6,592.4	8,034.6	7,395.0	6,896.0	7,272.5	8,426.7	9,540.7	11,104.2	12,285.8	11,991.1	12,732.9
Other European Union.....	9,319.4	8,758.6	14,854.1	18,223.5	19,941.0	24,392.5	25,256.0	27,385.9	29,911.3	32,652.5	35,952.7	41,365.5	45,140.6	44,204.6	47,306.4
Brazil.....	440.4	353.9	607.9	842.5	915.3	818.5	1,079.3	1,505.8	1,774.5	2,369.5	2,810.4	3,096.5	3,554.6	3,345.1	3,531.3
Argentina.....	358.4	254.9	219.0	241.6	385.4	578.0	755.9	922.6	864.8	1,021.6	1,219.0	1,507.0	1,449.4	1,405.9	1,464.4
Chile.....	105.1	84.8	126.3	137.9	164.2	210.6	245.6	279.0	345.7	401.8	464.3	509.1	519.8	492.3	525.4
Peru.....	120.7	92.7	94	110.0	140.9	173.0	167.4	197.7	291.1	278.8	339.0	422.9	384.9	357.4	379.2
Costa Rica.....	56.0	44.4	60.4	55.8	63.3	74.3	89.4	88.7	76.4	90.7	100.6	132.4	126.0	134.5	148.0
Japan.....	2,950.0	3,336.4	5,917.0	6,110.8	6,424.3	7,464.8	7,956.4	8,382.3	8,570.3	8,059.8	8,230.2	7,460.5	8,765.1	8,537.6	8,710.5
China.....	56.2	267.2	757.2	1,089.9	1,511.1	1,595.1	1,560.1	1,646.8	1,866.9	2,085.6	2,138.5	2,397.3	2,298.3	2,230.8	2,467.6
South Korea.....	210.7	321.3	565.5	686.5	843.5	920.0	1,035.1	1,133.0	1,302.6	1,508.5	1,482.1	1,170.9	1,412.5	1,540.9	1,662.8
Australia.....	494.4	709.2	1,280.9	1,485.3	1,485.2	1,852.1	2,026.6	2,164.9	2,312.0	2,770.5	3,194.9	3,578.1	3,946.2	4,153.6	4,424.1
Taiwan.....	307.3	423.2	608.6	703.5	785.7	1,011.8	1,067.0	1,159.5	1,250.5	1,401.7	1,439.0	1,519.1	1,709.7	1,716.2	1,786.4
Singapore.....	314.8	304.6	483.9	498.5	504.9	595.3	799.3	862.9	1,043.7	1,105.0	1,257.0	1,056.3	1,190.9	1,223.1	1,290.7
Hong Kong.....	605.2	686.2	1,182.8	1,442.6	1,855.7	2,074.5	1,849.0	2,072.0	2,314.8	2,312.8	2,369.9	2,381.3	2,022.2	1,679.2	1,793.2
India.....	224.5	315.3	417.5	480.7	451.7	599.1	523.5	601.4	774.4	679.6	839.4	877.8	850.7	955.9	1,054.1
Malaysia.....	221.7	305.1	390.6	433.9	468.0	498.0	513.8	600.9	665.8	711.5	812.7	612.0	706.0	706.9	755.4
Thailand.....	327.5	328.4	459.1	511.7	573.5	716.7	744.6	851.1	1,033.1	1,063.3	1,123.6	781.4	980.5	1,003.8	1,123.1
Philippines.....	216.2	161.9	311.9	354.9	339.7	412.1	471.0	561.9	602.7	666.8	744.7	703.3	761.1	715.6	777.1
Indonesia.....	251.3	258.2	293.2	391.7	404.9	463.2	400.6	362.5	479.1	461.4	550.1	409.9	329.0	365.4	396.2
South Africa.....	393.2	329.0	456.2	580.9	626.2	753.3	724.1	859.7	985.6	1,059.1	1,205.5	1,274.3	1,350.3	1,380.5	1,464.5
Apparent consumption all countries.....	146,110.3	192,680.9	263,982.7	276,784.5	310,008.8	281,147.6	285,671.0	294,078.4	308,385.9	332,780.3	356,004.3	365,449.1	397,963.7	401,428.2	401,255.1
United States.....	23,360.4	33,541.5	51,317.7	54,184.5	59,196.4	62,669.6	64,809.6	69,500.9	74,634.4	81,182.9	91,484.3	94,441.9	105,077.1	108,612.7	103,021.5
Canada.....	1,904.4	2,519.9	3,479.7	3,873.4	3,650.9	4,661.1	5,415.2	5,209.9	5,107.3	5,403.4	6,543.6	8,024.5	9,350.3	9,040.7	10,475.4
Mexico.....	1,770.5	2,200.3	2,825.0	3,161.5	3,205.6	3,368.9	3,782.8	3,684.3	3,676.6	4,038.2	4,698.2	5,627.3	6,174.5	6,769.6	6,451.4
European Union.....	36,027.6	47,707.5	60,838.9	64,671.1	72,578.5	76,869.5	74,744.4	77,617.6	83,127.7	87,716.3	87,709.5	91,571.3	102,975.9	100,760.0	96,777.7
Germany.....	4,947.2	6,836.2	6,790.7	7,657.1	13,381.1	12,923.9	11,067.8	11,818.6	13,206.8	14,360.9	12,005.2	10,079.9	10,651.2	12,890.0	10,049.9
France.....	8,117.5	10,232.2	15,053.3	16,030.3	17,443.7	18,672.8	18,621.6	19,273.9	21,275.9	21,374.2	21,921.7	22,046.0	24,762.0	24,781.5	22,085.6
United Kingdom.....	3,807.5	4,631.3	6,790.5	6,642.5	7,323.6	9,024.2	7,700.6	9,210.6	8,745.6	8,971.3	9,477.3	9,330.4	10,725.2	10,304.2	11,703.6
Italy.....	9,339.1	13,925.2	16,918.7	17,793.7	16,488.5	16,239.8	16,964.8	16,930.0	17,621.2	17,351.1	17,256.0	19,011.5	21,249.6	18,094.8	17,907.2
Other European Union.....	9,816.4	12,082.6	15,285.8	16,547.5	17,941.7	20,008.7	20,389.6	20,384.6	22,278.2	25,658.9	27,049.2	31,103.6	35,587.9	34,689.5	35,031.5
Brazil.....	13,256.4	13,489.0	14,272.3	11,585.4	10,656.3	12,050.6	13,612.3	13,110.3	12,479.0	12,782.6	13,885.3	14,362.8	15,678.0	14,133.9	14,844.7
Argentina.....	2,948.8	2,650.7	2,016.9	2,509.4	2,821.8	3,623.5	3,357.7	3,914.3	3,637.4	3,857.7	4,333.8	4,874.7	4,333.3	4,453.7	3,820.9
Chile.....	552.7	624.8	764.2	750.8	795.0	920.1	1,078.3	1,061.0	1,019.5	1,012.2	1,031.8	1,125.9	1,110.9	1,168.4	1,264.8
Peru.....	999.6	712.2	384.2	493.6	580.3	641.4	683.3	632.8	735.7	745.6	847.6	847.2	864.9	880.7	901.3
Costa Rica.....	91.3	101.4	107.1	88.5	110.6	120.1	177.7	171.2	126.5	116.6	110.7	128.3	137.4	114.2	116.2
Japan.....	30,367.1	38,715.5	49,082.5	50,805.2	50,463.0	51,598.7	52,761.6	51,566.9	53,943.2	59,411.9	61,361.4	61,279.3	62,707.4	57,650.5	59,140.4
China.....	2,255.5	3,885.1	6,628.3	6,860.8	8,679.6	10,209.1	11,148.8	11,074.9	10,469.3	12,896.2	14,187.4	14,704.8	16,403.0	19,043.2	20,618.1
South Korea.....	2,411.9	4,199.4	6,824.1	7,702.8	7,902.3	8,757.8	10,015.6	10,859.4	10,423.8	12,208.2	12,757.1	9,666.6	12,095.2	14,761.2	16,066.1

Appendix table 6-1  
World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of 1997 U.S. dollars														
Australia.....	1,402.1	1,827.3	2,333.1	2,683.0	3,024.4	3,490.2	3,832.7	3,760.5	3,920.5	4,216.8	5,117.5	6,038.2	6,270.5	5,679.8	6,262.7
Taiwan.....	744.6	1,251.3	1,543.4	1,637.0	1,778.1	2,140.3	2,150.5	2,464.4	2,652.2	2,890.3	3,018.6	3,114.0	3,198.2	3,043.7	3,142.5
Singapore.....	88.7	403.3	912.9	896.6	1,149.1	1,152.1	1,124.8	909.1	1,946.8	2,100.6	2,651.8	2,283.2	2,343.0	2,874.8	3,098.6
Hong Kong.....	279.8	341.9	314.4	441.4	485.4	425.8	539.5	646.9	802.0	678.6	704.0	782.4	640.8	527.0	527.2
India.....	1,297.4	1,804.2	2,728.9	2,485.4	2,694.8	3,246.8	3,821.8	4,021.3	4,455.9	4,661.3	4,912.7	4,596.2	5,392.7	5,770.0	5,547.2
Malaysia.....	155.2	269.4	403.3	422.3	466.2	482.8	505.7	575.2	668.4	697.5	844.6	680.4	788.9	808.8	840.4
Thailand.....	1,214.2	1,268.7	1,518.9	724.5	1,122.2	1,321.9	1,063.5	1,175.0	1,494.6	1,658.6	1,992.6	1,725.0	2,009.2	2,209.8	2,412.4
Philippines.....	1,128.0	717.7	1,367.3	1,340.3	1,312.1	1,441.4	1,477.5	1,524.0	1,603.1	1,780.4	1,906.6	1,861.7	1,893.9	1,864.1	2,085.6
Indonesia.....	378.4	766.0	961.7	1,206.8	1,526.9	1,267.5	1,504.0	1,845.7	1,812.8	1,841.8	1,780.8	1,661.2	1,477.6	1,774.6	2,171.5
South Africa.....	1,535.2	1,314.8	1,579.2	1,639.5	1,613.8	1,676.8	1,727.4	1,914.2	2,092.0	2,277.0	2,357.1	2,299.2	2,415.2	2,492.5	2,801.4
Medical, precision and optical instruments															
Production all countries.....	194,551.4	238,972.4	274,578.1	279,924.8	287,259.7	283,632.7	285,650.0	288,931.0	311,912.8	325,530.6	329,103.5	342,391.7	353,391.9	391,614.9	404,948.1
United States.....	87,693.3	111,887.9	125,995.5	128,851.5	128,185.0	128,570.4	130,061.5	131,570.6	148,250.0	156,802.2	151,967.0	157,265.3	168,367.6	187,945.2	199,444.3
Canada.....	1,483.9	1,519.2	1,715.5	1,611.2	1,547.1	1,437.2	1,520.1	1,469.6	2,102.7	2,114.6	2,434.1	2,545.9	2,327.2	2,537.5	2,604.0
Mexico.....	363.0	201.7	270.3	353.9	382.5	383.4	570.6	291.2	409.9	538.3	633.9	821.6	863.4	1,130.5	1,250.1
European Union.....	56,619.8	68,970.6	79,692.3	82,245.2	85,471.2	87,448.4	86,478.0	88,079.4	92,113.0	94,769.0	94,914.8	98,892.2	101,735.0	114,726.2	121,068.6
Germany.....	23,237.2	26,752.3	29,518.9	30,658.5	32,101.5	33,750.2	31,574.6	30,956.6	28,736.5	28,999.9	30,510.4	31,273.5	31,635.9	37,565.3	39,652.9
France.....	9,717.3	13,474.7	16,965.6	17,466.8	17,813.5	17,542.7	16,973.5	17,255.6	19,524.8	20,371.2	20,204.6	21,753.9	22,198.5	23,523.2	25,537.3
United Kingdom.....	12,912.2	13,871.9	16,488.0	16,496.0	17,452.1	17,607.1	17,619.9	17,302.1	17,823.2	18,740.7	16,867.0	16,128.2	16,074.7	17,145.9	18,079.5
Italy.....	4,719.0	6,763.4	7,633.5	7,715.4	7,925.4	8,083.1	8,872.4	9,533.4	11,367.9	10,915.8	10,604.5	11,403.0	11,483.0	12,176.5	11,809.1
Other European Union.....	6,034.1	8,108.3	9,086.2	9,908.5	10,178.6	10,465.4	11,437.7	13,033.8	14,660.8	15,741.4	16,728.4	18,333.6	20,342.8	24,315.3	25,989.9
Brazil.....	6,133.5	5,636.9	6,998.1	4,941.6	4,448.5	4,570.6	4,544.5	4,478.3	3,533.8	3,603.3	3,700.0	3,486.4	3,385.7	3,826.0	3,753.7
Argentina.....	404.3	265.0	198.6	233.9	263.9	257.6	457.4	454.6	394.2	375.8	532.3	483.9	386.4	378.3	356.9
Chile.....	21.2	15.4	28.0	29.5	31.2	35.8	41.6	52.4	52.9	58.0	68.6	62.7	38.5	43.1	36.9
Peru.....	108.8	64.2	59.7	46.5	41.0	46.7	48.7	82.0	40.2	32.2	31.9	29.2	24.7	23.9	23.6
Costa Rica.....	28.3	10.7	14.1	14.9	9.2	12.0	32.2	46.4	43.9	26.0	7.1	5.4	5.6	5.0	4.9
Japan.....	23,121.3	28,196.5	30,795.5	32,886.8	35,930.9	33,052.4	29,196.9	28,849.9	29,957.1	31,684.9	36,147.3	37,224.1	33,774.2	33,369.4	27,784.4
China.....	677.7	1,976.1	2,477.5	2,248.9	2,648.8	3,328.5	5,900.4	5,610.3	5,037.3	6,258.2	7,237.2	8,663.1	9,340.2	10,790.0	10,349.3
South Korea.....	818.2	1,252.3	2,049.7	2,305.9	2,730.4	2,809.7	3,235.4	3,954.5	5,053.5	4,878.8	5,028.0	3,280.2	5,575.1	6,049.8	5,851.1
Australia.....	1,006.8	1,000.9	1,197.9	1,043.0	1,195.0	1,097.1	1,273.4	1,224.9	1,145.8	1,137.9	1,323.8	1,473.9	1,637.1	1,938.1	1,831.7
Taiwan.....	820.0	1,553.2	2,058.2	1,973.6	2,025.5	2,005.3	1,850.8	2,009.3	2,160.1	2,020.6	1,989.7	1,893.2	2,084.3	2,534.2	2,348.6
Singapore.....	389.6	288.8	556.3	638.9	670.4	740.2	819.8	877.9	1,103.7	1,150.0	1,140.4	1,248.4	1,483.5	1,391.6	1,288.8
Hong Kong.....	2,606.3	3,024.5	3,766.9	3,580.8	3,351.3	3,378.4	2,864.6	2,937.4	2,517.3	1,758.9	1,437.6	1,473.1	1,265.8	1,480.9	1,357.7
India.....	231.1	333.0	479.2	574.3	558.8	606.6	782.3	858.0	1,071.3	1,025.8	976.9	1,224.1	1,091.1	1,142.7	1,184.3
Malaysia.....	61.4	85.9	258.9	368.5	646.6	602.3	703.8	949.9	1,207.8	973.2	1,000.8	1,035.7	1,085.8	1,239.7	1,287.5
Thailand.....	22.3	131.5	129.1	90.1	213.3	192.2	138.9	296.8	320.9	345.1	342.9	306.7	344.2	359.3	359.4
Philippines.....	15.3	24.4	44.2	21.9	29.5	36.4	101.1	66.0	76.2	100.0	107.3	105.4	114.5	134.3	152.1
Indonesia.....	4.0	14.3	39.4	33.3	47.7	137.2	112.1	147.1	220.1	329.4	308.4	3,575.3	473.9	458.8	467.6
South Africa.....	131.8	255.3	299.1	277.6	290.1	302.7	280.2	275.2	276.7	276.5	274.1	213.9	206.2	208.6	214.5
Value added all countries.....	80,967.9	98,097.8	114,616.1	118,782.9	122,556.2	120,336.3	117,753.9	116,497.8	120,194.4	131,566.0	131,156.3	137,820.6	140,347.0	157,120.3	159,926.0
United States.....	31,630.8	39,018.9	45,857.6	50,200.8	50,551.5	50,409.4	46,990.2	45,607.9	48,668.0	56,968.4	53,574.0	57,425.4	60,376.6	70,197.5	71,357.2
Canada.....	568.1	627.1	720.5	719.4	714.5	653.7	690.0	695.3	1,069.7	1,104.9	1,260.0	1,313.2	1,242.1	1,354.3	1,415.4
Mexico.....	170.4	90.4	95.5	120.8	136.2	133.8	185.0	110.8	136.6	167.1	173.4	257.0	257.2	342.6	378.4
European Union.....	27,163.9	33,441.9	38,016.2	39,157.8	40,600.6	41,468.0	40,610.7	41,192.7	41,899.0	43,178.0	43,511.0	44,505.9	45,863.3	51,009.3	54,442.2
Germany.....	11,804.2	13,589.9	14,958.2	15,574.1	16,307.2	17,402.7	15,787.3	15,496.6	14,243.4	14,712.1	14,978.9	15,056.0	15,035.6	17,628.9	19,090.5
France.....	4,184.1	5,899.2	7,120.9	7,141.7	7,142.3	7,035.8	7,020.9	7,067.8	7,800.5	7,814.1	8,088.3	8,217.1	8,689.3	8,608.2	9,476.0
United Kingdom.....	5,826.7	6,556.3	7,444.2	7,499.9	8,131.0	8,200.7	8,155.7	8,157.2	8,146.3	8,437.2	7,859.7	7,598.5	7,546.3	8,043.4	8,500.1
Italy.....	2,609.3	3,739.6	4,220.7	4,266.1	4,180.8	3,766.1	4,089.4	4,255.4	4,939.6	4,851.0	4,776.1	5,102.2	5,115.8	5,383.8	5,237.2
Other European Union.....	2,739.6	3,656.9	4,235.2	4,676.0	4,839.3	5,062.7	5,557.5	6,215.7	6,769.2	7,363.7	7,808.1	8,532.2	9,476.2	11,345.0	12,138.5
Brazil.....	4,706.4	4,265.7	5,358.4	3,700.2	3,331.0	3,575.7	3,640.3	3,459.0	2,455.1	2,503.4	2,570.6	2,422.2	2,352.2	2,658.1	2,606.1
Argentina.....	202.2	173.6	130.4	125.5	141.6	138.3	205.3	196.3	193.2	156.3	221.4	201.2	160.7	157.3	147.9
Chile.....	10.1	9.4	14.7	13.8	17.3	20.1	26.0	30.6	29.3	28.8	33.0	30.2	18.6	20.8	17.7
Peru.....	43.5	29.1	31.5	26.5	18.3	18.0	18.8	37.5	16.1	14.0	13.8	12.6	10.7	10.3	10.2

## World industry and trade data for selected countries or economies and industries: 1980-2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Costa Rica .....	10.2	5.1	7.0	7.2	4.4	5.8	14.3	21.3	19.3	12.0	4.1	2.8	2.9	2.6	2.6
Japan .....	9,666.3	12,316.9	14,232.6	14,867.4	16,323.8	14,599.6	13,252.5	12,505.8	13,303.2	14,518.3	16,060.7	16,564.7	15,029.5	14,849.4	12,431.3
China .....	390.1	881.9	943.2	823.6	959.3	1,173.3	1,972.4	1,707.3	1,450.1	1,708.7	1,792.7	2,106.8	2,388.3	2,748.5	2,626.1
South Korea .....	273.5	409.6	588.0	698.8	795.4	827.6	955.4	1,260.5	1,502.1	1,501.4	1,559.2	1,040.1	1,693.2	1,802.3	1,743.6
Australia .....	331.9	357.6	348.3	348.5	328.0	351.3	407.2	386.3	374.0	388.3	371.5	365.3	366.8	434.3	409.6
Taiwan .....	271.7	505.2	625.7	632.5	668.8	696.9	663.3	707.6	688.7	658.9	683.9	690.9	756.7	856.8	890.5
Singapore .....	175.9	173.5	281.7	296.5	309.1	366.6	418.2	448.6	525.3	569.0	566.4	659.9	791.3	742.4	688.4
Hong Kong .....	544.2	521.8	718.2	687.4	599.5	580.1	508.8	484.4	426.4	341.6	332.2	301.4	242.1	312.6	287.0
India .....	68.2	98.9	142.9	134.8	154.7	148.1	197.7	208.7	274.2	273.6	205.9	371.2	331.0	346.5	359.1
Malaysia .....	23.6	32.4	95.9	106.7	176.5	162.6	180.5	227.7	263.6	231.3	282.7	290.9	304.9	346.5	355.2
Thailand .....	16.2	98.2	54.5	59.7	120.2	108.3	29.0	117.4	126.9	136.5	135.6	121.3	136.1	142.1	142.2
Philippines .....	7.3	7.6	23.2	15.4	17.3	20.5	44.7	38.0	37.5	55.0	59.5	58.5	63.5	73.5	82.8
Indonesia .....	2.0	4.5	8.0	12.2	14.4	35.1	20.8	56.8	72.9	102.6	143.3	1,693.8	194.0	168.1	171.0
South Africa .....	74.8	109.7	174.2	175.9	185.5	225.1	208.7	205.4	207.3	207.4	206.0	159.8	154.1	156.4	161.1
Exports all countries .....	115,367.9	143,847.0	192,356.9	204,321.9	212,233.3	226,931.5	225,299.3	237,455.0	270,528.7	287,110.7	316,670.0	324,698.5	344,415.5	381,929.4	379,615.1
United States .....	29,811.6	28,087.4	39,892.9	40,608.6	42,731.7	45,128.3	45,603.6	49,276.1	55,487.5	61,230.2	68,217.1	69,579.1	72,414.6	83,050.5	84,376.8
Canada .....	1,533.0	2,280.8	2,542.9	2,085.9	2,171.3	2,711.8	2,657.4	3,226.4	3,516.2	4,141.0	4,633.2	5,175.1	5,943.2	8,731.3	8,628.7
Mexico .....	58.2	618.0	349.4	497.4	502.3	2,218.8	2,405.1	2,567.3	2,749.5	3,826.3	5,161.5	6,579.7	7,358.5	9,006.7	8,783.8
European Union .....	46,087.7	62,338.4	78,170.5	84,574.4	83,993.3	89,289.9	87,880.0	89,151.2	102,488.8	108,289.5	118,672.8	124,626.6	129,621.5	137,361.4	139,230.4
Germany .....	16,202.8	22,063.0	27,935.6	29,096.7	28,376.8	30,832.3	28,646.1	30,014.8	33,071.6	34,754.6	36,525.4	40,628.8	42,573.3	44,207.0	45,028.4
France .....	6,510.2	8,889.7	10,154.2	11,319.4	11,353.1	11,631.1	11,304.2	11,565.8	12,910.6	12,745.0	13,758.9	13,921.6	13,928.4	15,608.6	15,757.1
United Kingdom .....	9,245.1	12,690.2	15,471.7	16,213.7	16,007.6	16,374.6	15,972.5	16,566.9	18,230.7	19,726.9	23,107.5	23,105.1	22,874.6	23,894.3	24,211.3
Italy .....	3,131.5	4,288.9	5,806.2	6,548.6	6,665.0	7,177.6	7,597.0	7,729.6	8,854.3	9,674.9	9,836.7	9,982.3	10,070.1	10,996.7	11,040.8
Other European Union .....	10,998.0	14,406.7	18,802.9	21,396.1	21,590.8	23,274.3	24,360.4	23,274.0	29,421.5	31,388.1	35,444.3	36,988.8	40,175.2	42,654.8	43,192.9
Brazil .....	345.0	408.3	425.2	339.7	373.5	368.2	463.8	504.0	416.2	375.6	453.0	585.6	719.7	783.6	793.6
Argentina .....	165.9	34.5	62.5	57.8	63.7	82.0	90.5	88.8	152.7	92.7	135.5	147.1	151.2	208.5	206.3
Chile .....	3.6	1.5	4.1	5.0	9.9	15.6	10.4	14.2	11.2	15.2	15.8	18.7	18.3	23.4	24.0
Peru .....	0.8	3.3	0.7	0.6	1.6	0.9	2.4	6.9	1.9	16.8	7.6	28.1	9.0	4.6	4.6
Costa Rica .....	0.5	0.2	3.6	6.3	9.8	11.9	15.6	2.9	3.3	3.2	53.4	93.9	96.2	146.2	156.1
Japan .....	20,108.5	29,358.9	38,362.6	37,762.5	40,505.8	39,796.9	38,028.5	38,756.7	43,397.5	43,443.6	46,803.5	44,049.3	48,677.2	54,217.4	48,454.7
China .....	317.2	260.4	1,093.0	3,000.9	3,423.0	4,647.5	5,362.8	6,510.6	8,089.3	9,391.5	11,808.5	12,680.1	13,737.1	17,139.3	17,678.3
South Korea .....	879.6	1,095.5	1,875.8	1,832.2	1,743.4	1,987.6	2,197.2	2,486.2	3,035.2	3,259.0	4,611.2	6,184.6	8,607.3	4,764.8	4,717.5
Australia .....	580.8	523.0	596.1	653.6	757.5	862.6	882.4	1,028.0	1,103.9	1,377.0	1,438.8	1,527.6	2,013.1	2,144.0	2,152.1
Taiwan .....	1,167.7	1,702.0	3,716.8	3,686.4	4,290.2	4,880.2	4,891.1	5,329.3	5,659.7	5,565.9	5,692.4	5,489.0	5,869.6	7,036.4	7,235.5
Singapore .....	829.6	1,230.5	2,284.0	2,742.0	3,290.8	3,614.4	4,041.9	4,985.1	6,230.9	6,475.0	7,317.7	6,798.4	7,302.9	8,352.4	8,305.1
Hong Kong .....	5,178.9	6,625.2	10,469.1	11,809.2	12,988.1	15,050.9	14,843.9	15,899.9	17,334.1	17,304.9	18,638.1	17,570.2	17,683.6	20,994.5	21,027.4
India .....	79.6	46.3	99.7	95.2	81.8	102.0	147.3	173.2	216.2	272.5	285.4	310.5	410.4	546.6	548.7
Malaysia .....	138.9	296.5	671.0	979.2	1,406.4	1,620.1	1,729.8	2,027.4	2,288.7	2,534.9	2,889.5	2,414.7	2,622.9	3,782.2	3,727.3
Thailand .....	63.7	184.0	466.0	658.0	1,065.4	1,414.2	1,530.9	1,912.0	2,175.6	2,363.3	2,271.6	1,996.1	2,054.8	2,577.2	2,538.6
Philippines .....	63.3	17.9	174.3	28.0	38.9	41.6	59.2	92.4	107.1	703.5	761.7	882.3	742.7	1,048.9	1,046.0
Indonesia .....	10.8	100.9	101.9	147.3	205.2	272.3	310.8	411.2	413.7	511.9	563.4	503.6	173.0	357.7	388.5
South Africa .....	42.6	68.4	40.1	56.3	61.0	123.9	132.5	152.4	192.6	241.6	319.4	295.9	301.2	301.5	306.1
Percent															
Import penetration all countries .....	56.7	58.3	64.5	65.9	64.4	77.8	77.4	80.7	85.4	88.6	96.4	94.5	95.7	95.2	91.8
United States .....	17.5	27.8	28.4	27.8	28.2	30.6	32.1	33.3	32.5	33.6	40.6	42.7	42.8	44.9	42.5
Canada .....	127.1	127.7	131.1	123.4	123.2	126.2	116.3	121.5	114.7	125.6	122.2	120.4	135.2	169.1	159.2
Mexico .....	121.3	126.0	98.1	99.3	105.9	173.4	181.6	203.5	195.8	256.7	372.2	511.3	538.6	620.2	509.7
European Union .....	87.0	87.1	101.4	108.5	103.5	107.1	103.9	102.8	113.4	116.8	124.7	125.2	123.8	113.3	108.2
Germany .....	67.7	82.2	103.3	101.5	92.4	95.2	92.4	99.8	125.2	130.6	129.6	146.8	151.0	122.8	115.3
France .....	76.8	62.5	66.0	71.0	70.1	72.3	71.7	71.5	71.8	68.8	71.7	69.4	68.7	67.1	63.0
United Kingdom .....	74.2	83.8	90.8	96.4	91.1	91.4	91.6	98.8	101.8	107.2	149.0	152.3	147.3	141.0	132.4
Italy .....	73.6	64.7	85.8	96.3	95.4	98.0	86.7	81.9	79.0	90.8	94.0	89.8	89.7	87.4	90.1
Other European Union .....	145.4	133.3	153.4	168.1	164.5	173.3	169.2	145.3	170.6	169.1	168.0	164.5	161.8	144.3	138.5
Brazil .....	19.5	13.9	19.0	26.4	27.4	25.6	27.7	33.2	50.2	52.9	56.3	58.3	46.3	45.8	42.5

