
Section 16

Science and Technology

This section presents statistics on scientific, engineering, and technological resources, with emphasis on patterns of research and development (R&D) funding and on scientific, engineering, and technical personnel; education; and employment.

The National Science Foundation (NSF) gathers data chiefly through recurring surveys. Current NSF publications containing data on funds for research and development and on scientific and engineering personnel include detailed statistical tables; info briefs; and annual, biennial, and special reports, see <<http://www.nsf.gov/statistics>>. Titles or the areas of coverage of these reports include the following: *Science and Engineering Indicators*; *National Patterns of R&D Resources*; *Women, Minorities, and Persons with Disabilities in Science and Engineering*, *Federal Funds for Research and Development*; *Federal R&D Funding by Budget Function*; *Federal Support to Universities, Colleges, and Selected Nonprofit Institutions*; *Research and Development in Industry*; R&D expenditures and graduate enrollment and support in academic science and engineering; and characteristics of doctoral scientists and engineers and of recent graduates in the United States. Statistical surveys in these areas pose problems of concept and definition and the data should therefore be regarded as broad estimates rather than precise, quantitative statements. See sources for methodological and technical details.

The National Science Board's biennial *Science and Engineering Indicators* at <<http://www.nsf.gov/statistics/seind10/>> contains data and analysis of international and domestic science and technology, including measures of inputs and outputs.

Research and development outlays—NSF defines research as “systematic study directed toward fuller scientific knowledge of the subject studied” and development as “the systematic use of

scientific knowledge directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes.”

National coverage of R&D expenditures is developed primarily from periodic surveys in four principal economic sectors: (1) *Government*, made up primarily of federal executive agencies; (2) *Industry*, consisting of manufacturing and nonmanufacturing firms and the federally funded research and development centers (FFRDCs) they administer; (3) *Universities and colleges*, composed of universities, colleges, and their affiliated institutions, agricultural experiment stations, and associated schools of agriculture and of medicine, and FFRDCs administered by educational institutions; and (4) *Other nonprofit institutions*, consisting of such organizations as private philanthropic foundations, nonprofit research institutes, voluntary health agencies, and FFRDCs administered by nonprofit organizations.

The R&D funds reported consist of current operating costs, including planning and administration costs, except as otherwise noted. They exclude funds for routine testing, mapping and surveying, collection of general purpose data, dissemination of scientific information, and training of scientific personnel.

Scientists, engineers, and technicians—Scientists and engineers are defined as persons engaged in scientific and engineering work at a level requiring a knowledge of sciences equivalent at least to that acquired through completion of a 4-year college course. Technicians are defined as persons engaged in technical work at a level requiring knowledge acquired through a technical institute, junior college, or other type of training less extensive than 4-year college training. Craftsmen and skilled workers are excluded.

Table 799. Research and Development (R&D) Expenditures by Source and Objective: 1980 to 2008

[In millions of dollars (63,224 represents \$63,224,000,000), except as indicated]

Year	Total	Sources of funds					Objective (percent of total)			Character of work		
		Federal government	Industry	Universities\ colleges	Non-profit	Non-federal government ¹	Defense related ²	Space related ³	Other	Basic research	Applied research	Development
1980.	63,224	29,986	30,929	920	871	519	24.3	5.3	70.4	8,745	13,714	40,765
1981.	72,292	33,739	35,948	1,058	967	581	24.4	5.2	70.4	9,658	16,329	46,305
1982.	80,748	37,133	40,692	1,207	1,095	621	26.1	4.9	69.0	10,651	18,218	51,879
1983.	89,950	41,451	45,264	1,357	1,220	658	27.7	4.2	68.1	11,880	20,298	57,771
1984.	102,244	46,470	52,187	1,514	1,351	721	28.7	3.0	68.3	13,332	22,451	66,461
1985.	114,671	52,641	57,962	1,743	1,491	834	29.9	3.1	67.0	14,748	25,401	74,522
1986.	120,249	54,622	60,991	2,019	1,647	969	31.4	3.0	65.6	17,154	27,240	75,855
1987.	126,360	58,609	62,576	2,262	1,849	1,065	31.7	3.2	65.1	18,481	27,951	79,929
1988.	133,881	60,131	67,977	2,527	2,081	1,165	30.2	3.5	66.3	19,787	29,528	84,567
1989.	141,891	60,466	74,966	2,852	2,333	1,274	27.6	3.9	68.5	21,891	32,277	87,723
1990.	151,993	61,610	83,208	3,187	2,589	1,399	25.1	4.3	70.6	23,029	34,897	94,067
1991.	160,876	60,783	92,300	3,458	2,852	1,483	22.4	4.5	73.1	27,140	38,631	95,105
1992.	165,350	60,915	96,229	3,569	3,113	1,525	21.6	4.3	74.1	27,604	37,936	99,811
1993.	165,730	60,528	96,549	3,709	3,388	1,557	21.2	4.4	74.4	28,743	37,283	99,705
1994.	169,207	60,777	99,204	3,938	3,665	1,623	19.7	4.5	75.8	29,651	36,618	102,938
1995.	183,625	62,969	110,871	4,110	3,925	1,751	18.6	4.5	76.9	29,610	40,936	113,079
1996.	197,346	63,394	123,417	4,436	4,239	1,861	17.6	4.1	78.3	32,799	43,170	121,377
1997.	212,152	64,574	136,228	4,838	4,590	1,922	16.7	4.1	79.2	36,921	46,554	128,677
1998.	226,402	66,383	147,846	5,163	5,038	1,972	15.8	3.8	80.4	35,341	46,348	144,712
1999.	244,922	67,055	164,660	5,619	5,489	2,098	14.6	3.2	82.2	38,887	52,006	154,029
2000.	267,298	66,417	186,136	6,232	6,267	2,247	13.4	2.3	84.3	42,667	56,826	167,805
2001.	277,366	72,836	188,440	6,827	6,867	2,397	14.0	2.4	83.6	47,617	64,583	165,167
2002.	276,022	77,710	180,711	7,344	7,700	2,557	15.6	2.4	82.0	51,174	50,814	174,034
2003.	288,324	83,618	186,174	7,650	8,140	2,742	16.5	2.3	81.2	54,375	61,563	172,386
2004.	299,201	88,766	191,376	7,937	8,239	2,883	17.2	2.1	80.7	55,868	70,095	173,238
2005.	322,104	93,817	207,826	8,579	8,960	2,922	17.1	2.0	80.9	59,462	70,215	192,427
2006.	347,048	98,038	227,254	9,307	9,429	3,021	16.8	1.8	81.4	61,038	76,428	209,582
2007.	372,535	101,772	246,927	9,993	10,593	3,249	16.2	1.5	82.3	65,988	83,214	223,333
2008 ⁴ . . .	397,629	103,709	267,847	10,600	12,020	3,453	15.3	1.4	83.3	69,146	88,591	239,891

¹ Nonfederal R&D expenditures to university and college performers. ² R&D spending by the Department of Defense, including space activities, and a portion of the Department of Energy funds. ³ For the National Aeronautics and Space Administration only. ⁴ Preliminary.

Source: U.S. National Science Foundation, *National Patterns of R&D Resources*, NSF 10-314, 2010. See also <www.nsf.gov/statistics/nsf10314/>.

