Chapter 8
State Indicators

Elementary/Secondary Education

Higher Education

Workforce

Financial Research and Development Inputs

R&D Outputs

Science and Technology in the Economy

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Introduction

Chapter Overview

In response to increasing interest in both the policy and research communities about the role of science and technology (S&T) in state and regional economic development, a new chapter devoted to the subject was introduced in the 2004 edition of *Science and Engineering Indicators.* The chapter focuses on the S&T indicators for individual states and the District of Columbia. It has been expanded in the 2008 edition from the original 24 state indicators to 47.

The reader is cautioned that all of the indicators are broad measures, and several rely on sample estimates that have a margin of error that may be substantial for some states; this is called out in appropriate places. In any case, small differences in state values generally carry no useful information.

The indicators are designed to present information about various aspects of state S&T infrastructure and to stimulate discussion about appropriate uses of state-level S&T indicators. The data used to calculate the indicators were gathered from both public and private sources. Whenever possible, data covering a 10-year span are provided to identify meaningful trends. However, because consistent data were not always available for the 10-year period, data for certain indicators are given only for the years in which comparisons are appropriate.

Ready access to accurate and timely information is an important tool for formulating effective S&T policies at the state level. By studying the programs and performance of their peers, state policymakers may be able to better assess and enhance their own programs and performance. The tables are intended to give the user a convenient listing of some of the quantitative data that may be relevant to technology-based economic development. In addition to describing the behavior of an indicator, the "Findings" section frequently presents an interpretation of the behavior's relevance and meaning. The interpretation is sometimes speculative, with the objective of motivating further thought and discussion.

Types of Indicators

Forty-seven indicators are included in this chapter and grouped into the following areas:

- Elementary and secondary education
- Higher education
- Workforce
- Financial research and development inputs
- Research and development outputs
- S&T in the economy

The first two areas address state educational attainment. In this edition of *Indicators*, emphasis has been increased on the science and mathematics skills students develop at the elementary and middle school levels. Additional information on gender and racial/ethnic performance has been added in appendix tables 8-1 through 8-12 for those indicators reporting mathematics and science results for fourth and eighth graders. Student achievement is expressed in terms of performance, which refers to the average state score on a standardized test, and proficiency, which is expressed as the percentage of students who have achieved at least the expected level of competence on the standardized test.

Comparable state-level performance data are not available for high school students. Instead, mastery of college-level material through performance on Advanced Placement Exams has been included as a measure of the skills being developed by the top-performing high school students. Other indicators in education focus on state spending, teacher salaries, student costs, and undergraduate and graduate degrees in S&E. Three new indicators have been added to measure the level of education in the population of individual states.

Workforce indicators focus on the level of S&E training in the employed labor force. These indicators reflect the higher education level of the labor force and the degree of specialization in S&E disciplines and occupations.

Financial indicators address the sources and level of funding for R&D. They show how much R&D is being performed relative to the size of a state's business base. Comparison of these indicators illustrates the extent to which R&D is conducted by industrial or academic performers.

The Experimental Program to Stimulate Competitive Research (EPSCoR program) is a federal program aimed at building R&D capacity in states that have historically been less competitive in receiving federal R&D funding. Because this program does not cover all states and is basically focused on academic institutions, it is covered in chapter 5, Academic Research and Development, in the sidebar, "EPSCoR—the Experimental Program to Stimulate Competitive Research."

The final two sections provide measures of outputs. The first focuses on the work products of the academic community and includes the production of new doctorate holders, the publication of academic articles, and patent activity both from the academic community and from all sources in the state.

The second section of output indicators examines the robustness of a region's S&T activity. These indicators include venture capital activity, Small Business Innovation Research awards, and high-technology business activity. Although data that adequately address both the quantity and quality of R&D results are difficult to find, these indicators offer a reasonable information base.

Data Sources and Considerations

Raw data for each indicator are presented in the tables. The first entry in each table represents the average value for the states. For most indicators, the state average was calculated by summing the values for the 50 states and the District of Columbia for both the numerator and the denominator and then dividing the two. Any alternate approach is indicated in the notes at the bottom of the table.

The values for most indicators are expressed as ratios or percentages to remove the effect of state size and facilitate comparison between large and small states or heavily and sparsely populated states. For example, an indicator of higher education achievement is not defined as the absolute number of degrees conferred in a state because sparsely populated states are neither likely to have nor need as extensive a higher education system as states with larger populations. Instead, the indicator is defined as the number of degrees per number of residents in the college-age cohort, which measures the intensity of educational services relative to the size of the resident population.

No official list of high-technology industries or sanctioned methodology to identify the most technology-intensive industries exists in the United States. The definition used here was developed by the Bureau of Labor Statistics and is based on the percentage of employment in technology-oriented occupations. See "Technical Note: Defining High-Technology Industries."

Although data for Puerto Rico are reported whenever available, they frequently were collected by a different source, making it unclear whether the methodology used for data collection and analysis is comparable with that used for the states. For this reason, Puerto Rico was neither ranked with the states nor assigned a quartile value that could be displayed on the maps. Including data for U.S. territories and protectorates, such as American Samoa, Guam, Northern Mariana Islands, and Virgin Islands, was considered; however, data for these areas were available only on a sporadic basis and for fewer than one-quarter of the indicators, so they were not included.

Key Elements for Indicators

Six key elements are provided for each indicator. The first element is a map that is color-coded to show in which quartile each state placed on that indicator for the latest year that data were available. This helps the reader quickly grasp geographic patterns. The sample map below shows the outline of each state. On the indicator maps, the darkest color indicates states ranking in the first or highest quartile, and white indicates states ranking in the fourth or lowest quartile. Cross-hatching indicates states for which no data are available.

The second element is a quartiles table. States are listed alphabetically by quartile. The range of indicator values for that quartile is shown at the top of the column. Ties at quartile breaks were resolved by moving the tied states into one quartile. Differences in states at the margins of adjacent quartiles will often not be substantively meaningful.

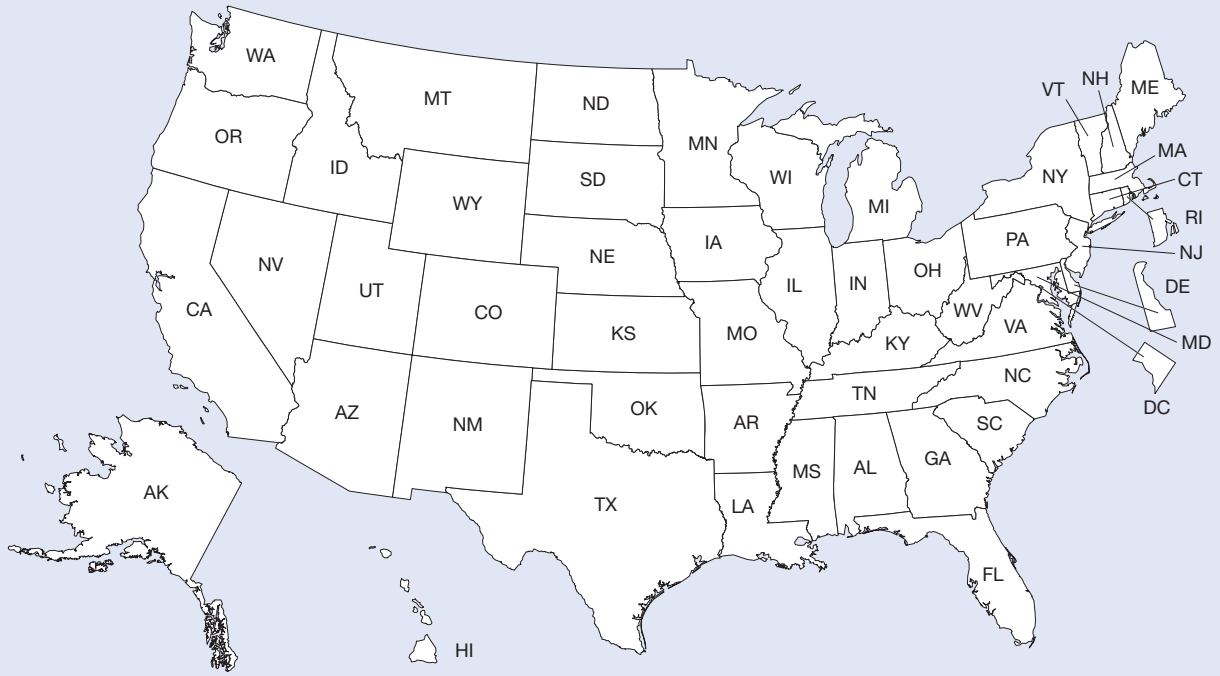
The third element, at the bottom of the map box, is a short citation for the data source. The full citation appears under the table on the facing page.

The fourth element, in a shaded box on the lower left side of the page, is a summary of findings that includes the national average and comments on trends and patterns for the particular indicator. Although most of the findings are directly related to the data, some represent interpretations that are meant to stimulate further investigation and discussion.

The fifth element, on the lower right side of the page, is a description of the indicator, a brief note about the nature of the data, and other information pertaining to the data.

The final element is the data table that appears on the facing page. Up to 3 years of data and the calculated values of the indicator are presented for each state, the District of Columbia, and Puerto Rico. Puerto Rico is included in the data table only when data are available.

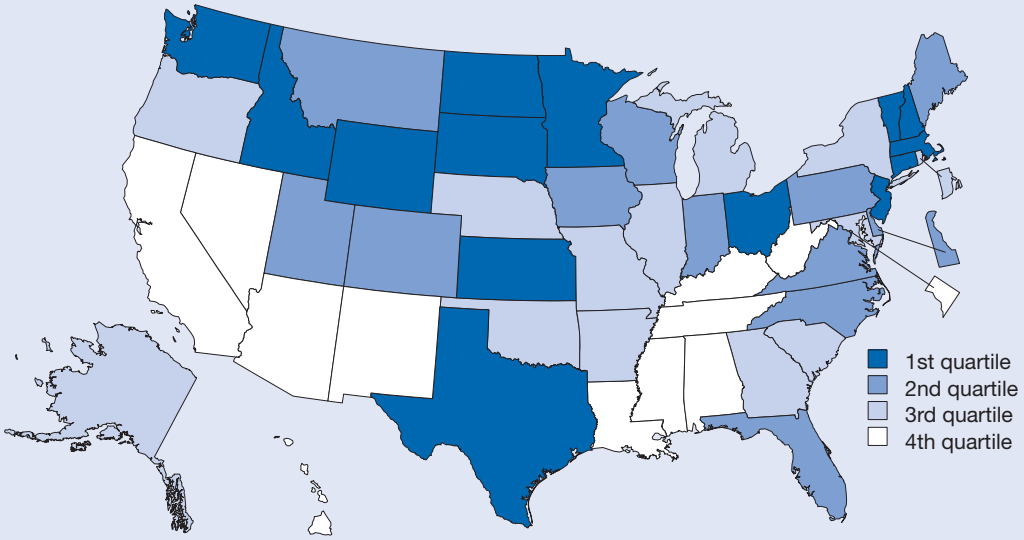
U.S. Map and List of Abbreviations



AK..... Alaska	HI .....Hawaii	ME .....Maine	NJ..... New Jersey	SD .....South Dakota
AL ..... Alabama	IA .....Iowa	MI .....Michigan	NM ..... New Mexico	TN .....Tennessee
AR..... Arkansas	ID .....Idaho	MN.....Minnesota	NV ..... Nevada	TX.....Texas
AZ..... Arizona	IL.....Illinois	MO .....Missouri	NY..... New York	UT .....Utah
CA..... California	IN .....Indiana	MS.....Mississippi	OH..... Ohio	VA.....Virginia
CO ..... Colorado	KS.....Kansas	MT .....Montana	OK..... Oklahoma	VT.....Vermont
CT..... Connecticut	KY.....Kentucky	NC .....North Carolina	OR..... Oregon	WA.....Washington
DC ..... District of Columbia	LA .....Louisiana	ND .....North Dakota	PA..... Pennsylvania	WI.....Wisconsin
DE..... Delaware	MA .....Massachusetts	NE.....Nebraska	RI..... Rhode Island	WV.....West Virginia
FL ..... Florida	MD .....Maryland	NH .....New Hampshire	SC ..... South Carolina	WY .....Wyoming
GA ..... Georgia				

Fourth Grade Mathematics Performance

Figure 8-1
Fourth grade mathematics performance: 2005



1st quartile (247–242)	2nd quartile (241–239)	3rd quartile (238–233)	4th quartile (232–211)
Connecticut	Colorado	Alaska	Alabama
Idaho	Delaware	Arkansas	Arizona
Kansas	Florida	Georgia	California
Massachusetts	Indiana	Illinois	District of Columbia
Minnesota	Iowa	Maryland	Hawaii
New Hampshire	Maine	Michigan	Kentucky
New Jersey	Montana	Missouri	Louisiana
North Dakota	North Carolina	Nebraska	Mississippi
Ohio	Pennsylvania	New York	Nevada
South Dakota	Utah	Oklahoma	New Mexico
Texas	Virginia	Oregon	Tennessee
Vermont	Wisconsin	Rhode Island	West Virginia
Washington		South Carolina	
Wyoming			

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (various years). See table 8-1.

Findings

- In 2005, the nationwide average mathematics score of fourth grade public school students was 237, a significant increase from 224 in 2000.
- For the 41 jurisdictions that participated in both the 2000 and 2005 mathematics assessments, the average score for public school fourth graders showed a statistically significant increase between 2000 and 2005. Only the District of Columbia reported a 2005 average score below the 2000 national average of 224.
- The entire fourth grade student sample, including students performing at the 10th, 25th, 50th, 75th, and 90th percentiles, demonstrated statistically significant gains in mathematics scores between 2000 and 2005.
- The gaps in mathematics scores between white fourth graders and black or Hispanic fourth graders narrowed between 2000 and 2005. The fourth grade gender gap in mathematics scores, although much smaller, decreased slightly between 2000 and 2005.

This indicator reports each state's average score on the National Assessment of Educational Progress (NAEP) in mathematics for its fourth grade students in public schools. High scores indicate that fourth graders are demonstrating a solid foundation for adult mathematics competency. The NAEP mathematics assessment is a federally authorized assessment of student performance in which all 50 states and the District of Columbia participated in 2005. Student performance is described in terms of average scores on a scale from 0 to 500.

Several recent changes to the NAEP methodology affect yearly comparisons. Beginning in 2002, NAEP obtained a national sample by aggregating the samples from each state rather than by selecting it independently; the increased national sample size makes smaller differences statistically significant. In 2005, NAEP included in the definition of the national sample all international Department of Defense schools.

NAEP allows students with disabilities or limited English proficiency to use certain accommodations (e.g., extended time, individual testing, or small group testing). All data presented here represent scores from tests taken with accommodations offered.

Table 8-1
Fourth grade mathematics performance, by state: 2000, 2003, and 2005
(Score)

State	2000	2003	2005
United States	224	234	237
Alabama	217	223	225
Alaska	NA	233	236
Arizona	219	229	230
Arkansas	216	229	236
California	213	227	230
Colorado	NA	235	239
Connecticut	234	241	242
Delaware	NA	236	240
District of Columbia	192	205	211
Florida	NA	234	239
Georgia	219	230	234
Hawaii	216	227	230
Idaho	224	235	242
Illinois	223	233	233
Indiana	233	238	240
Iowa	231	238	240
Kansas	232	242	246
Kentucky	219	229	231
Louisiana	218	226	230
Maine	230	238	241
Maryland	222	233	238
Massachusetts	233	242	247
Michigan	229	236	238
Minnesota	234	242	246
Mississippi	211	223	227
Missouri	228	235	235
Montana	228	236	241
Nebraska	225	236	238
Nevada	220	228	230
New Hampshire	NA	243	246
New Jersey	NA	239	244
New Mexico	213	223	224
New York	225	236	238
North Carolina	230	242	241
North Dakota	230	238	243
Ohio	230	238	242
Oklahoma	224	229	234
Oregon	224	236	238
Pennsylvania	NA	236	241
Rhode Island	224	230	233
South Carolina	220	236	238
South Dakota	NA	237	242
Tennessee	220	228	232
Texas	231	237	242
Utah	227	235	239
Vermont	232	242	244
Virginia	230	239	240
Washington	NA	238	242
West Virginia	223	231	231
Wisconsin	NA	237	241
Wyoming	229	241	243
Puerto Rico	NA	NA	NA

NA = not available

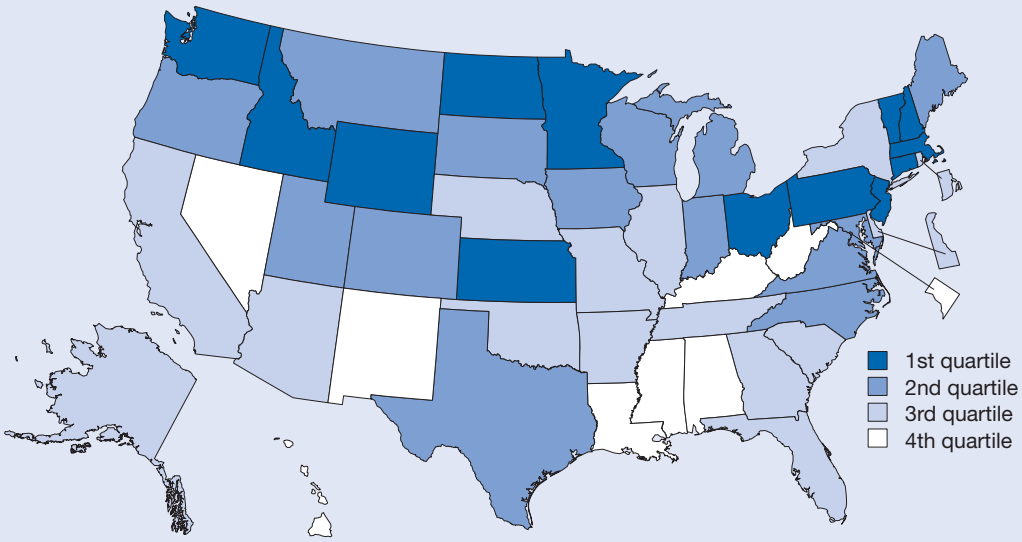
NOTES: National average for United States is reported value in National Assessment of Educational Progress (NAEP) reports. NAEP grade 4 mathematics scores for public schools only.

SOURCE: National Center for Education Statistics, NAEP (various years).

Science & Engineering Indicators 2008

Fourth Grade Mathematics Proficiency

Figure 8-2
Fourth grade mathematics proficiency: 2005



1st quartile (49%–41%)	2nd quartile (40%–37%)	3rd quartile (36%–28%)	4th quartile (27%–9%)
Connecticut	Colorado	Alaska	Alabama
Idaho	Indiana	Arizona	District of Columbia
Kansas	Iowa	Arkansas	Hawaii
Massachusetts	Maine	California	Kentucky
Minnesota	Maryland	Delaware	Louisiana
New Hampshire	Michigan	Florida	Mississippi
New Jersey	Montana	Georgia	Nevada
North Dakota	North Carolina	Illinois	New Mexico
Ohio	Oregon	Missouri	West Virginia
Pennsylvania	South Dakota	Nebraska	
Vermont	Texas	New York	
Washington	Utah	Oklahoma	
Wyoming	Virginia	Rhode Island	
	Wisconsin	South Carolina	
		Tennessee	

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (various years). See table 8-2.

Findings

- In 2005 nationwide, 35% of fourth grade public school students performed at or above the proficient level in mathematics, which represents a significant increase from 22% in 2000.
- Of the 41 jurisdictions that participated in both the 2000 and 2005 assessments, all showed increases in mathematics proficiency levels for public school fourth graders in 2005. In 2005, only 3 states and the District of Columbia had mathematics proficiency percentages below the 2000 national average of 22% compared with 20 jurisdictions below 22% in 2000.
- Substantial differences in mathematics proficiency exist between racial/ethnic groups of fourth graders. The gaps increased between 2000 and 2005 as blacks and Hispanics failed to match the gains made in mathematics proficiency by whites. The gender gap in proficiency among fourth graders is much smaller and remained unchanged between 2000 and 2005.

This indicator is the proportion of a state's fourth grade students in public schools that have achieved proficiency in mathematics. High indicator values show that a high percentage of a state's fourth graders has demonstrated a solid foundation for adult mathematics competency. Proficiency is based on achievement levels in the National Assessment of Educational Progress (NAEP) that reflect performance standards set by the National Assessment Governing Board to provide a context for interpreting student performance on NAEP. Approximately 172,000 fourth grade students in 8,700 schools participated in the 2005 NAEP mathematics assessment.

For the fourth grade, the basic level (scores of 214–248) denotes partial mastery of knowledge and skills that are prerequisite for proficient work. The proficient level (249–281) represents solid academic performance and demonstrates competency over challenging subject matter knowledge, its application to real-world situations, and mastery of appropriate analytical skills. The advanced level (282–500) signifies superior performance.

Table 8-2
Fourth grade mathematics proficiency, by state: 2000, 2003, and 2005
(Percent)

State	2000	2003	2005
United States	22	31	35
Alabama	13	19	21
Alaska	NA	30	34
Arizona	16	25	28
Arkansas	14	26	34
California	13	25	28
Colorado	NA	34	39
Connecticut	31	41	43
Delaware	NA	31	36
District of Columbia	5	7	9
Florida	NA	31	36
Georgia	17	27	30
Hawaii	14	23	27
Idaho	20	31	41
Illinois	20	32	32
Indiana	30	35	38
Iowa	26	36	37
Kansas	29	41	47
Kentucky	17	22	27
Louisiana	14	21	24
Maine	23	34	39
Maryland	21	31	38
Massachusetts	31	41	49
Michigan	28	34	37
Minnesota	33	42	47
Mississippi	9	17	19
Missouri	23	30	31
Montana	24	31	39
Nebraska	24	34	36
Nevada	16	23	26
New Hampshire	NA	43	47
New Jersey	NA	39	46
New Mexico	12	17	19
New York	21	33	36
North Carolina	25	41	40
North Dakota	25	34	41
Ohio	25	36	43
Oklahoma	16	23	28
Oregon	23	33	37
Pennsylvania	NA	36	41
Rhode Island	22	28	31
South Carolina	18	32	36
South Dakota	NA	34	40
Tennessee	18	24	28
Texas	25	33	40
Utah	23	31	37
Vermont	29	42	43
Virginia	24	36	40
Washington	NA	36	42
West Virginia	17	24	26
Wisconsin	NA	35	40
Wyoming	25	39	42
Puerto Rico	NA	NA	NA

NA = not available

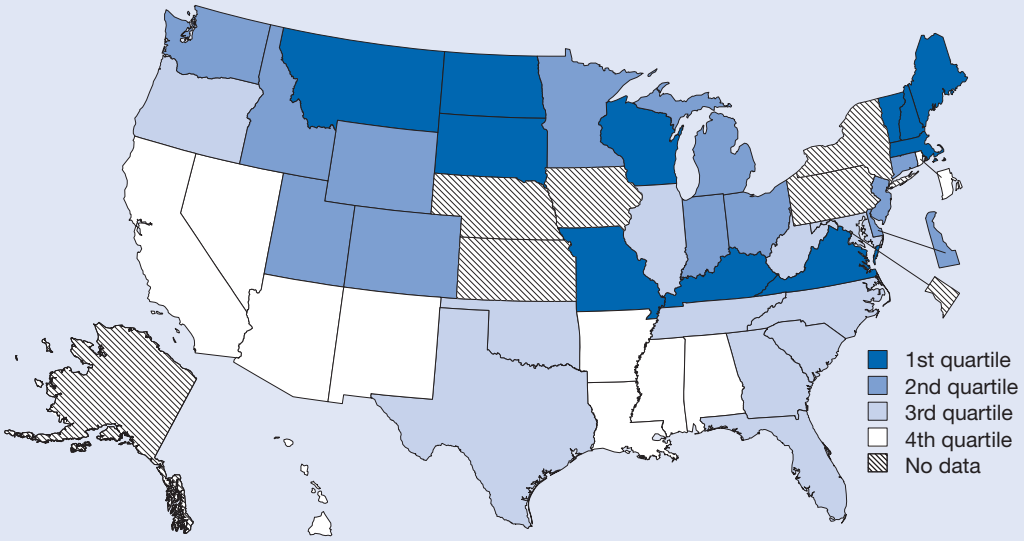
NOTES: National average for United States is reported value in National Assessment of Educational Progress (NAEP) reports. NAEP grade 4 mathematics scores for public schools only.

SOURCE: National Center for Education Statistics, NAEP (various years).

Science & Engineering Indicators 2008

Fourth Grade Science Performance

Figure 8-3
Fourth grade science performance: 2005



1st quartile (161–158)	2nd quartile (157–152)	3rd quartile (151–148)	4th quartile (147–133)	No data
Kentucky	Colorado	Florida	Alabama	Alaska
Maine	Connecticut	Georgia	Arizona	District of Columbia
Massachusetts	Delaware	Illinois	Arkansas	Iowa
Missouri	Idaho	Maryland	California	Kansas
Montana	Indiana	North Carolina	Hawaii	Nebraska
New Hampshire	Michigan	Oklahoma	Louisiana	New York
North Dakota	Minnesota	Oregon	Mississippi	Pennsylvania
South Dakota	New Jersey	South Carolina	Nevada	
Vermont	Ohio	Tennessee	New Mexico	
Virginia	Utah	Texas	Rhode Island	
Wisconsin	Washington	West Virginia		
	Wyoming			

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (various years). See table 8-3.

Findings

- In 2005, the nationwide average science score of fourth grade public school students was 149, an increase from 145 in 2000.
- Of the 36 states that participated in both the 2000 and 2005 science assessments, 20 reported numerical increases in average scores of their public school fourth graders, but only 9 of these increases were statistically significant. Likewise, although 11 states reported lower scores in 2005, none of these declines was statistically significant, resulting in no states with lower average scores in 2005 than in 2000.
- Students performing at the 10th, 25th, and 50th percentiles demonstrated gains in science scores between 2000 and 2005, whereas students performing at the 75th and 90th percentiles showed no statistically significant change in average score.
- The gaps in science scores between white fourth graders and black or Hispanic fourth graders narrowed significantly between 2000 and 2005. The fourth grade gender gap in science scores, although much smaller, remained unchanged between 2000 and 2005.

This indicator reports each state's average score on the National Assessment of Educational Progress (NAEP) in science for its fourth grade students in public schools. High scores indicate that fourth graders are demonstrating a solid foundation for adult science competency. The NAEP science assessment is a federally authorized assessment of student performance in which 44 states participated in 2005. Student performance is described in terms of average scores on a scale from 0 to 300.

Several recent changes to the NAEP methodology affect yearly comparisons. Beginning in 2002, NAEP obtained the national sample by aggregating the samples from each state rather than by selecting it independently; the increased national sample size makes smaller differences statistically significant. In 2005, NAEP included in the definition of the national sample all international Department of Defense schools.

NAEP allows students with disabilities or limited English proficiency to use certain accommodations (e.g., extended time, individual testing, or small group testing). All data presented here represent scores from tests taken with accommodations offered.

Table 8-3
Fourth grade science performance, by state: 2000 and 2005
(Score)

State	2000	2005
United States	145	149
Alabama	143	142
Alaska	NA	NA
Arizona	140	139
Arkansas	145	147
California	129	137
Colorado	NA	155
Connecticut	156	155
Delaware	NA	152
District of Columbia	NA	NA
Florida	NA	150
Georgia	142	148
Hawaii	136	142
Idaho	152	155
Illinois	150	148
Indiana	154	152
Iowa	159	NA
Kansas	NA	NA
Kentucky	152	158
Louisiana	139	143
Maine	161	160
Maryland	145	149
Massachusetts	161	160
Michigan	152	152
Minnesota	157	156
Mississippi	133	133
Missouri	157	158
Montana	160	160
Nebraska	150	NA
Nevada	142	140
New Hampshire	NA	161
New Jersey	NA	154
New Mexico	140	141
New York	148	NA
North Carolina	147	149
North Dakota	160	160
Ohio	155	157
Oklahoma	151	150
Oregon	148	151
Pennsylvania	NA	NA
Rhode Island	148	146
South Carolina	140	148
South Dakota	NA	158
Tennessee	145	150
Texas	145	150
Utah	154	155
Vermont	160	160
Virginia	155	161
Washington	NA	153
West Virginia	149	151
Wisconsin	NA	158
Wyoming	156	157
Puerto Rico	NA	NA

NA = not available

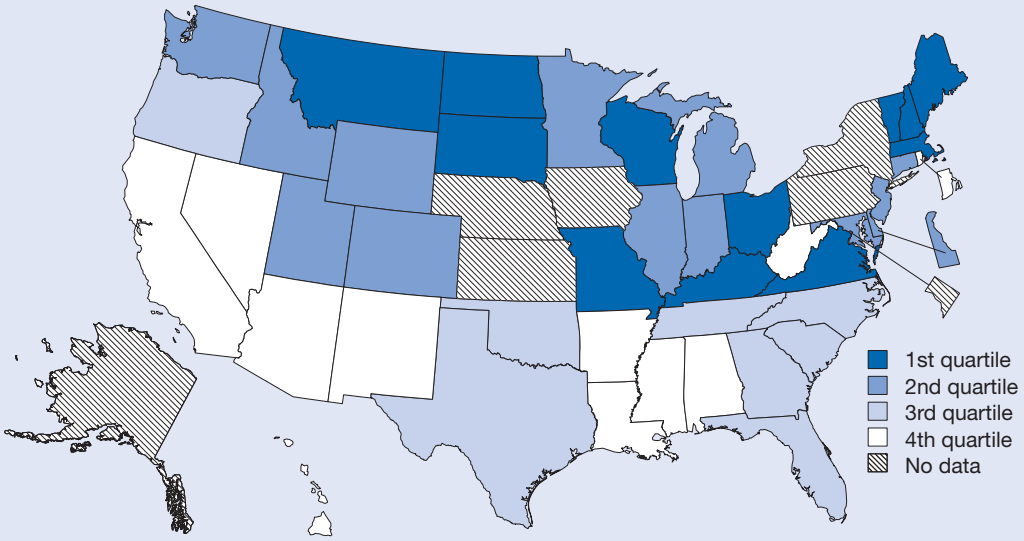
NOTES: National average for United States is reported value in National Assessment of Educational Progress (NAEP) reports. NAEP grade 4 science scores for public schools only. In 2000, California, Georgia, Hawaii, Kentucky, Maryland, South Carolina, Tennessee, Texas, and Virginia significantly different from 2005 when only one jurisdiction or the nation is examined. In 2005, Alaska, District of Columbia, Iowa, Kansas, Nebraska, New York, and Pennsylvania did not participate.

SOURCE: National Center for Education Statistics, NAEP (various years).

Science & Engineering Indicators 2008

Fourth Grade Science Proficiency

Figure 8-4
Fourth grade science proficiency: 2005



1st quartile (40%–35%)	2nd quartile (33%–27%)	3rd quartile (26%–25%)	4th quartile (24%–12%)	No data
Kentucky	Colorado	Florida	Alabama	Alaska
Maine	Connecticut	Georgia	Arizona	District of Columbia
Massachusetts	Delaware	North Carolina	Arkansas	Iowa
Missouri	Idaho	Oklahoma	California	Kansas
Montana	Illinois	Oregon	Hawaii	Nebraska
New Hampshire	Indiana	South Carolina	Louisiana	New York
North Dakota	Maryland	Tennessee	Mississippi	Pennsylvania
Ohio	Michigan	Texas	Nevada	
South Dakota	Minnesota		New Mexico	
Vermont	New Jersey		Rhode Island	
Virginia	Utah		West Virginia	
Wisconsin	Washington			
	Wyoming			

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (various years). See table 8-4.

Findings

- In 2005 nationwide, 27% of fourth grade public school students performed at or above the proficient level in science, which showed little change from 26% in 2000.
- Of the 36 states that participated in both the 2000 and 2005 science assessments, 18 states showed numerical increases in science proficiency for public school fourth graders in 2005, although only 4 of these increases were statistically significant. Likewise, although 13 states showed numerical decreases in 2005, none of these declines was statistically significant.
- Among fourth graders in public schools in 2005, proficiency in mathematics was more widespread than in science, a reversal of the 2000 results.
- Substantial differences in science proficiency exist between racial/ethnic groups of fourth graders, but these narrowed between 2000 and 2005. The gender gap is much smaller and remained unchanged between 2000 and 2005.

This indicator is the proportion of a state's fourth grade students in public schools that have achieved proficiency in science. High indicator values show that a high percentage of a state's fourth graders has demonstrated a solid foundation for adult science competency. Proficiency is based on achievement levels in the National Assessment of Educational Progress (NAEP) that reflect performance standards set by the National Assessment Governing Board to provide a context for interpreting student performance on NAEP. A National Academy of Sciences panel evaluated the process used to establish the achievement levels for the science assessment and urged that they be considered developmental and interpreted with caution. Approximately 147,700 fourth grade students in 8,500 schools participated in the 2005 NAEP science assessment.

For the fourth grade, the basic level (scores of 138–169) denotes partial mastery of knowledge and skills that are prerequisite for proficient work. The proficient level (170–204) represents solid academic performance and demonstrates competency over challenging subject matter knowledge, its application to real-world situations, and mastery of appropriate analytical skills. The advanced level (205–300) signifies superior performance.

Table 8-4
Fourth grade science proficiency, by state: 2000 and 2005
(Percent)

State	2000	2005
United States	26	27
Alabama	22	21
Alaska	NA	NA
Arizona	22	18
Arkansas	23	24
California	13	17
Colorado	NA	32
Connecticut	35	33
Delaware	NA	27
District of Columbia	NA	NA
Florida	NA	26
Georgia	23	25
Hawaii	16	19
Idaho	29	29
Illinois	31	27
Indiana	32	27
Iowa	36	NA
Kansas	NA	NA
Kentucky	28	36
Louisiana	18	20
Maine	37	36
Maryland	24	27
Massachusetts	42	38
Michigan	32	30
Minnesota	34	33
Mississippi	13	12
Missouri	34	36
Montana	36	37
Nebraska	26	NA
Nevada	19	17
New Hampshire	NA	37
New Jersey	NA	32
New Mexico	17	18
New York	24	NA
North Carolina	23	25
North Dakota	36	36
Ohio	31	35
Oklahoma	26	25
Oregon	27	26
Pennsylvania	NA	NA
Rhode Island	25	23
South Carolina	20	25
South Dakota	NA	35
Tennessee	24	26
Texas	23	25
Utah	31	33
Vermont	38	38
Virginia	32	40
Washington	NA	28
West Virginia	24	24
Wisconsin	NA	35
Wyoming	31	32
Puerto Rico	NA	NA

NA = not available

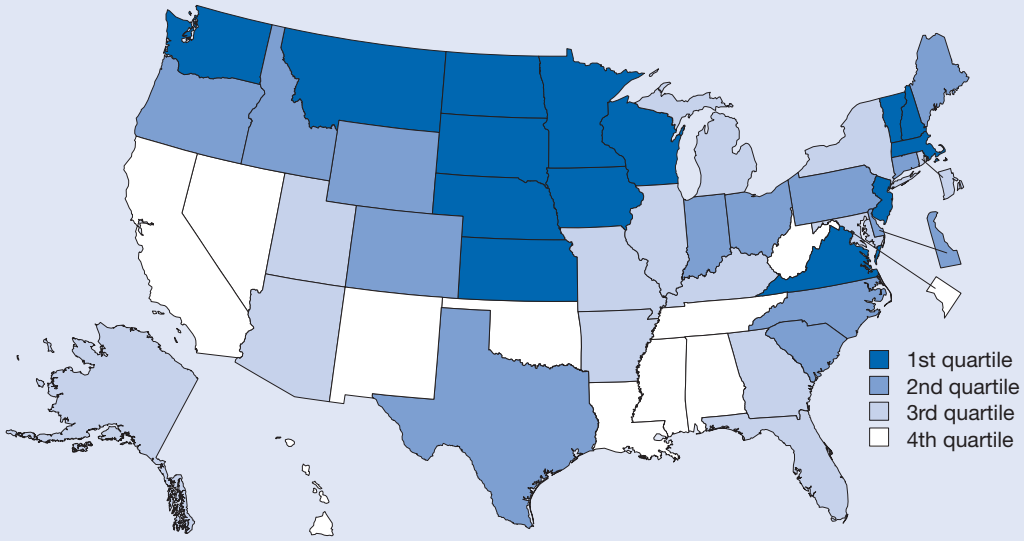
NOTE: National average for United States is reported value in National Assessment of Educational Progress (NAEP) reports. NAEP grade 4 science scores for public schools only. In 2000, California, Georgia, Hawaii, Kentucky, Maryland, South Carolina, Tennessee, Texas, and Virginia significantly different from 2005 when only one jurisdiction or the nation is examined. In 2005, Alaska, District of Columbia, Iowa, Kansas, Nebraska, New York, and Pennsylvania did not participate.

SOURCE: National Center for Education Statistics, NAEP (various years).

Science & Engineering Indicators 2008

Eighth Grade Mathematics Performance

Figure 8-5
Eighth grade mathematics performance: 2005



1st quartile (292–284)	2nd quartile (283–281)	3rd quartile (280–272)	4th quartile (271–245)
Iowa	Colorado	Alaska	Alabama
Kansas	Connecticut	Arizona	California
Massachusetts	Delaware	Arkansas	District of Columbia
Minnesota	Idaho	Florida	Hawaii
Montana	Indiana	Georgia	Louisiana
Nebraska	Maine	Illinois	Mississippi
New Hampshire	North Carolina	Kentucky	Nevada
New Jersey	Ohio	Maryland	New Mexico
North Dakota	Oregon	Michigan	Oklahoma
South Dakota	Pennsylvania	Missouri	Tennessee
Vermont	South Carolina	New York	West Virginia
Virginia	Texas	Rhode Island	
Washington	Wyoming	Utah	
Wisconsin			

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (various years). See table 8-5.

Findings

- In 2005, the nationwide average mathematics score of eighth grade public school students was 278, an increase from 272 in 2000.
- Of the 41 jurisdictions that participated in both the 2000 and 2005 mathematics assessments, 37 reported increases in the average score for public school eighth graders, but only 28 of these increases were statistically significant. A single state reported a decline in test scores between 2000 and 2005 for public school eighth graders, but this decline was not statistically significant, meaning that no state showed a statistically significant decline in test scores during this period.
- The entire eighth grade student sample, including students performing at the 10th, 25th, 50th, 75th, and 90th percentiles, demonstrated statistically significant gains in mathematics scores between 2000 and 2005.
- The gaps in mathematics scores between white eighth graders and black or Hispanic eighth graders narrowed significantly between 2000 and 2005. The eighth grade gender gap in mathematics scores, although much smaller, remained unchanged between 2000 and 2005.

This indicator reports each state's average score on the National Assessment of Educational Progress (NAEP) in mathematics for its eighth grade students in public schools. High scores indicate that eighth graders are demonstrating a solid foundation for adult mathematics competency. The NAEP mathematics assessment is a federally authorized assessment of student performance in which all 50 states and the District of Columbia participated in 2005. Student performance is described in terms of average scores on a scale from 0 to 500.

Several recent changes to the NAEP methodology affect yearly comparisons. Beginning in 2002, NAEP obtained the national sample by aggregating the samples from each state rather than by selecting it independently; the increased national sample size makes smaller differences statistically significant. In 2005, NAEP included in the definition of the national sample all international Department of Defense schools.

NAEP allows students with disabilities or limited English proficiency to use certain accommodations (e.g., extended time, individual testing, or small group testing). All data presented here represent scores from tests taken with accommodations offered.

Table 8-5
Eighth grade mathematics performance, by state: 2000, 2003, and 2005
(Score)

State	2000	2003	2005
United States	272	276	278
Alabama	264	262	262
Alaska	NA	279	279
Arizona	269	271	274
Arkansas	257	266	272
California	260	267	269
Colorado	NA	283	281
Connecticut	281	284	281
Delaware	NA	277	281
District of Columbia	235	243	245
Florida	NA	271	274
Georgia	265	270	272
Hawaii	262	266	266
Idaho	277	280	281
Illinois	275	277	278
Indiana	281	281	282
Iowa	NA	284	284
Kansas	283	284	284
Kentucky	270	274	274
Louisiana	259	266	268
Maine	281	282	281
Maryland	272	278	278
Massachusetts	279	287	292
Michigan	277	276	277
Minnesota	287	291	290
Mississippi	254	261	262
Missouri	271	279	276
Montana	285	286	286
Nebraska	280	282	284
Nevada	265	268	270
New Hampshire	NA	286	285
New Jersey	NA	281	284
New Mexico	259	263	263
New York	271	280	280
North Carolina	276	281	282
North Dakota	282	287	287
Ohio	281	282	283
Oklahoma	270	272	271
Oregon	280	281	282
Pennsylvania	NA	279	281
Rhode Island	269	272	272
South Carolina	265	277	281
South Dakota	NA	285	287
Tennessee	262	268	271
Texas	273	277	281
Utah	274	281	279
Vermont	281	286	287
Virginia	275	282	284
Washington	NA	281	285
West Virginia	266	271	269
Wisconsin	NA	284	285
Wyoming	276	284	282
Puerto Rico	NA	NA	NA

NA = not available

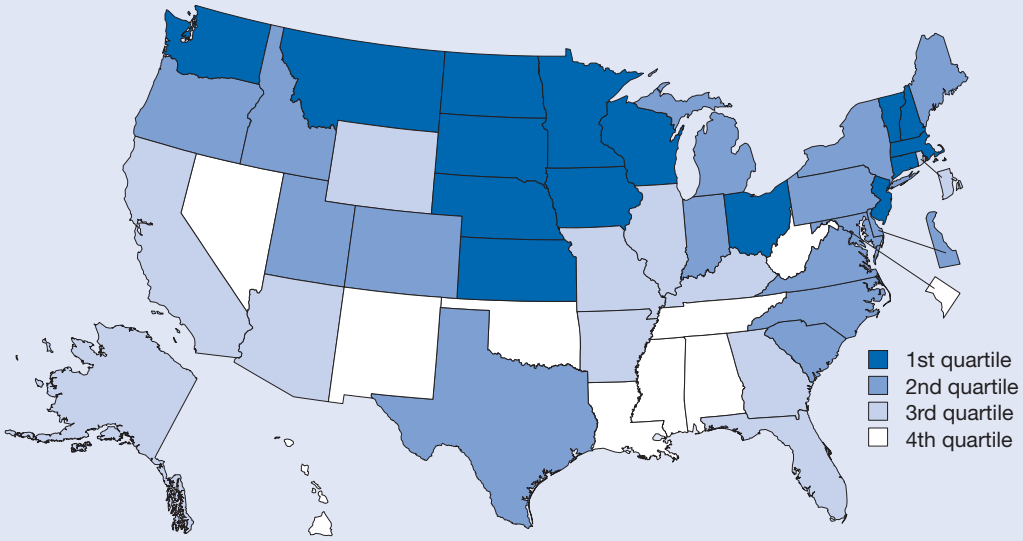
NOTES: National average for United States is reported value in National Assessment of Educational Progress (NAEP) reports. NAEP grade 8 mathematics scores for public schools only.

SOURCE: National Center for Education Statistics, NAEP (various years).

Science & Engineering Indicators 2008

Eighth Grade Mathematics Proficiency

Figure 8-6
Eighth grade mathematics proficiency: 2005



1st quartile (43%–34%)	2nd quartile (33%–30%)	3rd quartile (29%–22%)	4th quartile (21%–7%)
Connecticut	Colorado	Alaska	Alabama
Iowa	Delaware	Arizona	District of Columbia
Kansas	Idaho	Arkansas	Hawaii
Massachusetts	Indiana	California	Louisiana
Minnesota	Maine	Florida	Mississippi
Montana	Maryland	Georgia	Nevada
Nebraska	Michigan	Illinois	New Mexico
New Hampshire	New York	Kentucky	Oklahoma
New Jersey	North Carolina	Missouri	Tennessee
North Dakota	Oregon	Rhode Island	West Virginia
Ohio	Pennsylvania	Wyoming	
South Dakota	South Carolina		
Vermont	Texas		
Washington	Utah		
Wisconsin	Virginia		

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (various years). See table 8-6.

Findings

- In 2005 nationwide, 29% of eighth grade public school students performed at or above the proficient level in mathematics, which represents a significant increase from 25% in 2000.
- Of the 39 states that participated in both the 2000 and 2005 assessments, 35 showed increases in mathematics proficiency among public school eighth graders in 2005. In 2005, 14 states and the District of Columbia had mathematics proficiency percentages below the 2000 national average of 25% compared with 21 jurisdictions in 2000.
- In 2005, all states showed higher proficiency in mathematics among fourth grade public school students than among eighth grade public school students.
- Substantial differences in mathematics proficiency exist between racial/ethnic groups of eighth graders, but these remained unchanged between 2000 and 2005. The gender gap in proficiency among eighth graders is much smaller and also remained unchanged between 2000 and 2005.

This indicator is the proportion of a state's eighth grade students in public schools that have achieved proficiency in mathematics. High indicator values show that a high percentage of a state's eighth graders has demonstrated a solid foundation for adult mathematics competency. Proficiency is based on achievement levels in the National Assessment of Educational Progress (NAEP) that reflect performance standards set by the National Assessment Governing Board to provide a context for interpreting student performance on NAEP. Approximately 161,600 eighth graders in 6,500 schools participated in the 2005 NAEP mathematics assessment.

For the eighth grade, the basic level (scores of 262–298) denotes partial mastery of knowledge and skills that are prerequisite for proficient work. The proficient level (299–332) represents solid academic performance and demonstrates competency over challenging subject matter knowledge, its application to real-world situations, and mastery of appropriate analytical skills. The advanced level (333–500) signifies superior performance.

Table 8-6
Eighth grade mathematics proficiency, by state: 2000, 2003, and 2005
(Percent)

State	2000	2003	2005
United States	25	27	29
Alabama	16	16	15
Alaska	NA	30	29
Arizona	20	21	26
Arkansas	13	19	22
California	17	22	22
Colorado	NA	34	32
Connecticut	33	35	35
Delaware	NA	26	30
District of Columbia	6	6	7
Florida	NA	23	26
Georgia	19	22	23
Hawaii	16	17	18
Idaho	26	28	30
Illinois	26	29	28
Indiana	29	31	30
Iowa	NA	33	34
Kansas	34	34	34
Kentucky	20	24	22
Louisiana	11	17	16
Maine	30	29	30
Maryland	27	30	30
Massachusetts	30	38	43
Michigan	28	28	30
Minnesota	39	44	43
Mississippi	9	12	13
Missouri	21	28	26
Montana	36	35	36
Nebraska	30	32	35
Nevada	18	20	21
New Hampshire	NA	35	35
New Jersey	NA	33	36
New Mexico	12	15	14
New York	24	32	31
North Carolina	27	32	32
North Dakota	30	36	35
Ohio	30	30	34
Oklahoma	18	20	20
Oregon	31	32	33
Pennsylvania	NA	30	31
Rhode Island	22	24	23
South Carolina	17	26	30
South Dakota	NA	35	36
Tennessee	16	21	21
Texas	24	25	31
Utah	25	31	30
Vermont	31	35	38
Virginia	25	31	33
Washington	NA	32	36
West Virginia	17	20	17
Wisconsin	NA	35	36
Wyoming	23	32	29
Puerto Rico	NA	NA	NA

NA = not available

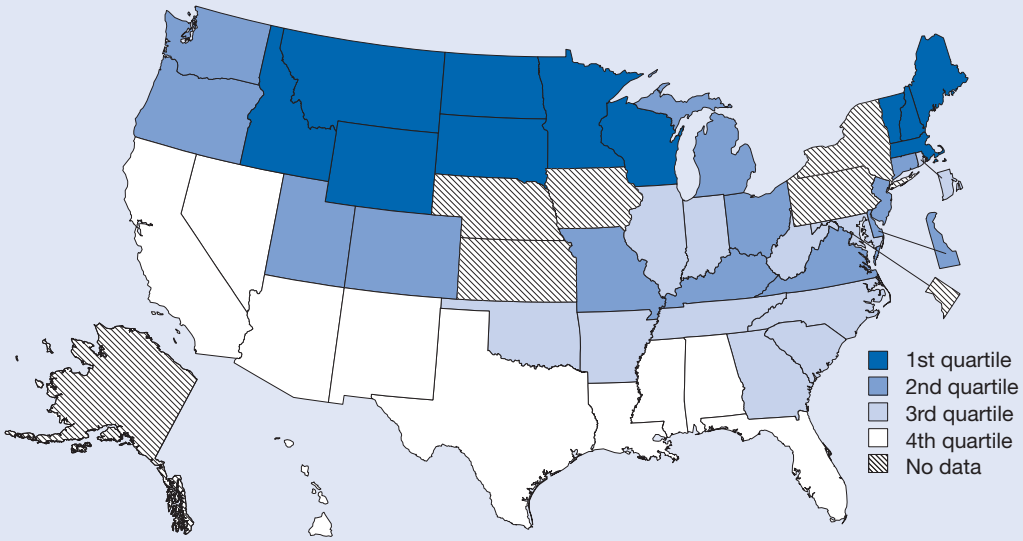
NOTES: National average for United States is reported value in National Assessment of Educational Progress (NAEP) reports. NAEP grade 8 mathematics scores for public schools only.

SOURCE: National Center for Education Statistics, NAEP (various years).

Science & Engineering Indicators 2008

Eighth Grade Science Performance

Figure 8-7
Eighth grade science performance: 2005



1st quartile (163–158)	2nd quartile (155–152)	3rd quartile (150–144)	4th quartile (143–132)	No data
Idaho	Colorado	Arkansas	Alabama	Alaska
Maine	Connecticut	Georgia	Arizona	District of Columbia
Massachusetts	Delaware	Illinois	California	Iowa
Minnesota	Kentucky	Indiana	Florida	Kansas
Montana	Michigan	Maryland	Hawaii	Nebraska
New Hampshire	Missouri	North Carolina	Louisiana	New York
North Dakota	New Jersey	Oklahoma	Mississippi	Pennsylvania
South Dakota	Ohio	Rhode Island	Nevada	
Vermont	Oregon	South Carolina	New Mexico	
Wisconsin	Utah	Tennessee	Texas	
Wyoming	Virginia	West Virginia		
	Washington			

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (various years). See table 8-7.

Findings

- In 2005, the nationwide average science score of eighth grade public school students was 147, a decrease from 148 in 2000.
- Of the 36 states that participated in both the 2000 and 2005 science assessments, 13 reported higher average scores for public school eighth graders in 2005, and 10 of these increases were statistically significant. Lower average scores were reported by 16 states in 2005, 4 of which were statistically significant.
- The gaps in science scores between white eighth graders and black or Hispanic eighth graders did not increase between 2000 and 2005.

This indicator reports each state's average score on the National Assessment of Educational Progress (NAEP) in science for its eighth grade students in public schools. High scores indicate that eighth graders are demonstrating a solid foundation for adult science competency. The NAEP science assessment is a federally authorized assessment of student performance in which 44 states participated in 2005. Student performance is described in terms of average scores on a scale from 0 to 300.

Several recent changes to the NAEP methodology affect yearly comparisons. Beginning in 2002, NAEP obtained a national sample by aggregating the samples from each state rather than by selecting it independently; the increased national sample size makes smaller differences statistically significant. In 2005, NAEP included in the definition of the national sample all international Department of Defense schools.

NAEP allows students with disabilities or limited English proficiency to use certain accommodations (e.g., extended time, individual testing, or small group testing). All data presented here represent scores from tests taken with accommodations offered.

Table 8-7
Eighth grade science performance, by state: 2000 and 2005
(Score)

State	2000	2005
United States	148	147
Alabama	143	138
Alaska	NA	NA
Arizona	145	140
Arkansas	142	144
California	129	136
Colorado	NA	155
Connecticut	153	152
Delaware	NA	152
District of Columbia	NA	NA
Florida	NA	141
Georgia	142	144
Hawaii	130	136
Idaho	158	158
Illinois	148	148
Indiana	154	150
Iowa	NA	NA
Kansas	NA	NA
Kentucky	150	153
Louisiana	134	138
Maine	158	158
Maryland	146	145
Massachusetts	158	161
Michigan	155	155
Minnesota	159	158
Mississippi	134	132
Missouri	154	154
Montana	164	162
Nebraska	158	NA
Nevada	141	138
New Hampshire	NA	162
New Jersey	NA	153
New Mexico	139	138
New York	145	NA
North Carolina	145	144
North Dakota	159	163
Ohio	159	155
Oklahoma	149	147
Oregon	154	153
Pennsylvania	NA	NA
Rhode Island	148	146
South Carolina	140	145
South Dakota	NA	161
Tennessee	145	145
Texas	143	143
Utah	154	154
Vermont	159	162
Virginia	151	155
Washington	NA	154
West Virginia	146	147
Wisconsin	NA	158
Wyoming	156	159
Puerto Rico	NA	NA

NA = not available

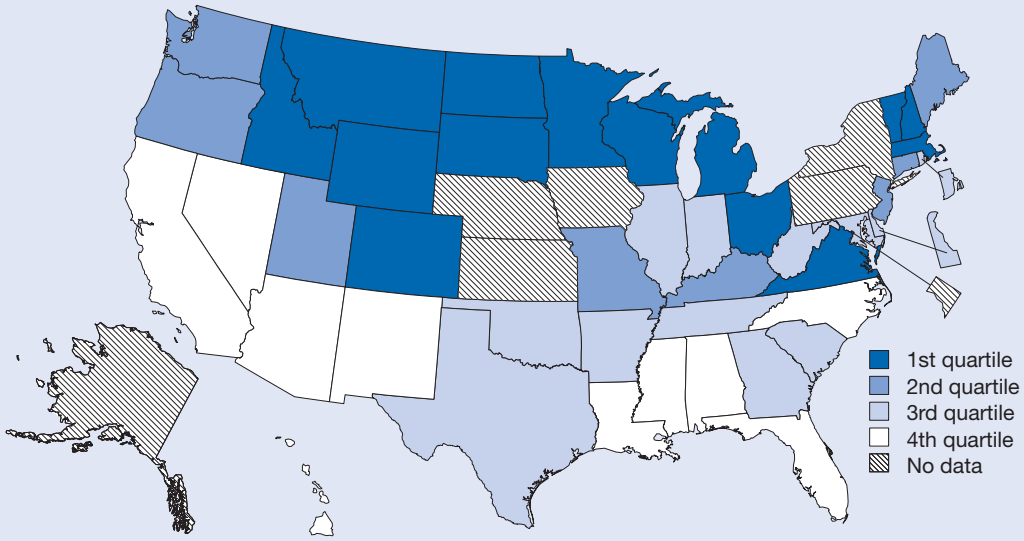
NOTES: National average for United States is reported value in National Assessment of Educational Progress (NAEP) reports. NAEP grade 8 science scores for public schools only. In 2000, Alaska, Colorado, Delaware, District of Columbia, Florida, Iowa, Kansas, New Hampshire, New Jersey, Pennsylvania, South Dakota, Washington, and Wisconsin did not participate or did not meet reporting standards. In 2000, Alabama, Arizona, California, Hawaii, Indiana, Kentucky, Louisiana, Massachusetts, Nevada, North Dakota, South Carolina, Vermont, Virginia, and Wyoming significantly different from 2005 when only one jurisdiction or the nation is examined. In 2005, Alaska, District of Columbia, Iowa, Kansas, Nebraska, New York, and Pennsylvania did not participate.