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Percent														
Argentina.....	63.0	56.7	56.1	66.6	81.5	88.3	78.6	81.4	87.2	86.4	79.9	83.6	90.5	95.0	95.6
Chile.....	95.6	64.3	67.3	70.6	76.7	79.4	77.2	80.8	91.6	90.5	94.1	92.2	88.1	87.5	79.7
Peru.....	38.6	41.6	53.5	58.8	72.5	81.2	71.4	72.8	93.5	94.4	93.7	97.7	83.6	83.6	84.1
Costa Rica.....	73.2	75.0	79.2	83.4	90.2	95.4	77.6	58.8	63.8	77.4	167.0	224.5	273.1	482.0	579.8
Japan.....	71.0	87.5	106.2	94.0	90.4	102.7	126.2	141.7	174.1	174.4	173.6	143.0	207.2	276.4	316.0
China.....	133.7	107.3	91.3	129.7	118.6	126.4	96.4	110.8	155.0	149.8	176.8	156.8	148.6	149.7	152.9
South Korea.....	140.0	112.0	120.6	106.3	92.6	93.3	91.5	89.2	86.5	91.7	96.5	155.0	133.0	85.0	80.8
Australia.....	92.1	89.2	92.8	94.4	90.9	92.7	84.4	95.1	99.5	111.3	102.5	90.9	99.3	88.3	84.9
Taiwan.....	150.3	125.9	204.8	201.6	213.8	232.6	236.1	222.6	189.7	170.9	154.3	135.8	122.6	113.4	109.8
Singapore.....	96.4	135.0	153.6	157.5	200.8	194.2	181.2	220.6	266.8	260.8	282.9	341.1	279.0	288.6	309.6
Hong Kong.....	482.3	481.2	447.3	433.8	613.8	619.5	796.0	841.8	901.2	994.7	1,084.6	1,113.8	1,079.8	1,028.8	1,015.4
India.....	126.4	132.8	110.0	95.0	72.9	73.8	61.8	62.2	66.1	64.9	72.7	69.3	75.5	81.9	81.7
Malaysia.....	169.0	172.6	139.3	142.8	137.3	167.9	162.4	144.0	136.9	167.6	171.5	144.0	151.1	183.6	176.1
Thailand.....	128.7	119.1	143.2	168.1	193.7	247.1	254.5	235.4	221.2	247.4	225.8	276.4	265.0	255.8	228.9
Philippines.....	120.4	101.2	116.6	87.7	89.2	95.8	86.4	100.4	102.6	189.4	181.6	177.3	173.6	205.3	168.4
Indonesia.....	177.1	155.4	104.1	108.4	111.7	107.7	114.8	132.8	117.6	123.5	127.1	17.1	53.9	72.4	72.6
South Africa.....	96.3	69.8	77.9	87.8	90.9	99.9	98.1	97.8	103.5	96.1	102.7	95.8	91.9	89.3	79.8
	Millions of 1997 U.S. dollars														
Imports all countries.....	113,610.6	147,258.2	198,643.4	212,007.0	219,270.0	234,180.0	236,576.9	250,196.0	286,236.3	304,532.6	337,447.8	345,433.5	369,653.6	419,786.8	424,531.8
United States.....	13,841.2	30,854.5	34,556.5	34,348.8	33,827.7	37,116.1	40,427.8	42,076.4	45,823.8	48,889.2	57,237.5	64,525.3	70,335.6	82,761.8	81,074.1
Canada.....	5,744.5	6,512.0	8,523.7	8,701.6	8,130.4	8,402.2	8,867.7	10,077.7	10,586.6	10,517.3	12,122.3	12,976.2	14,642.5	15,524.8	15,810.8
Mexico.....	1,909.9	1,597.3	2,663.7	3,021.0	3,863.0	4,852.3	5,014.6	5,296.8	4,136.3	5,152.3	6,191.3	7,025.0	7,845.1	9,388.0	9,570.5
European Union.....	52,706.6	57,326.4	84,790.1	92,252.3	93,970.9	97,859.7	90,080.9	91,936.7	105,901.2	110,510.8	119,889.4	126,440.3	132,688.6	139,138.7	142,584.2
Germany.....	12,074.5	12,536.0	18,214.7	20,409.3	22,455.2	23,777.3	21,383.2	22,289.0	25,498.4	25,942.2	26,355.7	28,701.2	29,745.1	31,366.2	31,722.2
France.....	8,716.0	8,678.0	12,851.4	13,478.2	13,896.9	13,799.1	13,507.6	13,735.9	15,411.7	15,645.3	16,339.7	17,735.3	19,021.1	19,822.1	20,549.0
United Kingdom.....	8,511.0	10,553.2	13,652.1	13,931.7	13,367.2	14,077.1	13,298.1	13,338.9	15,790.3	16,866.7	18,965.3	19,402.8	19,668.1	21,249.4	21,743.8
Italy.....	5,752.9	6,171.9	10,405.4	11,351.3	11,553.8	11,795.7	9,727.1	9,475.2	10,649.2	10,751.8	11,979.9	12,508.7	13,479.4	14,156.8	14,663.8
Other European Union.....	17,652.2	19,387.4	29,666.4	33,081.8	32,697.9	34,410.5	32,164.9	33,097.6	38,551.6	41,304.8	46,248.7	48,092.3	50,774.8	52,544.3	53,905.5
Brazil.....	1,491.4	900.9	1,633.8	1,746.7	1,776.2	1,674.2	1,787.2	2,193.0	3,356.2	3,703.2	4,181.6	4,204.7	3,568.4	3,739.8	3,768.6
Argentina.....	1,242.6	386.5	302.5	348.3	670.3	980.6	1,031.1	1,324.2	1,185.9	1,346.0	1,580.7	1,652.8	1,525.3	1,302.0	1,302.6
Chile.....	304.1	214.7	380.0	397.7	458.7	567.9	602.3	697.8	706.4	743.9	846.6	855.2	748.7	665.6	670.7
Peru.....	149.7	110.6	89.8	92.7	108.3	144.0	179.8	238.6	361.9	335.5	363.6	361.9	307.3	282.7	289.0
Costa Rica.....	34.4	25.8	45.9	52.7	49.4	48.2	65.6	68.1	72.4	79.0	115.3	153.8	130.2	168.6	173.9
Japan.....	5,124.3	6,159.3	10,900.9	11,735.3	12,420.7	12,097.6	13,339.5	15,523.4	19,871.4	23,286.6	25,133.7	23,725.8	25,674.6	30,955.3	31,054.1
China.....	1,332.4	4,921.3	4,236.4	4,390.2	5,280.3	6,824.1	7,971.8	7,945.3	9,158.5	9,776.1	10,520.4	11,605.2	13,952.2	19,252.2	21,628.6
South Korea.....	1,295.9	2,656.4	5,166.2	5,360.2	5,851.7	5,535.9	6,437.0	8,283.4	10,965.2	11,792.7	11,530.1	6,973.4	9,943.1	13,334.2	13,797.9
Australia.....	2,142.7	3,170.8	3,498.5	3,336.9	3,286.3	3,492.1	3,686.0	4,017.6	4,248.2	4,318.7	4,694.5	4,634.0	4,834.5	4,807.2	4,765.2
Taiwan.....	1,479.8	1,683.5	3,574.6	3,609.8	4,363.9	5,049.4	5,288.1	5,850.9	7,026.2	8,313.0	10,522.0	11,429.9	14,573.7	19,409.3	18,643.6
Singapore.....	1,907.0	2,452.6	3,611.1	4,387.2	4,630.2	5,170.4	6,262.2	6,834.1	7,835.0	8,419.1	9,555.6	7,736.6	8,856.7	10,665.0	10,170.1
Hong Kong.....	3,916.2	5,420.1	9,064.5	11,042.7	11,913.2	14,064.1	13,765.5	14,659.9	16,364.0	17,122.2	18,947.5	17,718.3	17,867.7	21,316.1	21,472.0
India.....	595.1	1,293.6	1,807.5	1,492.8	950.9	1,140.5	1,090.5	1,139.7	1,656.1	1,516.0	1,845.5	2,015.9	2,086.4	2,437.4	2,587.6
Malaysia.....	655.7	1,097.3	1,507.0	1,935.7	2,471.9	2,436.1	2,562.4	3,371.5	4,375.2	4,030.7	4,528.9	3,673.3	3,922.0	5,174.8	5,221.8
Thailand.....	448.3	713.8	1,348.4	1,580.8	1,898.5	2,048.2	2,296.7	2,810.0	3,551.1	3,685.9	3,462.0	2,438.3	2,518.8	3,234.9	3,376.7
Philippines.....	403.3	214.7	589.7	369.4	357.6	469.2	624.8	748.7	882.5	1,332.8	1,456.4	1,370.8	1,318.1	1,442.3	1,475.5
Indonesia.....	465.2	794.4	726.6	908.2	1,016.6	1,027.0	1,030.2	863.4	1,057.2	1,032.4	1,197.4	685.5	568.7	906.9	907.7
South Africa.....	1,503.2	1,099.5	1,255.4	1,226.4	1,284.3	1,360.5	1,385.0	1,519.0	1,667.6	1,723.6	1,706.3	1,704.7	1,691.9	1,819.8	1,802.1
Apparent consumption all countries.....	200,432.0	252,721.7	307,934.4	321,888.1	340,287.9	301,026.3	305,821.4	310,108.0	335,040.1	343,858.2	349,926.9	365,686.5	386,231.7	440,962.2	462,663.7
United States.....	79,221.7	111,200.3	121,695.5	123,619.1	120,002.5	121,284.9	126,103.1	126,404.7	141,134.9	145,733.1	140,987.4	151,112.4	164,228.9	184,533.9	190,940.1
Canada.....	4,521.2	5,098.7	6,499.7	7,050.2	6,597.6	6,657.7	7,626.9	8,291.4	9,228.2	8,372.2	9,923.2	10,777.5	10,828.8	9,180.9	9,928.6
Mexico.....	1,574.6	1,267.8	2,716.8	3,041.9	3,647.3	2,798.3	2,761.0	2,602.5	2,112.8	2,007.0	1,663.7	1,374.0	1,456.5	1,513.6	1,877.8
European Union.....	60,608.4	65,817.1	83,618.4	85,019.1	90,791.1	91,370.3	86,728.6	89,401.7	93,428.0	94,603.9	96,131.3	100,994.5	107,181.4	122,760.7	131,735.0
Germany.....	17,830.1	15,248.7	17,640.8	20,099.8	24,295.4	24,973.1	23,144.4	22,334.3	20,366.9	19,868.9	20,340.7	19,550.0	19,703.2	25,543.4	27,506.8
France.....	11,347.9	13,887.2	19,483.1	18,995.2	19,824.3	19,096.9	18,836.7	19,213.4	21,466.8	22,732.4	22,785.4	25,546.1	27,704.5	29,537.6	32,600.7
United Kingdom.....	11,476.6	12,590.7	15,028.7	14,459.4	14,678.3	15,403.2	14,514.1	13,508.3	15,517.9	15,737.2	12,724.8	12,736.4	13,356.5	15,071.6	16,425.8

## World industry and trade data for selected countries or economies and industries: 1980–2001

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Millions of 1997 U.S. dollars															
Italy .....	7,814.8	9,542.5	12,127.3	11,785.0	12,117.0	12,034.9	11,225.9	11,570.1	13,477.1	11,843.6	12,747.7	13,925.9	15,028.1	16,192.6	16,280.2
Other European Union.....	12,139.1	14,548.0	19,338.5	19,679.7	19,876.1	19,862.2	19,007.5	22,775.6	22,599.2	24,421.8	27,532.8	29,236.2	31,389.3	36,415.6	38,921.5
Brazil.....	7,645.1	6,498.0	8,585.7	6,606.2	6,477.4	6,539.3	6,446.6	6,615.2	6,689.2	6,995.7	7,428.7	7,218.8	7,700.1	8,161.6	8,861.2
Argentina.....	1,972.3	681.4	539.5	523.1	822.7	1,111.1	1,311.2	1,627.2	1,360.6	1,558.0	1,977.5	1,977.3	1,685.5	1,370.3	1,363.0
Chile.....	318.3	334.2	564.9	563.6	598.4	715.4	780.3	863.8	771.4	822.1	899.5	927.5	849.8	760.3	841.4
Peru .....	388.2	266.0	167.9	157.5	149.4	177.4	251.9	327.7	387.1	355.6	387.9	370.6	367.6	338.0	343.7
Costa Rica.....	47.0	34.4	57.9	63.2	54.8	50.5	84.6	115.8	113.6	102.1	69.0	68.5	47.7	35.0	30.0
Japan.....	7,214.7	7,041.0	10,263.5	12,486.5	13,735.7	11,780.8	10,566.5	10,955.9	11,414.7	13,352.6	14,477.5	16,588.4	12,390.7	11,199.7	9,826.9
China.....	996.4	4,584.8	4,640.9	3,383.9	4,454.0	5,399.7	8,273.0	7,169.1	5,908.5	6,527.6	5,949.1	7,399.6	9,391.1	12,858.6	14,144.0
South Korea.....	926.0	2,372.9	4,282.4	5,041.4	6,320.0	5,936.0	7,034.7	9,287.5	12,674.7	12,864.5	11,946.8	4,500.1	7,473.5	15,679.7	17,075.9
Australia.....	2,326.5	3,556.7	3,769.4	3,535.9	3,615.2	3,768.6	4,365.8	4,225.8	4,269.2	3,882.0	4,579.4	5,095.9	4,867.8	5,444.8	5,615.2
Taiwan .....	984.8	1,337.4	1,745.6	1,790.5	2,041.0	2,171.0	2,239.3	2,628.7	3,703.2	4,863.8	6,819.3	8,416.6	11,883.6	17,111.5	16,987.6
Singapore.....	1,977.9	1,816.5	2,350.6	2,784.9	2,305.8	2,662.3	3,455.5	3,097.7	2,937.2	3,228.8	3,378.4	2,268.3	3,174.1	3,695.8	3,284.7
Hong Kong.....	811.9	1,126.3	2,026.7	2,545.7	1,941.1	2,270.2	1,729.3	1,741.4	1,815.9	1,721.3	1,747.0	1,590.8	1,654.7	2,071.9	2,114.6
India.....	470.8	974.3	1,642.8	1,571.1	1,305.4	1,546.1	1,764.3	1,831.2	2,505.5	2,336.1	2,537.1	2,909.3	2,762.8	2,977.9	3,166.5
Malaysia.....	388.1	635.9	1,081.5	1,355.4	1,800.1	1,450.6	1,577.6	2,341.5	3,196.7	2,404.8	2,640.2	2,551.1	2,596.5	2,818.1	2,965.5
Thailand.....	348.5	599.2	941.9	940.7	980.1	828.9	902.4	1,194.0	1,605.2	1,489.7	1,533.3	882.3	950.3	1,264.5	1,475.5
Philippines.....	335.0	212.1	505.5	421.2	400.8	490.1	723.1	745.9	860.1	703.6	802.0	773.0	759.2	702.7	876.1
Indonesia.....	262.6	511.3	697.9	838.1	909.8	953.8	897.2	650.2	899.1	835.7	942.5	4,010.6	1,055.3	1,253.2	1,249.6
South Africa.....	1,561.0	1,574.9	1,610.9	1,396.4	1,412.4	1,361.5	1,411.2	1,553.3	1,612.0	1,793.1	1,661.1	1,778.7	1,841.9	2,038.6	2,257.2

NOTES: Production = total gross output; import penetration = (imports/apparent consumption)100; apparent consumption, a measure of home-market demand, is calculated by taking production plus imports minus exports (corrected for implied service costs). Gross value added reported here is equal to gross output less the consumption of intermediate inputs and supplies. Conceptually, value added is the current income from ongoing current production that is available for distribution to factors of production. Seventy countries or economies are included in "all countries." High-technology sectors cover aerospace; computers and office machinery; communications equipment; pharmaceuticals; and medical, precision and optical instruments. Other European Union countries include Austria, Belgium, Denmark, Finland, Greece, Ireland, Netherlands, Portugal, Spain, and Sweden.

SOURCES: Global Insight, Inc., World Industry Service database, 2003. Historical data are from United Nations Industrial Development Organization, United Nations System of National Accounts, Organisation for Economic Co-operation and Development, and country sources.

Appendix table 6-2

**Service industry revenues for selected countries or economies: 1980–2001**

(Millions of 1997 U.S. dollars)

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All service industries, all countries	15,777,311.0	18,589,879.3	22,137,708.8	22,615,534.3	23,105,890.1	23,944,808.6	24,846,573.2	25,404,007.7	26,421,854.8	27,427,960.4	28,510,756.1	29,449,141.2	30,567,697.9	32,028,608.1	32,699,029.4
United States	5,322,988.0	6,022,932.4	7,112,783.7	7,337,050.9	7,327,308.9	7,471,484.9	7,737,602.7	8,014,112.1	8,331,740.3	8,741,501.5	9,155,110.0	9,610,752.6	10,103,330.3	10,664,506.1	10,828,803.6
Canada	361,286.6	425,474.7	499,893.9	506,000.1	504,298.4	515,573.2	530,016.3	554,439.4	571,610.8	590,163.7	616,150.7	649,148.3	686,428.5	713,097.0	737,477.2
Mexico	248,706.6	284,783.7	253,058.8	263,944.2	277,623.7	291,029.7	298,547.5	312,166.5	293,687.4	303,769.9	326,448.6	342,659.2	355,078.2	379,349.4	384,992.2
European Union	4,512,175.1	5,449,270.9	6,437,150.7	6,644,994.6	6,839,030.3	7,010,544.2	7,349,008.9	7,555,188.4	7,932,966.6	8,068,210.8	8,320,641.9	8,651,644.2	9,056,273.7	9,456,398.4	9,686,217.2
Germany	1,233,875.2	1,395,849.9	1,571,667.7	1,653,736.9	1,783,500.5	1,846,788.5	1,869,497.9	1,886,731.2	1,932,395.4	1,986,329.5	2,030,333.7	2,093,908.3	2,204,522.9	2,318,472.1	2,355,155.6
France	784,223.7	1,030,656.4	1,245,903.0	1,277,842.5	1,282,108.7	1,297,713.4	1,295,710.9	1,307,603.5	1,322,176.2	1,346,392.6	1,383,689.6	1,424,631.7	1,487,298.1	1,564,009.7	1,595,481.7
United Kingdom	874,391.5	966,897.5	1,116,720.8	1,135,670.2	1,141,872.2	1,154,751.4	1,211,628.9	1,303,758.2	1,385,050.9	1,465,531.7	1,539,130.0	1,621,252.5	1,701,486.8	1,761,922.5	1,818,432.4
Italy	453,403.8	655,691.9	815,972.7	828,982.3	840,677.2	882,440.8	1,050,874.9	1,077,804.0	1,244,583.0	1,163,210.5	1,171,461.3	1,203,979.6	1,248,012.2	1,302,349.4	1,344,472.3
Other European Union	1,166,280.8	1,400,175.3	1,686,886.6	1,748,762.8	1,790,871.8	1,828,850.1	1,921,296.3	1,979,291.5	2,048,761.1	2,106,746.5	2,196,027.4	2,307,872.2	2,414,953.6	2,509,644.7	2,572,675.3
Brazil	501,517.9	548,112.3	805,540.5	528,203.3	532,627.1	764,777.7	888,675.1	686,642.9	665,537.9	691,424.4	709,080.0	709,427.8	670,154.1	689,212.8	700,572.8
Argentina	204,941.6	177,024.5	208,855.5	192,460.7	207,091.0	227,340.0	207,768.3	226,676.3	221,514.7	233,801.6	253,195.0	261,817.0	259,815.4	256,684.1	244,661.3
Chile	33,055.9	29,499.1	36,781.1	37,913.7	40,440.1	44,493.4	46,758.6	48,693.2	52,518.5	56,835.5	60,352.9	62,307.2	62,447.5	65,930.7	68,337.4
Peru	33,938.2	36,690.0	40,933.4	38,172.1	40,805.0	38,491.9	39,484.1	42,570.6	47,553.3	49,581.6	53,171.1	52,962.5	52,731.3	53,742.6	54,366.7
Costa Rica	5,491.8	5,331.1	6,564.2	7,060.1	6,908.4	7,855.4	8,697.1	9,321.4	9,579.9	9,741.4	10,359.2	11,102.8	11,486.5	11,885.0	11,817.3
Japan	2,501,883.3	2,977,930.7	3,537,449.0	3,711,488.1	3,853,359.9	3,938,233.4	3,929,232.7	3,999,766.7	4,116,571.6	4,269,280.1	4,364,892.0	4,375,874.9	4,467,660.4	4,626,739.8	4,695,073.7
China	69,262.3	120,986.1	183,403.7	191,130.8	206,092.4	238,237.5	259,926.2	276,633.3	294,204.7	328,328.6	369,067.6	415,540.6	452,113.8	488,213.0	524,703.1
South Korea	117,859.2	165,442.8	225,401.9	242,420.9	264,857.8	281,956.8	299,775.8	323,756.2	349,137.8	381,252.1	411,925.3	407,991.8	435,695.3	473,990.4	490,198.3
Australia	212,136.8	249,911.5	302,038.9	304,374.2	307,977.7	319,181.2	331,737.2	351,936.5	368,057.0	385,157.7	409,447.9	430,090.9	448,652.0	458,479.5	477,573.3
Taiwan	70,485.7	95,961.1	146,227.4	160,366.8	172,739.2	189,632.3	203,997.4	218,695.4	233,680.7	251,248.8	272,120.0	290,520.3	302,958.2	323,165.2	323,382.4
Singapore	27,235.8	40,636.8	54,115.8	59,688.9	64,545.2	64,598.3	73,569.7	81,445.0	87,233.6	93,960.4	102,719.0	102,263.5	109,690.0	115,169.8	115,169.8
Hong Kong	61,511.8	83,612.9	136,000.9	152,434.2	163,355.1	172,723.7	191,889.6	215,054.5	224,170.8	238,374.5	254,183.6	244,592.9	245,855.1	262,925.2	266,592.6
India	89,350.9	118,038.6	153,507.2	161,313.8	166,721.4	174,956.3	191,737.2	204,299.7	225,872.7	242,618.0	264,623.2	288,858.7	277,388.9	297,198.3	323,810.7
Malaysia	18,522.1	23,308.9	32,918.5	36,486.5	40,073.4	45,160.4	51,591.3	56,068.5	62,499.9	69,770.2	73,884.2	65,376.8	66,681.6	70,412.8	73,623.7
Thailand	37,067.8	47,161.7	66,207.0	74,954.2	79,365.5	86,418.4	94,790.6	102,986.6	112,983.8	118,262.1	115,084.2	102,048.0	104,990.8	109,038.6	114,831.5
Philippines	32,810.0	32,854.3	42,619.4	45,022.8	44,916.8	45,434.3	46,437.3	49,064.9	52,206.4	56,197.4	60,327.4	62,763.0	65,362.1	63,515.8	62,754.4
Indonesia	40,548.5	58,030.6	71,819.7	80,142.3	87,424.7	93,915.1	103,388.2	109,593.2	119,265.8	127,529.5	130,016.4	107,136.9	107,604.6	115,961.8	120,685.5
South Africa	81,888.6	97,896.3	109,382.1	111,940.9	112,956.5	113,746.7	114,989.7	119,934.7	123,393.1	130,591.2	135,400.8	139,245.3	142,822.0	145,581.9	149,057.0
High-technology service industries, all countries	5,383,076.0	6,358,350.8	7,929,454.7	8,003,475.7	8,216,538.7	8,481,855.3	8,894,328.0	8,963,002.3	9,406,117.1	9,857,936.6	10,315,448.1	10,773,495.9	11,320,151.8	12,017,300.8	12,322,239.2
United States	1,896,502.8	2,105,769.1	2,573,709.2	2,659,292.3	2,689,081.9	2,678,600.0	2,811,153.9	2,893,489.5	3,036,118.1	3,196,352.7	3,396,734.6	3,616,430.5	3,852,862.6	4,120,234.9	4,189,525.9
Canada	129,901.9	158,116.0	190,473.8	194,508.4	197,088.1	198,817.7	204,625.1	212,810.7	220,196.2	228,321.8	240,861.0	253,554.0	269,562.7	284,498.7	297,292.6
Mexico	46,101.2	52,913.4	57,079.2	58,704.6	62,504.7	68,004.7	73,428.3	77,662.0	77,770.0	79,363.6	85,882.0	89,569.6	94,927.4	101,654.7	104,460.5
European Union	1,540,817.5	1,863,625.9	2,265,633.6	2,358,447.9	2,437,703.9	2,496,768.1	2,631,063.3	2,696,666.1	2,898,115.0	2,995,685.6	3,098,694.9	3,269,149.3	3,494,163.6	3,708,830.0	3,804,313.0
Germany	491,277.6	539,723.1	605,363.2	632,850.3	690,073.9	717,775.3	747,426.0	758,087.5	783,048.9	814,574.0	823,889.4	865,601.8	934,436.4	998,829.0	1,014,327.0
France	296,839.7	379,919.9	480,249.3	490,928.7	485,783.7	494,126.9	484,580.3	486,396.2	494,619.3	506,394.1	515,754.8	538,239.1	573,018.1	608,383.3	615,859.9
United Kingdom	243,704.9	281,565.9	351,250.9	371,712.5	381,194.1	388,205.4	414,297.9	462,057.7	503,080.0	538,300.7	584,662.0	628,387.7	679,148.8	714,232.1	750,478.8
Italy	144,081.9	219,575.1	272,111.4	280,843.3	284,496.4	297,291.0	358,964.5	352,873.1	408,046.6	392,140.6	403,996.0	417,208.7	443,076.2	471,716.6	485,629.8
Other European Union	364,913.5	442,841.9	556,658.9	582,113.1	596,155.9	599,369.6	625,794.7	637,251.5	709,319.1	744,274.2	770,392.8	819,712.1	864,484.2	915,677.2	938,017.5
Brazil	265,873.2	298,467.6	490,323.1	260,020.1	268,129.6	408,456.6	505,372.6	307,598.6	271,685.2	296,662.0	301,180.2	297,713.3	275,844.8	280,174.5	284,708.7
Argentina	68,546.9	59,723.7	70,574.8	72,849.6	80,245.5	88,179.9	73,722.7	81,346.0	81,287.1	85,998.3	92,582.9	95,499.6	98,925.8	98,427.1	93,551.2
Chile	7,490.4	10,309.1	12,956.3	13,309.4	14,592.4	15,818.1	16,763.4	17,602.7	18,558.3	19,609.2	20,385.0	21,041.4	21,073.4	22,316.7	23,185.2
Peru	7,685.7	9,610.5	10,572.3	10,814.6	13,184.6	12,433.6	12,603.0	13,365.5	15,074.8	15,871.7	17,036.3	16,942.7	16,768.1	17,184.7	17,447.9
Costa Rica	1,382.0	1,384.5	1,743.5	1,841.9	1,846.0	2,731.8	3,008.6	3,237.1	3,358.0	3,442.9	3,648.3	3,877.6	4,053.9	4,226.8	4,233.9
Japan	762,534.6	962,751.4	1,210,907.2	1,276,968.6	1,315,995.1	1,358,547.9	1,346,421.6	1,385,141.6	1,432,746.4	1,503,849.3	1,538,954.2	1,565,154.3	1,593,810.7	1,688,065.8	1,747,842.3
China	24,770.6	38,785.4	69,803.0	69,716.6	69,662.0	79,734.4	89,414.9	99,534.7	107,586.4	122,935.1	139,982.4	154,840.7	168,015.4	181,368.8	194,783.8
South Korea	27,486.2	43,621.6	65,253.3	71,446.9	80,269.5	87,215.5	96,251.8	105,987.3	117,075.3	128,458.0	145,912.9	143,311.8	156,350.3	180,396.9	188,905.6
Australia	87,589.4	106,433.0	134,400.8	139,208.2	141,029.5	147,683.7	152,507.5	159,175.9	167,578.8	174,403.8	183,533.5	193,345.9	201,310.4	203,257.3	212,293.9
Taiwan	14,691.7	19,638.7	36,585.1	40,019.9	41,045.0	45,701.1	49,730.5	55,319.5	58,324.9	62,268.1	70,710.8	77,308.2	84,004.1	90,159.5	91,634.8
Singapore	10,236.0	17,166.1	22,925.6	25,214.4	27,355.1	26,958.9	31,450.5	34,919.6	36,450.2	38,581.0	43,290.7	43,635.7	46,934.4	47,985.9	49,836.3
Hong Kong	13,931.7	20,034.2	30,291.4	33,612.6	38,206.0	41,327.4	47,821.3	5							