Table 800. National Research and Development (R&D) Expenditures as a Percent of Gross Domestic Product by Country: 1990 to 2009

Year	United States	Japan ¹	Germany ²	France	United Kingdom	Italy	Canada	South Korea	OECD total ³	Russia ⁴	China ⁵
1990.	2.65	2.81	2.61	2.32	2.10	1.25	1.51	(NA)	2.25	2.03	(NA)
1995.	2.50	2.71	2.19	2.29	1.91	0.97	1.70	2.27	2.06	0.85	0.57
2000.	2.71	3.04	2.45	2.15	1.81	1.05	1.91	2.30	2.21	1.05	0.90
2001.	2.72	3.12	2.46	2.20	1.79	1.09	2.09	2.47	2.25	1.18	0.95
2002.	2.62	3.17	2.49	2.23	1.79	1.13	2.04	2.40	2.22	1.25	1.07
2003.	2.61	3.20	2.52	2.17	1.75	1.11	2.03	2.49	2.22	1.28	1.13
2004.	2.54	3.17	2.49	2.15	1.69	1.10	2.08	2.68	2.17	1.15	1.23
2005.	2.57	3.32	2.49	2.10	1.73	1.09	2.05	2.79	2.21	1.07	1.34
2006.	2.61	3.41	2.53	2.10	1.76	1.13	1.97	3.01	2.24	1.07	1.42
2007.	2.66	3.44	2.53	2.04	1.82	1.18	1.90	3.21	2.28	1.12	1.44
2008.	2.77	(NA)	(NA)	2.02	1.88	1.18	1.84	(NA)	(NA)	1.04	(NA)
2009.	(NA)	(NA)	2.82	2.21	1.87	1.27	1.96	(NA)	(NA)	1.24	(NA)

NA Not available. ¹ Data on Japanese research and development after 1995 may not be consistent with data in earlier years because of changes in methodology. ² Data for 1990 are for West Germany only. ³ Organization for Economic Cooperation and Development. ⁴ As of May 16, 2007 Russia is an OECD accession candidate country. ⁵ As of 2007 China is an OECD enhanced engagement country.

Source: Organization for Economic Cooperation and Development, *Main Science and Technology Indicators*, 2010/2nd edition (copyright). See also <<http://www.oecd.org/>>.

Table 801. Performance Sector of Research and Development (R&D) Expenditures: 2000 to 2008

[In millions of dollars (267,298 represents \$267,298,000,000). For calendar year. FFRDCs are federally funded research and development centers]

Year	Federal government		Industry			Industry FFRDC's	Universities and colleges						University & college FFRDCs ³	Other nonprofit institutions			
			Total	Funded by—			Total	Funded by—				Total		Funded by—			
				Federal government	Industry ¹			Federal government	Non-federal government ²	Industry	Universities & colleges			Non-profits	Federal government	Industry	Non-profits
RESEARCH AND DEVELOPMENT TOTAL	Total	Federal government	Total	Federal government	Industry¹	Industry FFRDC's	Total	Federal government	Non-federal government²	Industry	Universities & colleges	Non-profits	University & college FFRDCs³	Total	Federal government	Industry	Non-profits
2000.....	267,298	17,917	199,961	17,117	182,844	2,001	30,705	17,727	2,247	2,174	6,232	2,326	5,742	9,506	4,447	1,118	3,941
2004.....	299,201	22,844	208,301	20,266	188,035	2,485	43,128	27,173	2,883	2,190	7,937	2,946	7,659	12,140	5,695	1,151	5,294
2005.....	322,104	24,470	226,159	21,909	204,250	2,601	45,197	28,260	2,922	2,323	8,579	3,113	7,817	13,032	5,932	1,253	5,846
2006.....	347,048	25,556	247,669	24,304	223,365	3,122	46,983	28,815	3,021	2,515	9,307	3,325	7,306	13,469	5,992	1,374	6,103
2007.....	372,535	25,858	269,267	26,585	242,682	5,165	49,021	29,322	3,249	2,748	9,993	3,703	5,567	14,341	5,954	1,497	6,890
2008 ⁴	397,629	27,000	289,105	25,795	263,310	6,337	51,163	30,178	3,453	2,908	10,600	4,024	4,717	15,606	5,982	1,629	7,995
BASIC RESEARCH																	
2000.....	42,867	3,765	7,040	925	6,115	547	22,917	13,966	1,550	1,499	4,298	1,604	2,874	4,908	2,099	621	2,188
2004.....	55,868	4,697	7,835	1,072	6,763	175	31,994	21,154	1,958	1,488	5,392	2,002	3,730	6,366	2,788	639	2,939
2005.....	59,462	4,770	8,667	1,108	7,559	136	34,044	22,198	2,043	1,625	6,000	2,177	3,820	6,844	2,903	696	3,246
2006.....	61,038	4,716	8,384	1,444	6,940	652	35,700	22,736	2,155	1,795	6,641	2,373	3,344	7,001	2,849	763	3,389
2007.....	65,988	4,600	11,268	2,780	8,488	2,258	37,323	23,070	2,351	1,989	7,233	2,680	1,724	7,466	2,809	831	3,826
2008 ⁴	69,146	4,734	11,907	2,697	9,209	2,390	38,822	23,608	2,503	2,108	7,685	2,918	1,634	8,229	2,885	904	4,439
APPLIED RESEARCH																	
2000.....	56,826	6,105	39,176	2,682	36,494	269	6,617	3,315	572	553	1,585	592	1,329	3,113	1,831	283	999
2004.....	70,095	7,455	45,432	4,775	40,657	1,509	9,335	5,140	759	576	2,087	774	1,920	4,081	2,448	292	1,342
2005.....	70,215	7,557	45,284	5,289	39,995	1,492	9,333	5,158	721	573	2,114	768	1,912	4,231	2,432	318	1,482
2006.....	76,428	7,435	51,173	6,140	45,033	1,331	9,557	5,290	710	590	2,186	781	1,874	4,487	2,592	348	1,547
2007.....	83,214	7,303	57,570	8,945	48,625	1,168	10,003	5,542	736	623	2,264	839	1,354	4,722	2,596	379	1,746
2008 ⁴	88,591	7,573	61,437	8,679	52,758	1,998	10,556	5,824	779	656	2,390	908	713	4,985	2,546	413	2,026
DEVELOPMENT																	
2000.....	167,805	8,047	153,745	13,510	140,235	1,185	1,172	447	125	121	348	130	1,539	1,485	517	214	754
2004.....	173,238	10,692	155,034	14,419	140,615	801	1,799	878	167	126	458	170	2,008	1,692	459	220	1,013
2005.....	192,427	12,142	172,208	15,512	156,696	974	1,820	904	158	126	464	169	2,085	1,957	598	240	1,119
2006.....	209,582	13,406	188,112	16,720	171,392	1,139	1,726	789	156	130	480	171	2,088	1,981	551	263	1,168
2007.....	223,333	13,955	200,429	14,860	185,569	1,738	1,695	716	162	137	497	184	2,488	2,154	549	286	1,318
2008 ⁴	239,891	14,693	215,761	14,419	201,342	1,949	1,785	746	171	144	525	199	2,370	2,392	551	312	1,530

¹ Includes all nonfederal sources of industry R&D expenditures. ² Includes all nonfederal sources. ³ Includes all R&D expenditures of FFRDCs administered by academic institutions and funded by the federal government. ⁴ Preliminary.

Source: National Science Foundation, data derived from: *Research and Development in Industry*, annual; *Academic Research and Development Expenditures*, annual; and *Federal Funds For Research and Development*, annual. See also <<http://www.nsf.gov/statistics/nsf10314/>>.

Table 802. Federal Obligations for Research in Current and Constant (2000) Dollars by Field of Science: 2005 to 2009

[In millions of dollars (53,738 represents \$53,738,000,000). For years ending September 30. Excludes R&D plant]

Field of science	Current dollars				Constant (2000) dollars ¹			
	2005	2007	2008,	2009,	2005	2007	2008,	2009,
			prel.	proj.			prel.	proj.
Research, total	53,738	54,094	55,097	54,801	47,682	45,248	45,213	44,081
Basic	27,140	26,866	27,559	28,536	24,082	22,472	22,615	22,954
Applied	26,598	27,228	27,538	26,265	23,601	22,775	22,598	21,127
Life sciences	28,128	29,464	29,675	29,299	24,958	24,645	24,351	23,567
Psychology	1,892	1,838	1,861	1,853	1,679	1,537	1,527	1,490
Physical sciences	5,494	5,136	5,249	5,593	4,875	4,296	4,308	4,499
Environmental sciences	3,503	3,171	3,315	3,352	3,108	2,652	2,720	2,697
Mathematics and computer sciences	2,983	2,946	3,285	3,333	2,647	2,464	2,696	2,681
Engineering	8,553	8,990	9,353	8,907	7,589	7,520	7,676	7,164
Social sciences	1,097	1,147	1,071	1,123	973	960	879	903
Other sciences, n.e.c. ²	2,089	1,403	1,287	1,341	1,854	1,174	1,056	1,079

¹ Based on gross domestic product implicit price deflator. ² Not elsewhere classified.

