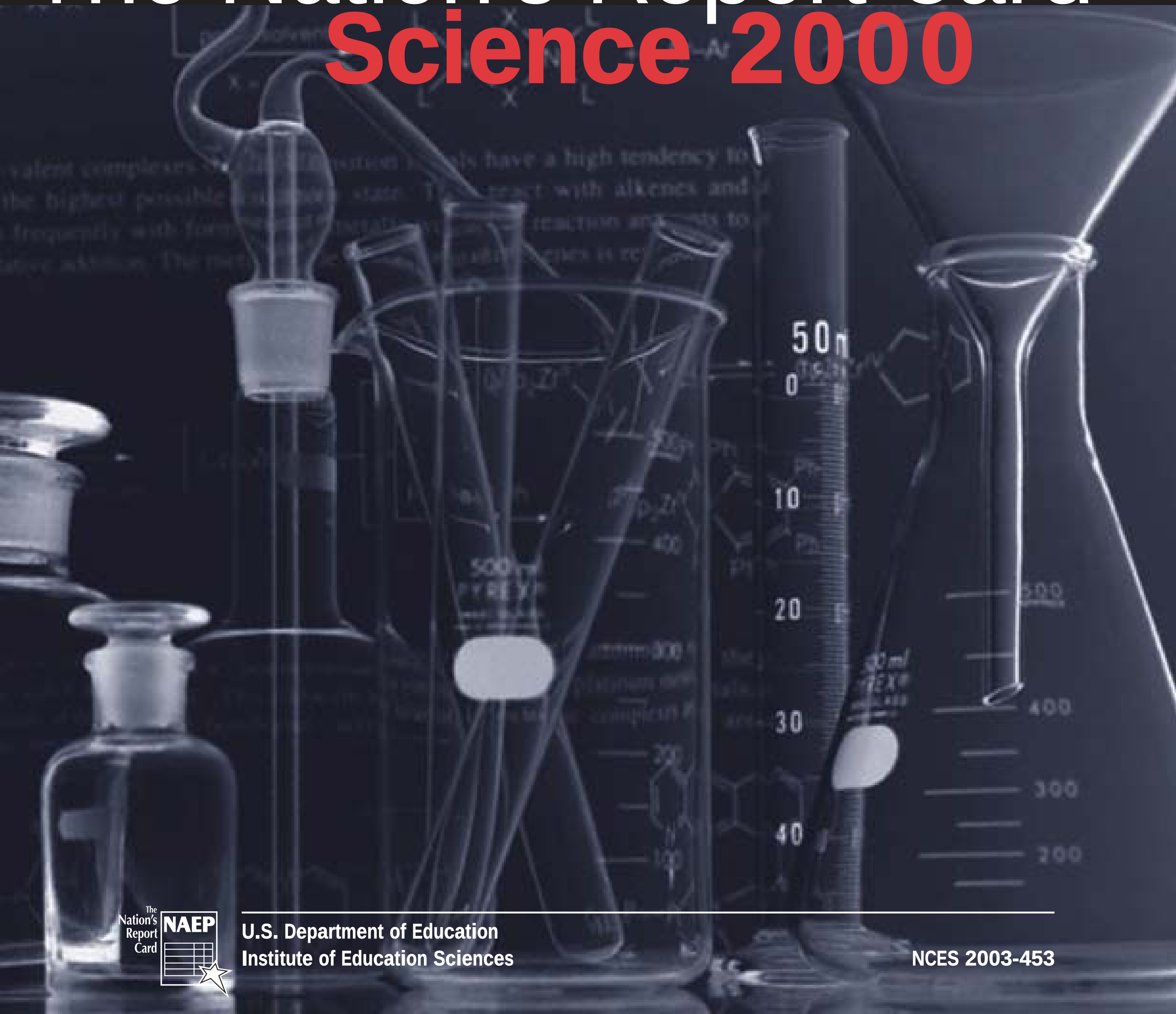
National Center for Education Statistics

The Nation's Report Card

Science 2000



The Nation's Report Card NAEP

U.S. Department of Education
Institute of Education Sciences

NCES 2003-453

What is The Nation's Report Card?

THE NATION'S REPORT CARD, the National Assessment of Educational Progress (NAEP), is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. Since 1969, assessments have been conducted periodically in reading, mathematics, science, writing, history, geography, and other fields. By making objective information on student performance available to policymakers at the national, state, and local levels, NAEP is an integral part of our nation's evaluation of the condition and progress of education. Only information related to academic achievement is collected under this program. NAEP guarantees the privacy of individual students and their families.

NAEP is conducted under the legislative authority of Congress. The Commissioner of the National Center for Education Statistics, under the U.S. Department of Education, is responsible by law for carrying out the NAEP project through competitive awards to qualified organizations. NAEP reports directly to the Commissioner, who is also responsible for providing continuing reviews, including validation studies and solicitation of public comment, on NAEP's conduct and usefulness.