Appendix table 6-2

**Service industry revenues for selected countries or economies: 1980–2001**

(Millions of 1997 U.S. dollars)

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Communication services, all countries.....	547,316.1	633,855.4	779,128.9	813,021.7	832,761.5	865,151.6	911,909.4	950,712.7	1,022,362.3	1,117,196.8	1,211,531.7	1,314,445.0	1,490,990.5	1,699,692.0	1,836,490.0
United States.....	250,739.1	262,752.7	304,613.6	315,219.8	316,325.9	329,705.1	344,333.0	363,236.6	387,712.6	423,541.3	452,646.0	491,743.1	556,610.6	632,116.3	699,505.2
Canada.....	8,962.8	12,321.4	17,349.9	18,580.4	19,064.3	19,426.5	19,837.2	20,839.4	22,245.8	22,920.7	24,917.2	26,510.0	29,340.2	33,298.7	37,502.6
Mexico.....	1,042.1	1,442.6	2,216.6	2,721.0	3,057.7	3,836.1	4,372.9	4,771.6	5,544.5	6,375.0	7,118.9	7,714.3	8,799.6	10,143.1	10,554.9
European Union.....	100,980.6	133,163.2	158,771.5	168,216.9	178,556.7	188,885.3	204,357.8	210,554.6	224,359.8	242,360.4	269,931.5	302,157.9	359,238.3	414,064.0	443,929.7
Germany.....	30,681.8	33,844.6	37,927.7	40,124.0	42,637.2	46,125.9	49,154.6	51,407.8	52,885.1	57,914.5	62,193.8	69,491.8	87,737.8	103,281.2	109,955.8
France.....	12,978.8	20,821.3	26,068.4	28,362.8	30,860.9	31,876.7	32,905.5	33,234.5	34,269.3	35,390.4	40,121.4	47,201.7	57,628.9	67,799.8	75,458.5
United Kingdom.....	20,433.9	26,009.6	31,125.4	31,898.9	33,620.2	34,736.4	37,101.2	40,905.3	44,646.5	49,770.8	58,783.4	64,507.1	74,483.9	83,523.6	91,737.9
Italy.....	9,930.7	17,056.4	19,488.0	19,776.8	20,888.5	22,481.3	27,524.7	24,856.9	29,172.2	28,781.3	30,249.1	32,285.0	38,881.0	42,033.6	43,471.1
Other European Union.....	26,955.5	35,431.2	44,162.0	48,054.4	50,550.0	53,665.0	57,671.9	60,150.2	63,386.8	70,503.4	78,583.7	88,672.4	100,506.8	117,425.9	123,306.4
Brazil.....	16,498.5	11,401.6	15,939.5	13,013.0	14,205.5	16,428.7	20,099.1	17,643.9	18,849.6	20,581.7	22,428.3	25,879.1	31,729.8	35,622.3	39,157.6
Argentina.....	10,151.0	941.8	9,450.5	9,148.9	10,071.2	11,118.1	14,356.1	15,690.5	15,919.8	17,078.5	19,133.0	20,639.5	20,412.5	20,728.2	20,189.8
Chile.....	543.9	597.5	792.8	855.5	1,091.1	1,346.4	1,598.3	1,761.9	1,902.9	2,087.5	2,298.2	2,491.4	2,513.3	2,749.5	2,991.2
Peru.....	2,672.1	3,524.6	2,580.7	2,517.4	2,407.2	2,383.7	2,535.1	2,715.0	3,021.2	3,222.5	3,448.1	3,560.9	3,701.2	3,918.5	3,975.9
Costa Rica.....	201.4	214.4	283.7	302.1	310.6	614.2	700.0	741.2	789.4	829.9	898.9	985.3	1,058.2	1,135.7	1,139.4
Japan.....	46,671.2	56,932.6	67,433.1	72,007.8	73,989.7	74,102.1	80,243.9	89,958.5	94,617.5	112,643.4	121,677.0	132,924.7	153,367.8	176,041.4	194,210.4
China.....	498.9	1,175.2	2,635.5	3,481.8	3,997.6	5,040.0	6,770.5	8,755.4	10,851.1	13,766.4	17,727.1	20,561.2	24,107.9	27,724.0	31,328.2
South Korea.....	1,384.4	3,139.8	4,672.4	5,274.5	6,007.4	6,634.0	7,005.1	7,962.0	9,504.5	12,159.3	17,213.7	20,799.8	28,728.5	44,850.4	49,634.1
Australia.....	7,406.3	9,666.3	13,055.5	14,164.9	15,397.1	15,976.2	17,012.1	18,026.2	21,164.1	21,818.8	23,038.1	25,684.1	27,913.1	28,902.0	30,272.0
Taiwan.....	1,598.7	2,574.9	3,705.2	4,179.1	4,678.2	5,367.9	5,865.6	5,954.5	6,290.1	6,575.9	6,893.1	9,026.0	11,085.6	14,157.7	14,836.5
Singapore.....	2,215.6	3,357.1	4,807.1	5,289.0	5,670.2	6,007.4	6,660.7	7,301.9	8,053.1	8,698.5	9,505.8	10,111.0	11,186.0	11,770.7	12,211.7
Hong Kong.....	1,283.3	1,574.9	2,712.4	3,148.1	3,688.9	4,278.1	5,155.6	5,658.3	6,294.4	7,366.9	7,505.8	6,690.2	7,145.9	7,830.0	7,909.6
India.....	2,518.8	2,840.0	4,828.7	4,880.8	5,137.5	5,688.3	7,148.9	8,140.3	9,337.9	10,127.8	11,559.7	13,582.0	12,355.5	13,457.5	14,539.3
Malaysia.....	1,176.2	1,640.6	2,494.9	2,673.9	3,172.0	3,441.0	3,894.3	4,447.9	5,042.2	5,561.7	5,956.3	5,476.8	5,924.2	6,676.5	6,978.9
Thailand.....	511.7	763.3	1,423.4	1,780.7	2,062.9	2,398.6	2,684.0	3,252.3	4,031.5	4,998.5	5,233.1	4,734.6	5,030.9	5,480.4	5,558.9
Philippines.....	509.6	782.2	1,255.5	1,229.3	1,116.3	1,206.2	1,323.8	1,440.2	1,584.9	1,918.2	2,132.7	2,273.8	2,436.1	2,269.5	2,098.8
Indonesia.....	3,137.1	4,746.9	6,361.3	6,928.1	7,514.5	8,124.6	8,755.7	9,449.5	10,276.1	11,171.1	11,827.9	9,594.1	10,116.8	11,116.0	11,650.4
South Africa.....	6,990.6	7,421.3	7,717.1	7,744.6	7,579.0	7,728.5	7,876.1	8,279.0	9,048.6	9,630.6	10,544.6	11,582.8	12,448.6	12,755.8	13,263.5
Financial institutions and insurance, all countries.....	1,693,575.2	1,901,366.9	2,526,042.4	2,391,886.6	2,437,757.4	2,487,355.6	2,709,981.2	2,576,382.2	2,646,797.2	2,731,978.4	2,929,904.7	3,050,354.4	3,160,777.9	3,343,753.7	3,342,378.1
United States.....	748,357.8	736,196.7	877,364.5	890,217.0	921,147.6	852,552.8	941,371.7	946,890.2	993,964.1	1,030,246.4	1,128,267.7	1,203,484.7	1,281,306.1	1,365,945.1	1,339,112.0
Canada.....	37,476.5	46,465.9	54,622.2	54,587.9	54,515.4	55,560.3	58,563.7	63,586.3	65,903.7	71,518.3	74,083.7	77,763.0	82,917.5	87,037.7	89,564.3
Mexico.....	6,397.3	6,591.4	8,270.2	7,998.0	8,259.1	8,903.5	10,061.2	10,701.8	12,473.5	12,654.1	15,711.1	16,864.3	17,358.4	19,560.3	20,458.8
European Union.....	418,390.1	508,624.4	616,215.9	633,399.5	639,787.0	630,461.3	655,646.3	657,239.0	681,801.5	697,392.3	742,665.7	782,325.3	820,512.3	874,842.2	887,191.3
Germany.....	99,933.3	114,624.2	131,900.6	138,621.6	154,112.0	152,923.2	159,556.5	164,007.8	165,037.8	173,469.6	183,141.3	194,264.1	219,323.3	236,263.7	240,536.4
France.....	94,990.3	115,586.4	149,470.0	140,763.1	130,852.2	132,296.4	124,207.7	122,316.9	120,802.7	120,754.9	120,486.2	117,619.0	120,038.6	130,719.0	128,137.1
United Kingdom.....	76,995.4	107,756.9	116,558.4	121,099.0	123,028.6	120,588.6	121,714.8	126,701.1	139,526.1	142,087.1	158,394.4	170,833.8	179,927.9	191,013.2	200,433.3
Italy.....	43,615.0	55,030.4	67,712.7	75,312.3	75,732.8	80,082.7	98,245.2	96,619.5	104,325.2	101,573.9	109,411.8	119,050.6	117,325.6	125,506.7	127,067.8
Other European Union.....	102,856.1	115,626.6	150,574.2	157,603.5	156,061.4	144,570.4	151,922.1	147,593.6	152,109.9	159,506.8	171,232.1	180,557.8	183,897.0	191,339.6	191,016.8
Brazil.....	166,631.1	185,986.2	340,602.9	152,000.1	155,447.3	273,100.2	365,211.1	181,495.3	148,615.8	162,202.2	164,091.5	160,454.9	144,440.3	139,709.5	138,046.2
Argentina.....	12,496.5	12,244.0	12,044.2	11,368.8	13,045.1	14,565.7	15,709.0	17,471.1	17,328.9	18,432.3	19,236.9	19,741.9	20,704.2	20,717.0	19,731.8
Chile.....	1,459.0	1,821.6	2,541.1	2,691.5	3,041.0	3,333.5	3,545.2	3,738.8	4,006.6	4,245.7	4,508.4	4,702.1	4,666.3	4,913.9	5,043.6
Peru.....	1,802.3	2,532.9	1,872.2	1,339.6	1,317.7	905.2	925.3	1,210.5	1,928.2	2,184.1	2,582.8	2,555.7	2,307.1	2,339.4	2,461.6
Costa Rica.....	244.7	268.8	339.6	358.1	365.0	510.1	579.0	632.0	673.2	680.6	715.0	743.3	764.7	783.8	799.5
Japan.....	125,643.4	187,958.0	309,237.5	316,894.4	307,708.1	308,165.2	286,996.9	298,006.8	301,308.8	285,252.4	307,205.1	307,637.2	300,659.8	326,146.0	322,334.3
China.....	7,817.8	13,623.6	37,021.7	38,332.6	35,639.2	38,629.9	44,573.4	48,839.2	53,861.9	60,084.2	66,521.7	70,168.9	74,482.6	78,810.1	83,069.4
South Korea.....	6,597.6	8,831.0	17,354.6	19,693.1	22,976.6	25,489.6	30,995.8	35,613.3	39,944.4	44,919.8	47,956.9	46,103.1	46,932.2	51,025.0	51,968.8
Australia.....	23,272.6	28,699.2	36,605.6	38,069.2	38,518.5	40,990.4	42,399.6	43,308.5	45,940.8	47,861.5	47,328.7	50,750.2	52,464.3	53,075.1	54,313.1
Taiwan.....	8,001.0	9,329.1	20,736.9	22,618.3	21,161.7	23,498.4	25,157.3	28,732.1	29,552.5	31,142.0	37,012.2	39,373.8	40,862.0	42,156.2	42,238.5
Singapore.....	4,506.0	8,202.6	10,584.5	11,806.9	12,843.8	11,859.8	15,138.6	16,971.9	16,491.7	16,174.1	18,833.3	18,670.1	20,885.7	20,574.9	21,336.9
Hong Kong.....	6,599.3	7,591.0	11,290.0	12,674.8	16,187.7	17,847.3	20,371.1	21,926.7	21,931.0	24,089.9	25,602.4	23,995.0	22,893.0	24,322.3	24,427.2
India.....	4,507.1	8,123.7	13,925.2	15,758.5	19,288.2	19,869.0	24,376.0	26,693.0	30,136.2	33,660.0	38,339.9	40,869.5	43,535.5	45,340.3	49,724.4
Malaysia.....	2,130.7	2,182.2	3,891.1	4,251.3	4,511.7	5,026.5	6,212.6	6,484.7	6,908.7	8,060.3	8,459.5	7,295.0	7,036.4	7,351.2	8,052.4
Thailand.....	2,132.5	2,595.9	5,205.1	6,956.4	7,748.1	10,513.1	12,970.1	14,970.8	16,087.4	16,969.8	15,812.3	12,519.4	10,961.8	10,890.0	11,272.9

## Appendix table 6-2

## Service industry revenues for selected countries or economies: 1980–2001

(Millions of 1997 U.S. dollars)

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>Business services, all countries</b>	1,338,031.7	1,737,392.9	2,295,159.6	2,403,086.6	2,477,486.2	2,619,757.6	2,708,653.7	2,802,351.8	2,991,185.7	3,191,293.7	3,379,381.7	3,591,138.4	3,819,064.7	4,059,353.4	4,184,933.7
United States	415,850.9	576,825.9	769,524.3	805,621.6	789,047.5	810,447.8	841,860.1	889,946.5	949,078.2	1,025,025.1	1,106,357.7	1,211,785.0	1,293,245.0	1,382,380.5	1,400,870.4
Canada	20,917.9	27,270.3	38,484.9	39,010.8	38,798.6	38,410.6	40,367.6	42,934.1	46,329.4	48,592.1	55,537.3	62,100.6	68,427.1	72,728.4	77,481.6
Mexico	16,152.8	16,962.0	17,515.6	18,235.2	20,162.9	23,116.0	25,516.7	27,769.3	26,568.1	27,088.3	28,528.3	29,523.1	32,349.0	34,943.9	36,549.1
European Union	524,913.1	659,107.4	854,369.9	897,257.0	932,596.9	959,327.9	1,001,133.7	1,021,018.9	1,103,339.0	1,153,073.1	1,215,125.3	1,299,524.8	1,410,061.9	1,505,717.5	1,555,029.7
Germany	169,083.3	192,534.2	224,516.4	237,025.3	266,142.5	277,755.0	292,226.1	288,970.3	303,285.3	313,563.5	330,899.5	353,083.5	376,638.6	410,219.6	421,160.1
France	127,632.8	174,926.7	225,327.1	235,745.9	235,069.8	236,558.6	233,217.8	236,621.2	245,942.8	253,356.7	256,357.2	272,301.8	292,965.8	305,749.4	308,995.3
United Kingdom	87,966.0	92,593.8	144,082.7	153,802.3	151,397.5	155,694.5	158,680.0	173,178.1	187,695.1	208,920.1	228,770.0	251,142.7	276,033.6	287,512.3	302,966.2
Italy	46,981.4	77,457.0	99,152.8	99,011.6	100,851.5	103,804.6	123,213.7	118,684.0	147,591.1	143,366.8	148,170.9	150,115.4	168,444.6	185,816.5	194,544.7
Other European Union	93,249.6	121,595.7	161,290.9	171,671.9	179,135.7	185,515.3	193,796.1	203,565.2	218,824.6	233,866.0	250,927.7	272,881.4	295,979.4	316,424.7	327,363.5
Brazil	23,460.1	29,346.6	54,079.5	24,064.8	26,237.4	69,498.4	68,223.6	58,097.3	51,384.2	58,547.4	61,229.0	61,145.8	55,300.7	57,375.3	58,098.6
Argentina	15,330.9	15,131.7	15,185.1	14,392.9	16,498.8	18,412.2	19,727.6	21,786.2	21,390.2	22,759.3	24,394.9	25,147.8	25,921.9	25,483.9	24,460.6
Chile	1,581.9	1,956.3	2,698.0	2,824.4	3,194.8	3,524.9	3,759.5	3,973.4	4,239.3	4,491.0	4,835.3	5,030.6	4,932.0	5,192.8	5,368.9
Peru	2,382.2	2,367.0	3,885.5	3,721.4	3,838.1	3,694.1	3,849.3	3,920.2	4,522.7	4,762.6	5,140.9	4,989.3	4,972.2	4,998.4	5,066.3
Costa Rica	234.8	259.8	327.5	344.7	348.5	487.8	486.0	505.7	515.8	524.3	547.0	574.2	597.8	612.5	606.9
Japan	159,122.3	217,566.7	304,563.4	352,349.8	390,838.8	424,049.6	420,184.9	433,866.8	463,538.3	508,714.5	522,217.3	539,479.3	561,714.4	596,036.6	627,823.5
China	3,909.5	4,585.0	4,129.8	4,261.9	4,736.6	5,550.6	7,575.1	9,301.6	10,297.8	11,903.4	14,056.6	15,893.7	16,653.9	17,911.8	19,398.5
South Korea	4,477.8	9,393.3	16,291.2	18,254.6	21,396.2	23,984.8	26,105.7	28,997.0	32,751.0	35,303.5	36,708.8	32,332.2	36,663.3	38,862.5	41,210.8
Australia	25,329.6	30,452.6	39,877.9	40,244.2	39,532.0	41,386.7	42,299.0	45,273.1	46,961.6	49,364.6	55,299.8	58,441.4	60,204.9	60,311.5	64,168.0
Taiwan	2,059.8	3,035.1	4,845.9	5,496.1	6,203.4	7,130.9	8,213.3	9,715.1	10,635.6	11,764.9	12,993.4	14,223.2	15,155.1	16,528.1	16,805.8
Singapore	2,077.2	3,753.7	4,857.6	5,285.6	5,741.8	5,738.4	5,895.8	6,563.3	7,606.3	9,033.8	9,843.6	9,607.6	9,300.5	9,910.9	10,214.3
Hong Kong	1,998.0	3,343.7	5,707.4	6,379.1	6,819.6	7,398.8	8,227.9	9,391.0	9,723.1	10,115.0	11,033.0	9,707.7	9,415.5	9,911.7	10,205.8
India	5,482.3	5,726.3	6,057.0	5,762.6	5,269.0	5,585.3	6,259.7	6,378.8	6,412.5	6,394.8	6,891.7	7,173.4	8,404.3	8,318.6	9,185.4
Malaysia	1,677.2	1,946.2	3,378.0	3,706.3	4,070.3	4,838.6	6,129.4	6,547.6	7,206.5	8,525.9	9,072.8	7,662.7	7,493.1	7,754.9	8,494.5
Thailand	1,676.8	2,080.0	2,776.4	3,080.5	3,047.5	3,026.0	3,298.6	3,493.2	3,628.0	3,730.5	3,121.7	2,507.0	3,096.4	3,278.6	3,644.3
Philippines	3,050.5	3,023.7	3,725.4	3,856.3	3,908.0	4,036.6	4,162.0	4,333.8	4,515.6	4,745.2	5,070.5	4,932.3	5,066.5	5,122.0	5,204.8
Indonesia	1,681.8	3,471.9	4,857.5	5,389.7	6,123.2	6,592.1	7,086.2	7,817.6	8,663.4	9,191.3	9,613.2	7,191.0	6,887.9	7,439.4	7,694.0
South Africa	7,603.4	8,927.8	9,788.5	9,829.2	9,958.1	10,038.8	10,121.4	10,819.7	11,074.7	11,772.5	12,291.7	13,172.5	13,910.0	14,141.9	14,679.3
<b>Education, all countries</b>	614,228.2	695,776.1	779,432.7	802,386.4	824,064.6	842,966.5	873,850.4	896,903.3	930,979.4	955,279.4	941,026.5	958,064.7	979,607.7	996,689.7	1,003,088.0
United States	78,135.1	83,696.1	94,349.3	96,585.9	97,295.8	98,779.9	100,686.4	102,883.4	106,147.4	108,087.0	109,432.0	110,549.4	113,077.9	115,765.6	116,504.5
Canada	32,116.3	33,933.0	35,955.5	36,582.1	37,257.9	37,507.9	38,009.9	38,474.8	39,069.9	39,852.2	38,604.4	38,416.0	39,343.5	39,751.9	40,038.4
Mexico	12,539.0	16,216.9	17,025.0	16,888.8	17,718.0	18,921.0	20,906.5	22,209.3	21,432.4	21,792.9	21,937.7	22,289.9	22,782.7	22,852.2	22,784.5
European Union	238,629.6	281,059.8	324,375.2	337,600.9	350,738.7	364,159.9	386,416.6	398,074.8	422,906.9	427,312.6	427,100.6	430,188.6	439,590.1	442,048.8	442,041.8
Germany	66,601.8	73,400.6	83,578.3	87,421.0	92,533.6	96,471.1	97,064.2	98,044.7	98,953.9	99,993.9	100,588.4	99,805.1	100,677.0	98,440.6	94,980.5
France	44,835.4	55,110.2	61,870.7	66,780.8	69,243.3	71,801.2	73,479.7	72,932.0	74,610.4	76,043.5	78,110.9	79,688.1	81,199.6	82,038.6	81,771.1
United Kingdom	33,474.2	33,225.6	37,731.1	40,019.6	44,334.5	45,910.1	52,735.4	60,213.1	63,880.5	66,302.0	65,982.3	65,938.3	69,641.8	70,887.5	71,568.6
Italy	25,101.6	38,824.0	46,245.2	46,667.2	45,930.5	47,755.5	56,545.4	57,434.9	64,672.9	62,427.2	61,912.2	62,045.5	62,492.9	62,781.3	63,672.7
Other European Union	68,616.6	80,499.3	94,950.0	96,712.3	98,696.8	102,221.9	106,591.9	109,450.0	120,789.3	122,546.0	120,506.8	122,711.6	125,578.8	127,900.9	130,048.9
Brazil	7,749.1	9,749.2	11,579.2	10,553.1	10,921.7	7,608.1	8,091.8	7,923.4	8,273.2	8,558.8	8,207.2	7,726.6	6,787.5	7,160.0	7,452.4
Argentina	4,718.6	4,844.3	5,273.0	5,897.2	6,329.2	6,837.4	3,704.3	4,085.7	4,138.6	4,289.1	4,580.1	4,610.0	4,879.2	4,795.4	4,440.8
Chile	2,049.9	3,086.5	3,592.2	3,450.4	3,506.1	3,656.3	3,720.2	3,926.8	4,112.0	4,306.9	4,268.2	4,307.8	4,388.2	4,642.6	4,800.1
Peru	214.7	399.6	1,119.3	1,339.2	2,922.9	2,936.5	2,905.4	3,056.0	3,062.3	3,087.5	3,110.1	3,080.0	2,882.4	2,928.1	2,913.5
Costa Rica	103.6	94.7	118.9	125.6	124.3	172.3	194.1	213.7	216.0	217.8	228.5	242.2	249.8	255.7	253.4
Japan	159,623.3	162,841.1	172,775.7	175,851.1	175,013.1	177,830.8	179,399.5	180,014.5	182,665.6	189,914.3	169,841.5	177,737.4	180,749.6	186,689.8	186,160.8
China	7,821.1	13,005.6	14,100.6	14,939.5	15,666.1	17,073.4	19,163.3	20,990.3	21,102.4	24,298.4	27,260.1	32,002.6	35,211.7	38,204.6	41,146.4
South Korea	13,182.8	17,430.7	21,254.1	22,342.3	23,458.8	24,344.0	25,331.9	26,224.4	27,330.0	28,297.8	29,129.1	28,344.1	29,214.5	29,287.1	29,684.9
Australia	13,602.8	17,387.9	21,160.4	21,580.3	21,947.7	23,273.5	23,964.4	24,471.9	24,284.2	25,191.0	25,596.1	25,717.9	26,435.4	26,475.3	27,600.6
Taiwan	1,674.1	2,691.3	3,925.0	4,328.7	5,189.9	5,646.7	6,152.7	6,318.4	6,802.7	7,530.4	8,185.9	8,666.0	9,932.9	9,571.7	9,405.5
Singapore	216.7	280.9	406.9	431.1	475.7	520.0	581.4	632.2	667.7	723.1	784.6	807.2	857.4	882.5	935.5
Hong Kong	586.9	1,113.5	1,597.7	1,722.9	1,752.7	1,801.6	2,160.2	2,388.5	2,638.3	2,833.6	2,986.6	3,070.4	3,043.9	3,238.3	3,278.7
India	1,581.3	1,916.6	2,305.3	2,514.4	2,550.4	2,669.3	3,148.6	3,271.0	3,526.5	3,802.4	4,157.3	4,753.4	4,239.1	4,632.2	5,021.2
Malaysia	186.5	235.1	248.2	264.9	279.2	305.2	322.2	342.5	376.3	407.6	421.5	370.1	384.9	393.5	395.8
Thailand	2,566.7	3,478.8	3,826.0	4,202.0	4,435.5	5,106.2	5,683.1	5,782.3	6,675.5	6,780.7	6,878.4	6,499.3	6,183.5	6,387.9	6,466.0
Philippines	549.6	764.4	1,006.0	1,054.3	1,076.6	1,151.1	1,296.0	1,479.9	1,588.9	1,725.3	1,863.0	2			



## Appendix table 6-2

**Service industry revenues for selected countries or economies: 1980–2001**

(Millions of 1997 U.S. dollars)