Source: U.S. National Science Foundation, *Federal Funds for Research and Development*, NSF 09-320, 2009. See also <<http://www.nsf.gov/statistics/fedfunds/>>.

Table 803. Federal Budget Authority for Research and Development (R&D) in Current and Constant (2000) Dollars by Selected Budget Functions: 2007 to 2010

[In millions of dollars (138,087 represents \$138,087,000,000). For year ending September 30. Excludes R&D plant. Represents budget authority. Functions shown are those for which \$1 billion or more was authorized since 2001]

Function	Current dollars				Constant (2000) dollars ¹			
	2007	2008	2009 ²	2010 ³	2007	2008	2009 ²	2010 ³
Total ⁴	138,087	140,113	156,009	143,892	115,506	114,979	125,490	113,479
National defense	82,272	84,713	85,166	86,082	68,818	69,517	68,505	67,888
Health	29,461	29,063	40,389	30,976	24,643	23,849	32,488	24,429
Space research and technology	9,024	8,323	6,891	6,622	7,548	6,830	5,543	5,222
Energy	1,893	1,896	3,318	2,138	1,583	1,556	2,669	1,686
General science	7,809	8,234	11,840	9,298	6,532	6,757	9,524	7,333
Natural resources and environment	1,936	2,106	2,245	2,300	1,619	1,728	1,806	1,814
Transportation	1,361	1,394	1,440	1,427	1,138	1,144	1,158	1,125
Agriculture	1,857	1,864	2,302	2,439	1,553	1,530	1,852	1,924

¹ Based on gross domestic product implicit price deflator. ² Includes ARRA (American Recovery and Reinvestment Act) funds.

³ Preliminary. ⁴ Includes other functions, not shown separately.

Source: U.S. National Science Foundation, *Federal R&D Funding by Budget Function*, NSF 10-317, 2010. See also <<http://www.nsf.gov/statistics/nsf10317/>>.

Table 804. Federal Research and Development (R&D) by Federal Agency: Fiscal Year (FY) 2009 and 2010

[In millions of dollars (145,605 represents \$145,605,000,000). For years ending September 30. R&D refers to actual research and development activities as well as R&D facilities. R&D facilities (also known as R&D plants) includes construction, repair, or alteration of physical plant used in the conduct of R&D. Based on Office of Management and Budget data]

Federal agency	2009 ¹	2010	Federal agency	2009 ¹	2010
Total research and development	145,605	149,295			
Defense R&D	85,309	86,756	Department of Veterans Affairs	925	1,073
Nondefense R&D	60,297	62,539	Department of Homeland Security	943	1,034
			Department of Transportation	1,096	887
Department of Defense	81,484	82,902	Department of Interior	702	776
Science and technology	13,967	14,749	U.S. Geological Survey	615	661
All other Department of Defense R&D	67,517	68,152	Environmental Protection Agency	563	597
Health and Human Services	31,058	31,458	Department of Education	312	353
National Institute of Health	29,752	30,189	Smithsonian	216	213
All other Health and Human Services R&D	1,306	1,269	International Assistance Programs	152	121
Department of Energy	10,301	10,836	Department of Housing and Urban Development	58	100
Atomic Energy Defense	3,825	3,854	Department of State	101	81
Office of Science	4,372	4,528	Nuclear Regulatory Commission	94	79
Energy R&D	2,104	2,454	Department of Justice	103	73
NASA	8,788	9,262	Social Security Administration	35	49
National Science Foundation	4,767	5,392	U.S. Postal Service	18	18
Department of Agriculture	2,437	2,611	Tennessee Valley Authority	43	12
Department of Commerce	1,389	1,337	Army Corps of Engineers	11	11
National Oceanic and Atmospheric Administration	785	685	Telecommunications Development Agency	6	7
National Institute of Standards and Technology	553	588	Department of Labor	4	4

¹ Includes ARRA (American Recovery and Reinvestment Act) funds.

Source: American Association for the Advancement of Science (AAAS), AAAS Report XXXIV *Research and Development FY 2011*, annual (copyright). See also <<http://www.aaas.org/spp/rd/rdreport2011/>>.

Table 805. Funds for Domestic Business Research and Development (R&D) Performed by Manufacturing and Nonmanufacturing Companies by Industry: 2006 to 2008

[Based on the Survey of Industry Research and Development and the Business R&D and Innovation Survey; for information about the surveys and methodology, see <http://www.nsf.gov/statistics/srvyindustry/sird.cfm>]

Industry	NAICS ¹ code	Total R&D funds as a percent of net sales			Company R&D funds as a percent of net sales ²		
		2006	2007	2008	2006	2007	2008
All industries, total	(X)	3.7	3.8	3.7	3.4	3.5	3.0
All manufacturing industries, total	(X)	4.0	4.1	4.4	3.6	3.7	3.5
Food	311	0.7	(D)	0.4	0.7	0.7	0.4
Paper, printing, and support activities	322, 323	(D)	(D)	1.4	1.2	1.3	1.3
Petroleum and coal products	324	0.3	(D)	(D)	0.3	0.3	(D)
Chemicals	325	7.6	(D)	6.5	7.5	7.9	6.1
Plastic and rubber products	326	2.0	(D)	1.1	1.9	1.5	1.1
Nonmetallic mineral products	327	2.1	1.8	2.0	1.9	1.8	1.9
Primary metals	331	0.5	0.6	0.4	0.5	0.6	0.4
Fabricated metal products	332	1.4	1.7	1.6	1.4	1.6	1.6
Machinery	333	3.6	3.7	3.6	3.6	3.7	3.5
Computer and electronic products	334	10.8	9.9	11.6	9.2	8.4	10.1
Electrical equipment, appliances, and components	335	2.6	3.1	2.9	2.5	3.0	2.7
Transportation equipment	336	(D)	(D)	5.7	2.9	3.1	2.6
All nonmanufacturing industries, total	(X)	3.2	3.4	2.8	2.9	3.0	2.2
Information	51	5.3	(D)	4.9	5.2	5.1	4.8
Software publishing	5112	(D)	(D)	10.8	19.9	19.6	10.6
Internet service and data processing providers	518	9.6	(D)	6.3	9.4	9.6	6.2
Professional, scientific, and technical services	54	9.5	11.7	8.4	7.6	9.5	4.5
Architectural, engineering, and related services	5413	14.4	12.0	8.2	10.7	8.1	3.3
Computer systems design and related services	5415	5.3	7.0	5.9	4.9	6.6	4.2
Scientific research and development services	5417	35.1	42.0	13.2	24.2	30.0	6.4

D Figure withheld to avoid disclosure of information pertaining to a specific organization or individual. X Not applicable.

¹ North American Industry Classification System (NAICS); see text, Section 15. ² For 2006–2007, company R&D funds included the company's own funds as well as funds from all other nonfederal sources. For 2008, company R&D funds included only the company's own funds.

Source: U.S. National Science Foundation, *Research and Development in Industry and Business Research and Development*, annual. See also <<http://www.nsf.gov/statistics/>>.

Table 806. Funds for Domestic Performance of Business Research and Development (R&D) in Current and Constant (2005) Dollars by Source of Funds and Selected Industries: 2005 to 2008

[In millions of dollars (226,159 represents \$226,159,000,000). For calendar years. Covers basic research, applied research, and development. Based on the Survey of Industry Research and Development and the Business R&D and Innovation Survey; for information about the surveys and methodology, see <http://www.nsf.gov/statistics/srvyindustry/sird.cfm>]