In 1988, Congress established the National Assessment Governing Board (NAGB) to formulate policy guidelines for NAEP. The Board is responsible for selecting the subject areas to be assessed from among those included in the National Education Goals; for setting appropriate student performance levels; for developing assessment objectives and test specifications through a national consensus approach; for designing the assessment methodology; for developing guidelines for reporting and disseminating NAEP results; for developing standards and procedures for interstate, regional, and national comparisons; for determining the appropriateness of test items and ensuring they are free from bias; and for taking actions to improve the form and use of the National Assessment.

The National Assessment Governing Board

National Center for Education Statistics

The Nation's Report Card

Science 2000

Christine Y. O'Sullivan

Mary A. Lauko

Wendy S. Grigg

Jiahe Qian

Jinming Zhang

In collaboration with

Steven P. Isham

Youn-Hee Lim

Satwinder Thind

Lois Worthington

January 2003

U.S. Department of Education
Institute of Education Sciences

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U.S. Department of Education
Rod Paige
Secretary

Institute of Education Sciences
Grover J. Whitehurst
Director

National Center for Education Statistics
Val Plisko
Associate Commissioner

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FOR MORE INFORMATION
Content contact:
Taslima Rahman
202–502–7316

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Executive Summary

The National Assessment of Educational Progress (NAEP) is the nation's only ongoing representative sample survey of student achievement in core subject areas. In 2000, NAEP conducted a national science assessment of fourth-, eighth-, and twelfth-grade students. State-level results were also collected at the fourth and eighth grades within participating states and jurisdictions.

Authorized by Congress and administered by the National Center for Education Statistics (NCES) in the U.S. Department of Education, NAEP regularly reports to the public on the educational progress of students in grades 4, 8, and 12. This report presents the results of the NAEP 2000 science assessment for the nation and the states. Results in 2000 are compared to results from the 1996 science assessment. Students' performance on the assessment is described in terms of average scores on a 0–300 scale for each grade and in terms of the percentages of students attaining three achievement levels: *Basic*, *Proficient*, and *Advanced*. The achievement levels are performance standards adopted by the National Assessment Governing Board (NAGB) as part of its statutory responsibilities and describe what students should know and be able to do. The Governing Board is an independent bipartisan group created by Congress in 1988 to set policy for NAEP.

As provided by law, the Deputy Commissioner of Education Statistics, upon review of a congressionally mandated evaluation of NAEP, determined that the achievement levels are to be considered developmental and should be interpreted and used with caution. However, both the Deputy Commissioner and NAGB believe these performance standards are useful for understanding trends in student achievement. They have been widely used by national and state officials as a common yardstick of academic performance.

In addition to providing average scores and achievement-level performance at the national level and state level, this report presents results for subgroups of students defined by various background and contextual characteristics. This report also contains results for a second sample at both the national and state levels—one in which testing accommodations were provided to students with special needs (i.e., students with disabilities or limited English proficient students).

The results presented in this report are based on representative samples of students for the nation and for participating states and jurisdictions. In the national sample, approximately 47,000 students from 2,100 schools were assessed. In the state samples, approximately 180,000 students from 7,500 schools were assessed. The national sample included students attending both public and nonpublic schools, while the state samples included only students attending public schools.

A summary of overall results from the 2000 NAEP science assessment is presented on the following pages. Differences between results from 1996 and 2000 or between groups of students are discussed only if they have been determined to be statistically significant.

Overall Science Results for the Nation, Regions, and States

Science Results for the Nation:

- Between 1996 and 2000, there was no statistically significant difference observed in the average science scores of fourth- or eighth-grade students. The average score of students in grade 12, however, declined from 150 in 1996 to 147 in 2000.
- In 2000, the percentage of students performing at or above *Proficient*—identified by NAGB as the level that all students should reach—was 29 percent at grade 4, 32 percent at grade 8, and 18 percent at grade 12. The percentage of eighth-graders at or above *Proficient* was higher in 2000 than in 1996. The percentage of twelfth-graders at or above *Basic* declined between 1996 and 2000.
- The 90th percentile score at grade 8 was higher in 2000 than in 1996, indicating improvement for the highest-performing eighth-graders. At grade 12, the 50th percentile score declined between 1996 and 2000, indicating a decline in the performance of middle-performing twelfth-graders.

Science Results for the Regions:

- In 2000, the average scores for fourth- and eighth-graders were higher in the Northeast and Central regions than in the Southeast and West. Among twelfth-graders, average scores were higher in the Northeast and Central regions than in the Southeast.
- Grade 12 students attending schools in the Central region had a lower average score in 2000 than in 1996.

Science Results for the States and Other Jurisdictions:

In the NAEP 2000 state-by-state assessment, results were reported for 39 states and 5 other jurisdictions that participated at grade 4, and 38 states and 4 other jurisdictions at grade 8. Only public schools participated in the state-by-state assessment.