SOURCE: National Center for Education Statistics, NAEP (various years).

Science & Engineering Indicators 2008

Eighth Grade Science Proficiency

Figure 8-8
Eighth grade science proficiency: 2005



1st quartile (43%–35%)	2nd quartile (34%–31%)	3rd quartile (29%–23%)	4th quartile (22%–14%)	No data
Colorado	Connecticut	Arkansas	Alabama	Alaska
Idaho	Kentucky	Delaware	Arizona	District of Columbia
Massachusetts	Maine	Georgia	California	Iowa
Michigan	Missouri	Illinois	Florida	Kansas
Minnesota	New Jersey	Indiana	Hawaii	Nebraska
Montana	Oregon	Maryland	Louisiana	New York
New Hampshire	Utah	Oklahoma	Mississippi	Pennsylvania
North Dakota	Washington	Rhode Island	Nevada	
Ohio		South Carolina	New Mexico	
South Dakota		Tennessee	North Carolina	
Vermont		Texas		
Virginia		West Virginia		
Wisconsin				
Wyoming				

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (various years). See table 8-8.

Findings

- In 2005 nationwide, 27% of eighth grade public school students performed at or above the proficient level in science, a decline from 29% in 2000.
- Of the 36 states that participated in both the 2000 and 2005 science assessments, 13 showed increases in science proficiency for public school eighth graders in 2005, 4 of which were statistically significant. Nineteen states showed numerical declines in science proficiency among public school eighth graders in 2005, although none of the declines was statistically significant.
- Among eighth graders in public schools in 2005, proficiency in mathematics was more widespread than proficiency in science, a reversal of the 2000 results.
- The nationwide percentage of students who performed at or above the proficient level in science was identical for fourth and eighth graders in 2005.

This indicator is the proportion of a state's eighth grade students in public schools that have achieved proficiency in science. High indicator values show that a high percentage of a state's eighth graders has demonstrated a solid foundation for adult science competency. Proficiency is based on achievement levels in the National Assessment of Educational Progress (NAEP) that reflect performance standards set by the National Assessment Governing Board to provide a context for interpreting student performance on NAEP. A National Academy of Sciences panel evaluated the process used to establish the achievement levels for the science assessment and urged that they be considered developmental and interpreted with caution. Approximately 143,400 eighth grade students in 6,400 schools participated in the 2005 NAEP science assessment.

For the eighth grade, the basic level (scores of 143–169) denotes partial mastery of knowledge and skills that are prerequisite for proficient work. The proficient level (170–207) represents solid academic performance and demonstrates competency over challenging subject matter knowledge, its application to real-world situations, and mastery of appropriate analytical skills. The advanced level (208–300) signifies superior performance.

Table 8-8
Eighth grade science proficiency, by state: 2000 and 2005
(Percent)

State	2000	2005
United States	29	27
Alabama	23	19
Alaska	NA	NA
Arizona	23	20
Arkansas	22	23
California	14	18
Colorado	NA	35
Connecticut	35	33
Delaware	NA	29
District of Columbia	NA	NA
Florida	NA	21
Georgia	23	25
Hawaii	14	15
Idaho	37	36
Illinois	29	27
Indiana	33	29
Iowa	NA	NA
Kansas	NA	NA
Kentucky	28	31
Louisiana	18	19
Maine	35	34
Maryland	27	26
Massachusetts	39	41
Michigan	35	35
Minnesota	41	39
Mississippi	15	14
Missouri	33	33
Montana	44	42
Nebraska	38	NA
Nevada	22	19
New Hampshire	NA	41
New Jersey	NA	33
New Mexico	20	18
New York	28	NA
North Carolina	25	22
North Dakota	38	43
Ohio	39	35
Oklahoma	25	25
Oregon	34	32
Pennsylvania	NA	NA
Rhode Island	27	26
South Carolina	20	23
South Dakota	NA	41
Tennessee	24	25
Texas	23	23
Utah	34	33
Vermont	39	41
Virginia	29	35
Washington	NA	33
West Virginia	24	23
Wisconsin	NA	39
Wyoming	34	37
Puerto Rico	NA	NA

NA = not available

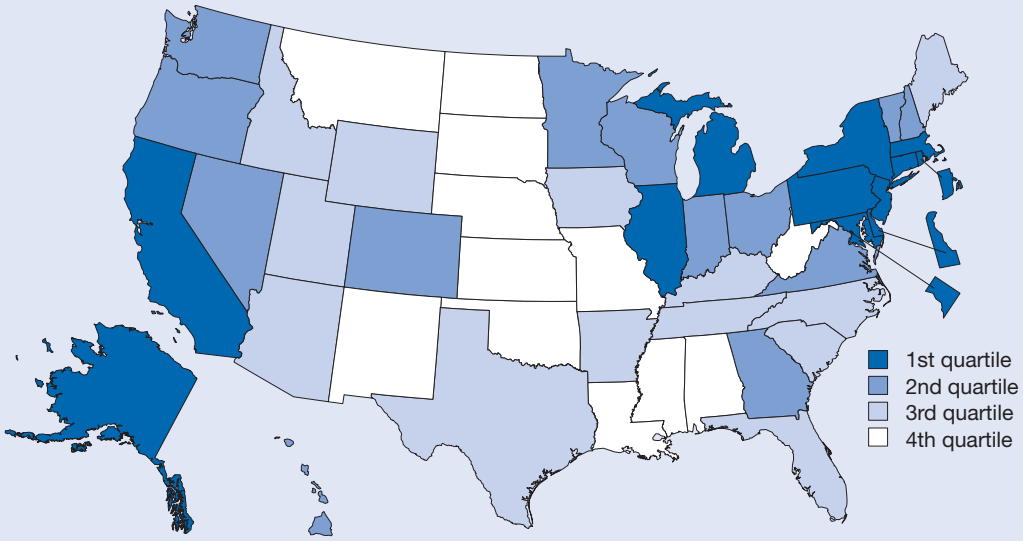
NOTES: National average for United States is reported value in National Assessment of Educational Progress (NAEP) reports. NAEP grade 8 science scores for public schools only. In 2000, Alaska, Colorado, Delaware, District of Columbia, Florida, Iowa, Kansas, New Hampshire, New Jersey, Pennsylvania, South Dakota, Washington, and Wisconsin did not participate or did not meet reporting standards. In 2000, Alabama, Arizona, California, Hawaii, Indiana, Kentucky, Louisiana, Massachusetts, Nevada, North Dakota, South Carolina, Vermont, Virginia, and Wyoming significantly different from 2005 when only one jurisdiction or the nation is examined. In 2005, Alaska, District of Columbia, Iowa, Kansas, Nebraska, New York, and Pennsylvania did not participate.

SOURCE: National Center for Education Statistics, NAEP (various years).

Science & Engineering Indicators 2008

Public School Teacher Salaries

Figure 8-9
Public school teacher salaries: 2005



1st quartile ($58,688–$50,869)	2nd quartile ($50,790–$43,394)	3rd quartile ($43,313–$39,965)	4th quartile ($39,456–$34,040)
Alaska	Colorado	Arizona	Alabama
California	Georgia	Arkansas	Kansas
Connecticut	Hawaii	Florida	Louisiana
Delaware	Indiana	Idaho	Mississippi
District of Columbia	Minnesota	Iowa	Missouri
Illinois	Nevada	Kentucky	Montana
Maryland	New Hampshire	Maine	Nebraska
Massachusetts	Ohio	North Carolina	New Mexico
Michigan	Oregon	South Carolina	North Dakota
New Jersey	Vermont	Tennessee	Oklahoma
New York	Virginia	Texas	South Dakota
Pennsylvania	Washington	Utah	West Virginia
Rhode Island	Wisconsin	Wyoming	

SOURCE: National Center for Education Statistics, *Digest of Education Statistics* (various years). See table 8-9.

Findings

- During the 2004–05 academic year, salaries for public school teachers nationwide averaged $47,750, ranging from a state high of $58,688 to a low of $34,040.
- Over the past decade, average teacher salaries across the nation rose by 30% in terms of current dollars. Average teacher salaries remained essentially flat when expressed in constant dollars based on the Consumer Price Index.
- California and Illinois moved into the upper ranks of teacher salaries with increases of more than 40% between 1995 and 2005.
- High salaries for public school teachers do not necessarily correspond to high student achievement scores on the NAEP mathematics and science tests.

This indicator measures the income public school teachers receive for their work. The average salary represents the average base salary of all full-time public school teachers. Figures are given in current dollars. The year is the latter date of the academic year. The average includes both recent college graduates and seasoned veterans. Their educational credentials may encompass provisional certification through bachelor's, master's, or doctoral degrees.

Public school teacher salaries may reflect a range of factors, including the value placed on primary and secondary education, a state's cost of living, the experience and educational attainment of the teachers, and the local supply and demand in the job market. Relatively low teacher salaries may hinder recruitment into the teaching profession.

Table 8-9
Public school teacher salaries, by state: 1995, 2000, and 2005
(Dollars)

State	1995	2000	2005
United States	36,685	41,807	47,750
Alabama	31,144	36,689	38,863
Alaska	47,951	46,462	52,424
Arizona	32,574	36,902	42,905
Arkansas	28,934	33,386	40,495
California	41,078	47,680	57,876
Colorado	34,571	38,163	44,161
Connecticut	50,045	51,780	58,688
Delaware	39,076	44,435	50,869
District of Columbia	43,700	47,076	58,456
Florida	32,588	36,722	41,081
Georgia	32,291	41,023	46,526
Hawaii	38,518	40,578	44,273
Idaho	29,783	35,547	42,122
Illinois	39,431	46,486	55,629
Indiana	36,785	41,850	46,851
Iowa	31,511	35,678	40,347
Kansas	34,652	34,981	39,190
Kentucky	32,257	36,380	41,002
Louisiana	26,461	33,109	38,880
Maine	31,972	35,561	40,940
Maryland	40,661	44,048	52,331
Massachusetts	40,718	46,580	54,596
Michigan	41,895	49,044	55,693
Minnesota	35,948	39,802	46,906
Mississippi	26,818	31,857	36,590
Missouri	31,189	35,656	38,971
Montana	28,785	32,121	38,485
Nebraska	30,922	33,237	39,456
Nevada	34,836	39,390	43,394
New Hampshire	34,720	37,734	43,941
New Jersey	47,038	52,015	56,600
New Mexico	28,493	32,554	39,328
New York	47,612	51,020	56,200
North Carolina	30,793	39,404	43,313
North Dakota	26,327	29,863	36,449
Ohio	36,802	41,436	48,692
Oklahoma	28,172	31,298	37,141
Oregon	38,555	42,336	50,790
Pennsylvania	44,510	48,321	52,700
Rhode Island	40,729	47,041	53,473
South Carolina	30,279	36,081	42,207
South Dakota	25,994	29,071	34,040
Tennessee	32,477	36,328	41,527
Texas	31,223	37,567	41,009
Utah	29,082	34,946	39,965
Vermont	35,406	37,758	44,535
Virginia	33,987	38,744	44,763
Washington	36,151	41,043	45,712
West Virginia	31,944	35,009	38,360
Wisconsin	37,746	41,153	43,466
Wyoming	31,285	34,127	40,392
Puerto Rico	NA	NA	NA

NA = not available

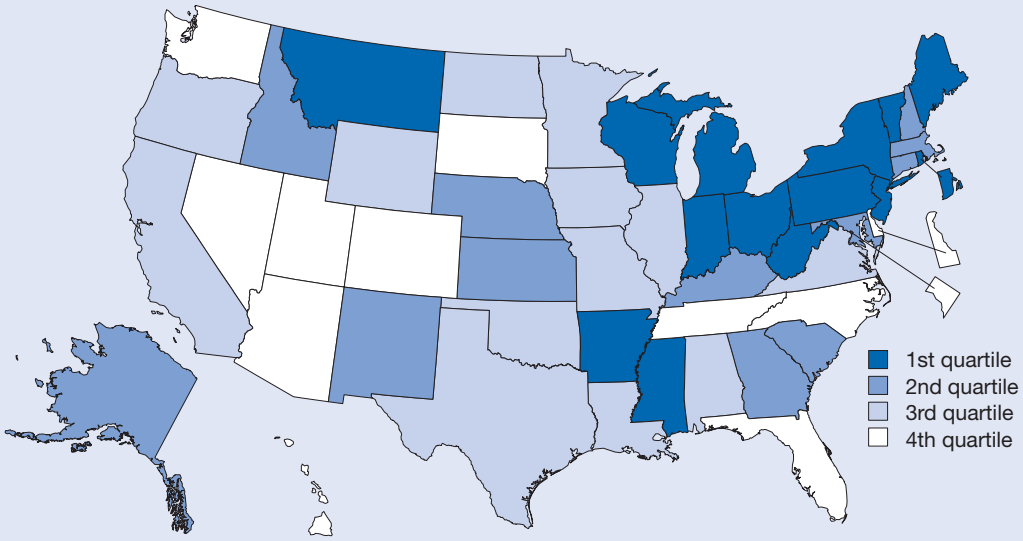
NOTES: National average for United States is reported value in *Digest of Education Statistics*. Average salaries reported in current dollars.

SOURCE: National Center for Education Statistics, *Digest of Education Statistics* (various years).

Science & Engineering Indicators 2008

Elementary and Secondary Public School Current Expenditures as Share of Gross Domestic Product

Figure 8-10
Elementary and secondary public school current expenditures as share of gross domestic product: 2005



1st quartile (5.11%–3.85%)	2nd quartile (3.79%–3.47%)	3rd quartile (3.42%–3.05%)	4th quartile (3.04%–1.24%)
Arkansas	Alaska	Alabama	Arizona
Indiana	Connecticut	California	Colorado
Maine	Georgia	Illinois	Delaware
Michigan	Idaho	Iowa	District of Columbia
Mississippi	Kansas	Louisiana	Florida
Montana	Kentucky	Minnesota	Hawaii
New Jersey	Maryland	Missouri	Nevada
New York	Massachusetts	North Dakota	North Carolina
Ohio	Nebraska	Oklahoma	South Dakota
Pennsylvania	New Hampshire	Oregon	Tennessee
Rhode Island	New Mexico	Texas	Utah
Vermont	South Carolina	Virginia	Washington
West Virginia		Wyoming	
Wisconsin			

SOURCES: National Center for Education Statistics (NCES), NCES Common Core of Data, National Public Education Financial Survey (various years); and Bureau of Economic Analysis, Gross Domestic Product data (various years). See table 8-10.

Findings

- The 2005 national average for spending on elementary and secondary education was 3.43% of the GDP, a slight increase from 3.37% in 1995.
- Among individual states, the value for this indicator ranged from 2.29% to 5.11% of the state's GDP in 2005, indicating that some states were directing a much higher percentage of their resources toward elementary and secondary education. The District of Columbia was an outlier at 1.24%.
- States spending the highest percentage of their GDP on elementary and secondary education tended to have relatively small student populations (100,000–300,000 students), indicating that some level of state spending may be required regardless of the size of the student population or the GDP.
- Spending for elementary and secondary current expenditures as a share of the state's GDP decreased in 24 states and the District of Columbia during the 1995–2005 period as spending for primary and secondary education failed to keep pace with growth in the local economy.

This indicator measures the relative amount of resources that local, state, and federal governments direct toward public education in prekindergarten through grade 12. It is calculated by dividing the current expenditures of elementary and secondary public schools by the gross domestic product (GDP). Current expenditures include instruction and instruction-related costs, student support services, administration, and operations and exclude funds for school construction and other capital outlays, debt services, and programs outside of public elementary and secondary education. State and local support represent the largest sources of revenue for elementary and secondary education.

Financial data on public elementary and secondary education are reported by the National Center for Educational Statistics, Department of Education. These data are part of the National Public Education Financial Survey and are included in the Common Core of Data, a comprehensive annual national statistical database covering approximately 94,000 public elementary and secondary schools and 14,000 school districts. Current expenditures are expressed in actual dollars. The year is the latter date of the academic year. For example, data for 2005 represent costs for the 2004–05 academic year. The District of Columbia and Hawaii each have only one school district; therefore, data for these two jurisdictions are not comparable to other states.

Table 8-10
Elementary and secondary public school current expenditures as share of gross domestic product, by state: 1995, 2000, and 2005

State	Public school expenditures ($thousands)			State GDP ($millions)			School expenditures/ GDP (%)		
	1995	2000	2005	1995	2000	2005	1995	2000	2005
United States	243,877,582	323,888,508	424,562,096	7,232,723	9,749,104	12,372,847	3.37	3.32	3.43
Alabama	3,026,287	4,176,082	5,164,406	94,021	114,576	151,342	3.22	3.64	3.41
Alaska	1,020,675	1,183,499	1,442,269	24,805	27,034	39,394	4.11	4.38	3.66
Arizona	3,144,540	4,288,739	6,451,870	104,036	158,533	212,312	3.02	2.71	3.04
Arkansas	1,873,595	2,380,331	3,546,999	53,303	66,801	87,004	3.51	3.56	4.08
California	25,949,033	38,129,479	50,918,654	908,963	1,287,145	1,616,351	2.85	2.96	3.15
Colorado	3,232,976	4,401,010	5,994,440	108,043	171,862	214,337	2.99	2.56	2.80
Connecticut	4,247,328	5,402,836	7,080,396	120,800	160,436	193,496	3.52	3.37	3.66
Delaware	694,473	937,630	1,299,349	27,507	41,472	56,731	2.52	2.26	2.29
District of Columbia	666,938	780,192	1,023,952	47,123	58,699	82,628	1.42	1.33	1.24
Florida	11,019,735	13,885,988	19,042,877	340,501	471,316	666,639	3.24	2.95	2.86
Georgia	6,136,689	9,158,624	12,528,856	199,138	290,887	358,365	3.08	3.15	3.50
Hawaii	1,028,729	1,213,695	1,648,086	36,572	40,202	54,773	2.81	3.02	3.01
Idaho	951,350	1,302,817	1,618,215	27,099	34,989	45,891	3.51	3.72	3.53
Illinois	10,640,279	14,462,773	18,658,428	359,723	464,194	555,599	2.96	3.12	3.36
Indiana	5,243,761	7,110,930	9,108,931	147,984	194,419	236,357	3.54	3.66	3.85
Iowa	2,622,510	3,264,336	3,808,200	71,905	90,186	117,635	3.65	3.62	3.24
Kansas	2,406,580	2,971,814	3,718,153	63,699	82,812	105,228	3.78	3.59	3.53
Kentucky	2,988,892	3,837,794	4,812,591	90,459	111,900	138,616	3.30	3.43	3.47
Louisiana	3,475,926	4,391,189	5,554,766	109,153	131,520	180,336	3.18	3.34	3.08
Maine	1,281,706	1,604,438	2,056,266	27,648	35,542	44,906	4.64	4.51	4.58
Maryland	5,083,380	6,545,135	8,682,586	137,391	180,367	244,447	3.70	3.63	3.55
Massachusetts	6,062,303	8,564,039	11,357,857	195,277	274,949	320,050	3.10	3.11	3.55
Michigan	10,440,206	13,994,294	16,353,921	251,017	337,235	372,148	4.16	4.15	4.39
Minnesota	4,622,930	6,140,442	7,310,284	131,357	185,093	231,437	3.52	3.32	3.16
Mississippi	1,921,480	2,510,376	3,243,888	53,816	64,266	79,786	3.57	3.91	4.07
Missouri	4,275,217	5,655,531	7,115,207	137,528	176,708	215,073	3.11	3.20	3.31
Montana	844,257	994,770	1,193,182	17,393	21,366	29,915	4.85	4.66	3.99
Nebraska	1,594,928	1,926,500	2,512,914	44,505	55,478	72,242	3.58	3.47	3.48
Nevada	1,186,132	1,875,467	2,722,264	48,974	73,719	110,158	2.42	2.54	2.47
New Hampshire	1,053,966	1,418,503	2,021,144	32,149	43,518	54,119	3.28	3.26	3.73
New Jersey	10,776,982	13,327,645	19,669,576	266,724	344,824	427,654	4.04	3.87	4.60
New Mexico	1,441,078	1,890,274	2,554,638	41,459	50,725	69,692	3.48	3.73	3.67
New York	22,989,629	28,433,240	38,866,853	594,444	777,157	961,385	3.87	3.66	4.04
North Carolina	5,440,426	7,713,293	9,567,000	191,579	273,698	350,700	2.84	2.82	2.73
North Dakota	534,632	638,946	786,870	14,515	17,752	24,935	3.68	3.60	3.16
Ohio	10,030,956	12,974,575	17,167,866	293,260	372,006	442,243	3.42	3.49	3.88
Oklahoma	2,763,721	3,382,581	4,161,024	69,580	89,757	121,558	3.97	3.77	3.42
Oregon	2,948,539	3,896,287	4,458,028	80,099	112,438	141,831	3.68	3.47	3.14
Pennsylvania	11,587,027	14,120,112	18,711,100	314,504	389,619	486,139	3.68	3.62	3.85
Rhode Island	1,050,969	1,393,143	1,825,900	25,666	33,609	43,623	4.09	4.15	4.19
South Carolina	2,920,230	4,087,355	5,312,739	86,053	112,514	140,088	3.39	3.63	3.79
South Dakota	612,825	737,998	916,563	17,807	23,099	30,541	3.44	3.19	3.00
Tennessee	3,540,682	4,931,734	6,446,691	135,655	174,851	224,995	2.61	2.82	2.87
Texas	17,572,269	25,098,703	31,919,107	507,441	727,233	989,333	3.46	3.45	3.23
Utah	1,618,047	2,102,655	2,627,022	46,303	67,568	88,364	3.49	3.11	2.97
Vermont	665,559	870,198	1,177,478	13,892	17,782	23,056	4.79	4.89	5.11
Virginia	5,750,318	7,757,598	10,705,162	185,490	260,743	350,692	3.10	2.98	3.05
Washington	5,138,928	6,399,885	7,870,979	151,338	221,961	271,381	3.40	2.88	2.90
West Virginia	1,758,557	2,086,937	2,527,767	36,362	41,476	53,091	4.84	5.03	4.76
Wisconsin	5,422,264	6,852,178	8,435,359	134,096	175,737	216,985	4.04	3.90	3.89
Wyoming	577,144	683,918	863,423	14,567	17,331	27,246	3.96	3.95	3.17
Puerto Rico	1,501,485	2,086,414	2,865,945	42,647	61,702	82,650	3.52	3.38	3.47

GDP = gross domestic product

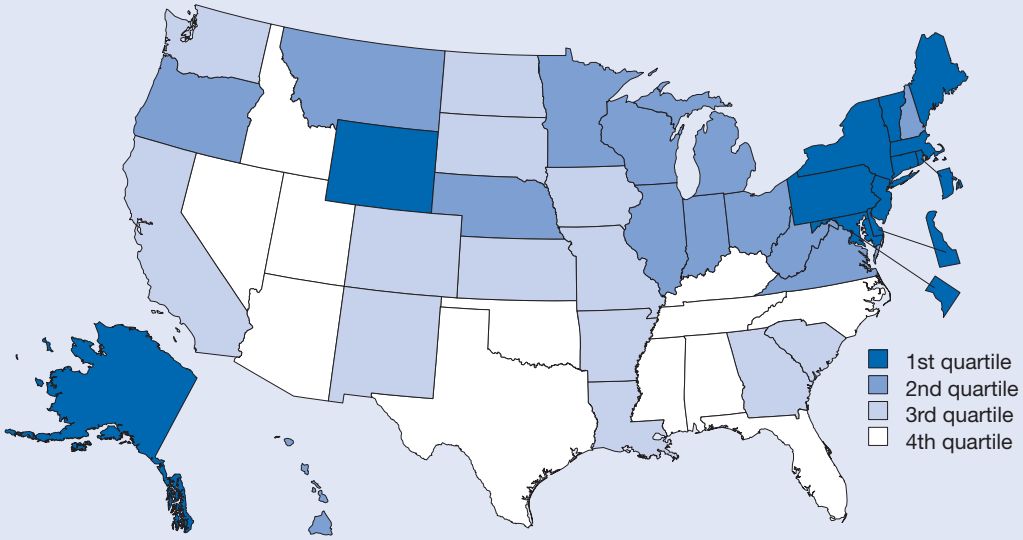
NOTES: Public school expenditures for Missouri, Tennessee, and Washington for 2005 affected by redistribution of reported values to correct for missing data items. GDP reported in current dollars.

SOURCES: National Center for Education Statistics (NCES), NCES Common Core of Data, National Public Education Financial Survey (various years); Bureau of Economic Analysis, Gross Domestic Product data (various years); and Government of Puerto Rico, Office of the Governor (various years).

Science & Engineering Indicators 2008

Current Expenditures per Pupil for Elementary and Secondary Public Schools

Figure 8-11
Current expenditures per pupil for elementary and secondary public schools: 2005



1st quartile ($14,117–$10,031)	2nd quartile ($9,771–$8,071)	3rd quartile ($8,065–$7,464)	4th quartile ($7,246–$5,216)
Alaska	Hawaii	Arkansas	Alabama
Connecticut	Illinois	California	Arizona
Delaware	Indiana	Colorado	Florida
District of Columbia	Michigan	Georgia	Idaho
Maine	Minnesota	Iowa	Kentucky
Maryland	Montana	Kansas	Mississippi
Massachusetts	Nebraska	Louisiana	Nevada
New Jersey	New Hampshire	Missouri	North Carolina
New York	Ohio	New Mexico	Oklahoma
Pennsylvania	Oregon	North Dakota	Tennessee
Rhode Island	Virginia	South Carolina	Texas
Vermont	West Virginia	South Dakota	Utah
Wyoming	Wisconsin	Washington	

SOURCES: National Center for Education Statistics (NCES), NCES Common Core of Data, State Nonfiscal Survey of Public Elementary/Secondary Education (various years); and National Public Education Financial Survey (various years). See table 8-11.

Findings

- Per-pupil spending on day-to-day operations grew nationwide from $5,529 in 1995 to $8,701 in 2005, an increase of 57% in unadjusted dollars.
- In 2005, all states showed substantial increases in per-pupil spending relative to 1995, and only 1 state failed to exceed the 1995 national average of $5,529 compared with 28 states in 1995.
- Per-pupil spending in individual states varied widely, ranging from a high of $14,117 to a low of $5,216 in 2005.
- There is no direct correlation between spending and academic performance. In fact, several states that ranked in the lower two quartiles of this indicator ranked in the upper quartiles of the National Assessment of Educational Progress indicators.

This indicator measures the investment by local, state, and federal governments in elementary and secondary education, adjusted for the size of the student body. It is calculated by dividing the current expenditures over the entire academic year for prekindergarten through grade 12 by the number of students in those grades in public schools. Current expenditures represent amounts expended for the day-to-day operations of schools and school districts. They include expenditures for instruction and instruction-related costs, student support services, administration, and operations and exclude funds for school construction and other capital outlays, debt services, and programs outside of public elementary and secondary education. During the 2004–05 school year, 65.9% of current expenses were used for instructional costs, 5.2% for student support services, 11.0% for administrative costs, and 17.8% for operational costs.

The number of pupils enrolled in prekindergarten through grade 12 is determined during the fall of the academic year. All figures represent actual spending and have not been adjusted for inflation. The year is the latter date of the academic year. For example, data for 2005 represent costs for the 2004–05 academic year.

Table 8-11
Current expenditures per pupil for elementary and secondary public schools, by state: 1995, 2000, and 2005

State	Public school expenditures ($thousands)			Student enrollment			Per-pupil expenditures ($)		
	1995	2000	2005	1995	2000	2005	1995	2000	2005
United States	243,877,582	323,888,508	424,562,096	44,111,482	46,857,149	48,794,911	5,529	6,912	8,701
Alabama	3,026,287	4,176,082	5,164,406	736,531	740,732	730,140	4,109	5,638	7,073
Alaska	1,020,675	1,183,499	1,442,269	127,057	134,391	132,970	8,033	8,806	10,847
Arizona	3,144,540	4,288,739	6,451,870	737,424	852,612	1,043,298	4,264	5,030	6,184
Arkansas	1,873,595	2,380,331	3,546,999	447,565	451,034	463,115	4,186	5,277	7,659
California	25,949,033	38,129,479	50,918,654	5,407,475	6,038,590	6,441,557	4,799	6,314	7,905
Colorado	3,232,976	4,401,010	5,994,440	640,521	708,109	765,976	5,047	6,215	7,826
Connecticut	4,247,328	5,402,836	7,080,396	506,824	553,993	577,390	8,380	9,753	12,263
Delaware	694,473	937,630	1,299,349	106,813	112,836	119,091	6,502	8,310	10,911
District of Columbia	666,938	780,192	1,023,952	80,450	77,194	76,714	8,290	10,107	13,348
Florida	11,019,735	13,885,988	19,042,877	2,111,188	2,381,396	2,639,336	5,220	5,831	7,215
Georgia	6,136,689	9,158,624	12,528,856	1,270,948	1,422,762	1,553,437	4,828	6,437	8,065
Hawaii	1,028,729	1,213,695	1,648,086	183,795	185,860	183,185	5,597	6,530	8,997
Idaho	951,350	1,302,817	1,618,215	240,448	245,136	256,084	3,957	5,315	6,319
Illinois	10,640,279	14,462,773	18,658,428	1,916,172	2,027,600	2,097,503	5,553	7,133	8,896
Indiana	5,243,761	7,110,930	9,108,931	969,022	988,702	1,021,348	5,411	7,192	8,919
Iowa	2,622,510	3,264,336	3,808,200	500,440	497,301	478,319	5,240	6,564	7,962
Kansas	2,406,580	2,971,814	3,718,153	460,838	472,188	469,136	5,222	6,294	7,926
Kentucky	2,988,892	3,837,794	4,812,591	657,642	648,180	674,796	4,545	5,921	7,132
Louisiana	3,475,926	4,391,189	5,554,766	797,933	756,579	724,281	4,356	5,804	7,669
Maine	1,281,706	1,604,438	2,056,266	212,601	209,253	198,820	6,029	7,667	10,342
Maryland	5,083,380	6,545,135	8,682,586	790,938	846,582	865,561	6,427	7,731	10,031
Massachusetts	6,062,303	8,564,039	11,357,857	893,727	971,425	975,574	6,783	8,816	11,642
Michigan	10,440,206	13,994,294	16,353,921	1,614,784	1,725,639	1,750,919	6,465	8,110	9,340
Minnesota	4,622,930	6,140,442	7,310,284	821,693	854,034	838,503	5,626	7,190	8,718
Mississippi	1,921,480	2,510,376	3,243,888	505,962	500,716	495,376	3,798	5,014	6,548
Missouri	4,275,217	5,655,531	7,115,207	878,541	914,110	905,449	4,866	6,187	7,858
Montana	844,257	994,770	1,193,182	164,341	157,556	146,705	5,137	6,314	8,133
Nebraska	1,594,928	1,926,500	2,512,914	287,100	288,261	285,761	5,555	6,683	8,794
Nevada	1,186,132	1,875,467	2,722,264	250,747	325,610	400,083	4,730	5,760	6,804
New Hampshire	1,053,966	1,418,503	2,021,144	189,319	206,783	206,852	5,567	6,860	9,771
New Jersey	10,776,982	13,327,645	19,669,576	1,174,206	1,289,256	1,393,347	9,178	10,337	14,117
New Mexico	1,441,078	1,890,274	2,554,638	327,248	324,495	326,102	4,404	5,825	7,834
New York	22,989,629	28,433,240	38,866,853	2,766,208	2,887,776	2,836,337	8,311	9,846	13,703
North Carolina	5,440,426	7,713,293	9,567,000	1,156,767	1,275,925	1,385,754	4,703	6,045	6,904
North Dakota	534,632	638,946	786,870	119,288	112,751	100,513	4,482	5,667	7,829
Ohio	10,030,956	12,974,575	17,167,866	1,814,290	1,836,554	1,840,032	5,529	7,065	9,330
Oklahoma	2,763,721	3,382,581	4,161,024	609,718	627,032	629,476	4,533	5,395	6,610
Oregon	2,948,539	3,896,287	4,458,028	521,945	545,033	552,322	5,649	7,149	8,071
Pennsylvania	11,587,027	14,120,112	18,711,100	1,764,946	1,816,716	1,828,089	6,565	7,772	10,235
Rhode Island	1,050,969	1,393,143	1,825,900	147,487	156,454	156,498	7,126	8,904	11,667
South Carolina	2,920,230	4,087,355	5,312,739	648,725	666,780	703,736	4,501	6,130	7,549
South Dakota	612,825	737,998	916,563	143,482	131,037	122,798	4,271	5,632	7,464
Tennessee	3,540,682	4,931,734	6,446,691	881,425	916,202	941,091	4,017	5,383	6,850
Texas	17,572,269	25,098,703	31,919,107	3,677,171	3,991,783	4,405,215	4,779	6,288	7,246
Utah	1,618,047	2,102,655	2,627,022	474,675	480,255	503,607	3,409	4,378	5,216
Vermont	665,559	870,198	1,177,478	104,533	104,559	98,352	6,367	8,323	11,972
Virginia	5,750,318	7,757,598	10,705,162	1,060,809	1,133,994	1,204,739	5,421	6,841	8,886
Washington	5,138,928	6,399,885	7,870,979	938,314	1,003,714	1,020,005	5,477	6,376	7,717
West Virginia	1,758,557	2,086,937	2,527,767	310,511	291,811	280,129	5,663	7,152	9,024
Wisconsin	5,422,264	6,852,178	8,435,359	860,581	877,753	864,757	6,301	7,806	9,755
Wyoming	577,144	683,918	863,423	100,314	92,105	84,733	5,753	7,425	10,190
Puerto Rico	1,501,485	2,086,414	2,865,945	621,121	613,019	575,648	2,417	3,404	4,979

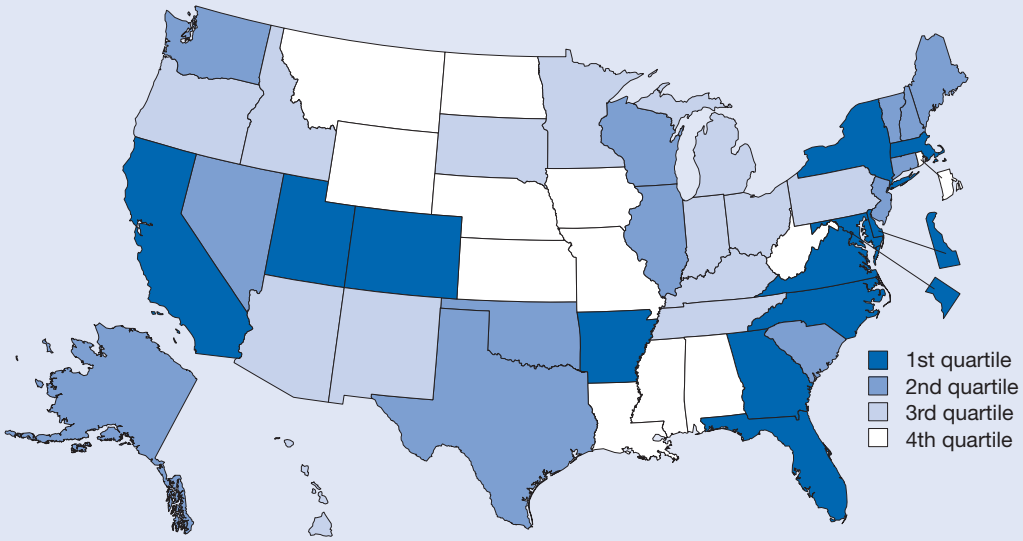
NOTES: Public school expenditures for Missouri, Tennessee, and Washington for 2005 affected by redistribution of reported values to correct for missing data items. Public school expenditures reported in current dollars. 2005 prekindergarten student membership for California was imputed, affecting the total student count and per pupil expenditures calculation.

SOURCES: National Center for Education Statistics (NCES), NCES Common Core of Data, State Nonfiscal Survey of Public Elementary/Secondary Education (various years); and National Public Education Financial Survey (various years).

Science & Engineering Indicators 2008

Share of Public High School Students Taking Advanced Placement Exams

Figure 8-12
Share of public high school students taking Advanced Placement Exams: 2006



1st quartile (36.4%–27.2%)	2nd quartile (27.0%–19.4%)	3rd quartile (19.2%–15.8%)	4th quartile (15.1%–5.1%)
Arkansas	Alaska	Arizona	Alabama
California	Connecticut	Hawaii	Iowa
Colorado	Illinois	Idaho	Kansas
Delaware	Maine	Indiana	Louisiana
District of Columbia	Nevada	Kentucky	Mississippi
Florida	New Hampshire	Michigan	Missouri
Georgia	New Jersey	Minnesota	Montana
Maryland	Oklahoma	New Mexico	Nebraska
Massachusetts	South Carolina	Ohio	North Dakota
New York	Texas	Oregon	Rhode Island
North Carolina	Vermont	Pennsylvania	West Virginia
Utah	Washington	South Dakota	Wyoming
Virginia	Wisconsin	Tennessee	

SOURCE: College Board, Advanced Placement Report to the Nation (various years). See table 8-12.

Findings

- Nationwide, the percent of public school students who took an AP Exam rose from 15.9% of the class of 2000 to 24.2% of the class of 2006.
- The percentage of public school students taking an AP Exam varied greatly among states and ranged from 5.1% to 36.4% of the class of 2006. Thirty-five states and the District of Columbia exceeded the 2000 national average in 2006, compared with 15 states and the District of Columbia that exceeded the national average in 2000.
- AP participation levels were higher for all jurisdictions in 2006 than in 2000. Arkansas and the District of Columbia showed the largest increases; class of 2006 members in these jurisdictions exceeded the participation of the class of 2000 by 22.5 and 16.4 percentage points, respectively.

Participation in the Advanced Placement (AP) program provides a measure of the extent to which a rigorous curriculum is available to and utilized by high school students. This indicator measures the percentage of students in the graduating class who have taken one or more AP Exams. It is calculated by dividing the number of students in the graduating class who have taken at least one AP Exam by the total number of students in the graduating class.

Throughout the United States, more than 660,000 public school students from the class of 2006 took nearly 1.7 million AP Exams during their high school careers. Generally, students who take AP Exams have completed a rigorous course of study in a specific subject area in high school with the expectation of obtaining college credit or advanced placement. AP Exams were taken most frequently in U.S. history, English literature and composition, English language and composition, calculus AB, and U.S. government and politics. In the 50 states and the District of Columbia, 12,037 public schools participated in the AP program in 2006. This represented over 65% of the public schools in the United States that offer a secondary curriculum. These schools make available an average of eight different AP courses to their students.

Table 8-12
Share of public high school students taking Advanced Placement Exams, by state: 2000, 2004, and 2006
(Percent)

State	2000	2004	2006
United States	15.9	20.9	24.2
Alabama	7.2	8.8	10.2
Alaska	15.4	16.7	20.0
Arizona	11.3	12.9	15.8
Arkansas	8.1	13.0	30.6
California	22.2	28.5	31.3
Colorado	18.6	25.3	28.9
Connecticut	19.1	24.6	26.7
Delaware	13.3	19.6	27.7
District of Columbia	17.3	23.1	33.7
Florida	22.7	33.5	36.4
Georgia	17.2	21.5	27.2
Hawaii	10.6	14.8	15.9
Idaho	9.6	12.5	16.0
Illinois	13.4	18.6	21.7
Indiana	11.9	15.5	18.8
Iowa	6.9	10.0	11.8
Kansas	7.0	9.2	12.2
Kentucky	10.6	15.5	18.9
Louisiana	3.2	5.0	5.1
Maine	14.8	19.9	23.6
Maryland	20.2	29.2	33.5
Massachusetts	19.6	25.3	27.7
Michigan	13.9	16.8	18.7
Minnesota	13.4	16.4	19.2
Mississippi	5.6	7.0	10.6
Missouri	5.5	8.1	9.8
Montana	10.1	13.0	15.1
Nebraska	5.0	6.3	9.3
Nevada	15.1	19.8	23.1
New Hampshire	13.3	16.0	19.4
New Jersey	17.9	21.3	23.5
New Mexico	11.1	17.0	19.1
New York	27.3	32.4	35.4
North Carolina	19.7	26.9	31.7
North Dakota	5.9	8.4	9.6
Ohio	11.3	15.2	17.2
Oklahoma	9.5	17.0	20.4
Oregon	10.5	13.6	17.0
Pennsylvania	12.4	14.9	16.6
Rhode Island	10.7	12.1	13.0
South Carolina	17.7	19.2	22.0
South Dakota	9.6	13.5	15.8
Tennessee	10.4	13.6	16.8
Texas	16.6	23.2	27.0
Utah	24.5	27.6	30.6
Vermont	16.6	21.2	24.8
Virginia	25.0	28.1	32.9
Washington	11.5	18.5	23.5
West Virginia	8.4	13.0	13.6
Wisconsin	15.2	20.0	23.0
Wyoming	6.1	11.2	13.2
Puerto Rico	NA	NA	NA

NA = not available

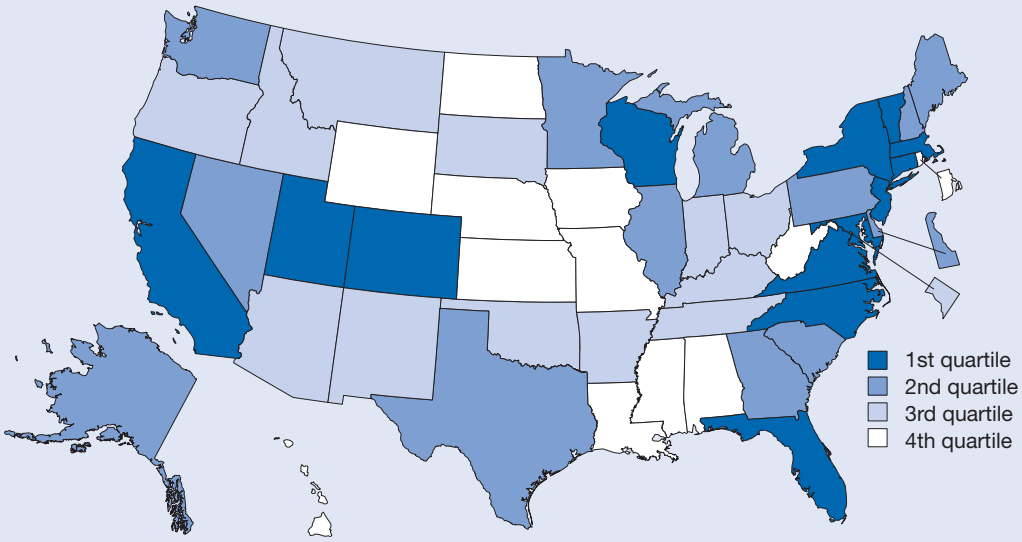
NOTE: National average for United States is reported value in Advanced Placement Report to the Nation.

SOURCE: College Board, Advanced Placement Report to the Nation (various years).

Science & Engineering Indicators 2008

Share of Public High School Students Scoring 3 or Higher on at Least One Advanced Placement Exam

Figure 8-13
Share of public high school students scoring 3 or higher on at least one Advanced Placement Exam: 2006



1st quartile (22.7%–15.8%)	2nd quartile (15.1%–11.1%)	3rd quartile (10.5%–9.0%)	4th quartile (8.4%–2.3%)
California	Alaska	Arizona	Alabama
Colorado	Delaware	Arkansas	Hawaii
Connecticut	Georgia	District of Columbia	Iowa
Florida	Illinois	Idaho	Kansas
Maryland	Maine	Indiana	Louisiana
Massachusetts	Michigan	Kentucky	Mississippi
New Jersey	Minnesota	Montana	Missouri
New York	Nevada	New Mexico	Nebraska
North Carolina	New Hampshire	Ohio	North Dakota
Utah	Pennsylvania	Oklahoma	Rhode Island
Vermont	South Carolina	Oregon	West Virginia
Virginia	Texas	South Dakota	Wyoming
Wisconsin	Washington	Tennessee	

SOURCE: College Board, Advanced Placement Report to the Nation (various years). See table 8-13.

Findings

- Nationally, 14.8% of public school students in the class of 2006 demonstrated the ability to do college-level work by obtaining a score of 3 or higher on at least one AP Exam, a significant increase over the 10.2% achieved by the class of 2000.
- Students from all states demonstrated greater success on AP Exams in 2006 than in 2000, but this success was not uniformly distributed. In 2006, 21 states and the District of Columbia had percentages below the national average of 10.2% compared with 38 jurisdictions in 2000.
- The percentage of students who are successful on AP Exams varies widely among states; state indicator values for public school students in the class of 2006 ranged from a low of 2.3% to a high of 22.7%. This wide range indicates that opportunities for advanced work are more readily available to students in certain states, and that these students are demonstrating college-level skills through successful completion of their AP programs.
- Values of this indicator were higher for all states in 2006 than in 2000. Maryland, Delaware, North Carolina, Washington, and Florida showed the largest increases; class of 2006 members in these states exceeded the performance of class of 2000 participants by more than 6 percentage points.

This indicator provides a measure of the extent to which high school students are successfully demonstrating their mastery of college-level material. It is defined as the percentage of U.S. public high school graduates who have scored 3 or higher on at least one Advanced Placement (AP) Exam. A high value on this indicator shows the extent to which students have been offered access to a rigorous curriculum and successfully mastered these requirements.

A total of 37 different AP Exams are offered each spring by the College Board. The exams are scored on a scale of 1 to 5, with 3 representing a range of work equivalent to midlevel B to midlevel C performance in college. To prepare for the AP Exam in a subject area, most students enroll in an AP class that employs a curriculum of high academic intensity. Scoring a 3 or higher indicates that the student has mastered the content of at least one such course of rigorous academic intensity at a level that would be acceptable in college. Performance on AP Exams is considered by many colleges and universities to be one of the best predictors of success in college. Many colleges and universities grant college credit or advanced placement for AP Exam grades of 3 or higher.

Table 8-13
Share of public high school students scoring 3 or higher on at least one Advanced Placement Exam, by state: 2000, 2004, and 2006
(Percent)

State	2000	2004	2006
United States	10.2	13.2	14.8
Alabama	3.9	5.0	5.7
Alaska	10.1	10.8	12.6
Arizona	7.2	8.0	9.4
Arkansas	4.3	6.1	9.8
California	15.0	18.7	20.1
Colorado	12.2	16.2	17.9
Connecticut	13.6	17.6	19.4
Delaware	7.6	11.1	14.5
District of Columbia	6.6	8.2	9.6
Florida	13.5	19.2	19.6
Georgia	9.7	12.0	14.8
Hawaii	5.8	7.7	7.6
Idaho	6.5	8.1	9.7
Illinois	9.9	13.3	15.1
Indiana	6.0	7.7	9.2
Iowa	4.9	6.6	7.8
Kansas	4.4	6.3	7.7
Kentucky	5.5	7.7	9.4
Louisiana	1.9	2.5	2.3
Maine	10.1	12.8	14.4
Maryland	14.1	19.4	22.0
Massachusetts	14.5	18.1	19.8
Michigan	8.8	10.9	12.2
Minnesota	8.1	10.6	12.4
Mississippi	2.3	2.9	3.5
Missouri	3.7	5.3	6.3
Montana	6.8	8.8	10.0
Nebraska	3.2	4.0	5.8
Nevada	9.1	12.4	13.3
New Hampshire	9.2	10.9	13.6
New Jersey	12.9	15.5	16.6
New Mexico	6.1	8.1	9.0
New York	17.9	21.2	22.7
North Carolina	11.3	15.8	18.0
North Dakota	4.4	5.7	6.8
Ohio	7.1	9.4	10.5
Oklahoma	5.4	8.3	9.6
Oregon	7.1	8.8	10.4
Pennsylvania	8.3	10.1	11.1
Rhode Island	6.9	7.8	8.4
South Carolina	10.0	11.2	12.5
South Dakota	5.9	8.3	9.4
Tennessee	6.2	7.9	9.5
Texas	9.9	13.1	14.6
Utah	17.4	19.3	20.8
Vermont	11.5	14.0	16.3
Virginia	15.9	17.7	20.7
Washington	7.6	11.6	14.1
West Virginia	4.6	6.4	6.4
Wisconsin	10.5	13.7	15.8
Wyoming	3.8	6.7	6.6
Puerto Rico	NA	NA	NA

NA = not available

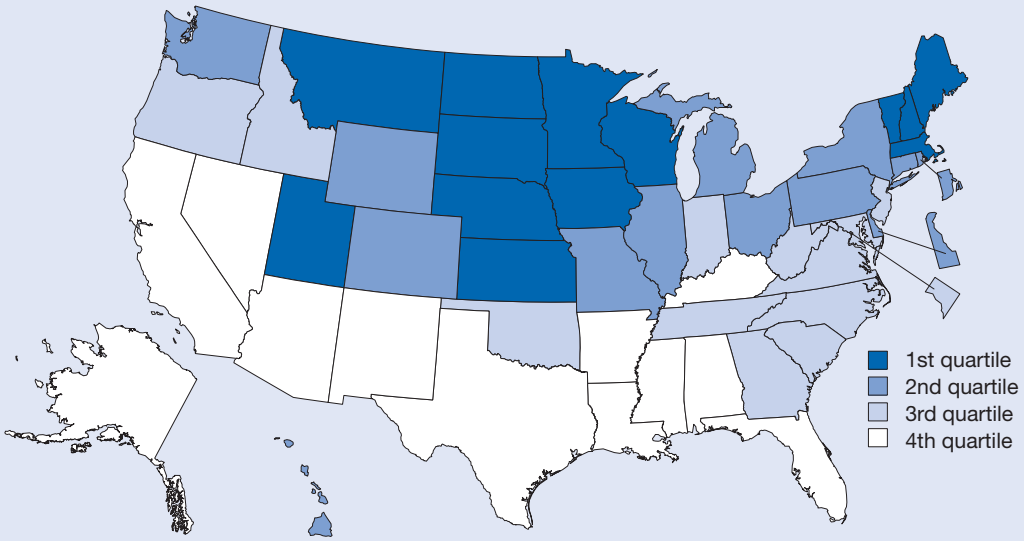
NOTE: National average for United States is reported value in Advanced Placement Report to the Nation.

SOURCE: College Board, Advanced Placement Report to the Nation (various years).

Science & Engineering Indicators 2008

High School Graduates or Higher Among Individuals 25–44 Years Old

Figure 8-14
High school graduates or higher among individuals 25–44 years old: 2005



1st quartile (99.4%–89.6%)	2nd quartile (89.3%–86.8%)	3rd quartile (86.7%–84.6%)	4th quartile (84.4%–77.0%)
Iowa	Colorado	District of Columbia	Alabama
Kansas	Connecticut	Georgia	Alaska
Maine	Delaware	Idaho	Arizona
Massachusetts	Hawaii	Indiana	Arkansas
Minnesota	Illinois	Maryland	California
Montana	Michigan	New Jersey	Florida
Nebraska	Missouri	North Carolina	Kentucky
New Hampshire	New York	Oklahoma	Louisiana
North Dakota	Ohio	Oregon	Mississippi
South Dakota	Pennsylvania	South Carolina	Nevada
Utah	Rhode Island	Tennessee	New Mexico
Vermont	Washington	Virginia	Texas
Wisconsin	Wyoming	West Virginia	

SOURCES: Census Bureau, 2000 Decennial Census; Population Estimates Program (various years); and American Community Survey (various years).
See Table 8-14.

Findings

- Nationwide, 84.8% of the early- to mid-career population had at least a high school credential in 2005, which is nearly identical with 85.0% in 2000.
- Only 21 states and the District of Columbia showed an increase in the percentage of their early- to mid-career population with at least a high school credential between 2000 and 2005. Thirteen states had 2005 values below the 2000 national average of 85.0% compared with 17 states and the District of Columbia in 2000.
- In 2005, the early- to mid-career population with at least a high school credential varied greatly among states, ranging from 77.0% to 99.4%. States in close proximity to the southern border tended to rank lowest on this indicator.

This indicator represents the percentage of the early- to mid-career population that has earned at least a high school credential. The indicator represents where high school graduates have chosen to live and work rather than where they were educated. The 25–44-year-old cohort was selected because it is likely to capture both high school diplomas and equivalency degrees. High values indicate a resident population and potential workforce with widespread basic education credentials.