Industry	NAICS ¹ code	2005	2006	2007	2008
CURRENT DOLLARS					
Total funds	(X)	226,159	247,669	269,267	290,681
Company and other funds	(X)	204,250	223,365	242,682	254,321
Federal funds	(X)	21,909	24,304	26,585	36,360
Petroleum and coal products	324	(D)	1,432	(D)	(D)
Chemicals and allied products	325	42,995	46,329	(D)	58,249
Pharmaceuticals and medicines	3254	34,839	38,901	(D)	48,131
Machinery	333	8,531	9,848	9,865	10,104
Computer and electronic products	334	(D)	56,773	58,599	60,463
Navigational, measuring, electromedical, and control instruments	3345	15,204	18,300	20,438	15,660
Electrical equipment, appliances, and components	335	2,424	2,281	(D)	3,143
Aerospace products and parts	3364	15,055	16,367	18,436	36,941
Information	51	23,836	26,883	(D)	37,964
Professional, scientific, and technical services	54	32,021	38,049	40,533	37,594
Computer systems design and related services	5415	13,592	14,841	14,407	12,146
Scientific R&D services	5417	12,299	14,525	16,849	17,913
CONSTANT (2005) DOLLARS²					
Total funds	(X)	226,159	239,850	253,309	267,613
Company and other funds	(X)	204,250	216,313	228,299	234,138
Federal funds	(X)	21,909	23,537	23,527	33,474
Petroleum and coal products	324	(D)	1,387	(D)	(D)
Chemicals	325	42,995	44,866	(D)	53,626
Pharmaceuticals and medicines	3254	34,839	37,673	(D)	44,311
Machinery	333	8,531	9,537	9,280	9,302
Computer and electronic products	334	(D)	54,981	55,126	55,665
Navigational, measuring, electromedical, and control instruments	3345	15,204	17,722	19,227	14,233
Electrical equipment, appliances, and components	335	2,424	2,209	(D)	2,894
Aerospace products and parts	3364	15,055	15,850	17,343	34,009
Information	51	23,836	26,034	(D)	34,703
Professional, scientific, and technical services	54	32,021	36,848	38,131	34,942
Computer systems design and related services	5415	13,592	14,372	13,553	11,182
Scientific R&D services	5417	12,299	14,066	15,850	16,491

D Figure withheld to avoid disclosure of information pertaining to a specific organization or individual. X Not applicable.

¹ North American Industry Classification System; see text, Section 15. ² Based on gross domestic product implicit price deflator.

Source: U.S. National Science Foundation, *Research and Development in Industry and Business Research and Development*, annual. See also: <<http://www.nsf.gov/statistics/>>

Table 807. Academic and Industrial Research and Development (R&D) Performed by State: 2007

[In millions of dollars (49,021 represents 49,021,000,000). For definition of Research and Development, see text, this section]

State	Academic R&D	Academic R&D per \$1,000 of state GDP	Industry-performed R&D	Industry R&D per \$1,000 of state GDP	State	Academic R&D	Academic R&D per \$1,000 of state GDP	Industry-performed R&D	Industry R&D per \$1,000 of state GDP
	(mil. dol.)		(mil. dol.)			(mil. dol.)		(mil. dol.)	
U.S. 1	49,021	3.55	269,267	19.50	MO.	941	4.11	2,736	11.95
AL	655	3.98	1,771	2 10.76	MT	179	5.22	134	3.91
AK	160	3.56	58	1.29	NE	365	4.54	489	6.09
AZ	783	3.18	3,846	15.64	NV	192	1.48	567	4.38
AR	240	2.52	339	3.56	NH	307	5.31	1,814	3 31.37
CA	6,734	3.74	64,187	35.62	NJ	865	1.88	17,892	38.79
CO	873	3.70	5,223	22.15	NM	410	5.45	568	7.55
CT	691	3.26	9,444	44.49	NY	3,964	3.59	10,916	9.88
DE	126	2.05	1,472	23.92	NC	1,885	4.83	6,829	17.49
DC	333	3.60	379	4.10	ND	169	5.93	126	4.42
FL	1,558	2.10	4,569	6.16	OH	1,807	3.91	7,265	15.71
GA	1,389	3.55	2,788	7.13	OK	299	2.19	527	3.86
HI	274	4.42	218	3.52	OR	575	3.63	3,629	3 22.92
ID	114	2.19	726	13.93	PA	2,438	4.57	10,387	19.48
IL	1,867	3.02	11,362	18.40	RI	230	4.93	411	8.80
IN	894	3.59	4,939	19.82	SC	569	3.75	1,426	9.40
IA	587	4.52	1,202	9.25	SD	82	2.33	132	3.75
KS	376	3.21	1,304	11.15	TN	761	3.10	1,638	6.68
KY	503	3.31	890	5.85	TX	3,417	2.98	13,889	12.09
LA	604	2.91	373	2 1.80	UT	415	3.93	1,764	16.71
ME	137	2.85	265	5.52	VT	115	4.67	413	16.77
MD	2,542	9.61	3,665	13.86	VA	971	2.53	4,840	12.60
MA	2,172	6.17	19,488	55.34	WA	981	3.16	12,687	40.89
MI	1,510	3.97	15,736	41.42	WV	167	2.89	233	4.03
MN	637	2.52	6,636	26.28	WI	1,067	4.57	3,411	14.61
MS	411	4.69	279	3.18	WY	80	2.54	37	2 1.17

¹ National totals for calendar year 2007. Includes \$3.3 billion of industrial R&D expenditures that year that could not be allocated to specific states. ² Estimated, more than 50 percent of the industrial R&D value is imputed due to raking of state data. ³ More than 50 percent of the industrial R&D value is imputed.

Source: U.S. National Science Foundation, *National Patterns of R&D Resources*, NSF-10-314, 2010. See also <<http://www.nsf.gov/statistics/nsf10314/>>.

Table 808. Research and Development (R&D) Expenditures in Science and Engineering at Universities and Colleges in Current and Constant (2005) Dollars: 2000 to 2009

[In millions of dollars (30,084 represents \$30,084,000,000). Totals may not add due to rounding]

Characteristic	Current dollars				Constant (2005) dollars ¹			
	2000	2005	2008	2009	2000	2005	2008	2009
Total	30,084	45,799	51,934	54,935	33,844	45,799	47,655	49,746
Basic research ²	22,547	34,368	39,408	40,955	25,365	34,367	36,161	37,087
Applied R&D ²	7,537	11,432	12,526	13,980	8,479	11,432	11,494	12,660
Source of funds:								
Federal government	17,548	29,209	31,281	32,588	19,741	29,209	28,703	29,510
State and local government	2,200	2,940	3,452	3,647	2,475	2,940	3,168	3,303
Institutions' own funds	5,925	8,266	10,408	11,198	6,666	8,266	9,550	10,140
Industry	2,156	2,291	2,865	3,197	2,425	2,291	2,629	2,895
Other	2,255	3,093	3,928	4,305	2,537	3,093	3,604	3,898
Fields:								
Physical sciences	2,713	3,704	3,941	4,294	3,052	3,704	3,616	3,888
Environmental sciences	1,766	2,555	2,806	2,940	1,987	2,555	2,575	2,662
Mathematical sciences	342	495	620	553	384	494	569	501
Computer sciences	877	1,406	1,472	1,592	987	1,406	1,351	1,442
Life sciences	17,471	27,605	31,210	32,791	19,655	27,605	28,638	29,694
Psychology	517	826	929	979	581	826	852	887
Social sciences	1,300	1,685	1,947	2,075	1,462	1,685	1,787	1,879
Other sciences	543	778	1,051	1,060	611	778	964	960
Engineering	4,557	6,746	7,958	8,651	5,127	6,746	7,302	7,834

¹ Based on gross domestic product implicit price deflator (updated February 2011). ² Basic research and applied R&D statistics were re-estimated for FY1998 and forward. These data are not directly comparable to those from earlier years.

Source: U.S. National Science Foundation, *Survey of Research and Development Expenditures at Universities and Colleges*, annual. See also <<http://www.nsf.gov/statistics/srvyrdexpenditures/>>.