At Grade 4:

- The top six states in 2000 were Iowa, Maine, Massachusetts, Montana, North Dakota, and Vermont. The average scores for these six states were higher than any other participating state but were not found to differ significantly from one another.
- Iowa, Maine, Massachusetts, Montana, and Vermont had percentages of fourth-graders at or above *Proficient* that were higher than the other participating states, but were not found to be significantly different from one another.

At Grade 8:

- The top 10 states and other jurisdictions in 2000 were Idaho, Maine, Massachusetts, Minnesota, Montana, North Dakota, Ohio, Vermont, and the Department of Defense domestic and overseas schools. The state of Montana, however, had an average eighth-grade score that was higher than any other participating state or jurisdiction.
- Between 1996 and 2000, eighth-graders' average scores increased in Missouri and at the Department of Defense domestic and overseas schools. (These results are based on multiple-comparison statistical significance testing procedures including all states or jurisdictions that participated in both years.)
- Massachusetts, Minnesota, Montana, and Ohio all had percentages of eighth-graders at or above *Proficient* that were higher than the percentages in other participating states, but were not found to differ significantly from one another.

National Science Results for Student Subgroups

In addition to overall results for the nation and for states and jurisdictions, NAEP reports on the performance of various subgroups of students. Observed differences between student subgroups in NAEP science performance most likely reflect a range of socioeconomic and educational factors not addressed in this report or by NAEP.

Gender

- In 2000, males had higher average scores than females at grades 4 and 8. The apparent gender difference at grade 12 was not statistically significant.
- Between 1996 and 2000, the average score for eighth-grade males increased, while the average score for twelfth-grade males decreased.
- Between 1996 and 2000, the average score gap favoring males over females widened by three points at grade 4 and by five points at grade 8.

Race/Ethnicity

- In 2000, the average scores of White students at all three grades were higher than those of their Black, Hispanic, or American Indian peers, and American Indian students scored higher on average than Black students.
- Between 1996 and 2000, average scores decreased for eighth-grade American Indian students and for twelfth-grade White students.
- Between 1996 and 2000, no significant difference was observed in the average score gap between White and Black students and between White and Hispanic students at any of the three grades.

Parents' Level of Education

- Generally, students in grades 8 and 12 who reported higher levels of parental education had higher average scores in 2000 than did their peers who reported lower levels of parental education. (Information about parental education was not collected at the fourth grade.)
- Between 1996 and 2000, average scores declined among twelfth-graders who reported that their parents' highest level of education was high school graduation and among those who reported that at least one parent had some education after high school.

Type of School

- At all three grades in 2000, students attending nonpublic schools had higher average scores than their peers attending public schools.
- Between 1996 and 2000, the average score for twelfth-grade public-school students decreased, while the average score for twelfth-grade nonpublic-school students increased.

Type of Location

- In 2000, fourth- and eighth-grade students attending schools in central city locations had lower average scores than their counterparts attending schools in urban fringe/large town or rural/small town locations. At grade 12, there was no statistically significant relationship between school location and students' average scores. (Results by type of location are not available from 1996.)

Free/Reduced-Price School Lunch Eligibility

- At all three grades in 2000, students eligible for the free/reduced-price school lunch program administered by the U.S. Department of Agriculture (USDA) had lower average scores than those who were not eligible. Free/reduced-price school lunches are intended for children at, near, or below the poverty line: eligibility is determined by the USDA's Income Eligibility Guidelines. (http://www.fns.usda.gov/cnd/IEGs&NAPs/IEGs.htm).
- Between 1996 and 2000, the average score of eighth-graders who were eligible for free/reduced-price school lunch decreased, while the average score of eighth-graders who were not eligible increased. Among twelfth-graders, the average score of students who were not eligible decreased between 1996 and 2000.

Becoming a More Inclusive NAEP

A second set of results from the NAEP 2000 science assessment includes the performance of special-needs students who were provided with testing accommodations. A similar set of results is available from 1996 at the national level only, allowing for comparisons between 1996 and 2000 national results based on administration procedures that permitted accommodations.

Science Results for the Nation:

- In 2000, the difference between "accommodations-permitted" and "accommodations-not-permitted" national average scores was not found to be statistically significant at grades 8 and 12. At grade 4, however, the "accommodations-permitted" average score was 2 points lower than the "accommodations-not-permitted" average score.[1]
- Between 1996 and 2000, the national average score for twelfth-graders declined when accommodations were not permitted and when accommodations were permitted.

Science Results for the States and Other Jurisdictions:

- In 2000, none of the apparent differences between "accommodations-permitted" and "accommodations-not-permitted" average scores were found to be statistically significant at either grade 4 or grade 8 for any of the participating states and jurisdictions. (These results are based on multiple-comparison statistical significance testing procedures including all states or jurisdictions that participated in 2000.)

[1] The effects of offering accommodations are examined in greater detail in two forthcoming reports:

Lutkus, A. D., & Mazzeo, J. *Including special-needs students in the NAEP 1998 reading assessment: Part I, comparison of overall results with and without accommodations.* Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (forthcoming).