Estimates of educational attainment are developed by the Census Bureau based on the 2000 Decennial Census and the American Community Survey (ACS). The census is conducted every 10 years, but the ACS provides annually updated data on the characteristics of population and housing. In 2005, ACS became the largest household survey in the United States, with an annual sample size of about 3 million addresses. Estimates of population are developed by the Census Bureau through the Population Estimates Program, which is also based on the 2000 Decennial Census. The value of this indicator may be imprecise for jurisdictions with small populations because both its numerator and denominator are based on estimates.

Table 8-14
High school graduates or higher among individuals 25–44 years old, by state: 2000, 2003, and 2005

State	Graduates 25–44 years old			Population 25–44 years old			Graduates/population 25–44 years old (%)		
	2000	2003	2005	2000	2003	2005	2000	2003	2005
United States	72,241,876	71,684,426	71,215,646	85,040,251	84,216,990	84,010,639	85.0	85.1	84.8
Alabama	1,064,945	1,027,964	1,035,193	1,288,527	1,241,184	1,234,729	82.6	82.8	83.8
Alaska	186,160	167,805	162,669	203,522	194,823	194,890	91.5	86.1	83.5
Arizona	1,232,818	1,286,915	1,367,583	1,511,469	1,599,029	1,694,572	81.6	80.5	80.7
Arkansas	622,698	608,116	633,557	750,972	738,579	750,229	82.9	82.3	84.4
California	8,286,071	8,529,909	8,316,850	10,714,403	10,832,873	10,794,860	77.3	78.7	77.0
Colorado	1,242,919	1,239,272	1,240,697	1,400,850	1,417,501	1,421,418	88.7	87.4	87.3
Connecticut	926,614	903,677	852,932	1,032,689	999,800	968,330	89.7	90.4	88.1
Delaware	207,799	204,842	206,583	236,441	233,356	233,683	87.9	87.8	88.4
District of Columbia	157,077	160,782	163,027	189,439	188,758	189,675	82.9	85.2	86.0
Florida	3,840,710	3,924,625	4,000,762	4,569,347	4,676,558	4,812,867	84.1	83.9	83.1
Georgia	2,238,995	2,280,061	2,368,999	2,652,764	2,723,720	2,784,441	84.4	83.7	85.1
Hawaii	333,762	316,491	308,637	362,336	352,806	355,620	92.1	89.7	86.8
Idaho	316,815	323,260	327,870	362,401	370,690	387,620	87.4	87.2	84.6
Illinois	3,265,416	3,267,787	3,200,557	3,795,544	3,727,314	3,672,713	86.0	87.7	87.1
Indiana	1,567,100	1,494,212	1,500,650	1,791,828	1,748,331	1,741,859	87.5	85.5	86.2
Iowa	740,397	709,299	713,525	808,259	775,320	764,399	91.6	91.5	93.3
Kansas	687,268	675,316	656,920	769,204	743,961	732,886	89.3	90.8	89.6
Kentucky	1,009,246	1,013,026	993,094	1,210,773	1,182,970	1,187,091	83.4	85.6	83.7
Louisiana	1,044,255	1,014,054	1,026,229	1,293,128	1,230,819	1,217,481	80.8	82.4	84.3
Maine	339,227	325,208	317,653	370,597	358,691	350,196	91.5	90.7	90.7
Maryland	1,487,216	1,454,663	1,399,879	1,664,677	1,641,907	1,615,367	89.3	88.6	86.7
Massachusetts	1,795,438	1,763,262	1,690,234	1,989,783	1,922,446	1,848,998	90.2	91.7	91.4
Michigan	2,630,713	2,551,652	2,455,339	2,960,544	2,840,435	2,772,896	88.9	89.8	88.5
Minnesota	1,395,170	1,374,938	1,345,742	1,497,320	1,465,370	1,443,493	93.2	93.8	93.2
Mississippi	650,242	645,671	648,458	807,170	782,327	778,254	80.6	82.5	83.3
Missouri	1,426,806	1,399,485	1,378,001	1,626,302	1,587,931	1,585,316	87.7	88.1	86.9
Montana	225,105	213,382	216,509	245,220	232,735	232,383	91.8	91.7	93.2
Nebraska	441,527	432,446	421,008	487,107	471,024	464,556	90.6	91.8	90.6
Nevada	508,173	538,622	585,942	628,572	679,392	729,594	80.8	79.3	80.3
New Hampshire	350,744	340,140	330,926	381,240	373,644	364,731	92.0	91.0	90.7
New Jersey	2,313,820	2,254,281	2,165,296	2,624,146	2,578,072	2,510,115	88.2	87.4	86.3
New Mexico	425,745	400,847	411,608	516,100	506,956	511,007	82.5	79.1	80.5
New York	4,926,064	4,912,059	4,786,794	5,831,622	5,667,484	5,501,929	84.5	86.7	87.0
North Carolina	2,117,289	2,096,022	2,148,501	2,500,535	2,507,025	2,523,658	84.7	83.6	85.1
North Dakota	164,893	157,062	155,297	174,891	160,522	156,178	94.3	97.8	99.4
Ohio	2,965,744	2,840,789	2,759,770	3,325,210	3,172,294	3,105,980	89.2	89.5	88.9
Oklahoma	836,030	796,708	807,209	975,169	946,358	944,171	85.7	84.2	85.5
Oregon	861,602	880,905	872,276	997,269	1,003,698	1,015,644	86.4	87.8	85.9
Pennsylvania	3,136,195	2,966,827	2,908,593	3,508,562	3,343,434	3,255,635	89.4	88.7	89.3
Rhode Island	265,033	262,340	264,154	310,636	306,459	296,717	85.3	85.6	89.0
South Carolina	990,207	1,002,730	999,627	1,185,955	1,167,347	1,171,573	83.5	85.9	85.3
South Dakota	188,052	182,643	180,013	206,399	197,386	195,213	91.1	92.5	92.2
Tennessee	1,439,729	1,446,735	1,459,559	1,718,428	1,684,796	1,698,611	83.8	85.9	85.9
Texas	5,115,457	5,136,496	5,248,281	6,484,321	6,644,003	6,762,605	78.9	77.3	77.6
Utah	555,513	602,199	646,632	626,600	648,111	695,736	88.7	92.9	92.9
Vermont	162,109	153,679	150,073	176,456	168,392	163,707	91.9	91.3	91.7
Virginia	1,962,040	1,911,347	1,896,614	2,237,655	2,227,978	2,228,610	87.7	85.8	85.1
Washington	1,617,766	1,607,576	1,592,550	1,816,217	1,803,610	1,820,192	89.1	89.1	87.5
West Virginia	420,900	400,998	411,155	501,343	479,781	478,383	84.0	83.6	85.9
Wisconsin	1,429,331	1,369,084	1,367,667	1,581,690	1,537,180	1,517,725	90.4	89.1	90.1
Wyoming	126,931	116,217	117,952	138,619	131,810	132,103	91.6	88.2	89.3
Puerto Rico	794,579	NA	868,650	1,049,995	1,069,617	1,077,981	75.7	NA	80.6

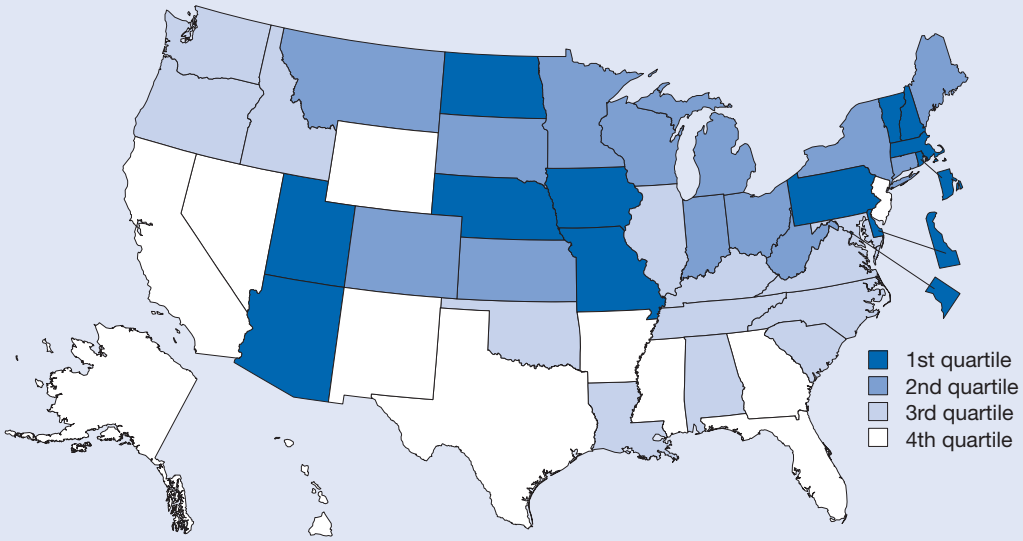
NA = not available

SOURCES: Census Bureau, 2000 Decennial Census; Population Estimates Program (various years); and American Community Survey (various years).

Science & Engineering Indicators 2008

Bachelor's Degrees Conferred per 1,000 Individuals 18–24 Years Old

Figure 8-15
Bachelor's degrees conferred per 1,000 individuals 18–24 years old: 2005



1st quartile (130.5–59.1)	2nd quartile (58.8–51.2)	3rd quartile (49.9–43.2)	4th quartile (42.8–20.3)
Arizona	Colorado	Alabama	Alaska
Delaware	Connecticut	Idaho	Arkansas
District of Columbia	Indiana	Illinois	California
Iowa	Kansas	Kentucky	Florida
Massachusetts	Maine	Louisiana	Georgia
Missouri	Michigan	Maryland	Hawaii
Nebraska	Minnesota	North Carolina	Mississippi
New Hampshire	Montana	Oklahoma	Nevada
North Dakota	New York	Oregon	New Jersey
Pennsylvania	Ohio	South Carolina	New Mexico
Rhode Island	South Dakota	Tennessee	Texas
Utah	West Virginia	Virginia	Wyoming
Vermont	Wisconsin	Washington	

SOURCES: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years); Census Bureau, 2000 Decennial Census; and Population Estimates Program (various years). See Table 8-15.

Findings

- In 2005, 1.42 million bachelor's degrees were conferred nationally in all fields, up from 1.17 million in 1996.
- Over the past decade, the ratio of bachelor's degrees conferred to the 18–24-year-old population has remained essentially constant.
- In 2005, there was great variability among states in undergraduate educational opportunities relative to the size of their youthful population. Across the states, a range of 20.3 to 84.4 bachelor's degrees were conferred per 1,000 18–24-year-olds; the District of Columbia was nearly 131 (an outlier reflecting a large concentration of academic institutions relative to the size of the resident population).
- In 18 states, the number of bachelor's degrees conferred per 1,000 18–24-year-olds decreased between 1996 and 2005.

Earning a bachelor's degree gives people greater opportunities to work in higher-paying jobs than are generally available to those with less education; it also prepares them for advanced education. In addition, the capacity to produce degrees may generate resources for the state. The ratio of bachelor's degrees awarded to a state's 18–24-year-old population is a broad measure of a state's relative success in producing degrees at this level. The 18–24-year-old cohort was chosen to approximate the age range of most students who are pursuing an undergraduate degree.

Although the number of bachelor's degrees awarded is based on an actual count, the population of 18–24-year-olds is an estimate developed by the Census Bureau in the Population Estimates Program, which relies on the Decennial Census. This estimate may make the value of this indicator imprecise for jurisdictions with small populations.

A high value for this indicator may suggest the successful provision of educational opportunity at this level. Student and graduate mobility after graduation, however, may make this indicator less meaningful in predicting the qualifications of a state's future workforce. The indicator's value may also be high when a higher education system draws a large percentage of out-of-state students, a situation that sometimes occurs in states with small resident populations and the District of Columbia.

Table 8-15
Bachelor's degrees conferred per 1,000 individuals 18–24 years old, by state: 1996, 2001, and 2005

State	Bachelor's degrees			Population 18–24 years old			Degrees/1,000 individuals 18–24 years old		
	1996	2001	2005	1996	2001	2005	1996	2001	2005
United States	1,165,138	1,241,507	1,420,043	24,842,610	27,998,931	29,333,266	46.9	44.3	48.4
Alabama	20,133	20,654	21,388	437,421	448,725	448,894	46.0	46.0	47.6
Alaska	1,497	1,343	1,427	64,682	60,394	70,429	23.1	22.2	20.3
Arizona	18,822	25,509	34,915	417,142	536,708	576,725	45.1	47.5	60.5
Arkansas	9,099	9,628	11,186	247,651	268,747	270,471	36.7	35.8	41.4
California	108,604	118,552	139,417	2,982,515	3,487,649	3,726,736	36.4	34.0	37.4
Colorado	20,043	21,698	24,936	354,247	449,661	459,040	56.6	48.3	54.3
Connecticut	13,814	14,249	16,835	261,580	282,433	313,202	52.8	50.5	53.8
Delaware	4,330	4,466	5,220	65,107	78,501	83,016	66.5	56.9	62.9
District of Columbia	7,787	8,113	9,169	45,801	72,372	70,265	170.0	112.1	130.5
Florida	46,274	49,914	60,434	1,168,986	1,399,219	1,572,959	39.6	35.7	38.4
Georgia	27,322	28,481	35,086	728,478	865,538	903,396	37.5	32.9	38.8
Hawaii	4,696	4,772	5,127	116,166	118,324	123,584	40.4	40.3	41.5
Idaho	4,489	4,646	7,235	130,028	144,632	149,739	34.5	32.1	48.3
Illinois	52,222	55,938	59,611	1,111,306	1,242,578	1,274,718	47.0	45.0	46.8
Indiana	30,571	31,854	36,579	571,520	627,241	623,312	53.5	50.8	58.7
Iowa	17,669	18,577	20,418	269,324	302,946	311,451	65.6	61.3	65.6
Kansas	14,873	15,014	16,565	249,744	281,504	292,984	59.6	53.3	56.5
Kentucky	14,674	15,460	17,905	397,201	409,650	395,618	36.9	37.7	45.3
Louisiana	17,989	19,854	21,199	459,805	484,149	490,354	39.1	41.0	43.2
Maine	5,619	5,429	6,485	110,955	108,029	117,048	50.6	50.3	55.4
Maryland	20,873	22,891	25,685	427,478	473,697	526,277	48.8	48.3	48.8
Massachusetts	40,681	42,717	45,623	511,122	593,001	625,908	79.6	72.0	72.9
Michigan	44,371	45,790	50,565	921,950	957,339	986,126	48.1	47.8	51.3
Minnesota	23,117	23,128	27,869	418,324	486,487	516,133	55.3	47.5	54.0
Mississippi	9,983	11,232	11,681	299,031	316,573	311,137	33.4	35.5	37.5
Missouri	27,251	30,083	33,838	495,615	552,843	572,472	55.0	54.4	59.1
Montana	4,622	5,016	5,177	85,538	88,639	94,488	54.0	56.6	54.8
Nebraska	9,889	10,788	11,993	161,398	178,383	188,583	61.3	60.5	63.6
Nevada	3,417	4,101	5,029	133,106	189,705	207,871	25.7	21.6	24.2
New Hampshire	7,660	7,266	8,111	94,357	108,106	121,124	81.2	67.2	67.0
New Jersey	24,572	26,948	31,987	668,453	696,100	747,332	36.8	38.7	42.8
New Mexico	6,048	5,959	6,580	169,870	186,485	205,017	35.6	32.0	32.1
New York	96,429	100,010	112,475	1,602,205	1,820,985	1,919,224	60.2	54.9	58.6
North Carolina	32,795	34,767	39,289	699,477	816,974	822,150	46.9	42.6	47.8
North Dakota	4,484	4,688	5,161	66,272	74,916	80,276	67.7	62.6	64.3
Ohio	48,865	51,026	56,993	1,052,052	1,081,211	1,112,156	46.4	47.2	51.2
Oklahoma	14,412	15,789	17,922	328,471	367,634	375,095	43.9	42.9	47.8
Oregon	13,159	13,452	16,296	287,641	337,895	341,623	45.7	39.8	47.7
Pennsylvania	61,840	67,041	78,044	1,039,419	1,121,633	1,191,907	59.5	59.8	65.5
Rhode Island	8,788	8,468	9,811	84,855	109,933	116,201	103.6	77.0	84.4
South Carolina	14,998	16,676	19,256	381,672	418,585	420,351	39.3	39.8	45.8
South Dakota	4,603	4,363	4,921	73,421	79,589	83,635	62.7	54.8	58.8
Tennessee	20,659	22,712	25,770	510,638	563,333	557,703	40.5	40.3	46.2
Texas	70,765	76,037	88,000	1,947,117	2,280,525	2,421,692	36.3	33.3	36.3
Utah	15,275	16,775	19,565	265,713	329,723	326,302	57.5	50.9	60.0
Vermont	4,492	4,671	4,841	51,912	58,647	62,424	86.5	79.6	77.6
Virginia	30,914	32,895	36,747	649,086	697,925	737,118	47.6	47.1	49.9
Washington	22,492	23,271	27,571	505,840	581,479	605,063	44.5	40.0	45.6
West Virginia	8,582	8,704	9,572	186,316	174,936	167,236	46.1	49.8	57.2
Wisconsin	26,934	28,415	30,839	483,384	535,174	562,611	55.7	53.1	54.8
Wyoming	1,641	1,677	1,695	51,218	51,476	54,090	32.0	32.6	31.3
Puerto Rico	14,110	15,762	16,669	NA	426,194	411,575	NA	37.0	40.5

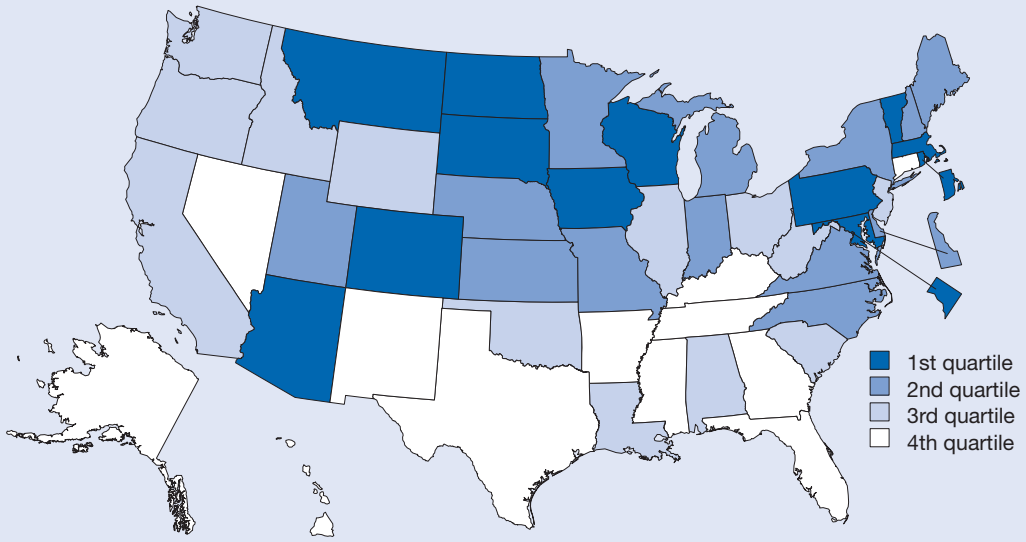
NA = not available

SOURCES: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years); Census Bureau, 2000 Decennial Census; and Population Estimates Program (various years).

Science & Engineering Indicators 2008

Bachelor's Degrees in Natural Sciences and Engineering Conferred per 1,000 Individuals 18–24 Years Old

Figure 8-16
Bachelor's degrees in natural sciences and engineering conferred per 1,000 individuals 18–24 years old: 2005



1st quartile (18.6–9.9)	2nd quartile (9.8–8.2)	3rd quartile (8.1–6.9)	4th quartile (6.8–3.1)
Arizona	Delaware	Alabama	Alaska
Colorado	Indiana	California	Arkansas
District of Columbia	Kansas	Idaho	Connecticut
Iowa	Maine	Illinois	Florida
Maryland	Michigan	Louisiana	Georgia
Massachusetts	Minnesota	New Jersey	Hawaii
Montana	Missouri	Ohio	Kentucky
North Dakota	Nebraska	Oklahoma	Mississippi
Pennsylvania	New Hampshire	Oregon	Nevada
Rhode Island	New York	South Carolina	New Mexico
South Dakota	North Carolina	Washington	Tennessee
Vermont	Utah	West Virginia	Texas
Wisconsin	Virginia	Wyoming	

SOURCES: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years); Census Bureau, 2000 Decennial Census; and Population Estimates Program (various years). See table 8-16.

Findings

- During the past decade, the value of this indicator has remained unchanged at 7.9 NS&E bachelor's degrees conferred per 1,000 18–24-year-olds.
- The percentage of NS&E bachelor's degrees among all bachelor's degrees conferred declined slightly from 16.8% in 1996 to 16.4% in 2005.
- The value of this indicator ranged from 3.1 to 14.9 for individual states. However, the District of Columbia had a value of 18.6, reflecting a large concentration of academic institutions relative to the size of the resident population.
- The value for this indicator has decreased in 21 states and the District of Columbia over the past decade.
- State rankings were generally in the same quartile for this indicator as for the number of bachelor's degrees conferred per 1,000 18–24-year-olds.

Natural sciences and engineering (NS&E) fields include physical, earth, ocean, atmospheric, biological, agricultural, and computer sciences; mathematics; and engineering but exclude social sciences and psychology. The ratio of new NS&E bachelor's degrees to the 18–24-year-old population indicates the extent to which a state prepares young people to enter the types of technology-intensive occupations that are fundamental to a knowledge-based, technology-driven economy. The capacity to produce NS&E degrees also may generate resources for the state. The 18–24-year-old cohort was chosen to approximate the age range of most students who are pursing an undergraduate degree.

Although the number of NS&E bachelor's degrees awarded is based on an actual count, the population of 18–24-year-olds is an estimate developed by the Census Bureau in the Population Estimates Program, which relies on the Decennial Census. This estimate may make the value of this indicator imprecise for jurisdictions with small populations.

A high value for this indicator may suggest relative success in providing a technical undergraduate education. Student and graduate mobility after graduation, however, may make this indicator less meaningful in predicting the qualifications of a state's future workforce. The indicator's value may also be high when a higher education system draws a large percentage of out-of-state students to study in NS&E fields, a situation that sometimes occurs in states with small resident populations and the District of Columbia.

Table 8-16
Bachelor's degrees in natural sciences and engineering conferred per 1,000 individuals 18–24 years old, by state: 1996, 2001, and 2005

State	NS&E bachelor's degrees			Population 18–24 years old			Degrees/1,000 individuals 18–24 years old		
	1996	2001	2005	1996	2001	2005	1996	2001	2005
United States	196,433	208,494	232,707	24,842,610	27,998,931	29,333,266	7.9	7.4	7.9
Alabama	3,635	3,596	3,424	437,421	448,725	448,894	8.3	8.0	7.6
Alaska	293	230	248	64,682	60,394	70,429	4.5	3.8	3.5
Arizona	2,846	3,004	6,028	417,142	536,708	576,725	6.8	5.6	10.5
Arkansas	1,408	1,492	1,630	247,651	268,747	270,471	5.7	5.6	6.0
California	20,744	22,180	25,702	2,982,515	3,487,649	3,726,736	7.0	6.4	6.9
Colorado	4,443	4,592	5,107	354,247	449,661	459,040	12.5	10.2	11.1
Connecticut	2,055	1,902	2,116	261,580	282,433	313,202	7.9	6.7	6.8
Delaware	674	682	689	65,107	78,501	83,016	10.4	8.7	8.3
District of Columbia	1,314	1,685	1,304	45,801	72,372	70,265	28.7	23.3	18.6
Florida	6,462	7,422	8,525	1,168,986	1,399,219	1,572,959	5.5	5.3	5.4
Georgia	4,565	5,025	5,943	728,478	865,538	903,396	6.3	5.8	6.6
Hawaii	615	670	724	116,166	118,324	123,584	5.3	5.7	5.9
Idaho	890	900	1,210	130,028	144,632	149,739	6.8	6.2	8.1
Illinois	8,339	9,216	9,667	1,111,306	1,242,578	1,274,718	7.5	7.4	7.6
Indiana	5,095	4,953	5,797	571,520	627,241	623,312	8.9	7.9	9.3
Iowa	2,888	3,055	3,199	269,324	302,946	311,451	10.7	10.1	10.3
Kansas	2,329	2,536	2,596	249,744	281,504	292,984	9.3	9.0	8.9
Kentucky	2,195	2,132	2,290	397,201	409,650	395,618	5.5	5.2	5.8
Louisiana	3,078	3,480	3,539	459,805	484,149	490,354	6.7	7.2	7.2
Maine	970	1,060	1,136	110,955	108,029	117,048	8.7	9.8	9.7
Maryland	4,086	4,737	5,845	427,478	473,697	526,277	9.6	10.0	11.1
Massachusetts	7,207	7,209	7,613	511,122	593,001	625,908	14.1	12.2	12.2
Michigan	8,342	8,344	9,096	921,950	957,339	986,126	9.0	8.7	9.2
Minnesota	3,719	4,009	4,652	418,324	486,487	516,133	8.9	8.2	9.0
Mississippi	1,714	1,755	1,630	299,031	316,573	311,137	5.7	5.5	5.2
Missouri	4,218	4,891	5,238	495,615	552,843	572,472	8.5	8.8	9.1
Montana	1,014	1,171	1,127	85,538	88,639	94,488	11.9	13.2	11.9
Nebraska	1,395	1,495	1,631	161,398	178,383	188,583	8.6	8.4	8.6
Nevada	493	527	653	133,106	189,705	207,871	3.7	2.8	3.1
New Hampshire	1,241	1,198	1,130	94,357	108,106	121,124	13.2	11.1	9.3
New Jersey	4,426	5,199	5,354	668,453	696,100	747,332	6.6	7.5	7.2
New Mexico	1,135	1,140	1,276	169,870	186,485	205,017	6.7	6.1	6.2
New York	14,026	15,153	16,686	1,602,205	1,820,985	1,919,224	8.8	8.3	8.7
North Carolina	6,236	6,183	6,773	699,477	816,974	822,150	8.9	7.6	8.2
North Dakota	821	798	913	66,272	74,916	80,276	12.4	10.7	11.4
Ohio	7,594	7,754	8,086	1,052,052	1,081,211	1,112,156	7.2	7.2	7.3
Oklahoma	2,182	2,491	2,580	328,471	367,634	375,095	6.6	6.8	6.9
Oregon	1,974	2,371	2,753	287,641	337,895	341,623	6.9	7.0	8.1
Pennsylvania	11,281	12,049	13,819	1,039,419	1,121,633	1,191,907	10.9	10.7	11.6
Rhode Island	1,229	1,202	1,730	84,855	109,933	116,201	14.5	10.9	14.9
South Carolina	2,711	2,795	3,062	381,672	418,585	420,351	7.1	6.7	7.3
South Dakota	988	939	1,090	73,421	79,589	83,635	13.5	11.8	13.0
Tennessee	3,511	3,281	3,528	510,638	563,333	557,703	6.9	5.8	6.3
Texas	11,390	11,798	13,681	1,947,117	2,280,525	2,421,692	5.8	5.2	5.6
Utah	2,606	2,797	3,184	265,713	329,723	326,302	9.8	8.5	9.8
Vermont	720	846	865	51,912	58,647	62,424	13.9	14.4	13.9
Virginia	5,564	5,978	6,187	649,086	697,925	737,118	8.6	8.6	8.4
Washington	3,503	3,861	4,426	505,840	581,479	605,063	6.9	6.6	7.3
West Virginia	1,248	1,296	1,288	186,316	174,936	167,236	6.7	7.4	7.7
Wisconsin	4,609	5,004	5,559	483,384	535,174	562,611	9.5	9.4	9.9
Wyoming	412	411	378	51,218	51,476	54,090	8.0	8.0	7.0
Puerto Rico	2,586	3,054	2,848	NA	426,194	411,575	NA	7.2	6.9

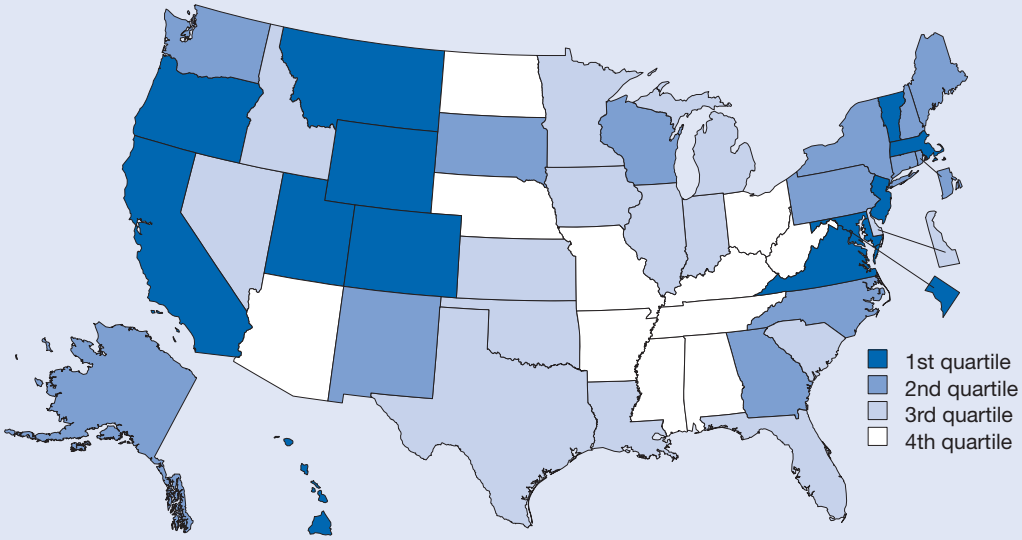
NA = not available
NS&E = natural sciences and engineering

SOURCES: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years); Census Bureau, 2000 Decennial Census; and Population Estimates Program (various years).

Science & Engineering Indicators 2008

S&E Degrees as Share of Higher Education Degrees Conferred

Figure 8-17
S&E degrees as share of higher education degrees conferred: 2005



1st quartile (40.8%–33.3%)	2nd quartile (32.9%–29.2%)	3rd quartile (28.9%–26.3%)	4th quartile (25.8%–18.2%)
California	Alaska	Delaware	Alabama
Colorado	Connecticut	Florida	Arizona
District of Columbia	Georgia	Idaho	Arkansas
Hawaii	Maine	Illinois	Kentucky
Maryland	New Hampshire	Indiana	Mississippi
Massachusetts	New Mexico	Iowa	Missouri
Montana	New York	Kansas	Nebraska
New Jersey	North Carolina	Louisiana	North Dakota
Oregon	Pennsylvania	Michigan	Ohio
Utah	Rhode Island	Minnesota	Tennessee
Vermont	South Dakota	Nevada	West Virginia
Virginia	Washington	Oklahoma	
Wyoming	Wisconsin	South Carolina	
		Texas	

SOURCE: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years). See Table 8-17.

Findings

- In 2005, more than 609,000 S&E bachelor's, master's, and doctoral degrees were conferred nationwide, an increase of 21% during the past decade.
- Overall, there has been a slight decline in the number of S&E degrees as a share of total degrees conferred from 31.0% in 1996 to 29.9% in 2005.
- States place different emphases on technical higher education. In some states, nearly 40% of their degrees are awarded in S&E fields; in others approximately 20% of their degrees are awarded in these fields.
- State emphasis on S&E education remained relatively constant over the decade; notable exceptions are increases in Hawaii and Maryland and decreases in Wyoming and Arizona.
- The District of Columbia has a high value of 41% because of the large S&E graduate programs in political science and public administration at several of its academic institutions.

This indicator is a measure of the extent to which a state's higher education programs are concentrated in S&E fields. The indicator is expressed as the percentage of higher education degrees that were conferred in S&E fields. High values for this indicator are from states that emphasize S&E fields in their higher education systems.

S&E fields include physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. For both S&E degrees and higher education degrees conferred, bachelor's, master's, and doctoral degrees are included; associate's degrees are excluded. Geographic location refers to the location of the degree-granting institution and does not reflect the state where students permanently reside. The year is the latter date of the academic year. For example, data for 2005 represent degrees conferred during the 2004–05 academic year.

Table 8-17
S&E degrees as share of higher education degrees conferred, by state: 1996, 2001, and 2005

State	S&E degrees			All higher education degrees			S&E/higher education degrees (%)		
	1996	2001	2005	1996	2001	2005	1996	2001	2005
United States	502,046	519,446	609,114	1,617,096	1,750,369	2,036,215	31.0	29.7	29.9
Alabama	6,975	7,426	7,951	27,139	29,302	31,951	25.7	25.3	24.9
Alaska	670	604	676	1,999	1,776	2,107	33.5	34.0	32.1
Arizona	6,655	6,565	10,968	27,922	40,468	60,188	23.8	16.2	18.2
Arkansas	2,774	2,844	3,306	11,239	12,058	14,303	24.7	23.6	23.1
California	58,551	62,752	75,803	152,162	167,200	197,839	38.5	37.5	38.3
Colorado	11,073	11,696	13,189	27,577	30,390	35,346	40.2	38.5	37.3
Connecticut	6,976	6,929	8,154	21,205	22,479	26,378	32.9	30.8	30.9
Delaware	1,894	1,861	2,158	5,739	6,116	7,455	33.0	30.4	28.9
District of Columbia	6,675	6,856	7,477	15,872	15,939	18,307	42.1	43.0	40.8
Florida	17,289	18,561	23,974	63,271	69,121	84,841	27.3	26.9	28.3
Georgia	10,572	11,489	14,394	37,426	39,537	48,691	28.2	29.1	29.6
Hawaii	1,942	2,131	2,349	6,419	6,461	7,031	30.3	33.0	33.4
Idaho	1,722	1,756	2,360	5,686	5,809	8,969	30.3	30.2	26.3
Illinois	21,551	23,370	25,927	80,126	86,923	95,634	26.9	26.9	27.1
Indiana	11,882	11,187	13,317	39,319	41,484	48,940	30.2	27.0	27.2
Iowa	6,506	6,389	7,328	21,761	22,680	25,393	29.9	28.2	28.9
Kansas	5,332	5,660	6,139	20,246	20,705	22,791	26.3	27.3	26.9
Kentucky	4,933	5,015	6,085	19,566	20,749	25,138	25.2	24.2	24.2
Louisiana	6,781	6,924	7,773	23,737	26,173	28,398	28.6	26.5	27.4
Maine	2,168	2,236	2,550	6,572	6,659	8,173	33.0	33.6	31.2
Maryland	11,479	12,710	15,608	31,688	34,738	39,918	36.2	36.6	39.1
Massachusetts	22,230	22,825	25,232	65,306	70,333	75,589	34.0	32.5	33.4
Michigan	18,796	18,611	21,249	61,625	68,231	74,695	30.5	27.3	28.4
Minnesota	9,289	9,163	11,199	30,672	31,906	40,897	30.3	28.7	27.4
Mississippi	3,473	3,472	3,577	13,108	14,904	15,931	26.5	23.3	22.5
Missouri	10,319	11,353	12,852	38,843	44,278	52,183	26.6	25.6	24.6
Montana	1,891	2,076	2,254	5,535	6,049	6,416	34.2	34.3	35.1
Nebraska	3,119	3,261	3,836	12,542	14,315	16,421	24.9	22.8	23.4
Nevada	1,178	1,277	1,826	4,448	5,366	6,723	26.5	23.8	27.2
New Hampshire	2,893	2,940	3,316	9,857	9,526	10,755	29.3	30.9	30.8
New Jersey	12,560	13,842	15,667	34,043	37,760	45,515	36.9	36.7	34.4
New Mexico	2,864	2,522	2,860	8,865	8,460	9,718	32.3	29.8	29.4
New York	43,392	44,664	51,555	144,398	153,327	176,746	30.1	29.1	29.2
North Carolina	14,516	14,543	16,664	41,615	45,316	52,136	34.9	32.1	32.0
North Dakota	1,462	1,397	1,539	5,268	5,597	6,454	27.8	25.0	23.8
Ohio	19,333	18,661	20,687	68,153	71,266	80,181	28.4	26.2	25.8
Oklahoma	4,982	5,914	6,286	18,626	21,421	23,921	26.7	27.6	26.3
Oregon	6,153	6,427	7,691	17,582	18,646	22,764	35.0	34.5	33.8
Pennsylvania	25,756	26,717	31,632	83,683	91,693	107,302	30.8	29.1	29.5
Rhode Island	3,243	2,872	3,646	11,089	10,633	12,277	29.2	27.0	29.7
South Carolina	5,893	6,131	6,857	19,889	21,781	24,873	29.6	28.1	27.6
South Dakota	1,990	1,801	2,017	5,757	5,445	6,227	34.6	33.1	32.4
Tennessee	7,813	7,787	8,706	27,572	31,505	34,953	28.3	24.7	24.9
Texas	27,252	28,242	34,716	96,227	103,447	123,473	28.3	27.3	28.1
Utah	6,308	6,101	7,840	18,498	20,346	23,521	34.1	30.0	33.3
Vermont	2,128	2,129	2,493	5,844	6,014	6,543	36.4	35.4	38.1
Virginia	15,376	15,782	17,549	42,580	44,738	50,670	36.1	35.3	34.6
Washington	9,523	9,907	12,020	31,320	31,299	36,531	30.4	31.7	32.9
West Virginia	2,761	2,699	2,945	10,885	11,225	12,520	25.4	24.0	23.5
Wisconsin	10,253	10,538	12,160	34,466	36,614	40,287	29.7	28.8	30.2
Wyoming	900	831	757	2,129	2,161	2,202	42.3	38.5	34.4
Puerto Rico	4,113	5,034	5,031	15,736	18,378	20,855	26.1	27.4	24.1

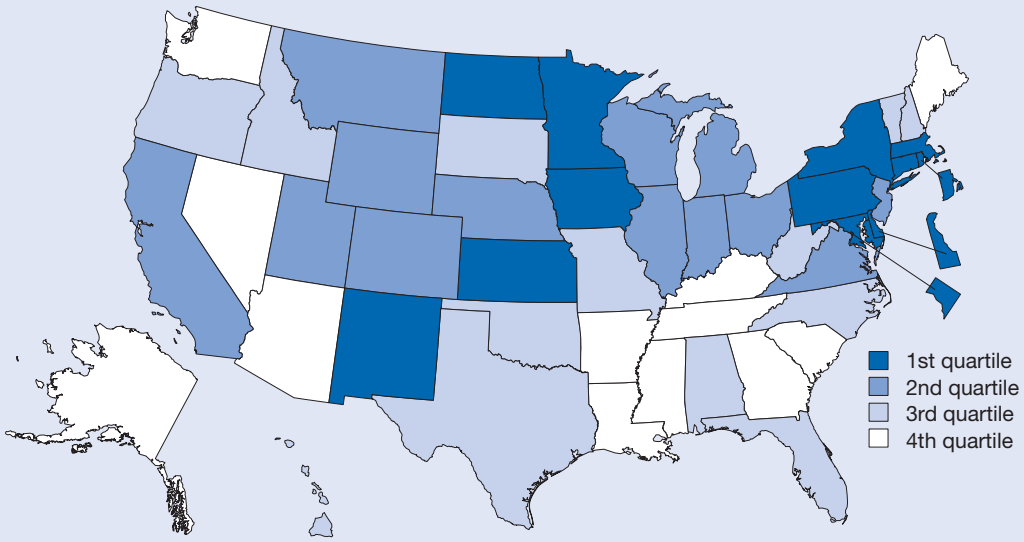
NOTES: S&E degrees include bachelor's, master's, and doctorate. S&E degrees include physical, computer, agricultural, biological, earth, atmospheric, ocean, and social sciences; psychology; mathematics; and engineering. All higher education degrees include bachelor's, master's, and doctorate.

SOURCE: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years).

Science & Engineering Indicators 2008

S&E Graduate Students per 1,000 Individuals 25–34 Years Old

Figure 8-18
S&E graduate students per 1,000 individuals 25–34 years old: 2005



1st quartile (83.1–13.8)	2nd quartile (13.6–10.9)	3rd quartile (10.8–8.5)	4th quartile (8.4–4.5)
Connecticut	California	Alabama	Alaska
Delaware	Colorado	Florida	Arizona
District of Columbia	Illinois	Hawaii	Arkansas
Iowa	Indiana	Idaho	Georgia
Kansas	Michigan	Missouri	Kentucky
Maryland	Montana	New Hampshire	Louisiana
Massachusetts	Nebraska	North Carolina	Maine
Minnesota	New Jersey	Oklahoma	Mississippi
New Mexico	Ohio	Oregon	Nevada
New York	Utah	South Dakota	South Carolina
North Dakota	Virginia	Texas	Tennessee
Pennsylvania	Wisconsin	Vermont	Washington
Rhode Island	Wyoming	West Virginia	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering; and Census Bureau, Population Estimates Program (various years). See table 8-18.

Findings

- The number of S&E graduate students in the United States grew 15% over the previous decade, rising from approximately 409,000 in 1996 to more than 471,000 in 2005.
- Individual states showed varying levels of graduate level S&E training, with 0.5%–2.7% of their 25–34-year-old population pursuing S&E graduate studies in 2005.
- The District of Columbia is an outlier, with about 8% of its 25–34-year-old population enrolled as S&E graduate students, reflecting a large concentration of S&E graduate programs in political science and public administration and a small resident population.
- Changes in the value of this indicator over the past decade may reflect shifts in population, changes in S&E graduate education, or a combination of both. Growth in the number of S&E graduate students was highest in California, Texas, and Florida between 1996 and 2005.

Graduate students in S&E fields may become the technical leaders of the future. The ratio of S&E graduate students to a state's 25–34-year-old population is a relative measure of a state's population with graduate training in S&E. The 25–34-year-old cohort was chosen to approximate the age of most graduate students. The cohort includes U.S. citizens and noncitizens as well as graduate students who come from other states. The population cohort includes all state residents ages 25–34 and does not distinguish between citizens and noncitizens.

Data on S&E graduate students were collected by surveying all academic institutions in the United States that offer doctoral or master's degree programs in any science or engineering field, including physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. Graduate students who are enrolled in schools of nursing, public health, dentistry, veterinary medicine, and other health-related disciplines are not included.

Table 8-18
S&E graduate students per 1,000 individuals 25–34 years old, by state: 1996, 2001, and 2005

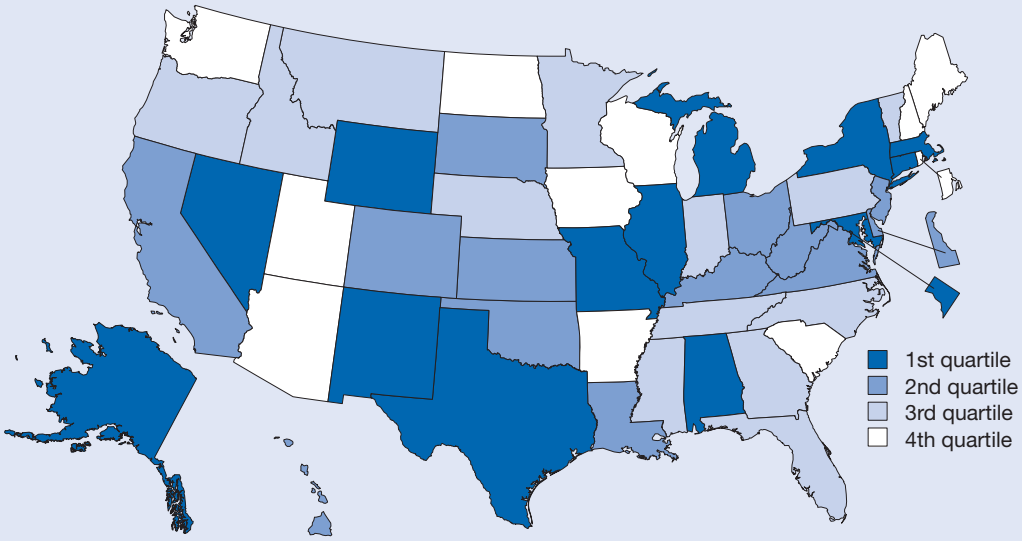
State	S&E graduate students			Population 25–34 years old			S&E graduate students/ 1,000 individuals 25–34 years old		
	1996	2001	2005	1996	2001	2005	1996	2001	2005
United States	408,754	422,331	471,371	40,245,871	39,701,883	40,144,656	10.2	10.6	11.7
Alabama	5,334	5,257	6,232	630,233	591,099	596,242	8.5	8.9	10.5
Alaska	782	611	795	84,704	88,274	94,149	9.2	6.9	8.4
Arizona	6,381	6,665	6,849	657,074	760,730	864,417	9.7	8.8	7.9
Arkansas	2,040	2,052	2,420	338,213	349,764	370,205	6.0	5.9	6.5
California	51,004	54,249	63,474	5,347,874	5,270,958	5,261,651	9.5	10.3	12.1
Colorado	8,364	8,843	8,835	558,163	681,814	706,360	15.0	13.0	12.5
Connecticut	5,732	6,900	6,943	503,807	438,925	413,537	11.4	15.7	16.8
Delaware	1,459	1,461	1,760	121,415	106,814	107,945	12.0	13.7	16.3
District of Columbia	8,255	7,448	8,662	108,632	102,322	104,177	76.0	72.8	83.1
Florida	14,264	16,345	19,130	2,002,813	2,086,696	2,234,269	7.1	7.8	8.6
Georgia	8,508	9,345	10,675	1,215,294	1,309,335	1,354,947	7.0	7.1	7.9
Hawaii	1,734	1,455	1,892	168,485	169,440	175,190	10.3	8.6	10.8
Idaho	1,343	1,495	1,923	149,784	171,653	196,134	9.0	8.7	9.8
Illinois	22,121	24,173	23,307	1,825,273	1,802,505	1,787,380	12.1	13.4	13.0
Indiana	8,781	8,489	9,695	867,584	822,315	841,485	10.1	10.3	11.5
Iowa	4,722	4,693	5,009	383,395	357,757	358,104	12.3	13.1	14.0
Kansas	5,873	5,846	5,825	368,460	345,539	351,504	15.9	16.9	16.6
Kentucky	3,740	4,017	4,625	565,744	560,393	578,303	6.6	7.2	8.0
Louisiana	5,585	5,703	4,777	614,661	585,687	593,005	9.1	9.7	8.1
Maine	666	605	684	176,186	154,509	151,290	3.8	3.9	4.5
Maryland	9,253	9,181	11,198	838,211	737,209	729,112	11.0	12.5	15.4
Massachusetts	19,537	20,118	22,493	1,036,693	911,871	838,499	18.8	22.1	26.8
Michigan	14,593	15,431	15,224	1,449,151	1,338,131	1,289,703	10.1	11.5	11.8
Minnesota	6,465	6,634	10,674	691,672	669,256	671,628	9.3	9.9	15.9
Mississippi	2,703	2,594	3,138	382,545	375,787	381,834	7.1	6.9	8.2
Missouri	5,895	6,320	7,278	770,644	731,638	757,374	7.6	8.6	9.6
Montana	1,146	1,176	1,371	101,054	101,958	109,731	11.3	11.5	12.5
Nebraska	2,560	2,428	2,811	223,417	221,334	225,120	11.5	11.0	12.5
Nevada	1,439	1,584	1,992	252,663	316,202	363,877	5.7	5.0	5.5
New Hampshire	1,216	1,337	1,448	188,221	158,323	153,457	6.5	8.4	9.4
New Jersey	10,429	11,148	12,093	1,200,054	1,170,282	1,105,168	8.7	9.5	10.9
New Mexico	3,171	3,269	3,762	228,959	231,954	249,745	13.8	14.1	15.1
New York	38,439	38,613	42,039	2,852,788	2,706,393	2,559,820	13.5	14.3	16.4
North Carolina	9,768	10,494	12,019	1,150,418	1,213,053	1,215,149	8.5	8.7	9.9
North Dakota	896	1,078	1,512	87,491	74,406	74,480	10.2	14.5	20.3
Ohio	17,491	16,080	18,885	1,633,740	1,489,708	1,459,108	10.7	10.8	12.9
Oklahoma	3,905	4,166	4,274	442,383	448,235	467,576	8.8	9.3	9.1
Oregon	3,831	3,844	4,310	437,028	476,414	506,932	8.8	8.1	8.5
Pennsylvania	18,814	18,348	20,146	1,705,702	1,520,455	1,460,565	11.0	12.1	13.8
Rhode Island	1,662	1,646	2,018	158,924	137,986	134,088	10.5	11.9	15.0
South Carolina	3,507	3,120	3,234	573,575	553,179	563,274	6.1	5.6	5.7
South Dakota	918	982	930	93,985	89,669	92,998	9.8	11.0	10.0
Tennessee	6,090	5,737	6,448	801,585	804,104	826,126	7.6	7.1	7.8
Texas	26,007	28,224	32,582	2,897,002	3,207,841	3,392,687	9.0	8.8	9.6
Utah	4,107	4,034	4,884	292,112	333,573	390,591	14.1	12.1	12.5
Vermont	599	597	644	87,507	72,773	71,097	6.8	8.2	9.1
Virginia	11,571	12,156	12,408	1,114,265	1,030,917	1,044,709	10.4	11.8	11.9
Washington	5,802	5,834	6,513	828,876	844,924	874,525	7.0	6.9	7.4
West Virginia	1,885	2,013	2,205	230,950	224,034	232,453	8.2	9.0	9.5
Wisconsin	7,606	7,729	8,439	750,352	694,595	697,679	10.1	11.1	12.1
Wyoming	761	764	887	56,110	59,150	65,257	13.6	12.9	13.6
Puerto Rico	2,206	3,062	3,649	NA	537,823	550,887	NA	5.7	6.6

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering; and Census Bureau, Population Estimates Program (various years).

Advanced S&E Degrees as Share of S&E Degrees Conferred

Figure 8-19
Advanced S&E degrees as share of S&E degrees conferred: 2005



1st quartile (44.4%–26.4%)	2nd quartile (25.8%–22.4%)	3rd quartile (22.2%–18.0%)	4th quartile (17.8%–7.7%)
Alabama	California	Florida	Arizona
Alaska	Colorado	Georgia	Arkansas
Connecticut	Delaware	Idaho	Iowa
District of Columbia	Hawaii	Indiana	Maine
Illinois	Kansas	Minnesota	New Hampshire
Maryland	Kentucky	Mississippi	North Dakota
Massachusetts	Louisiana	Montana	Rhode Island
Michigan	New Jersey	Nebraska	South Carolina
Missouri	Ohio	North Carolina	Utah
Nevada	Oklahoma	Oregon	Washington
New Mexico	South Dakota	Pennsylvania	Wisconsin
New York	Virginia	Tennessee	
Texas	West Virginia	Vermont	
Wyoming			

SOURCE: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years). See table 8-19.

Findings

- In 2005, more than 147,000 advanced S&E degrees were awarded nationwide; this total represented approximately 22% more than in 1996, but the share of advanced degrees remained stable at 24% of all S&E degrees conferred.
- Some states specialize in providing graduate-level technical training, with nearly 35% of their S&E graduates completing training at the master's or doctoral level; other states have much smaller graduate S&E programs, with values as low as 8%.
- Over the past decade, the largest absolute increases in the production of advanced S&E degree holders have occurred in California, New York, and Texas.
- In states with small S&E graduate programs, the number of advanced S&E degrees conferred varies considerably from year to year. Caution should be used in making annual comparisons for those states with small S&E graduate programs.
- The District of Columbia is an outlier, with 44% reflecting large S&E graduate programs in political science and public administration at several of its academic institutions.

This indicator shows the extent to which a state's higher education programs in S&E are concentrated at the graduate level. S&E fields include physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. Advanced S&E degrees include master's and doctoral degrees. All S&E degrees include bachelor's, master's, and doctoral degrees but exclude associate's degrees.

The indicator value is obtained by dividing the number of advanced S&E degrees by the total number of S&E degrees awarded by the higher education institutions within the state. A high value shows that a state's higher education institutions are emphasizing S&E training at the graduate level.