Table 809. Federal Research and Development (R&D) Obligations to Selected Universities and Colleges: 2006 and 2007

[In millions of dollars (24,991.8 represents \$24,991,800,000). For years ending September 30. For the top 40 institutions receiving federal R&D funds in 2007. Awards to the administrative offices of university systems are excluded from totals for individual institutions because that allocation of funds is unknown, but those awards are included in "total all institutions"]

Major institution ranked by total 2007 federal R&D obligations	2006		2007		Major institution ranked by total 2007 federal R&D obligations	2006		2007	
	Total, all institutions ¹	24,991.8	24,998.0	24,991.8		24,998.0	Cornell University	299.1	326.1
Johns Hopkins University	1,153.2	1,054.9	1,153.2	1,054.9	Pennsylvania State University	291.8	320.8	291.8	320.8
University of Washington	612.1	608.0	612.1	608.0	Case Western Reserve University	277.9	278.9	277.9	278.9
University of Michigan	516.2	501.5	516.2	501.5	University Southern California	265.5	260.3	265.5	260.3
University of Pennsylvania	497.5	498.5	497.5	498.5	University of Rochester	252.3	255.2	252.3	255.2
University of California—Los Angeles	477.6	480.0	477.6	480.0	Northwestern University	222.2	254.2	222.2	254.2
Duke University	472.5	470.7	472.5	470.7	University of Chicago	219.8	248.6	219.8	248.6
University of California—San Francisco	441.9	433.4	441.9	433.4	Emory University	228.1	247.9	228.1	247.9
University of California—San Diego	401.2	432.7	401.2	432.7	University of California—Davis	236.4	243.1	236.4	243.1
Harvard University	420.8	429.3	420.8	429.3	University of Alabama—Birmingham	235.4	235.1	235.4	235.1
University of Pittsburgh	425.4	425.9	425.4	425.9	Baylor College of Medicine	236.5	227.9	236.5	227.9
Columbia University—City of NY	467.8	425.7	467.8	425.7	University of California—Irvine	161.3	219.6	161.3	219.6
Stanford University	455.9	424.0	455.9	424.0	Ohio State University	205.9	217.2	205.9	217.2
Washington University	410.7	407.8	410.7	407.8	University of California—Berkeley	228.6	214.2	228.6	214.2
Yale University	361.7	387.3	361.7	387.3	University of Arizona	200.7	212.0	200.7	212.0
Massachusetts Institute of Technology	357.1	380.8	357.1	380.8	University of Illinois—Urbana				
University of Minnesota	331.2	370.7	331.2	370.7	Champaign	184.6	210.5	184.6	210.5
University of Wisconsin—Madison	373.7	369.2	373.7	369.2	Boston University	204.7	208.5	204.7	208.5
University of North Carolina at Chapel Hill	343.4	353.5	343.4	353.5	University of Iowa	193.0	208.4	193.0	208.4
University of Colorado	340.1	330.0	340.1	330.0	The Scripps Research Institute	217.5	199.0	217.5	199.0
Vanderbilt University	306.4	329.6	306.4	329.6	University of Virginia	176.3	198.4	176.3	198.4

¹ Includes other institutions, not shown separately.

Source: U.S. National Science Foundation, *Federal S&E Support to Universities and Colleges and Nonprofit Institutions*, NSF 09-313, 2009. See also <<http://www.nsf.gov/statistics/fedsupport/>>.

Table 810. Graduate Science/Engineering Students in Doctorate-Granting Colleges by Characteristic and Field: 1990 to 2009

[In thousands (409.4 represents 409,400). As of fall. Includes outlying areas]

Field of science or engineering	Total			Characteristic								
				Female			Foreign			Part-time		
	1990	2000	2009	1990	2000	2009	1990	2000	2009	1990	2000	2009
Total, all surveyed fields	409.4	443.5	573.9	155.5	201.8	269.7	103.0	123.3	163.3	130.8	123.6	145.0
Science/engineering	360.6	374.8	497.2	117.9	150.3	212.1	98.9	118.0	155.1	107.5	99.3	120.7
Engineering, total	101.0	98.8	136.7	13.8	19.7	31.8	36.9	46.3	62.8	36.7	28.2	35.2
Sciences, total ¹	259.6	275.9	360.5	104.2	130.7	180.3	62.0	71.7	92.3	70.8	71.1	85.4
Physical sciences	32.9	29.6	37.1	7.7	8.8	12.2	12.2	11.5	14.8	3.9	3.5	3.4
Environmental	13.1	13.0	13.9	3.8	5.3	6.4	2.6	2.6	2.7	3.2	2.8	2.7
Mathematical sciences	18.1	14.4	20.5	5.6	5.2	7.2	6.4	5.9	8.2	4.7	3.0	4.2
Computer sciences	29.2	40.3	45.6	6.8	11.7	11.4	9.7	19.7	22.1	14.1	16.7	15.9
Agricultural sciences	11.0	11.3	14.1	3.2	4.8	6.9	3.2	2.4	3.2	2.0	2.4	3.9
Biological sciences	46.7	53.1	68.6	21.4	27.8	38.9	11.2	11.6	16.8	7.2	7.6	9.3
Psychology	38.5	40.3	46.6	25.5	29.0	34.9	1.7	2.1	2.7	12.0	10.8	12.0
Social sciences	70.0	79.9	95.2	30.1	38.1	50.5	15.0	15.8	18.7	23.8	24.3	28.1
Health fields, total	48.8	68.8	76.7	37.6	51.5	57.6	4.1	5.4	8.2	23.3	24.3	24.4

¹ For 2009, includes other sciences, not shown separately.

Source: U.S. National Science Foundation, *Survey of Graduate Science Engineering Students and Postdoctorates*, annual. See also <<http://www.nsf.gov/statistics/gradpostdoc/>>.

Table 811. Non-U.S. Citizens Awarded Doctorates in Science and Engineering by Visa Type and Country of Citizenship: 2000 to 2009

[For description of science and engineering fields, see Table 815]

Visa and country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All non-U.S. citizens	7,664	7,953	7,707	8,393	9,164	10,427	11,587	12,371	12,628	12,217
Canada	243	253	251	280	337	312	315	341	355	371
Mexico	190	186	175	198	164	193	169	166	160	170
Brazil	121	130	113	99	124	140	128	111	123	121
United Kingdom	64	86	86	77	73	68	77	82	84	78
France	64	62	81	68	82	98	106	120	120	112
Germany	169	181	164	154	153	145	128	126	137	165
China	2,034	2,146	2,121	2,263	2,718	3,281	4,056	4,215	4,072	3,680
Japan	166	128	141	170	166	183	187	201	196	188
Korea	695	814	807	915	1,003	1,118	1,167	1,089	1,111	1,156
Taiwan	611	492	428	407	359	401	403	432	415	511
Thailand	149	231	258	307	263	248	194	218	273	193
India	726	717	601	688	788	1,033	1,415	1,842	2,061	2,029
Iran	40	71	35	45	45	112	124	127	129	137
Turkey	248	274	320	348	319	321	321	410	466	444
Science	5,213	5,164	5,057	5,475	5,852	6,665	7,289	7,773	8,139	8,006
Engineering	2,451	2,789	2,650	2,918	3,312	3,762	4,298	4,598	4,489	4,211
Permanent visa	1,409	1,271	1,173	1,099	1,003	1,113	1,252	1,222	(NA)	(NA)
Temporary visa	7,661	7,946	7,694	8,384	9,155	10,406	11,525	12,323	(NA)	(NA)

NA Not available.

Source: U.S. National Science Foundation, *Science and Engineering Doctorate Awards*, NSF 09-311, 2009. See also <<http://www.nsf.gov/statistics/nsf09311/>>.

Table 812. Science and Engineering (S&E) Degrees Awarded by Degree Level and Sex of Recipient: 1990 to 2009

[For a description of science and engineering degree categories, see source, Appendix B, <http://www.nsf.gov/statistics/nsf07307/content.cfm?pub_id=3634&id=4>]

Academic year ending	Bachelor's degree				Master's degree				Doctoral degree			
	Total S&E	Men	Women	Percent women	Total S&E	Men	Women	Percent women	Total S&E	Men	Women	Percent women
1990.....	329,094	189,082	140,012	42.5	77,788	51,230	26,558	34.1	22,867	16,498	6,369	27.9
2000.....	399,686	197,827	201,859	50.5	94,706	53,382	41,324	43.6	25,966	16,518	9,394	36.3
2005.....	469,340	233,313	236,027	50.3	120,071	66,361	53,710	44.7	27,985	17,405	10,539	37.7
2006.....	477,589	237,336	240,253	50.3	119,686	65,262	54,424	45.5	29,866	18,369	11,478	38.5
2007.....	484,350	240,986	243,364	50.2	118,942	64,232	54,710	46.0	31,806	19,529	12,265	38.6
2008.....	494,627	246,014	248,613	50.3	124,754	67,600	57,154	45.8	32,832	19,854	12,971	39.5
2009.....	502,561	249,745	252,816	50.3	132,390	71,995	60,395	45.6	33,470	19,849	13,593	40.6

Source: U.S. National Science Foundation, *Science and Engineering Degrees: 1966–2008*, NSF-11-316, 2011, and unpublished data. See also <<http://www.nsf.gov/statistics/degrees/>>.