Lutkus, A. D. *Including special-needs students in the NAEP 1998 reading assessment: Part II, results for students with disabilities and limited English proficient students.* Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (forthcoming).

School Contexts for Learning Science

NAEP collects information about the contexts for student learning by administering questionnaires to assessed students, their teachers, and school administrators. Using the student as the unit of analysis, NAEP examines the relationship between selected contextual variables drawn from these questionnaires and students' average scores on the science assessment. In interpreting these data, readers are reminded that the relationship between contextual variables and student performance is not necessarily causal. There are many factors that may play a role in student performance on NAEP.

Grade 4:

Computer Availability and Use

- In 2000, fourth-graders whose teachers reported that they used computers for science instruction scored higher, on average, than fourth-graders whose teachers reported that they did not.
- Between 1996 and 2000, the percentage of fourth-graders whose teachers reported using computers for science instruction increased from 47 to 57 percent.

Coursework

- In 2000, fourth-graders whose teachers reported spending a lot of time or some time on life science and Earth science had higher average scores than fourth-graders whose teachers reported spending only a little time on these domains.
- In 2000, 31 percent of fourth-grade students were taught by teachers who reported spending a lot of time on life science and Earth science, and 22 percent were taught by teachers who reported spending a lot of time on physical science.
- Between 1996 and 2000, the percentage of fourth-graders whose teachers reported spending a lot of time on Earth science increased from 19 to 31 percent.

Grade 8:

Computer Availability and Use

- In 2000, eighth-graders whose science teachers reported having their students use computers for simulations and modeling or for data analysis and other applications had higher average scores than eighth-graders whose science teachers reported not having students use computers in this manner.
- Between 1996 and 2000, the percentage of eighth-graders whose science teachers reported having their students use computers for data analysis and other applications or for word processing increased.

Coursework

- In 2000, 45 and 47 percent of eighth-graders were taught by teachers who reported spending a lot of time on Earth science and physical science, respectively. Twenty-one percent of eighth-graders were taught by teachers who reported spending a lot of time on life science.

Grade 12:

Computer Use

- In 2000, twelfth-graders who reported using computers to collect data or to analyze data in their science classes once a month or more had higher average scores than twelfth-graders who reported doing so less frequently.
- In 2000, twelfth-graders who reported never downloading data and related information from the Internet for their science classes had lower average scores than twelfth-graders who reported doing so at least sometimes.

Coursework

- Twelfth-graders who reported that they were currently taking a science course in 2000 scored higher, on average, than twelfth-graders who reported that they were not.
- According to twelfth-graders' reports in 2000 about the types of science courses they had taken since eighth-grade, approximately 74 percent had taken Earth science, 92 percent had taken biology, 70 percent had taken chemistry, and 36 percent had taken physics.
- Twelfth-grade students who reported in 2000 that they had taken or were currently enrolled in Advanced Placement (AP) biology, chemistry, or physics had higher average scores than twelfth-grade students who said they had not taken and were not enrolled in these AP courses.

The full set of results is available in an interactive database on the NAEP web site,

http://nces.ed.gov/nationsreportcard

Released test questions from the 1996 and 2000 science assessments and question-level performance data are also available on the web site.

1 NAEP 2000 Science Assessment

Introduction

National and international concern for students' achievement in science has been the impetus for several recent large-scale efforts to measure science knowledge and skills. For example, a repeat of the Third International Mathematics and Science Study (TIMSS-R) was conducted in 38 countries in 1999, 26 of which had also participated in 1995.[1] This assessment, conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA), was given to eighth-graders and measured students' knowledge and skills in the areas of mathematics and science. In 2000, the Program for International Student Assessment (PISA), organized by the Organization for Economic Cooperation and Development (OECD), was given to 15-year-olds in 32 countries for the first time.[2] This series of tests assessed reading literacy, mathematics literacy, and scientific literacy and was designed to measure the functional skills that students have acquired as they near the end of mandatory schooling. In addition to these assessments, in 2000

Chapter Focus

What is the NAEP science assessment?

How does the NAEP science assessment measure and report student progress?

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1 Martin, M. O., Mullis, I.V. S., Gonzalez, E. J., Gregory, K. D., Smith, T. A., Chrostowski, S. J., Garden, R. A., & O'Connor, K. M. (2000). *TIMSS 1999 international science report: Findings from IEA's repeat of the Third International Mathematics and Science Study at the eighth grade.* Chestnut Hill, MA: International Study Center, Lynch School of Education, Boston College.