Country/economy	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Health services, all countries .....	1,189,924.9	1,389,959.6	1,549,691.1	1,593,094.4	1,644,469.0	1,666,623.9	1,689,933.3	1,736,652.4	1,814,792.5	1,862,188.4	1,853,603.5	1,859,493.5	1,869,711.0	1,917,812.0	1,955,349.5
United States .....	403,419.9	446,297.6	527,857.5	551,648.0	565,265.0	587,114.5	582,902.7	590,532.8	599,215.8	609,452.8	600,031.2	598,868.4	608,623.0	624,088.6	633,533.8
Canada .....	30,428.5	38,125.4	44,061.3	45,747.3	47,451.9	47,912.4	47,846.6	46,976.1	46,647.5	45,438.6	47,718.4	48,764.5	49,534.4	51,682.0	52,705.7
Mexico .....	9,970.1	11,700.5	12,051.8	12,861.6	13,307.1	13,228.0	12,571.0	12,209.9	11,751.5	11,453.2	12,586.1	13,178.0	13,637.8	14,155.1	14,113.2
European Union.....	257,904.1	281,671.1	311,901.0	321,973.6	336,024.7	353,933.8	383,508.9	409,778.8	465,707.8	475,545.2	443,871.9	454,952.7	464,761.0	472,165.5	476,120.4
Germany .....	124,977.5	125,319.5	127,440.2	129,658.3	134,648.7	144,500.2	149,424.6	155,656.9	162,886.8	169,632.5	147,066.4	148,957.4	150,059.7	150,624.0	147,694.2
France.....	16,402.5	13,475.3	17,513.0	19,276.2	19,757.5	21,594.0	20,769.5	21,291.6	18,994.2	20,848.5	20,679.1	21,428.5	21,185.2	22,076.5	21,497.8
United Kingdom.....	24,835.4	21,980.0	21,753.3	24,892.7	28,813.4	31,275.9	44,066.6	61,060.0	67,332.9	71,220.8	72,731.9	75,965.8	79,061.7	81,295.5	83,772.9
Italy.....	18,453.2	31,207.3	39,512.8	40,075.4	41,093.2	43,166.8	53,435.5	55,277.7	62,285.3	55,991.4	54,252.1	53,712.2	55,932.1	55,583.5	56,873.5
Other European Union .....	73,235.6	89,689.1	105,681.7	108,071.0	111,712.0	113,396.9	115,812.7	116,492.5	154,208.6	157,852.0	149,142.5	154,888.9	158,522.3	162,586.1	166,282.0
Brazil .....	51,534.4	61,984.0	68,121.9	60,389.0	61,317.7	41,821.3	43,747.0	42,438.6	44,562.5	46,771.9	45,224.2	42,506.8	37,586.5	40,307.5	41,953.9
Argentina .....	25,850.0	26,561.9	28,621.9	32,041.8	34,301.2	37,246.6	20,225.7	22,312.5	22,509.7	23,439.1	25,238.0	25,360.4	27,007.9	26,702.6	24,728.2
Chile .....	1,855.8	2,847.2	3,332.3	3,487.6	3,759.3	3,957.0	4,140.2	4,201.8	4,297.5	4,478.2	4,475.0	4,509.6	4,573.5	4,817.9	4,981.4
Peru .....	614.4	786.5	1,699.6	1,897.1	2,698.6	2,514.1	2,388.0	2,469.3	2,539.4	2,615.0	2,754.4	2,756.9	2,905.2	3,000.3	3,030.7
Costa Rica.....	597.5	546.8	673.9	711.4	697.7	947.3	1,049.5	1,144.6	1,163.5	1,190.2	1,259.0	1,332.6	1,383.5	1,439.2	1,434.8
Japan.....	271,474.3	337,452.9	356,897.6	359,865.5	368,445.4	374,400.1	379,596.4	383,295.1	390,616.3	407,324.8	418,013.4	407,375.8	397,319.1	403,152.1	417,313.4
China .....	4,723.3	6,396.1	7,995.3	8,700.8	9,622.4	10,679.5	11,332.5	11,648.2	11,473.1	12,882.7	14,416.9	16,214.4	17,559.4	18,718.3	19,841.4
South Korea .....	1,843.6	4,826.8	5,681.0	5,882.4	6,430.5	6,763.1	6,813.3	7,189.6	7,545.5	7,777.6	14,904.6	15,732.7	16,811.8	16,371.8	16,407.0
Australia.....	17,978.1	20,227.1	23,701.3	25,149.6	25,634.2	26,057.0	26,832.4	28,096.2	29,228.2	30,168.0	32,270.8	32,752.4	34,292.8	34,493.4	35,940.2
Taiwan .....	1,358.1	2,008.4	3,372.1	3,397.7	3,811.9	4,057.3	4,341.7	4,599.4	5,044.1	5,255.0	5,626.1	6,019.2	6,908.3	7,745.8	8,348.5
Singapore .....	1,220.5	1,571.9	2,269.6	2,401.8	2,623.6	2,833.3	3,174.0	3,450.3	3,631.5	3,951.5	4,323.4	4,439.8	4,704.8	4,847.0	5,138.0
Hong Kong .....	3,464.3	6,411.0	8,984.0	9,687.6	9,757.1	10,001.4	11,906.4	13,042.1	14,487.7	15,484.9	16,457.3	16,891.0	16,855.9	18,047.7	18,301.7
India.....	9,161.9	10,815.5	12,785.5	13,955.8	14,040.4	14,387.8	16,866.5	17,520.0	18,995.1	20,779.3	22,907.7	26,150.0	23,474.6	26,077.3	28,478.5
Malaysia .....	1,274.8	1,548.7	1,460.2	1,516.0	1,567.7	1,677.8	1,741.7	1,834.3	2,026.9	2,227.2	2,322.4	2,036.1	2,131.3	2,215.1	2,228.0
Thailand.....	927.0	1,319.9	1,555.9	1,716.1	1,790.9	2,001.9	2,334.7	2,505.9	2,868.5	3,050.2	3,119.9	2,943.1	2,818.6	2,900.5	3,005.8
Philippines .....	2,266.9	3,131.9	3,753.5	3,900.3	3,944.6	4,199.0	4,249.4	4,410.5	4,592.6	4,810.3	4,991.3	5,211.2	5,597.1	6,073.8	6,455.7
Indonesia .....	2,833.2	3,928.9	4,279.4	4,553.2	4,726.1	4,973.6	5,508.4	5,654.4	6,099.8	6,492.3	6,156.2	5,919.8	6,132.0	6,430.1	6,556.8
South Africa .....	1,904.0	2,401.3	2,659.3	2,850.5	2,982.3	3,109.2	3,156.0	3,474.9	3,841.1	3,967.5	3,951.0	3,935.4	4,022.0	4,097.9	4,185.7

NOTES: Production equals total gross output. Seventy countries or economies are included in "all countries." High-technology sectors cover communications services, finance and insurance, business services, education, and health services. Other European Union countries include Austria, Belgium, Denmark, Finland, Greece, Ireland, Netherlands, Portugal, Spain, and Sweden.

SOURCES: Global Insight, Inc., World Industry Service database, 2003. Historical data are from United Nations Industrial Development Organization, United Nations System of National Accounts, Organisation for Economic Co-operation and Development, and country sources.

Appendix table 6-3

**U.S. receipts and payments of royalties and fees associated with affiliated and unaffiliated foreign companies: 1987–2001**

(Millions of U.S. dollars)

Year	Receipts			Payments			Balance		
	All	Affiliated	Unaffiliated	All	Affiliated	Unaffiliated	All	Affiliated	Unaffiliated
1987 .....	9,914	7,629	2,285	1,844	1,296	547	8,070	6,333	1,738
1988 .....	11,802	9,156	2,646	2,585	1,410	1,175	9,217	7,746	1,471
1989 .....	13,064	10,207	2,857	2,602	1,778	824	10,462	8,429	2,033
1990 .....	16,634	13,251	3,384	3,135	2,206	929	13,499	11,045	2,455
1991 .....	18,107	14,395	3,712	4,076	2,996	1,080	14,031	11,399	2,632
1992 .....	19,715	15,718	3,997	5,074	3,381	1,694	14,641	12,337	2,303
1993 .....	20,323	15,707	4,616	4,765	3,364	1,401	15,558	12,343	3,215
1994 .....	26,712	20,275	6,437	5,852	3,934	1,919	20,860	16,341	4,518
1995 .....	30,289	22,859	7,430	6,919	5,257	1,663	23,370	17,602	5,767
1996 .....	32,470	24,556	7,914	7,837	5,406	2,431	24,633	19,150	5,483
1997 .....	33,639	24,876	8,763	9,614	7,202	2,412	24,025	17,674	6,351
1998 .....	35,626	26,313	9,314	11,235	8,547	2,688	24,391	17,766	6,626
1999 .....	36,902	26,507	10,395	12,609	9,876	2,733	24,293	16,631	7,662
2000 .....	39,607	26,816	12,791	16,115	12,180	3,935	23,492	14,636	8,856
2001 .....	38,668	25,873	12,795	16,359	13,008	3,351	22,309	12,865	9,444

NOTES: Details may not add to totals because of rounding. Affiliate refers to a business enterprise located in one country that is directly or indirectly owned or controlled by an entity in another country. Controlling interest must equal 10 percent or more of its voting stock or its equivalent.

SOURCE: U.S. Bureau of Economic Analysis, *Survey of Current Business*, 80 (10): 67–124, 2002.

*Science & Engineering Indicators – 2004*

Appendix table 6-4

(Page 1 of 3)

**U.S. receipts and payments of royalties and license fees generated from exchange and use of industrial processes with unaffiliated foreign companies, by region or country/economy: 1987-2001**

(Millions of U.S. dollars)

Region or country/economy	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>Receipts</b>															
All countries/economies.....	1,678	1,962	2,051	2,333	2,434	2,525	2,820	3,026	3,513	3,566	3,544	3,499	3,900	4,705	4,852
Canada.....	87	60	62	79	62	47	41	54	55	82	92	82	118	159	151
Europe .....	446	517	530	630	575	637	642	768	829	1,042	979	1,170	1,416	1,446	1,493
Eastern Europe <sup>a</sup> .....	7	32	12	15	8	D	16	30	21	11	7	14	34	5	9
European Union <sup>b</sup> .....	353	410	378	500	475	498	496	598	756	937	885	1,071	1,283	1,314	1,350
Belgium-Luxembourg.....	29	37	34	22	34	25	49	88	83	90	57	72	102	126	100
France .....	73	82	52	78	91	64	89	107	84	123	92	142	226	153	203
Germany <sup>c</sup> .....	79	73	77	107	97	108	109	142	171	219	184	243	297	373	368
Italy.....	57	73	68	105	70	99	69	71	66	66	77	53	117	106	106
Netherlands .....	31	40	37	59	35	60	27	30	36	80	71	59	45	54	49
Spain .....	13	26	20	21	29	20	23	18	31	28	29	27	18	14	19
Sweden <sup>b</sup> .....	31	19	53	44	35	48	53	55	106	137	115	148	100	85	52
United Kingdom .....	60	67	81	91	106	103	103	113	115	129	147	154	216	156	178
Norway .....	10	10	32	10	14	5	3	15	5	3	4	3	2	2	3
Switzerland .....	16	14	23	24	15	50	45	44	41	84	76	77	94	122	129
All others.....	29	32	32	37	28	36	29	26	6	7	7	5	3	5	2
South/Central America.....	64	48	54	59	85	73	D	83	D	D	81	109	96	85	99
Brazil .....	19	7	14	8	8	6	7	8	9	14	17	17	10	D	D
Mexico .....	14	13	18	23	31	29	28	33	24	26	32	40	36	22	30
All others.....	31	28	22	28	46	38	D	42	D	D	11	D	50	17	D
Africa .....	D	22	24	22	34	27	36	26	35	28	15	17	19	14	17
Middle East .....	D	18	17	22	25	21	33	20	35	25	41	20	50	81	52
Asia and Pacific.....	936	1,185	1,248	1,465	1,638	1,704	1,966	2,063	2,462	2,299	2,299	2,094	2,188	2,910	3,029
China .....	NA	NA	NA	NA	NA	NA	NA	33	31	43	52	47	32	44	45
Hong Kong .....	4	6	7	6	6	11	12	15	22	19	21	23	12	12	14
India.....	18	40	26	21	14	34	D	28	27	37	29	20	17	23	20
Indonesia .....	5	5	8	11	20	13	20	20	15	13	26	11	21	15	9
Japan.....	723	883	897	1,028	1,219	1,268	1,434	1,372	1,548	1,429	1,508	1,172	1,161	1,636	1,879
Malaysia .....	—	—	2	2	2	7	18	19	D	D	12	43	12	10	11
Philippines .....	3	4	4	4	2	3	D	1	2	2	7	8	7	7	4
Singapore .....	30	13	8	19	21	20	20	73	34	37	39	37	37	20	16
South Korea .....	34	107	167	249	225	220	278	396	607	478	389	483	650	896	742
Taiwan .....	21	46	34	55	57	42	34	39	80	130	144	192	187	196	229
All others <sup>d</sup> .....	98	81	95	70	72	86	D	67	96	D	1	58	52	3	60
All other countries .....	145	112	116	56	15	16	102	12	97	90	37	7	13	34	11
<b>Payments</b>															
All countries/economies.....	459	525	612	665	796	818	1,054	1,034	948	1,319	1,417	1,319	1,568	1,695	1,815
Canada.....	9	11	8	16	11	10	8	11	13	66	89	82	136	117	118
Europe .....	320	355	433	482	637	635	820	712	572	782	729	705	766	908	1,115
Eastern Europe <sup>a</sup> .....	—	—	1	D	1	3	9	D	1	4	2	—	D	1	8
European Union <sup>b</sup> .....	248	279	342	360	426	417	472	395	461	649	558	555	578	695	829
Belgium-Luxembourg.....	5	7	10	15	14	21	22	27	30	D	30	29	31	29	30
France .....	33	37	51	54	73	D	92	92	121	192	D	D	D	133	D

Appendix table 6-4

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**U.S. receipts and payments of royalties and license fees generated from exchange and use of industrial processes with unaffiliated foreign companies, by region or country/economy: 1987-2001**

(Millions of U.S. dollars)

Region or country/economy	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Germany <sup>c</sup> .....	100	112	137	133	182	D	187	113	110	148	149	124	148	211	263
Italy.....	25	20	22	29	34	24	9	7	9	49	35	18	6	12	11
Netherlands .....	5	5	8	9	14	14	15	22	27	24	30	33	37	33	30
Spain .....	—	—	1	1	—	1	1	—	1	1	1	3	D	D	D
Sweden <sup>b</sup> .....	D	D	D	62	122	D	198	D	3	49	61	55	57	69	54
United Kingdom .....	72	90	102	111	106	125	123	104	126	135	118	146	147	162	160
Norway .....	1	D	D	D	D	D	D	D	D	5	9	6	9	5	D
Switzerland .....	27	9	6	19	26	45	60	114	79	72	86	76	112	135	159
All others.....	44	67	84	41	62	170	81	203	31	52	74	68	67	72	119
South/Central America.....	5	—	—	—	1	D	D	D	D	D	28	45	29	120	82
Brazil .....	—	—	—	—	—	—	2	2	—	—	4	D	D	D	D
Mexico .....	3	—	—	—	—	1	—	1	D	5	D	2	7	14	6
All others.....	2	NA	NA	NA	1	D	D	D	D	D	D	D	D	D	D
Africa .....	—	4	—	0	—	—	—	1	—	4	5	—	—	D	—
Middle East .....	2	3	4	3	4	5	9	9	13	12	9	5	14	26	22
Asia and Pacific.....	95	112	120	160	140	152	200	283	333	401	530	480	614	515	472
China .....	NA	NA	NA	NA	NA	NA	NA	7	—	D	D	D	13	6	2
Hong Kong .....	1	—	—	0	—	—	2	3	D	2	2	—	2	2	1
India.....	—	—	—	—	—	—	0	—	—	D	D	—	1	D	D
Indonesia .....	0	—	0	0	0	—	0	0	—	—	—	—	—	D	D
Japan.....	88	108	109	141	138	145	191	262	307	308	360	374	550	460	412
Malaysia .....	0	0	0	0	0	0	—	0	—	3	3	—	—	—	D
Philippines .....	0	—	1	0	0	—	—	—	—	1	—	—	—	—	—
Singapore .....	—	0	0	0	—	D	—	—	—	—	2	—	—	—	D
South Korea .....	—	—	D	D	—	1	1	6	D	D	D	D	22	19	18
Taiwan .....	—	—	D	1	—	2	2	2	—	2	4	—	7	D	2
All others <sup>d</sup> .....	—	4	10	D	2	D	4	3	26	—	D	D	D	D	D
All other countries .....	28	40	47	4	3	16	17	18	17	54	27	47	112	9	6
Balance															
All countries/economies.....	1,219	1,437	1,439	1,668	1,638	1,707	1,766	1,992	2,565	2,247	2,127	2,180	2,332	3,010	3,037
Canada.....	78	49	54	63	51	37	33	43	42	16	3	0	-18	42	33
Europe .....	126	162	97	148	-62	2	-178	56	257	260	250	465	650	538	378
Eastern Europe <sup>a</sup> .....	—	—	11	—	7	—	7	—	20	7	5	—	—	4	1
European Union <sup>b</sup> .....	105	131	36	140	49	81	24	203	295	288	327	516	705	619	521
Belgium-Luxembourg.....	24	30	24	7	20	4	27	61	53	—	27	43	71	97	70
France .....	40	45	1	24	18	—	-3	15	-37	-69	—	—	—	20	—
Germany <sup>c</sup> .....	-21	-39	-60	-26	-85	—	-78	29	61	71	35	119	149	162	105
Italy.....	32	53	46	76	36	75	60	64	57	17	42	35	111	94	95
Netherlands .....	26	35	29	50	21	46	12	8	9	56	41	26	8	21	19
Spain .....	—	—	19	20	—	19	22	—	30	27	28	24	—	—	—
Sweden <sup>b</sup> .....	—	—	—	-18	-87	—	-145	—	103	88	54	93	43	16	-2
United Kingdom .....	-12	-23	-21	-20	0	-22	-20	9	-11	-6	29	8	69	-6	18
Norway .....	9	—	—	—	—	—	—	—	—	-2	-5	-3	-7	-3	—
Switzerland .....	-11	5	17	5	-11	5	-15	-70	-38	12	-10	1	-18	-13	-30

Appendix table 6-4

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**U.S. receipts and payments of royalties and license fees generated from exchange and use of industrial processes with unaffiliated foreign companies, by region or country/economy: 1987–2001**

(Millions of U.S. dollars)

Region or country/economy	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All others.....	-15	-35	-52	-4	-34	-134	-52	-177	-25	-45	-67	-63	-64	-67	-117
South/Central America.....	59	—	—	—	84	—	—	—	—	—	53	64	67	-35	17
Brazil .....	—	—	—	—	—	—	5	6	—	—	13	—	—	—	—
Mexico .....	11	—	—	—	—	28	—	32	—	21	—	38	29	8	24
All other .....	29	—	—	—	45	—	—	—	—	—	—	—	—	—	—
Africa .....	—	18	—	22	—	—	—	25	—	24	10	—	—	—	—
Middle East .....	—	15	13	19	21	16	24	11	22	13	32	15	36	55	30
Asia and Pacific.....	841	1,073	1,128	1,305	1,498	1,552	1,766	1,780	2,129	1,898	1,769	1,614	1,574	2,395	2,557
China .....	—	—	—	—	—	—	—	26	—	—	—	—	19	38	43
Hong Kong .....	3	—	—	6	—	—	10	12	—	17	19	—	10	10	13
India.....	—	—	—	—	—	—	—	—	—	—	—	—	16	—	—
Indonesia .....	5	—	8	11	20	—	20	20	—	—	—	—	—	—	—
Japan.....	635	775	788	887	1,081	1,123	1,243	1,110	1,241	1,121	1,148	798	611	1,176	1,467
Malaysia .....	—	—	2	2	2	7	—	19	—	—	9	—	—	—	—
Philippines .....	3	—	3	4	2	—	—	—	—	1	—	—	—	—	—
Singapore .....	—	13	8	19	—	—	—	—	—	—	37	—	—	—	—
South Korea .....	—	—	—	—	—	219	277	390	—	—	—	—	628	877	724
Taiwan .....	—	—	—	54	—	40	32	37	—	128	140	—	180	—	227
All others <sup>d</sup> .....	—	77	85	—	70	—	—	64	70	—	—	—	—	—	—
All other countries .....	117	72	69	52	12	0	85	-6	80	36	10	-40	-99	25	5

— less than \$500,000

D withheld to avoid disclosing operations of individual companies

NA not available

<sup>a</sup>Comprises Albania, Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.<sup>b</sup>Austria, Finland, and Sweden joined European Union in 1995. European Union countries not listed separately are Denmark, Greece, Ireland, and Portugal.<sup>c</sup>Data before 1990 are for the former West Germany only. Beginning in 1990, data include former East Germany.<sup>d</sup>Includes data before 1994.

NOTES: Industrial processes include patents and other proprietary inventions and technology. Affiliate refers to a business enterprise located in one country that is directly or indirectly owned or controlled by an entity in another country. Controlling interest must equal 10 percent or more of its voting stock or its equivalent.

SOURCE: U.S. Bureau of Economic Analysis, *Survey of Current Business*, vol. 80 (10): 67–124, 2002.

Science &amp; Engineering Indicators – 2004

Appendix table 6-5

**Leading indicators of technological competitiveness: 2002**

(Index)

Region or country/economy	National orientation	Socioeconomic infrastructure	Technological infrastructure	Productive capacity	Total
Argentina.....	44.9	52.4	31.0	32.5	160.7
Brazil.....	52.5	50.5	35.4	35.8	174.2
China.....	63.0	55.0	55.2	49.6	222.7
Czech Republic.....	64.6	64.4	34.7	44.6	208.3
Germany.....	75.6	78.2	65.5	65.0	284.3
Hungary.....	66.7	67.9	40.0	42.2	216.7
India.....	62.5	49.3	37.0	47.8	196.6
Indonesia.....	45.1	39.1	20.7	27.7	132.6
Ireland.....	84.1	80.7	44.2	53.0	262.0
Israel.....	79.5	85.0	52.3	49.4	266.2
Japan.....	76.4	67.6	73.8	80.3	298.1
Malaysia.....	73.0	64.9	28.8	39.1	205.9
Mexico.....	55.2	49.0	28.7	35.4	168.2
Philippines.....	59.3	55.0	24.0	45.0	183.3
Poland.....	63.7	68.3	36.6	42.5	211.1
South Korea.....	80.4	81.1	45.2	52.3	259.0
Taiwan.....	83.0	84.4	45.3	59.6	272.2
United States.....	79.8	85.9	92.7	82.8	341.2
Thailand.....	47.7	54.2	23.9	30.9	156.7
Venezuela.....	37.2	46.0	19.5	20.3	123.0

NOTES: For score and indicator calculations, raw data were transformed into scales of 0–100 for each indicator component and then averaged to generate comparable indicators with a 0–100 range. For survey items, 100 represents the highest response category for each question; for statistical data, 100 typically represents the value attained by the country with the largest value among the 33 countries included in the study. In the indicator formulations cited below, each term carries equal weight.

National orientation (NO) provides evidence that a nation is taking directed action to achieve technological competitiveness. These actions could take place in the business, government, or cultural sector or any combination of the three.

Indicator formulation:  $NO = [Q1 + (Q2 + Q3)/2 + Q4 + F1V2002]/4$ .

Data used: Published data from the PRS Group, Political and Economic Forecast table, Political Risk Letter for 2002 rating each country's investment risk (F1V2002); and survey data assessing each country's national strategy to promote high-technology development (Q1), social influences favoring technological change (Q2 and Q3), and entrepreneurial spirit (Q4).

Socioeconomic infrastructure (SE) assesses the social and economic institutions that support and maintain the physical, human, organizational, and economic resources essential to the functioning of a modern, technology-based industrial nation.

Indicator formulation:  $SE = (Q5 + Q10 + HMHS2000)/3$ .

Data used: Published data on the percentage of students enrolled in secondary (net percentage) and tertiary (gross percentage) education (HMHS2000) from the Harbison-Myers Skills Index for 2000, *Gross and Net Enrollment Ratio at Secondary Level by Country and by Gender for the School Years 1998/1999 and 1999/2000*, Institute for Statistics, United Nations Educational, Scientific, and Cultural Organization (UNESCO), October 2002 and *Gross Enrollment Ratio at Tertiary Level by Country and Gender for the Academic Years 1998/1999 and 1999/2000*, Institute for Statistics, UNESCO, October 2002; and survey data assessing each country's efforts to attract foreign investment (Q10) and the mobility of capital (Q5).

Technological infrastructure (TI) assesses the institutions and resources that contribute to a nation's capacity to develop, produce, and market new technology.

Indicator formulation:  $TI = [(Q7 + Q8)/2 + Q9 + Q11 + EDP2002 + S\&E2000]/5$ .

Data used: Published data from *Science and Technology*, Personnel Engaged in R&D by Category of Personnel (new available data for 1996-2000), Institute for Statistics, UNESCO, November 2002, on the number of scientists and engineers involved in research in 2000 (S&E 2000), national purchases of electronic data-processing equipment (EDP2002) from Reed Electronics Research, *Yearbook of World Electronics Data 2002/2003*, Reed Business Information Ltd., England, 2002; and survey data assessing linkages of R&D to industry (Q9), output of indigenous academic S&E (Q7 and Q8), and the ability to make effective use of technological knowledge (Q11).

Productive capacity (PC) assesses the physical and human resources devoted to manufacturing products and the efficiency with which those resources are employed.

Indicator formulation:  $PC = (Q6 + Q12 + Q13 + A262002)/4$ .

Data used: Published data on electronics production (A262002) from Reed Electronics Research, *Yearbook of World Electronics Data 2002/2003*, Reed Business Information Ltd., England, 2002; and survey data assessing the supply and quality of skilled labor (Q6), capability of the indigenous management (Q13), and the existence of indigenous suppliers of components for technology-intensive products (Q12).

SOURCE: Georgia Technology Research Co., *High Tech Statistics, Preliminary Report* (Atlanta, GA, 2003).

Appendix table 6-6

**Leading indicators of technological competitiveness: 1999**

(Index)

Region or country/economy	National orientation	Socioeconomic infrastructure	Technological infrastructure	Productive capacity	Total
Argentina.....	41.3	53.3	27.5	31.0	153.1
Brazil.....	61.5	49.1	40.4	39.6	190.6
China.....	65.3	52.4	46.4	41.9	206.0
Czech Republic.....	68.2	58.9	41.5	44.6	213.2
Hungary.....	73.7	60.9	43.0	42.2	219.8
India.....	67.7	48.4	46.8	51.3	214.2
Indonesia.....	53.9	43.8	19.2	23.7	140.6
Ireland.....	92.2	75.6	48.0	55.9	271.7
Israel.....	92.0	74.1	58.2	50.6	274.9
Malaysia.....	69.5	58.9	31.9	44.1	204.4
Mexico.....	41.8	40.4	21.8	24.8	128.8
Philippines.....	60.9	63.7	24.4	42.6	191.6
Poland.....	69.6	58.4	38.2	44.3	210.5
South Korea.....	74.9	73.5	44.6	48.8	241.8
Taiwan.....	90.7	74.2	43.6	53.7	262.2
Thailand.....	50.7	46.5	20.5	30.6	148.3
Venezuela.....	39.8	49.4	21.3	24.3	134.8

NOTES: For score and indicator calculations, raw data were transformed into scales of 0–100 for each indicator component and then averaged to generate comparable indicators with a 0–100 range. For survey items, 100 represents the highest response category for each question; for statistical data, 100 typically represents the value attained by the country with the largest value among the 30 countries included in the study. In the indicator formulations cited below, each term carries equal weight.

National orientation (NO) provides evidence that a nation is taking directed action to achieve technological competitiveness. These actions could take place in the business, government, or cultural sector or any combination of the three.

Indicator formulation:  $NO = [Q1 + (Q2 + Q3)/2 + Q4 + F1V99]/4$ .

Data used: Published data from the PRS Group, Political and Economic Forecast table, Political Risk Letter for 1999 rating each country's investment risk (F1V99); and survey data assessing each country's national strategy to promote high-technology development (Q1), social influences favoring technological change (Q2 and Q3), and entrepreneurial spirit (Q4).

Socioeconomic infrastructure (SE) assesses the social and economic institutions that support and maintain the physical, human, organizational, and economic resources essential to the functioning of a modern, technology-based industrial nation.

Indicator formulation:  $SE = (Q5 + Q10 + HMHS99)/3$ .

Data used: Published data on the percentage of students enrolled in secondary and tertiary education (HMHS99) from the Harbison-Myers Skills Index for 1999, table 2.10, *1999 World Development Indicators*, World Bank, 1999; and survey data assessing each country's efforts to attract foreign investment (Q10) and the mobility of capital (Q5).

Technological infrastructure (TI) assesses the institutions and resources that contribute to a nation's capacity to develop, produce, and market new technology.