Table 8-19
Advanced S&E degrees as share of S&E degrees conferred, by state: 1996, 2001, and 2005

State	Advanced S&E degrees			All S&E degrees			Advanced/all S&E degrees (%)		
	1996	2001	2005	1996	2001	2005	1996	2001	2005
United States	121,109	123,561	147,339	502,046	519,446	609,114	24.1	23.8	24.2
Alabama	1,470	1,969	2,271	6,975	7,426	7,951	21.1	26.5	28.6
Alaska	209	184	236	670	604	676	31.2	30.5	34.9
Arizona	1,810	1,632	1,851	6,655	6,565	10,968	27.2	24.9	16.9
Arkansas	439	440	558	2,774	2,844	3,306	15.8	15.5	16.9
California	14,889	15,208	18,894	58,551	62,752	75,803	25.4	24.2	24.9
Colorado	2,919	2,991	3,194	11,073	11,696	13,189	26.4	25.6	24.2
Connecticut	1,767	1,768	2,209	6,976	6,929	8,154	25.3	25.5	27.1
Delaware	434	419	507	1,894	1,861	2,158	22.9	22.5	23.5
District of Columbia	3,194	2,990	3,317	6,675	6,856	7,477	47.9	43.6	44.4
Florida	4,022	4,176	5,253	17,289	18,561	23,974	23.3	22.5	21.9
Georgia	2,403	2,551	3,182	10,572	11,489	14,394	22.7	22.2	22.1
Hawaii	444	529	538	1,942	2,131	2,349	22.9	24.8	22.9
Idaho	389	341	424	1,722	1,756	2,360	22.6	19.4	18.0
Illinois	6,366	7,171	8,280	21,551	23,370	25,927	29.5	30.7	31.9
Indiana	2,629	2,439	2,840	11,882	11,187	13,317	22.1	21.8	21.3
Iowa	1,178	1,014	1,261	6,506	6,389	7,328	18.1	15.9	17.2
Kansas	1,201	1,203	1,394	5,332	5,660	6,139	22.5	21.3	22.7
Kentucky	887	974	1,551	4,933	5,015	6,085	18.0	19.4	25.5
Louisiana	1,481	1,435	1,758	6,781	6,924	7,773	21.8	20.7	22.6
Maine	207	174	196	2,168	2,236	2,550	9.5	7.8	7.7
Maryland	3,458	3,832	4,617	11,479	12,710	15,608	30.1	30.1	29.6
Massachusetts	6,477	6,636	7,653	22,230	22,825	25,232	29.1	29.1	30.3
Michigan	4,734	4,933	5,741	18,796	18,611	21,249	25.2	26.5	27.0
Minnesota	1,843	1,683	2,137	9,289	9,163	11,199	19.8	18.4	19.1
Mississippi	709	636	793	3,473	3,472	3,577	20.4	18.3	22.2
Missouri	2,807	2,939	3,452	10,319	11,353	12,852	27.2	25.9	26.9
Montana	345	358	447	1,891	2,076	2,254	18.2	17.2	19.8
Nebraska	671	697	808	3,119	3,261	3,836	21.5	21.4	21.1
Nevada	297	304	482	1,178	1,277	1,826	25.2	23.8	26.4
New Hampshire	416	463	490	2,893	2,940	3,316	14.4	15.7	14.8
New Jersey	3,023	3,225	3,811	12,560	13,842	15,667	24.1	23.3	24.3
New Mexico	931	729	857	2,864	2,522	2,860	32.5	28.9	30.0
New York	11,219	11,444	13,816	43,392	44,664	51,555	25.9	25.6	26.8
North Carolina	2,502	2,717	3,177	14,516	14,543	16,664	17.2	18.7	19.1
North Dakota	221	183	234	1,462	1,397	1,539	15.1	13.1	15.2
Ohio	5,257	4,650	5,222	19,333	18,661	20,687	27.2	24.9	25.2
Oklahoma	1,285	1,847	1,624	4,982	5,914	6,286	25.8	31.2	25.8
Oregon	1,299	1,296	1,544	6,153	6,427	7,691	21.1	20.2	20.1
Pennsylvania	5,449	5,507	6,753	25,756	26,717	31,632	21.2	20.6	21.3
Rhode Island	662	532	610	3,243	2,872	3,646	20.4	18.5	16.7
South Carolina	1,025	1,114	1,104	5,893	6,131	6,857	17.4	18.2	16.1
South Dakota	417	379	472	1,990	1,801	2,017	21.0	21.0	23.4
Tennessee	1,427	1,506	1,563	7,813	7,787	8,706	18.3	19.3	18.0
Texas	7,072	7,464	9,438	27,252	28,242	34,716	26.0	26.4	27.2
Utah	1,054	1,011	1,283	6,308	6,101	7,840	16.7	16.6	16.4
Vermont	379	295	501	2,128	2,129	2,493	17.8	13.9	20.1
Virginia	3,199	3,238	3,926	15,376	15,782	17,549	20.8	20.5	22.4
Washington	1,970	1,852	2,141	9,523	9,907	12,020	20.7	18.7	17.8
West Virginia	483	523	660	2,761	2,699	2,945	17.5	19.4	22.4
Wisconsin	1,863	1,730	2,069	10,253	10,538	12,160	18.2	16.4	17.0
Wyoming	277	230	200	900	831	757	30.8	27.7	26.4
Puerto Rico	453	791	910	4,113	5,034	5,031	11.0	15.7	18.1

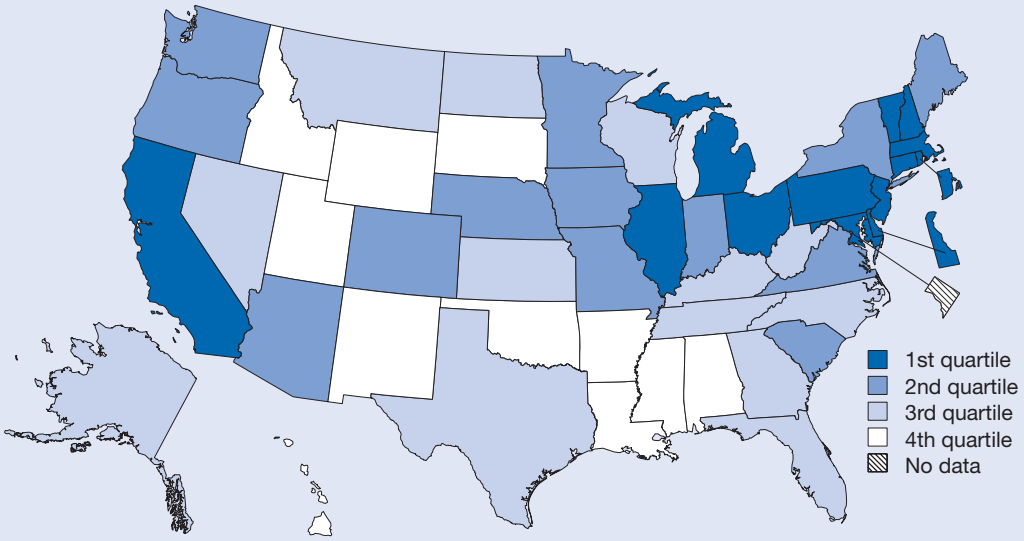
NOTES: All degrees include bachelor's, master's, and doctorate; advanced degrees include only master's and doctorate. S&E degrees include physical, computer, agricultural, biological, earth, atmospheric, ocean, and social sciences; psychology; mathematics; and engineering.

SOURCE: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years).

Science & Engineering Indicators 2008

Average Undergraduate Charge at Public 4-Year Institutions

Figure 8-20
Average undergraduate charge at public 4-year institutions: 2006



1st quartile ($17,708–$13,685)	2nd quartile ($13,275–$11,286)	3rd quartile ($10,973–$9,675)	4th quartile ($9,625–$8,506)	No data
California	Arizona	Alaska	Alabama	District of Columbia
Connecticut	Colorado	Florida	Arkansas	
Delaware	Indiana	Georgia	Hawaii	
Illinois	Iowa	Kansas	Idaho	
Maryland	Maine	Kentucky	Louisiana	
Massachusetts	Minnesota	Montana	Mississippi	
Michigan	Missouri	Nevada	New Mexico	
New Hampshire	Nebraska	North Carolina	Oklahoma	
New Jersey	New York	North Dakota	South Dakota	
Ohio	Oregon	Tennessee	Utah	
Pennsylvania	South Carolina	Texas	Wyoming	
Rhode Island	Virginia	West Virginia		
Vermont	Washington	Wisconsin		

SOURCE: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years). See table 8-20.

Findings

- During 2006, the total annual nominal charge for a full-time undergraduate student to attend a public 4-year institution averaged $12,108 nationally, an increase of 73% during the past decade in current dollars.
- All states showed major increases in undergraduate charges at public institutions in 2006 compared with 1996. In Oklahoma, Iowa, Nebraska, and Texas, undergraduate charges more than doubled during this period.
- In 2006, the state average for a year of undergraduate education at a public 4-year institution ranged from a low of $8,506 to a high of $17,708.
- Tuition and required fees averaged approximately 40% of the total charges at public 4-year institutions, but individual states had different cost structures.

The average annual charge for an undergraduate student to attend a public 4-year academic institution is one indicator of how accessible higher education in S&E is to a state's students. The annual charge includes standard in-state charges for tuition, required fees, room, and board for a full-time undergraduate student who is a resident of that state. These charges were weighted by the number of full-time undergraduates attending each public institution within the state. The total charge for all public 4-year institutions in the state was divided by the total number of full-time undergraduates attending all public 4-year institutions in the state. The year is the latter date of the academic year. For example, data for 2006 represent costs for the 2005–06 academic year.

To improve the educational attainment of their residents, many states have chosen to reduce the charge to students by providing state subsidies or direct financial aid. Additional financial aid is provided by the federal government and by the academic institutions. The data in this indicator do not include any adjustment for financial aid that a student might receive.

Table 8-20
Average undergraduate charge at public 4-year institutions, by state: 1996, 2001, and 2006
(Dollars)

State	1996	2001	2006
United States	7,014	8,653	12,108
Alabama	5,735	7,349	9,625
Alaska	6,663	8,390	10,620
Arizona	5,996	7,874	11,480
Arkansas	5,055	6,797	9,192
California	8,209	9,590	13,685
Colorado	7,030	8,362	11,569
Connecticut	8,755	10,521	14,658
Delaware	8,512	10,283	14,326
District of Columbia	NA	NA	NA
Florida	6,251	7,947	10,141
Georgia	5,690	7,463	10,062
Hawaii	NA	8,272	9,042
Idaho	5,306	6,765	8,982
Illinois	7,841	9,532	13,976
Indiana	7,388	9,239	12,388
Iowa	5,945	7,587	12,329
Kansas	5,688	6,654	9,980
Kentucky	5,454	6,923	10,663
Louisiana	5,503	6,329	8,506
Maine	7,899	9,371	12,568
Maryland	8,731	10,834	14,793
Massachusetts	8,770	9,207	14,651
Michigan	8,189	9,825	13,693
Minnesota	6,734	8,127	12,777
Mississippi	5,416	7,195	9,461
Missouri	6,768	8,203	11,861
Montana	7,803	7,615	10,613
Nebraska	5,503	7,355	11,286
Nevada	7,400	8,247	10,865
New Hampshire	8,730	11,720	15,479
New Jersey	9,118	12,007	17,708
New Mexico	5,299	7,086	9,579
New York	8,971	10,260	13,275
North Carolina	5,119	7,076	9,675
North Dakota	5,641	6,418	9,829
Ohio	8,157	10,451	16,032
Oklahoma	4,296	6,022	9,404
Oregon	7,395	9,394	12,720
Pennsylvania	9,138	11,091	15,464
Rhode Island	9,453	11,095	14,315
South Carolina	6,964	9,096	13,145
South Dakota	5,613	6,975	9,493
Tennessee	5,373	7,658	9,956
Texas	5,471	7,614	10,973
Utah	5,389	6,598	8,745
Vermont	10,657	12,847	16,571
Virginia	8,207	8,751	12,279
Washington	7,129	8,909	12,384
West Virginia	6,119	7,290	9,992
Wisconsin	5,839	7,396	10,560
Wyoming	5,429	7,017	8,946
Puerto Rico	NA	NA	NA

NA = not available

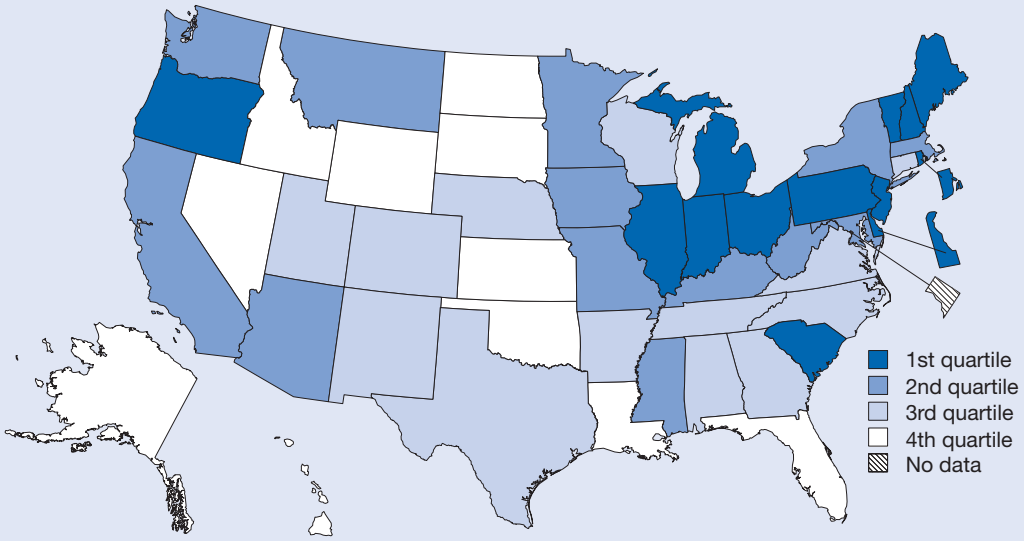
NOTES: National average for United States from Digest of Education Statistics data tables. Average charges for entire academic year. Tuition and fees weighted by number of full-time-equivalent undergraduates but not adjusted to reflect student residency. Room and board based on full-time students.

SOURCE: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years).

Science & Engineering Indicators 2008

Average Undergraduate Charge at Public 4-Year Institutions as Share of Disposable Personal Income

Figure 8-21
Average undergraduate charge at public 4-year institutions as share of disposable personal income: 2006



1st quartile (54.9%–41.8%)	2nd quartile (41.4%–37.2%)	3rd quartile (36.8%–33.7%)	4th quartile (33.6%–24.7%)	No data
Delaware	Arizona	Alabama	Alaska	District of Columbia
Illinois	California	Arkansas	Florida	
Indiana	Iowa	Colorado	Hawaii	
Maine	Kentucky	Connecticut	Idaho	
Michigan	Maryland	Georgia	Kansas	
New Hampshire	Massachusetts	Nebraska	Louisiana	
New Jersey	Minnesota	New Mexico	Nevada	
Ohio	Mississippi	North Carolina	North Dakota	
Oregon	Missouri	Tennessee	Oklahoma	
Pennsylvania	Montana	Texas	South Dakota	
Rhode Island	New York	Utah	Wyoming	
South Carolina	Washington	Virginia		
Vermont	West Virginia	Wisconsin		

SOURCES: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years); and Bureau of Economic Analysis, State and Local Personal Income data. See table 8-21.

Findings

- In 2006 throughout the United States, a year of undergraduate education at a state institution would have consumed 38.2% of an average resident's disposable income, an increase from the 33.3% it would have consumed a decade earlier.
- The cost of a year of undergraduate education at a public institution consumed one-quarter to one-half of the per capita disposable income for residents of most states in 2006.
- Although a year of undergraduate education at a public institution became less affordable for residents in most states, affordability improved in six states during the past decade.
- Residents in Ohio, Iowa, South Carolina, and Nebraska experienced the steepest increases in the cost of a year of undergraduate education relative to their purchasing power (in excess of 10% of per capita disposable income) between 1996 and 2006.

This indicator provides a broad measure of the affordability of higher education at a public institution for the average resident. It is calculated by dividing the average undergraduate charge at all public 4-year institutions in the state by the per capita disposable personal income of state residents. The average undergraduate charge includes standard in-state tuition, room, board, and required fees for a student who is a resident of the state. Disposable personal income is the income that is available to state residents for spending or saving. It is calculated as personal income minus personal current taxes paid to federal, state, and local governments. The year is the latter date of the academic year. For example, data for 2006 represent costs for the 2005–06 academic year.

High values indicate that a year of undergraduate education is more costly or less affordable to state residents. However, the data in this indicator do not include any adjustment for financial aid that a student might receive.

Table 8-21

Average undergraduate charge at public 4-year institutions as share of disposable personal income, by state: 1996, 2001, and 2006

State	Average undergraduate charge ($)			Per capita disposable personal income ($)			Undergraduate charge/ disposable personal income (%)		
	1996	2001	2006	1996	2001	2006	1996	2001	2006
United States	7,014	8,653	12,108	21,089	26,228	31,735	33.3	33.0	38.2
Alabama	5,735	7,349	9,625	17,842	21,998	28,185	32.1	33.4	34.1
Alaska	6,663	8,390	10,620	23,003	28,155	33,595	29.0	29.8	31.6
Arizona	5,996	7,874	11,480	18,306	22,932	27,763	32.8	34.3	41.3
Arkansas	5,055	6,797	9,192	16,920	20,443	25,112	29.9	33.2	36.6
California	8,209	9,590	13,685	22,011	27,492	33,373	37.3	34.9	41.0
Colorado	7,030	8,362	11,569	22,174	29,575	34,332	31.7	28.3	33.7
Connecticut	8,755	10,521	14,658	27,105	34,610	40,973	32.3	30.4	35.8
Delaware	8,512	10,283	14,326	22,071	27,266	33,683	38.6	37.7	42.5
District of Columbia	NA	NA	NA	28,275	37,147	47,515	NA	NA	NA
Florida	6,251	7,947	10,141	20,962	25,611	31,635	29.8	31.0	32.1
Georgia	5,690	7,463	10,062	20,029	24,670	28,109	28.4	30.3	35.8
Hawaii	NA	8,272	9,042	22,086	25,136	31,856	NA	32.9	28.4
Idaho	5,306	6,765	8,982	17,898	21,904	26,754	29.6	30.9	33.6
Illinois	7,841	9,532	13,976	22,924	27,852	33,419	34.2	34.2	41.8
Indiana	7,388	9,239	12,388	19,528	23,925	28,979	37.8	38.6	42.7
Iowa	5,945	7,587	12,329	19,962	23,921	29,808	29.8	31.7	41.4
Kansas	5,688	6,654	9,980	20,036	25,045	30,935	28.4	26.6	32.3
Kentucky	5,454	6,923	10,663	17,443	21,766	26,104	31.3	31.8	40.8
Louisiana	5,503	6,329	8,506	17,690	22,047	28,553	31.1	28.7	29.8
Maine	7,899	9,371	12,568	18,801	23,715	28,777	42.0	39.5	43.7
Maryland	8,731	10,834	14,793	23,396	30,061	37,574	37.3	36.0	39.4
Massachusetts	8,770	9,207	14,651	24,439	31,746	38,794	35.9	29.0	37.8
Michigan	8,189	9,825	13,693	21,040	25,998	30,117	38.9	37.8	45.5
Minnesota	6,734	8,127	12,777	21,986	27,825	33,494	30.6	29.2	38.1
Mississippi	5,416	7,195	9,461	16,004	19,849	24,360	33.8	36.2	38.8
Missouri	6,768	8,203	11,861	19,777	24,178	29,066	34.2	33.9	40.8
Montana	7,803	7,615	10,613	16,983	21,889	27,419	45.9	34.8	38.7
Nebraska	5,503	7,355	11,286	20,879	25,117	30,676	26.4	29.3	36.8
Nevada	7,400	8,247	10,865	22,803	26,776	32,290	32.5	30.8	33.6
New Hampshire	8,730	11,720	15,479	23,434	29,223	34,964	37.3	40.1	44.3
New Jersey	9,118	12,007	17,708	26,299	32,816	39,840	34.7	36.6	44.4
New Mexico	5,299	7,086	9,579	17,034	21,491	26,839	31.1	33.0	35.7
New York	8,971	10,260	13,275	24,212	29,154	35,407	37.1	35.2	37.5
North Carolina	5,119	7,076	9,675	19,548	23,834	28,339	26.2	29.7	34.1
North Dakota	5,641	6,418	9,829	19,084	23,199	29,515	29.6	27.7	33.3
Ohio	8,157	10,451	16,032	20,217	24,665	29,223	40.3	42.4	54.9
Oklahoma	4,296	6,022	9,404	17,523	22,999	28,895	24.5	26.2	32.5
Oregon	7,395	9,394	12,720	20,232	24,506	29,310	36.6	38.3	43.4
Pennsylvania	9,138	11,091	15,464	21,258	26,135	32,222	43.0	42.4	48.0
Rhode Island	9,453	11,095	14,315	21,213	26,404	32,734	44.6	42.0	43.7
South Carolina	6,964	9,096	13,145	17,724	22,065	26,406	39.3	41.2	49.8
South Dakota	5,613	6,975	9,493	19,661	24,328	31,116	28.5	28.7	30.5
Tennessee	5,373	7,658	9,956	19,628	24,157	29,456	27.4	31.7	33.8
Texas	5,471	7,614	10,973	19,802	25,691	31,012	27.6	29.6	35.4
Utah	5,389	6,598	8,745	17,085	21,687	25,792	31.5	30.4	33.9
Vermont	10,657	12,847	16,571	19,418	25,221	30,317	54.9	50.9	54.7
Virginia	8,207	8,751	12,279	21,761	27,547	33,628	37.7	31.8	36.5
Washington	7,129	8,909	12,384	22,202	28,169	33,334	32.1	31.6	37.2
West Virginia	6,119	7,290	9,992	16,540	20,776	25,204	37.0	35.1	39.6
Wisconsin	5,839	7,396	10,560	20,091	25,322	30,439	29.1	29.2	34.7
Wyoming	5,429	7,017	8,946	19,159	26,351	36,176	28.3	26.6	24.7
Puerto Rico	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = not available

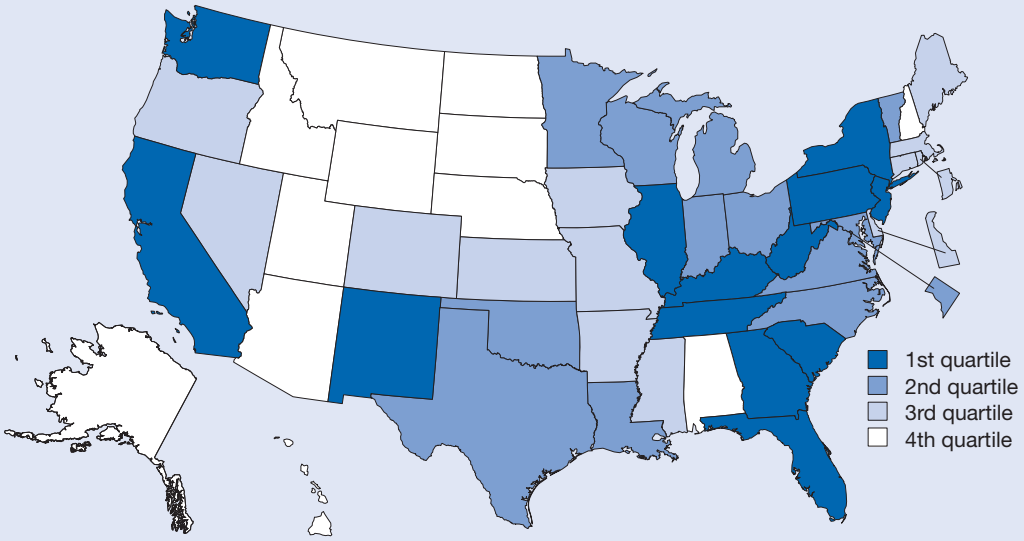
NOTES: National average undergraduate charge for United States from Digest of Education Statistics data tables. Average charges for entire academic year. Tuition and fees weighted by number of full-time-equivalent undergraduates but not adjusted to reflect student residency. Room and board based on full-time students. National value for disposable personal income is value reported by Bureau of Economic Analysis.

SOURCES: National Center for Education Statistics, Integrated Postsecondary Education Data System (various years); and Bureau of Economic Analysis, State and Local Personal Income data.

Science & Engineering Indicators 2008

State Expenditures on Student Aid per Full-Time Undergraduate Student

Figure 8-22
State expenditures on student aid per full-time undergraduate student: 2006



1st quartile ($2,449–$881)	2nd quartile ($860–$505)	3rd quartile ($494–$165)	4th quartile ($158–$12)
California	District of Columbia	Arkansas	Alabama
Florida	Indiana	Colorado	Alaska
Georgia	Louisiana	Connecticut	Arizona
Illinois	Maryland	Delaware	Hawaii
Kentucky	Michigan	Iowa	Idaho
New Jersey	Minnesota	Kansas	Montana
New Mexico	North Carolina	Maine	Nebraska
New York	Ohio	Massachusetts	New Hampshire
Pennsylvania	Oklahoma	Mississippi	North Dakota
South Carolina	Texas	Missouri	South Dakota
Tennessee	Vermont	Nevada	Utah
Washington	Virginia	Oregon	Wyoming
West Virginia	Wisconsin	Rhode Island	

SOURCES: National Association of State Scholarship and Grant Programs, Annual Survey Report (various years); and National Center for Education Statistics, Integrated Postsecondary Education Data System (various years). See Table 8-22.

Findings

- In the United States, the total amount of state financial aid from grants that were provided to undergraduates rose from nearly $2.9 billion in 1996 to nearly $6.8 billion in 2006.
- On a per-student basis, state expenditures for student grants across the United States increased from $427 in 1996 to $802 in 2006 in current dollars.
- The amount of financial assistance provided by the states and the District of Columbia varied greatly in 2006; 10 jurisdictions averaged less than $100 per undergraduate student, while 11 provided more than $1,000 per student, including South Carolina and Georgia with more than $2,000 per student.
- Four states reported spending less in current dollars for student financial aid in 2006 than in 1996 even though the cost of undergraduate education rose rapidly during this time period. All of these states were among the group spending less than $100 per undergraduate student.

The cost of an undergraduate education can be reduced with financial assistance from the state, federal government, or academic institution. This indicator measures the amount of financial support from state grants that go to undergraduate students at both public and private institutions in the state. It is calculated by dividing the total state grant aid to undergraduates by the number of full-time undergraduates who are attending school in the state. A high value is one indicator of state efforts to provide access to higher education at a time of escalating undergraduate costs.

This indicator should be viewed relative to the level of tuition charged to undergraduates in a state because some states have chosen to subsidize tuition for all students at public institutions rather than provide grants.

Total state grant expenditures for financial aid include both need-based and non-need-based grants. State assistance through subsidized or unsubsidized loans and awards to students at the graduate and first professional degree levels is not included. The year is the latter date of the academic year. For example, data for 2006 represent costs for the 2005–06 academic year.

Table 8-22
State expenditures on student aid per full-time undergraduate student, by state: 1996, 2001, and 2006

State	State expenditures on student aid ($thousands)			Undergraduate enrollment at 4-year institutions			State expenditures on student aid/ undergraduate ($)		
	1996	2001	2006	1996	2001	2006	1996	2001	2006
United States	2,870,447	4,605,393	6,789,273	6,725,612	7,193,814	8,460,873	427	640	802
Alabama	8,320	7,413	7,626	120,895	130,189	140,142	69	57	54
Alaska	430	0	502	26,641	24,573	26,802	16	0	19
Arizona	2,291	2,990	2,798	88,412	111,429	242,591	26	27	12
Arkansas	11,727	39,151	28,364	63,756	70,538	81,086	184	555	350
California	235,582	461,914	757,809	517,769	599,658	698,811	455	770	1,084
Colorado	36,401	54,151	60,737	119,686	133,500	160,580	304	406	378
Connecticut	20,374	44,763	39,366	79,673	85,143	92,522	256	526	425
Delaware	1,390	1,432	10,240	26,513	25,761	29,225	52	56	350
District of Columbia	939	781	33,856	43,365	40,703	62,888	22	19	538
Florida	100,363	302,633	410,758	235,558	288,143	466,469	426	1,050	881
Georgia	165,220	310,995	461,615	175,093	188,383	222,706	944	1,651	2,073
Hawaii	499	535	410	28,048	26,290	34,336	18	20	12
Idaho	1,027	1,138	5,424	36,169	39,343	57,809	28	29	94
Illinois	282,809	382,566	380,349	259,759	276,559	333,959	1,089	1383	1,139
Indiana	69,599	111,618	182,281	205,747	217,294	241,153	338	514	756
Iowa	39,431	53,100	53,815	93,412	97,241	119,841	422	546	449
Kansas	9,588	12,819	15,168	81,295	84,620	92,127	118	151	165
Kentucky	26,215	66,931	172,866	107,893	109,981	126,074	243	609	1,371
Louisiana	15,053	91,166	116,432	143,810	146,259	135,457	105	623	860
Maine	6,988	11,961	13,387	40,895	42,093	44,100	171	284	304
Maryland	36,066	50,416	76,362	108,231	117,720	130,057	333	428	587
Massachusetts	54,646	116,892	80,093	236,525	235,263	243,742	231	497	329
Michigan	84,154	102,164	197,674	264,454	287,233	318,373	318	356	621
Minnesota	92,099	120,465	131,010	137,830	142,734	167,954	668	844	780
Mississippi	1,235	20,163	22,285	56,733	61,043	65,515	22	330	340
Missouri	24,236	43,882	42,068	166,157	180,799	209,818	146	243	200
Montana	393	3,195	3,760	32,170	32,393	33,784	12	99	111
Nebraska	3,114	5,975	9,918	62,045	58,789	62,753	50	102	158
Nevada	3,063	13,449	39,671	24,519	32,012	80,249	125	420	494
New Hampshire	773	1,497	3,753	40,511	40,367	43,915	19	37	85
New Jersey	141,198	197,619	256,047	146,595	156,867	167,990	963	1,260	1,524
New Mexico	16,988	38,736	61,780	40,438	43,089	50,390	420	899	1,226
New York	630,069	659,394	895,129	560,579	569,260	617,536	1,124	1,158	1,450
North Carolina	43,968	121,153	192,018	182,725	191,117	224,053	241	634	857
North Dakota	2,187	1,152	1,864	28,514	28,462	33,164	77	40	56
Ohio	120,967	173,868	221,411	300,831	302,681	334,964	402	574	661
Oklahoma	20,501	29,035	58,216	90,281	98,512	115,304	227	295	505
Oregon	13,651	19,711	29,429	66,714	76,071	90,742	205	259	324
Pennsylvania	232,020	325,234	403,957	356,314	377,646	415,319	651	861	973
Rhode Island	5,741	6,164	12,883	45,757	49,484	53,930	125	125	239
South Carolina	18,622	98,095	255,744	86,620	92,074	104,430	215	1,065	2,449
South Dakota	562	0	3,367	31,718	32,310	37,183	18	0	91
Tennessee	19,289	30,156	173,907	133,310	139,743	157,956	145	216	1,101
Texas	40,768	108,628	366,873	405,011	432,747	530,410	101	251	692
Utah	1,197	2,511	7,409	102,588	120,151	143,077	12	21	52
Vermont	11,874	14,414	17,560	25,652	25,972	27,968	463	555	628
Virginia	77,386	115,242	132,720	167,392	180,573	210,638	462	638	630
Washington	57,866	98,533	173,835	97,139	105,470	123,879	596	934	1,403
West Virginia	8,132	18,217	70,981	66,079	68,435	66,790	123	266	1,063
Wisconsin	49,528	71,145	93,583	158,986	168,547	180,721	312	422	518
Wyoming	219	0	163	8,805	8,550	9,591	25	0	17
Puerto Rico	23,689	40,231	33,840	138,665	149,699	163,259	171	269	207

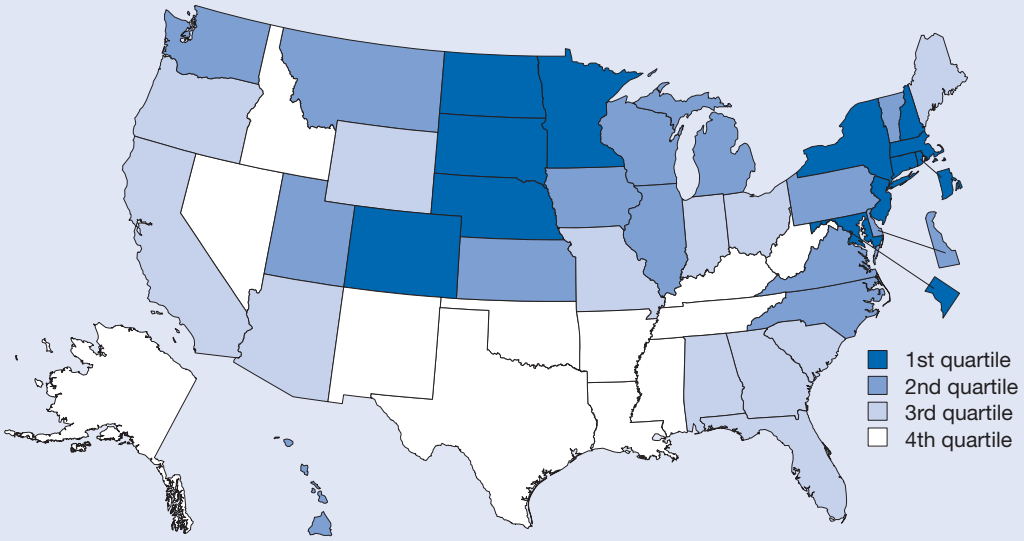
NOTES: 2001 and 2006 enrollment data for 4-year degree-granting institutions participating in Title IV federal financial aid programs.

SOURCES: National Association of State Scholarship and Grant Programs, Annual Survey Report (various years); and National Center for Education Statistics, Integrated Postsecondary Education Data System (various years).

Science & Engineering Indicators 2008

Associate's Degree Holders or Higher Among Individuals 25–44 Years Old

Figure 8-23
Associate's degree holders or higher among individuals 25–44 years old: 2005



1st quartile (54.4%–42.3%)	2nd quartile (41.8%–36.5%)	3rd quartile (36.4%–31.5%)	4th quartile (31.4%–26.2%)
Colorado	Delaware	Alabama	Alaska
Connecticut	Hawaii	Arizona	Arkansas
District of Columbia	Illinois	California	Idaho
Maryland	Iowa	Florida	Kentucky
Massachusetts	Kansas	Georgia	Louisiana
Minnesota	Michigan	Indiana	Mississippi
Nebraska	Montana	Maine	Nevada
New Hampshire	North Carolina	Missouri	New Mexico
New Jersey	Pennsylvania	Ohio	Oklahoma
New York	Utah	Oregon	Tennessee
North Dakota	Vermont	South Carolina	Texas
Rhode Island	Virginia	Wyoming	West Virginia
South Dakota	Washington		
	Wisconsin		

SOURCES: Census Bureau, 2000 Decennial Census; Population Estimates Program (various years); and American Community Survey (various years).
See table 8-23.

Findings

- The early- to mid-career population with at least an associate's degree was 37.4% nationwide in 2005, which represents an increase from 34.7% in 2000.
- Only Alaska failed to show an increase in the percentage of its early career population with at least an associate's degree between 2000 and 2005. Eighteen states had 2005 values below the 2000 national average of 34.7% compared with 27 states with values below this level in 2000.
- In 2005, the percentage of this cohort with at least an associate's degree varied greatly among states, ranging from 50.4% to 26.2%. States with the lowest cost of living tended to rank lowest on this indicator.

This indicator represents the percentage of the early- to mid-career population that has earned at least a college degree. That degree may be at the associate's through doctoral level. The indicator represents where college degree holders have chosen to live and work rather than where they were educated. The age cohort of 25–44 years represents the group most likely to have completed a college program. High values indicate a resident population or potential workforce with widespread credentials at the community college level or higher.

Estimates of educational attainment are developed by the Census Bureau based on the 2000 Decennial Census and the American Community Survey (ACS). The census is conducted every 10 years, but the ACS provides annually updated data on the characteristics of population and housing. In 2005, ACS became the largest household survey in the United States, with an annual sample size of about 3 million addresses. Estimates of population are taken from the Census Bureau's Population Estimates Program, which is also based on the 2000 Decennial Census.

Table 8-23
Associate's degree holders or higher among individuals 25–44 years old, by state: 2000, 2003, and 2005

State	Associate's degree holders 25–44 years old			Population 25–44 years old			Associate's degree holders/ individuals 25–44 years old (%)		
	2000	2003	2005	2000	2003	2005	2000	2003	2005
United States	29,471,612	30,738,684	31,382,831	85,040,251	84,216,990	84,010,639	34.7	36.5	37.4
Alabama	370,196	381,050	389,490	1,288,527	1,241,184	1,234,729	28.7	30.7	31.5
Alaska	61,646	58,059	58,631	203,522	194,823	194,890	30.3	29.8	30.1
Arizona	472,901	498,703	552,805	1,511,469	1,599,029	1,694,572	31.3	31.2	32.6
Arkansas	177,657	187,589	202,622	750,972	738,579	750,229	23.7	25.4	27.0
California	3,670,622	3,918,228	3,892,099	10,714,403	10,832,873	10,794,860	34.3	36.2	36.1
Colorado	596,036	623,279	636,437	1,400,850	1,417,501	1,421,418	42.5	44.0	44.8
Connecticut	443,608	447,818	432,451	1,032,689	999,800	968,330	43.0	44.8	44.7
Delaware	84,170	90,649	87,994	236,441	233,356	233,683	35.6	38.8	37.7
District of Columbia	90,097	100,283	103,236	189,439	188,758	189,675	47.6	53.1	54.4
Florida	1,513,345	1,616,842	1,694,517	4,569,347	4,676,558	4,812,867	33.1	34.6	35.2
Georgia	884,108	929,979	1,013,471	2,652,764	2,723,720	2,784,441	33.3	34.1	36.4
Hawaii	136,758	132,630	129,858	362,336	352,806	355,620	37.7	37.6	36.5
Idaho	112,690	121,592	121,718	362,401	370,690	387,620	31.1	32.8	31.4
Illinois	1,444,942	1,487,189	1,530,725	3,795,544	3,727,314	3,672,713	38.1	39.9	41.7
Indiana	537,644	543,808	562,483	1,791,828	1,748,331	1,741,859	30.0	31.1	32.3
Iowa	289,740	294,559	317,772	808,259	775,320	764,399	35.8	38.0	41.6
Kansas	282,475	307,608	289,848	769,204	743,961	732,886	36.7	41.3	39.5
Kentucky	317,109	335,263	353,170	1,210,773	1,182,970	1,187,091	26.2	28.3	29.8
Louisiana	316,348	346,949	340,337	1,293,128	1,230,819	1,217,481	24.5	28.2	28.0
Maine	122,958	128,525	123,129	370,597	358,691	350,196	33.2	35.8	35.2
Maryland	672,460	714,825	693,317	1,664,677	1,641,907	1,615,367	40.4	43.5	42.9
Massachusetts	942,748	970,834	932,197	1,989,783	1,922,446	1,848,998	47.4	50.5	50.4
Michigan	982,169	1,026,212	1,013,031	2,960,544	2,840,435	2,772,896	33.2	36.1	36.5
Minnesota	631,677	668,668	684,727	1,497,320	1,465,370	1,443,493	42.2	45.6	47.4
Mississippi	208,866	214,703	231,759	807,170	782,327	778,254	25.9	27.4	29.8
Missouri	517,750	541,597	543,130	1,626,302	1,587,931	1,585,316	31.8	34.1	34.3
Montana	81,428	85,047	85,590	245,220	232,735	232,383	33.2	36.5	36.8
Nebraska	185,090	187,939	202,182	487,107	471,024	464,556	38.0	39.9	43.5
Nevada	152,536	167,370	193,902	628,572	679,392	729,594	24.3	24.6	26.6
New Hampshire	156,434	163,231	161,161	381,240	373,644	364,731	41.0	43.7	44.2
New Jersey	1,076,450	1,105,776	1,114,215	2,624,146	2,578,072	2,510,115	41.0	42.9	44.4
New Mexico	149,398	142,448	153,406	516,100	506,956	511,007	28.9	28.1	30.0
New York	2,359,507	2,432,498	2,499,314	5,831,622	5,667,484	5,501,929	40.5	42.9	45.4
North Carolina	844,019	892,169	933,034	2,500,535	2,507,025	2,523,658	33.8	35.6	37.0
North Dakota	71,509	70,144	73,974	174,891	160,522	156,178	40.9	43.7	47.4
Ohio	1,075,353	1,107,195	1,098,912	3,325,210	3,172,294	3,105,980	32.3	34.9	35.4
Oklahoma	276,525	275,638	296,769	975,169	946,358	944,171	28.4	29.1	31.4
Oregon	333,963	355,143	361,760	997,269	1,003,698	1,015,644	33.5	35.4	35.6
Pennsylvania	1,230,548	1,243,379	1,269,457	3,508,562	3,343,434	3,255,635	35.1	37.2	39.0
Rhode Island	117,758	128,487	127,598	310,636	306,459	296,717	37.9	41.9	43.0
South Carolina	357,570	370,577	389,378	1,185,955	1,167,347	1,171,573	30.2	31.7	33.2
South Dakota	73,128	76,724	82,619	206,399	197,386	195,213	35.4	38.9	42.3
Tennessee	489,940	511,871	521,417	1,718,428	1,684,796	1,698,611	28.5	30.4	30.7
Texas	1,973,279	2,059,427	2,112,582	6,484,321	6,644,003	6,762,605	30.4	31.0	31.2
Utah	222,534	247,337	276,707	626,600	648,111	695,736	35.5	38.2	39.8
Vermont	70,277	68,018	68,447	176,456	168,392	163,707	39.8	40.4	41.8
Virginia	874,239	904,354	925,208	2,237,655	2,227,978	2,228,610	39.1	40.6	41.5
Washington	693,591	721,329	739,976	1,816,217	1,803,610	1,820,192	38.2	40.0	40.7
West Virginia	115,337	123,752	125,231	501,343	479,781	478,383	23.0	25.8	26.2
Wisconsin	566,244	566,942	596,923	1,581,690	1,537,180	1,517,725	35.8	36.9	39.3
Wyoming	44,235	44,448	42,115	138,619	131,810	132,103	31.9	33.7	31.9
Puerto Rico	358,595	NA	424,718	1,049,995	1,069,617	1,077,981	34.2	NA	39.4

NA = not available

SOURCES: Census Bureau, 2000 Decennial Census; Population Estimates Program (various years); and American Community Survey (various years).

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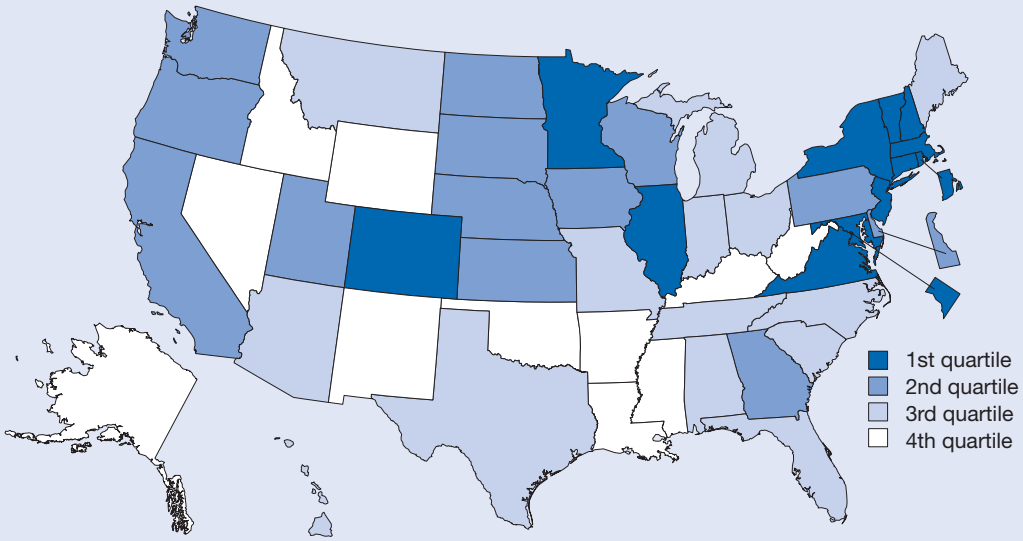
Bachelor's Degree Holders or Higher Among Individuals 25–44 Years Old

Figure 8-24
Bachelor's degree holders or higher among individuals 25–44 years old: 2005



1st quartile (51.0%–32.8%)	2nd quartile (32.1%–28.0%)	3rd quartile (27.6%–23.4%)	4th quartile (23.3%–19.1%)
Colorado	California	Alabama	Alaska
Connecticut	Delaware	Arizona	Arkansas
District of Columbia	Georgia	Florida	Idaho
Illinois	Iowa	Hawaii	Kentucky
Maryland	Kansas	Indiana	Louisiana
Massachusetts	Nebraska	Maine	Mississippi
Minnesota	North Dakota	Michigan	Nevada
New Hampshire	Oregon	Missouri	New Mexico
New Jersey	Pennsylvania	Montana	Oklahoma
New York	South Dakota	North Carolina	West Virginia
Rhode Island	Utah	Ohio	Wyoming
Vermont	Washington	South Carolina	
Virginia	Wisconsin	Tennessee	
		Texas	

SOURCES: Census Bureau, 2000 Decennial Census; Population Estimates Program (various years); and American Community Survey (various years).
See table 8-24.

Findings

- The early- to mid-career population with at least a bachelor's degree was 29.0% nationwide in 2005, which represents an increase from 26.8% in 2000.
- Only Hawaii failed to show an increase in the percentage of its early career population with at least a bachelor's degree between 2000 and 2005. Twenty states had 2005 values below the 2000 national average of 26.8% compared with 30 states with values below this level in 2000.
- In 2005, the percentage of the early career population with at least a bachelor's degree varied greatly among states, ranging from 42.2% to 19.1%. States with the lowest cost of living tended to rank lowest on this indicator.

This indicator represents the percentage of the early- to mid-career population that has earned at least a 4-year undergraduate degree. That degree may be at the bachelor's through doctoral level. The indicator represents where college degree holders have chosen to live and work rather than where they were educated. The age cohort of 25–44 years represents the group most likely to have completed a college program. High values indicate a resident population or potential workforce with widespread credentials at the college or university level.

Estimates of educational attainment are developed by the Census Bureau based on the 2000 Decennial Census and the American Community Survey (ACS). The census is conducted every 10 years, but the ACS provides annually updated data on the characteristics of population and housing. In 2005, ACS became the largest household survey in the United States, with an annual sample size of about 3 million addresses. Estimates of population are taken from the Census Bureau's Population Estimates Program, which is also based on the 2000 Decennial Census.

Table 8-24
Bachelor's degree holders or higher among individuals 25–44 years old, by state: 2000, 2003, and 2005

State	Bachelor's degree holders 25–44 years old			Population 25–44 years old			Bachelor's degree holders/individuals 25–44 years old (%)		
	2000	2003	2005	2000	2003	2005	2000	2003	2005
United States	22,781,996	23,984,096	24,353,620	85,040,251	84,216,990	84,010,639	26.8	28.5	29.0
Alabama	275,759	282,805	288,817	1,288,527	1,241,184	1,234,729	21.4	22.8	23.4
Alaska	45,560	44,868	45,315	203,522	194,823	194,890	22.4	23.0	23.3
Arizona	355,836	374,059	408,522	1,511,469	1,599,029	1,694,572	23.5	23.4	24.1
Arkansas	136,883	149,619	152,225	750,972	738,579	750,229	18.2	20.3	20.3
California	2,882,717	3,134,086	3,112,603	10,714,403	10,832,873	10,794,860	26.9	28.9	28.8
Colorado	480,984	513,973	512,178	1,400,850	1,417,501	1,421,418	34.3	36.3	36.0
Connecticut	362,272	380,576	362,929	1,032,689	999,800	968,330	35.1	38.1	37.5
Delaware	65,811	73,052	71,090	236,441	233,356	233,683	27.8	31.3	30.4
District of Columbia	84,836	96,119	96,816	189,439	188,758	189,675	44.8	50.9	51.0
Florida	1,081,551	1,159,165	1,212,200	4,569,347	4,676,558	4,812,867	23.7	24.8	25.2
Georgia	718,591	766,181	820,695	2,652,764	2,723,720	2,784,441	27.1	28.1	29.5
Hawaii	99,378	97,202	95,029	362,336	352,806	355,620	27.4	27.6	26.7
Idaho	80,235	88,937	89,959	362,401	370,690	387,620	22.1	24.0	23.2
Illinois	1,149,688	1,191,554	1,216,933	3,795,544	3,727,314	3,672,713	30.3	32.0	33.1
Indiana	397,050	404,241	408,107	1,791,828	1,748,331	1,741,859	22.2	23.1	23.4
Iowa	202,004	200,579	221,497	808,259	775,320	764,399	25.0	25.9	29.0
Kansas	223,467	243,308	224,946	769,204	743,961	732,886	29.1	32.7	30.7
Kentucky	234,921	247,142	256,209	1,210,773	1,182,970	1,187,091	19.4	20.9	21.6
Louisiana	256,363	283,161	267,429	1,293,128	1,230,819	1,217,481	19.8	23.0	22.0
Maine	86,989	92,827	85,987	370,597	358,691	350,196	23.5	25.9	24.6
Maryland	566,294	600,135	582,280	1,664,677	1,641,907	1,615,367	34.0	36.6	36.0
Massachusetts	773,569	820,821	780,522	1,989,783	1,922,446	1,848,998	38.9	42.7	42.2
Michigan	719,607	764,082	757,970	2,960,544	2,840,435	2,772,896	24.3	26.9	27.3
Minnesota	476,707	506,833	511,402	1,497,320	1,465,370	1,443,493	31.8	34.6	35.4
Mississippi	144,488	149,176	152,606	807,170	782,327	778,254	17.9	19.1	19.6
Missouri	407,449	424,660	429,501	1,626,302	1,587,931	1,585,316	25.1	26.7	27.1
Montana	62,682	63,186	63,693	245,220	232,735	232,383	25.6	27.1	27.4
Nebraska	134,516	138,152	149,233	487,107	471,024	464,556	27.6	29.3	32.1
Nevada	111,517	128,178	143,301	628,572	679,392	729,594	17.7	18.9	19.6
New Hampshire	114,745	121,639	122,682	381,240	373,644	364,731	30.1	32.6	33.6
New Jersey	899,016	932,505	943,939	2,624,146	2,578,072	2,510,115	34.3	36.2	37.6
New Mexico	110,360	106,530	110,562	516,100	506,956	511,007	21.4	21.0	21.6
New York	1,817,661	1,885,493	1,964,870	5,831,622	5,667,484	5,501,929	31.2	33.3	35.7
North Carolina	636,799	682,432	697,740	2,500,535	2,507,025	2,523,658	25.5	27.2	27.6
North Dakota	46,291	49,712	48,381	174,891	160,522	156,178	26.5	31.0	31.0
Ohio	806,803	835,693	833,138	3,325,210	3,172,294	3,105,980	24.3	26.3	26.8
Oklahoma	209,025	211,507	218,272	975,169	946,358	944,171	21.4	22.3	23.1
Oregon	257,875	278,460	284,778	997,269	1,003,698	1,015,644	25.9	27.7	28.0
Pennsylvania	938,930	959,366	979,367	3,508,562	3,343,434	3,255,635	26.8	28.7	30.1
Rhode Island	88,647	101,468	98,477	310,636	306,459	296,717	28.5	33.1	33.2
South Carolina	259,773	279,322	283,280	1,185,955	1,167,347	1,171,573	21.9	23.9	24.2
South Dakota	51,213	52,989	56,951	206,399	197,386	195,213	24.8	26.8	29.2
Tennessee	380,929	393,328	401,027	1,718,428	1,684,796	1,698,611	22.2	23.3	23.6
Texas	1,571,951	1,623,020	1,668,865	6,484,321	6,644,003	6,762,605	24.2	24.4	24.7
Utah	162,495	174,787	197,780	626,600	648,111	695,736	25.9	27.0	28.4
Vermont	52,787	53,121	53,693	176,456	168,392	163,707	29.9	31.5	32.8
Virginia	722,081	750,953	763,865	2,237,655	2,227,978	2,228,610	32.3	33.7	34.3
Washington	520,382	553,669	554,104	1,816,217	1,803,610	1,820,192	28.7	30.7	30.4
West Virginia	83,441	92,148	91,539	501,343	479,781	478,383	16.6	19.2	19.1
Wisconsin	402,965	396,601	430,486	1,581,690	1,537,180	1,517,725	25.5	25.8	28.4
Wyoming	30,103	30,676	29,830	138,619	131,810	132,103	21.7	23.3	22.6
Puerto Rico	245,975	NA	276,934	1,049,995	1,069,617	1,077,981	23.4	NA	25.7

NA = not available

SOURCES: Census Bureau, 2000 Decennial Census; Population Estimates Program (various years); and American Community Survey (various years).

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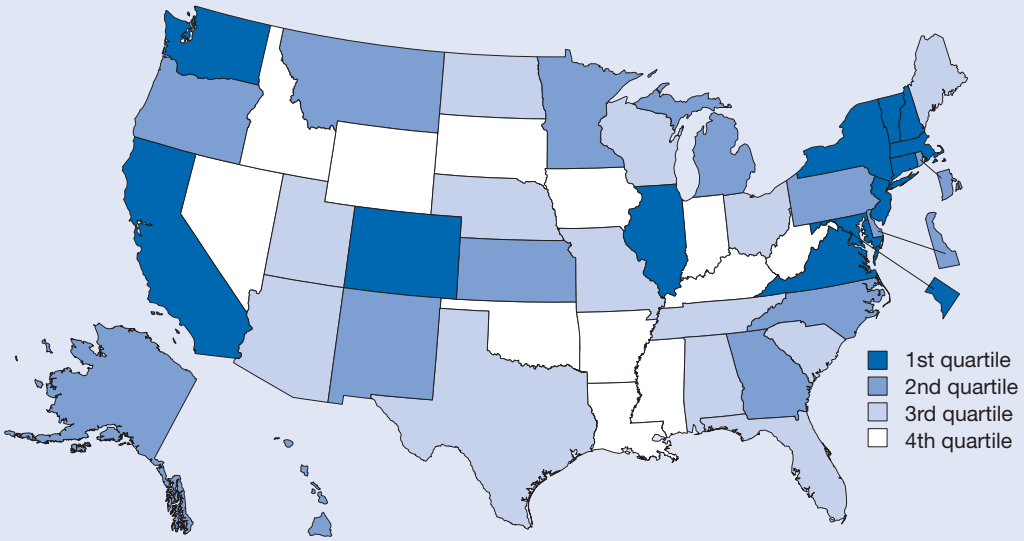
Bachelor's Degree Holders Potentially in the Workforce

Figure 8-25
Bachelor's degree holders potentially in the workforce: 2005



1st quartile (51.2%–34.2%)	2nd quartile (33.6%–29.1%)	3rd quartile (28.9%–26.7%)	4th quartile (26.5%–22.5%)
California	Alaska	Alabama	Arkansas
Colorado	Delaware	Arizona	Idaho
Connecticut	Georgia	Florida	Indiana
District of Columbia	Hawaii	Maine	Iowa
Illinois	Kansas	Missouri	Kentucky
Maryland	Michigan	Nebraska	Louisiana
Massachusetts	Minnesota	North Dakota	Mississippi
New Hampshire	Montana	Ohio	Nevada
New Jersey	New Mexico	South Carolina	Oklahoma
New York	North Carolina	Tennessee	South Dakota
Vermont	Oregon	Texas	West Virginia
Virginia	Pennsylvania	Utah	Wyoming
Washington	Rhode Island	Wisconsin	

SOURCES: Census Bureau, 2000 Decennial Census and American Community Survey (various years); and Bureau of Labor Statistics, Local Area Unemployment Statistics. See table 8-25.