Gonzales, P., Calsyn, C., Jocelyn, L., Mak, K., Kastberg, D., Arafeh, S., Williams, T., & Tsen, W. (2000). *Pursuing excellence: Comparisons of international eighth-grade mathematics and science achievement from a U.S. perspective, 1995 and 1999* (NCES Publication No. 2001-028). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

2 Lemke, M., Calsyn, C., Lippman, L., Jocelyn, L., Kastberg, D., Liu, Y., Roey, S., Williams, T., Kruger, T., & Bairu, G. (2000). *Outcomes of learning: Results from the 2000 program for international student assessment of 15-year-olds in reading, mathematics, and science literacy* (NCES Publication No. 2002–115). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

the National Assessment of Educational Progress (NAEP) administered assessments in science and mathematics to students at grades 4, 8, and 12, and in reading to students at grade 4. A number of states and other jurisdictions also took part in the science and mathematics assessments at grades 4 and 8. As with the TIMSS-R assessment, the NAEP assessments were designed to measure knowledge and skills in the various content domains.

The results of the TIMSS-R study and PISA study provide valuable information about the achievement of students in the United States vis-à-vis their counterparts throughout the world. For example, TIMSS-R showed that the science performance of eighth-graders in the U.S. was at the international average and no significant change was detected since the first TIMSS administration in 1995, and the PISA study showed that 15-year-olds in the U.S. performed at an average level in science literacy when compared to students in other countries.[3]

A voluntary Benchmarking Study was included as part of TIMSS 1999 that allowed the participating U.S. states and districts or consortia to assess the achievement of their students in an international context. Of the 13 states that participated in the study, all but 3 performed above the international average in science.[4]

The results of the NAEP 2000 science assessment provide important information about the performance of students in the nation, states, and other jurisdictions. This report discusses these results. It summarizes student achievement, compares results from the nation, states, and other jurisdictions, and discusses some of the many contextual variables collected during administration. In addition, the report also compares, where appropriate, results from the 1996 and 2000 science assessments. These results add to the body of information obtained from studies such as TIMSS-R and PISA about what students know and can do. The results also provide educators and policymakers with information that can be used to ascertain the well-being of science education in the U.S.

Overview of the 2000 National Assessment of Educational Progress (NAEP)

In 1969, NAEP was authorized by Congress to collect, analyze, and report reliable and valuable information about what American students know and can do in core subject areas. Since that time, in what has come to be referred to as the "long-term trend assessment," NAEP has assessed public- and nonpublic-school students who are 9, 13, and 17 years old. Since 1990, the

[3] Martin, M. O., Mullis, I.V. S., Gonzalez, E. J., Gregory, K. D., Smith, T. A., Chrostowski, S. J., Garden, R. A., & O'Connor, K. M. (2000). *TIMSS 1999 international science report: Findings from IEA's repeat of the Third International Mathematics and Science Study at the eighth grade.* Chestnut Hill, MA: International Study Center, Lynch School of Education, Boston College.

Lemke, M., Calsyn, C., Lippman, L., Jocelyn, L., Kastberg, D., Liu, Y., Roey, S., Williams, T., Kruger, T., & Bairu, G. (2000). *Outcomes of learning: Results from the 2000 program for international student assessment of 15-year-olds in reading, mathematics, and science literacy* (NCES Publication No. 2002–115). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Gonzales, P., Calsyn, C., Jocelyn, L., Mak, K., Kastberg, D., Arafeh, S., Williams, T., & Tsen, W. (2000). *Pursuing excellence: Comparisons of international eighth-grade mathematics and science achievement from a U.S. perspective, 1995 and 1999* (NCES Publication No. 2001-028). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

[4] Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., O'Connor, K.M., Chrostowski, S.J., Gregory, K.D., Smith, T.A., & Garden, R.A. (2001). *Science benchmarking report: TIMSS 1999—eighth grade.* Chestnut Hill, MA: International Study Center, Lynch School of Education, Boston College.

more recently developed assessments, referred to as the main NAEP, have also assessed public- and nonpublic-school students in grades 4, 8, and 12. The results provided in this report from the 2000 science assessment are not comparable to those obtained from the 1999 science long-term trend assessment due to differences in the content of the two assessments, as well as different sampling and administration procedures.

All NAEP assessments are based on frameworks developed through a national consensus process. The 2000 NAEP science assessment was the second administration of an assessment based on *The NAEP Science Framework*.[5] In 1996 and 2000, the NAEP science assessment was administered to national samples of fourth-, eighth-, and twelfth-graders. The science assessment was also administered to samples of eighth-graders participating in the state-by-state assessment in 1996 and 2000 and to samples of fourth-graders participating in the state-by-state assessment in 2000. The legislation authorizing NAEP did not include state-by-state testing in grade 12.[6]

This report describes the results of the 2000 NAEP science assessment at grades 4, 8, and 12 and, where appropriate, compares results in 2000 to those in 1996. Comparisons across assessment years are possible because the assessments were developed under the same framework and share a common set of science questions, and because the populations of students in both assessments were sampled and assessed using comparable procedures.