Indicator formulation:  $TI = [(Q7 + Q8)/2 + Q9 + Q11 + EDP99 + S\&E96]/5$ .

Data used: Published data from *Statistical Yearbook 1998*, UNESCO, 1998, on the number of scientists and engineers involved in research in 1996 (S&E 96), national purchases of electronic data-processing equipment (EDP99) from Reed Electronics Research, *Yearbook of World Electronics Data 1999/2000*, Reed Business Information Ltd., England, 1999; and survey data assessing linkages of R&D to industry (Q9), output of indigenous academic S&E (Q7 and Q8), and the ability to make effective use of technological knowledge (Q11).

Productive capacity (PC) assesses the physical and human resources devoted to manufacturing products and the efficiency with which those resources are employed.

Indicator formulation:  $PC = (Q6 + Q12 + Q13 + A2699)/4$ .

Data used: Published data on electronics production (A2696) from Reed Electronics Research, *Yearbook of World Electronics Data 1999/2000*, Reed Business Information Ltd., England, 1999; and survey data assessing the supply and quality of skilled labor (Q6), capability of the indigenous management (Q13), and the existence of indigenous suppliers of components for technology-intensive products (Q12).

SOURCE: A. L. Porter, J. D. Roessner, N. Newman, and X. Y. Jin, *Indicators of Technology-Based Competitiveness of Nations, Summary Report* (Atlanta, GA, 2000).

Appendix table 6-7

## U.S. industrial R&amp;D performance: 1987–2000

(Millions of PPP dollars)

Industry	ISIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total business enterprise .....		92,155.0	97,014.8	102,054.7	109,727.3	116,952.0	119,110.0	117,399.0	119,595.0	132,103.0	144,667.0	157,539.0	169,180.0	182,823.0	199,539.0
Total manufacturing .....	15–37	84,311.0	86,502.0	88,024.0	88,934.0	88,506.0	90,177.0	90,931.0	96,307.0	104,237.0	116,953.0	125,902.0	125,447.0	122,565.0	129,594.0
Food, beverages, and tobacco .....	15, 16	1,206.0	1,229.3	1,275.3	1,414.4	1,277.0	1,386.0	1,345.0	1,476.0	1,566.0	1,564.0	1,907.9	1,949.41	534.21	587.0
Food, products, and beverages .....	15	NA	NA	NA	NA	NA	1,346.0	1,305.0	NA	NA	NA	NA	NA	NA	NA
Tobacco products .....	16	NA	NA	NA	NA	NA	40.0	40.0	NA	NA	NA	NA	NA	NA	NA
Textiles, fur, and leather .....	17–19	243.0	259.9	260.4	296.9	283.0	275.0	318.2	356.8	395.1	485.7	535.0	577.0	337.0	266.0
Textiles .....	17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	257.0	NA	NA
Wearing apparel and fur .....	18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	294.0	NA	NA
Leather products and footwear .....	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26.0	NA	NA
Wood, paper, printing, and publishing .....	20–22	741.0	961.0	1,075.8	1,303.8	1,445.5	1,491.9	1,916.2	2,010.0	2,010.5	2,925.0	2,284.3	2,693.0	2,961.3	3,270.4
Wood and cork (not furniture) .....	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	70.0	180.0
Pulp, paper, and paper products .....	21	604.0	788.1	879.0	1,059.0	1,235.1	1,245.4	1,649.1	1,693.8	1,773.1	2,181.1	1,901.5	NA	NA	NA
Publishing, printing, and reproduction of recorded media .....	22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Coke, refined petroleum products, and nuclear fuel .....	23	1,897.0	1,997.0	2,180.0	2,306.0	2,498.0	2,277.0	2,152.0	1,950.0	1,760.0	1,654.0	1,689.7	1,808.0	615.0	1,176.2
Chemicals and chemical products .....	24	9,635.0	11,067.0	12,069.0	13,291.0	14,648.0	15,381.0	17,520.6	17,463.0	17,613.2	18,867.1	19,130.7	21,930.0	20,372.0	21,284.0
Chemicals (less pharmaceuticals) .....	24–2423	5,535.0	6,160.8	6,261.4	7,003.7	7,587.2	7,437.0	8,374.6	7,830.0	7,398.2	9,094.1	7,232.1	9,263.1	8,067.5	8,338.8
Pharmaceuticals .....	2423	4,100.0	4,906.2	5,807.7	6,287.4	7,060.8	7,944.0	9,146.0	9,633.0	10,215.0	9,773.0	11,898.7	12,666.9	12,304.5	12,945.2
Rubber and plastic products .....	25	607.0	752.5	884.7	1,152.6	1,236.2	1,323.3	1,178.4	1,617.0	1,254.6	1,488.9	1,438.9	1,841.7	1,845.0	1,693.0
Nonmetallic mineral products .....	26	995.0	737.7	636.8	615.8	483.5	509.7	538.0	591.0	448.0	468.0	633.5	727.0	617.0	886.0
Basic metals .....	27	730.0	637.1	686.0	739.0	714.0	522.0	669.0	690.0	593.0	746.2	988.0	785.0	470.0	624.0
Fabricated metal products .....	28	783.0	881.0	904.0	939.0	974.0	1,017.0	1,158.0	1,111.0	1,023.0	1,551.1	1,818.0	1,643.0	1,704.0	1,939.0
Machinery NEC .....	29	2,428.0	2,682.2	2,729.1	2,753.0	3,554.8	3,533.8	3,431.0	4,004.0	5,041.0	6,108.1	5,888.7	6,116.0	6,327.0	6,766.0
Office, accounting, and computing machinery .....	30	9,347.0	10,444.3	11,704.6	11,693.0	11,220.2	11,404.2	9,313.0	9,664.0	8,869.0	13,221.0	18,238.3	14,102.0	9,403.2	10,322.0
Electrical machinery .....	31	1,239.0	1,419.2	2,126.0	3,444.0	3,090.5	2,722.0	2,537.0	2,664.0	3,473.0	3,360.0	4,507.4	4,845.2	4,224.5	3,828.4
Radio, television, and communication equipment and apparatus .....	32	14,609.0	12,708.8	11,192.0	9,956.0	10,324.5	10,638.0	10,812.0	12,674.0	15,278.0	19,138.0	20,464.6	21,329.8	17,668.8	25,795.0
Electronic components (includes semi-conductors) .....	321	4,286.0	4,133.1	4,025.4	3,914.1	NA	NA	NA	NA	NA	NA	NA	NA	10,827.0	12,919.0
Television, radio, and communication equipment .....	32–321	10,323.0	8,575.7	7,166.6	6,041.9	NA	NA	NA	NA	NA	NA	NA	NA	6,841.8	12,876.0
Instruments, watches, and clocks .....	33	5,222.0	5,530.0	5,992.0	7,055.0	8,705.0	9,542.0	10,119.0	11,441.0	11,976.0	12,149.0	13,835.0	14,833.1	19,566.0	19,191.0
Motor vehicles .....	34	9,279.4	10,085.4	11,020.1	10,255.6	10,387.6	9,923.6	11,718.0	13,405.7	15,003.4	16,021.9	15,201.5	14,315.0	18,274.0	18,581.4
Other transport equipment .....	35	24,966.6	24,689.6	22,838.9	21,105.4	17,040.4	17,570.4	15,539.0	14,681.3	17,437.6	16,715.1	16,795.5	14,981.0	15,784.0	11,603.6
Ships .....	351	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aerospace .....	353	24,458.0	24,168.0	22,331.0	20,635.0	16,629.0	17,158.0	15,056.0	14,260.0	16,951.0	16,224.0	16,298.0	14,457.4	14,425.0	10,319.0
Other transport NEC .....	352, 359	508.6	521.6	507.9	470.4	411.4	412.4	483.0	421.3	486.6	491.1	497.5	523.6	1,359.0	1,284.6
Furniture, other manufacturing NEC .....	36	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	862.0	782.0
Electricity, gas, and water .....	40, 41	266.0	236.0	234.0	244.0	278.0	292.0	342.0	403.0	440.0	352.0	300.0	303.2	142.0	155.0
Construction .....	45	NA	NA	NA	NA	NA	NA	NA	NA	NA	283.0	261.0	445.9	699.0	241.0
Total services .....	50–99	7,844.0	10,512.8	14,030.7	20,793.3	28,446.0	28,933.0	26,468.0	23,288.0	27,866.0	26,958.0	30,964.0	42,884.0	57,063.2	68,564.0
Wholesale, retail trade, motor vehicle repair, etc. ....	50–52	NA	NA	NA	NA	NA	NA	NA	NA	NA	6,389.0	8,150.0	12,019.5	19,960.0	25,132.0
Hotels and restaurants .....	55	NA	NA	NA	NA	NA	NA	NA	NA	NA	272.0	155.0	113.0	NA	NA
Transport and storage .....	60–63	NA	NA	NA	NA	NA	NA	NA	NA	NA	223.0	681.0	424.5	466.0	277.0
Communications .....	64	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,103.0	2,017.0	2,151.8	NA	NA
Post .....	641	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.0	58.0	103.0	NA	NA
Telecommunications .....	642	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,030.0	1,959.0	2,048.8	1,564.5	1,407.0
Financial intermediation (includes insurance) .....	65–67	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,297.0	1,499.1	1,586.7	1,577.2	4,025.0
Computer and related activities .....	72	3,805.0	3,828.0	3,784.0	4,629.0	5,769.0	6,663.0	5,003.0	4,292.8	7,822.0	6,944.1	8,868.0	11,935.1	10,670.3	14,799.0
Software consultancy .....	722	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,691.0	7,658.0
Other computer services NEC .....	72–722	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,979.3	7,141.0
Research and development .....	73	919.0	1,164.0	1,405.0	1,335.0	9,302.0	9,667.0	2,541.0	3,765.0	4,584.4	5,484.0	7,029.3	9,169.0	11,264.0	14,018.0

ISIC International Standard Industrial Classification; NA not available; NEC not elsewhere classified; PPP purchasing power parity

NOTES: Wood, paper, printing, and publishing (ISIC, R-3: 20...22) includes furniture (ISIC, R-3: 361). Pulp, paper, and paper products (ISIC, R-3: 21) includes publishing, printing, and reproduction of recorded media (ISIC, R-3: 22). Other transport NEC (ISIC, R-3: 3 for 1987–95). Total services (ISIC, R-3: 50...99) includes agriculture (ISIC, R-3: 1+2+5); mining (ISIC, R-3: 10...14); electricity, gas, and water (ISIC, R-3: 40+41), and construction (ISIC, R-3: 45). Industry-level data may not add to totals because of rounding and incomplete data.

SOURCE: Organisation for Economic Co-operation and Development, EAS, ANBERD database, July 2002.



Appendix table 6-8

## Japan industrial R&amp;D performance: 1987–2000

(Millions of PPP dollars)

Industry	ISIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total business enterprise .....		30,901.0	35,424.4	41,340.2	47,450.1	50,466.4	50,811.2	49,122.5	49,727.6	55,288.9	60,733.6	65,384.0	64,814.4	65,603.8	69,699.7
Total manufacturing .....	15–37	29,819.6	34,119.5	39,833.9	45,574.5	48,574.3	48,641.0	46,891.6	47,504.3	53,198.3	57,372.2	61,997.0	60,840.8	61,677.2	66,191.8
Food products and beverages.....	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tobacco products.....	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Textiles .....	17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wearing apparel and fur.....	18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Leather products and footwear.....	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wood and cork (not furniture).....	20	76.7	87.4	150.8	126.3	160.9	145.9	168.2	176.9	202.8	197.2	206.3	207.5	168.6	193.6
Pulp, paper, and paper products.....	21	262.6	334.0	398.0	442.3	474.4	397.0	394.9	405.0	478.8	502.4	526.9	NA	NA	NA
Publishing, printing, and reproduction of recorded media.....	22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Coke, refined petroleum products, and nuclear fuel.....	23	334.2	367.4	423.1	471.6	459.0	478.2	444.9	437.9	398.7	377.4	395.9	302.1	247.8	228.1
Chemicals and chemical products.....	24	5,218.5	5,834.5	6,602.4	7,265.6	8,019.2	8,535.8	8,486.1	8,556.9	9,149.5	9,620.2	9,750.0	9,787.7	9,800.8	10,435.0
Pharmaceuticals.....	2423	1,811.4	2,042.3	2,289.2	2,642.6	3,056.6	3,419.5	3,413.8	3,504.1	3,778.9	4,028.3	3,946.3	4,087.6	4,254.9	4,789.1
Rubber and plastic products.....	25	814.7	943.4	1,168.6	1,176.9	1,325.7	1,326.9	1,294.5	1,375.7	1,452.1	1,589.2	1,569.6	1,562.5	1,603.8	1,669.6
Nonmetallic mineral products.....	26	847.1	973.7	1,112.7	1,104.1	1,345.9	1,139.8	1,078.4	1,009.3	1,176.7	1,290.4	1,305.0	1,303.2	1,133.2	1,134.3
Basic metals .....	27	1,664.9	1,813.8	1,985.8	2,279.0	2,637.5	2,435.0	2,361.5	2,086.2	2,160.4	2,142.3	2,299.8	1,975.8	1,892.3	1,942.3
Fabricated metal products.....	28	451.6	439.2	549.4	664.6	711.2	674.4	654.3	616.9	694.9	892.1	816.2	753.9	676.9	775.8
Machinery NEC.....	29	2,534.5	2,771.7	3,386.7	4,110.6	4,349.0	4,235.7	4,355.9	4,617.7	4,934.6	5,253.8	5,659.6	5,656.1	5,839.0	6,447.3
Office, accounting, and computing machinery.....	30	2,223.0	2,954.7	4,084.6	4,591.3	4,829.6	4,382.8	4,358.2	4,295.9	4,987.6	6,020.9	6,403.7	6,468.2	7,034.1	7,560.4
Electrical machinery.....	31	3,170.0	3,636.4	4,353.9	5,108.7	5,233.2	5,145.6	5,274.5	5,564.2	6,077.9	6,601.7	6,918.1	6,746.3	6,231.0	6,848.4
Radio, television, and communication equipment and apparatus.....	32	5,581.0	6,293.9	6,652.3	7,445.8	8,106.3	8,487.0	7,702.5	8,194.2	9,701.6	9,798.0	10,749.7	10,850.7	11,734.8	13,090.7
Instruments, watches, and clocks.....	33	972.5	1,170.4	1,337.2	1,722.1	1,626.8	1,740.5	1,747.2	1,842.6	2,091.3	2,211.7	2,582.1	2,842.9	3,033.5	3,124.6
Motor vehicles.....	34	3,771.7	4,511.5	5,385.9	6,556.8	6,549.9	6,738.6	5,807.5	5,521.4	6,721.2	7,757.4	8,494.0	8,317.1	7,971.7	8,638.8
Other transport equipment .....	35	423.3	360.2	454.8	562.8	715.6	543.8	576.8	507.3	564.7	658.9	873.7	893.6	867.0	760.1
Building and repairing of ships and boats.....	351	41.8	46.2	58.9	66.1	75.8	101.9	99.2	87.3	81.8	74.7	67.3	120.4	61.0	58.5
Aircraft and spacecraft.....	353	281.3	239.6	311.0	407.2	550.4	350.5	381.3	316.5	365.4	449.5	647.0	623.0	636.9	550.8
Furniture, other manufacturing NEC.....	36	259.8	278.5	312.1	356.4	401.4	411.8	394.0	473.3	467.8	483.5	559.5	581.3	642.8	624.4
Recycling .....	37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Construction.....	45	611.0	727.8	930.4	1,090.3	1,060.1	1,295.1	1,348.9	1,226.5	1,202.6	1,355.6	1,364.2	1,060.4	1,230.9	1,215.0
Total services.....	50–99	830.7	1,012.3	1,196.7	1,315.0	1,071.6	1,062.8	1,111.7	1,249.3	1,661.4	2,578.9	2,895.6	2,060.1	1,800.1	1,479.1
Hotels and restaurants .....	55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Communications.....	64	790.3	975.4	1,148.3	1,234.9	947.5	963.9	1,020.7	1,178.3	1,566.8	1,440.5	1,755.7	NA	NA	NA
Computer and related activities.....	72	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,069.7	1,051.3	1,973.0	1,695.3	1,350.8
R&D .....	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

ISIC International Standard Industrial Classification; NA not available; NEC not elsewhere classified; PPP purchasing power parity

NOTES: Wood, paper, printing, and publishing (ISIC, R-3: 20...22) includes furniture (ISIC, R-3: 361). Pulp, paper, and paper products (ISIC, R-3: 21) includes publishing, printing, and reproduction of recorded media (ISIC, R-3: 22). Industry-level data may not add to totals because of rounding and incomplete data.

SOURCE: Organisation for Economic Co-operation and Development, EAS, ANBERD database, July 2002.

Science &amp; Engineering Indicators – 2004

Appendix table 6-9

## European Union industrial R&amp;D performance: 1992–99

(Millions of PPP dollars)

Industry	ISIC code	1992	1993	1994	1995	1996	1997	1998	1999
Total business enterprise .....	na	74,702.0	74,093.9	75,202.1	79,703.0	82,432.8	88,338.4	92,432.0	101,680.5
Total manufacturing .....	15–37	65,584.8	64,892.3	66,117.1	69,629.0	71,629.0	75,840.9	78,878.1	85,735.8
Food products and beverages .....	15	NA	NA	NA	NA	NA	NA	NA	NA
Tobacco products .....	16	NA	NA	NA	NA	NA	NA	NA	NA
Textiles .....	17	NA	NA	NA	NA	NA	NA	NA	NA
Wearing apparel and fur .....	18	NA	NA	NA	NA	NA	NA	NA	NA
Leather, leather products, and footwear .....	19	NA	NA	NA	NA	NA	NA	NA	NA
Wood and cork (except furniture) .....	20	NA	NA	NA	NA	NA	NA	NA	NA
Paper and paper products .....	21	NA	NA	NA	NA	NA	NA	NA	NA
Publishing, printing, and reproduction of recorded media .....	22	NA	NA	NA	NA	NA	NA	NA	NA
Coke, refined petroleum products, and nuclear fuel .....	23	977.5	933.7	806.1	862.7	859.4	889.1	901.1	852.4
Chemicals and chemical products .....	24	14,697.7	14,813.1	15,207.7	16,025.0	16,663.4	18,317.5	19,144.9	20,235.1
Chemicals excluding pharmaceuticals .....	24–2423	NA	NA	NA	NA	NA	NA	NA	NA
Pharmaceuticals .....	2423	NA	NA	NA	NA	NA	NA	NA	NA
Rubber and plastics products .....	25	1,035.2	1,102.8	1,142.0	1,212.8	1,382.6	1,500.0	1,485.7	1,774.2
Other nonmetallic mineral products .....	26	666.8	664.8	694.8	729.7	775.6	771.1	799.9	899.5
Basic metals .....	27	1,036.0	989.4	984.2	1,055.7	1,026.2	1,051.9	1,040.3	1,067.4
Fabricated metal products (except machinery and equipment) .....	28	894.7	949.4	971.1	1,069.2	1,121.7	1,079.8	1,097.0	1,146.7
Machinery and equipment NEC .....	29	5,908.5	5,876.0	6,285.0	6,450.9	6,534.7	7,341.3	7,510.7	7,690.2
Office, accounting, and computing machinery .....	30	2,763.7	2,592.0	2,324.7	2,374.5	2,194.1	1,854.2	1,808.7	1,782.4
Electrical machinery and apparatus NEC .....	31	4,205.6	4,258.6	4,149.0	4,175.6	3,573.3	2,954.6	3,083.2	3,162.5
Radio, television, and communication equipment .....	32	8,034.8	8,229.0	8,826.0	9,525.8	10,515.4	11,561.4	12,408.9	13,746.6
Instruments, watches, and clocks .....	33	4,379.4	4,276.9	4,287.4	4,586.6	4,377.3	4,671.6	4,270.5	4,687.1
Motor vehicles .....	34	10,335.1	10,119.6	10,192.9	10,989.7	11,740.1	12,868.6	13,934.9	16,404.5
Other transport equipment .....	35	8,025.3	7,344.9	7,362.3	7,562.1	7,795.3	7,860.2	8,081.7	8,769.4
Building and repairing of ships and boats .....	351	NA	NA	NA	NA	NA	NA	NA	NA
Aircraft and spacecraft .....	353	7,370.2	6,697.8	6,662.6	6,822.8	6,901.8	6,876.6	7,109.4	7,722.4
Railroad and other transport equipment NEC .....	352,359	NA	NA	NA	NA	NA	NA	NA	NA
Furniture, manufacturing NEC .....	36	364.8	399.2	424.9	457.8	446.5	471.0	550.5	537.0
Total services .....	50–99	6,224.1	6,630.6	6,850.4	7,492.3	8,278.4	9,903.6	10,868.2	13,192.3
Computer and related activities .....	72	NA	NA	NA	2,136.6	NA	2,969.2	NA	3,809.3
R&D .....	73	NA	NA	NA	NA	NA	NA	NA	NA
Other business activities .....	74	NA	NA	NA	1,670.1	NA	1,891.1	NA	2,282.0

ISIC International Standard Industrial Classification; NA not available; NEC not elsewhere classified; PPP purchasing power parity; na not applicable

NOTES: Wood, paper, printing, and publishing (ISIC, R-3: 20...22) includes furniture (ISIC, R-3: 361). Pulp, paper, and paper products (ISIC, R-3: 21) includes publishing, printing, and reproduction of recorded media (ISIC, R-3: 22). Industry-level data may not add to totals because of rounding and incomplete data.

SOURCE: Organisation for Economic Co-operation and Development, EAS, ANBERD database, July 2002.

Appendix table 6-10

## U.S. patents granted, by residence of inventor/type of ownership: Pre-1988 and 1988–2001

Country/economy	Total	Pre-1988	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All.....	3,247,452	1,642,070	77,924	95,537	90,365	96,512	97,444	98,342	101,676	101,419	109,645	111,983	147,518	153,485	157,495	166,037
U.S. origin.....	1,957,663	1,091,442	40,497	50,185	47,391	51,178	52,253	53,231	56,066	55,739	61,104	61,707	80,289	83,905	85,070	87,606
Foreign origin.....	1,289,789	550,628	37,427	45,352	42,974	45,334	45,191	45,111	45,610	45,680	48,541	50,276	67,229	69,580	72,425	78,431
Japan.....	485,959	148,022	16,158	20,168	19,525	21,025	21,925	22,293	22,384	21,764	23,053	23,179	30,840	31,104	31,296	33,223
Germany.....	242,588	130,307	7,352	8,351	7,614	7,680	7,309	6,893	6,731	6,600	6,818	7,008	9,095	9,337	10,234	11,259
Taiwan.....	30,017	1,293	457	591	732	906	1,001	1,189	1,443	1,620	1,897	2,057	3,100	3,693	4,667	5,371
France.....	93,259	48,924	2,661	3,140	2,866	3,030	3,029	2,909	2,779	2,821	2,788	2,958	3,674	3,820	3,819	4,041
United Kingdom.....	105,645	65,151	2,579	3,095	2,789	2,800	2,425	2,295	2,234	2,478	2,453	2,678	3,464	3,572	3,667	3,965
Canada.....	60,896	27,696	1,489	1,959	1,859	2,037	1,964	1,944	2,008	2,104	2,232	2,379	2,974	3,226	3,419	3,606
South Korea.....	21,707	343	97	159	225	405	538	779	943	1,161	1,493	1,891	3,259	3,562	3,314	3,538
Sweden.....	31,604	18,067	777	837	768	716	626	636	706	806	854	867	1,225	1,401	1,577	1,741
Italy.....	35,855	17,227	1,076	1,297	1,259	1,209	1,271	1,285	1,215	1,078	1,200	1,239	1,584	1,492	1,714	1,709
Switzerland.....	46,056	28,778	1,245	1,363	1,284	1,335	1,197	1,127	1,169	1,056	1,112	1,090	1,279	1,279	1,322	1,420
Netherlands.....	29,262	15,486	806	1,061	960	992	855	800	852	799	797	808	1,226	1,247	1,241	1,332
Israel.....	9,131	2,314	238	325	299	304	335	314	350	384	484	534	754	743	783	970
Australia.....	12,965	5,485	416	501	432	463	409	378	467	459	471	478	720	707	704	875
Finland.....	8,334	2,423	232	230	304	331	361	293	312	358	444	452	595	649	618	732
Belgium.....	12,384	5,906	302	359	313	324	325	350	352	397	488	515	693	648	694	718
Austria.....	11,354	5,856	337	402	393	359	371	312	289	337	362	376	387	479	505	589
Denmark.....	7,394	3,490	151	221	158	210	193	197	207	199	241	333	392	487	436	479
Singapore.....	1,261	76	6	18	12	15	32	38	51	53	88	94	120	144	218	296
Spain.....	4,140	1,677	126	131	130	153	133	158	141	148	157	177	248	222	270	269
Norway.....	4,106	1,939	121	126	112	111	108	117	126	130	139	142	198	224	248	265
Hong Kong.....	1,745	391	41	48	52	50	60	60	57	86	88	81	160	155	179	237
Russian Federation.....	1,153	NA	NA	NA	NA	NA	NA	3	38	98	116	111	189	181	183	234
China.....	1,125	141	47	52	47	50	41	53	48	62	46	62	72	90	119	195
India.....	1,079	301	14	14	23	22	24	30	27	37	35	47	85	112	131	177
Ireland.....	1,446	435	43	65	54	56	55	53	50	50	78	73	74	94	123	143
New Zealand.....	1,702	737	55	58	51	41	44	39	37	44	52	85	114	114	107	124
South Africa.....	3,282	1,744	103	134	114	105	97	93	101	123	111	101	115	110	111	120
Brazil.....	1,373	487	29	36	41	62	40	57	60	63	63	62	74	91	98	110
Mexico.....	1,988	1,302	44	39	32	29	39	45	44	40	39	45	57	76	76	81
Hungary.....	2,495	1,596	94	129	93	85	88	61	46	50	43	25	50	39	36	60
Argentina.....	955	522	16	20	17	16	20	24	32	31	30	35	43	44	54	51
Luxembourg.....	722	365	29	29	17	27	26	28	22	24	18	22	20	22	40	33
Venezuela.....	583	221	20	23	20	25	22	31	23	29	25	25	27	39	27	26
Poland.....	715	550	8	14	17	8	5	8	8	8	15	11	15	19	13	16
Czechoslovakia.....	2,137	1,893	33	34	39	27	17	13	19	15	8	9	9	5	9	7
Soviet Union.....	6,993	6,158	96	161	174	178	66	65	53	12	16	4	6	3	1	0
Others (128).....	6,379	3,325	129	162	149	148	140	141	186	156	187	223	292	350	372	419
Ownership																
U.S. corporations.....	1,525,517	830,372	31,437	38,664	36,094	39,133	40,308	41,825	44,036	44,035	48,741	50,220	66,052	69,390	70,884	74,326
U.S. Government.....	50,208	36,052	733	880	983	1,183	1,161	1,167	1,258	1,028	923	944	1,027	983	929	957
U.S. individuals.....	456,650	265,947	10,122	13,028	12,542	13,207	12,751	12,281	12,805	12,885	13,729	12,914	16,407	16,698	16,129	15,205
Foreign corporations.....	1,045,592	415,526	30,960	37,506	35,548	37,593	38,239	38,401	38,788	38,688	41,477	42,907	57,667	60,168	63,182	68,942
Foreign government.....	10,784	6,411	453	441	423	472	463	434	296	245	259	273	256	162	104	92
Foreign individuals.....	158,701	87,762	4,219	5,018	4,775	4,924	4,522	4,234	4,493	4,538	4,516	4,725	6,109	6,084	6,267	6,515

NA not available

SOURCE: U.S. Patent and Trademark Office, Information Products Division, Technology Assessment and Forecast Branch, special tabulations (Washington, DC, December 2002).