Findings

- In 2005, 45 million individuals between the ages of 25 and 64 held bachelor's degrees in the United States, up from 39 million in 2000. Nationwide, the ratio of bachelor's degree holders to the size of the workforce rose from 28.5% in 2000 to 31.7% in 2005. This ratio varied considerably among the states, ranging from 22.5% to 43.2% in 2005.
- The value of this indicator increased in all states and the District of Columbia between 2000 and 2005. This may reflect a replacement of older cohorts of workers with younger, more educated ones. It may also indicate the restructuring of state economies to emphasize work that requires a higher level of education or credentials.
- Between 2000 and 2005, Michigan, Massachusetts, and the District of Columbia showed the largest increases in the ratio of bachelor's degree holders to workforce size.
- The geographic distribution of bachelor's degree holders bears little resemblance to any of the degree production indicators, which attests to the considerable mobility of the college-educated population in the United States.

The ratio of bachelor's, graduate, or professional degree holders to the size of a state's workforce is an indicator of a population with undergraduate and/or graduate education skill levels potentially available for its workforce. Workers with at least a bachelor's degree have a clear advantage over less-educated workers in expected lifetime earnings. A high value for this indicator suggests a large percentage of the potential workforce with an undergraduate education. This indicator does not imply that all degree holders are currently employed; rather, it indicates the potential educational level of the workforce if all degree holders were employed. Knowledge-intensive businesses seeking to relocate may be attracted to states with high values on this indicator.

Degree data are based on the U.S. Census Bureau's 2000 Decennial Census and American Community Survey and are limited to individuals who are 25–64 years old because this is the age range of most of the workforce. Individuals younger than age 25 are considered to be in the process of completing their education. Individuals older than 64 are considered to be largely retired, so their educational attainment would have limited applicability to the quality of the workforce. Civilian workforce data are Bureau of Labor Statistics estimates based on Local Area Unemployment Statistics. Estimates for sparsely populated states and the District of Columbia may be imprecise because of their small representation in the survey samples.

Table 8-25
Bachelor's degree holders potentially in the workforce, by state: 2000, 2003, and 2005

State	Bachelor's degree holders 25–64 years old			Employed workforce			Bachelor's degree holders/workforce (%)		
	2000	2003	2005	2000	2003	2005	2000	2003	2005
United States	39,078,598	43,038,717	44,972,214	136,940,378	137,418,377	141,739,774	28.5	31.3	31.7
Alabama	479,734	532,098	549,086	2,067,147	2,000,039	2,056,800	23.2	26.6	26.7
Alaska	87,739	91,931	96,854	299,324	308,523	318,423	29.3	29.8	30.4
Arizona	638,515	689,950	781,932	2,404,916	2,565,030	2,727,003	26.6	26.9	28.7
Arkansas	247,079	276,084	287,058	1,207,352	1,199,379	1,276,851	20.5	23.0	22.5
California	4,960,210	5,611,074	5,732,017	16,024,341	16,226,987	16,782,260	31.0	34.6	34.2
Colorado	819,906	901,534	936,007	2,300,192	2,323,554	2,436,795	35.6	38.8	38.4
Connecticut	633,867	695,356	707,700	1,697,670	1,704,693	1,734,386	37.3	40.8	40.8
Delaware	111,260	126,828	131,287	402,777	403,504	415,687	27.6	31.4	31.6
District of Columbia	133,155	148,230	150,461	291,916	283,736	293,900	45.6	52.2	51.2
Florida	1,968,126	2,266,930	2,398,022	7,569,406	7,811,887	8,375,993	26.0	29.0	28.6
Georgia	1,148,814	1,266,705	1,394,550	4,095,362	4,180,568	4,384,030	28.1	30.3	31.8
Hawaii	184,130	196,970	200,132	584,858	588,880	614,290	31.5	33.4	32.6
Idaho	149,622	172,807	178,690	632,451	652,627	698,466	23.7	26.5	25.6
Illinois	1,876,455	2,032,846	2,113,824	6,176,837	5,942,720	6,112,981	30.4	34.2	34.6
Indiana	672,835	707,713	745,940	3,052,719	3,011,436	3,054,803	22.0	23.5	24.4
Iowa	351,922	366,596	404,729	1,557,081	1,543,507	1,568,561	22.6	23.8	25.8
Kansas	385,924	434,766	425,214	1,351,988	1,364,410	1,389,201	28.5	31.9	30.6
Kentucky	402,094	435,777	467,998	1,866,348	1,851,017	1,879,413	21.5	23.5	24.9
Louisiana	453,353	512,319	496,071	1,930,662	1,899,642	1,938,280	23.5	27.0	25.6
Maine	170,334	193,729	193,647	650,385	655,561	669,250	26.2	29.6	28.9
Maryland	979,588	1,083,343	1,095,665	2,711,382	2,750,040	2,820,526	36.1	39.4	38.8
Massachusetts	1,266,113	1,370,101	1,387,065	3,273,281	3,211,853	3,211,033	38.7	42.7	43.2
Michigan	1,242,388	1,378,696	1,407,669	4,953,421	4,681,180	4,726,204	25.1	29.5	29.8
Minnesota	783,613	891,852	906,335	2,720,492	2,765,997	2,796,622	28.8	32.2	32.4
Mississippi	256,581	279,111	293,533	1,239,859	1,228,526	1,226,492	20.7	22.7	23.9
Missouri	695,491	776,798	792,737	2,875,336	2,819,935	2,847,758	24.2	27.5	27.8
Montana	124,462	130,542	139,593	446,552	447,679	463,929	27.9	29.2	30.1
Nebraska	230,857	244,248	267,867	923,198	932,870	940,040	25.0	26.2	28.5
Nevada	206,361	241,719	272,492	1,015,221	1,092,651	1,178,072	20.3	22.1	23.1
New Hampshire	207,431	226,741	243,698	675,541	684,348	703,175	30.7	33.1	34.7
New Jersey	1,510,429	1,639,510	1,734,942	4,130,310	4,126,674	4,255,813	36.6	39.7	40.8
New Mexico	226,334	232,196	252,804	810,024	832,639	867,317	27.9	27.9	29.1
New York	3,031,927	3,275,249	3,460,430	8,751,441	8,713,529	8,959,845	34.6	37.6	38.6
North Carolina	1,044,025	1,155,486	1,229,917	3,969,235	3,965,695	4,112,828	26.3	29.1	29.9
North Dakota	80,545	91,105	95,520	335,780	335,453	341,847	24.0	27.2	27.9
Ohio	1,375,311	1,480,377	1,521,816	5,573,154	5,502,110	5,546,537	24.7	26.9	27.4
Oklahoma	383,381	414,535	431,778	1,609,522	1,597,338	1,629,217	23.8	26.0	26.5
Oregon	488,862	533,853	564,786	1,716,954	1,704,397	1,754,715	28.5	31.3	32.2
Pennsylvania	1,618,658	1,736,241	1,842,351	5,830,902	5,818,296	5,966,226	27.8	29.8	30.9
Rhode Island	156,862	185,148	181,553	520,758	535,458	539,709	30.1	34.6	33.6
South Carolina	454,656	521,905	534,821	1,902,029	1,868,309	1,939,646	23.9	27.9	27.6
South Dakota	89,855	95,907	104,555	397,678	405,840	411,551	22.6	23.6	25.4
Tennessee	649,844	719,592	750,100	2,756,498	2,720,676	2,758,184	23.6	26.4	27.2
Texas	2,646,909	2,892,917	3,062,665	9,896,002	10,260,318	10,677,171	26.7	28.2	28.7
Utah	276,360	292,932	339,337	1,097,915	1,132,948	1,211,803	25.2	25.9	28.0
Vermont	103,476	113,291	118,184	326,742	333,788	341,442	31.7	33.9	34.6
Virginia	1,232,454	1,361,804	1,438,181	3,502,524	3,646,114	3,785,583	35.2	37.3	38.0
Washington	932,352	1,037,358	1,069,031	2,898,677	2,916,045	3,089,953	32.2	35.6	34.6
West Virginia	157,883	179,117	181,476	764,649	742,990	754,060	20.6	24.1	24.1
Wisconsin	690,065	732,493	791,966	2,894,884	2,866,994	2,887,434	23.8	25.5	27.4
Wyoming	60,451	64,307	68,128	256,685	259,987	267,669	23.6	24.7	25.5
Puerto Rico	378,586	NA	454,714	1,162,153	1,200,322	1,250,335	32.6	NA	36.4

NA = not available

NOTES: Bachelor's degree holders include those completing a bachelor's or higher degree. Workforce represents employed component of civilian labor force and reported as annual data not seasonally adjusted.

SOURCES: Census Bureau, 2000 Decennial Census and American Community Survey (various years); and Bureau of Labor Statistics, Local Area Unemployment Statistics.

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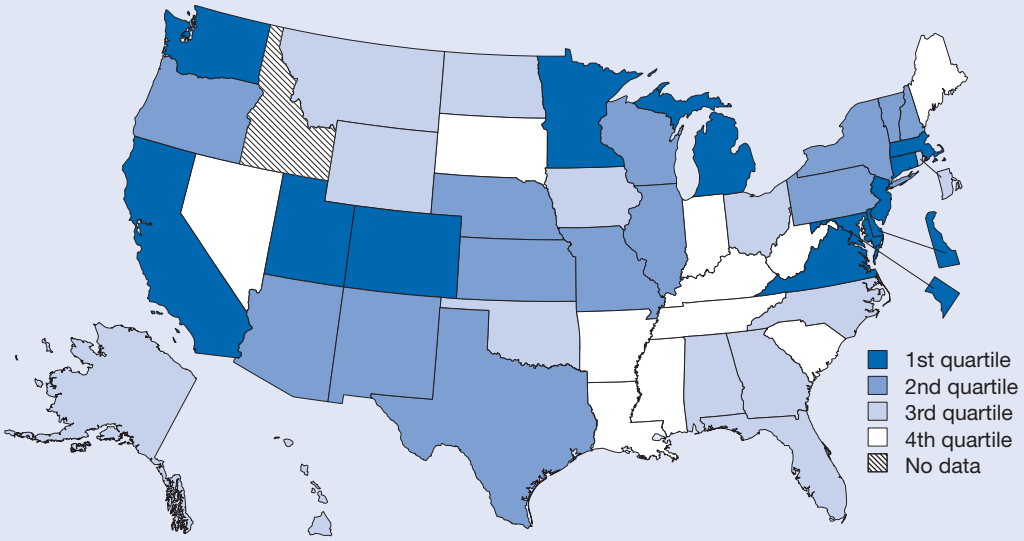
Individuals in S&E Occupations as Share of Workforce

Figure 8-26
Individuals in S&E occupations as share of workforce: 2006



1st quartile (21.59%–3.90%)	2nd quartile (3.89%–3.32%)	3rd quartile (3.31%–2.70%)	4th quartile (2.68%–1.92%)	No data
California	Arizona	Alabama	Arkansas	Idaho
Colorado	Illinois	Alaska	Indiana	
Connecticut	Kansas	Florida	Kentucky	
Delaware	Missouri	Georgia	Louisiana	
District of Columbia	Nebraska	Hawaii	Maine	
Maryland	New Hampshire	Iowa	Mississippi	
Massachusetts	New Mexico	Montana	Nevada	
Michigan	New York	North Carolina	South Carolina	
Minnesota	Oregon	North Dakota	South Dakota	
New Jersey	Pennsylvania	Ohio	Tennessee	
Utah	Texas	Oklahoma	West Virginia	
Virginia	Vermont	Rhode Island		
Washington	Wisconsin	Wyoming		

SOURCES: Bureau of Labor Statistics, Occupational Employment and Wage Estimates; and Local Area Unemployment Statistics. See table 8-26.

Findings

- In 2006, 3.7% of the U.S. workforce, or about 5.4 million people, worked in occupations classified as S&E.
- The percentage of the workforce engaged in S&E occupations ranged from 1.9% to 6.5% in individual states in 2006.
- The highest percentage of S&E occupations was found in the District of Columbia and the adjacent states of Maryland and Virginia as well as in Massachusetts, Washington, and Colorado.
- Between 2004 and 2006, the percentage of S&E occupations increased in 29 states and the District of Columbia, and it decreased in 18 states.

This indicator shows the extent to which a state's workforce is employed in S&E occupations. A high value for this indicator shows that a state's economy has a high percentage of technical jobs relative to other states.

S&E occupations are defined by standard occupational codes that encompass mathematical, computer, life, physical, and social scientists; engineers; and postsecondary teachers in any of these S&E fields. Managers, technicians, elementary and secondary schoolteachers, and medical personnel are excluded.

The location of S&E occupations primarily reflects where the individuals work and is based on estimates from the Occupational Employment Statistics survey, a cooperative program between the Bureau of Labor Statistics (BLS) and state employment security agencies. Civilian workforce data are BLS estimates based on the Current Population Survey, which assigns workers to a location based on residence. Because of this difference and the sample-based nature of the data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Table 8-26
Individuals in S&E occupations as share of workforce, by state: 2004 and 2006

State	S&E occupations		Employed workforce		Workforce in S&E occupations (%)	
	2004	2006	2004	2006	2004	2006
United States	5,065,330	5,383,860	139,213,523	144,581,912	3.64	3.72
Alabama	57,560	66,100	2,014,678	2,120,573	2.86	3.12
Alaska	10,660	10,720	312,922	323,531	3.41	3.31
Arizona	95,380	98,110	2,649,243	2,854,381	3.60	3.44
Arkansas	22,150	24,860	1,228,163	1,292,886	1.80	1.92
California	693,670	730,010	16,444,457	17,029,307	4.22	4.29
Colorado	126,280	133,730	2,384,562	2,537,037	5.30	5.27
Connecticut	82,820	79,380	1,714,758	1,765,075	4.83	4.50
Delaware	17,980	21,550	408,022	424,506	4.41	5.08
District of Columbia	57,750	64,120	285,567	296,957	20.22	21.59
Florida	229,950	246,190	8,056,259	8,692,761	2.85	2.83
Georgia	141,710	136,470	4,257,465	4,522,025	3.33	3.02
Hawaii	16,360	18,940	597,147	628,277	2.74	3.01
Idaho	22,310	NA	670,746	723,621	3.33	NA
Illinois	219,530	222,470	6,012,320	6,315,715	3.65	3.52
Indiana	79,120	80,110	3,017,271	3,108,806	2.62	2.58
Iowa	39,280	43,670	1,542,342	1,602,849	2.55	2.72
Kansas	52,020	48,620	1,378,713	1,400,169	3.77	3.47
Kentucky	44,350	44,680	1,859,902	1,922,163	2.38	2.32
Louisiana	42,230	40,180	1,926,594	1,910,348	2.19	2.10
Maine	15,160	15,950	661,163	678,843	2.29	2.35
Maryland	154,310	159,470	2,766,653	2,892,620	5.58	5.51
Massachusetts	186,260	198,670	3,204,653	3,234,860	5.81	6.14
Michigan	183,140	208,520	4,694,981	4,730,291	3.90	4.41
Minnesota	119,380	125,930	2,781,744	2,822,297	4.29	4.46
Mississippi	23,190	24,910	1,234,167	1,218,664	1.88	2.04
Missouri	87,200	96,420	2,821,802	2,885,857	3.09	3.34
Montana	11,390	13,010	456,624	478,162	2.49	2.72
Nebraska	31,720	32,500	940,047	945,270	3.37	3.44
Nevada	23,980	26,930	1,134,550	1,240,868	2.11	2.17
New Hampshire	24,350	27,680	693,648	711,512	3.51	3.89
New Jersey	165,150	176,460	4,177,841	4,309,021	3.95	4.10
New Mexico	33,500	30,800	850,164	895,623	3.94	3.44
New York	272,930	306,810	8,810,155	9,072,733	3.10	3.38
North Carolina	135,380	138,790	4,028,598	4,250,619	3.36	3.27
North Dakota	8,420	9,360	338,221	346,359	2.49	2.70
Ohio	180,360	185,190	5,507,404	5,609,056	3.27	3.30
Oklahoma	NA	50,770	1,608,849	1,650,877	NA	3.08
Oregon	62,570	64,520	1,722,058	1,796,165	3.63	3.59
Pennsylvania	195,730	214,910	5,889,957	6,009,858	3.32	3.58
Rhode Island	19,660	18,060	531,121	547,618	3.70	3.30
South Carolina	51,030	53,230	1,900,122	1,988,378	2.69	2.68
South Dakota	9,420	10,120	409,263	417,100	2.30	2.43
Tennessee	65,120	67,040	2,733,793	2,835,530	2.38	2.36
Texas	383,180	408,710	10,456,224	10,921,673	3.66	3.74
Utah	43,030	49,690	1,169,163	1,272,801	3.68	3.90
Vermont	11,770	12,780	337,709	348,026	3.49	3.67
Virginia	220,180	251,720	3,704,593	3,878,988	5.94	6.49
Washington	154,610	171,780	3,008,352	3,160,350	5.14	5.44
West Virginia	16,100	17,150	744,034	767,134	2.16	2.24
Wisconsin	95,230	96,860	2,871,034	2,918,155	3.32	3.32
Wyoming	6,760	7,640	263,705	275,617	2.56	2.77
Puerto Rico	20,410	23,850	1,226,251	1,260,703	1.66	1.89

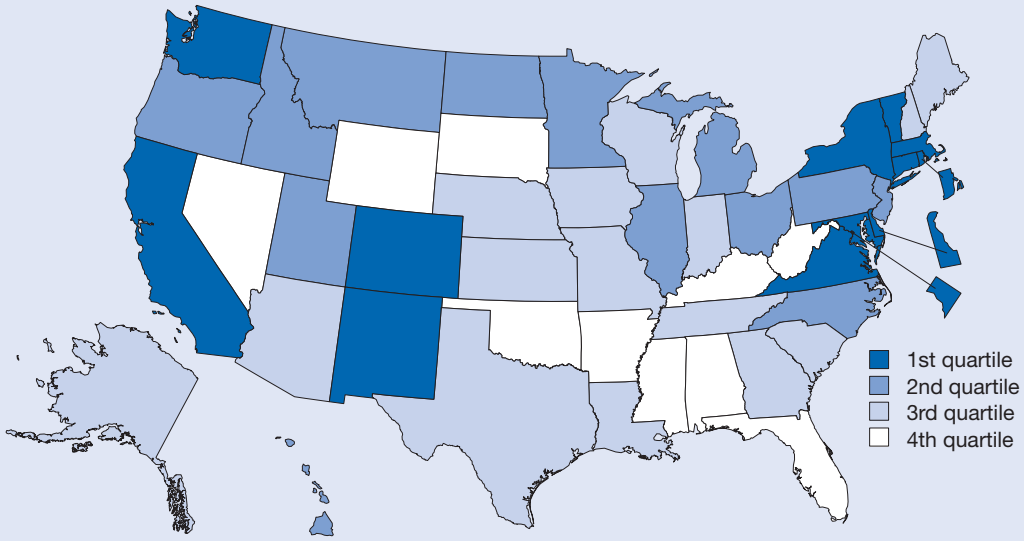
NOTE: Workforce represents employed component of civilian labor force and reported as annual data not seasonally adjusted.

SOURCES: Bureau of Labor Statistics, Occupational Employment and Wage Estimates; and Local Area Unemployment Statistics.

Science & Engineering Indicators 2008

Employed S&E Doctorate Holders as Share of Workforce

Figure 8-27
Employed S&E doctorate holders as share of workforce: 2006



1st quartile (4.49%–0.49%)	2nd quartile (0.48%–0.37%)	3rd quartile (0.35%–0.29%)	4th quartile (0.28%–0.20%)
California	Hawaii	Alaska	Alabama
Colorado	Idaho	Arizona	Arkansas
Connecticut	Illinois	Georgia	Florida
Delaware	Michigan	Indiana	Kentucky
District of Columbia	Minnesota	Iowa	Mississippi
Maryland	Montana	Kansas	Nevada
Massachusetts	New Jersey	Louisiana	Oklahoma
New Mexico	North Carolina	Maine	South Dakota
New York	North Dakota	Missouri	West Virginia
Rhode Island	Ohio	Nebraska	Wyoming
Vermont	Oregon	New Hampshire	
Virginia	Pennsylvania	South Carolina	
Washington	Utah	Tennessee	
		Texas	
		Wisconsin	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients; and Bureau of Labor Statistics, Local Area Unemployment Statistics. See table 8-27.

Findings

- The number of employed S&E doctorate holders in the United States rose from 517,000 in 1997 to 618,000 in 2006, an increase of 20%.
- For the United States, the value of this indicator rose from 0.39% to 0.43% of the workforce because the number of employed S&E doctorate holders increased more rapidly than the size of the workforce during this period.
- In 2006, the values for this indicator in individual states ranged from 0.20% to 1.00% of the state's workforce; the District of Columbia was an outlier at 4.49%, reflecting the fact that there are many government offices, colleges and universities, and government contractors in the area that employ scientists and engineers.
- States in the top quartile tend to be home to major research laboratories, research universities, or research-intensive industries.

This indicator shows a state's ability to attract and retain highly trained scientists and engineers. These individuals often conduct R&D, manage R&D activities, or are otherwise engaged in knowledge-intensive activities. A high value for this indicator in a state suggests employment opportunities for individuals with highly advanced training in S&E.

S&E fields include physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. S&E doctorate data derive from NSF's Survey of Doctorate Recipients, which excludes those with doctorates from foreign institutions. The location of the employed doctorate holders primarily reflects the state in which the individuals work. Civilian workforce data are Bureau of Labor Statistics' estimates from the Local Area Unemployment Statistics, which bases location on residence. Because of this difference and the sample-based nature of the data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Table 8-27
Employed S&E doctorate holders as share of workforce, by state: 1997, 2001, and 2006

State	Employed S&E doctorate holders			Employed workforce			S&E doctorate holders in workforce (%)		
	1997	2001	2006	1997	2001	2006	1997	2001	2006
United States	516,560	572,800	618,370	130,988,267	137,115,199	144,581,912	0.39	0.42	0.43
Alabama	6,610	5,330	5,900	2,035,156	2,034,909	2,120,573	0.32	0.26	0.28
Alaska[a]	1,110	1,200	1,110	289,963	301,694	323,531	0.38	0.40	0.34
Arizona	6,280	7,070	8,410	2,196,901	2,453,453	2,854,381	0.29	0.29	0.29
Arkansas	2,320	2,560	2,840	1,177,143	1,194,024	1,292,886	0.20	0.21	0.22
California	70,490	80,870	87,370	14,780,791	16,220,033	17,029,307	0.48	0.50	0.51
Colorado	10,740	11,780	13,150	2,154,294	2,303,494	2,537,037	0.50	0.51	0.52
Connecticut	8,770	9,490	10,330	1,674,937	1,700,046	1,765,075	0.52	0.56	0.59
Delaware	3,710	3,540	3,110	378,117	404,135	424,506	0.98	0.88	0.73
District of Columbia	11,800	14,200	13,330	262,789	286,649	296,957	4.49	4.95	4.49
Florida	13,330	15,740	17,630	7,040,660	7,624,718	8,692,761	0.19	0.21	0.20
Georgia	9,880	11,990	12,940	3,751,699	4,112,868	4,522,025	0.26	0.29	0.29
Hawaii	2,550	2,580	2,850	566,766	589,216	628,277	0.45	0.44	0.45
Idaho[a]	2,030	2,230	2,840	598,004	644,816	723,621	0.34	0.35	0.39
Illinois	21,260	22,110	24,110	5,988,296	6,113,536	6,315,715	0.36	0.36	0.38
Indiana	7,570	9,580	9,870	3,014,499	3,020,985	3,108,806	0.25	0.32	0.32
Iowa	4,120	4,390	4,890	1,555,837	1,568,638	1,602,849	0.26	0.28	0.31
Kansas	3,770	3,970	4,250	1,329,797	1,347,715	1,400,169	0.28	0.29	0.30
Kentucky	4,110	4,590	4,990	1,809,785	1,852,056	1,922,163	0.23	0.25	0.26
Louisiana	5,360	5,290	5,470	1,890,102	1,922,110	1,910,348	0.28	0.28	0.29
Maine[a]	2,150	1,990	2,350	624,410	650,699	678,843	0.34	0.31	0.35
Maryland	21,020	22,730	26,220	2,646,200	2,712,268	2,892,620	0.79	0.84	0.91
Massachusetts	23,330	29,100	32,360	3,158,851	3,275,343	3,234,860	0.74	0.89	1.00
Michigan	15,050	17,380	17,900	4,748,691	4,876,338	4,730,291	0.32	0.36	0.38
Minnesota	9,810	11,410	11,850	2,605,673	2,755,808	2,822,297	0.38	0.41	0.42
Mississippi	3,000	3,170	3,310	1,200,845	1,229,884	1,218,664	0.25	0.26	0.27
Missouri	9,490	9,280	9,230	2,780,185	2,867,853	2,885,857	0.34	0.32	0.32
Montana[a]	1,690	1,440	1,990	427,504	447,827	478,162	0.40	0.32	0.42
Nebraska	3,010	2,890	2,970	904,492	925,783	945,270	0.33	0.31	0.31
Nevada	1,620	2,030	2,620	895,258	1,042,182	1,240,868	0.18	0.19	0.21
New Hampshire[a]	2,230	2,470	2,440	635,469	680,706	711,512	0.35	0.36	0.34
New Jersey	20,440	22,740	20,840	4,031,022	4,117,543	4,309,021	0.51	0.55	0.48
New Mexico	7,480	7,750	8,330	768,596	821,003	895,623	0.97	0.94	0.93
New York	40,080	43,980	45,840	8,416,544	8,743,924	9,072,733	0.48	0.50	0.51
North Carolina	13,730	16,760	18,880	3,809,601	3,929,977	4,250,619	0.36	0.43	0.44
North Dakota[a]	1,350	1,080	1,380	335,854	336,228	346,359	0.40	0.32	0.40
Ohio	18,700	20,070	20,540	5,448,161	5,566,735	5,609,056	0.34	0.36	0.37
Oklahoma	4,580	4,360	4,420	1,543,105	1,614,627	1,650,877	0.30	0.27	0.27
Oregon	6,210	7,040	8,280	1,652,997	1,711,041	1,796,165	0.38	0.41	0.46
Pennsylvania	23,940	26,140	29,090	5,775,178	5,874,153	6,009,858	0.41	0.45	0.48
Rhode Island	2,450	2,640	3,020	504,147	520,677	547,618	0.49	0.51	0.55
South Carolina	4,780	5,130	5,920	1,819,508	1,842,291	1,988,378	0.26	0.28	0.30
South Dakota[a]	1,060	1,000	1,050	383,216	400,352	417,100	0.28	0.25	0.25
Tennessee	8,520	8,980	9,980	2,640,005	2,728,523	2,835,530	0.32	0.33	0.35
Texas	28,570	32,490	35,970	9,395,279	9,991,920	10,921,673	0.30	0.33	0.33
Utah	4,800	4,820	5,540	1,034,429	1,108,547	1,272,801	0.46	0.43	0.44
Vermont[a]	1,750	1,750	1,700	315,806	330,099	348,026	0.55	0.53	0.49
Virginia	15,250	17,460	19,790	3,323,266	3,537,719	3,878,988	0.46	0.49	0.51
Washington	13,360	14,760	16,920	2,822,223	2,863,705	3,160,350	0.47	0.52	0.54
West Virginia[a]	1,980	1,890	2,020	746,442	758,904	767,134	0.27	0.25	0.26
Wisconsin	8,460	8,720	9,500	2,855,830	2,897,937	2,918,155	0.30	0.30	0.33
Wyoming[a]	860	840	730	243,944	259,508	275,617	0.35	0.32	0.26
Puerto Rico	660	1,410	1,690	1,132,658	1,133,988	1,260,703	0.06	0.12	0.13

[a]Estimates for S&E doctorate holders may vary between 10% and 25% because geography is not part of the sample design.

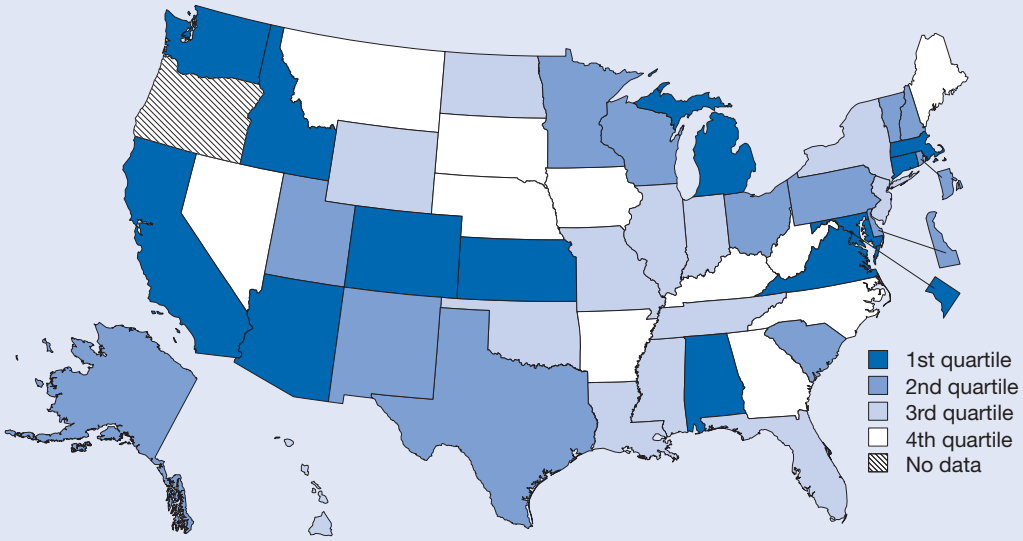
NOTES: Data on S&E doctorate holders classified by employer location, and workforce data based on respondents' residence. Data on 2006 employed S&E doctorate holders are preliminary. Workforce represents employed component of civilian labor force and reported as annual data not seasonally adjusted.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients; and Bureau of Labor Statistics, Local Area Unemployment Statistics.

Science & Engineering Indicators 2008

Engineers as Share of Workforce

Figure 8-28
Engineers as share of workforce, by state: 2006



1st quartile (3.00%–1.24%)	2nd quartile (1.21%–0.99%)	3rd quartile (0.94%–0.73%)	4th quartile (0.71%–0.53%)	No data
Alabama	Alaska	Florida	Arkansas	Oregon
Arizona	Delaware	Hawaii	Georgia	
California	Minnesota	Illinois	Iowa	
Colorado	New Hampshire	Indiana	Kentucky	
Connecticut	New Mexico	Louisiana	Maine	
District of Columbia	Ohio	Mississippi	Montana	
Idaho	Pennsylvania	Missouri	Nebraska	
Kansas	Rhode Island	New Jersey	Nevada	
Maryland	South Carolina	New York	North Carolina	
Massachusetts	Texas	North Dakota	South Dakota	
Michigan	Utah	Oklahoma	West Virginia	
Virginia	Vermont	Tennessee		
Washington	Wisconsin	Wyoming		

SOURCES: Bureau of Labor Statistics, Occupational Employment and Wage Estimates; and Local Area Unemployment Statistics. See table 8-28.

Findings

- In the United States, 1.54 million individuals were employed in engineering occupations in 2006, an increase over the 1.48 million engineers employed in 2004. During this period, the percentage of the workforce employed in engineering occupations remained unchanged at 1.06%.
- The concentration of engineers in individual states ranged from 0.53% to 2.11% in 2006.
- The District of Columbia was an outlier at 3.00%, reflecting the fact that there are many government offices, colleges and universities, and government contractors in the area that employ scientists and engineers.
- Between 2004 and 2006, the percentage of engineers in the workforce increased in 28 states and decreased in 17 states and the District of Columbia.
- States in the top quartile for this indicator tended to have a relatively high concentration of high-technology businesses.

This indicator shows the extent to which a state's workforce includes trained engineers. The indicator encompasses the standard occupational codes for engineering fields such as aerospace, agricultural, biomedical, chemical, civil, computer hardware, electrical and electronics, environmental, industrial, marine and naval architectural, materials, mechanical, mining and geological, nuclear, and petroleum. Engineers design and operate production processes and create new products and services.

The location of engineering occupations primarily reflects where the individuals work and is based on estimates from the Occupational Employment Statistics survey, a cooperative program between the Bureau of Labor Statistics (BLS) and state employment security agencies. The size of a state's civilian workforce is estimated from the BLS Current Population Survey, which assigns workers to a location based on residence. Because of this difference and the sample-based nature of the data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Table 8-28
Engineers as share of workforce, by state: 2004 and 2006

State	Engineers		Employed workforce		Engineers in workforce (%)	
	2004	2006	2004	2006	2004	2006
United States	1,480,520	1,535,620	139,213,523	144,581,912	1.06	1.06
Alabama	22,170	26,210	2,014,678	2,120,573	1.10	1.24
Alaska	3,480	3,330	312,922	323,531	1.11	1.03
Arizona	36,180	35,630	2,649,243	2,854,381	1.37	1.25
Arkansas	5,900	7,210	1,228,163	1,292,886	0.48	0.56
California	220,120	231,480	16,444,457	17,029,307	1.34	1.36
Colorado	34,370	37,040	2,384,562	2,537,037	1.44	1.46
Connecticut	26,160	24,070	1,714,758	1,765,075	1.53	1.36
Delaware	3,810	4,810	408,022	424,506	0.93	1.13
District of Columbia	10,490	8,920	285,567	296,957	3.67	3.00
Florida	59,070	67,810	8,056,259	8,692,761	0.73	0.78
Georgia	30,550	30,170	4,257,465	4,522,025	0.72	0.67
Hawaii	4,560	5,380	597,147	628,277	0.76	0.86
Idaho	8,250	9,270	670,746	723,621	1.23	1.28
Illinois	59,010	57,270	6,012,320	6,315,715	0.98	0.91
Indiana	30,380	28,380	3,017,271	3,108,806	1.01	0.91
Iowa	9,900	10,420	1,542,342	1,602,849	0.64	0.65
Kansas	19,020	17,480	1,378,713	1,400,169	1.38	1.25
Kentucky	12,870	12,950	1,859,902	1,922,163	0.69	0.67
Louisiana	15,790	15,250	1,926,594	1,910,348	0.82	0.80
Maine	4,830	4,230	661,163	678,843	0.73	0.62
Maryland	33,190	36,880	2,766,653	2,892,620	1.20	1.27
Massachusetts	50,370	51,750	3,204,653	3,234,860	1.57	1.60
Michigan	91,600	99,680	4,694,981	4,730,291	1.95	2.11
Minnesota	30,370	28,280	2,781,744	2,822,297	1.09	1.00
Mississippi	8,140	9,830	1,234,167	1,218,664	0.66	0.81
Missouri	21,070	22,870	2,821,802	2,885,857	0.75	0.79
Montana	2,580	2,840	456,624	478,162	0.57	0.59
Nebraska	5,810	5,820	940,047	945,270	0.62	0.62
Nevada	7,190	7,960	1,134,550	1,240,868	0.63	0.64
New Hampshire	7,890	8,090	693,648	711,512	1.14	1.14
New Jersey	37,850	38,130	4,177,841	4,309,021	0.91	0.88
New Mexico	12,170	10,870	850,164	895,623	1.43	1.21
New York	64,920	68,540	8,810,155	9,072,733	0.74	0.76
North Carolina	31,400	30,040	4,028,598	4,250,619	0.78	0.71
North Dakota	2,230	2,520	338,221	346,359	0.66	0.73
Ohio	62,560	57,810	5,507,404	5,609,056	1.14	1.03
Oklahoma	12,520	13,840	1,608,849	1,650,877	0.78	0.84
Oregon	18,500	NA	1,722,058	1,796,165	1.07	NA
Pennsylvania	NA	61,620	5,889,957	6,009,858	NA	1.03
Rhode Island	5,270	5,430	531,121	547,618	0.99	0.99
South Carolina	21,260	22,460	1,900,122	1,988,378	1.12	1.13
South Dakota	2,050	2,210	409,263	417,100	0.50	0.53
Tennessee	21,100	21,230	2,733,793	2,835,530	0.77	0.75
Texas	120,810	123,990	10,456,224	10,921,673	1.16	1.14
Utah	11,560	13,090	1,169,163	1,272,801	0.99	1.03
Vermont	3,440	3,780	337,709	348,026	1.02	1.09
Virginia	47,180	50,780	3,704,593	3,878,988	1.27	1.31
Washington	45,140	49,840	3,008,352	3,160,350	1.50	1.58
West Virginia	4,920	5,230	744,034	767,134	0.66	0.68
Wisconsin	29,590	30,990	2,871,034	2,918,155	1.03	1.06
Wyoming	2,290	2,570	263,705	275,617	0.87	0.93
Puerto Rico	7,290	8,280	1,226,251	1,260,703	0.59	0.66

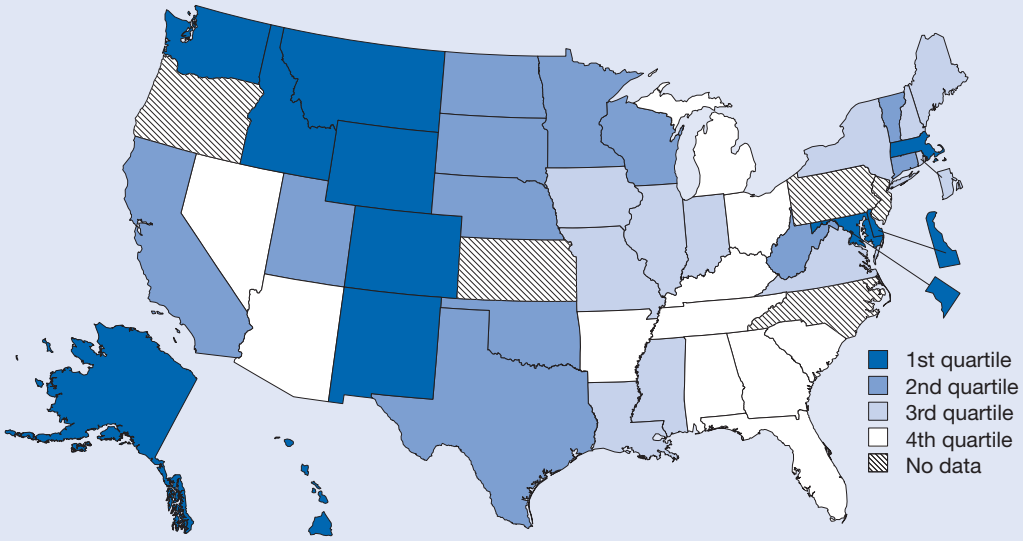
NOTE: Workforce represents employed component of civilian labor force and reported as annual data not seasonally adjusted.

SOURCES: Bureau of Labor Statistics, Occupational Employment and Wage Estimates; and Local Area Unemployment Statistics.

Science & Engineering Indicators 2008

Life and Physical Scientists as Share of Workforce

Figure 8-29
Life and physical scientists as share of workforce: 2006



1st quartile (2.15%–0.52%)	2nd quartile (0.50%–0.42%)	3rd quartile (0.40%–0.32%)	4th quartile (0.31%–0.22%)	No data
Alaska	California	Illinois	Alabama	Kansas
Colorado	Connecticut	Indiana	Arizona	New Jersey
Delaware	Minnesota	Iowa	Arkansas	North Carolina
District of Columbia	Nebraska	Louisiana	Florida	Oregon
Hawaii	North Dakota	Maine	Georgia	Pennsylvania
Idaho	Oklahoma	Mississippi	Kentucky	
Maryland	South Dakota	Missouri	Michigan	
Massachusetts	Texas	New Hampshire	Nevada	
Montana	Utah	New York	Ohio	
New Mexico	Vermont	Rhode Island	South Carolina	
Washington	West Virginia	Virginia	Tennessee	
Wyoming	Wisconsin			

SOURCES: Bureau of Labor Statistics, Occupational Employment and Wage Estimates; and Local Area Unemployment Statistics. See Table 8-29.

Findings

- Nearly 578,000 individuals, or 0.40% of the workforce, were employed as life and physical scientists in the United States in 2006, an increase over the 546,000 life and physical scientists employed in 2004, which was 0.39% of the workforce.
- In 2006, individual states had indicator values ranging from 0.22% to 0.93%, which showed major differences in the concentration of jobs in the life and physical sciences.
- The District of Columbia was an outlier at 2.15%, reflecting the fact that there are many government offices, colleges and universities, and government contractors in the area that employ scientists and engineers.
- Between 2004 and 2006, the percentage of life and physical scientists in the workforce increased in 18 states and the District of Columbia and decreased in 11 states.

This indicator shows a state's ability to attract and retain life and physical scientists. Life scientists are identified from standard occupational codes that include agricultural and food scientists, biological scientists, conservation scientists and foresters, and medical scientists. Physical scientists are identified from standard occupational codes that include astronomers, physicists, atmospheric and space scientists, chemists, materials scientists, environmental scientists, and geoscientists, and postsecondary teachers in these subject areas. A high share of life and physical scientists could indicate several scenarios ranging from a robust cluster of life sciences companies to a high percentage of acreage in forests or national parks. The latter requires foresters, wildlife specialists, and conservationists to manage the natural assets in an area with low population density.

The location of life and physical scientists reflects where the individuals work and is based on estimates from the Occupational Employment Statistics survey, a cooperative program between the Bureau of Labor Statistics (BLS) and state employment security agencies. The size of a state's civilian workforce is estimated from the BLS Current Population Survey, which assigns workers to a location based on residence. Because of this difference and the sample-based nature of the data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Table 8-29
Life and physical scientists as share of workforce, by state: 2004 and 2006

State	Life and physical scientists		Employed workforce		Life and physical scientists in workforce (%)	
	2004	2006	2004	2006	2004	2006
United States	546,160	577,890	139,213,523	144,581,912	0.39	0.40
Alabama	5,630	5,690	2,014,678	2,120,573	0.28	0.27
Alaska	3,090	3,010	312,922	323,531	0.99	0.93
Arizona	6,940	6,460	2,649,243	2,854,381	0.26	0.23
Arkansas	2,890	2,880	1,228,163	1,292,886	0.24	0.22
California	68,020	72,590	16,444,457	17,029,307	0.41	0.43
Colorado	NA	14,130	2,384,562	2,537,037	NA	0.56
Connecticut	8,460	7,750	1,714,758	1,765,075	0.49	0.44
Delaware	3,100	2,940	408,022	424,506	0.76	0.69
District of Columbia	5,860	6,370	285,567	296,957	2.05	2.15
Florida	20,490	22,100	8,056,259	8,692,761	0.25	0.25
Georgia	13,090	9,820	4,257,465	4,522,025	0.31	0.22
Hawaii	2,400	3,390	597,147	628,277	0.40	0.54
Idaho	9,930	3,860	670,746	723,621	1.48	0.53
Illinois	19,390	22,650	6,012,320	6,315,715	0.32	0.36
Indiana	NA	10,350	3,017,271	3,108,806	NA	0.33
Iowa	NA	5,390	1,542,342	1,602,849	NA	0.34
Kansas	4,640	NA	1,378,713	1,400,169	0.34	NA
Kentucky	5,300	4,990	1,859,902	1,922,163	0.28	0.26
Louisiana	6,130	6,090	1,926,594	1,910,348	0.32	0.32
Maine	2,430	2,650	661,163	678,843	0.37	0.39
Maryland	18,150	19,930	2,766,653	2,892,620	0.66	0.69
Massachusetts	20,700	23,260	3,204,653	3,234,860	0.65	0.72
Michigan	10,340	12,940	4,694,981	4,730,291	0.22	0.27
Minnesota	11,700	13,450	2,781,744	2,822,297	0.42	0.48
Mississippi	4,540	4,490	1,234,167	1,218,664	0.37	0.37
Missouri	9,920	10,190	2,821,802	2,885,857	0.35	0.35
Montana	3,050	3,450	456,624	478,162	0.67	0.72
Nebraska	4,280	4,350	940,047	945,270	0.46	0.46
Nevada	3,210	3,460	1,134,550	1,240,868	0.28	0.28
New Hampshire	1,870	2,250	693,648	711,512	0.27	0.32
New Jersey	19,710	NA	4,177,841	4,309,021	0.47	NA
New Mexico	7,550	5,380	850,164	895,623	0.89	0.60
New York	NA	31,280	8,810,155	9,072,733	NA	0.34
North Carolina	19,190	NA	4,028,598	4,250,619	0.48	NA
North Dakota	1,570	1,610	338,221	346,359	0.46	0.46
Ohio	15,020	17,320	5,507,404	5,609,056	0.27	0.31
Oklahoma	NA	7,010	1,608,849	1,650,877	NA	0.42
Oregon	7,990	NA	1,722,058	1,796,165	0.46	NA
Pennsylvania	25,460	NA	5,889,957	6,009,858	0.43	NA
Rhode Island	2,790	2,120	531,121	547,618	0.53	0.39
South Carolina	5,190	5,680	1,900,122	1,988,378	0.27	0.29
South Dakota	1,770	1,900	409,263	417,100	0.43	0.46
Tennessee	7,380	7,680	2,733,793	2,835,530	0.27	0.27
Texas	47,540	50,040	10,456,224	10,921,673	0.45	0.46
Utah	5,820	6,330	1,169,163	1,272,801	0.50	0.50
Vermont	1,250	1,480	337,709	348,026	0.37	0.43
Virginia	NA	15,370	3,704,593	3,878,988	NA	0.40
Washington	NA	20,590	3,008,352	3,160,350	NA	0.65
West Virginia	2,850	3,230	744,034	767,134	0.38	0.42
Wisconsin	11,660	13,000	2,871,034	2,918,155	0.41	0.45
Wyoming	1,840	2,070	263,705	275,617	0.70	0.75
Puerto Rico	4,840	5,470	1,226,251	1,260,703	0.39	0.43

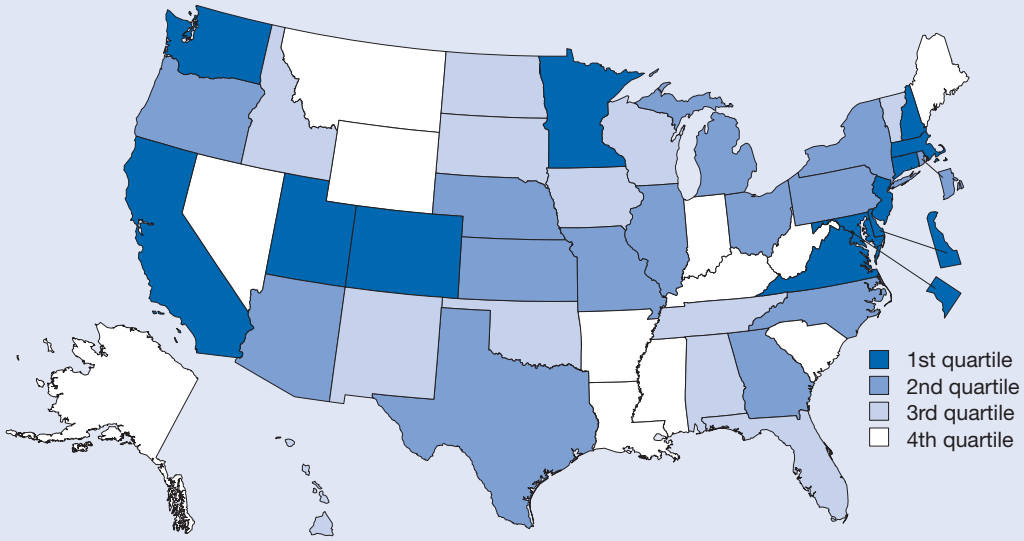
NOTE: Workforce represents employed component of civilian labor force and reported as annual data not seasonally adjusted.

SOURCES: Bureau of Labor Statistics, Occupational Employment and Wage Estimates; and Local Area Unemployment Statistics.

Science & Engineering Indicators 2008

Computer Specialists as Share of Workforce

Figure 8-30
Computer specialists as share of workforce: 2006



1st quartile (10.71%–2.23%)	2nd quartile (2.12%–1.72%)	3rd quartile (1.70%–1.23%)	4th quartile (1.22%–0.70%)
California	Arizona	Alabama	Alaska
Colorado	Georgia	Florida	Arkansas
Connecticut	Illinois	Hawaii	Indiana
Delaware	Kansas	Idaho	Kentucky
District of Columbia	Michigan	Iowa	Louisiana
Maryland	Missouri	New Mexico	Maine
Massachusetts	Nebraska	North Dakota	Mississippi
Minnesota	New York	Oklahoma	Montana
New Hampshire	North Carolina	South Dakota	Nevada
New Jersey	Ohio	Tennessee	South Carolina
Utah	Oregon	Vermont	West Virginia
Virginia	Pennsylvania	Wisconsin	Wyoming
Washington	Rhode Island		
	Texas		

SOURCES: BLS, Occupational Employment and Wage Estimates; and Local Area Unemployment Statistics. See Table 8-30.

Findings

- In the United States, 2.96 million individuals, or 2.05% of the workforce, were employed as computer specialists in 2006, an increase over the 2.80 million computer specialists employed in 2004, which was 2.02% of the workforce.
- Individual states showed considerable differences in the intensity of computer-related operations in their economies, with 0.70% to 4.38% of their workforce employed in computer-related occupations in 2006.
- There was a concentration of computer-intensive occupations in the District of Columbia and the adjacent states of Maryland and Virginia. This may be due to the fact that there are many government offices, colleges and universities, and government contractors in the area that employ scientists and engineers, especially computer scientists.
- Between 2004 and 2006, the percentage of computer specialists in the workforce increased in 31 states and the District of Columbia and decreased in 18 states.

This indicator shows the extent to which a state's workforce makes use of specialists with advanced computer training. Computer specialists are identified from 10 standard occupational codes that include computer and information scientists, programmers, software engineers, support specialists, systems analysts, database administrators, and network and computer system administrators. States with higher values may indicate a state workforce that is better able to thrive in an information economy or to embrace and utilize computer technology.

The location of computer specialists reflects where the individuals work and is based on estimates from the Occupational Employment Statistics survey, a cooperative program between the Bureau of Labor Statistics (BLS) and state employment security agencies. The size of a state's civilian workforce is estimated from the BLS Current Population Survey, which assigns workers to a location based on residence. Because of this difference and the sample-based nature of the data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Table 8-30
Computer specialists as share of workforce, by state: 2004 and 2006

State	Computer specialists		Employed workforce		Computer specialists in workforce (%)	
	2004	2006	2004	2006	2004	2006
United States	2,806,910	2,960,460	139,213,523	144,581,912	2.02	2.05
Alabama	28,320	32,720	2,014,678	2,120,573	1.41	1.54
Alaska	3,320	3,810	312,922	323,531	1.06	1.18
Arizona	45,930	49,180	2,649,243	2,854,381	1.73	1.72
Arkansas	12,470	13,360	1,228,163	1,292,886	1.02	1.03
California	370,180	380,040	16,444,457	17,029,307	2.25	2.23
Colorado	74,940	76,200	2,384,562	2,537,037	3.14	3.00
Connecticut	44,120	44,160	1,714,758	1,765,075	2.57	2.50
Delaware	8,730	11,930	408,022	424,506	2.14	2.81
District of Columbia	28,040	31,810	285,567	296,957	9.82	10.71
Florida	137,740	143,450	8,056,259	8,692,761	1.71	1.65
Georgia	94,080	89,390	4,257,465	4,522,025	2.21	1.98
Hawaii	7,440	8,140	597,147	628,277	1.25	1.30
Idaho	8,710	10,180	670,746	723,621	1.30	1.41
Illinois	114,860	129,880	6,012,320	6,315,715	1.91	2.06
Indiana	37,540	37,230	3,017,271	3,108,806	1.24	1.20
Iowa	22,650	24,940	1,542,342	1,602,849	1.47	1.56
Kansas	20,850	24,110	1,378,713	1,400,169	1.51	1.72
Kentucky	23,800	23,510	1,859,902	1,922,163	1.28	1.22
Louisiana	18,500	17,090	1,926,594	1,910,348	0.96	0.89
Maine	6,860	7,640	661,163	678,843	1.04	1.13
Maryland	92,450	91,040	2,766,653	2,892,620	3.34	3.15
Massachusetts	103,280	109,430	3,204,653	3,234,860	3.22	3.38
Michigan	74,600	89,280	4,694,981	4,730,291	1.59	1.89
Minnesota	67,600	71,930	2,781,744	2,822,297	2.43	2.55
Mississippi	8,770	8,510	1,234,167	1,218,664	0.71	0.70
Missouri	56,460	61,120	2,821,802	2,885,857	2.00	2.12
Montana	4,500	5,790	456,624	478,162	0.99	1.21
Nebraska	15,890	20,030	940,047	945,270	1.69	2.12
Nevada	11,540	12,940	1,134,550	1,240,868	1.02	1.04
New Hampshire	13,180	16,390	693,648	711,512	1.90	2.30
New Jersey	114,370	116,290	4,177,841	4,309,021	2.74	2.70
New Mexico	9,720	11,060	850,164	895,623	1.14	1.23
New York	170,140	188,620	8,810,155	9,072,733	1.93	2.08
North Carolina	77,240	80,150	4,028,598	4,250,619	1.92	1.89
North Dakota	4,250	4,650	338,221	346,359	1.26	1.34
Ohio	93,300	99,960	5,507,404	5,609,056	1.69	1.78
Oklahoma	21,600	26,200	1,608,849	1,650,877	1.34	1.59
Oregon	29,120	33,960	1,722,058	1,796,165	1.69	1.89
Pennsylvania	102,590	110,090	5,889,957	6,009,858	1.74	1.83
Rhode Island	7,150	9,490	531,121	547,618	1.35	1.73
South Carolina	20,730	23,070	1,900,122	1,988,378	1.09	1.16
South Dakota	5,090	5,160	409,263	417,100	1.24	1.24
Tennessee	36,870	36,570	2,733,793	2,835,530	1.35	1.29
Texas	209,360	224,330	10,456,224	10,921,673	2.00	2.05
Utah	25,340	30,060	1,169,163	1,272,801	2.17	2.36
Vermont	5,810	5,920	337,709	348,026	1.72	1.70
Virginia	151,810	169,830	3,704,593	3,878,988	4.10	4.38
Washington	83,480	80,140	3,008,352	3,160,350	2.77	2.54
West Virginia	7,230	7,250	744,034	767,134	0.97	0.95
Wisconsin	46,380	46,400	2,871,034	2,918,155	1.62	1.59
Wyoming	1,750	2,040	263,705	275,617	0.66	0.74
Puerto Rico	7,380	9,050	1,226,251	1,260,703	0.60	0.72

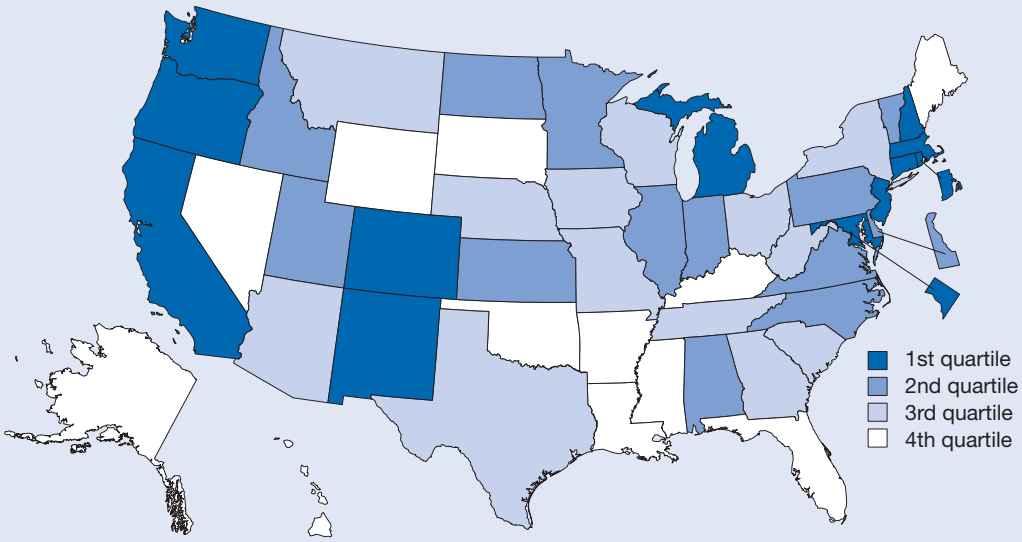
NOTES: For a small number of states, data for selected computer occupations suppressed by state or Bureau of Labor Statistics (BLS) and not reported at state level. Workforce represents employed component of civilian labor force and reported as annual data not seasonally adjusted.