The Science Assessment Framework

The NAEP Science Framework[7] provided the operational specifications and theoretical basis for developing NAEP science assessments in 1996 and 2000. It was developed in 1991 through a consensus process involving educators, policymakers, science teachers, representatives of the business community, assessment and curriculum experts, and members of the public. The project was managed by the Council of Chief State School Officers (CCSSO) under the auspices of the National Assessment Governing Board (NAGB).

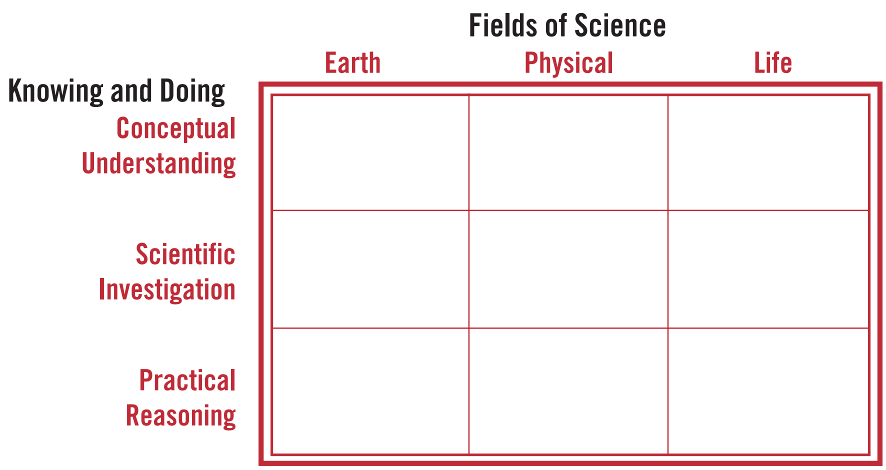
The framework is organized along a content dimension and a cognitive dimension (knowing and doing). The content dimension is divided into three major fields of science: Earth, physical, and life. Science content pertaining to physics and chemistry is assessed within the field of physical science. The cognitive domain is divided into conceptual understanding, scientific investigation, and practical reasoning. Each question in the assessment is categorized by its content and cognitive domains. The framework also specifies two overarching categories—the nature of science and the organizing themes of science. Figure 1.1 summarizes the structure of the 1996 and 2000 assessments. The framework also specifies the percentage of assessment time to be devoted to each content and cognitive domain. A fuller description of the framework and a breakdown of the distribution of assessment time can be found in appendix A.

5 National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress*. Washington DC: Author. (Also available online at http://www.nagb.org/pubs/)

6 Public Law 100–297. (1988). National Assessment of Education Improvement Act (20 USC 1211).

7 National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress*. Washington DC: Author. (Also available online at http://www.nagb.org/pubs/)

Figure 1.1: Structure of the 2000 Assessment



SOURCE: National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress.* Washington, DC: Author.

The Science Assessment Instruments

As the only federally mandated ongoing assessment of student science achievement on a national scale, it is imperative that NAEP reflect the framework and expert perspectives and opinions about science and its measurement. To that end, the assessment development process involves reviews by teachers and teacher educators as well as by state officials and measurement experts. All components of the assessment are evaluated for curricular relevance, developmental appropriateness, and fairness.

The 2000 science assessment booklets at grades 4, 8, and 12 consisted of two separately timed sections (i.e. blocks) of science questions that included both multiple-choice questions and constructed-response questions requiring students to create a written response. At the fourth grade, 20 minutes were allowed for each section of questions and at the eighth and twelfth grades, 30 minutes. In addition, one-half of the students in each school sample conducted a hands-on task and answered questions related to the task. For this, too, the time allotted was 20 minutes at grade 4 and 30 minutes at grades 8 and 12. It should be noted that students only took a portion of the assessment—two or three sections of the 14 sections that comprise the whole assessment at grades 4, 8, and 12. In addition to the science questions that students answered, they also responded to background questions that asked them to give information about themselves and their school experiences. For example, students were asked how much time they spent on homework, how often they used a computer, and what science subjects they were currently taking in school.

Additional information about the design of the 2000 science assessment is presented in appendix A.

Description of School and Student Samples

The NAEP 2000 science assessment was conducted nationally at grades 4, 8, and 12 and state-by-state at grades 4 and 8. The national assessment included representative samples of both public and nonpublic schools. The state-by-state assessments included only public schools. In total, 47,000 students from 2,100 schools were assessed in the national sample and 180,000 students from 7,500 schools in the state samples. Additional information about school and student samples is given in appendix A.

Jurisdictions including 40 states and 5 other jurisdictions participated in the state-by-state 2000 science assessment at grade 4 and 39 states and 5 other jurisdictions participated at grade 8. The 5 other jurisdictions that participated were American Samoa, the Department of Defense Domestic Dependent Elementary and Secondary Schools (DDESS), the overseas Department of Defense Dependents Schools (DoDDS), Guam, and the Virgin Islands. To ensure comparability across jurisdictions, NCES has established guidelines for school and student participation rates. Appendix A highlights these guidelines, and jurisdictions failing to meet them are noted in the tables and figures that present the state-by-state results.