Table 813. Science and Engineering (S&E) Degrees as Share of Higher Education Degrees Conferred by State: 2007

[S&E degrees include physical, computer, agricultural, biological, earth, atmospheric, ocean, and social sciences; psychology; mathematics; and engineering]

State	S&E degrees conferred ¹	All higher education degrees ¹	S&E higher education degrees (percent)	State	S&E degrees conferred ¹	All higher education degrees ¹	S&E higher education degrees (percent)	State	S&E degrees conferred ¹	All higher education degrees ¹	S&E higher education degrees (percent)
U.S.	685,914	2,138,003	32.1								
AL.....	9,920	32,207	30.8	KY.....	7,218	27,152	26.6	ND.....	1,731	7,042	24.6
AK.....	750	2,261	33.2	LA.....	7,767	28,224	27.5	OH.....	24,410	82,584	29.6
AZ.....	13,463	74,778	18.0	ME.....	2,733	8,532	32.0	OK.....	7,442	24,244	30.7
AR.....	3,440	14,835	23.2	MD.....	16,932	41,936	40.4	OR.....	8,387	23,655	35.5
CA.....	89,947	204,838	43.9	MA.....	26,363	78,421	33.6	PA.....	35,314	113,396	31.1
CO.....	13,729	35,981	38.2	MI.....	23,006	75,304	30.6	RI.....	3,875	12,724	30.5
CT.....	9,052	27,781	32.6	MN.....	12,571	45,085	27.9	SC.....	7,649	25,841	29.6
DE.....	2,325	7,642	30.4	MS.....	4,294	16,438	26.1	SD.....	2,204	6,386	34.5
DC.....	8,287	20,489	40.4	MO.....	13,515	53,828	25.1	TN.....	9,272	36,576	25.3
FL.....	27,510	91,561	30.0	MT.....	2,450	6,509	37.6	TX.....	40,387	130,830	30.9
GA.....	16,566	49,495	33.5	NE.....	4,115	15,765	26.1	UT.....	8,787	23,993	36.6
HI.....	2,511	7,330	34.3	NV.....	2,267	7,279	31.1	VT.....	2,880	7,042	40.9
ID.....	2,859	9,614	29.7	NH.....	3,725	11,207	33.2	VA.....	20,679	53,981	38.3
IL.....	30,055	101,537	29.6	NJ.....	16,851	46,676	36.1	WA.....	14,206	37,541	37.4
IN.....	14,442	51,564	28.0	NM.....	3,302	9,748	33.9	WV.....	3,239	13,707	23.6
IA.....	7,893	25,698	30.7	NY.....	55,360	185,736	29.8	WI.....	13,691	41,842	32.7
KS.....	6,552	23,943	27.4	NC.....	19,022	55,071	34.5	WY.....	1,149	2,154	53.3

¹ Includes bachelor's, master's, and doctorate degrees.

Source: National Science Foundation, *Science and Engineering Indicators, 2010*, January 2010. See also <<http://www.nsf.gov/statistics/seind10/>>.

Table 814. Doctorates Conferred by Characteristics of Recipients: 2000 and 2009

[In percent, except as indicated. Based on the Survey of Earned Doctorate Awards. For description of methodology, see source]

Characteristic	2000, total ¹	2009										
		All fields ¹	Engineering	Physical sciences ²	Earth sciences ³	Mathematics	Computer sciences	Biological sciences ⁴	Agricultural	Social sciences ⁵	Psychology	
Total conferred (number).....	41,365	49,562	7,634	4,289	877	1,554	1,611	8,026	1,166	4,842	3,471	
Male.....	56.0	53.2	78.7	70.1	61.5	68.9	78.2	47.8	56.7	51.5	28.6	
Female.....	43.8	46.8	21.3	29.9	38.5	31.1	21.8	52.2	43.3	48.5	71.4	
RACE/ETHNICITY⁶												
Total conferred (number).....	29,936	32,231	3,148	2,351	556	772	735	5,513	668	3,026	2,896	
White ⁷	79.2	74.6	69.8	79.5	86.3	76.8	72.1	74.5	81.6	73.5	76.2	
Black ⁷	5.8	6.9	4.3	3.1	1.4	3.2	3.8	4.4	4.8	7.3	6.3	
Asian/Pacific ⁷	7.6	8.3	16.3	8.8	3.6	10.9	17.0	11.4	4.5	7.2	5.1	
Indian/Alaskan ⁷	0.6	0.5	0.4	0.2	0.4	0.4	0.0	0.3	0.4	0.7	0.4	
Hispanic.....	4.4	5.8	5.0	4.5	4.5	4.7	2.7	5.5	4.2	6.2	7.8	
Other/unknown ⁸	2.4	3.9	4.2	3.9	3.8	4.0	4.4	3.8	4.5	5.0	4.2	

¹ Includes other fields, not shown separately. ² Astronomy, physics, and chemistry. ³ Includes earth, atmospheric and ocean sciences. ⁴ Biochemistry, botany, microbiology, physiology, zoology, and related fields. ⁵ Anthropology, sociology, political science, economics, international relations, and related fields. ⁶ Excludes those with temporary visas. ⁷ Non-Hispanic. ⁸ Data 2001 and after includes Native Hawaiians and Other Pacific Islanders, respondents choosing multiple races (excluding those selecting an Hispanic ethnicity), and respondents with unknown race/ethnicity.

Source: U.S. National Science Foundation, *Science and Engineering Doctorate Awards*, NSF-11-306, annual. See also <<http://www.nsf.gov/statistics/doctorates/>>.

Table 815. Doctorates Awarded by Field of Study and Year of Doctorate: 2000 to 2009

[Based on the Survey of Earned Doctorates; for information, see source]

Field of Study	2000	2004	2005	2006	2007	2008	2009
Total, all fields	41,366	42,118	43,381	45,617	48,130	48,763	49,562
Science and engineering, total	25,966	26,274	27,986	29,866	31,806	32,832	33,470
Engineering, total	5,323	5,777	6,427	7,185	7,745	7,859	7,634
Aeronautical/astronautical	214	201	219	238	267	266	296
Chemical	619	638	774	799	807	872	808
Civil	480	547	622	655	701	712	708
Electrical	1,330	1,389	1,547	1,786	1,968	1,887	1,694
Industrial/manufacturing	176	217	221	234	281	280	252
Materials/metallurgical	404	474	493	583	648	635	622
Mechanical	807	754	892	1,044	1,072	1,081	1,095
Other	1,293	1,557	1,659	1,846	2,001	2,126	2,159
Science, total	20,643	20,497	21,559	22,681	24,061	24,973	25,836
Biological/agricultural sciences	6,890	6,987	7,404	7,682	8,320	8,885	9,192
Agricultural sciences	1,037	1,045	1,038	1,033	1,133	1,087	1,166
Biological sciences	5,853	5,942	6,366	6,649	7,187	7,798	8,026
Earth, atmospheric, and ocean sciences, total	694	686	714	757	878	865	877
Atmospheric	143	126	145	146	167	188	167
Earth/ocean sciences	551	560	569	611	711	677	710
Mathematical/computer sciences, total	1,911	2,024	2,334	2,778	3,049	3,186	3,165
Computer sciences	861	948	1,129	1,453	1,656	1,787	1,611
Mathematics	1,050	1,076	1,205	1,325	1,393	1,399	1,554
Physical sciences, total	3,378	3,335	3,643	3,927	4,101	4,082	4,289
Astronomy	185	165	186	197	223	249	262
Chemistry	1,989	1,986	2,126	2,362	2,324	2,247	2,398
Physics	1,204	1,184	1,331	1,368	1,554	1,586	1,629
Psychology	3,615	3,326	3,323	3,260	3,291	3,356	3,471
Social sciences, total	4,155	4,139	4,141	4,277	4,422	4,599	4,842
Economics	1,086	1,069	1,183	1,142	1,180	1,202	1,237
Political science	986	947	990	1,001	1,037	1,020	1,140
Sociology	617	580	536	579	576	601	664
Other social sciences	1,466	1,543	1,432	1,555	1,629	1,776	1,801
Non-science and engineering, total	15,400	15,844	15,395	15,751	16,324	15,931	16,092
Education	6,437	6,633	6,225	6,120	6,456	6,554	6,531
Health	1,591	1,719	1,784	1,905	2,132	2,090	2,094
Humanities	5,213	5,012	4,950	5,124	4,890	4,502	4,667
Professional/other/unknown	2,159	2,480	2,436	2,602	2,846	2,785	2,800

Source: U.S. National Science Foundation, *Science and Engineering Doctorate Awards*, annual. See also <<http://www.nsf.gov/statistics/doctorates/>>.