SOURCES: BLS, Occupational Employment and Wage Estimates; and Local Area Unemployment Statistics.

Science & Engineering Indicators 2008

R&D as Share of Gross Domestic Product

Figure 8-31
R&D as share of gross domestic product: 2004



1st quartile (8.01%–2.71%)	2nd quartile (2.69%–1.95%)	3rd quartile (1.84%–1.05%)	4th quartile (0.96%–0.41%)
California	Alabama	Arizona	Alaska
Colorado	Delaware	Georgia	Arkansas
Connecticut	Idaho	Iowa	Florida
District of Columbia	Illinois	Missouri	Hawaii
Maryland	Indiana	Montana	Kentucky
Massachusetts	Kansas	Nebraska	Louisiana
Michigan	Minnesota	New York	Maine
New Hampshire	North Carolina	Ohio	Mississippi
New Jersey	North Dakota	South Carolina	Nevada
New Mexico	Pennsylvania	Tennessee	Oklahoma
Oregon	Utah	Texas	South Dakota
Rhode Island	Vermont	West Virginia	Wyoming
Washington	Virginia	Wisconsin	

SOURCES: National Science Foundation, Division of Science Resources Statistics, National Patterns of R&D Resources (various years); and Bureau of Economic Analysis, Gross Domestic Product data. See Table 8-31.

Findings

- The national value of R&D expenditures as a share of GDP has varied from 2.47% in 1998 to 2.44% in 2004.
- In 2004, state values for this indicator ranged from 0.41% to 8.01%, indicating large differences in the geographic concentration of R&D.
- New Mexico is an outlier on this indicator because of the presence of large federal R&D activities and a relatively small GDP.
- Between 1998 and 2004, the value of this indicator increased in 31 states and declined in 18 states and the District of Columbia.
- States with high rankings on this indicator also tended to rank high on S&E doctorate holders as a share of the workforce.

This indicator shows the extent to which R&D play a role in a state's economy. A high value indicates that the state has a high intensity of R&D activity, which may support future growth in knowledge-based industries. Industries that have a high percentage of R&D activity include pharmaceuticals, chemicals, computer equipment and services, electronic components, aerospace, and motor vehicles. R&D refers to R&D activities performed by federal agencies, industry, universities, and other nonprofit organizations. At the national level in 2004, industry performed roughly 71% of total R&D, followed by colleges and universities at 15%; government facilities, including federally funded R&D centers, at 12%; and nonprofit institutions at 2%. Data for the value of gross domestic product (GDP) and for R&D expenditures are shown in current dollars.

The methodology for assigning R&D activity at the state level was modified in 2001, and data back to 1998 were recalculated using the new methodology. State-level R&D data from years before 1998 are not comparable.

Table 8-31
R&D as share of gross domestic product, by state: 1998, 2001, and 2004

State	R&D performed ($millions)			State GDP ($millions)			R&D performed/GDP (%)		
	1998	2001	2004	1998	2001	2004	1998	2001	2004
United States	214,752	255,897	283,439	8,679,660	10,058,169	11,633,573	2.47	2.54	2.44
Alabama	1,926	2,251	2,760	106,656	118,682	141,702	1.81	1.90	1.95
Alaska	NA	297	271	23,165	26,609	34,729	NA	1.11	0.78
Arizona	2,318	3,048	3,544	137,581	165,358	194,134	1.68	1.84	1.83
Arkansas	283	451	514	61,861	68,927	81,752	0.46	0.65	0.63
California	43,919	50,959	59,607	1,085,884	1,301,050	1,515,453	4.04	3.92	3.93
Colorado	4,565	4,313	5,497	143,160	178,078	198,407	3.19	2.42	2.77
Connecticut	3,559	5,311	7,881	145,373	165,025	183,873	2.45	3.22	4.29
Delaware	2,556	1,316	1,182	36,831	44,206	52,454	6.94	2.98	2.25
District of Columbia	2,606	2,543	2,383	51,682	63,730	77,782	5.04	3.99	3.06
Florida	4,773	5,642	5,409	417,169	497,423	607,201	1.14	1.13	0.89
Georgia	2,492	3,236	3,655	255,612	299,442	337,622	0.97	1.08	1.08
Hawaii	242	358	490	37,549	41,822	50,781	0.64	0.86	0.96
Idaho	1,127	1,259	1,006	29,800	35,631	42,697	3.78	3.53	2.36
Illinois	8,830	10,472	11,300	423,855	476,461	534,364	2.08	2.20	2.11
Indiana	3,089	4,235	5,130	178,909	195,196	229,618	1.73	2.17	2.23
Iowa	1,054	1,324	1,625	83,665	91,920	111,626	1.26	1.44	1.46
Kansas	1,518	1,597	2,169	76,005	86,430	99,125	2.00	1.85	2.19
Kentucky	645	951	1,006	108,813	115,113	131,839	0.59	0.83	0.76
Louisiana	542	827	972	118,085	133,689	162,646	0.46	0.62	0.60
Maine	159	389	384	31,731	37,129	43,131	0.50	1.05	0.89
Maryland	8,019	11,379	14,341	161,954	192,659	229,158	4.95	5.91	6.26
Massachusetts	13,382	14,665	15,987	236,079	280,509	309,483	5.67	5.23	5.17
Michigan	13,655	15,533	16,722	309,431	334,419	363,380	4.41	4.64	4.60
Minnesota	3,818	5,010	5,992	164,897	190,231	222,628	2.32	2.63	2.69
Mississippi	366	650	651	60,513	65,961	76,534	0.61	0.99	0.85
Missouri	1,868	2,550	3,038	164,267	182,362	204,733	1.14	1.40	1.48
Montana	191	239	295	19,884	22,471	27,790	0.96	1.06	1.06
Nebraska	315	580	740	52,076	57,438	67,976	0.60	1.01	1.09
Nevada	571	444	623	63,635	77,291	99,342	0.90	0.57	0.63
New Hampshire	1,340	1,587	1,665	39,102	44,279	51,656	3.43	3.58	3.22
New Jersey	11,368	11,392	12,460	314,117	362,987	409,156	3.62	3.14	3.05
New Mexico	3,032	3,947	5,114	45,918	51,359	63,861	6.60	7.69	8.01
New York	13,731	14,422	13,113	686,906	808,537	908,308	2.00	1.78	1.44
North Carolina	4,560	5,825	6,491	242,904	285,651	324,622	1.88	2.04	2.00
North Dakota	119	461	558	16,936	18,527	22,715	0.71	2.49	2.46
Ohio	6,970	8,790	7,816	348,723	374,719	424,562	2.00	2.35	1.84
Oklahoma	513	872	814	79,341	94,329	111,400	0.65	0.92	0.73
Oregon	1,910	5,447	3,664	100,951	110,916	135,014	1.89	4.91	2.71
Pennsylvania	8,762	11,156	10,813	361,800	406,713	464,467	2.42	2.74	2.33
Rhode Island	1,677	1,579	1,840	29,537	35,149	42,213	5.68	4.49	4.36
South Carolina	989	1,447	1,599	102,945	117,296	132,348	0.96	1.23	1.21
South Dakota	60	141	149	20,771	23,910	29,519	0.29	0.59	0.50
Tennessee	2,503	2,651	3,180	160,872	180,582	214,400	1.56	1.47	1.48
Texas	10,774	12,722	14,266	629,209	762,247	904,412	1.71	1.67	1.58
Utah	1,495	1,495	1,602	60,168	70,109	81,059	2.48	2.13	1.98
Vermont	175	423	546	15,935	18,828	22,002	1.10	2.24	2.48
Virginia	4,934	5,544	7,345	226,569	276,762	325,467	2.18	2.00	2.26
Washington	8,466	10,372	10,936	195,794	225,765	252,384	4.32	4.59	4.33
West Virginia	421	466	523	39,500	43,365	49,903	1.07	1.07	1.05
Wisconsin	2,501	3,249	3,675	160,681	181,936	208,269	1.56	1.79	1.76
Wyoming	65	82	98	14,859	18,941	23,876	0.44	0.44	0.41
Puerto Rico	NA	NA	NA	54,086	69,208	79,209	NA	NA	NA

NA = not available
GDP = gross domestic product

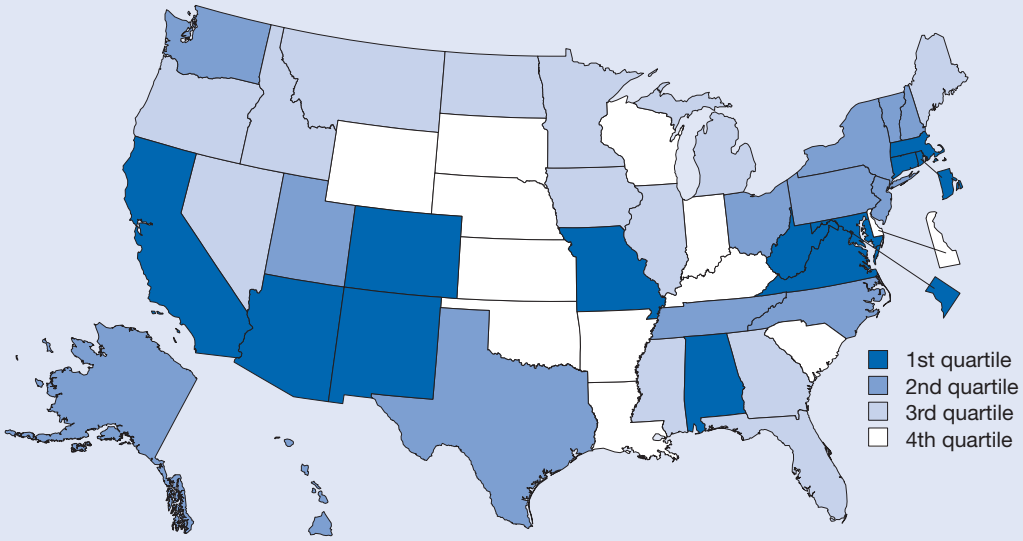
NOTES: R&D includes R&D performed by federal agencies, industry, universities, and other nonprofit organizations. R&D and GDP reported in current dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics, National Patterns of R&D Resources (various years); Bureau of Economic Analysis, Gross Domestic Product data; and Government of Puerto Rico, Office of the Governor.

Science & Engineering Indicators 2008

Federal R&D Obligations per Civilian Worker

Figure 8-32
Federal R&D obligations per civilian worker: 2005



1st quartile ($13,588–$836)	2nd quartile ($773–$427)	3rd quartile ($391–$234)	4th quartile ($226–$121)
Alabama	Alaska	Florida	Arkansas
Arizona	Hawaii	Georgia	Delaware
California	New Hampshire	Idaho	Indiana
Colorado	New Jersey	Illinois	Kansas
Connecticut	New York	Iowa	Kentucky
District of Columbia	North Carolina	Maine	Louisiana
Maryland	Ohio	Michigan	Nebraska
Massachusetts	Pennsylvania	Minnesota	Oklahoma
Missouri	Tennessee	Mississippi	South Carolina
New Mexico	Texas	Montana	South Dakota
Rhode Island	Utah	Nevada	Wisconsin
Virginia	Vermont	North Dakota	Wyoming
West Virginia	Washington	Oregon	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Federal Funds for Research and Development (various years); and Bureau of Labor Statistics, Local Area Unemployment Statistics. See Table 8-32.

Findings

- Federal R&D obligations rose from $67 billion in 1995 to nearly $107 billion in 2005, an increase of 59% in current dollars.
- The increase in federal R&D obligations (in current dollars) was greater than the increase in the civilian workforce causing the value of this indicator to rise from $532 per worker in 1995 to $753 per worker in 2005.
- Federal R&D obligations in 2005 varied greatly among the states, ranging from $121 to $4,329 per worker. Higher values were found in the states surrounding the District of Columbia and in sparsely populated states with national laboratories or federal facilities.
- The District of Columbia was an outlier with $13,588 per worker in 2005, possibly because many federal employees work there but live in neighboring states.
- Between 1995 and 2005, the value of R&D obligations per worker increased in 44 states and the District of Columbia and decreased in 6 states.

This indicator shows how federal R&D funding is disbursed geographically relative to the size of states' civilian workforces. Because the Department of Defense is the primary source for federal R&D obligations, much of this funding is used for development, but it also may provide direct and indirect benefits to a state's economy and may stimulate the conduct of basic research. A high value may indicate the existence of major federally funded R&D facilities in the state.

Federal R&D dollars are attributed to the states in which the recipients of federal obligations are located. The size of a state's civilian workforce is estimated based on the Bureau of Labor Statistics Current Population Survey, which assigns workers to a location based on residence. Because of these differences and the sample-based nature of the population data, estimates for sparsely populated states and the District of Columbia may be imprecise.

Table 8-32
Federal R&D obligations per civilian worker, by state: 1995, 2000, and 2005

State	Federal R&D obligations ($thousands)			Civilian workers			Federal R&D obligations/ civilian worker ($)		
	1995	2000	2005	1995	2000	2005	1995	2000	2005
United States	67,033,110	71,034,535	106,743,406	126,063,353	136,940,378	141,739,774	532	519	753
Alabama	2,016,252	1,614,901	2,800,183	1,955,846	2,067,147	2,056,800	1,031	781	1,361
Alaska	96,915	146,777	233,543	282,098	299,324	318,423	344	490	733
Arizona	915,087	1,121,701	2,674,487	2,095,749	2,404,916	2,727,003	437	466	981
Arkansas	97,724	116,333	154,255	1,170,593	1,207,352	1,276,851	83	96	121
California	12,703,572	14,082,960	19,379,567	14,062,361	16,024,341	16,782,260	903	879	1,155
Colorado	965,060	1,369,733	2,036,617	2,041,652	2,300,192	2,436,795	473	595	836
Connecticut	902,334	806,228	2,153,517	1,657,732	1,697,670	1,734,386	544	475	1,242
Delaware	56,381	69,867	94,151	366,200	402,777	415,687	154	173	226
District of Columbia	2,805,093	2,374,647	3,993,434	273,764	291,916	293,900	10,246	8,135	13,588
Florida	2,403,899	2,216,206	2,197,889	6,655,500	7,569,406	8,375,993	361	293	262
Georgia	4,365,770	2,632,186	1,707,465	3,522,905	4,095,362	4,384,030	1,239	643	389
Hawaii	480,428	209,737	384,401	557,042	584,858	614,290	862	359	626
Idaho	211,063	216,928	273,093	567,558	632,451	698,466	372	343	391
Illinois	1,116,137	1,404,613	1,982,619	5,857,677	6,176,837	6,112,981	191	227	324
Indiana	426,192	506,326	553,616	2,977,440	3,052,719	3,054,803	143	166	181
Iowa	214,316	267,038	447,661	1,527,972	1,557,081	1,568,561	140	171	285
Kansas	120,846	223,493	198,017	1,296,202	1,351,988	1,389,201	93	165	143
Kentucky	75,670	203,851	262,780	1,757,111	1,866,348	1,879,413	43	109	140
Louisiana	176,253	249,045	402,068	1,820,359	1,930,662	1,938,280	97	129	207
Maine	54,476	249,812	239,831	601,565	650,385	669,250	91	384	358
Maryland	7,039,183	8,684,796	12,211,434	2,572,708	2,711,382	2,820,526	2,736	3,203	4,329
Massachusetts	3,339,532	4,145,472	5,701,829	3,029,360	3,273,281	3,211,033	1,102	1,266	1,776
Michigan	688,376	975,052	1,105,199	4,576,521	4,953,421	4,726,204	150	197	234
Minnesota	571,128	781,132	758,267	2,529,464	2,720,492	2,796,622	226	287	271
Mississippi	212,739	394,585	424,101	1,175,278	1,239,859	1,226,492	181	318	346
Missouri	1,613,322	890,597	4,040,346	2,690,210	2,875,336	2,847,758	600	310	1,419
Montana	64,821	95,025	176,841	417,770	446,552	463,929	155	213	381
Nebraska	86,762	98,491	145,135	882,603	923,198	940,040	98	107	154
Nevada	372,570	263,897	382,463	805,286	1,015,221	1,178,072	463	260	325
New Hampshire	213,647	356,873	364,332	605,929	675,541	703,175	353	528	518
New Jersey	1,325,902	1,937,769	2,344,121	3,846,322	4,130,310	4,255,813	345	469	551
New Mexico	1,987,076	2,130,504	3,279,285	744,557	810,024	867,317	2,669	2,630	3,781
New York	2,581,383	2,927,523	4,955,670	8,125,798	8,751,441	8,959,845	318	335	553
North Carolina	825,433	1,062,536	1,791,495	3,582,647	3,969,235	4,112,828	230	268	436
North Dakota	47,313	64,051	105,109	331,252	335,780	341,847	143	191	307
Ohio	1,811,413	1,799,136	2,369,822	5,330,591	5,573,154	5,546,537	340	323	427
Oklahoma	159,395	185,121	253,602	1,490,602	1,609,522	1,629,217	107	115	156
Oregon	277,229	468,167	557,481	1,583,153	1,716,954	1,754,715	175	273	318
Pennsylvania	2,414,250	2,357,552	3,234,522	5,554,303	5,830,902	5,966,226	435	404	542
Rhode Island	515,425	418,037	572,251	477,409	520,758	539,709	1,080	803	1,060
South Carolina	177,962	248,988	408,407	1,754,633	1,902,029	1,939,646	101	131	211
South Dakota	26,492	38,803	69,982	373,515	397,678	411,551	71	98	170
Tennessee	581,956	734,406	1,292,888	2,574,000	2,756,498	2,758,184	226	266	469
Texas	4,062,175	2,671,790	4,988,545	8,985,635	9,896,002	10,677,171	452	270	467
Utah	371,208	285,968	813,912	979,367	1,097,915	1,211,803	379	260	672
Vermont	53,590	72,030	170,743	305,279	326,742	341,442	176	220	500
Virginia	3,603,023	4,842,811	8,214,449	3,317,434	3,502,524	3,785,583	1,086	1,383	2,170
Washington	1,127,750	1,329,466	2,387,686	2,636,011	2,898,677	3,089,953	428	459	773
West Virginia	296,347	235,677	772,528	723,904	764,649	754,060	409	308	1,024
Wisconsin	347,089	420,839	648,219	2,773,640	2,894,884	2,887,434	125	145	224
Wyoming	35,151	35,059	33,548	240,846	256,685	267,669	146	137	125
Puerto Rico	46,657	81,016	101,433	1,076,473	1,162,153	1,250,335	43	70	81

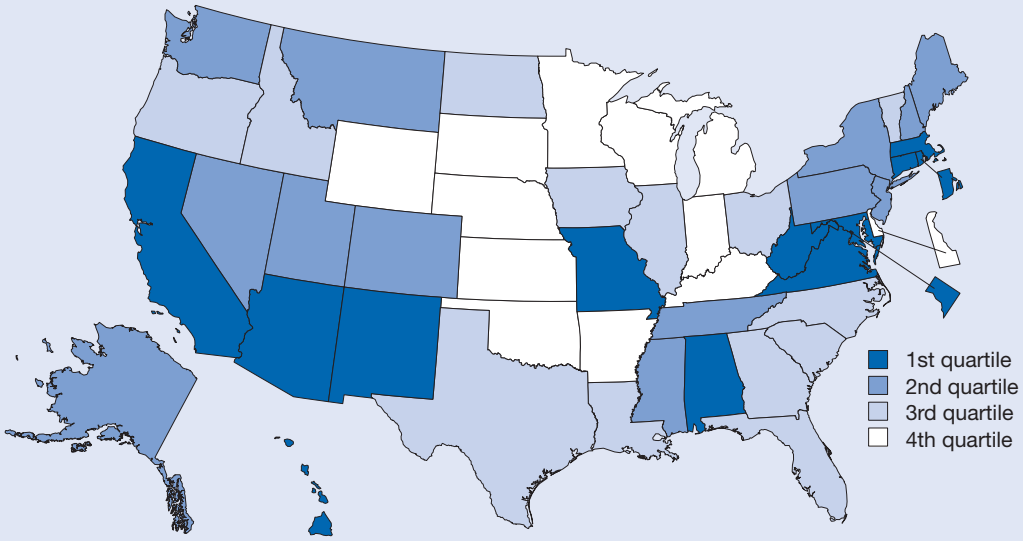
NOTES: Only 11 agencies required to report federal R&D obligations: Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Homeland Security (not established in 1995 and 2000), Interior, and Transportation; Environmental Protection Agency; National Aeronautics and Space Administration; and National Science Foundation. These obligations represent approximately 98% of total federal R&D obligations in FY 1995, 2000, and 2005. Civilian workers represent employed component of civilian labor force and reported as annual data not seasonally adjusted.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Federal Funds for Research and Development (various years); and Bureau of Labor Statistics, Local Area Unemployment Statistics.

Science & Engineering Indicators 2008

Federal R&D Obligations per Individual in S&E Occupation

Figure 8-33
Federal R&D obligations per individual in S&E occupation: 2005



1st quartile ($100,808–$22,016)	2nd quartile ($20,796–$13,451)	3rd quartile ($13,371–$8,094)	4th quartile ($7,398–$3,835)
Alabama	Alaska	Florida	Arkansas
Arizona	Colorado	Georgia	Delaware
California	Maine	Idaho	Indiana
Connecticut	Mississippi	Illinois	Kansas
District of Columbia	Montana	Iowa	Kentucky
Hawaii	Nevada	Louisiana	Michigan
Maryland	New Hampshire	North Carolina	Minnesota
Massachusetts	New Jersey	North Dakota	Nebraska
Missouri	New York	Ohio	Oklahoma
New Mexico	Pennsylvania	Oregon	South Dakota
Rhode Island	Tennessee	South Carolina	Wisconsin
Virginia	Utah	Texas	Wyoming
West Virginia	Washington	Vermont	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Federal Funds for Research and Development (various years); and Bureau of Labor Statistics, Occupational Employment and Wage Estimates. See Table 8-33.

Findings

- The federal government obligated nearly $107 billion for R&D in 2005, more than $20,000 for each person employed in an S&E occupation.
- The distribution for this indicator was highly skewed in 2005, with only 13 states and the District of Columbia above the national average. High values were reported in the District of Columbia and adjoining states and also in states where federal facilities or major defense contractors are located.
- The state distribution of federal R&D obligations per person employed in an S&E occupation ranged from $3,835 to $100,808 in 2005.
- Between 2003 and 2005, the value of this indicator increased in 25 states and the District of Columbia and decreased in 25 states. The largest increases in indicator value occurred in Missouri, West Virginia, and Maryland, and the largest decreases in Mississippi.

This indicator demonstrates how federal R&D obligations are distributed geographically based on individuals with a bachelor's or higher degree who work in S&E occupations. These positions include mathematical, computer, life, physical, and social scientists; engineers; and postsecondary teachers in any of these fields. Positions such as managers and elementary and secondary schoolteachers are excluded. A high value may indicate the existence of major federally funded R&D facilities or the presence of large defense or other federal contractors in the state.

Federal R&D dollars are counted where they are obligated but may be expended in many locations. Data on people in S&E occupations are sample based. For these reasons, estimates for sparsely populated states and the District of Columbia may be imprecise.

Table 8-33
Federal R&D obligations per individual in S&E occupation, by state: 2003 and 2005

State	Federal R&D obligations ($millions)		Individuals in S&E occupations		Federal R&D obligations/ individual in S&E occupation ($)	
	2003	2005	2003	2005	2003	2005
United States	91,247	106,743	4,961,550	5,233,510	18,391	20,396
Alabama	2,933	2,800	56,380	62,790	52,020	44,596
Alaska	246	234	10,600	11,230	23,210	20,796
Arizona	1,857	2,674	92,120	96,410	20,156	27,741
Arkansas	140	154	21,340	24,660	6,547	6,255
California	17,410	19,380	676,180	716,530	25,748	27,046
Colorado	1,612	2,037	124,140	126,110	12,985	16,150
Connecticut	2,068	2,154	81,380	83,930	25,411	25,658
Delaware	91	94	17,370	18,010	5,261	5,228
District of Columbia	2,916	3,993	54,890	63,410	53,127	62,978
Florida	2,522	2,198	221,070	241,000	11,408	9,120
Georgia	1,514	1,707	144,170	137,580	10,503	12,411
Hawaii	350	384	16,090	17,460	21,731	22,016
Idaho	216	273	22,150	23,880	9,757	11,436
Illinois	1,900	1,983	211,230	221,630	8,996	8,946
Indiana	561	554	78,410	79,910	7,158	6,928
Iowa	465	448	37,320	40,300	12,466	11,108
Kansas	190	198	51,970	51,630	3,656	3,835
Kentucky	232	263	45,230	44,530	5,131	5,901
Louisiana	442	402	41,900	41,030	10,547	9,799
Maine	145	240	15,020	15,500	9,650	15,473
Maryland	7,804	12,211	149,250	160,120	52,291	76,264
Massachusetts	5,157	5,702	184,690	193,180	27,920	29,516
Michigan	1,673	1,105	182,940	192,150	9,146	5,752
Minnesota	861	758	117,120	120,930	7,354	6,270
Mississippi	1,174	424	22,190	23,480	52,900	18,062
Missouri	1,270	4,040	84,150	92,260	15,091	43,793
Montana	130	177	11,450	11,940	11,314	14,811
Nebraska	146	145	30,710	31,530	4,765	4,603
Nevada	409	382	22,330	24,400	18,330	15,675
New Hampshire	363	364	23,430	26,840	15,498	13,574
New Jersey	1,786	2,344	161,420	174,270	11,063	13,451
New Mexico	2,850	3,279	33,600	32,530	84,823	100,808
New York	3,973	4,956	272,440	289,010	14,583	17,147
North Carolina	1,611	1,791	132,440	134,290	12,163	13,340
North Dakota	102	105	8,430	9,070	12,070	11,589
Ohio	2,396	2,370	177,100	180,900	13,529	13,100
Oklahoma	274	254	44,360	46,370	6,185	5,469
Oregon	480	557	61,230	62,030	7,843	8,987
Pennsylvania	3,788	3,235	185,560	204,270	20,413	15,835
Rhode Island	523	572	18,740	18,080	27,927	31,651
South Carolina	412	408	48,740	50,460	8,447	8,094
South Dakota	55	70	9,150	9,460	5,988	7,398
Tennessee	1,039	1,293	63,680	66,390	16,320	19,474
Texas	4,757	4,989	365,270	389,550	13,023	12,806
Utah	650	814	45,570	45,110	14,268	18,043
Vermont	182	171	11,420	12,770	15,926	13,371
Virginia	6,213	8,214	209,280	236,650	29,687	34,711
Washington	2,292	2,388	150,230	160,960	15,257	14,834
West Virginia	367	773	16,220	16,040	22,651	48,163
Wisconsin	657	648	93,320	93,590	7,042	6,926
Wyoming	41	34	6,130	7,350	6,704	4,564
Puerto Rico	112	101	19,940	20,950	5,628	4,842

NOTES: Only 11 agencies required to report federal R&D obligations: Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Homeland Security (2005 only), Interior, and Transportation; Environmental Protection Agency; National Aeronautics and Space Administration; and National Science Foundation. These obligations represent approximately 98% of total federal R&D obligations in FY 2003 and 2005.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Federal Funds for Research and Development (various years); and Bureau of Labor Statistics, Occupational Employment and Wage Estimates.

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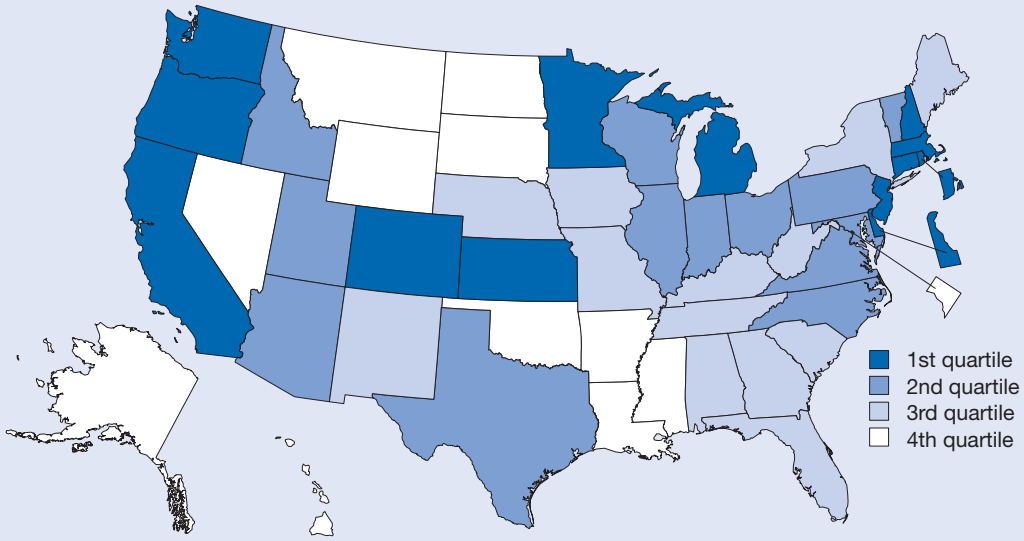
Industry-Performed R&D as Share of Private-Industry Output

Figure 8-34
Industry-performed R&D as share of private-industry output: 2005



1st quartile (5.04%–2.23%)	2nd quartile (2.17%–1.41%)	3rd quartile (1.37%–0.55%)	4th quartile (0.49%–0.10%)
California	Arizona	Alabama	Alaska
Colorado	Idaho	Florida	Arkansas
Connecticut	Illinois	Georgia	District of Columbia
Delaware	Indiana	Iowa	Hawaii
Kansas	Maryland	Kentucky	Louisiana
Massachusetts	North Carolina	Maine	Mississippi
Michigan	Ohio	Missouri	Montana
Minnesota	Pennsylvania	Nebraska	Nevada
New Hampshire	Texas	New Mexico	North Dakota
New Jersey	Utah	New York	Oklahoma
Oregon	Vermont	South Carolina	South Dakota
Rhode Island	Virginia	Tennessee	Wyoming
Washington	Wisconsin	West Virginia	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development (various years); and Bureau of Economic Analysis, Gross Domestic Product data. See Table 8-34.

Findings

- The amount of R&D performed by industry rose from $164 billion in 1998 to $222 billion in 2005, an increase of 36% (unadjusted for inflation).
- The value of this indicator for the United States has shown a downward trend over the past 7 years; starting at 2.14% in 1998, it declined to 2.03% in 2002 and has held steady through 2005.
- Industrial R&D is concentrated in a few states—only 14 states had indicator values exceeding the national average in 2005.
- States with high values for this indicator were usually located on the West Coast or the northern half of the East Coast.

This indicator measures the emphasis that private industry places on R&D. Industrial R&D focuses on projects that are expected to yield new or improved products, processes, or services and to bring direct benefits to the company. A high value for this indicator shows that the companies and industries within a state are making major investments in their R&D activities.

Differences among states on this indicator should be interpreted with caution. Because industries differ in their reliance on R&D, the indicator reflects state differences in industrial structure as much as the behavior of individual companies. Furthermore, industrial R&D data for states with small economies may be based on data imputed from previous years' survey results and imprecise estimates.

The methodology for making state-level assignments of the industrial R&D reported by companies with operations in multiple states changed in 1998. Industrial R&D data from years before 1998 are not comparable.

Table 8-34
Industry-performed R&D as share of private-industry output, by state: 1998, 2002, and 2005

State	Industry-performed R&D ($millions)			Private-industry output ($millions)			Industry-performed R&D/ private-industry output (%)		
	1998	2002	2005	1998	2002	2005	1998	2002	2005
United States	163,658	185,505	222,427	7,652,500	9,131,170	10,892,216	2.14	2.03	2.04
Alabama	845	846	1,417	89,994	104,211	128,397	0.94	0.81	1.10
Alaska	37	51	32	18,175	23,302	32,416	0.20	0.22	0.10
Arizona	1,801	3,201	2,980	120,484	150,429	185,757	1.49	2.13	1.60
Arkansas	213	225	271	54,258	62,883	75,322	0.39	0.36	0.36
California	32,856	42,177	50,683	965,937	1,184,559	1,435,610	3.40	3.56	3.53
Colorado	3,180	2,823	4,299	126,013	160,289	188,879	2.52	1.76	2.28
Connecticut	3,346	6,077	7,885	132,955	150,755	176,328	2.52	4.03	4.47
Delaware	1,356	1,219	1,511	33,652	41,196	52,017	4.03	2.96	2.90
District of Columbia	598	194	166	32,710	43,937	54,453	1.83	0.44	0.30
Florida	3,265	3,707	4,164	365,813	459,933	590,516	0.89	0.81	0.71
Georgia	1,617	2,107	2,282	224,870	267,441	311,917	0.72	0.79	0.73
Hawaii	55	103	168	29,201	33,619	42,515	0.19	0.31	0.40
Idaho	1,103	992	642	25,510	31,197	39,542	4.32	3.18	1.62
Illinois	7,318	7,616	9,712	384,342	438,363	500,730	1.90	1.74	1.94
Indiana	2,922	3,572	4,610	161,797	184,923	212,463	1.81	1.93	2.17
Iowa	750	753	1,039	73,908	85,652	104,033	1.01	0.88	1.00
Kansas	1,384	1,427	1,993	65,697	77,183	89,350	2.11	1.85	2.23
Kentucky	606	656	660	94,081	103,514	118,016	0.64	0.63	0.56
Louisiana	377	248	300	103,343	116,505	159,901	0.36	0.21	0.19
Maine	137	250	350	27,363	33,121	38,543	0.50	0.75	0.91
Maryland	1,905	3,800	3,706	133,482	168,770	203,772	1.43	2.25	1.82
Massachusetts	10,367	10,609	13,342	214,890	258,688	291,776	4.82	4.10	4.57
Michigan	12,554	13,565	16,752	278,874	313,384	332,057	4.50	4.33	5.04
Minnesota	3,367	4,460	6,340	148,057	177,427	207,306	2.27	2.51	3.06
Mississippi	183	224	194	50,894	56,215	65,879	0.36	0.40	0.29
Missouri	1,505	1,592	2,602	146,453	166,436	190,015	1.03	0.96	1.37
Montana	63	66	77	16,607	19,565	25,066	0.38	0.34	0.31
Nebraska	195	342	407	44,485	50,901	62,166	0.44	0.67	0.65
Nevada	476	339	382	56,995	72,826	99,213	0.84	0.47	0.39
New Hampshire	1,138	1,153	1,435	35,812	41,991	49,161	3.18	2.75	2.92
New Jersey	11,107	11,566	13,214	282,938	335,111	383,478	3.93	3.45	3.45
New Mexico	1,450	331	405	37,455	41,702	56,803	3.87	0.79	0.71
New York	10,283	9,234	9,474	614,396	736,066	861,618	1.67	1.25	1.10
North Carolina	3,483	3,704	5,158	212,790	259,825	305,739	1.64	1.43	1.69
North Dakota	46	154	104	14,277	16,671	21,012	0.32	0.92	0.49
Ohio	5,742	6,230	5,900	312,647	346,524	393,696	1.84	1.80	1.50
Oklahoma	369	412	422	65,997	80,492	102,166	0.56	0.51	0.41
Oregon	1,345	2,320	3,252	88,532	100,222	122,121	1.52	2.31	2.66
Pennsylvania	7,393	7,064	8,846	324,847	381,405	437,693	2.28	1.85	2.02
Rhode Island	1,332	1,121	1,387	25,892	32,294	38,160	5.14	3.47	3.63
South Carolina	996	1,054	1,402	87,771	102,565	117,441	1.13	1.03	1.19
South Dakota	40	53	68	17,932	23,084	26,493	0.22	0.23	0.26
Tennessee	2,440	1,289	1,246	142,438	169,564	200,821	1.71	0.76	0.62
Texas	8,984	10,744	12,438	558,165	691,968	882,277	1.61	1.55	1.41
Utah	1,119	1,116	1,234	51,610	61,934	75,777	2.17	1.80	1.63
Vermont	114	286	360	13,976	16,974	19,963	0.82	1.68	1.80
Virginia	2,540	2,920	4,379	186,444	235,685	290,120	1.36	1.24	1.51
Washington	7,072	8,579	9,736	168,427	198,461	233,449	4.20	4.32	4.17
West Virginia	335	264	242	33,440	37,308	43,913	1.00	0.71	0.55
Wisconsin	1,929	2,649	2,729	143,368	167,489	192,732	1.35	1.58	1.42
Wyoming	20	21	30	12,506	16,611	23,628	0.16	0.13	0.13
Puerto Rico	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = not available

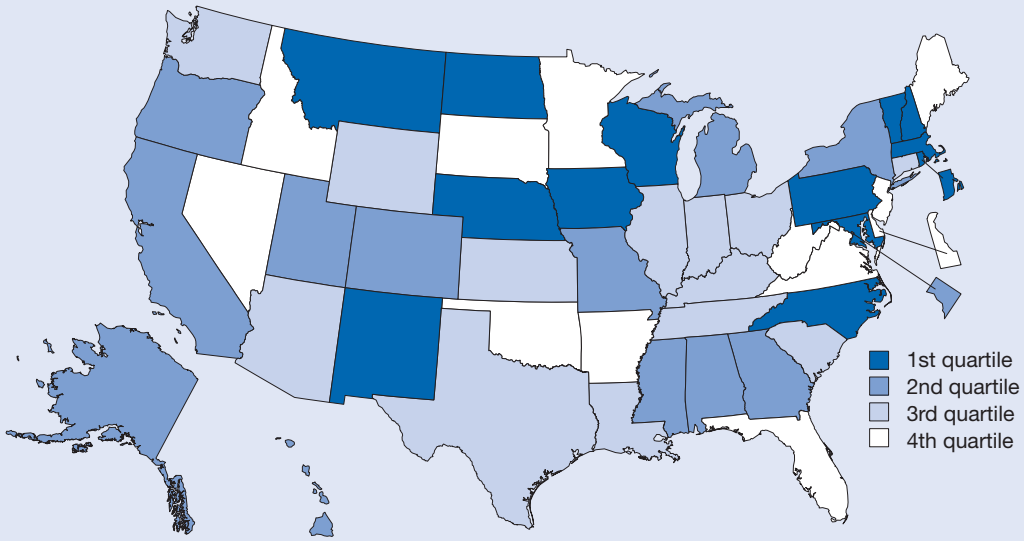
NOTES: In 1998, >50% of industrial R&D value imputed because of raking of state data for Alaska, Arkansas, Hawaii, Louisiana, Mississippi, Nebraska, North Dakota, South Dakota, and Wyoming. In 1998, >50% of industrial R&D value imputed for Delaware, District of Columbia, Idaho, Kansas, New Mexico, Rhode Island, and Washington. In 2002, >50% of industrial R&D value imputed because of raking of state data for Alaska, Arkansas, Louisiana, and Wisconsin. In 2002, >50% of industrial R&D value imputed for Kansas, Maine, Oregon, and Vermont. In 2005, >50% of industrial R&D value imputed because of raking of state data for Alaska. In 2005, >50% of industrial R&D value imputed for Indiana, Kansas, Montana, and Rhode Island. Private-industry output reported in current dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Industrial Research and Development (various years); and Bureau of Economic Analysis, Gross Domestic Product data.

Science & Engineering Indicators 2008

Academic R&D per $1,000 of Gross Domestic Product

Figure 8-35
Academic R&D per $1,000 of gross domestic product: 2005



1st quartile ($6.87–$4.58)	2nd quartile ($4.53–$3.56)	3rd quartile ($3.47–$3.06)	4th quartile ($2.73–$1.62)
Iowa	Alabama	Arizona	Arkansas
Maryland	Alaska	Connecticut	Delaware
Massachusetts	California	Illinois	Florida
Montana	Colorado	Indiana	Idaho
Nebraska	District of Columbia	Kansas	Maine
New Hampshire	Georgia	Kentucky	Minnesota
New Mexico	Hawaii	Louisiana	Nevada
North Carolina	Michigan	Ohio	New Jersey
North Dakota	Mississippi	South Carolina	Oklahoma
Pennsylvania	Missouri	Tennessee	South Dakota
Rhode Island	New York	Texas	Virginia
Vermont	Oregon	Washington	West Virginia
Wisconsin	Utah	Wyoming	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Academic Research and Development Expenditures (various years); and Bureau of Economic Analysis, Gross Domestic Product data. See table 8-35.

Findings

- Expenditures for research performed in academic institutions have doubled in a decade, rising from $21.6 billion in 1995 to $44.9 billion in 2005 (unadjusted for inflation).
- In the United States, academic research increased more rapidly than GDP, causing the value of this indicator to increase by 21% between 1995 and 2005. During this period, 45 states reported increases in the value of this indicator and 5 states and the District of Columbia showed decreases.
- The largest percentage increases in academic R&D as a share of GDP occurred in Hawaii and Mississippi, where the value of this indicator approximately doubled between 1995 and 2005.
- States ranking high on the intensity of academic research usually did not rank high on the intensity of industrial research.

This indicator measures the extent of spending on academic research performed in a state relative to the size of the state's economy. Academic R&D is more basic and less product oriented than R&D performed by industry. It can be a valuable basis for future economic development. High values for this indicator may reflect an academic R&D system that can compete for funding from federal, state, and industrial sources.

In this indicator, Maryland data exclude expenditures by the Applied Physics Laboratory (APL) at the Johns Hopkins University. APL employs more than 3,000 people and supports the Department of Defense, the National Aeronautics and Space Administration, and other government agencies rather than focusing on academic research. Data for the value of gross domestic product (GDP) by state and for R&D expenditures are shown in current dollars.

Table 8-35
Academic R&D per $1,000 of gross domestic product, by state: 1995, 2000, and 2005

State	Academic R&D ($thousands)			State GDP ($millions)			Academic R&D/ $1,000 GDP		
	1995	2000	2005	1995	2000	2005	1995	2000	2005
United States	21,649,053	29,551,103	44,945,923	7,232,723	9,749,104	12,372,847	2.99	3.03	3.63
Alabama	336,644	428,122	589,860	94,021	114,576	151,342	3.58	3.74	3.90
Alaska	72,453	108,099	153,721	24,805	27,034	39,394	2.92	4.00	3.90
Arizona	380,216	465,777	720,184	104,036	158,533	212,312	3.65	2.94	3.39
Arkansas	94,257	131,868	209,518	53,303	66,801	87,004	1.77	1.97	2.41
California	2,666,631	4,065,130	6,272,890	908,963	1,287,145	1,616,351	2.93	3.16	3.88
Colorado	399,315	544,584	825,984	108,043	171,862	214,337	3.70	3.17	3.85
Connecticut	380,511	468,435	669,199	120,800	160,436	193,496	3.15	2.92	3.46
Delaware	54,197	78,126	115,751	27,507	41,472	56,731	1.97	1.88	2.04
District of Columbia	187,695	245,828	302,921	47,123	58,699	82,628	3.98	4.19	3.67
Florida	608,896	851,932	1,448,634	340,501	471,316	666,639	1.79	1.81	2.17
Georgia	684,492	926,749	1,274,410	199,138	290,887	358,365	3.44	3.19	3.56
Hawaii	78,429	161,300	240,247	36,572	40,202	54,773	2.14	4.01	4.39
Idaho	61,906	73,726	119,871	27,099	34,989	45,891	2.28	2.11	2.61
Illinois	831,644	1,170,743	1,770,938	359,723	464,194	555,599	2.31	2.52	3.19
Indiana	377,034	509,141	759,419	147,984	194,419	236,357	2.55	2.62	3.21
Iowa	323,535	418,263	548,237	71,905	90,186	117,635	4.50	4.64	4.66
Kansas	181,777	258,336	348,751	63,699	82,812	105,228	2.85	3.12	3.31
Kentucky	155,345	276,986	452,265	90,459	111,900	138,616	1.72	2.48	3.26
Louisiana	329,534	409,143	579,734	109,153	131,520	180,336	3.02	3.11	3.21
Maine	33,512	57,753	81,624	27,648	35,542	44,906	1.21	1.62	1.82
Maryland	762,306	1,070,630	1,678,649	137,391	180,367	244,447	5.55	5.94	6.87
Massachusetts	1,164,614	1,486,174	2,079,463	195,277	274,949	320,050	5.96	5.41	6.50
Michigan	779,483	1,007,582	1,455,849	251,017	337,235	372,148	3.11	2.99	3.91
Minnesota	342,003	418,029	559,585	131,357	185,093	231,437	2.60	2.26	2.42
Mississippi	118,436	217,064	353,445	53,816	64,266	79,786	2.20	3.38	4.43
Missouri	403,589	614,028	893,013	137,528	176,708	215,073	2.93	3.47	4.15
Montana	69,975	99,069	170,791	17,393	21,366	29,915	4.02	4.64	5.71
Nebraska	158,717	208,480	360,148	44,505	55,478	72,242	3.57	3.76	4.99
Nevada	86,902	106,154	178,492	48,974	73,719	110,158	1.77	1.44	1.62
New Hampshire	93,073	150,982	287,472	32,149	43,518	54,119	2.90	3.47	5.31
New Jersey	441,835	567,666	867,121	266,724	344,824	427,654	1.66	1.65	2.03
New Mexico	232,428	243,822	345,844	41,459	50,725	69,692	5.61	4.81	4.96
New York	1,780,233	2,291,749	3,604,414	594,444	777,157	961,385	2.99	2.95	3.75
North Carolina	720,413	1,039,812	1,652,049	191,579	273,698	350,700	3.76	3.80	4.71
North Dakota	59,617	67,406	149,994	14,515	17,752	24,935	4.11	3.80	6.02
Ohio	646,498	918,241	1,530,915	293,260	372,006	442,243	2.20	2.47	3.46
Oklahoma	189,722	252,419	291,697	69,580	89,757	121,558	2.73	2.81	2.40
Oregon	260,059	346,149	536,228	80,099	112,438	141,831	3.25	3.08	3.78
Pennsylvania	1,150,888	1,552,417	2,353,640	314,504	389,619	486,139	3.66	3.98	4.84
Rhode Island	99,408	129,697	199,709	25,666	33,609	43,623	3.87	3.86	4.58
South Carolina	227,727	294,274	486,399	86,053	112,514	140,088	2.65	2.62	3.47
South Dakota	21,747	27,589	67,012	17,807	23,099	30,541	1.22	1.19	2.19
Tennessee	310,766	405,291	726,078	135,655	174,851	224,995	2.29	2.32	3.23
Texas	1,510,543	2,037,681	3,073,724	507,441	727,233	989,333	2.98	2.80	3.11
Utah	202,212	308,059	400,276	46,303	67,568	88,364	4.37	4.56	4.53
Vermont	54,839	64,762	117,442	13,892	17,782	23,056	3.95	3.64	5.09
Virginia	452,717	553,924	914,166	185,490	260,743	350,692	2.44	2.12	2.61
Washington	494,333	643,757	901,102	151,338	221,961	271,381	3.27	2.90	3.32
West Virginia	53,510	73,420	145,150	36,362	41,476	53,091	1.47	1.77	2.73
Wisconsin	481,967	661,641	998,449	134,096	175,737	216,985	3.59	3.76	4.60
Wyoming	40,470	43,094	83,449	14,567	17,331	27,246	2.78	2.49	3.06
Puerto Rico	69,636	74,529	100,235	42,647	61,702	82,650	1.63	1.21	1.21

GDP = gross domestic product

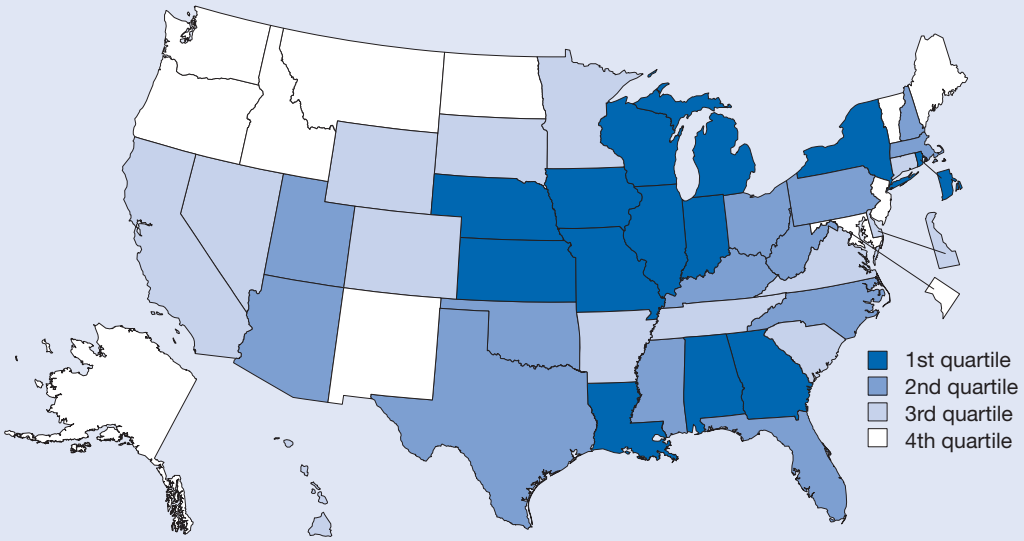
NOTES: In 2000 and 2005, academic R&D reported for all institutions; in 1995, reported for doctorate-granting institutions only. For Maryland, academic R&D excludes R&D performed by Applied Physics Laboratory at Johns Hopkins University. GDP reported in current dollars.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Academic Research and Development Expenditures (various years); Bureau of Economic Analysis, Gross Domestic Product data; and Government of Puerto Rico, Office of the Governor.

Science & Engineering Indicators 2008

S&E Doctorates Conferred per 1,000 S&E Doctorate Holders

Figure 8-36
S&E Doctorates Conferred per 1,000 S&E Doctorate Holders: 2005 and 2006



1st quartile (61.8–47.3)	2nd quartile (47.1–39.8)	3rd quartile (38.1–30.5)	4th quartile (29.0–8.2)
Alabama	Arizona	Arkansas	Alaska
Georgia	Florida	California	District of Columbia
Illinois	Kentucky	Colorado	Idaho
Indiana	Massachusetts	Connecticut	Maine
Iowa	Mississippi	Delaware	Maryland
Kansas	New Hampshire	Hawaii	Montana
Louisiana	North Carolina	Minnesota	New Jersey
Michigan	Ohio	Nevada	New Mexico
Missouri	Oklahoma	South Carolina	North Dakota
Nebraska	Pennsylvania	South Dakota	Oregon
New York	Texas	Tennessee	Vermont
Rhode Island	Utah	Virginia	Washington
Wisconsin	West Virginia	Wyoming	

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Earned Doctorates and Survey of Doctorate Recipients. See table 8-36.

Findings

- In 2005, nearly 28,000 S&E doctorates were awarded by U.S. academic institutions, approximately 10% more than in 2001 and 3% more than in 1997.
- Nationwide, the value of this indicator declined between 1997 and 2003, reflecting an increase in the stock of S&E doctorate holders living in the United States.
- This indicator is volatile for many states and may reflect the migration patterns of existing S&E doctorate holders.