Figure 1.2 lists the jurisdictions that participated in the 2000 science assessment and notes those jurisdictions that failed to meet one or more NCES-established participation rate guidelines for public schools. Results are not reported for the jurisdictions that failed to meet the initial school participation rate of 70 percent.

Figure 1.2 Participating jurisdictions in the NAEP 2000 state assessment program in science

Grade 4	Alabama	Louisiana	New York[2]	Virginia
	Arizona	Maine[2]	North Carolina	West Virginia
	Arkansas	Maryland	North Dakota	Wisconsin[1]
	California[2]	Massachusetts	Ohio[2]	Wyoming
	Connecticut	Michigan[2]	Oklahoma	American Samoa
	Georgia	Minnesota[2]	Oregon[2]	DDESS
	Hawaii	Mississippi	Rhode Island	DoDDS
	Idaho[2]	Missouri	South Carolina	Guam
	Illinois[2]	Montana[2]	Tennessee	Virgin Islands
	Indiana[2]	Nebraska	Texas	
	Iowa[2]	Nevada	Utah	
	Kentucky	New Mexico	Vermont[2]	
Grade 8	Alabama	Maine[2]	North Carolina	West Virginia
	Arizona[2]	Maryland	North Dakota	Wisconsin[1]
	Arkansas	Massachusetts	Ohio	Wyoming
	California[2]	Michigan[2]	Oklahoma	American Samoa
	Connecticut	Minnesota[2]	Oregon[2]	DDESS
	Georgia	Mississippi	Rhode Island	DoDDS
	Hawaii	Missouri	South Carolina	Guam
	Idaho[2]	Montana[2]	Tennessee	Virgin Islands[1]
	Illinois[2]	Nebraska	Texas	
	Indiana[2]	Nevada	Utah	
	Kentucky	New Mexico	Vermont[2]	
	Louisiana	New York[2]	Virginia	

[1] Failed to meet the initial school participation rate of 70 percent; results not reported.
[2] Failed to meet one or more participation rate guidelines; results reported with appropriate notation.
For more details on participation rate guidelines, see appendix A.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools
DoDDS: Department of Defense Dependents School (Overseas)
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Two Sets of NAEP Results:
Accommodations Not Permitted and Accommodations Permitted

The NAEP assessments have always sought to include special-needs students—students with disabilities (SD) and limited English proficient students (LEP)—to the fullest degree possible. However, there have always been some special-needs students who were excluded from taking the NAEP assessment because they could not participate meaningfully in the assessment. Schools that participate in NAEP have been permitted to exclude some students who may have Individualized Education Programs (IEPs) or are receiving services under section 504 of the Rehabilitation act of 1973.[8] Similarly, schools have been permitted to exclude students they identify as being LEP. Schools are encouraged to make exclusion decisions in accordance with explicit criteria provided by NAEP.

[8] Section 504 of the Rehabilitation Act of 1973 is a civil rights law designed to prohibit discrimination on the basis of disability in programs and activities, including education, that receive federal financial assistance.

In order to move its assessments toward more inclusive samples, NAEP began to explore the use of accommodations, or alternate testing situations, with special-needs students in the 1996 science and mathematics assessments. This shift toward greater inclusiveness allowed NAEP to more closely approximate state and district testing policies that have increasingly offered testing accommodations to special-needs students. In 1996, the national NAEP sample was split so that some of the schools sampled were permitted to provide accommodations to special-needs students and the others were not. This split-sample design made it possible to study the effects on NAEP results of including special-needs students in the assessments under alternate testing conditions. A series of technical research papers has been published with the results of these comparisons.[9] Based on the outcomes of these technical analyses, the 1998 results of those NAEP assessments that used new test frameworks (writing and civics), and hence also began new trend lines, were reported for the first time with the inclusion of data from accommodated special-needs students.

This report includes two different sets of NAEP results based on the split-sample design:

- results based on a less inclusive sample that did not offer accommodations to special-needs students, and
- results based on a more inclusive sample that did offer accommodations (such as extended time and small-group administration) to special-needs students.

Although accommodated students make up a small proportion of the total weighted number of students assessed (see table A.9 in appendix A, for details), making accommodations available to special-needs students may change the overall assessment results in subtle ways. For example, some special-needs students who might have been tested without accommodations in previous assessment years might now receive accommodations, and, possibly, attain higher scores. Further, special-needs students who might have been excluded in previous years might now be included, but attain relatively low scores. The findings on results when accommodated special-needs students were included in the NAEP assessment are presented in chapter 4 of this report. In addition, appendix A contains a more detailed discussion of NAEP's intent to assess all students from the target population.