## U.S. patent applications, by residence of inventor: 1989–2001

Country/economy	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All.....	152,750	164,558	164,306	173,075	174,743	189,857	212,377	195,187	215,257	243,062	270,187	295,926	326,511
U.S. origin.....	82,370	90,643	87,955	92,425	99,955	107,233	123,958	106,892	120,445	135,483	149,825	164,795	177,511
Foreign origin.....	70,380	73,915	76,351	80,650	74,788	82,624	88,419	88,295	94,812	107,579	120,362	131,131	148,997
Japan.....	31,791	34,113	36,846	38,633	34,816	37,768	39,872	39,510	41,767	45,260	47,821	52,891	61,238
Germany.....	11,437	11,292	10,874	11,652	10,500	11,324	11,853	11,550	12,333	13,885	16,978	17,715	19,900
Taiwan.....	1,507	2,035	2,252	2,667	2,874	3,560	4,054	4,766	5,492	7,412	9,411	9,046	11,086
United Kingdom.....	5,066	4,959	4,557	4,587	4,414	4,856	5,202	4,791	5,147	6,110	6,948	7,523	8,362
Canada.....	3,425	3,511	3,641	3,761	3,910	4,255	4,745	4,443	4,694	5,689	6,149	6,809	7,221
France.....	4,268	4,771	4,723	4,828	4,320	4,528	5,001	4,486	4,759	5,249	6,216	6,623	6,852
South Korea.....	607	775	1,321	1,471	1,624	2,354	2,820	4,248	4,920	5,452	5,033	5,705	6,719
Italy.....	1,964	2,093	2,123	2,288	1,906	1,998	2,128	2,062	2,119	2,313	2,577	2,704	2,967
Sweden.....	1,114	1,057	1,086	1,072	1,157	1,405	1,500	1,481	1,980	2,359	2,570	2,825	2,827
Netherlands.....	1,570	1,588	1,397	1,547	1,472	1,455	1,570	1,559	1,726	1,816	2,058	2,289	2,712
Israel.....	624	608	633	780	803	1,040	1,072	1,042	1,198	1,442	2,009	2,509	2,710
Switzerland.....	2,019	1,931	1,902	1,922	1,759	1,852	1,917	1,609	1,637	1,875	2,144	2,233	2,337
Australia.....	800	811	783	863	781	921	1,007	1,057	1,006	1,420	1,462	1,800	1,995
Finland.....	513	595	592	576	568	707	745	836	891	970	1,376	1,530	1,840
Belgium.....	572	592	614	692	685	862	1,001	930	894	1,059	1,204	1,245	1,286
Denmark.....	284	370	358	378	376	445	618	496	634	748	863	859	1,113
Austria.....	511	560	516	566	526	599	619	543	552	710	823	881	961
Singapore.....	37	36	63	89	104	134	144	176	213	336	460	632	786
India.....	50	58	51	64	54	70	91	115	137	180	271	438	643
Hong Kong.....	108	86	132	150	155	219	163	222	207	274	403	473	626
China.....	112	111	126	129	135	100	144	142	117	181	257	469	626
Spain.....	302	289	258	313	269	315	357	359	370	409	464	549	601
Norway.....	141	164	169	212	190	203	243	227	303	337	415	447	475
Russian Federation.....	NA	NA	NA	183	153	206	221	254	249	273	388	382	433
Ireland.....	99	130	116	103	104	149	131	114	138	228	252	362	366
New Zealand.....	121	105	91	107	85	130	137	174	174	187	240	279	318
South Africa.....	215	185	186	207	246	238	187	189	174	211	179	209	231
Brazil.....	111	88	124	112	105	156	115	145	134	165	186	220	219
Mexico.....	77	76	106	105	82	105	99	97	110	141	147	190	196
Argentina.....	32	56	59	59	56	75	65	78	77	119	96	137	137
Malaysia.....	14	11	22	16	20	37	30	30	61	41	76	104	116
Hungary.....	174	138	103	76	69	76	70	59	40	73	120	107	103
Czech Republic.....	NA	NA	NA	NA	1	15	14	17	30	34	30	52	77
Thailand.....	3	8	4	11	15	19	21	20	21	26	41	92	70
Luxembourg.....	35	32	36	39	35	39	20	31	32	36	59	57	61
Venezuela.....	26	48	43	47	38	43	32	38	40	35	42	45	53
Iceland.....	3	3	10	16	3	6	6	13	8	25	31	30	51
Philippines.....	13	9	10	10	9	7	12	9	15	13	20	32	51
Greece.....	33	27	20	28	19	27	29	23	30	45	50	44	49
Poland.....	24	13	21	16	27	20	19	22	19	19	31	33	39
Ukraine.....	NA	NA	NA	4	16	14	17	18	24	28	22	40	32
Liechtenstein.....	15	13	14	19	13	15	13	17	19	24	26	28	29

**U.S. patent applications, by residence of inventor: 1989–2001**

Country/economy	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Colombia .....	5	10	5	13	3	18	19	10	6	12	20	21	29
Turkey .....	3	6	3	2	3	5	6	7	10	16	29	28	28
Portugal.....	9	6	3	11	9	14	10	16	12	17	28	17	28
Saudi Arabia.....	12	8	12	11	17	23	24	19	17	26	11	28	26
Chile.....	11	13	12	12	11	11	10	23	17	17	16	24	23
Croatia .....	NA	NA	NA	NA	6	9	15	16	20	20	12	21	21
Monaco .....	3	4	3	8	6	3	6	12	10	13	21	26	20
Slovenia .....	NA	NA	NA	8	19	11	13	19	24	29	21	27	20
Egypt.....	4	3	4	10	4	6	2	2	10	11	16	20	16
Bahamas.....	2	7	2	6	11	8	15	9	14	20	15	18	16
Bulgaria.....	30	31	11	7	3	4	6	5	4	3	11	18	13
Belarus.....	NA	NA	NA	4	8	5	7	9	3	5	10	7	10
Indonesia .....	3	4	11	11	7	5	4	11	3	9	12	9	5
Czechoslovakia .....	71	39	32	41	26	13	22	13	10	19	16	0	0
Other foreign .....	410	437	271	108	161	142	156	126	161	153	176	229	228

NA not available

SOURCE: U.S. Patent and Trademark Office, Information Products Division, Technology Assessment and Forecast Branch, special tabulations (Washington, DC, February 2003).

Appendix table 6-12

## Patent classes most emphasized (top 50) by United Kingdom inventors patenting in United States: 1991 and 2001

Title (partial)	Class	Patents granted to investors from:					
		All countries		United Kingdom		Active 5 index	
		1991	2001	1991	2001	1991	2001
All classes .....	TOT	76,726	143,268	2,519	3,832	1.000	1.000
Electrical audio signal processing systems and devices .....	381	151	229	3	25	0.624	4.358
Cleaning compositions for solid surfaces, auxiliary compositions therefor, or processes of preparing the compositions .....	510	245	562	25	46	3.206	3.267
Wells (shafts or deep borings in the earth, e.g., for oil and gas) .....	166	330	503	20	39	1.904	3.095
Fluid sprinkling, spraying, and diffusing .....	239	263	349	10	26	1.195	2.974
Compositions: coating or plastic .....	106	309	386	12	23	1.220	2.379
Drug, bioaffecting and body treating compositions (includes class 514) .....	424	3,321	6,570	250	385	2.365	2.339
Chemistry: analytical and immunological testing .....	436	197	368	4	18	0.638	1.953
Aeronautics .....	244	216	335	19	16	2.764	1.907
Boring or penetrating the earth .....	175	136	254	10	12	2.310	1.886
Seal for a joint or juncture .....	277	170	291	12	13	2.218	1.783
Winding, tensioning, or guiding .....	242	319	352	2	15	0.197	1.701
Organic compounds (includes classes 532–570) .....	532	2,788	3,160	101	130	1.138	1.642
Registers (e.g., cash registers, calculators, devices for counting movements of devices) .....	235	208	467	7	19	1.057	1.624
Rotary kinetic fluid motors or pumps .....	415	117	271	11	11	2.954	1.620
Chemistry: molecular biology and microbiology .....	435	860	3,650	29	146	1.059	1.597
Multiplex communications .....	370	339	1,898	9	74	0.834	1.556
Brakes .....	188	194	424	11	16	1.782	1.506
Receptacles .....	220	221	296	8	11	1.137	1.483
Electrolysis: processes, compositions used therein, and methods of preparing the compositions .....	205	243	405	11	15	1.422	1.478
Measuring and testing .....	073	897	1,364	39	50	1.366	1.463
Optical waveguides .....	385	603	1,239	40	45	2.084	1.450
Chemistry: natural resins or derivatives; peptides or proteins; lignins or reaction products thereof .....	530	264	553	6	20	0.714	1.444
Telecommunications .....	455	251	1,763	5	63	0.626	1.426
Prosthesis (i.e., artificial body members), parts thereof, or aids and accessories therefor .....	623	167	560	3	20	0.564	1.426
Multicellular living organisms and unmodified parts thereof and related processes .....	800	23	548	2	19	2.732	1.384
Fluid reaction surfaces (i.e., impellers) .....	416	88	202	6	7	2.142	1.383
Fluent material handling, with receiver or receiver coating means .....	141	123	260	3	9	0.766	1.382
Typewriting machines .....	400	290	232	4	8	0.433	1.377
Electric lamp and discharge devices: systems .....	315	392	552	16	19	1.282	1.374
Rotary expandable chamber devices .....	418	140	204	4	7	0.898	1.370
Special receptacle or package .....	206	341	438	11	15	1.014	1.367
Communications: electrical .....	340	446	1,041	13	35	0.916	1.342
Power plants .....	060	430	902	21	30	1.534	1.328
Telephonic communications .....	379	274	891	3	29	0.344	1.299
Multiple computer or process coordinating (electrical computers and digital processing systems) .....	709	80	1,395	5	45	1.964	1.288
Optics: measuring and testing .....	356	538	651	20	21	1.168	1.288
Static structures (e.g., buildings) .....	052	380	604	20	19	1.654	1.256
Coded data generation or conversion .....	341	281	609	9	19	1.006	1.245
Machine element or mechanism .....	074	364	522	12	16	1.036	1.224
Optics: systems (including communication) and elements .....	359	882	1,925	32	59	1.140	1.223
Dispensing (apparatus and process) .....	222	376	471	15	14	1.253	1.187
Electricity: magnetically operated switches, magnets, and electromagnets .....	335	155	203	3	6	0.608	1.180
Pipe joints or couplings .....	285	191	240	11	7	1.809	1.164
Data processing: measuring, calibrating, or testing .....	702	205	518	6	15	0.920	1.156
Food or edible material: processes, compositions, and products .....	426	556	692	14	20	0.791	1.154
Data processing: database and file management, data structures, or document processing .....	707	95	1,186	4	34	1.323	1.144
Internal-combustion engines .....	123	1,012	1,546	31	44	0.962	1.136
Surgery (includes class 600) .....	128	746	1,796	14	51	0.590	1.134
Pumps .....	417	341	577	14	16	1.290	1.107
Fluid-pressure and analogous brake systems .....	303	162	291	10	8	1.939	1.097
Chemistry of inorganic compounds .....	423	502	444	17	12	1.064	1.079

NOTES: Activity index is the percentage of patents in a class that are granted to inventors from one country divided by the percentage of all patents that have inventors from that country in that year. Listing is limited to Patent and Trademark Office classes that have received at least 200 patents from all countries in 2001.

SOURCE: U.S. Patent and Trademark Office, Information Products Division, Technology Assessment and Forecast Branch, special tabulations. (Washington, DC, 2002).

Appendix table 6-13

## Patent classes most emphasized (top 50) by French inventors patenting in United States: 1991 and 2001

Title (partial)	Class	Patents granted to inventors from:					
		All countries		France		Active 5 index	
		1991	2001	1991	2001	1991	2001
All classes .....	TOT	76,726	143,268	2,519	3,832	1.000	1.000
Chemistry of hydrocarbon compounds .....	585	304	209	9	28	0.902	5.009
Aeronautics .....	244	216	335	19	39	2.679	4.353
Clutches and power-stop control .....	192	291	256	12	27	1.256	3.943
Dispensing (apparatus and process) .....	222	376	471	18	45	1.458	3.572
Fluent material handling, with receiver or receiver coacting means .....	141	123	260	2	21	0.495	3.020
Joints and connections .....	403	167	216	8	17	1.459	2.943
Chemistry of inorganic compounds .....	423	502	444	35	34	2.124	2.863
Catalyst, solid sorbent, or support therefor: product or process of making .....	502	436	398	25	30	1.746	2.818
Drug, bio-affecting and body treating compositions (includes class 514) .....	424	3,321	6,570	176	408	1.614	2.322
Rotary shafts, gudgeons, housings, and flexible couplings for rotary shafts .....	464	62	204	7	12	3.439	2.199
Refrigeration .....	062	446	848	13	48	0.888	2.116
Electricity: magnetically operated switches, magnets, and electromagnets .....	335	155	203	7	11	1.376	2.026
Optics: eye examining, vision testing and correcting .....	351	102	205	4	11	1.194	2.006
Land vehicles .....	280	488	1,041	44	53	2.746	1.903
Communications: radio wave antennas .....	343	138	686	7	34	1.545	1.853
Chairs and seats .....	297	157	326	11	16	2.134	1.835
Liquid purification or separation .....	210	863	908	33	42	1.165	1.729
Receptacles .....	220	221	296	8	13	1.103	1.642
Arithmetic processing and calculating (electrical computers) .....	708	227	280	8	12	1.073	1.602
Pipe joints or couplings .....	285	191	240	17	10	2.711	1.558
Compositions: coating or plastic .....	106	309	386	9	16	0.887	1.550
Prosthesis (i.e., artificial body members), parts thereof, or aids and accessories therefor .....	623	167	560	7	23	1.277	1.536
Fluid sprinkling, spraying, and diffusing .....	239	263	349	9	14	1.042	1.500
Optical waveguides .....	385	603	1,239	18	49	0.909	1.479
Electricity: circuit makers and breakers .....	200	220	253	7	10	0.969	1.478
Organic compounds (includes classes 532–570) .....	532	2,788	3,160	135	123	1.475	1.455
Metal deforming .....	072	311	397	8	15	0.784	1.413
Wells (shafts or deep borings in the earth, e.g., for oil and gas) .....	166	330	503	11	19	1.015	1.412
Electrolysis: processes, compositions used therein, and methods of preparing the compositions .....	205	243	405	9	15	1.128	1.385
Communications: directive radio wave systems and devices (e.g., radar, radio navigation) .....	342	252	464	22	17	2.659	1.370
Bearings .....	384	217	279	7	10	0.983	1.340
Heat exchange .....	165	297	363	9	13	0.923	1.339
Land vehicles: bodies and tops .....	296	253	618	1	22	0.120	1.331
Measuring and testing .....	073	897	1,364	35	48	1.188	1.316
Chemical apparatus and process disinfecting, deodorizing, preserving, or sterilizing .....	422	393	541	21	19	1.628	1.313
Metal treatment .....	148	297	435	12	15	1.231	1.289
Registers (e.g., cash registers, calculators, devices for counting movements of devices) .....	235	208	467	14	16	2.050	1.281
Special receptacle or package .....	206	341	438	14	15	1.251	1.280
Electricity: conductors and insulators .....	174	246	821	6	28	0.743	1.275
Illumination .....	362	307	623	8	21	0.794	1.260
Power plants .....	060	430	902	17	30	1.204	1.243
Electric power conversion systems .....	363	196	453	7	15	1.088	1.238
Data processing: measuring, calibrating, or testing .....	702	205	518	2	17	0.297	1.227
Chemistry: molecular biology and microbiology .....	435	860	3,650	22	118	0.779	1.209
Brushing, scrubbing, and general cleaning .....	015	200	318	6	10	0.914	1.176
Seal for a joint or juncture .....	277	170	291	6	9	1.075	1.156
Supports (e.g., for holding articles) .....	248	340	357	14	11	1.254	1.152
Data processing: design and analysis of circuit or semiconductor mask .....	716	33	390	0	12	0.000	1.150
Brakes .....	188	194	424	17	13	2.669	1.146
Compositions .....	252	479	462	11	14	0.699	1.133
Amplifiers .....	330	227	429	9	13	1.208	1.133

NOTES: Activity index is the percentage of patents in a class that are granted to inventors from one country divided by the percentage of all patents that have inventors from that country in that year. Listing is limited to Patent and Trademark Office classes that have received at least 200 patents from all countries in 2001.

SOURCE: U.S. Patent and Trademark Office, Information Products Division, Technology Assessment and Forecast Branch, special tabulations. (Washington, DC, 2002).

## Patents granted in selected countries, by inventor residence: Selected years, 1985–2000

Granting country	Patents Number	Patents to nonresidents	United States	Japan	Germany	France	Percent					Former Soviet Union	Other
							United Kingdom	Italy	Sweden	India			
1985													
Brazil.....	3,934	84.6	37.0	7.3	20.7	9.9	4.0	4.6	2.8	0.0	0.4	13.3	
Canada.....	18,697	92.8	54.8	11.7	8.8	5.6	5.3	1.5	1.8	0.0	0.4	10.0	
France.....	37,530	73.8	27.4	15.8	25.9	0.0	5.9	4.1	2.4	0.0	1.3	17.0	
Germany.....	33,377	60.4	29.2	23.9	0.0	12.4	6.7	2.8	2.8	0.0	1.7	20.5	
India.....	1,814	76.2	33.5	6.4	11.2	8.1	10.1	3.4	1.3	0.0	3.0	23.0	
Italy.....	47,924	79.0	6.1	2.3	8.0	4.2	2.0	0.0	0.4	0.0	0.0	77.0	
Japan.....	50,100	15.5	46.4	0.0	19.6	6.4	5.4	1.5	2.3	0.0	1.4	17.0	
Mexico.....	1,374	93.4	56.3	6.6	7.6	7.0	4.0	2.6	1.5	0.0	0.5	14.0	
South Korea.....	2,268	84.6	30.4	42.3	6.2	5.4	3.5	1.8	1.4	0.0	0.0	9.1	
Soviet Union.....	74,745	2.0	13.7	8.4	16.9	8.2	3.1	3.9	2.7	0.0	0.0	42.9	
United Kingdom.....	34,480	82.3	28.6	20.8	20.9	8.4	0.0	2.9	2.2	0.0	0.6	15.6	
1990													
Brazil.....	3,355	86.5	41.4	6.6	16.1	9.4	7.4	4.4	2.3	0.0	0.7	11.8	
Canada.....	14,187	92.2	52.2	13.7	8.3	6.0	5.4	2.0	1.8	0.0	0.3	10.3	
France.....	35,149	74.6	24.9	18.2	26.9	0.0	6.0	4.2	2.2	0.0	0.6	17.0	
Germany.....	42,860	61.2	27.8	28.4	0.0	10.8	6.5	3.7	2.7	0.0	0.7	19.3	
India.....	1,611	81.0	35.3	9.3	14.6	6.2	7.8	3.1	1.2	0.0	3.4	19.1	
Italy.....	17,794	98.7	23.7	9.4	28.5	12.4	6.8	0.0	2.4	0.0	0.1	16.7	
Japan.....	59,401	15.2	45.5	0.0	21.3	7.7	5.1	2.4	2.4	0.0	1.1	14.4	
Mexico.....	1,752	92.0	63.4	5.4	7.3	5.1	3.2	2.4	0.8	0.1	0.2	12.2	
South Korea.....	7,762	67.1	23.0	66.7	2.5	1.8	0.8	1.1	0.3	0.0	0.0	3.8	
Soviet Union.....	84,658	1.4	12.0	8.1	18.8	7.8	3.6	6.7	3.8	0.0	0.0	39.2	
United Kingdom.....	32,179	86.4	25.6	20.8	22.8	9.1	0.0	3.2	2.0	0.0	0.4	15.9	
1994													
Brazil.....	2,469	83.0	41.3	6.6	12.5	6.9	4.9	6.4	2.7	0.0	0.0	18.7	
Canada.....	11,641	92.7	51.3	18.8	7.6	5.6	4.6	1.5	1.0	0.0	0.0	9.5	
France.....	54,964	75.3	25.0	23.5	25.5	0.0	5.3	3.9	1.6	0.0	0.0	15.2	
Germany.....	57,803	64.1	28.2	32.5	0.0	9.8	5.9	4.0	2.0	0.0	0.0	17.4	
India.....	1,735	74.2	42.9	6.1	12.4	7.1	6.6	2.6	1.6	0.0	0.2	20.4	
Italy.....	37,096	85.5	24.8	13.4	27.6	10.2	5.9	0.0	1.9	0.0	0.1	16.1	
Japan.....	82,400	11.7	50.1	0.0	18.9	6.5	4.1	2.5	1.8	0.0	0.0	16.3	
Mexico.....	4,367	93.4	58.0	4.3	9.7	5.1	4.3	2.4	1.1	0.0	0.0	14.9	
Russian Federation.....	20,581	22.0	4.0	2.1	4.7	1.1	0.8	1.5	0.6	0.0	0.0	85.2	
South Korea.....	11,683	50.6	22.9	62.6	3.9	2.5	1.1	0.8	0.5	0.0	0.0	5.8	
United Kingdom.....	48,772	89.3	24.9	25.7	22.0	8.0	0.0	3.3	1.5	0.0	0.0	14.5	
1996													
Brazil.....	1,487	87.3	37.8	8.2	15.7	7.4	4.2	4.3	2.3	0.0	0.0	20.1	
Canada.....	7,145	90.1	52.2	24.1	6.0	4.1	3.1	1.4	0.9	0.0	0.0	8.1	
France.....	49,245	75.7	27.3	24.0	22.9	0.0	5.1	3.7	1.7	0.0	0.0	15.3	
Germany.....	55,444	64.3	29.7	32.8	0.0	9.1	5.5	3.8	2.0	0.0	0.1	17.0	



## Patents granted in selected countries, by inventor residence: Selected years, 1985–2000

Granting country	Patents Number	Patents to nonresidents	United States	Japan	Germany	France	Percent					Former Soviet Union	Other
							United Kingdom	Italy	Sweden	India			
India.....	1,020	64.8	42.4	6.1	15.3	6.4	8.2	1.4	0.5	0.0	0.3	19.7	
Italy.....	37,935	78.2	26.8	14.3	25.2	10.0	5.4	0.0	1.9	0.0	0.0	16.4	
Japan.....	215,100	12.7	51.4	0.0	17.4	6.1	3.6	2.1	1.6	0.0	0.0	17.6	
Mexico.....	3,186	96.4	67.9	3.3	7.0	3.5	2.3	1.7	2.9	0.0	0.0	11.5	
Russian Federation.....	19,678	16.2	8.2	3.5	8.9	3.5	2.4	2.3	1.1	0.0	0.0	70.2	
South Korea.....	16,516	49.6	23.6	57.7	5.1	2.7	1.9	1.0	0.8	0.0	0.1	7.2	
United Kingdom.....	44,335	90.3	27.4	25.5	20.0	7.7	0.0	3.1	1.7	0.0	0.0	14.6	
1998													
Brazil.....	2,825	85.6	39.8	4.8	17.1	6.9	3.8	4.8	3.2	0.0	0.0	19.6	
Canada.....	9,572	90.1	54.5	17.5	6.7	3.7	4.4	1.4	1.2	0.0	0.1	10.4	
China.....	4,735	65.1	25.5	30.1	10.3	4.6	4.3	2.5	1.8	0.1	0.0	20.8	
France.....	46,213	73.9	27.5	21.4	23.3	0.0	5.8	3.7	1.9	0.0	0.1	16.3	
Germany.....	51,685	62.7	30.4	28.6	0.0	9.9	6.2	3.9	2.2	0.0	0.1	18.7	
India.....	1,711	65.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Italy.....	38,988	65.1	27.5	12.7	24.3	10.7	6.4	0.0	2.2	0.0	0.1	16.3	
Japan.....	141,448	11.1	44.8	0.0	17.5	6.9	4.3	2.2	1.6	0.0	0.0	22.7	
Mexico.....	3,219	95.6	66.9	3.3	7.0	3.8	3.7	1.8	2.2	0.0	0.0	11.2	
Russian Federation.....	23,315	17.6	20.8	4.0	14.4	7.2	4.7	3.1	3.7	0.0	0.0	42.1	
South Korea.....	52,890	32.1	25.6	54.2	6.7	2.7	1.8	1.0	0.5	0.0	0.0	7.5	
United Kingdom.....	43,181	88.8	27.7	23.1	19.8	8.1	0.0	3.0	1.7	0.0	0.1	16.4	
1999													
Brazil.....	3,219	86.8	41.1	6.1	13.6	7.2	4.5	4.3	3.1	0.0	0.1	20.1	
Canada.....	13,778	90.2	57.8	16.7	5.7	5.1	3.3	1.2	1.2	0.0	0.1	8.8	
China.....	7,637	59.4	24.8	32.3	10.8	4.6	3.8	2.1	2.6	0.0	0.2	18.8	
France.....	44,287	74.0	27.7	20.5	23.8	0.0	5.6	3.6	1.9	0.0	0.0	16.8	
Germany.....	49,548	62.0	31.0	27.5	0.0	9.9	6.1	3.8	2.3	0.0	0.1	19.2	
India.....	2,160	70.7	36.6	6.5	17.6	4.6	5.1	1.9	1.6	0.0	0.7	25.5	
Italy.....	32,476	80.0	26.9	12.3	25.0	10.5	5.8	0.0	2.2	0.0	0.1	17.2	
Japan.....	150,059	10.7	43.8	0.0	16.6	6.7	4.0	1.8	1.8	0.0	0.0	25.3	
Mexico.....	3,899	96.9	61.5	3.5	9.3	5.5	3.3	1.6	1.7	0.0	0.0	13.5	
Russian Federation.....	19,508	21.3	25.1	5.0	14.1	7.3	5.0	3.7	3.5	0.0	0.0	36.3	
South Korea.....	62,635	30.8	26.0	52.9	6.3	3.0	2.0	1.0	0.7	0.0	0.1	7.9	
United Kingdom.....	40,683	89.0	28.3	21.8	20.1	8.0	0.0	2.9	1.9	0.0	0.0	17.0	
2000													
Brazil.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Canada.....	12,125	90.8	56.9	16.2	5.9	4.9	3.6	1.1	1.5	0.0	0.1	9.8	
China.....	13,356	51.5	22.5	34.1	11.3	5.9	2.9	1.7	2.1	0.0	0.1	19.3	
France.....	36,404	71.7	28.3	20.2	22.6	0.0	5.3	3.7	2.0	0.0	0.1	17.7	
Germany.....	41,585	59.4	31.5	27.2	0.0	8.8	5.7	3.9	2.4	0.0	0.1	20.3	
India.....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Italy.....	24,937	81.0	27.4	12.5	24.3	9.6	5.6	0.0	2.2	0.0	0.1	18.1	

**Patents granted in selected countries, by inventor residence: Selected years, 1985–2000**

Granting country	Patents Number	Patents to nonresidents	United States	Japan	Germany	France	Percent					Former Soviet Union	Other
							United Kingdom	Italy	Sweden	India			
Japan .....	125,880	10.8	44.1	0.0	15.5	5.8	3.3	1.7	1.7	0.0	0.0	27.8	
Mexico .....	5,527	98.0	58.7	4.5	9.8	6.2	3.1	2.2	1.4	0.0	0.0	14.1	
Russian Federation .....	17,592	17.9	25.1	4.4	16.6	8.0	5.1	3.2	4.1	0.2	0.0	33.3	
South Korea .....	34,956	34.4	26.2	55.7	5.8	2.3	1.5	0.8	1.0	0.0	0.1	6.5	
United Kingdom .....	33,756	87.6	29.8	21.3	18.4	7.0	0.0	2.9	1.9	0.1	0.1	18.4	

NA not available

NOTE: German data before 1996 are for former West Germany only.

SOURCE: World Intellectual Property Organization, Industrial Property Statistics, selected years, (Geneva, Switzerland) <http://www.wipo.org/ipstats/en>.