This indicator provides a measure of the rate at which the states are training new S&E doctorate recipients for entry into the workforce. High values indicate relatively large production of new doctorate holders compared with the existing stock. Some states with relatively low values may need to attract S&E doctorate holders from elsewhere to meet the needs of local employers.

This indicator does not account for the mobility of recent S&E doctorate recipients, which is very high. Foreign-born graduate students may decide to return home after graduation to begin their careers. Most recent doctorate recipients are influenced by the location of employment opportunities.

U.S. S&E doctorate holders include those in the physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. Medical doctorates are excluded. The population of doctorate holders for this indicator consisted of all individuals under age 76 years who received a research doctorate in science or engineering from a U.S. institution and were residing in the United States.

Table 8-36
S&E doctorates conferred per 1,000 S&E doctorate holders, by state: 1997, 2001, 2005, and 2006

State	S&E doctorates conferred			S&E doctorate holders			S&E doctorates/1,000 doctorate holders		
	1997	2001	2005	1997	2001	2006	1997	2001	2005/2006
United States	27,145	25,404	27,930	579,610	654,180	708,080	46.8	38.8	39.4
Alabama	332	300	338	7,450	6,380	7,090	44.6	47.0	47.7
Alaska[a]	20	26	25	1,320	1,430	1,330	15.2	18.2	18.8
Arizona	480	403	473	7,450	8,720	10,050	64.4	46.2	47.1
Arkansas	67	62	116	2,630	3,040	3,250	25.5	20.4	35.7
California	3,493	3,345	3,600	78,910	91,690	99,110	44.3	36.5	36.3
Colorado	566	491	522	12,280	14,220	16,080	46.1	34.5	32.5
Connecticut	398	371	428	9,930	11,030	11,830	40.1	33.6	36.2
Delaware	131	128	128	4,400	4,370	3,880	29.8	29.3	33.0
District of Columbia	319	291	307	12,220	14,560	13,750	26.1	20.0	22.3
Florida	825	782	977	16,320	19,410	22,020	50.6	40.3	44.4
Georgia	544	612	742	11,030	13,640	14,890	49.3	44.9	49.8
Hawaii	130	107	99	2,810	2,860	3,230	46.3	37.4	30.7
Idaho	57	51	56	2,400	2,660	3,190	23.8	19.2	17.6
Illinois	1,370	1,325	1,332	23,630	24,610	26,800	58.0	53.8	49.7
Indiana	691	668	686	8,320	10,870	11,380	83.1	61.5	60.3
Iowa	404	376	355	4,720	5,060	5,740	85.6	74.3	61.8
Kansas	285	264	246	4,340	4,720	4,830	65.7	55.9	50.9
Kentucky	214	172	242	4,540	5,400	5,760	47.1	31.9	42.0
Louisiana	317	333	338	6,110	6,140	6,290	51.9	54.2	53.7
Maine[a]	41	30	24	2,740	2,400	2,930	15.0	12.5	8.2
Maryland	682	663	744	23,760	25,590	29,870	28.7	25.9	24.9
Massachusetts	1,500	1,454	1,632	25,310	31,860	35,440	59.3	45.6	46.0
Michigan	973	909	1,075	16,750	19,210	19,790	58.1	47.3	54.3
Minnesota	472	457	504	10,980	12,640	13,220	43.0	36.2	38.1
Mississippi	153	131	168	3,300	3,580	3,910	46.4	36.6	43.0
Missouri	482	438	489	10,330	10,290	10,340	46.7	42.6	47.3
Montana	59	42	59	2,120	1,820	2,480	27.8	23.1	23.8
Nebraska	179	164	166	3,210	3,150	3,320	55.8	52.1	50.0
Nevada	48	52	90	1,930	2,320	2,940	24.9	22.4	30.6
New Hampshire	94	76	117	2,590	3,000	2,760	36.3	25.3	42.4
New Jersey	623	620	628	22,420	25,350	23,610	27.8	24.5	26.6
New Mexico	162	147	176	8,570	9,140	9,960	18.9	16.1	17.7
New York	2,360	2,140	2,419	43,880	49,100	50,760	53.8	43.6	47.7
North Carolina	729	726	863	15,480	19,120	21,670	47.1	38.0	39.8
North Dakota[a]	51	43	45	1,580	1,270	1,550	32.3	33.9	29.0
Ohio	1,229	1,061	1,041	20,990	23,370	23,630	58.6	45.4	44.1
Oklahoma	241	237	232	5,310	5,160	5,290	45.4	45.9	43.9
Oregon	295	262	260	7,600	8,720	10,900	38.8	30.0	23.9
Pennsylvania	1,376	1,235	1,397	26,710	29,280	32,780	51.5	42.2	42.6
Rhode Island	160	161	175	2,700	2,880	3,290	59.3	55.9	53.2
South Carolina	222	216	227	5,560	6,010	6,920	39.9	35.9	32.8
South Dakota[a]	37	34	38	1,170	1,250	1,220	31.6	27.2	31.1
Tennessee	394	377	377	9,570	10,350	11,380	41.2	36.4	33.1
Texas	1,653	1,613	1,781	31,600	37,510	41,420	52.3	43.0	43.0
Utah	279	236	290	5,350	5,920	6,730	52.1	39.9	43.1
Vermont[a]	34	52	37	1,960	2,040	2,070	17.3	25.5	17.9
Virginia	669	628	695	17,340	20,360	22,800	38.6	30.8	30.5
Washington	482	458	495	15,390	17,150	19,900	31.3	26.7	24.9
West Virginia[a]	77	67	108	2,330	2,360	2,510	33.0	28.4	43.0
Wisconsin	681	530	532	9,310	10,130	11,200	73.1	52.3	47.5
Wyoming[a]	65	38	36	960	1,040	990	67.7	36.5	36.4
Puerto Rico	84	92	44	770	1,530	1,860	109.1	60.1	23.7

[a]Estimates for S&E doctorate holders may vary between 10% and 25% because geography is not part of the sample design.

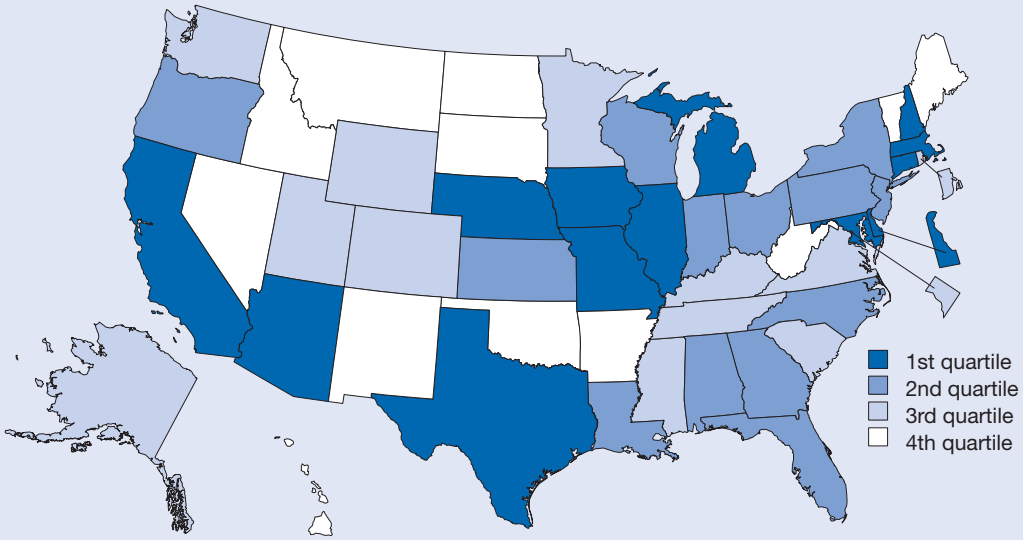
NOTES: Data on U.S. S&E doctorate holders classified by employer location. Data on 2006 S&E doctorate holders are preliminary.

SOURCES: National Science Foundation, Division of Science Resources Statistics, Survey of Earned Doctorates and Survey of Doctorate Recipients.

Science & Engineering Indicators 2008

Academic Article Output per 1,000 S&E Doctorate Holders in Academia

Figure 8-37
Academic article output per 1,000 S&E doctorate holders in academia: 2005 and 2006



1st quartile (717–603)	2nd quartile (595–524)	3rd quartile (505–410)	4th quartile (399–233)
Arizona	Alabama	Alaska	Arkansas
California	Florida	Colorado	Hawaii
Connecticut	Georgia	District of Columbia	Idaho
Delaware	Indiana	Kentucky	Maine
Illinois	Kansas	Minnesota	Montana
Iowa	Louisiana	Mississippi	Nevada
Maryland	New Jersey	Rhode Island	New Mexico
Massachusetts	New York	South Carolina	North Dakota
Michigan	North Carolina	Tennessee	Oklahoma
Missouri	Ohio	Utah	South Dakota
Nebraska	Oregon	Virginia	Vermont
New Hampshire	Pennsylvania	Washington	West Virginia
Texas	Wisconsin	Wyoming	

SOURCES: Thomson Scientific ISI database; ipIQ, Inc.; and National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients. See table 8-37.

Findings

- Between 1997 and 2005, the number of scientific and technical articles increased by 16% and the number of S&E doctorate holders increased by nearly the same percentage, causing the value of this indicator to remain almost unchanged for the United States.
- The publication rate for academic S&E doctorate holders in states in the top quartile of this indicator was approximately twice as high as for states in the bottom quartile.
- States with the greatest volatility on this indicator frequently had larger changes in academic employment than in number of publications; this may indicate that academic article output is lower at the beginning and end of academic careers.
- In 2003, the states with the highest values for this indicator were distributed across the nation.

The volume of peer-reviewed articles per 1,000 academic S&E doctorate holders is an approximate measure of their contribution to scientific knowledge. Publications are only one measure of academic productivity, which includes trained personnel, patents, and other outputs. A high value on this indicator shows that the S&E faculty in a state's academic institutions are generating a high volume of publications relative to other states. Academic institutions include both 2-year and 4-year schools.

Publication counts are based on the number of articles appearing in a set of journals listed in Thomson ISI's Science Citation Index and Social Sciences Citation Index. The number of journals in this set was 5,029 in 1997, 5,255 in 2001, and 5,161 in 2005. Articles with authors in different institutions were counted fractionally. For a publication with N authors, each author's institution was credited with $1/N$ articles.

S&E doctorates include physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. Medical doctorates and S&E doctorates from foreign institutions are excluded.

Table 8-37
Academic article output per 1,000 S&E doctorate holders in academia, by state: 1997, 2001, 2005, and 2006

State	Academic article output			S&E doctorate holders in academia			Academic articles/ 1,000 academic doctorate holders		
	1997	2001	2005	1997	2001	2006	1997	2001	2005/2006
United States	144,319	147,450	167,720	245,670	261,780	295,390	587	563	568
Alabama	1,910	1,899	1,996	4,640	3,050	3,510	412	623	569
Alaska[a]	163	186	245	450	530	580	362	351	422
Arizona	2,257	2,199	2,459	3,050	3,340	4,080	740	658	603
Arkansas[a]	603	608	743	1,520	1,640	1,960	397	371	379
California	17,512	18,115	20,807	26,050	26,790	30,800	672	676	676
Colorado	2,524	2,630	2,853	4,550	5,120	5,840	555	514	489
Connecticut	2,808	2,755	3,145	4,000	4,420	4,770	702	623	659
Delaware[a]	499	560	638	750	840	950	665	667	672
District of Columbia	1,224	1,211	1,267	2,210	2,840	2,600	554	426	487
Florida	4,186	4,256	5,424	6,850	8,250	9,590	611	516	566
Georgia	3,255	3,576	4,190	5,780	6,450	7,750	563	554	541
Hawaii[a]	574	539	618	1,380	1,570	1,680	416	343	368
Idaho[a]	295	309	347	780	980	1,490	378	315	233
Illinois	6,893	7,007	7,776	10,620	11,090	12,040	649	632	646
Indiana	3,103	3,095	3,557	4,680	5,710	6,220	663	542	572
Iowa	2,273	2,226	2,401	3,100	3,220	3,510	733	691	684
Kansas[a]	1,199	1,251	1,362	2,260	2,270	2,600	531	551	524
Kentucky	1,380	1,356	1,642	3,040	3,240	3,640	454	419	451
Louisiana	1,895	1,828	2,064	3,580	3,470	3,470	529	527	595
Maine[a]	247	234	303	1,340	1,200	1,240	184	195	244
Maryland	4,391	4,935	5,506	6,400	6,100	7,680	686	809	717
Massachusetts	9,143	9,597	10,695	11,810	13,390	15,380	774	717	695
Michigan	4,880	5,078	5,841	7,850	8,820	9,580	622	576	610
Minnesota	2,435	2,388	2,680	4,490	5,540	5,810	542	431	461
Mississippi	629	692	843	1,940	2,000	2,020	324	346	417
Missouri	3,160	3,229	3,469	5,770	5,710	5,660	548	565	613
Montana[a]	272	328	380	1,020	810	1,230	267	405	309
Nebraska[a]	1,030	1,011	1,167	2,360	1,960	1,930	436	516	605
Nevada[a]	370	447	532	980	1,260	1,630	378	355	326
New Hampshire[a]	605	614	776	1,130	1,240	1,240	535	495	626
New Jersey	3,102	3,054	3,422	5,290	5,860	6,530	586	521	524
New Mexico	808	780	840	2,450	2,910	2,990	330	268	281
New York	12,381	12,406	13,624	20,900	21,770	23,290	592	570	585
North Carolina	4,958	5,141	6,087	7,740	9,050	10,300	641	568	591
North Dakota[a]	269	271	362	900	660	970	299	411	373
Ohio	5,170	5,078	5,597	9,750	9,920	10,690	530	512	524
Oklahoma	919	925	1,034	2,680	2,800	2,890	343	330	358
Oregon	1,613	1,556	1,920	2,690	3,250	3,640	600	479	527
Pennsylvania	8,194	8,362	9,588	12,150	13,590	16,250	674	615	590
Rhode Island[a]	852	862	942	1,730	1,730	2,060	492	498	457
South Carolina	1,210	1,351	1,528	3,230	3,030	3,730	375	446	410
South Dakota[a]	140	131	165	700	640	690	200	205	239
Tennessee	2,255	2,285	2,767	4,720	4,800	5,740	478	476	482
Texas	8,755	9,040	10,626	13,760	14,270	17,240	636	633	616
Utah	1,570	1,570	1,777	3,080	3,100	3,600	510	506	494
Vermont[a]	380	412	423	1,140	1,050	1,060	333	392	399
Virginia	3,014	3,104	3,509	5,830	7,180	8,050	517	432	436
Washington	3,207	3,339	3,697	5,410	6,390	7,320	593	523	505
West Virginia[a]	417	388	419	1,190	1,150	1,350	350	337	310
Wisconsin	3,190	3,046	3,451	5,390	5,210	6,000	592	585	575
Wyoming[a]	200	190	216	560	570	520	357	333	415
Puerto Rico[a]	168	186	204	640	1,070	1,250	263	174	163

[a]Estimates for S&E doctorate holders may vary between 10% and 25% because geography is not part of the sample design.

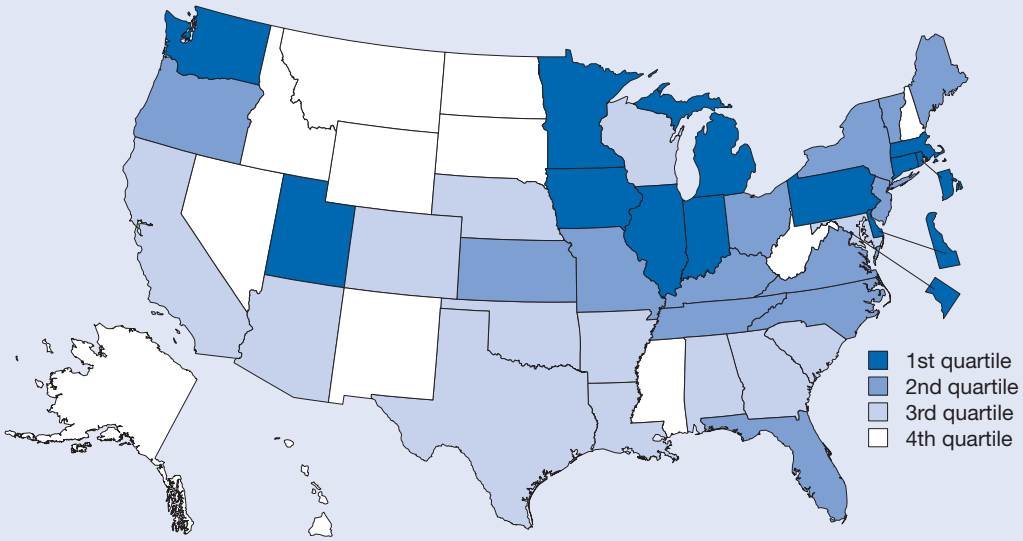
NOTES: Data on U.S. S&E doctorate holders classified by employer location. Data on 2006 S&E doctorate holders are preliminary.

SOURCES: Thomson Scientific ISI database; ipIQ, Inc.; and National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients.

Science & Engineering Indicators 2008

Academic Article Output per $1 Million of Academic R&D

Figure 8-38
Academic article output per $1 million of academic R&D: 2005



1st quartile (5.50–4.01)	2nd quartile (3.95–3.58)	3rd quartile (3.56–3.14)	4th quartile (2.99–1.59)
Connecticut	Florida	Alabama	Alaska
Delaware	Kansas	Arizona	Hawaii
District of Columbia	Kentucky	Arkansas	Idaho
Illinois	Maine	California	Mississippi
Indiana	Missouri	Colorado	Montana
Iowa	New Jersey	Georgia	Nevada
Massachusetts	New York	Louisiana	New Hampshire
Michigan	North Carolina	Maryland	New Mexico
Minnesota	Ohio	Nebraska	North Dakota
Pennsylvania	Oregon	Oklahoma	South Dakota
Rhode Island	Tennessee	South Carolina	West Virginia
Utah	Vermont	Texas	Wyoming
Washington	Virginia	Wisconsin	

SOURCES: Thomson Scientific ISI database; ipIQ, Inc.; and National Science Foundation, Division of Science Resources Statistics, Academic Research and Development Expenditures (various years). See table 8-38.

Findings

- From 1995 to 2005, the number of academic publications rose from 146,000 to nearly 168,000, an increase of 15%.
- In 2005, academic researchers produced an average of 4.3 publications per $1 million of academic R&D, compared with 7.5 in 1995. This partly reflects the effect of general price inflation (28% during this time period), but may also indicate rising academic research costs.
- The value for this indicator decreased for all states between 1995 and 2005.

This indicator shows the relationship between the number of academic publications and the expenditure for academic R&D. A high value for this indicator means that a state's academic institutions have a high publications output relative to their R&D spending. Academic institutions include both 2-year and 4-year schools. This indicator is not an efficiency measure; it is affected by the highly variable costs of R&D and by publishing conventions in different fields and institutions. It may reflect variations in field emphasis among states and institutions.

Publication counts are based on the number of articles appearing in a set of journals listed in Thomson ISI's *Science Citation Index* and *Social Sciences Citation Index*. The number of journals in this set was 4,601 in 1993, 5,084 in 1998, and 5,161 in 2005. Articles with authors in different institutions were counted fractionally. For a publication with *N* authors, each author's institution was credited with 1/*N* articles. In this indicator, Maryland data exclude expenditures by the Applied Physics Laboratory (APL) at the Johns Hopkins University. APL employs more than 3,000 workers and supports the Department of Defense, the National Aeronautics and Space Administration, and other government agencies rather than focusing on academic research.

Table 8-38
Academic article output per $1 million of academic R&D, by state: 1995, 2000, and 2005

State	Academic article output			Academic R&D ($millions)			Academic articles/ $1 million academic R&D		
	1995	2000	2005	1995	2000	2005	1995	2000	2005
United States	146,122	143,922	167,720	19,438	25,317	39,369	7.52	5.68	4.26
Alabama	1,925	1,772	1,996	337	428	590	5.71	4.14	3.38
Alaska	165	174	245	72	108	154	2.29	1.61	1.59
Arizona	2,318	2,179	2,459	380	466	720	6.10	4.68	3.42
Arkansas	518	572	743	94	132	210	5.51	4.33	3.54
California	18,004	17,634	20,807	2,667	4,065	6,273	6.75	4.34	3.32
Colorado	2,568	2,504	2,853	399	545	826	6.44	4.59	3.45
Connecticut	2,811	2,788	3,145	381	468	669	7.38	5.96	4.70
Delaware	515	520	638	54	78	116	9.54	6.67	5.50
District of Columbia	1,233	1,244	1,267	188	246	303	6.56	5.06	4.18
Florida	4,154	4,247	5,424	609	852	1,449	6.82	4.98	3.74
Georgia	2,959	3,294	4,190	684	927	1,274	4.33	3.55	3.29
Hawaii	615	557	618	78	161	240	7.88	3.46	2.58
Idaho	257	277	347	62	74	120	4.15	3.74	2.89
Illinois	6,979	6,910	7,776	832	1,171	1,771	8.39	5.90	4.39
Indiana	3,182	3,069	3,557	377	509	759	8.44	6.03	4.69
Iowa	2,352	2,198	2,401	324	418	548	7.26	5.26	4.38
Kansas	1,226	1,286	1,362	182	258	349	6.74	4.98	3.90
Kentucky	1,280	1,337	1,642	155	277	452	8.26	4.83	3.63
Louisiana	1,946	1,787	2,064	330	409	580	5.90	4.37	3.56
Maine	258	272	303	34	58	82	7.59	4.69	3.70
Maryland	4,431	4,598	5,506	762	1,071	1,679	5.81	4.29	3.28
Massachusetts	9,128	9,347	10,695	1,165	1,486	2,079	7.84	6.29	5.14
Michigan	4,965	4,885	5,841	779	1,008	1,456	6.37	4.85	4.01
Minnesota	2,574	2,259	2,680	342	418	560	7.53	5.40	4.79
Mississippi	621	653	843	118	217	353	5.26	3.01	2.39
Missouri	3,368	3,052	3,469	404	614	893	8.34	4.97	3.88
Montana	256	313	380	70	99	171	3.66	3.16	2.22
Nebraska	1,091	979	1,167	159	208	360	6.86	4.71	3.24
Nevada	390	443	532	87	106	178	4.48	4.18	2.99
New Hampshire	596	592	776	93	151	287	6.41	3.92	2.70
New Jersey	2,919	2,993	3,422	442	568	867	6.60	5.27	3.95
New Mexico	766	802	840	232	244	346	3.30	3.29	2.43
New York	12,818	12,146	13,624	1,780	2,292	3,604	7.20	5.30	3.78
North Carolina	5,189	5,073	6,087	720	1,040	1,652	7.21	4.88	3.68
North Dakota	263	242	362	60	67	150	4.38	3.61	2.41
Ohio	5,156	5,064	5,597	646	918	1,531	7.98	5.52	3.66
Oklahoma	949	906	1,034	190	252	292	4.99	3.60	3.54
Oregon	1,648	1,665	1,920	260	346	536	6.34	4.81	3.58
Pennsylvania	8,244	8,037	9,588	1,151	1,552	2,354	7.16	5.18	4.07
Rhode Island	858	853	942	99	130	200	8.67	6.56	4.71
South Carolina	1,179	1,285	1,528	228	294	486	5.17	4.37	3.14
South Dakota	128	135	165	22	28	67	5.82	4.82	2.46
Tennessee	2,296	2,278	2,767	311	405	726	7.38	5.62	3.81
Texas	8,997	8,795	10,626	1,511	2,038	3,074	5.95	4.32	3.46
Utah	1,539	1,559	1,777	202	308	400	7.62	5.06	4.44
Vermont	403	405	423	55	65	117	7.33	6.23	3.62
Virginia	3,007	3,075	3,509	453	554	914	6.64	5.55	3.84
Washington	3,189	3,288	3,697	494	644	901	6.46	5.11	4.10
West Virginia	419	376	419	54	73	145	7.76	5.15	2.89
Wisconsin	3,278	3,025	3,451	482	662	998	6.80	4.57	3.46
Wyoming	192	178	216	40	43	83	4.80	4.14	2.60
Puerto Rico	171	192	204	70	75	100	2.44	2.56	2.04

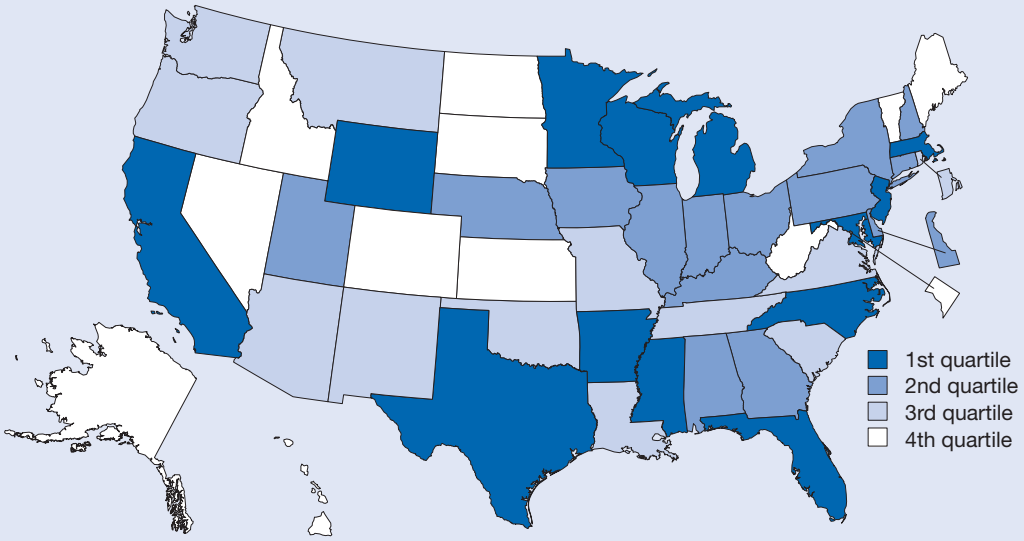
NOTES: In 2000 and 2005, academic R&D reported for all institutions. In 1995, academic R&D reported for doctorate-granting institutions only.

SOURCES: Thomson Scientific ISI database; ipIQ, Inc.; and National Science Foundation, Division of Science Resources Statistics, Academic Research and Development Expenditures (various years).

Science & Engineering Indicators 2008

Academic Patents Awarded per 1,000 S&E Doctorate Holders in Academia

Figure 8-39
Academic patents awarded per 1,000 S&E doctorate holders in academia: 2005 and 2006



1st quartile (20.2–8.9)	2nd quartile (8.8–6.3)	3rd quartile (5.5–4.1)	4th quartile (3.8–0.0)
Arkansas	Alabama	Arizona	Alaska
California	Connecticut	Louisiana	Colorado
Florida	Delaware	Missouri	District of Columbia
Maryland	Georgia	Montana	Hawaii
Massachusetts	Illinois	New Mexico	Idaho
Michigan	Indiana	Oklahoma	Kansas
Minnesota	Iowa	Oregon	Maine
Mississippi	Kentucky	Rhode Island	Nevada
New Jersey	Nebraska	South Carolina	North Dakota
North Carolina	New Hampshire	Tennessee	South Dakota
Texas	New York	Virginia	Vermont
Wisconsin	Ohio	Washington	West Virginia
Wyoming	Pennsylvania		
	Utah		

SOURCES: Patent and Trademark Office, Technology Assessment and Forecast Branch, U.S. Colleges and Universities—Utility Patent Grants, Calendar Years 1969–2005; and National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients. See table 8-39.

Findings

- Throughout the United States, the number of patents awarded to academic institutions increased from more than 2,400 in 1997 to more than 2,700 in 2005, an increase of 11%, while the number of academic S&E doctorate holders rose by 20% between 1997 and 2006.
- In 2005, 9.2 academic patents were produced nationally for each 1,000 S&E doctorate holders employed in academia, slightly lower than the 10.0 patents produced in 1997.
- In 2003, states varied widely on this indicator, with values ranging from 0 to 20.2 patents per 1,000 S&E doctorate holders employed in academia, indicating a difference in patenting philosophy or mix of industries that these academic institutions deal with.
- California and Massachusetts showed both the highest levels of academic patenting activity and the highest levels of venture capital investment.

Since the early 1980s, academic institutions have increasingly been viewed as engines of economic growth. Growing attention has been paid to the results of academic R&D in terms of their role in creating new products, processes, and services. One indicator of such R&D results is volume of academic patents. Academic patenting is highly concentrated and partly reflects the resources devoted to institutional patenting offices.

This indicator relates the number of academic-owned utility patents to the size of the doctoral S&E workforce in academia. Academia includes both 2-year and 4-year institutions. Utility patents, commonly known as patents for inventions, include any new, useful, or improved method, process, machine, device, manufactured item, or chemical compound, and represent a key measure of intellectual property. This indicator is an approximate measure of the degree to which results with perceived economic value are generated by the doctoral academic workforce.

S&E doctorates include physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. Medical doctorates and S&E doctorates from foreign institutions are excluded.

Table 8-39
Academic patents awarded per 1,000 S&E doctorate holders in academia, by state: 1997, 2001, 2005, and 2006

State	Patents awarded to academic institutions			S&E doctorate holders in academia			Academic patents/ 1,000 academic S&E doctorate holders		
	1997	2001	2005	1997	2001	2006	1997	2001	2005/2006
United States	2,447	3,219	2,725	245,670	261,780	295,390	10.0	12.3	9.2
Alabama	23	40	28	4,640	3,050	3,510	5.0	13.1	8.0
Alaska[a]	2	0	0	450	530	580	4.4	0.0	0.0
Arizona	21	17	22	3,050	3,340	4,080	6.9	5.1	5.4
Arkansas[a]	8	28	19	1,520	1,640	1,960	5.3	17.1	9.7
California	409	638	622	26,050	26,790	30,800	15.7	23.8	20.2
Colorado	32	31	14	4,550	5,120	5,840	7.0	6.1	2.4
Connecticut	34	37	41	4,000	4,420	4,770	8.5	8.4	8.6
Delaware[a]	4	5	7	750	840	950	5.3	6.0	7.4
District of Columbia	28	13	7	2,210	2,840	2,600	12.7	4.6	2.7
Florida	94	103	128	6,850	8,250	9,590	13.7	12.5	13.3
Georgia	45	75	68	5,780	6,450	7,750	7.8	11.6	8.8
Hawaii[a]	6	4	6	1,380	1,570	1,680	4.3	2.5	3.6
Idaho[a]	0	0	0	780	980	1,490	0.0	0.0	0.0
Illinois	81	109	84	10,620	11,090	12,040	7.6	9.8	7.0
Indiana	39	17	39	4,680	5,710	6,220	8.3	3.0	6.3
Iowa	51	67	29	3,100	3,220	3,510	16.5	20.8	8.3
Kansas[a]	7	18	6	2,260	2,270	2,600	3.1	7.9	2.3
Kentucky	16	20	23	3,040	3,240	3,640	5.3	6.2	6.3
Louisiana	26	42	18	3,580	3,470	3,470	7.3	12.1	5.2
Maine[a]	0	2	1	1,340	1,200	1,240	0.0	1.7	0.8
Maryland	66	114	98	6,400	6,100	7,680	10.3	18.7	12.8
Massachusetts	188	218	213	11,810	13,390	15,380	15.9	16.3	13.8
Michigan	104	105	110	7,850	8,820	9,580	13.2	11.9	11.5
Minnesota	50	65	63	4,490	5,540	5,810	11.1	11.7	10.8
Mississippi	6	12	18	1,940	2,000	2,020	3.1	6.0	8.9
Missouri	40	55	28	5,770	5,710	5,660	6.9	9.6	4.9
Montana[a]	4	4	5	1,020	810	1,230	3.9	4.9	4.1
Nebraska[a]	27	21	14	2,360	1,960	1,930	11.4	10.7	7.3
Nevada[a]	2	4	2	980	1,260	1,630	2.0	3.2	1.2
New Hampshire[a]	3	10	10	1,130	1,240	1,240	2.7	8.1	8.1
New Jersey	52	81	58	5,290	5,860	6,530	9.8	13.8	8.9
New Mexico	19	17	16	2,450	2,910	2,990	7.8	5.8	5.4
New York	224	283	201	20,900	21,770	23,290	10.7	13.0	8.6
North Carolina	96	148	106	7,740	9,050	10,300	12.4	16.4	10.3
North Dakota[a]	5	4	3	900	660	970	5.6	6.1	3.1
Ohio	75	93	72	9,750	9,920	10,690	7.7	9.4	6.7
Oklahoma	17	22	14	2,680	2,800	2,890	6.3	7.9	4.8
Oregon	27	23	16	2,690	3,250	3,640	10.0	7.1	4.4
Pennsylvania	138	213	117	12,150	13,590	16,250	11.4	15.7	7.2
Rhode Island[a]	9	19	11	1,730	1,730	2,060	5.2	11.0	5.3
South Carolina	14	14	18	3,230	3,030	3,730	4.3	4.6	4.8
South Dakota[a]	2	2	0	700	640	690	2.9	3.1	0.0
Tennessee	25	42	24	4,720	4,800	5,740	5.3	8.8	4.2
Texas	125	155	157	13,760	14,270	17,240	9.1	10.9	9.1
Utah	38	48	26	3,080	3,100	3,600	12.3	15.5	7.2
Vermont[a]	3	3	4	1,140	1,050	1,060	2.6	2.9	3.8
Virginia	49	41	37	5,830	7,180	8,050	8.4	5.7	4.6
Washington	42	56	40	5,410	6,390	7,320	7.8	8.8	5.5
West Virginia[a]	2	4	0	1,190	1,150	1,350	1.7	3.5	0.0
Wisconsin	65	74	77	5,390	5,210	6,000	12.1	14.2	12.8
Wyoming[a]	4	3	5	560	570	520	7.1	5.3	9.6
Puerto Rico[a]	0	5	0	640	1,070	1,250	0.0	4.7	0.0

[a]Estimates for S&E doctorate holders may vary between 10% and 25% because geography is not part of the sample design.

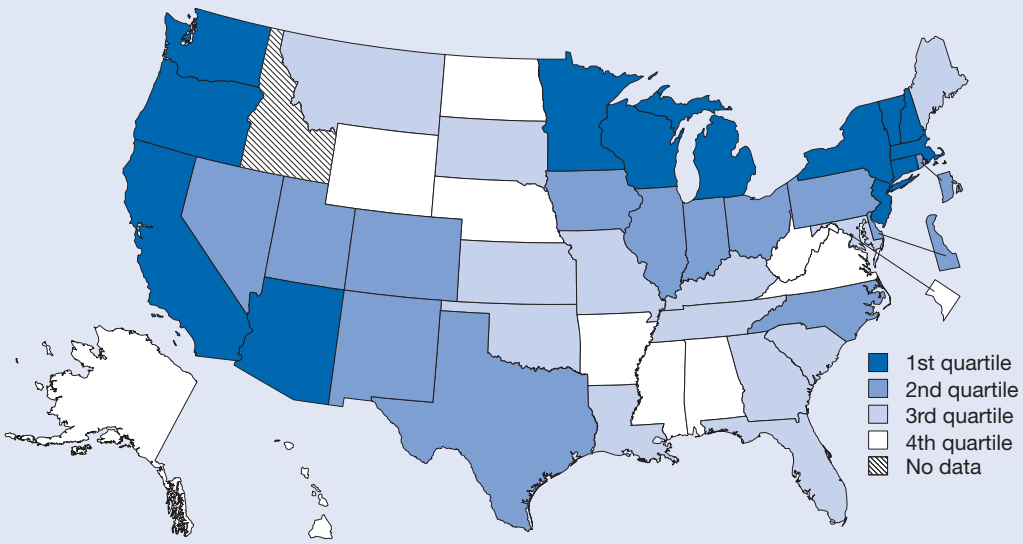
NOTES: Data on U.S. S&E doctorate holders classified by employer location. Data on 2006 S&E doctorate holders in academia are preliminary.

SOURCES: Patent and Trademark Office, Technology Assessment and Forecast Branch, U.S. Colleges and Universities—Utility Patent Grants, Calendar Years 1969–2005; and National Science Foundation, Division of Science Resources Statistics, Survey of Doctorate Recipients.

Science & Engineering Indicators 2008

Patents Awarded per 1,000 Individuals in S&E Occupations

Figure 8-40
Patents awarded per 1,000 individuals in S&E occupations: 2006



1st quartile (34.2–17.4)	2nd quartile (16.6–11.2)	3rd quartile (10.9–7.3)	4th quartile (7.1–1.0)	No data
Arizona	Colorado	Florida	Alabama	Idaho
California	Delaware	Georgia	Alaska	
Connecticut	Illinois	Kansas	Arkansas	
Massachusetts	Indiana	Kentucky	District of Columbia	
Michigan	Iowa	Louisiana	Hawaii	
Minnesota	Nevada	Maine	Mississippi	
New Hampshire	New Mexico	Maryland	Nebraska	
New Jersey	North Carolina	Missouri	North Dakota	
New York	Ohio	Montana	Virginia	
Oregon	Pennsylvania	Oklahoma	West Virginia	
Vermont	Rhode Island	South Carolina	Wyoming	
Washington	Texas	South Dakota		
Wisconsin	Utah	Tennessee		

SOURCES: U.S. Patent and Trademark Office, Electronic Information Products Division/Patent Technology Monitoring Branch, Patent Counts by Country/State and Year, Utility Patents, January 1, 1963–December 31, 2006; and Bureau of Labor Statistics, Occupational Employment and Wage Estimates. See table 8-40.

Findings

- Nearly 90,000 utility patents were awarded to inventors residing in the United States in 2006, an increase of almost 7% from the 84,000 utility patents awarded in 2004.
- In 2006, the national average for this indicator was 16.7 patents per 1,000 individuals in an S&E occupation, which was slightly higher than the average of 16.6 in 2004.
- The state of Idaho typically reports the highest values for this indicator, reflecting the presence of a high-patenting Department of Energy National Laboratory in this sparsely populated state. In 2006, this may not be evident because the Idaho data for individuals in S&E occupations were suppressed.
- Values for the remaining states varied widely, ranging from 3.4 to 34.2 patents per 1,000 individuals in S&E occupations in 2006.
- Nearly 25% of all 2006 U.S. utility patents were awarded to residents of California.

This indicator shows state patent activity normalized to the size of its S&E workforce, specifically employees in S&E occupations. People in S&E occupations include mathematical, computer, life, physical, and social scientists; engineers; and postsecondary teachers in any of these fields. Managers, technicians, elementary and secondary schoolteachers, and medical personnel are excluded.

Although the Patent and Trademark Office grants several types of patents, this indicator includes only utility patents, commonly known as patents for inventions. Utility patents can be granted for any new, useful, or improved method, process, machine, device, manufactured item, or chemical compound, and represent a key measure of intellectual property. The Patent and Trademark Office classifies patents based on the residence of the first-named inventor. Only U.S.-origin patents are included.

The location of S&E occupations primarily reflects where the individuals work and is based on estimates from the Occupational Employment Statistics survey, a cooperative program between the Bureau of Labor Statistics and state employment security agencies. Because of the different methods of assigning geographic location, this indicator is of limited applicability for sparsely populated states or for locations where a large percentage of the population lives in one state or region and works in another.

Table 8-40
Patents awarded per 1,000 individuals in S&E occupations, by state: 2004 and 2006

State	Patents awarded		Individuals in S&E occupations		Patents/1,000 individuals in S&E occupations	
	2004	2006	2004	2006	2004	2006
United States	84,249	89,795	5,065,330	5,383,860	16.6	16.7
Alabama	375	357	57,560	66,100	6.5	5.4
Alaska	39	36	10,660	10,720	3.7	3.4
Arizona	1,621	1,705	95,380	98,110	17.0	17.4
Arkansas	132	138	22,150	24,860	6.0	5.6
California	19,488	22,275	693,670	730,010	28.1	30.5
Colorado	2,099	2,118	126,280	133,730	16.6	15.8
Connecticut	1,577	1,652	82,820	79,380	19.0	20.8
Delaware	342	357	17,980	21,550	19.0	16.6
District of Columbia	75	63	57,750	64,120	1.3	1.0
Florida	2,456	2,600	229,950	246,190	10.7	10.6
Georgia	1,326	1,487	141,710	136,470	9.4	10.9
Hawaii	76	84	16,360	18,940	4.6	4.4
Idaho	1,785	1,663	22,310	NA	80.0	NA
Illinois	3,162	3,294	219,530	222,470	14.4	14.8
Indiana	1,280	1,165	79,120	80,110	16.2	14.5
Iowa	658	666	39,280	43,670	16.8	15.3
Kansas	448	492	52,020	48,620	8.6	10.1
Kentucky	407	413	44,350	44,680	9.2	9.2
Louisiana	343	321	42,230	40,180	8.1	8.0
Maine	134	142	15,160	15,950	8.8	8.9
Maryland	1,313	1,410	154,310	159,470	8.5	8.8
Massachusetts	3,672	4,011	186,260	198,670	19.7	20.2
Michigan	3,756	3,758	183,140	208,520	20.5	18.0
Minnesota	2,754	2,957	119,380	125,930	23.1	23.5
Mississippi	136	119	23,190	24,910	5.9	4.8
Missouri	768	721	87,200	96,420	8.8	7.5
Montana	119	121	11,390	13,010	10.4	9.3
Nebraska	191	186	31,720	32,500	6.0	5.7
Nevada	410	386	23,980	26,930	17.1	14.3
New Hampshire	626	602	24,350	27,680	25.7	21.7
New Jersey	2,957	3,172	165,150	176,460	17.9	18.0
New Mexico	370	344	33,500	30,800	11.0	11.2
New York	5,846	5,627	272,930	306,810	21.4	18.3
North Carolina	1,794	1,974	135,380	138,790	13.3	14.2
North Dakota	53	66	8,420	9,360	6.3	7.1
Ohio	2,889	2,630	180,360	185,190	16.0	14.2
Oklahoma	447	544	NA	50,770	NA	10.7
Oregon	1,725	2,060	62,570	64,520	27.6	31.9
Pennsylvania	2,883	2,842	195,730	214,910	14.7	13.2
Rhode Island	309	269	19,660	18,060	15.7	14.9
South Carolina	524	577	51,030	53,230	10.3	10.8
South Dakota	82	74	9,420	10,120	8.7	7.3
Tennessee	681	669	65,120	67,040	10.5	10.0
Texas	5,930	6,308	383,180	408,710	15.5	15.4
Utah	683	684	43,030	49,690	15.9	13.8
Vermont	400	437	11,770	12,780	34.0	34.2
Virginia	1,077	1,094	220,180	251,720	4.9	4.3
Washington	2,221	3,286	154,610	171,780	14.4	19.1
West Virginia	100	103	16,100	17,150	6.2	6.0
Wisconsin	1,658	1,688	95,230	96,860	17.4	17.4
Wyoming	52	48	6,760	7,640	7.7	6.3
Puerto Rico	19	25	20,410	23,850	0.9	1.0

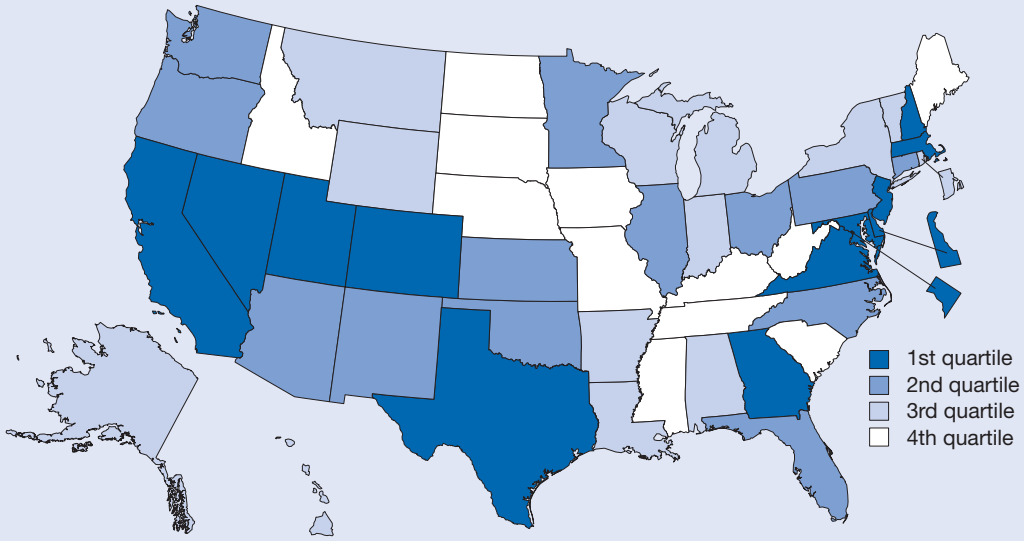
NOTE: Origin of utility patent determined by residence of first-named inventor.

SOURCES: U.S. Patent and Trademark Office, Electronic Information Products Division/Patent Technology Monitoring Branch, Patent Counts by Country/State and Year, Utility Patents, January 1, 1963–December 31, 2006; and Bureau of Labor Statistics, Occupational Employment and Wage Estimates.

Science & Engineering Indicators 2008

High-Technology Share of All Business Establishments

Figure 8-41
High-technology share of all business establishments: 2004



1st quartile (15.42%–9.07%)	2nd quartile (8.95%–7.26%)	3rd quartile (7.25%–6.36%)	4th quartile (6.35%–4.68%)
California	Arizona	Alabama	Idaho
Colorado	Connecticut	Alaska	Iowa
Delaware	Florida	Arkansas	Kentucky
District of Columbia	Illinois	Hawaii	Maine
Georgia	Kansas	Indiana	Mississippi
Maryland	Minnesota	Louisiana	Missouri
Massachusetts	New Mexico	Michigan	Nebraska
Nevada	North Carolina	Montana	North Dakota
New Hampshire	Ohio	New York	South Carolina
New Jersey	Oklahoma	Rhode Island	South Dakota
Texas	Oregon	Vermont	Tennessee
Utah	Pennsylvania	Wisconsin	West Virginia
Virginia	Washington	Wyoming	

SOURCE: Census Bureau, 1989–2004 Business Information Tracking Series, special tabulations. See table 8-41.

Findings

- The number of establishments in high-technology industries rose from more than 590,000 in 2003 to nearly 604,000 in 2004, an increase of about 14,000 or 2%.
- The percentage of U.S. establishments in high-technology industries grew from 8.17% to 8.19% of the total business establishments during the 2003–04 period. However, in 22 states the high-technology share of all business establishments declined in 2004 relative to 2003.
- Between 2003 and 2004, the largest growth in the number of establishments in high-technology industries occurred in Florida and California, which added 2,000 and 1,700 establishments, respectively.
- The state distribution of this indicator is similar to that of three other indicators: bachelor's degree holders, S&E doctoral degree holders, and S&E occupations, all expressed as a share of the workforce.

This indicator measures the portion of a state's business establishments that are classified as high-technology industries. High-technology industries are defined as those in which the proportion of employees in technology-oriented occupations is at least twice the average proportion for all industries. State economies with a high percentage of business establishments in high-technology industries are likely to be well positioned to take advantage of new technological developments.

The data pertaining to establishments for the years 2003 and 2004 were based on their classification according to the 2002 edition of the North American Industry Classification System (NAICS). A list of the 46 industries (by 4-digit NAICS code) that are defined as high-technology can be found in the Technical Note at the end of this chapter. Data for earlier years are not directly comparable.

Table 8-41
High-technology share of all business establishments, by state: 2003 and 2004

State	High-technology establishments		All business establishments		High-technology/ business establishments (%)	
	2003	2004	2003	2004	2003	2004
United States	590,417	603,642	7,223,240	7,366,978	8.17	8.19
Alabama	6,347	6,407	99,453	100,521	6.38	6.37
Alaska	1,345	1,358	19,037	19,309	7.07	7.03
Arizona	10,433	10,901	120,966	125,330	8.62	8.70
Arkansas	4,012	4,142	64,058	65,127	6.26	6.36
California	77,614	79,288	822,751	838,615	9.43	9.45
Colorado	15,532	16,027	143,398	146,937	10.83	10.91
Connecticut	7,827	7,794	91,207	92,710	8.58	8.41
Delaware	3,964	3,907	24,739	25,344	16.02	15.42
District of Columbia	2,589	2,695	19,357	19,503	13.38	13.82
Florida	38,118	40,165	458,823	483,693	8.31	8.30
Georgia	18,820	19,424	208,350	214,200	9.03	9.07
Hawaii	2,097	2,152	30,950	31,538	6.78	6.82
Idaho	2,515	2,582	39,582	41,205	6.35	6.27
Illinois	27,606	28,200	310,589	315,093	8.89	8.95
Indiana	9,626	9,858	147,073	149,050	6.55	6.61
Iowa	4,316	4,324	80,745	81,334	5.35	5.32
Kansas	5,716	5,900	74,637	75,600	7.66	7.80
Kentucky	5,453	5,585	90,358	91,598	6.03	6.10
Louisiana	7,218	7,192	101,933	102,866	7.08	6.99
Maine	2,466	2,541	40,519	41,131	6.09	6.18
Maryland	13,428	13,974	132,782	135,699	10.11	10.30
Massachusetts	17,183	17,305	177,910	175,426	9.66	9.86
Michigan	16,937	16,988	236,221	237,392	7.17	7.16
Minnesota	12,834	13,055	145,364	148,276	8.83	8.80
Mississippi	3,269	3,274	59,565	60,364	5.49	5.42
Missouri	9,562	9,745	149,753	153,584	6.39	6.35
Montana	2,108	2,229	33,616	34,570	6.27	6.45
Nebraska	2,797	2,864	50,213	50,803	5.57	5.64
Nevada	5,387	5,493	53,080	55,713	10.15	9.86
New Hampshire	3,511	3,559	38,119	38,707	9.21	9.19
New Jersey	24,286	24,256	237,097	240,013	10.24	10.11
New Mexico	3,322	3,385	43,386	44,071	7.66	7.68
New York	35,926	36,706	500,559	509,873	7.18	7.20
North Carolina	14,869	15,426	207,500	212,457	7.17	7.26
North Dakota	964	972	20,371	20,763	4.73	4.68
Ohio	19,875	20,120	269,202	271,078	7.38	7.42
Oklahoma	6,859	6,965	85,633	87,180	8.01	7.99
Oregon	7,500	7,659	102,462	104,966	7.32	7.30
Pennsylvania	22,266	22,796	297,040	300,832	7.50	7.58
Rhode Island	1,976	2,043	29,172	29,900	6.77	6.83
South Carolina	5,869	6,048	98,735	100,947	5.94	5.99
South Dakota	1,206	1,234	24,314	24,693	4.96	5.00
Tennessee	8,196	8,226	129,458	131,355	6.33	6.26
Texas	45,062	45,522	481,804	489,782	9.35	9.29
Utah	5,474	5,716	60,011	62,644	9.12	9.12
Vermont	1,453	1,498	21,747	22,072	6.68	6.79
Virginia	18,868	19,758	182,783	188,533	10.32	10.48
Washington	13,171	13,480	166,229	170,848	7.92	7.89
West Virginia	2,257	2,259	40,225	40,732	5.61	5.55
Wisconsin	9,035	9,249	141,560	143,739	6.38	6.43
Wyoming	1,353	1,396	18,804	19,262	7.20	7.25
Puerto Rico	NA	NA	NA	NA	NA	NA

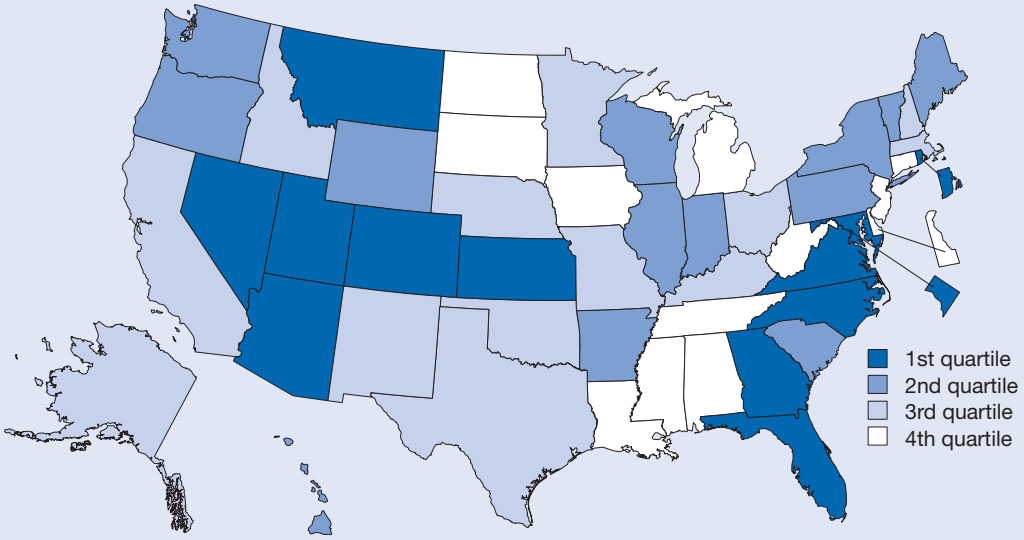
NA = not available

SOURCE: Census Bureau, 1989–2004 Business Information Tracking Series, special tabulations.