Table 816. Scientists and Engineers by Selected Demographic Characteristics: 2006

[In thousands (22,630 represents 22,630,000). Scientists and engineers refer to all persons who have received a bachelor's degree or higher in science and engineering (S&E), or S&E related field, plus persons holding a non-S&E degree or higher, employed in S&E or S&E related field]

Characteristic	Both sexes			Characteristic	Both sexes		
	Female	Male	Female		Male		
All scientists and engineers	22,630	10,230	12,400	Highest degree attained:			
Age:				Bachelor's	13,228	6,223	7,005
29 or younger	2,732	1,542	1,190	Master's	6,411	3,039	3,373
30-39 years	5,302	2,596	2,705	Doctorate	1,018	308	710
40-49 years	5,849	2,699	3,150	Professional	1,973	660	1,312
50-59 years	5,400	2,303	3,097	Citizenship status:			
60-69 years	2,497	835	1,662	U.S. citizen, native	19,131	8,743	10,387
70 or older	851	254	596	U.S. citizen, naturalized	2,373	1,062	1,311
Race/ethnicity:				Non-U.S. citizen, permanent resident	835	330	505
American Indian/Alaska Native	102	51	50	Non-U.S. citizen, temporary resident	291	95	196
Asian	2,255	994	1,261	Marital status:			
Black	1,258	738	520	Married	16,100	6,655	9,445
Native Hawaiian/Other Pacific Islander	85	33	53	Living in marriage-like relationship	892	482	410
White	17,420	7,670	9,751	Widowed	356	245	111
Multiple race	316	156	159	Separated	243	131	111
Hispanic, any race	1,193	588	605	Divorced	1,518	887	631
Children in the home?				Never married	3,521	1,829	1,692
Yes	10,966	5,015	5,951				
No	11,664	5,215	6,449				

Source: National Science Foundation, Division of Science Resource Statistics, Scientists and Engineers Statistical Data System (SESTAT), <<http://www.nsf.gov/statistics/sestat/>>, accessed March 2008.

Table 817. Civilian Employment of Scientists, Engineers, and Related Occupations by Occupation and Industry: 2008

[In thousands (293.0 represents 293,000). Standard Occupational Classification system categorize workers in 1 of 801 detailed occupations. Industry classifications correspond to 2007 North American Industry Classification (NAICS) industrial groups. For definition of scientists and engineers, see text this section]

Occupation	Total employment, all workers	Wage and salary workers						Self employed ²
		Mining (NAICS 21) ¹	Construction (NAICS 23)	Manufacturing (NAICS 31-33)	Information (NAICS 51)	Professional, technical and scientific services (NAICS 54)	Government (NAICS 99)	
Computer and information systems managers	293.0	0.4	0.7	27.5	33.6	73.5	19.0	9.6
Engineering managers	184.0	1.8	5.0	74.9	5.2	59.2	15.7	1.1
Natural science managers	44.6	0.2	(NA)	6.9	(NA)	16.2	13.8	(NA)
Computer and mathematical scientists	3,540.4	7.6	(NA)	272.7	422.3	1,121.5	247.4	155.3
Computer specialists	3,424.3	7.1	9.8	266.1	415.7	1,096.0	228.2	154.6
Mathematical science occupations	116.1	(NA)	0.2	6.6	6.5	25.5	19.2	0.8
Surveyors, cartographers, and photogrammetrists	70.0	0.8	3.8	0.1	(NA)	50.4	10.1	1.8
Engineers ³	1,571.9	26.1	47.7	559.6	41.5	468.8	190.3	41.8
Aerospace engineers	71.6	(NA)	(NA)	38.4	(NA)	17.8	9.5	2.4
Civil engineers	278.4	0.8	31.1	2.5	0.8	141.0	75.4	12.0
Computer and hardware engineers	74.7	(NA)	(NA)	32.1	3.5	24.5	4.7	1.0
Electrical and electronics engineers	301.5	0.3	4.8	105.3	32.4	76.9	26.4	4.8
Industrial engineers ⁴	240.4	2.4	6.4	155.2	2.5	33.5	6.1	1.8
Mechanical engineers	238.7	1.3	3.1	121.2	0.2	69.7	12.3	5.5
Drafters, engineering, and mapping technicians ⁵	826.2	5.3	26.0	229.8	22.4	315.0	108.5	15.1
Engineering technicians	497.3	3.9	5.1	169.5	18.9	124.3	91.7	3.6
Surveying and mapping technicians	77.0	0.6	(NA)	0.1	0.8	53.0	11.7	4.3
Life, physical, and social science occupations	1,460.8	20.1	(NA)	155.6	28.6	376.0	314.5	97.8
Life scientists	279.4	(NA)	(NA)	36.5	0.2	71.9	67.9	9.9
Physical scientists	275.5	9.4	(NA)	43.3	1.2	100.8	76.3	6.3
Social scientists and related occupations	549.4	0.3	2.6	22.3	26.7	111.0	82.6	78.2
Life, physical, and social science technicians	356.5	10.3	0.6	53.4	0.5	92.4	87.7	3.4

NA Not available. ¹ Includes oil and gas extraction. ² Includes secondary jobs and unpaid private household employment.

³ Includes kinds of engineers not shown separately. ⁴ Includes health and safety engineers. ⁵ Includes other drafters, technicians, and mapping technicians.

Source: U.S. Bureau of Labor Statistics, National Employment Matrix, December 2009 (data collected biennially). See also <<http://www.bls.gov/emp/empolls.htm>>.

Table 818. Employment and Earnings in Science and Engineering (S&E) Occupations by Industry: 2006

[As of May 2006. Industries ordered by Science and Engineering share of total employment]

Industry	2002 NAICS code ¹	Workers employed (number)		S&E workers as percent of all employed	Mean earnings in S&E occupations (dollars)
		All occupations	S&E occupations		
Computer systems design and related services	5415	1,254,320	609,590	48.6	75,040
Software publishers	5112	240,130	116,260	48.4	79,120
Scientific research and development services	5417	586,220	247,310	42.2	81,220
Computer and peripheral equipment manufacturing	3341	199,370	79,040	39.6	90,710
Internet service providers and Web search portals	5181	119,560	46,120	38.6	69,720
Data processing, hosting, and related services	5182	264,320	83,470	31.6	70,460
Internet publishing and broadcasting	5161	33,220	9,810	29.5	69,800
Architectural, engineering, and related services	5413	1,361,280	397,910	29.2	74,570
Communications equipment manufacturing	3342	144,200	39,270	27.2	83,400
Navigational, measuring, electromedical, and control instruments manufacturing	3345	435,510	117,950	27.1	82,190
Aerospace product and parts manufacturing	3364	464,990	114,620	24.6	80,410
Securities and commodity exchanges	5232	8,850	1,930	21.8	74,000
Semiconductor and other electronic component manufacturing	3344	452,060	93,940	20.8	83,490
Pharmaceutical and medicine manufacturing	3254	288,270	55,640	19.3	73,710
Other telecommunications	5179	5,300	980	18.5	73,820

¹ North American Industry Classification System (NAICS), 2002; see text Section 15.

Source: U.S. National Science Foundation, *Science and Engineering Indicators 2008*, January 2008. See also <<http://nsf.gov/statistics/seind08/>>.