Science &amp; Engineering Indicators – 2004

## U.S. venture capital disbursements, by industry category: 1980-2002

Industry category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	Millions of U.S. dollars										
All industries.....	574.4	1,184.3	1,654.5	3,010.3	3,031.3	2,838.5	3,052.6	3,293.6	3,347.5	3,367.0	2,796.7
Biotechnology.....	44.0	102.1	78.2	128.0	108.6	141.9	228.0	283.8	335.3	305.6	285.0
Communications.....	53.0	154.9	208.2	384.5	407.7	473.2	385.7	359.2	362.9	389.8	346.3
Computer hardware.....	128.3	321.4	552.8	1,084.3	913.1	649.6	601.8	488.8	473.7	375.3	286.9
Consumer related.....	29.5	26.7	83.9	173.7	124.4	142.5	286.0	477.8	431.9	404.6	328.2
Industrial/energy.....	141.5	222.7	204.7	211.0	243.6	199.9	194.0	224.2	181.3	247.1	166.3
Medical/health.....	52.8	75.7	110.7	238.3	299.6	277.7	299.4	405.8	453.8	535.1	442.6
Semiconductors/other electronics.....	60.5	141.3	183.9	298.7	378.8	356.5	391.0	374.8	373.7	257.9	242.4
Software and services.....	17.7	57.1	153.5	356.4	433.5	423.0	415.6	405.9	370.3	402.0	464.2
Other products/services.....	47.2	80.9	76.3	117.7	118.9	172.8	234.2	253.7	330.2	405.4	204.7
Internet specific.....	0.1	1.6	2.3	17.6	3.2	1.5	16.9	19.6	34.3	44.1	30.1
	Percent distribution										
All industries.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Biotechnology.....	7.7	8.6	4.7	4.3	3.6	5.0	7.5	8.6	10.0	9.1	10.2
Communications.....	9.2	13.1	12.6	12.8	13.5	16.7	12.6	10.9	10.8	11.6	12.4
Computer hardware.....	22.3	27.1	33.4	36.0	30.1	22.9	19.7	14.8	14.2	11.1	10.3
Consumer related.....	5.1	2.3	5.1	5.8	4.1	5.0	9.4	14.5	12.9	12.0	11.7
Industrial/energy.....	24.6	18.8	12.4	7.0	8.0	7.0	6.4	6.8	5.4	7.3	5.9
Medical/health.....	9.2	6.4	6.7	7.9	9.9	9.8	9.8	12.3	13.6	15.9	15.8
Semiconductors/other electronics.....	10.5	11.9	11.1	9.9	12.5	12.6	12.8	11.4	11.2	7.7	8.7
Software and services.....	3.1	4.8	9.3	11.8	14.3	14.9	13.6	12.3	11.1	11.9	16.6
Other products/services.....	8.2	6.8	4.6	3.9	3.9	6.1	7.7	7.7	9.9	12.0	7.3
Internet specific.....	0.0	0.1	0.1	0.6	0.1	0.1	0.6	0.6	1.0	1.3	1.1

## U.S. venture capital disbursements, by industry category: 1980–2002

Industry category	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	Millions of U.S. dollars											
All industries.....	2,269.7	3,586.7	3,794.0	4,148.2	7,638.1	11,610.5	15,080.1	21,447.9	54,793.9	106,270.2	40,825.2	21,279.4
Biotechnology.....	268.0	517.5	458.4	539.3	737.6	1,064.4	1,256.9	1,251.7	1,698.0	3,270.6	2,074.4	1,750.3
Communications.....	270.8	507.8	790.4	701.0	1,272.9	2,128.5	2,512.2	3,812.2	7,743.6	16,353.4	7,006.0	3,334.3
Computer hardware.....	222.9	230.3	186.4	193.1	410.1	419.3	450.4	521.7	1,182.9	2,876.7	1,142.0	723.3
Consumer related.....	242.6	260.6	475.8	445.4	950.8	784.6	999.4	1,050.7	1,843.8	1,759.1	739.5	216.5
Industrial/energy.....	114.1	96.1	190.3	196.3	364.7	375.8	561.3	886.0	800.7	1,126.1	707.2	534.7
Medical/health.....	339.4	766.8	640.0	670.7	1,202.4	1,467.2	1,985.4	2,282.9	2,555.1	4,213.4	3,568.4	3,280.3
Semiconductors/other electronics.....	149.9	226.5	185.5	238.0	409.2	524.5	936.4	1,033.3	2,069.8	7,106.2	4,175.6	1,975.3
Software and services.....	436.1	580.4	472.3	721.7	1,103.6	2,246.6	2,939.7	4,007.7	8,396.3	18,313.1	8,449.1	4,237.7
Other products/services.....	199.9	343.6	326.1	279.0	663.1	810.1	988.5	1,545.3	2,821.5	3,512.6	1,479.5	719.6
Internet specific.....	26.0	57.2	68.8	163.7	523.7	1,789.4	2,449.9	5,056.5	25,682.3	47,739.0	11,483.6	4,507.5
	Percent distribution											
All industries.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Biotechnology.....	11.8	14.4	12.1	13.0	9.7	9.2	8.3	5.8	3.1	3.1	5.1	8.2
Communications.....	11.9	14.2	20.8	16.9	16.7	18.3	16.7	17.8	14.1	15.4	17.2	15.7
Computer hardware.....	9.8	6.4	4.9	4.7	5.4	3.6	3.0	2.4	2.2	2.7	2.8	3.4
Consumer related.....	10.7	7.3	12.5	10.7	12.4	6.8	6.6	4.9	3.4	1.7	1.8	1.0
Industrial/energy.....	5.0	2.7	5.0	4.7	4.8	3.2	3.7	4.1	1.5	1.1	1.7	2.5
Medical/health.....	15.0	21.4	16.9	16.2	15.7	12.6	13.2	10.6	4.7	4.0	8.7	15.4
Semiconductors/other electronics.....	6.6	6.3	4.9	5.7	5.4	4.5	6.2	4.8	3.8	6.7	10.2	9.3
Software and services.....	19.2	16.2	12.4	17.4	14.4	19.3	19.5	18.7	15.3	17.2	20.7	19.9
Other products/services.....	8.8	9.6	8.6	6.7	8.7	7.0	6.6	7.2	5.1	3.3	3.6	3.4
Internet specific.....	1.1	1.6	1.8	4.0	6.9	15.4	16.3	23.6	46.9	44.9	28.1	21.2

SOURCE: Thomson Venture Economics, special tabulations (Newark, N.J., June 2003).

Science &amp; Engineering Indicators – 2004

## U.S. venture capital disbursements, by financing stage: 1980-2002

Industry category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Millions of U.S. dollars											
Total disbursements.....	574.3	1,184.3	1,654.4	3,010.3	3,033.1	2,838.5	3,052.5	3,293.6	3,347.5	3,367.0	2,796.8
Early-stage disbursements .....	286.6	647.0	660.7	1,290.0	1,358.8	1,033.2	1,364.6	1,345.7	1,403.3	1,309.1	1,100.9
Seed .....	11.7	54.1	68.3	111.9	132.4	104.5	120.7	116.1	144.9	182.3	124.2
Startup .....	164.9	301.2	288.2	431.5	539.1	424.3	639.4	516.5	529.1	394.8	278.3
Other.....	110.0	291.7	304.2	746.6	687.3	504.4	604.5	713.1	729.3	732.0	698.4
Later-stage disbursements .....	287.7	537.3	993.7	1,720.3	1,674.3	1,805.3	1,687.9	1,947.9	1,944.2	2,057.9	1,695.9
Expansion.....	181.8	401.5	634.4	1,252.6	1,203.1	1,241.5	1,212.9	1,460.8	1,543.4	1,626.6	1,332.5
Acquisition .....	53.6	99.7	239.3	401.2	429.2	542.1	474.5	485.1	395.8	424.7	363.4
Other.....	52.3	36.1	120.0	66.5	42.0	21.7	0.5	2.0	5.0	6.6	0.0
Percent distribution											
Total disbursements.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Early-stage disbursements .....	49.9	54.6	39.9	42.9	44.8	36.4	44.7	40.9	41.9	38.9	39.4
Seed .....	2.0	4.6	4.1	3.7	4.4	3.7	4.0	3.5	4.3	5.4	4.4
Startup .....	28.7	25.4	17.4	14.3	17.8	14.9	20.9	15.7	15.8	11.7	10.0
Other.....	19.2	24.6	18.4	24.8	22.7	17.8	19.8	21.7	21.8	21.7	25.0
Later-stage disbursements .....	50.1	45.4	60.1	57.1	55.2	63.6	55.3	59.1	58.1	61.1	60.6
Expansion.....	31.7	33.9	38.3	41.6	39.7	43.7	39.7	44.4	46.1	48.3	47.6
Acquisition .....	9.3	8.4	14.5	13.3	14.2	19.1	15.5	14.7	11.8	12.6	13.0
Other.....	9.1	3.0	7.3	2.2	1.4	0.8	0.0	0.1	0.1	0.2	0.0
Number of disbursements											
Total disbursements.....	451	756	1,081	1,330	1,367	1,274	1,297	1,431	1,320	1,321	1,151
Early-stage disbursements .....	197	378	453	672	696	604	658	714	664	631	518
Seed .....	17	45	67	128	116	101	113	112	127	152	87
Startup .....	93	177	193	216	253	234	245	242	212	185	133
Other.....	87	156	193	328	327	269	300	360	325	294	298
Later-stage disbursements .....	254	378	628	658	671	670	639	717	656	690	633
Expansion.....	123	242	303	440	471	488	467	521	510	543	460
Acquisition .....	27	51	100	102	128	157	171	194	145	143	173
Other.....	104	85	225	116	72	25	1	2	1	4	0
Average value of disbursement (millions)											
Total disbursements.....	1.3	1.6	1.5	2.3	2.2	2.2	2.4	2.3	2.5	2.5	2.4
Early-stage disbursements .....	1.5	1.7	1.5	1.9	2.0	1.7	2.1	1.9	2.1	2.1	2.1
Seed .....	0.7	1.2	1.0	0.9	1.1	1.0	1.1	1.0	1.1	1.2	1.4
Startup .....	1.8	1.7	1.5	2.0	2.1	1.8	2.6	2.1	2.5	2.1	2.1
Other.....	1.3	1.9	1.6	2.3	2.1	1.9	2.0	2.0	2.2	2.5	2.3
Later-stage disbursements .....	1.1	1.4	1.6	2.6	2.5	2.7	2.6	2.7	3.0	3.0	2.7
Expansion.....	1.5	1.7	2.1	2.8	2.6	2.5	2.6	2.8	3.0	3.0	2.9
Acquisition .....	2.0	2.0	2.4	3.9	3.4	3.5	2.8	2.5	2.7	3.0	2.1
Other.....	0.5	0.4	0.5	0.6	0.6	0.9	0.5	1.0	5.0	1.7	0.0

## U.S. venture capital disbursements, by financing stage: 1980–2002

Industry category	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Millions of U.S. dollars												
Total disbursements.....	2,269.8	3,586.8	3,793.9	4,148.2	7,635.2	11,610.5	15,080.2	21,448.0	54,785.2	106,269.8	40,825.2	21,278.8
Early-stage disbursements .....	804.9	1,139.3	1,347.3	1,618.1	3,114.2	4,358.6	4,837.5	7,306.5	15,444.5	29,285.8	9,934.5	4,416.9
Seed .....	87.9	166.1	319.9	223.7	360.3	569.9	790.0	908.1	1,222.1	1,927.1	429.9	203.7
Startup .....	162.5	395.7	382.2	570.4	964.6	953.6	545.3	941.1	2,095.2	1,143.0	377.9	117.0
Other .....	554.5	577.5	645.2	824.0	1,789.3	2,835.1	3,502.2	5,457.3	12,127.2	26,215.7	9,126.7	4,096.2
Later-stage disbursements .....	1,464.9	2,447.5	2,446.6	2,530.1	4,521.0	7,251.9	10,242.7	14,141.5	39,340.7	76,984.0	30,890.7	16,861.9
Expansion.....	1,104.9	1,843.7	1,964.6	1,587.7	3,240.7	5,470.5	7,879.2	10,772.5	30,081.2	60,582.3	23,087.6	13,195.6
Acquisition .....	360.0	603.8	472.6	942.4	1,277.5	1,779.1	2,363.4	3,362.2	9,256.4	16,401.6	7,803.1	3,666.3
Other .....	0.0	283.2	9.4	239.0	2.8	2.3	0.1	6.8	3.1	0.1	0.0	0.0
Percent distribution												
Total disbursements.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Early-stage disbursements .....	35.5	31.8	35.5	39.0	40.8	37.5	32.1	34.1	28.2	27.6	24.3	20.8
Seed .....	3.9	4.6	8.4	5.4	4.7	4.9	5.2	4.2	2.2	1.8	1.1	1.0
Startup .....	7.2	11.0	10.1	13.8	12.6	8.2	3.6	4.4	3.8	1.1	0.9	0.5
Other .....	24.4	16.1	17.0	19.9	23.4	24.4	23.2	25.4	22.1	24.7	22.4	19.3
Later-stage disbursements .....	64.5	68.2	64.5	61.0	59.2	62.5	67.9	65.9	71.8	72.4	75.7	79.2
Expansion.....	48.7	51.4	51.8	38.3	42.4	47.1	52.2	50.2	54.9	57.0	56.6	62.0
Acquisition .....	15.9	16.8	12.5	22.7	16.7	15.3	15.7	15.7	16.9	15.4	19.1	17.2
Other .....	0.0	7.9	0.2	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of disbursements												
Total disbursements.....	1,022	1,127	969	1,041	1,656	2,320	2,811	3,697	5,080	7,240	4,105	2,678
Early-stage disbursements .....	394	450	389	493	834	1,137	1,260	1,557	2,383	3,276	1,407	878
Seed .....	64	95	111	99	161	265	329	410	430	451	168	109
Startup .....	95	118	126	178	216	196	138	237	357	187	71	29
Other .....	235	237	152	216	457	676	793	910	1,596	2,638	1,168	740
Later-stage disbursements .....	628	677	580	548	822	1,183	1,551	2,140	2,697	3,964	2,698	1,800
Expansion.....	429	492	425	378	624	923	1,246	1,734	2,155	3,253	2,128	1,436
Acquisition .....	199	184	153	170	197	257	303	366	540	709	570	364
Other .....	0	1	2	0	1	3	2	40	2	2	0	0
Average value of disbursement (millions)												
Total disbursements.....	2.2	3.2	3.9	4.0	4.6	5.0	5.4	5.8	10.8	14.7	9.9	7.9
Early-stage disbursements .....	2.0	2.5	3.5	3.3	3.7	3.8	3.8	4.7	6.5	8.9	7.1	5.0
Seed .....	1.4	1.7	2.9	2.3	2.2	2.2	2.4	2.2	2.8	4.3	2.6	1.9
Startup .....	1.7	3.4	3.0	3.2	4.5	4.9	4.0	4.0	5.9	6.1	5.3	4.0
Other .....	2.4	2.4	4.2	3.8	3.9	4.2	4.4	6.0	7.6	9.9	7.8	5.5
Later-stage disbursements .....	2.3	3.6	4.2	4.6	5.5	6.1	6.6	6.6	14.6	19.4	11.4	9.4
Expansion.....	2.6	3.7	4.6	4.2	5.2	5.9	6.3	6.2	14.0	18.6	10.8	9.2
Acquisition .....	1.8	3.3	3.1	5.5	6.5	6.9	7.8	9.2	17.1	23.1	13.7	10.1
Other .....	0.0	283.2	4.7	—	2.8	0.8	0.1	0.2	1.6	0.1	0.0	0.0

NOTES: Early-stage disbursements include seed, startup, and other early-stage disbursements. Later-stage disbursements include expansion, acquisition, leveraged buyout, unknown, and other disbursements (e.g., bridge, special situation, turnaround, secondary purchase, other later-stage, and public market disbursements).

SOURCE: Thomson Venture Economics, special tabulations (Newark, N.J., June 2003).

## U.S. venture capital seed-stage disbursements, by industry category: 1980-2002

Industry category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Millions of U.S. dollars											
All industries.....	11.7	54.1	68.3	111.9	132.4	104.5	120.7	116.1	144.9	182.3	124.2
Biotechnology.....	1.1	2.1	1.6	5.5	10.4	3.5	13.8	15.8	30.9	48.3	7.4
Communications.....	1.5	5.5	13.2	18.2	17.9	3.5	7.2	10.7	15.0	19.2	13.2
Computer hardware.....	6.0	14.1	14.7	13.7	34.8	10.9	2.6	15.6	14.5	14.4	14.0
Consumer related.....	0.0	0.0	1.1	1.5	0.7	3.0	15.6	10.7	5.7	20.2	26.0
Industrial/energy.....	0.5	5.1	5.1	4.1	5.5	16.9	7.2	5.0	26.5	10.2	1.0
Medical/health.....	1.2	10.7	11.5	18.4	14.8	17.6	38.6	23.9	26.3	37.3	28.7
Semiconductors/other electronics.....	0.0	10.3	10.5	14.9	17.4	14.7	14.9	19.8	9.7	2.3	2.7
Software and services.....	1.5	6.2	9.1	29.9	24.3	17.8	12.3	11.5	12.4	20.7	26.2
Other products/services.....	0.0	0.2	1.4	5.5	6.2	15.9	7.8	3.0	3.6	8.5	1.1
Internet specific.....	0.0	0.0	0.0	0.3	0.3	0.7	1.0	0.0	0.3	1.2	3.9
Percent distribution											
All industries.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Biotechnology.....	9.4	3.8	2.3	4.9	7.9	3.4	11.4	13.6	21.3	26.5	6.0
Communications.....	12.8	10.2	19.3	16.3	13.5	3.4	6.0	9.2	10.4	10.5	10.6
Computer hardware.....	50.7	26.1	21.6	12.2	26.3	10.5	2.1	13.5	10.0	7.9	11.3
Consumer related.....	0.0	0.0	1.6	1.3	0.5	2.9	12.9	9.2	3.9	11.1	20.9
Industrial/energy.....	4.3	9.3	7.5	3.7	4.2	16.1	5.9	4.3	18.3	5.6	0.8
Medical/health.....	10.1	19.8	16.9	16.5	11.2	16.8	31.9	20.6	18.2	20.4	23.1
Semiconductors/other electronics.....	0.0	19.0	15.4	13.3	13.2	14.0	12.3	17.1	6.7	1.3	2.2
Software and services.....	12.8	11.4	13.4	26.8	18.4	17.0	10.2	9.9	8.6	11.4	21.1
Other products/services.....	0.0	0.3	2.1	4.9	4.7	15.2	6.5	2.6	2.5	4.7	0.9
Internet specific.....	0.0	0.0	0.0	0.2	0.2	0.7	0.8	0.0	0.2	0.7	3.1

## U.S. venture capital seed-stage disbursements, by industry category: 1980–2002

Industry category	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	Millions of U.S. dollars											
All industries.....	87.9	166.1	319.9	223.7	360.3	569.9	790.0	908.1	1222.1	1927.1	429.9	203.7
Biotechnology.....	6.3	49.9	40.6	25.2	7.4	48.8	50.9	90.5	69.4	40.6	20.6	31.4
Communications.....	4.1	24.1	83.1	20.6	50.3	43.9	115.7	123.4	71.1	395.2	135.0	26.9
Computer hardware.....	11.3	3.8	18.2	2.6	35.8	23.9	15.0	42.2	12.5	48.0	5.2	1.6
Consumer related.....	3.1	9.7	15.8	45.1	57.5	7.8	43.6	14.4	26.2	20.1	3.5	1.5
Industrial/energy.....	0.0	4.0	25.3	45.4	7.9	24.7	17.9	4.2	3.0	9.3	4.6	3.9
Medical/health.....	31.7	36.2	57.7	38.4	60.1	113.7	127.7	159.6	64.4	78.5	42.3	41.2
Semiconductors/other electronics.....	1.5	7.3	10.6	10.6	38.0	34.0	63.2	40.3	48.1	170.2	36.2	29.9
Software and services.....	19.5	23.3	42.8	29.4	65.4	138.0	183.3	176.7	181.6	283.2	66.7	47.4
Other products/services.....	9.3	0.2	18.0	0.6	9.0	7.2	45.5	33.3	34.4	51.1	24.6	5.0
Internet specific.....	1.1	7.8	7.9	5.8	28.9	128.0	127.3	223.6	711.4	830.9	91.3	15.1
	Percent distribution											
All industries.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Biotechnology.....	7.2	30.0	12.7	11.3	2.1	8.6	6.4	10.0	5.7	2.1	4.8	15.4
Communications.....	4.7	14.5	26.0	9.2	14.0	7.7	14.6	13.6	5.8	20.5	31.4	13.2
Computer hardware.....	12.9	2.3	5.7	1.2	9.9	4.2	1.9	4.6	1.0	2.5	1.2	0.8
Consumer related.....	3.5	5.8	4.9	20.2	16.0	1.4	5.5	1.6	2.1	1.0	0.8	0.7
Industrial/energy.....	0.0	2.4	7.9	20.3	2.2	4.3	2.3	0.5	0.2	0.5	1.1	1.9
Medical/health.....	36.0	21.8	18.0	17.2	16.7	20.0	16.2	17.6	5.3	4.1	9.8	20.2
Semiconductors/other electronics.....	1.8	4.4	3.3	4.7	10.5	6.0	8.0	4.4	3.9	8.8	8.4	14.7
Software and services.....	22.2	14.0	13.4	13.2	18.2	24.2	23.2	19.5	14.9	14.7	15.5	23.3
Other products/services.....	10.6	0.1	5.6	0.3	2.5	1.3	5.8	3.7	2.8	2.6	5.7	2.5
Internet specific.....	1.3	4.7	2.5	2.6	8.0	22.5	16.1	24.6	58.2	43.1	21.2	7.4

SOURCE: Thomson Venture Economics, special tabulations, (Newark, N.J., June 2003).

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Appendix table 6-18

**Development of products or processes as result of IT-based innovation in past 12 months, by industry and revenue size: 2001**

(Frequency)

Characteristic	Respondents	Yes	No	Nonresponse
All companies	72,400	24,300	47,300	800
IT	9,700	5,500	4,100	S
Manufacturing	3,000	1,000	2,000	S
Communication	1,600	1,000	600	S
Computer-related services	5,100	3,400	1,600	S
Non-IT	62,700	18,800	43,200	S
Manufacturing	39,300	9,700	29,200	S
Transportation and public utilities	8,500	2,700	5,700	S
Finance, insurance and real estate	11,900	5,200	6,500	S
Engineering and AAB services	2,900	1,100	1,800	S
Revenue size (millions of dollars)				
2.5–4.9	26,500	7,600	18,400	S
5–9.9	17,800	5,800	11,900	S
10–24.9	16,100	5,500	10,600	S
25–50	6,000	2,100	3,900	S
More than 50	5,900	3,300	2,600	S
Innovators <sup>a</sup>	34,400	24,300	9,900	S
IT	7,000	5,500	1,400	S
Manufacturing	1,500	1,000	500	S
Communication	1,200	1,000	100	S
Computer-related services	4,300	3,400	800	S
Non-IT	27,400	18,800	8,500	S
Manufacturing	15,300	9,700	5,500	0
Transportation and public utilities	3,700	2,700	900	S
Finance, insurance and real estate	6,900	5,200	1,600	S
Engineering and AAB services	1,500	1,100	400	S
Revenue size (millions of dollars)				
2.5–4.9	11,400	7,600	3,600	S
5–9.9	8,100	5,800	2,300	S
10–24.9	7,700	5,500	2,200	S
25–50	3,500	2,100	1,400	0
More than 50	3,700	3,300	S	S
Noninnovators <sup>a</sup>	37,000	0	36,500	S
IT	2,600	0	2,600	S
Manufacturing	1,500	0	1,400	S
Communication	400	0	400	0
Computer-related services	800	0	800	S
Non-IT	34,300	0	33,900	S
Manufacturing	23,500	0	23,200	S
Transportation and public utilities	4,600	0	4,600	S
Finance, insurance and real estate	4,800	0	4,800	S
Engineering and AAB services	1,400	0	1,400	S
Revenue size (millions of dollars)				
2.5–4.9	14,400	0	14,100	S
5–9.9	9,500	0	9,400	S
10–24.9	8,400	0	8,400	0
25–50	2,500	0	2,500	S
More than 50	2,200	0	2,100	S

AAB accounting, auditing, bookkeeping

IT information technology

S suppressed for reasons of reliability due to receiving fewer than 20 responses

<sup>a</sup>Breakdown by innovation excludes 32 cases, representing 1,100 companies, in which innovator status could not be determined. To be classified as an innovator, the company had to indicate that it had developed a product or process in the past 12 months or believed it would develop a product or process in the next 12 months as a result of IT-based innovation. The survey was conducted between July 2001 and April 2002.

NOTES: Responses are to the question: "Did your company develop any products or processes in the past 12 months that were the result of IT-based innovation?" Nonresponse consists of item nonresponse, don't know responses, and item refusal. IT is defined as the hardware and software that support the production or use of computer-based information systems, the infrastructure necessary to access such information systems, or data-processing services. Companies are classified as IT or non-IT based on their 4-digit standard industrial classification (SIC) number. IT manufacturing includes companies with SICs 3571–3579, 3651, 3661–3679, 3823–3826, and 3895. IT communication includes companies with SICs 4812–4822, 4832, 4833, and 4841–4899. IT computer-related services include companies with SICs 7371–7379. Non-IT manufacturing includes companies with SICs 2011–3569, 3581–3648, 3652, 3691–3694, 3699–3822, and 3827–3999. Non-IT transportation and public utilities include companies with SICs 4011–4231, 4412–4789, and 4911–4971. Non-IT finance, insurance, and real estate include companies with SICs 6011–6036, 6081–6153, 6159, and 6162–6799. Non-IT engineering and AAB services include companies with SICs 8711 and 8721.

SOURCE: National Science Foundation, Division of Science Resource Statistics, Information Technology Information Survey, 2001.