Science & Engineering Indicators 2008

Net High-Technology Business Formations as Share of All Business Establishments

Figure 8-42
Net high-technology business formations as share of all business establishments: 2004



1st quartile (0.45%–0.21%)	2nd quartile (0.20%–0.14%)	3rd quartile (0.13%–0.08%)	4th quartile (0.06% to –0.21%)
Arizona	Arkansas	Alaska	Alabama
Colorado	Hawaii	California	Connecticut
District of Columbia	Illinois	Idaho	Delaware
Florida	Indiana	Kentucky	Iowa
Georgia	Maine	Massachusetts	Louisiana
Kansas	New York	Minnesota	Michigan
Maryland	Oregon	Missouri	Mississippi
Montana	Pennsylvania	Nebraska	New Jersey
Nevada	South Carolina	New Hampshire	North Dakota
North Carolina	Vermont	New Mexico	South Dakota
Rhode Island	Washington	Ohio	Tennessee
Utah	Wisconsin	Oklahoma	West Virginia
Virginia	Wyoming	Texas	

SOURCE: Census Bureau, 1989–2004 Business Information Tracking Series, special tabulations. See table 8-42.

Findings

- In 2004, 11,598 net new businesses in high-technology industries were formed in the United States. From a base of approximately 7 million total business establishments, 84,155 new business establishments were formed in high-technology industries and 72,557 ceased operation in those same industries.
- Net business formations cannot be used to directly link the number of high-technology business establishments in 2003 and 2004. In addition to the births and deaths that occurred during 2004, the total number of 2004 high-technology establishments also includes business establishments that were reclassified during 2004. There were 12,387 establishments that were in operation in both 2003 and 2004 and were classified in a high-technology NAICS code in 2003 but not in 2004. Similarly, there were 14,014 establishments that were in operation in both 2003 and 2004 that were not classified with a high-technology NAICS code in 2003 but acquired one in 2004.
- Four states had net losses of business establishments in high-technology industries in 2004.
- Utah and Virginia showed the highest rates of net high-technology business formations in 2004. However, the largest numbers of net new businesses were formed in Florida and California.

The business base of a state is constantly changing as new businesses form and others cease to function. The term *net business formations* refers to the difference between the number of businesses that are formed and the number that cease operations during any particular year. This difference can be small or can vary considerably from year to year.

The ratio of the number of net business formations that occur in high-technology industries to the number of business establishments in a state indicates the changing role of high-technology industries in a state's economy. High positive values indicate an increasingly prominent role for these industries.

The data on business establishments in high-technology industries for 2003 and 2004 were based on their classification according to the 2002 edition of the North American Industry Classification System (NAICS). A list of the 46 industries (by 4-digit NAICS code) that are defined as high-technology can be found in the Technical Note at the end of this chapter. Data for earlier years are not directly comparable. Company births and deaths are determined from Employer Identification Numbers in the Census Bureau records; thus, changes in company name, ownership, or address are not counted as business formations or business deaths.

Table 8-42
Net high-technology business formations as share of all business establishments, by state: 2004

State	Net high-technology business formations	All business establishments	High-technology formations/business establishments (%)
United States	11,598	7,366,978	0.16
Alabama	63	100,521	0.06
Alaska	22	19,309	0.11
Arizona	357	125,330	0.28
Arkansas	123	65,127	0.19
California	1,099	838,615	0.13
Colorado	490	146,937	0.33
Connecticut	-47	92,710	-0.05
Delaware	-52	25,344	-0.21
District of Columbia	66	19,503	0.34
Florida	1,743	483,693	0.36
Georgia	642	214,200	0.30
Hawaii	51	31,538	0.16
Idaho	54	41,205	0.13
Illinois	452	315,093	0.14
Indiana	208	149,050	0.14
Iowa	12	81,334	0.01
Kansas	160	75,600	0.21
Kentucky	116	91,598	0.13
Louisiana	-38	102,866	-0.04
Maine	81	41,131	0.20
Maryland	475	135,699	0.35
Massachusetts	156	175,426	0.09
Michigan	44	237,392	0.02
Minnesota	185	148,276	0.12
Mississippi	7	60,364	0.01
Missouri	195	153,584	0.13
Montana	108	34,570	0.31
Nebraska	64	50,803	0.13
Nevada	169	55,713	0.30
New Hampshire	30	38,707	0.08
New Jersey	-80	240,013	-0.03
New Mexico	37	44,071	0.08
New York	702	509,873	0.14
North Carolina	514	212,457	0.24
North Dakota	-1	20,763	0.00
Ohio	204	271,078	0.08
Oklahoma	75	87,180	0.09
Oregon	156	104,966	0.15
Pennsylvania	474	300,832	0.16
Rhode Island	67	29,900	0.22
South Carolina	175	100,947	0.17
South Dakota	16	24,693	0.06
Tennessee	39	131,355	0.03
Texas	401	489,782	0.08
Utah	283	62,644	0.45
Vermont	42	22,072	0.19
Virginia	845	188,533	0.45
Washington	346	170,848	0.20
West Virginia	16	40,732	0.04
Wisconsin	215	143,739	0.15
Wyoming	37	19,262	0.19
Puerto Rico	NA	NA	NA

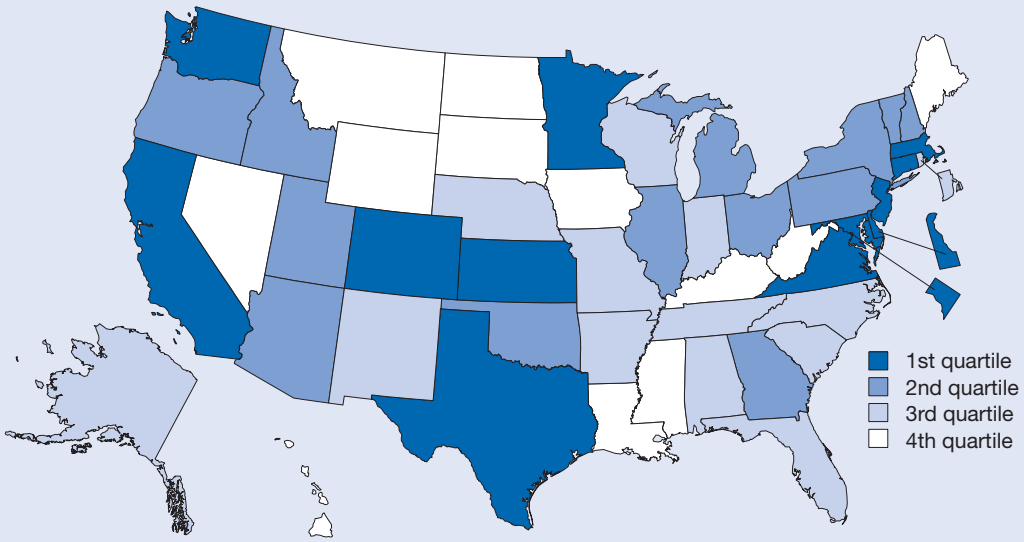
NA = not available

SOURCE: Census Bureau, 1989–2004 Business Information Tracking Series, special tabulations.

Science & Engineering Indicators 2008

Employment in High-Technology Establishments as Share of Total Employment

Figure 8-43
Employment in high-technology establishments as share of all employment: 2004



1st quartile (16.03%–12.93%)	2nd quartile (12.49%–10.74%)	3rd quartile (10.63%–8.42%)	4th quartile (8.12%–5.54%)
California	Arizona	Alabama	Hawaii
Colorado	Georgia	Alaska	Iowa
Connecticut	Idaho	Arkansas	Kentucky
Delaware	Illinois	Florida	Louisiana
District of Columbia	Michigan	Indiana	Maine
Kansas	New Hampshire	Missouri	Mississippi
Maryland	New York	Nebraska	Montana
Massachusetts	Ohio	New Mexico	Nevada
Minnesota	Oklahoma	North Carolina	North Dakota
New Jersey	Oregon	Rhode Island	South Dakota
Texas	Pennsylvania	South Carolina	West Virginia
Virginia	Utah	Tennessee	Wyoming
Washington	Vermont	Wisconsin	

SOURCE: Census Bureau, 1989–2004 Business Information Tracking Series, special tabulations. See table 8-43.

Findings

- Employment in high-technology industries in the United States declined slightly between 2003 and 2004, continuing a trend that was observed during the 1998–2002 period.
- Nationwide this indicator declined from 11.96 in 2003 to 11.61 in 2004, or about 3%; only 10 states and the District of Columbia showed increases in high-technology employment as a share of total employment.
- Washington and Texas reported the loss of 72,000 and 57,000 jobs, respectively, in high-technology industries in 2004.
- On this indicator, states varied greatly in 2004, ranging from 5.5% to 16.0% of their workforce employed in high-technology industries.
- Not surprisingly, states were distributed similarly on the high-technology employment and high-technology establishment indicators.

This indicator measures the extent to which the workforce in a state is employed in high-technology industries. High-technology industries are defined as those in which the proportion of employees in technology-oriented occupations is at least twice the average proportion for all industries. State economies with a high value are probably well positioned to take advantage of new technological developments because they have a relatively larger pool of experienced high-technology workers.

The data pertaining to establishments for the years 2003 and 2004 were based on their classification according to the 2002 edition of the North American Industry Classification System (NAICS). A list of the 46 industries (by 4-digit NAICS code) that are defined as high-technology can be found in the Technical Note at the end of this chapter. Data for earlier years are not directly comparable.

Table 8-43
Employment in high-technology establishments as share of all employment, by state: 2003 and 2004

State	Employment in high-technology establishments		All employment		High-technology/all employment (%)	
	2003	2004	2003	2004	2003	2004
United States	13,563,122	13,356,596	113,373,663	115,049,548	11.96	11.61
Alabama	152,879	158,927	1,597,265	1,628,733	9.57	9.76
Alaska	21,851	22,107	216,707	223,099	10.08	9.91
Arizona	234,603	238,462	1,997,990	2,043,729	11.74	11.67
Arkansas	95,180	101,124	988,822	1,007,283	9.63	10.04
California	1,781,830	1,767,202	12,986,496	13,260,306	13.72	13.33
Colorado	274,979	265,613	1,883,883	1,908,126	14.60	13.92
Connecticut	210,114	204,107	1,550,615	1,537,160	13.55	13.28
Delaware	52,349	54,164	385,098	391,647	13.59	13.83
District of Columbia	54,314	57,250	422,912	436,791	12.84	13.11
Florida	576,274	587,452	6,548,276	6,863,196	8.80	8.56
Georgia	413,384	411,977	3,386,590	3,451,802	12.21	11.94
Hawaii	25,777	26,203	458,952	473,181	5.62	5.54
Idaho	55,706	53,738	466,379	488,557	11.94	11.00
Illinois	646,285	617,306	5,204,887	5,216,180	12.42	11.83
Indiana	219,598	219,694	2,540,554	2,586,282	8.64	8.49
Iowa	102,387	96,100	1,232,709	1,241,688	8.31	7.74
Kansas	155,023	153,046	1,109,699	1,115,930	13.97	13.71
Kentucky	121,838	119,167	1,471,622	1,489,285	8.28	8.00
Louisiana	137,029	129,722	1,603,492	1,623,431	8.55	7.99
Maine	35,184	36,221	488,788	494,165	7.20	7.33
Maryland	315,887	323,966	2,088,552	2,151,093	15.12	15.06
Massachusetts	460,984	455,749	2,974,164	2,979,251	15.50	15.30
Michigan	499,133	486,706	3,884,881	3,895,217	12.85	12.49
Minnesota	315,994	309,303	2,381,860	2,392,481	13.27	12.93
Mississippi	66,566	61,858	912,004	928,181	7.30	6.66
Missouri	254,299	257,290	2,387,245	2,420,994	10.65	10.63
Montana	20,296	20,452	302,932	314,806	6.70	6.50
Nebraska	68,975	69,724	774,858	774,187	8.90	9.01
Nevada	61,847	64,648	970,678	1,021,842	6.37	6.33
New Hampshire	63,264	63,907	540,132	550,869	11.71	11.60
New Jersey	550,224	558,921	3,578,674	3,609,297	15.38	15.49
New Mexico	60,399	61,149	571,057	580,443	10.58	10.53
New York	823,992	798,462	7,415,430	7,431,893	11.11	10.74
North Carolina	349,424	345,316	3,337,552	3,365,050	10.47	10.26
North Dakota	20,584	20,176	258,878	265,632	7.95	7.60
Ohio	531,491	512,352	4,769,406	4,761,492	11.14	10.76
Oklahoma	132,887	133,871	1,184,312	1,194,830	11.22	11.20
Oregon	152,140	147,549	1,338,380	1,355,101	11.37	10.89
Pennsylvania	566,406	551,971	5,028,650	5,106,171	11.26	10.81
Rhode Island	35,806	36,577	427,369	434,600	8.38	8.42
South Carolina	163,373	164,035	1,550,227	1,560,401	10.54	10.51
South Dakota	18,890	19,897	299,723	307,944	6.30	6.46
Tennessee	219,898	217,191	2,298,836	2,346,903	9.57	9.25
Texas	1,158,481	1,101,175	8,049,300	8,116,465	14.39	13.57
Utah	99,856	101,547	900,331	934,939	11.09	10.86
Vermont	29,402	27,572	256,401	256,040	11.47	10.77
Virginia	459,017	489,703	2,932,471	3,054,221	15.65	16.03
Washington	401,413	329,698	2,292,462	2,268,155	17.51	14.54
West Virginia	46,635	46,172	561,317	568,581	8.31	8.12
Wisconsin	233,967	245,257	2,382,979	2,434,580	9.82	10.07
Wyoming	15,008	14,820	180,866	187,318	8.30	7.91
Puerto Rico	NA	NA	NA	NA	NA	NA

NA = not available

SOURCE: Census Bureau, 1989–2004 Business Information Tracking Series, special tabulations.

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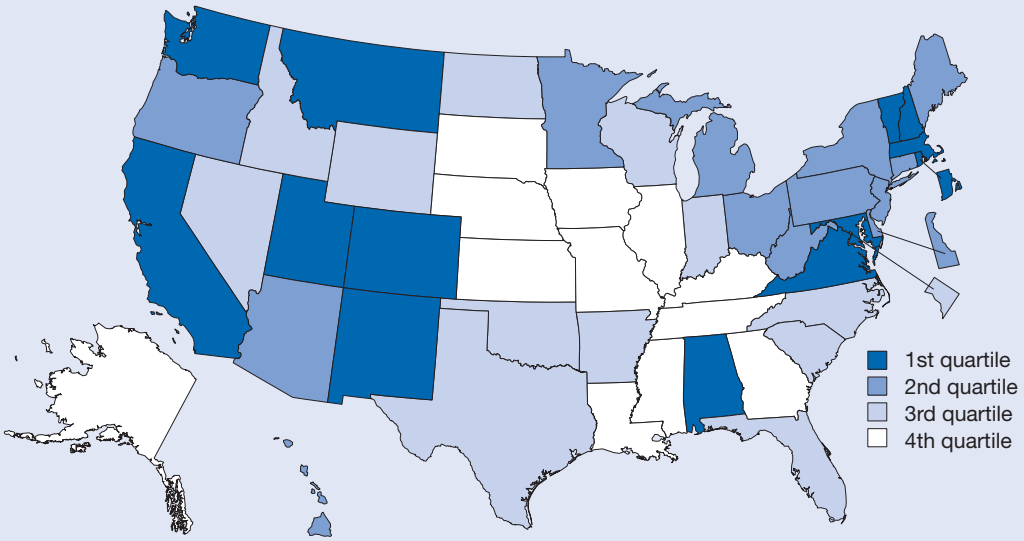
SBIR Average Annual Federal Funding per $1 Million of Gross Domestic Product

Figure 8-44
Average annual federal SBIR funding per $1 million of gross domestic product: 2003–05



1st quartile ($825–$187)	2nd quartile ($180–$98)	3rd quartile ($96–$56)	4th quartile ($53–$19)
Alabama	Arizona	Arkansas	Alaska
California	Connecticut	District of Columbia	Georgia
Colorado	Delaware	Florida	Illinois
Maryland	Hawaii	Idaho	Iowa
Massachusetts	Maine	Indiana	Kansas
Montana	Michigan	Nevada	Kentucky
New Hampshire	Minnesota	North Carolina	Louisiana
New Mexico	New Jersey	North Dakota	Mississippi
Rhode Island	New York	Oklahoma	Missouri
Utah	Ohio	South Carolina	Nebraska
Vermont	Oregon	Texas	South Dakota
Virginia	Pennsylvania	Wisconsin	Tennessee
Washington	West Virginia	Wyoming	

SOURCES: Small Business Administration, Office of Technology, SBIR program statistics (various years); and Bureau of Economic Analysis, Gross Domestic Product data. See table 8-44.

Findings

- Strong growth has occurred in the SBIR program in recent years as total annual awards have increased from nearly $1 billion in 1995–97 to nearly $1.9 billion in 2003–05.
- The value of SBIR awards is not evenly distributed but is concentrated in relatively few states; the total of annual state awards may range from under $1 million to nearly $400 million.
- Many of the states with the highest rankings on this indicator are locations of federal laboratories or well-recognized academic research institutions from which innovative small businesses have emerged.
- States with a high ranking on this indicator also tend to rank high on the high-technology and venture capital indicators.

Funds awarded through the federal Small Business Innovation Research (SBIR) program support technological innovation in small companies (i.e., companies with 500 or fewer employees). Awards are made to evaluate the feasibility and scientific merit of new technology (up to $100,000) and to develop the technology to a point where it can be commercialized (up to $750,000). The total award dollars include both Phase 1 and Phase 2 SBIR awards.

Because of year-to-year fluctuations, this indicator is calculated using 3-year averages. The average annual SBIR award dollars won by small businesses in a state are divided by the average annual gross domestic product. A high value indicates that small business firms in a state are doing cutting-edge development work that attracts federal support.

Table 8-44
Average annual federal SBIR funding per $1 million of gross domestic product, by state: 1995–97, 1999–2001, and 2003–05

State	Average SBIR funding ($thousands)			Average state GDP ($millions)			SBIR funding ($)/ $1 million of GDP		
	1995–97	1999–2001	2003–05	1999–97	1999–2001	2003–05	1995–97	1999–2001	2003–05
United States	998,381	1,087,387	1,877,206	7,687,788	9,669,468	11,630,863	130	112	161
Alabama	21,780	18,081	34,425	98,165	115,060	141,085	222	157	244
Alaska	416	589	682	25,924	25,988	35,114	16	23	19
Arizona	14,899	20,981	29,176	113,354	157,470	196,152	131	133	149
Arkansas	146	1,459	4,989	56,168	67,114	81,480	3	22	61
California	222,268	224,699	396,052	965,361	1,256,262	1,512,772	230	179	262
Colorado	38,530	57,727	82,889	117,345	168,741	200,047	328	342	414
Connecticut	31,192	18,208	30,596	128,332	158,588	182,418	243	115	168
Delaware	4,307	4,785	6,756	29,220	41,706	52,591	147	115	128
District of Columbia	2,589	4,650	4,342	48,037	59,612	77,376	54	78	56
Florida	21,025	24,095	41,373	362,477	470,440	610,954	58	51	68
Georgia	7,493	11,933	17,979	214,879	289,137	337,970	35	41	53
Hawaii	2,993	3,800	8,306	37,151	40,216	50,665	81	94	164
Idaho	1,013	1,320	4,061	28,213	34,424	42,245	36	38	96
Illinois	12,097	17,018	25,857	379,354	461,469	533,420	32	37	48
Indiana	5,505	5,537	12,985	155,901	191,784	227,136	35	29	57
Iowa	665	1,704	3,777	77,010	89,406	110,490	9	19	34
Kansas	2,857	2,984	4,825	68,058	82,635	99,304	42	36	49
Kentucky	2,708	2,629	4,271	95,764	113,498	131,782	28	23	32
Louisiana	1,344	1,988	4,372	115,288	129,752	163,236	12	15	27
Maine	2,046	2,770	6,172	28,743	35,344	42,730	71	78	144
Maryland	42,552	53,590	103,691	144,187	181,466	228,970	295	295	453
Massachusetts	152,375	164,626	253,901	208,863	269,358	307,791	730	611	825
Michigan	20,248	17,629	41,062	264,568	332,602	364,853	77	53	113
Minnesota	17,242	14,500	26,135	141,752	182,733	220,748	122	79	118
Mississippi	1,006	1,739	3,675	56,030	64,421	76,193	18	27	48
Missouri	2,222	3,963	8,067	145,677	176,017	205,118	15	23	39
Montana	1,285	5,630	7,429	18,053	21,414	27,744	71	263	268
Nebraska	943	1,969	3,359	47,547	55,440	68,282	20	36	49
Nevada	1,656	2,751	6,871	54,003	73,284	99,109	31	38	69
New Hampshire	14,564	12,825	20,737	34,703	42,670	51,324	420	301	404
New Jersey	30,943	32,380	49,318	281,557	345,025	408,629	110	94	121
New Mexico	18,184	21,530	22,009	44,225	50,361	63,674	411	428	346
New York	47,360	40,693	88,804	630,846	771,996	906,645	75	53	98
North Carolina	11,556	12,646	28,500	203,755	274,008	327,113	57	46	87
North Dakota	742	1,391	2,020	15,552	17,711	23,107	48	79	87
Ohio	34,970	43,771	76,282	308,011	369,113	423,068	114	119	180
Oklahoma	2,135	2,943	8,718	74,657	89,102	112,137	29	33	78
Oregon	14,841	13,359	22,383	89,588	109,208	132,828	166	122	169
Pennsylvania	34,431	37,231	73,221	327,334	390,814	463,770	105	95	158
Rhode Island	2,417	3,791	8,200	27,094	33,200	41,731	89	114	196
South Carolina	1,072	3,439	7,927	90,070	112,824	133,440	12	30	59
South Dakota	681	1,011	1,047	18,793	22,861	29,159	36	44	36
Tennessee	8,812	9,078	9,660	142,663	175,027	213,225	62	52	45
Texas	33,955	40,169	80,597	554,252	719,492	907,514	61	56	89
Utah	9,660	9,285	15,231	50,776	67,170	81,617	190	138	187
Vermont	2,820	3,477	5,875	14,661	17,799	21,878	192	195	269
Virginia	60,204	64,819	101,364	196,908	260,061	326,233	306	249	311
Washington	23,336	25,187	48,596	162,503	220,700	254,859	144	114	191
West Virginia	503	2,516	6,677	37,408	41,982	49,815	13	60	134
Wisconsin	8,930	11,030	19,944	141,561	175,562	207,053	63	63	96
Wyoming	863	1,462	2,021	15,447	17,401	24,269	56	84	83
Puerto Rico	23	207	503	45,392	62,917	78,896	1	3	6

GDP = gross domestic product; SBIR = Small Business Innovation Research

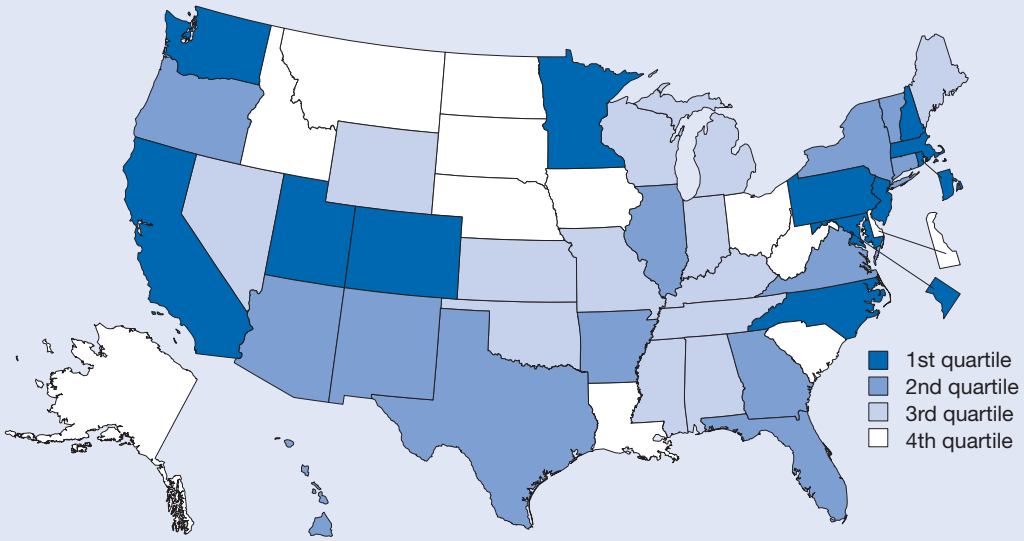
NOTES: GDP reported in current dollars.

SOURCES: Small Business Administration, Office of Technology, SBIR program statistics (various years); Bureau of Economic Analysis, Gross Domestic Product data; and Government of Puerto Rico, Office of the Governor.

Science & Engineering Indicators 2008

Venture Capital Disbursed per $1,000 of Gross Domestic Product

Figure 8-45
Venture capital disbursed per $1,000 of gross domestic product: 2006



1st quartile ($8.51–$1.31)	2nd quartile ($1.30–$0.29)	3rd quartile ($0.28–$0.10)	4th quartile ($0.09–$0.00)
California	Arizona	Alabama	Alaska
Colorado	Arkansas	Indiana	Delaware
District of Columbia	Connecticut	Kansas	Idaho
Maryland	Florida	Kentucky	Iowa
Massachusetts	Georgia	Maine	Louisiana
Minnesota	Hawaii	Michigan	Montana
New Hampshire	Illinois	Mississippi	Nebraska
New Jersey	New Mexico	Missouri	North Dakota
North Carolina	New York	Nevada	Ohio
Pennsylvania	Oregon	Oklahoma	South Carolina
Rhode Island	Texas	Tennessee	South Dakota
Utah	Vermont	Wisconsin	West Virginia
Washington	Virginia	Wyoming	

SOURCES: PricewaterhouseCoopers, Venture Economics, and National Venture Capital Association, MoneyTree Survey, special tabulations; and Bureau of Economic Analysis, Gross Domestic Product data. See table 8-45.

Findings

- The amount of venture capital invested in the United States increased approximately 10-fold, from only $11 billion in 1996 to a record $106 billion in 2000, before falling to $26 billion in 2006 (in current dollars).
- In 2006, the state average for venture capital disbursed per $1,000 GDP was $1.98, which was larger than the $1.47 invested in 1996 but only about one-half the fraction of GDP invested in 2001.
- Venture capital is concentrated in relatively few states. Companies in California received 48% of the total venture capital disbursed in the United States in 2006, followed by companies in Massachusetts with 11%.
- The distribution of venture capital among states is becoming more limited. Twenty-one states reported lower values for this indicator in 2006 than in 1996.
- The state distribution of venture capital was similar to that for the high-technology indicators.

Venture capital represents an important source of funding for startup companies. This indicator shows the relative magnitude of venture capital investments in a state after adjusting for the size of the state's economy. The indicator is expressed as dollars of venture capital disbursed per $1,000 of gross domestic product (GDP). A high value indicates that companies in those states are successfully attracting venture capital to fuel their growth.

Venture capital investments represent a method of funding the growth and expansion of companies early in their development before establishing a predictable sales history that would qualify them for other types of financing. Access to this type of financing varies greatly in different states.

Table 8-45
Venture capital disbursed per $1,000 of gross domestic product, by state: 1996, 2001, and 2006

State	Venture capital disbursed ($thousands)			State GDP ($millions)			Venture capital ($)/ $1,000 GDP		
	1996	2001	2006	1996	2001	2006	1996	2001	2006
United States	11,270,035	40,664,265	26,075,607	7,659,648	10,058,169	13,149,033	1.47	4.04	1.98
Alabama	50,170	80,347	18,895	97,941	118,682	160,569	0.51	0.68	0.12
Alaska	0	0	0	26,083	26,609	41,105	0.00	0.00	0.00
Arizona	95,347	196,804	270,796	113,138	165,358	232,463	0.84	1.19	1.16
Arkansas	0	10,400	39,181	56,455	68,927	91,837	0.00	0.15	0.43
California	4,558,144	16,694,055	12,577,804	958,476	1,301,050	1,727,355	4.76	12.83	7.28
Colorado	318,354	1,263,862	643,352	116,045	178,078	230,478	2.74	7.10	2.79
Connecticut	142,694	535,779	247,117	126,744	165,025	204,134	1.13	3.25	1.21
Delaware	4,742	164,630	0	28,885	44,206	60,361	0.16	3.72	0.00
District of Columbia	7,113	162,181	114,927	47,560	63,730	87,664	0.15	2.54	1.31
Florida	412,331	895,125	317,110	362,950	497,423	713,505	1.14	1.80	0.44
Georgia	274,324	931,562	357,314	215,128	299,442	379,550	1.28	3.11	0.94
Hawaii	20,150	37,811	17,132	36,959	41,822	58,307	0.55	0.90	0.29
Idaho	133	2,700	0	28,152	35,631	49,907	0.00	0.08	0.00
Illinois	362,761	958,237	407,650	377,271	476,461	589,598	0.96	2.01	0.69
Indiana	22,766	53,755	68,932	155,512	195,196	248,915	0.15	0.28	0.28
Iowa	22,100	6,041	0	77,244	91,920	123,970	0.29	0.07	0.00
Kansas	25,162	39,923	11,000	67,965	86,430	111,699	0.37	0.46	0.10
Kentucky	31,097	23,855	34,710	94,987	115,113	145,959	0.33	0.21	0.24
Louisiana	13,660	80,450	11,450	114,967	133,689	193,138	0.12	0.60	0.06
Maine	1,467	3,878	7,649	28,636	37,129	46,973	0.05	0.10	0.16
Maryland	137,409	1,001,492	657,280	142,910	192,659	257,815	0.96	5.20	2.55
Massachusetts	1,075,645	4,779,022	2,874,103	208,288	280,509	337,570	5.16	17.04	8.51
Michigan	85,666	156,285	103,009	263,871	334,419	381,003	0.32	0.47	0.27
Minnesota	172,950	478,587	323,978	141,664	190,231	244,546	1.22	2.52	1.32
Mississippi	10,580	30,000	9,140	55,997	65,961	84,225	0.19	0.45	0.11
Missouri	47,881	248,870	62,058	145,044	182,362	225,876	0.33	1.36	0.27
Montana	0	24,820	0	17,998	22,471	32,322	0.00	1.10	0.00
Nebraska	10,436	58,963	6,500	48,317	57,438	75,700	0.22	1.03	0.09
Nevada	1,985	28,250	18,400	54,085	77,291	118,399	0.04	0.37	0.16
New Hampshire	42,628	224,616	75,857	34,823	44,279	56,276	1.22	5.07	1.35
New Jersey	402,077	1,510,888	780,017	281,806	362,987	453,177	1.43	4.16	1.72
New Mexico	22,412	14,215	30,118	43,658	51,359	75,910	0.51	0.28	0.40
New York	406,025	2,104,368	1,285,864	630,003	808,537	1,021,944	0.64	2.60	1.26
North Carolina	184,939	589,751	510,345	201,329	285,651	374,525	0.92	2.06	1.36
North Dakota	0	1,017	0	16,075	18,527	26,385	0.00	0.05	0.00
Ohio	162,972	233,615	43,508	305,413	374,719	461,302	0.53	0.62	0.09
Oklahoma	31,803	29,800	13,834	74,936	94,329	134,651	0.42	0.32	0.10
Oregon	94,973	233,391	143,287	91,166	110,916	151,301	1.04	2.10	0.95
Pennsylvania	305,140	960,191	763,712	325,515	406,713	510,293	0.94	2.36	1.50
Rhode Island	300	118,709	113,505	26,665	35,149	45,660	0.01	3.38	2.49
South Carolina	91,850	97,141	9,994	89,260	117,296	149,214	1.03	0.83	0.07
South Dakota	0	500	0	19,073	23,910	32,330	0.00	0.02	0.00
Tennessee	146,787	212,801	47,000	141,335	180,582	238,029	1.04	1.18	0.20
Texas	532,761	2,945,371	1,387,544	550,014	762,247	1,065,891	0.97	3.86	1.30
Utah	52,270	210,147	168,564	51,442	70,109	97,749	1.02	3.00	1.72
Vermont	2,000	11,600	10,143	14,632	18,828	24,213	0.14	0.62	0.42
Virginia	453,255	978,848	391,793	196,638	276,762	369,260	2.31	3.54	1.06
Washington	412,415	1,145,091	1,030,511	161,760	225,765	293,531	2.55	5.07	3.51
West Virginia	0	1,400	3,724	37,346	43,365	55,658	0.00	0.03	0.07
Wisconsin	20,361	93,121	60,300	141,755	181,936	227,230	0.14	0.51	0.27
Wyoming	0	0	6,500	15,732	18,941	29,561	0.00	0.00	0.22
Puerto Rico	4,080	32,000	14,291	45,341	69,208	86,464	0.09	0.46	0.17

GDP = gross domestic product

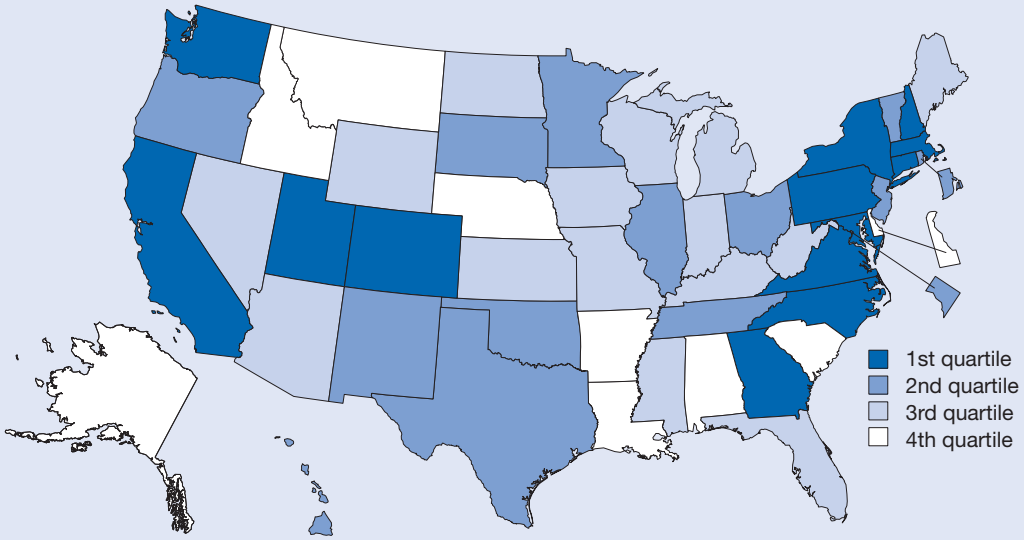
NOTES: GDP reported in current dollars. Preliminary Puerto Rico 2006 GDP.

SOURCES: PricewaterhouseCoopers, Venture Economics, and National Venture Capital Association, MoneyTree Survey, special tabulations; Bureau of Economic Analysis, Gross Domestic Product data; and Government of Puerto Rico, Office of the Governor.

Science & Engineering Indicators 2008

Venture Capital Deals as Share of High-Technology Business Establishments

Figure 8-46
Venture capital deals as share of high-technology business establishments: 2004



1st quartile (2.11%–0.37%)	2nd quartile (0.36%–0.16%)	3rd quartile (0.15%–0.09%)	4th quartile ($0.08%–0.00%)
California	District of Columbia	Arizona	Alabama
Colorado	Hawaii	Florida	Alaska
Connecticut	Illinois	Indiana	Arkansas
Georgia	Minnesota	Iowa	Delaware
Maryland	New Jersey	Kansas	Idaho
Massachusetts	New Mexico	Kentucky	Louisiana
New Hampshire	Ohio	Maine	Montana
New York	Oklahoma	Michigan	Nebraska
North Carolina	Oregon	Mississippi	South Carolina
Pennsylvania	Rhode Island	Missouri	
Utah	South Dakota	Nevada	
Virginia	Tennessee	North Dakota	
Washington	Texas	West Virginia	
	Vermont	Wisconsin	
		Wyoming	

SOURCE: SOURCES: PricewaterhouseCoopers, Venture Economics, and National Venture Capital Association, MoneyTree Survey, special tabulations; and Census Bureau, 1989–2004 Business Information Tracking Series, special tabulations. See table 8-46.

Findings

- The number of venture capital deals that involved U.S. companies fell from a high of 7,900 deals in 2000 to a fairly consistent value of 2,900–3,100 deals annually during the period of 2002–04.
- In 2004, the distribution of venture capital among high-technology companies was uneven between states. Companies in only five states exceeded the national average of 0.50%.
- Companies in high-technology industries located in Massachusetts were the most successful in accessing venture capital investments in 2004 with a 2.1% rate. This was less than half the rate of Massachusetts companies that received such funding in 2000. California companies in high-technology industries obtained venture capitol investment at a rate of 1.6%. No other states exceeded a rate of 1%.
- In 2004, no venture capital deals were reported in Alaska, Montana, or Nebraska.

This indicator provides a measure of the extent to which high-technology companies in a state receive venture capital investments. The value of the indicator is calculated by dividing the number of venture capital deals by the number of companies operating in high-technology industries in that state. In most cases, a company will not receive more than one infusion of venture capital in a given year.

Venture capital investment can bring needed capital and management expertise that can help to grow a high-technology company. High values indicate that high-technology companies in a state are frequently using venture capital to facilitate their growth and development.

Table 8-46
Venture capital deals as share of high-technology business establishments, by state: 2003 and 2004

State	Venture capital deals		High-technology establishments		Venture capital deals/ high-technology establishment (%)	
	2003	2004	2003	2004	2003	2004
United States	2,903	3,036	590,417	603,642	0.49	0.50
Alabama	9	5	6,347	6,407	0.14	0.08
Alaska	0	0	1,345	1,358	0.00	0.00
Arizona	16	12	10,433	10,901	0.15	0.11
Arkansas	3	1	4,012	4,142	0.07	0.02
California	1,122	1,225	77,614	79,288	1.45	1.55
Colorado	72	75	15,532	16,027	0.46	0.47
Connecticut	34	32	7,827	7,794	0.43	0.41
Delaware	1	1	3,964	3,907	0.03	0.03
District of Columbia	6	8	2,589	2,695	0.23	0.30
Florida	61	57	38,118	40,165	0.16	0.14
Georgia	55	73	18,820	19,424	0.29	0.38
Hawaii	6	4	2,097	2,152	0.29	0.19
Idaho	5	2	2,515	2,582	0.20	0.08
Illinois	58	51	27,606	28,200	0.21	0.18
Indiana	8	9	9,626	9,858	0.08	0.09
Iowa	1	4	4,316	4,324	0.02	0.09
Kansas	2	9	5,716	5,900	0.03	0.15
Kentucky	3	5	5,453	5,585	0.06	0.09
Louisiana	1	3	7,218	7,192	0.01	0.04
Maine	2	3	2,466	2,541	0.08	0.12
Maryland	84	85	13,428	13,974	0.63	0.61
Massachusetts	378	365	17,183	17,305	2.20	2.11
Michigan	17	19	16,937	16,988	0.10	0.11
Minnesota	58	47	12,834	13,055	0.45	0.36
Mississippi	4	5	3,269	3,274	0.12	0.15
Missouri	23	10	9,562	9,745	0.24	0.10
Montana	1	0	2,108	2,229	0.05	0.00
Nebraska	2	0	2,797	2,864	0.07	0.00
Nevada	6	5	5,387	5,493	0.11	0.09
New Hampshire	32	23	3,511	3,559	0.91	0.65
New Jersey	88	88	24,286	24,256	0.36	0.36
New Mexico	5	8	3,322	3,385	0.15	0.24
New York	119	149	35,926	36,706	0.33	0.41
North Carolina	76	57	14,869	15,426	0.51	0.37
North Dakota	2	1	964	972	0.21	0.10
Ohio	25	32	19,875	20,120	0.13	0.16
Oklahoma	2	11	6,859	6,965	0.03	0.16
Oregon	21	27	7,500	7,659	0.28	0.35
Pennsylvania	90	92	22,266	22,796	0.40	0.40
Rhode Island	10	7	1,976	2,043	0.51	0.34
South Carolina	4	5	5,869	6,048	0.07	0.08
South Dakota	1	3	1,206	1,234	0.08	0.24
Tennessee	22	23	8,196	8,226	0.27	0.28
Texas	165	162	45,062	45,522	0.37	0.36
Utah	22	27	5,474	5,716	0.40	0.47
Vermont	6	4	1,453	1,498	0.41	0.27
Virginia	80	73	18,868	19,758	0.42	0.37
Washington	81	114	13,171	13,480	0.61	0.85
West Virginia	5	3	2,257	2,259	0.22	0.13
Wisconsin	8	10	9,035	9,249	0.09	0.11
Wyoming	1	2	1,353	1,396	0.07	0.14
Puerto Rico	1	1	NA	NA	NA	NA

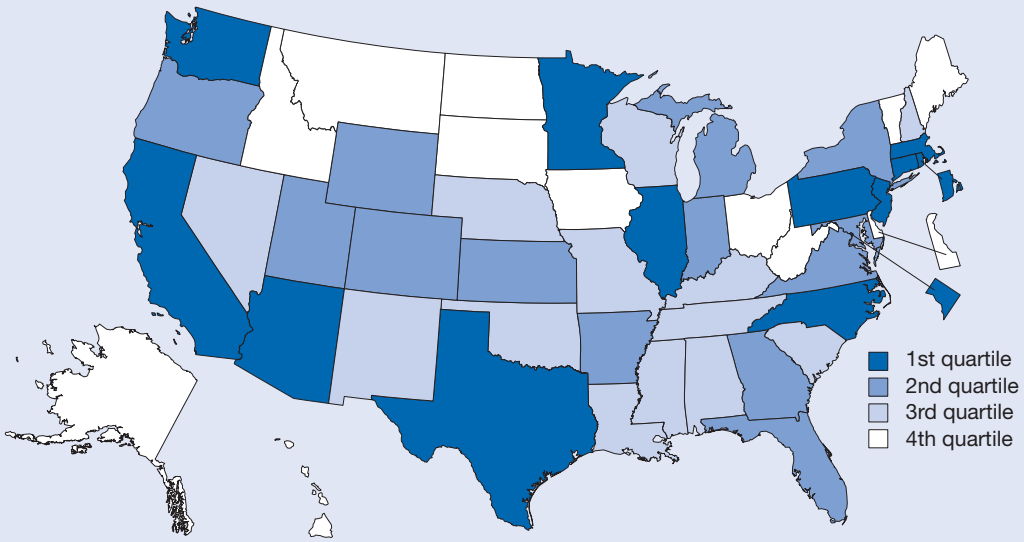
NA = not available

SOURCES: PricewaterhouseCoopers, Venture Economics, and National Venture Capital Association, MoneyTree Survey, special tabulations; and Census Bureau, 1989–2004 Business Information Tracking Series, special tabulations.

Science & Engineering Indicators 2008

Venture Capital Disbursed per Venture Capital Deal

Figure 8-47
Venture capital disbursed per venture capital deal: 2006



1st quartile ($16.22–$7.29)	2nd quartile ($6.87–$4.62)	3rd quartile ($4.34–$2.17)	4th quartile ($1.91–$0.00)
Arizona	Arkansas	Alabama	Alaska
California	Colorado	Kentucky	Delaware
Connecticut	Florida	Louisiana	Hawaii
District of Columbia	Georgia	Mississippi	Idaho
Illinois	Indiana	Missouri	Iowa
Massachusetts	Kansas	Nebraska	Maine
Minnesota	Maryland	Nevada	Montana
New Jersey	Michigan	New Hampshire	North Dakota
North Carolina	New York	New Mexico	Ohio
Pennsylvania	Oregon	Oklahoma	South Dakota
Rhode Island	Utah	South Carolina	Vermont
Texas	Virginia	Tennessee	West Virginia
Washington	Wyoming	Wisconsin	

SOURCE: PricewaterhouseCoopers, Venture Economics, and National Venture Capital Association, MoneyTree Survey, special tabulations. See table 8-47.

Findings

- The size of the average venture capital investment in the United States rose over the past decade to more than $7 million per deal in 2006. This average represented an increase in investment size from $4 million per deal in 1996 and $5 million per deal in 1998 but a decline from $13 million per deal in 2000.
- The total number of venture capital deals began to rise again during the past few years, increasing from 2,872 in 2004 to 3,519 in 2006.
- The state distribution on this indicator was skewed in 2006; only 11 states and the District of Columbia were above the national average, and 7 states reported no venture capital investments.
- The value of this indicator has shown a high level of variability during the past decade both at the national level and for individual states.

This indicator provides a measure of the average size of the venture capital investments being made in a state. The indicator is expressed as the total dollars of venture capital invested in millions divided by the number of companies receiving venture capital. The availability of venture capital may vary widely based on local business climate and entrepreneurial activity. The amount also will vary by stage of investment and type of company.

This indicator provides some measure of the magnitude of investment that developing companies in a specific state have attracted from venture capital sources. High values indicate a large average deal size.

Some states have relatively few venture capital deals taking place in a given year; thus, the value of this indicator may show large fluctuations on a year-to-year basis. This variation is further compounded by the large change in total venture capital investments that has occurred since 2000, making the use of a 3-year average of state investments misleading. Twenty-three states reported fewer than 10 venture capital deals in 2006. In such states, a single large or small venture capital investment can significantly affect the value of this indicator.

Table 8-47
Venture capital disbursed per venture capital deal, by state: 1996, 2001, and 2006

State	Venture capital disbursed ($thousands)			Venture capital deals			Venture capital/deal ($millions)		
	1996	2001	2006	1996	2001	2006	1996	2001	2006
United States	11,270,037	40,664,265	26,075,607	2,566	4,473	3,519	4.39	9.09	7.41
Alabama	50,170	80,347	18,895	8	16	7	6.27	5.02	2.70
Alaska	0	0	0	0	0	0	0.00	0.00	0.00
Arizona	95,347	196,804	270,796	28	32	31	3.41	6.15	8.74
Arkansas	0	10,400	39,181	0	3	6	0.00	3.47	6.53
California	4,558,144	16,694,055	12,577,804	1,018	1,528	1,495	4.48	10.93	8.41
Colorado	318,354	1,263,862	643,352	79	113	96	4.03	11.18	6.70
Connecticut	142,694	535,779	247,117	44	69	30	3.24	7.76	8.24
Delaware	4,742	164,630	0	4	2	1	1.19	82.32	0.00
District of Columbia	7,113	162,181	114,927	4	24	14	1.78	6.76	8.21
Florida	412,331	895,125	317,110	56	113	56	7.36	7.92	5.66
Georgia	274,324	931,562	357,314	54	139	75	5.08	6.70	4.76
Hawaii	20,150	37,811	17,132	2	5	11	10.08	7.56	1.56
Idaho	133	2,700	0	1	2	0	0.13	1.35	0.00
Illinois	362,761	958,237	407,650	54	126	54	6.72	7.61	7.55
Indiana	22,766	53,755	68,932	8	6	13	2.85	8.96	5.30
Iowa	22,100	6,041	0	6	4	1	3.68	1.51	0.00
Kansas	25,162	39,923	11,000	8	9	2	3.15	4.44	5.50
Kentucky	31,097	23,855	34,710	7	4	8	4.44	5.96	4.34
Louisiana	13,660	80,450	11,450	4	11	3	3.42	7.31	3.82
Maine	1,467	3,878	7,649	5	5	4	0.29	0.78	1.91
Maryland	137,409	1,001,492	657,280	45	92	109	3.05	10.89	6.03
Massachusetts	1,075,645	4,779,022	2,874,103	287	512	380	3.75	9.33	7.56
Michigan	85,666	156,285	103,009	21	24	15	4.08	6.51	6.87
Minnesota	172,950	478,587	323,978	53	85	38	3.26	5.63	8.53
Mississippi	10,580	30,000	9,140	3	3	3	3.53	10.00	3.05
Missouri	47,881	248,870	62,058	21	18	16	2.28	13.83	3.88
Montana	0	24,820	0	0	2	0	0.00	12.41	0.00
Nebraska	10,436	58,963	6,500	5	7	3	2.09	8.42	2.17
Nevada	1,985	28,250	18,400	2	4	6	0.99	7.06	3.07
New Hampshire	42,628	224,616	75,857	16	30	22	2.66	7.49	3.45
New Jersey	402,077	1,510,888	780,017	63	151	88	6.38	10.01	8.86
New Mexico	22,412	14,215	30,118	5	4	8	4.48	3.55	3.76
New York	406,025	2,104,368	1,285,864	91	289	196	4.46	7.28	6.56
North Carolina	184,939	589,751	510,345	61	91	70	3.03	6.48	7.29
North Dakota	0	1,017	0	0	1	0	0.00	1.02	0.00
Ohio	162,972	233,615	43,508	53	43	31	3.07	5.43	1.40
Oklahoma	31,803	29,800	13,834	7	7	5	4.54	4.26	2.77
Oregon	94,973	233,391	143,287	30	44	31	3.17	5.30	4.62
Pennsylvania	305,140	960,191	763,712	82	135	101	3.72	7.11	7.56
Rhode Island	300	118,709	113,505	1	11	7	0.30	10.79	16.22
South Carolina	91,850	97,141	9,994	13	5	4	7.07	19.43	2.50
South Dakota	0	500	0	0	1	1	0.00	0.50	0.00
Tennessee	146,787	212,801	47,000	24	29	11	6.12	7.34	4.27
Texas	532,761	2,945,371	1,387,544	131	329	179	4.07	8.95	7.75
Utah	52,270	210,147	168,564	15	43	35	3.48	4.89	4.82
Vermont	2,000	11,600	10,143	1	3	9	2.00	3.87	1.13
Virginia	453,255	978,848	391,793	62	137	84	7.31	7.14	4.66
Washington	412,415	1,145,091	1,030,511	76	139	138	5.43	8.24	7.47
West Virginia	0	1,400	3,724	0	2	2	0.00	0.70	1.86
Wisconsin	20,361	93,121	60,300	8	21	19	2.55	4.43	3.17
Wyoming	0	0	6,500	0	0	1	0.00	0.00	6.50
Puerto Rico	4,080	32,000	14,291	5	5	3	0.82	6.40	4.76

SOURCE: PricewaterhouseCoopers, Venture Economics, and National Venture Capital Association, MoneyTree Survey, special tabulations.

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Technical Note: Defining High-Technology Industries

Although there is no consensus on the identity of high-technology industries, this chapter utilizes a modification of the approach employed by the Bureau of Labor Statistics (BLS). That approach is based on the intensity of high-technology employment within an industry. High-technology occupations include scientific, engineering, and technician occupations. These occupations employ workers who possess an in-depth knowledge of the theories and principles of science, engineering, and mathematics, which are generally acquired through postsecondary education in some field of technology. An industry is considered a high-technology industry if employment in technology-oriented occupations accounts for a proportion of that industry's total employment that is at least twice the 4.9% average for all industries (i.e., 9.8% or higher). Level I high-technology industries include the 14 industries in which technology-oriented employment is at least 5 times the average for all industries, or 24.7%. Level II high-technology industries

Table 8-48
2002 NAICS codes that constitute high-technology industries

NAICS code	Industry
Level I industries	
3254	Pharmaceutical and medicine manufacturing
3341	Computer and peripheral equipment manufacturing
3342	Communications equipment manufacturing
3344	Semiconductor and other electronic component manufacturing
3345	Navigational, measuring, electromedical, and control instruments manufacturing
3364	Aerospace product and parts manufacturing
5112	Software publishers
5161	Internet publishing and broadcasting
5179	Other telecommunications
5181	Internet service providers and Web search portals
5182	Data processing, hosting, and related services
5413	Architectural, engineering, and related services
5415	Computer systems design and related services
5417	Scientific research and development services
Level II industries	
1131,32	Forestry
2111	Oil and gas extraction
2211	Electric power generation, transmission, and distribution
3251	Basic chemical manufacturing
3252	Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing
3332	Industrial machinery manufacturing
3333	Commercial and service industry machinery manufacturing
3343	Audio and video equipment manufacturing
3346	Manufacturing and reproducing magnetic and optical media
4234	Professional and commercial equipment and supplies, merchant wholesalers
5416	Management, scientific, and technical consulting services
Level III industries	
3241	Petroleum and coal products manufacturing
3253	Pesticide, fertilizer, and other agricultural chemical manufacturing
3255	Paint, coating, and adhesive manufacturing
3259	Other chemical product and preparation manufacturing
3336	Engine, turbine, and power transmission equipment manufacturing
3339	Other general purpose machinery manufacturing
3353	Electrical equipment manufacturing
3369	Other transportation equipment manufacturing
4861	Pipeline transportation of crude oil
4862	Pipeline transportation of natural gas
4869	Other pipeline transportation
5171	Wired telecommunications carriers
5172	Wireless telecommunications carriers (except satellite)
5173	Telecommunications resellers
5174	Satellite telecommunications
5211	Monetary authorities, central bank
5232	Securities and commodity exchanges
5511	Management of companies and enterprises
5612	Facilities support services
8112	Electronic and precision equipment repair and maintenance

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include the 12 industries in which the high-technology occupations are 3.0–4.9 times the average or 14.8%–24.7% of total employment. Level III high-technology industries include the 20 industries with a proportion of high-technology employment that is 2.0–2.9 times the industry average or 9.8%–14.7% of total employment.

In each case, the industry is defined by a four-digit code that is based on the listings in the 2002 North American Industry Classification System (NAICS). The 2002 NAICS codes contain a number of new additions and changes from the previous 1997 NAICS codes that were used to classify business establishments in datasets covering the period 1998–2002. Therefore, this listing of high-technology industry codes can be applied only to datasets covering the years after 2002 when the 2002 NAICS codes were used to classify business establishments.

The BLS methodology includes the "Federal Government, excluding Postal Service" in its listing of high-technology industries. However, in this chapter "high-technology industries" is used in indicators that refer to business establishments and employment in those business establishments. These indicators are intended to measure private-sector activity. For this reason, "Federal Government, excluding Postal Service" was deleted from the list of high-technology industries. With this deletion, the list of high-technology industries used in this chapter includes the 46 four-digit codes from the 2002 NAICS listing shown in table 8-48.

Reference

Hecker D. 2005. High-technology employment: A NAICS-based update. *Monthly Labor Review* 128(7):57–72.