Table 819. Employment, Mean Earnings, and Growth in Science and Engineering (S&E) Occupations: 2004 to 2008

[Minus sign (-) represents a decrease. Based on data derived from Bureau of Labor Statistics' Occupational Employment Survey (OES)]

Occupation	Employment					Mean earnings	
	2004, total	2008, total	Total growth	Total growth rate (percent)	Average annual growth rate (percent)	2008 annual earnings (dol.)	Average annual growth rate (percent)
All occupations	128,127,360	135,185,230	7,057,870	5.5	1.3	42,270	3.4
STEM ¹	7,160,770	7,852,710	691,940	9.7	2.3	74,950	3.6
S&E	5,085,740	5,781,460	695,720	13.7	3.3	76,680	3.5
Engineers	1,487,810	1,626,330	138,520	9.3	2.3	84,120	3.7
Mathematical and computer scientists	2,566,170	2,972,940	406,770	15.9	3.7	74,420	3.4
Life scientists	275,500	319,520	44,020	16.0	3.8	75,130	3.7
Physical scientists	273,360	301,500	28,140	10.3	2.5	76,710	3.8
Social scientists	482,900	561,160	78,260	16.2	3.8	67,980	2.9
Technicians, programmers, and S&E managers	2,075,020	2,071,260	-3,760	-0.2	(Z)	70,170	3.6
S&E related	6,914,070	7,737,490	823,420	11.9	2.9	(NA)	(NA)
Healthcare practitioners and technicians	6,769,900	7,569,040	799,140	11.8	2.8	(NA)	(NA)
Other S&E related	144,170	168,450	24,280	16.8	4.0	(NA)	(NA)
Not STEM or S&E related	114,052,530	119,595,020	5,542,490	4.9	1.2	(NA)	(NA)

NA Not available. Z Less than 0.05. ¹ STEM = science, technology, engineering, and mathematics.

Source: National Science Foundation, *Employment in Science and Engineering Occupations Reached 5.8 Million in 2008*, NSF 10-315, 2010. See also <<http://www.nsf.gov/statistics/infbrief/nsf10315/>>.

Table 820. Research and Development (R&D) Scientists and Engineers—Employment and Cost by Industry: 2005 to 2007

[In thousands (1,104.5 represents 1,104,500). Data are estimates on full-time-equivalent (FTE) basis. Based on the Survey of Industrial Research and Development. The Business R&D and Innovation Survey replaces the Survey of Industrial Research and Development for data available as of December 2010; see <<http://www.nsf.gov/statistics/srvyindustry/about/brdis/>>]

Industry	NAICS ¹ code	Employed scientists and engineers ² (1,000)			Cost per scientist or engineer, constant (2000) dollars ^{3,4} (\$1,000)		
		2005	2006	2007	2005	2006	2007
All industries ⁵	(X)	1,104.5	1,116.6	1,133.0	192.4	201.6	211.9
Chemicals	325	118.3	123.2	134.0	328.5	330.1	356.4
Machinery	333	61.1	62.3	61.9	125.2	141.1	144.4
Electrical equipment, appliances, and components	335	18.7	16.9	15.8	(D)	(D)	(D)
Motor vehicles, trailers, and parts	3361-3363	42.0	42.0	(NA)	(D)	(D)	(D)
Aerospace products and parts	3364	39.7	39.5	40.2	335.4	359.4	380.5
Software publishing	5112	93.4	46.5	(NA)	162.5	174.0	175.4
Architectural, engineering, and related services	5413	35.8	41.2	48.5	129.3	146.4	113.9
Computer systems design and related services	5415	82.4	93.1	88.1	158.5	157.2	160.3
Scientific R&D services	5417	43.7	44.3	50.4	264.0	298.2	308.7
NOTE: Constant 2000 dollar deflator.	(X)	(X)	(X)	(X)	1.1303	1.1668	1.1982

D Withheld to avoid disclosure. NA Not available. X Not applicable. ¹ North American Industry Classification System 2002 (NAICS); see text, Section 15. ² The mean number of full-time equivalent (R&D) scientists and engineers employed in January of the year shown and the following January. ³ Based on gross domestic product implicit price deflator. ⁴ Represents the arithmetic mean of the numbers of R&D scientists and engineers reported in each industry for January in 2 consecutive years divided into total R&D expenditures in each industry. ⁵ Includes other industries not shown separately.

Source: National Science Foundation, *Research and Development in Industry*, NSF 10-319, 2010, and unpublished data. See also <<http://www.nsf.gov/statistics/industry/>>.

Table 821. Federal Outlays for General Science, Space, and Other Technology, 1970 to 2010, and Projections, 2011 and 2012

[In billions of dollars (4.5 represents \$4,500,000,000). For fiscal years ending in year shown; see text, Section 8]

Year	Current dollars			Constant (2005) dollars		
	Total	General science/basic research	Space and other technologies	Total	General science/basic research	Space and other technologies
1970.....	4.5	0.9	3.6	22.7	4.8	17.9
1980.....	5.8	1.4	4.5	13.5	3.2	10.3
1985.....	8.6	2.0	6.6	14.7	3.4	11.3
1990.....	14.4	2.8	11.6	21.1	4.1	17.0
1995 ¹	16.7	4.1	12.6	20.9	5.1	15.8
2000.....	18.6	6.2	12.4	21.2	7.0	14.2
2001.....	19.8	6.5	13.2	22.0	7.3	14.7
2002.....	20.7	7.3	13.5	22.7	7.9	14.7
2003.....	20.8	8.0	12.9	22.2	8.5	13.7
2004.....	23.0	8.4	14.6	23.9	8.7	15.2
2005.....	23.6	8.8	14.8	23.6	8.8	14.8
2006.....	23.6	9.1	14.5	22.8	8.8	14.0
2007.....	25.5	10.3	15.3	24.0	9.6	14.3
2008.....	27.7	10.5	17.2	25.1	9.5	15.6
2009.....	29.4	11.1	18.4	26.6	10.0	16.6
2010.....	31.0	12.7	18.4	27.5	11.2	16.3
2011, proj.....	33.4	14.7	17.1	29.2	12.9	14.9
2012, proj.....	32.3	14.9	17.4	27.8	12.8	15.0

¹ Due to the effects of the Credit Reform Act of 1990 on the measurement and classification of federal credit activities, the discretionary outlays for years prior to 1995 are not strictly comparable to those for 1995 and after. However, the discretionary outlays shown for 1995 are no more than \$1 billion higher than they would have been if measured on the same (pre-credit reform) basis as the 1990 outlays.

Source: U.S. Office of Management and Budget, *Budget of the United States Government: Historical Tables, Fiscal Year 2012*, annual. See also <<http://www.gpoaccess.gov/usbudget/fy12/hist.html>>.

Table 822. Worldwide Space Launch Events: 2000 to 2010

[In millions of dollars (2,729 represents \$2,729,000,000)]

Country	Non-commercial launches				Commercial launches				Launch revenues for commercial launch events (mil. dol.)			
	2000	2005	2009	2010	2000	2005	2009	2010	2000	2005	2009	2010
Total.....	50	37	54	51	35	18	24	23	2,729	1,190	2,410	2,453
United States.....	21	11	20	11	7	1	4	4	370	70	298	307
Russia.....	23	18	19	18	13	8	10	13	671	350	742	826
Europe.....	—	—	2	0	12	5	5	6	1,433	490	1,020	1,320
China ¹	5	5	5	15	—	—	1	—	(X)	(X)	70	(X)
India.....	—	1	2	3	—	—	—	—	(X)	(X)	(X)	(X)
Japan.....	1	2	3	2	—	—	—	—	(X)	(X)	(X)	(X)
Israel.....	—	—	—	1	—	—	—	—	(X)	(X)	(X)	(X)
Ukraine.....	—	—	—	—	—	—	—	—	(X)	(X)	(X)	(X)
Iran.....	—	—	1	—	—	—	—	—	(X)	(X)	(X)	(X)
Brazil.....	—	—	—	—	—	—	—	—	(X)	(X)	(X)	(X)
Korea, North.....	—	—	1	—	—	—	—	—	(X)	(X)	(X)	(X)
Korea, South.....	—	—	1	1	—	—	—	—	(X)	(X)	(X)	(X)
Multinational.....	—	—	—	—	3	4	4	—	255	280	280	(X)

— Represents zero. X Not applicable. ¹ See footnote 4, Table 1332.

Source: Federal Aviation Administration, *Commercial Space Transportation: 2010 Year in Review*, January 2011, and prior years. See also <http://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/year_review>.