Appendix table 6-19

**Expectation of developing products or processes as result of IT-based innovation in next 12 months, by industry, revenue size, and innovator: 2001**

(Frequency)

Characteristic	Respondents	Definitely yes	Probably yes	Probably not	Definitely not	Nonresponse	Not applicable
All companies .....	72,400	2,700	7,400	18,900	18,100	1,100	24,300
IT .....	9,700	300	1,200	1,600	1,000	S	5,500
Manufacturing .....	3,000	S	400	900	600	S	1,000
Communication .....	1,600	S	100	200	200	S	1,000
Computer related services .....	5,100	S	700	500	S	0	3,400
Non-IT .....	62,700	2,300	6,300	17,300	17,000	1,000	18,800
Manufacturing .....	39,300	S	4,000	12,600	10,900	S	9,700
Transportation and public utilities .....	8,500	S	800	1,900	2,700	S	2,700
Finance, insurance and real estate .....	11,900	S	1,100	2,100	2,700	S	5,200
Engineering and AAB services .....	2,900	S	300	700	700	S	1,100
Revenue size (millions of dollars)							
2.5–4.9 .....	26,500	900	2,800	7,100	7,400	S	7,600
5–9.9 .....	17,800	S	1,800	5,100	4,400	S	5,800
10–24.9 .....	16,100	S	1,500	4,000	4,400	S	5,500
25–50 .....	6,000	S	S	1,600	900	S	2,100
More than 50 .....	5,900	S	S	1,100	S	S	3,300
Innovators <sup>a</sup> .....	34,400	2,700	7,400	0	0	0	24,300
IT .....	7,000	300	1,200	0	0	0	5,500
Manufacturing .....	1,500	S	400	0	0	0	1,000
Communication .....	1,200	S	100	0	0	0	1,000
Computer related services .....	4,300	S	700	0	0	0	3,400
Non-IT .....	27,400	2,300	6,300	0	0	0	18,800
Manufacturing .....	15,300	S	4,000	0	0	0	9,700
Transportation and public utilities .....	3,700	S	800	0	0	0	2,700
Finance, insurance and real estate .....	6,900	S	1,100	0	0	0	5,200
Engineering and AAB services .....	1,500	S	300	0	0	0	1,100
Revenue size (millions of dollars)							
2.5–4.9 .....	11,400	900	2,800	0	0	0	7,600
5–9.9 .....	8,100	S	1,800	0	0	0	5,800
10–24.9 .....	7,700	S	1,500	0	0	0	5,500
25–50 .....	3,500	S	S	0	0	0	2,100
More than 50 .....	3,700	S	S	0	0	0	3,300
Noninnovators <sup>a</sup> .....	37,000	0	0	18,900	18,100	0	0
IT .....	2,600	0	0	1,600	1,000	0	0
Manufacturing .....	1,500	0	0	900	600	0	0
Communication .....	400	0	0	200	200	0	0
Computer related services .....	800	0	0	500	S	0	0
Non-IT .....	34,300	0	0	17,300	17,000	0	0
Manufacturing .....	23,500	0	0	12,600	10,900	0	0
Transportation and public utilities .....	4,600	0	0	1,900	2,700	0	0
Finance, insurance and real estate .....	4,800	0	0	2,100	2,700	0	0
Engineering and AAB services .....	1,400	0	0	700	700	0	0
Revenue size (millions of dollars)							
2.5–4.9 .....	14,400	0	0	7,100	7,400	0	0
5–9.9 .....	9,500	0	0	5,100	4,400	0	0
10–24.9 .....	8,400	0	0	4,000	4,400	0	0
25–50 .....	2,500	0	0	1,600	900	0	0
More than 50 .....	2,200	0	0	1,100	S	0	0

AAB accounting, auditing, bookkeeping

IT information technology

S suppressed for reasons of reliability due to receiving fewer than 20 responses

<sup>a</sup>Breakdown by innovation excludes 32 cases, representing 1,100 companies, in which innovator status could not be determined. To be classified as an innovator, the company had to indicate that it had developed a product or process in the past 12 months or believed it would develop a product or process in the next 12 months as a result of IT-based innovation. The survey was conducted between July 2001 and April 2002.

NOTES: Responses are to the question: "Did your company develop any products or processes in the past 12 months that were the result of IT-based innovation?" Nonresponse consists of item non-response, don't know responses, and item refusal. IT is defined as the hardware and software that support the production or use of computer-based information systems, the infrastructure necessary to access such information systems, or data-processing services. Companies are classified as IT or non-IT based on their 4-digit standard industrial classification (SIC) number. IT manufacturing includes companies with SICs 3571–3579, 3651, 3661–3679, 3823–3826, and 3895. IT communication includes companies with SICs 4812–4822, 4832, 4833, and 4841–4899. IT computer-related services include companies with SICs 7371–7379. Non-IT manufacturing includes companies with SICs 2011–3569, 3581–3648, 3652, 3691–3694, 3699–3822, and 3827–3999. Non-IT transportation and public utilities include companies with SICs 4011–4231, 4412–4789, and 4911–4971. Non-IT finance, insurance, and real estate include companies with SICs 6011–6036, 6081–6153, 6159, and 6162–6799. Non-IT engineering and AAB services include companies with SICs 8711 and 8721.

SOURCE: National Science Foundation, Division of Science Resource Statistics, Information Technology Information Survey, 2001.

Appendix table 6-20

**Product or process developed as result of IT-based innovation that contributed most to revenue in past 12 months, by industry and revenue size: 2001**

(Frequency)

Characteristic of innovators <sup>a</sup>	Respondents	Product	Process	Nonresponse	Not applicable
All industries.....	34,400	9,200	14,600	S	10,100
IT.....	7,000	3,200	2,200	S	1,500
Manufacturing.....	1,500	500	500	S	500
Communication.....	1,200	600	400	S	100
Computer-related services.....	4,300	2,100	1,300	S	800
Non-IT.....	27,400	6,000	12,400	S	8,600
Manufacturing.....	15,300	3,300	6,300	S	5,500
Transportation and public utilities.....	3,700	800	1,900	S	1,000
Finance, insurance, and real estate.....	6,900	1,500	3,500	S	1,700
Engineering and AAB services.....	1,500	400	700	S	400
Revenue size (millions of dollars)					
2.5–4.9.....	11,400	3,500	4,000	S	3,800
5–9.9.....	8,100	2,300	3,400	S	2,400
10–24.9.....	7,700	1,600	3,700	S	2,200
25–50.....	3,500	900	1,200	S	1,400
More than 50.....	3,700	900	2,300	S	400

AAB accounting, auditing, bookkeeping

IT information technology

S suppressed for reasons of reliability due to receiving fewer than 20 responses

<sup>a</sup>Breakdown by innovation excludes 32 cases, representing 1,100 companies, in which innovator status could not be determined. To be classified as an innovator, the company had to indicate that it had developed a product or process in the past 12 months or believed it would develop a product or process in the next 12 months as a result of IT-based innovation. The survey was conducted between July 2001 and April 2002.

NOTES: Responses are to the question: "Please think of the single IT-based product or process that has contributed most to your company's revenue in the past 12 months. Is this contribution a product or a process?" This question was only asked of innovators. Nonresponse consists of item nonresponse, don't know responses, and item refusal. Not applicable represents those respondents who were not asked the question. IT is defined as the hardware and software that support the production or use of computer-based information systems, the infrastructure necessary to access such information systems, or data processing services. Companies are classified as IT or non-IT based on their 4-digit standard industrial classification (SIC) number. IT manufacturing includes companies with SICs 3571–3579, 3651, 3661–3679, 3823–3826 and 3895. IT communication includes companies with SICs 4812–4822, 4832, 4833, and 4841–4899. IT computer-related services includes companies with SICs 7371–7379. Non-IT manufacturing include companies with SICs 2011–3569, 3581–3648, 3652, 3691–3694, 3699–3822, and 3827–3999. Non-IT transportation and public utilities include companies with SICs 4011–4231, 4412–4789, and 4911–4971. Non-IT finance, insurance, and real estate include companies with SICs 6011–6036, 6081–6153, 6159, and 6162–6799. Non-IT engineering and AAB services include companies with SICs 8711 and 8721.

SOURCE: National Science Foundation, Division of Science Resource Statistics, Information Technology Information Survey, 2001.

Appendix table 6-21

**Type of development expected as result of IT-based innovation in next 12 months, by industry and revenue size: 2001**

(Frequency)

Characteristic of innovators <sup>a</sup>	Respondents	Product	Process	Nonresponse	Not applicable
All industry .....	34,400	3,300	6,700	S	24,300
IT .....	7,000	700	800	S	5,500
Manufacturing .....	1,500	300	200	0	1,000
Communication .....	1,200	S	S	0	1,000
Computer-related services .....	4,300	400	500	S	3,400
Non-IT .....	27,400	2,600	5,900	S	18,800
Manufacturing .....	15,300	S	3,700	0	9,700
Transportation and public utilities .....	3,700	S	800	S	2,700
Finance, insurance, and real estate.....	6,900	S	1,000	S	5,200
Engineering and AAB services .....	1,500	S	300	S	1,100
Revenue size (millions of dollars)					
2.5–4.9 .....	11,400	1,300	2,400	S	7,600
5–9.9 .....	8,100	800	1,600	S	5,800
10–24.9 .....	7,700	S	1,500	S	5,500
25–50 .....	3,500	S	S	0	2,100
More than 50 .....	3,700	S	S	0	3,300

AAB accounting, auditing, bookkeeping

IT information technology

S suppressed for reasons of reliability due to receiving fewer than 20 responses

<sup>a</sup>Breakdowns by innovation exclude 32 cases, representing 1,100 companies, in which innovator status could not be determined. To be classified as an innovator, the company had to indicate that it had developed a product or process in the past 12 months or believed it would develop a product or process in the next 12 months as a result of IT-based innovation. The survey was conducted during the period July 2001–April 2002.

NOTES: Responses are to the question: "Will the result be primarily products or processes?" This question was only asked of innovators. Nonresponse consists of item nonresponse, don't know responses, and item refusal. Not applicable represents those respondents who were not asked the question. Companies are classified as IT or Non-IT based on their four-digit standard industrial classification (SIC) number. IT manufacturing includes companies with SICs 3571–3579, 3651, 3661–3679, 3823–3826 and 3895. IT communication includes companies with SICs 4812–4822, 4832, 4833, and 4841–4899. IT computer-related services include companies with SICs 7371–7379. Non-IT manufacturing include companies with SICs 2011–3569, 3581–3648, 3652, 3691–3694, 3699–3822, and 3827–3999. Non-IT transportation and public utilities include companies with SICs 4011–4231, 4412–4789, and 4911–4971. Non-IT finance, insurance, and real estate include companies with SICs 6011–6036, 6081–6153, 6159, and 6162–6799. Non-IT engineering and AAB services include companies with SICs 8711 and 8721.

SOURCE: National Science Foundation, Division of Science Resource Statistics, Information Technology Information Survey, 2001.

Appendix table 7-1  
**Leading source for current news: 2001**

Respondent characteristic	Newspaper	Magazine	Internet	Books/ other print	Television	Radio	Family	Friend/ colleague	Other	Do not know	Sample size
											Percent
All adults .....	29	3	7	—	53	5	—	1	1	—	1,574
Male .....	29	4	10	—	48	7	—	1	1	—	751
Female.....	29	3	5	1	57	4	—	1	1	—	823
Formal education											
Less than high school.....	22	2	3	0	69	1	0	4	0	1	116
High school graduate.....	29	3	7	—	54	6	—	1	1	—	834
Baccalaureate .....	30	7	12	1	42	8	0	1	—	—	393
Graduate/professional degree.....	43	6	10	1	30	9	—	1	1	—	221
Science/mathematics education <sup>a</sup>											
Low.....	25	2	3	—	62	4	—	2	—	—	674
Middle.....	33	4	9	—	46	5	—	1	1	1	469
High .....	33	6	16	—	35	9	—	1	1	—	431
Attentiveness to science and technology <sup>b</sup>											
Attentive public .....	37	7	8	—	44	3	0	—	1	—	195
Interested public.....	27	4	9	1	53	6	—	1	1	—	755
Residual public.....	29	2	6	—	55	6	0	2	1	—	624

— less than 0.5 percent responded.

<sup>a</sup>Low = five or fewer high school and college science/math courses, middle = six to eight courses, high = nine or more courses.

<sup>b</sup>Attentive = very interested in the issue, very well informed about it, and a regular reader of a daily newspaper or relevant national magazine. Interested = very interested but not well informed. Residual = all others. Classifications encompass new scientific discoveries, inventions, and technologies.

NOTES: Percents may not sum to 100 because of rounding. A few respondents did not provide information about highest level of education. Responses are to the following question: *We are interested in how people get information about events in the news. Thinking about the kind of issues we have been talking about, where do you get most of your information about current news events?*

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Public Attitudes Toward and Understanding of Science and Technology, 2001.

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Appendix table 7-2  
**Leading source of information about science and technology: 2001**

Respondent characteristic	Newspaper	Magazine	Internet	Books/ other print	Television	Radio	Government agency	Family	Friend/ colleague	Other	Do not know	Sample size
												Percent
All adults .....	16	16	9	2	44	3	—	2	1	5	2	1,574
Male .....	17	18	13	2	41	4	—	1	1	3	1	751
Female.....	16	14	6	2	48	2	1	2	1	6	2	823
Formal education												
Less than high school.....	13	9	2	4	53	4	1	1	1	9	4	116
High school graduate.....	16	15	10	2	48	2	—	2	1	3	1	834
Baccalaureate .....	17	23	16	3	31	3	0	1	1	4	1	393
Graduate/professional degree.....	25	30	11	2	23	2	—	1	1	4	0	221
Science/mathematics education <sup>a</sup>												
Low.....	16	12	5	2	53	3	—	2	1	5	2	674
Middle.....	19	18	12	1	39	2	—	2	1	4	1	469
High .....	15	27	19	4	28	3	—	1	1	4	—	431
Attentiveness to science and technology <sup>b</sup>												
Attentive public .....	20	35	14	3	21	1	—	1	0	5	0	195
Interested public.....	14	18	11	2	46	3	—	2	1	4	—	755
Residual public.....	18	10	7	2	48	3	—	1	1	5	3	624

— less than 0.5 percent responded.

<sup>a</sup>Low = five or fewer high school and college science/math courses, middle = six to eight courses, high = nine or more courses.

<sup>b</sup>Attentive = very interested in the issue, very well informed about it, and a regular reader of a daily newspaper or relevant national magazine. Interested = very interested but not well informed. Residual = all others. Classifications encompass new scientific discoveries, inventions, and technologies.

NOTES: Percents may not sum to 100 because of rounding. A few respondents did not provide information about highest level of education. Responses are to the following question: *We are also interested in how people get information about science and technology. Thinking about the kind of issues we have been talking about, where do you get most of your information about science and technology?*

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Public Attitudes Toward and Understanding of Science and Technology, 2001.

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Appendix table 7-3  
**Leading source of information about specific scientific issue: 2001**

Respondent characteristic	Newspaper	Magazine	Internet	Books/ other print	Television	Radio	Government agency	Family	Friend/ colleague	Other	Do not know	Sample size
												Percent
All adults .....	4	8	44	24	6	—	—	—	1	8	5	1,574
Male .....	4	9	45	22	6	—	—	—	1	8	5	751
Female.....	2	8	43	26	6	0	1	1	—	8	5	823
Formal education												
Less than high school.....	3	5	26	29	13	0	0	1	1	9	12	116
High school graduate.....	3	7	45	25	6	0	—	—	—	8	4	834
Baccalaureate .....	3	13	55	18	3	—	1	—	0	7	1	393
Graduate/professional degree.....	2	13	55	21	1	0	—	0	1	6	1	221
Science/mathematics education <sup>a</sup>												
Low.....	4	8	33	28	9	0	—	1	1	8	7	674
Middle.....	2	7	53	23	4	0	—	—	—	8	2	469
High .....	2	12	60	15	2	—	1	—	1	8	0	431
Attentiveness to science and technology <sup>b</sup>												
Attentive public .....	3	11	47	25	5	0	0	0	—	5	2	195
Interested public.....	2	10	49	23	7	0	—	—	—	6	2	755
Residual public.....	4	6	38	25	6	—	—	1	1	11	8	624

— less than 0.5 percent responded.

<sup>a</sup>Low = five or fewer high school and college science/math courses, middle = six to eight courses, high = nine or more courses.

<sup>b</sup>Attentive = very interested in the issue, very well informed about it, and a regular reader of a daily newspaper or relevant national magazine. Interested = very interested but not well informed. Residual = all others. Classifications encompass new scientific discoveries, inventions, and technologies.

NOTES: Percents may not sum to 100 because of rounding. A few respondents did not provide information about highest level of education. Responses are to the following question: *If you wanted to learn more about a scientific issue such as global warming or biotechnology, how would you get more information?*

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Public Attitudes Toward and Understanding of Science and Technology, 2001.

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Appendix table 7-4

## Feeling informed about selected policy issues: 1979–2001

Issue	1979	1981	1983	1985	1988	1990	1992	1995	1997	1999	2001
	Mean index score										
Local schools.....	44	55	54	54	55	55	55	59	61	58	59
Economy and business conditions .....	42	55	54	48	50	53	56	52	51	50	51
New medical discoveries .....	—	—	—	53	52	53	51	52	56	53	51
Environmental pollution .....	—	—	—	—	—	60	57	52	51	48	47
New scientific discoveries.....	36	38	40	43	42	42	39	42	48	44	42
Military and defense policy .....	—	—	46	45	43	51	49	40	39	44	39
Use of new inventions and technologies.....	35	35	42	39	38	38	38	40	44	43	38
Agricultural and farming .....	33	35	—	41	46	36	—	35	38	33	35
International and foreign policy .....	35	44	40	42	42	51	46	36	36	40	35
Space exploration .....	—	37	39	42	39	37	33	33	41	37	32
	Number										
Sample size .....	1,635	3,195	1,631	2,005	2,041	2,033	2,001	2,006	2,000	1,882	1,574
—	not asked										

NOTES: Responses are to the following statement: *Now, I'd like to go through this list with you again, and for each issue I'd like you to tell me if you are very well informed, moderately well informed, or poorly informed.* Responses are converted to a 0–100 scale, with 100 for “very well informed,” 50 for “moderately well informed,” and 0 for “poorly informed.” Indices were obtained by adding all the values for each policy issue and computing the average.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Public Attitudes Toward and Understanding of Science and Technology, various years.

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Appendix table 7-5

Public assessment of astrology, by respondent characteristic: 1979–2001

Characteristic	1979	1981	1985	1988	1990	1992	1995	1997	1999	2001
	Percent									
<b>All adults</b>										
Very scientific .....	7	10	8	6	6	6	7	7	7	9
Sort of scientific .....	34	35	31	31	29	29	28	29	29	31
Not at all scientific .....	50	51	57	60	60	62	60	59	59	56
Do not know .....	9	4	4	3	5	3	5	5	5	4
<b>Male</b>										
Very scientific.....	7	9	7	5	5	6	7	7	7	9
Sort of scientific .....	30	29	29	25	23	25	24	27	25	27
Not at all scientific.....	54	58	60	67	67	67	65	63	63	60
Do not know.....	9	4	4	3	5	2	4	3	5	3
<b>Female</b>										
Very scientific.....	8	10	9	7	6	7	7	7	7	8
Sort of scientific .....	37	41	32	37	35	32	32	31	32	36
Not at all scientific.....	46	44	55	53	55	58	55	55	56	52
Do not know.....	9	5	4	3	4	3	6	7	5	4
<b>Less than high school graduate</b>										
Very scientific.....	11	13	14	11	7	12	11	11	13	14
Sort of scientific .....	34	37	38	35	31	33	28	37	34	35
Not at all scientific.....	39	40	43	50	50	49	48	42	41	45
Do not know.....	16	10	5	4	12	6	13	10	12	6
<b>High school graduate</b>										
Very scientific.....	7	10	8	6	6	6	8	7	7	9
Sort of scientific .....	37	38	29	32	32	31	30	30	30	35
Not at all scientific.....	50	50	60	59	60	61	59	59	60	52
Do not know.....	6	2	3	3	2	2	3	4	3	4
<b>Baccalaureate or higher</b>										
Very scientific.....	2	3	3	2	3	3	2	3	2	4
Sort of scientific .....	20	25	25	23	18	17	22	19	19	21
Not at all scientific.....	71	69	70	74	77	78	74	76	76	74
Do not know.....	7	3	2	1	2	2	2	2	3	2
<b>Attentive to science and technology<sup>a</sup></b>										
Very scientific.....	8	9	7	3	6	15	8	7	12	4
Sort of scientific .....	28	34	27	29	21	23	24	29	23	25
Not at all scientific.....	60	54	62	66	72	58	65	62	64	68
Do not know.....	4	3	4	2	1	4	3	2	1	2
	Number									
<b>Sample size</b>										
All adults .....	1,635	1,631	2,005	2,041	2,033	1,004	2,006	2,000	1,882	1,574
Male .....	773	775	950	958	964	486	953	930	900	751
Female.....	862	856	1,054	1,084	1,070	533	1,053	1,070	982	823
Less than high school graduate.....	465	404	507	530	495	215	418	420	403	116
High school graduate .....	932	941	1,147	1,158	1,202	623	1,196	1,188	1,111	834
Baccalaureate or higher .....	238	282	349	353	336	203	392	392	368	614
Attentive to science and technology ..	154	208	235	233	229	105	195	288	216	195

<sup>a</sup>Very interested in science and technology issues, very well informed about science and technology, and a regular reader of a daily newspaper or relevant national magazine.

NOTES: A few respondents did not provide information about highest level of education. Responses are to the following question: *Would you say that astrology is very scientific, sort of scientific, or not at all scientific?*

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Public Attitudes Toward and Understanding of Science and Technology, various years.

Appendix table 7-6  
**Public opinion on whether Federal Government should fund basic research, by respondent characteristic: 1985–2001**  
 (Percent)

Characteristic	1985	1988	1990	1992	1995	1997	1999	2001
<b>All adults</b>								
Strongly agree .....	9	16	17	14	19	22	21	19
Agree .....	70	65	62	63	61	57	61	62
Do not know .....	5	4	4	3	3	3	3	3
Disagree .....	16	14	15	18	17	15	13	15
Strongly disagree .....	0	1	2	2	2	3	2	1
<b>Male</b>								
Strongly agree .....	11	20	23	17	19	24	24	23
Agree .....	71	63	60	62	60	54	60	63
Do not know .....	2	2	2	2	2	3	2	2
Disagree .....	15	13	13	17	18	16	12	11
Strongly disagree .....	1	2	2	2	1	3	2	2
<b>Female</b>								
Strongly agree .....	8	11	13	11	15	20	18	16
Agree .....	68	68	65	64	62	59	62	61
Do not know .....	8	6	5	4	5	4	4	5
Disagree .....	16	14	16	19	16	15	14	18
Strongly disagree .....	0	1	1	2	2	2	2	1
<b>Less than high school graduate</b>								
Strongly agree .....	5	6	10	10	8	20	17	13
Agree .....	65	66	59	61	59	50	55	66
Do not know .....	9	7	8	5	7	5	7	5
Disagree .....	21	18	20	21	24	22	18	16
Strongly disagree .....	0	3	3	3	2	3	3	0
<b>High school graduate</b>								
Strongly agree .....	8	17	18	12	16	19	18	18
Agree .....	72	66	65	64	63	60	66	60
Do not know .....	4	3	2	3	3	3	2	3
Disagree .....	15	13	14	19	17	15	12	17
Strongly disagree .....	1	1	1	2	1	3	2	1
<b>Baccalaureate</b>								
Strongly agree .....	19	26	27	22	24	31	34	23
Agree .....	68	62	60	64	62	56	53	68
Do not know .....	2	3	2	2	2	2	1	1
Disagree .....	10	8	10	12	11	10	10	8
Strongly disagree .....	1	1	1	0	1	1	2	1
<b>Graduate degree</b>								
Strongly agree .....	20	29	31	26	43	40	40	32
Agree .....	70	61	58	53	46	51	51	56
Do not know .....	2	2	4	5	2	2	1	3
Disagree .....	8	7	6	14	8	5	8	8
Strongly disagree .....	0	1	1	2	1	2	0	1
<b>Attentive to science and technology<sup>a</sup></b>								
Strongly agree .....	17	27	35	28	35	46	35	35
Agree .....	76	62	50	61	48	42	52	49
Do not know .....	0	2	4	1	1	1	0	3
Disagree .....	6	8	10	9	14	7	9	12
Strongly disagree .....	1	1	1	1	2	4	4	3

<sup>a</sup>Very interested in science and technology issues, very well informed about science and technology, and a regular reader of a daily newspaper or relevant national magazine.

NOTES: Responses are to the following question: *Even if it brings no immediate benefits, scientific research that advances the frontiers of knowledge is necessary and should be supported by the Federal Government—do you strongly agree, agree, disagree, or strongly disagree?*

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Public Attitudes Toward and Understanding of Science and Technology, various years.

Appendix table 7-7

## Public assessment of Federal Government spending in selected policy areas: 1981–2002

Policy area	1981	1983	1985	1988	1990	1992	1997	1999	2001	2002
	Percent									
Exploring space										
Too little.....	18	17	9	17	9	12	14	15	11	12
Too much.....	43	39	45	42	52	50	45	46	48	38
Reducing pollution										
Too little.....	52	54	69	76	76	72	65	65	63	60
Too much.....	14	11	6	4	5	7	8	7	6	7
Improving health care										
Too little.....	61	—	68	68	75	79	68	71	70	75
Too much.....	6	—	3	2	3	5	7	5	4	4
Supporting scientific research										
Too little.....	31	—	29	34	30	34	34	37	36	36
Too much.....	18	—	18	15	16	19	14	14	14	14
Improving education										
Too little.....	62	71	73	76	77	81	76	75	76	74
Too much.....	6	5	3	4	4	4	6	6	5	5
Helping older people										
Too little.....	73	—	72	76	75	73	66	71	73	—
Too much.....	3	—	3	2	2	4	5	4	3	—
Improving national defense <sup>a</sup>										
Too little.....	33	19	11	11	15	15	23	31	29	31
Too much.....	26	47	50	53	40	40	32	25	25	22
Helping low-income people										
Too little.....	45	—	54	55	57	56	44	49	53	—
Too much.....	24	—	13	12	15	17	23	19	15	—
	Number									
Sample size.....	1,659	1,631	2,005	2,041	2,033	2,001	2,000	1,882	1,574	912

— not asked

<sup>a</sup>Only 1,013 responses in 1988 because question was asked on a split ballot.

NOTES: Responses are to the following statement: *We are faced with many problems in this country. I'm going to name some of these problems, and for each one, I'd like you to tell me if you think that the Government is spending too little money on it, about the right amount, or too much.* Percents do not sum to 100 because "about the right amount" and "do not know" responses are not shown.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Public Attitudes Toward and Understanding of Science and Technology, various years, 1981–2001; and University of Chicago, National Opinion Research Center, General Social Survey, 2002.

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Appendix table 7-8

## Public confidence in leadership of various institutions: 1973–2002

Institution	1973	1974	1975	1976	1977	1978	1980	1982	1983	1984	1986	1987	1988	1989	1990	1991	1993	1994	1996	1998	2000	2002
	Percent																					
Medicine.....	54	60	50	54	51	46	52	45	51	50	46	52	51	46	46	48	39	41	45	44	44	37
Scientific community .....	37	45	39	43	41	36	41	38	41	44	39	45	39	40	37	41	37	38	39	40	41	39
Military .....	32	40	35	39	36	29	28	31	29	36	31	34	34	32	33	60	42	37	37	36	39	55
U.S. Supreme Court .....	31	33	31	35	35	28	25	30	27	33	30	36	35	34	35	37	31	30	28	37	32	37
Banks and financial institutions.....	—	—	32	39	42	33	32	27	24	31	21	27	27	19	18	12	15	18	25	26	29	22
Major companies.....	29	31	19	22	27	22	27	23	24	30	24	30	25	24	25	20	21	25	23	26	28	18
Organized religion.....	35	44	24	30	40	31	35	32	28	31	25	29	20	22	23	25	23	24	25	27	28	19
Education .....	37	49	31	37	41	28	30	33	29	28	28	35	29	30	27	30	22	25	23	27	27	25
Executive Branch of Federal Government.....	29	14	13	13	28	12	12	19	13	18	21	18	16	20	23	26	12	11	10	14	13	27
Organized labor .....	15	18	10	12	15	11	15	12	8	8	8	10	10	9	11	11	8	10	11	11	13	12
Congress.....	23	17	13	14	19	13	9	13	10	12	16	16	15	17	15	18	7	8	8	11	12	13
Press .....	23	26	24	28	25	20	22	18	13	17	18	18	18	17	15	16	11	8	11	9	10	10
Television .....	18	23	18	19	17	14	16	14	12	13	15	12	14	14	14	14	12	9	10	10	10	10
Average <sup>a</sup> .....	30	33	26	29	31	24	26	26	24	27	25	28	26	25	25	29	22	22	23	24	25	25
	Number																					
Sample size.....	1,504	1,484	1,490	1,499	1,530	1,532	1,468	1,506	1,599	989	1,470	1,466	997	1,035	899	1,017	1,057	2,011	1,925	1,911	1,887	912

— not asked

<sup>a</sup>Does not include banks and financial institutions.

NOTES: Percents represent respondents expressing a "great deal of confidence" when asked the following question: *As far as the people running these institutions are concerned, would you say that you have a great deal of confidence, only some confidence, or hardly any confidence at all in them?* The survey was not conducted in 1979 and 1981 and was conducted every other year from 1994 through 2002; the question was not asked in 1985.

SOURCE: J. A. Davis, T. W. Smith, and P. V. Marsden, *General Social Survey 1972–2002 Cumulative Codebook* (Chicago: University of Chicago, National Opinion Research Center, 2003).

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