[9] Olsen, J. F., & Goldstein, A. A. (1997). *The inclusion of students with disabilities and limited English proficient students in large-scale assessments: A summary of recent progress* (NCES Publication No. 97–482). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Mazzeo, J., Carlson, J. E., Voelkl, K. E., & Lutkus, A. D. (1999). *Increasing the participation of special-needs students in NAEP: A report on 1996 research activities* (NCES Publication No. 2000–473). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Lutkus, A. D., & Mazzeo, J. *Including special-needs students in the NAEP 1998 reading assessment: Part I, comparison of overall results with and without accommodations.* Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (forthcoming).

Lutkus, A. D. *Including special-needs students in the NAEP 1998 reading assessment: Part II, results for students with disabilities and limited English proficient students.* Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (forthcoming).

Reporting the Assessment Results

The results of student performance on the NAEP science assessment are presented in two ways: one, as average scores on the NAEP composite science scale and two, as the percentage of students attaining NAEP science achievement levels. The average scale score represents students' performance on the assessment. The achievement levels reflect goals for student performance, and the percentage of students at each achievement level indicate the extent to which students are meeting those goals.

The composite scale at each grade ranges from 0 to 300. While the scale score ranges are identical, the scale was derived independently at each grade. Also scales were weighted differently at different grades in determining the overall scale. Therefore, average scale scores across grades cannot be compared. For example, equal scale scores on the grade 4 and grade 8 scales do not imply equal levels of science achievement. A full description of NAEP scales and scaling procedures can be found in the *NAEP 2000 Technical Report*.[10]

Achievement-level results are presented in terms of science achievement levels as authorized by the NAEP legislation and adopted by the National Assessment Governing Board (NAGB).[11] For each grade assessed, NAGB has adopted three achievement levels: *Basic*, *Proficient*, and *Advanced*. For reporting purposes, the achievement cut scores are placed on the science scale, resulting in four ranges: below *Basic*, *Basic*, *Proficient*, and *Advanced*.

The Setting of Achievement Levels

The 1988 NAEP legislation that created the National Assessment Governing Board directed the Board to identify "appropriate achievement goals.....for each subject area" that NAEP measures.[12] The 1994 NAEP reauthorization reaffirmed many of the Board's statutory responsibilities including "developing appropriate student performance standards for each age and grade in each subject area to be tested under the National Assessment."[13] In order to follow this directive and achieve the mandate of the 1988 statute to "improve the form and use of NAEP results," the Board undertook the development of student performance standards called "achievement levels." Since 1990 the Board has adopted achievement levels in mathematics, reading, U.S. history, world geography, science, writing, and civics.

The Board defined three levels for each grade: *Basic*, *Proficient*, and *Advanced*. The *Basic* level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at a given grade. The *Proficient* level represents solid

10 National Center for Education Statistics. *NAEP 2000 technical report*. Washington, DC: Author (forthcoming).

11 Public Law 100-297. (1988). National Assessment of Educational Progress Improvement Act (20USC 1211). Public Law 102-382. (1994). Improving America's Schools Act (20USC 9010).

12 Public Law 100-297. (1988). National Assessment of Educational Progress Improvement Act (20USC 1211).

13 Public Law 102-382. (1994). Improving America's Schools Act (20USC 9010).

academic performance for each grade assessed. Students reaching this level demonstrate competency over challenging subject matter. The *Advanced* level signifies superior performance at a given grade. Furthermore, for each grade, the levels are cumulative; that is, abilities achieved at the *Proficient* level presume mastery of abilities associated with the *Basic* level, and attainment of the *Advanced* level presumes mastery of both the *Basic* and *Proficient* levels.

Figure 1.3 presents the policy definitions of the achievement levels that apply across all grades and subject areas. Adopting three levels of achievement for each grade signals the importance of looking at more than one standard of performance. The Board believes, however, that all students should reach the *Proficient* level; the *Basic* level is not the desired goal, but rather represents partial mastery that is a step towards *Proficient*.

Figure 1.3

Achievement Levels

Policy definitions of the three achievement levels

Basic	This level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.
Proficient	This level represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
Advanced	This level signifies superior performance.

SOURCE: National Assessment Governing Board.

The achievement levels in this report were arrived at somewhat differently from those adopted by the Board for other subject areas. A standard-setting process was carried out by ACT, Inc., under contract to the Board. ACT convened a cross section of educators and interested citizens across the nation and asked them to judge what students should know and be able to do relative to the body of content reflected in the NAEP framework for science. The achievement levels arrived at by this process were examined by the Board. In several cases, the levels appeared to be set either lower or higher than would be reasonable, resulting in too few or too many students placing at or above the *Basic, Proficient,* or *Advanced* levels. This belief was based on information about eighth-grade students from achievement levels adopted for other NAEP subjects, 1996 Advanced Placement (AP) results for twelfth-graders, and information about eighth-grade students from the Third International Mathematics and Science Study (TIMSS). The Board, therefore, adjusted the cut scores of some of the levels. Since the content descriptions developed by the ACT panelists no longer matched the cut scores adopted by the Board, a second panel of science educators and scientists was convened to develop new descriptions. These descriptions were based on student performance at each achievement level, and are a measure of what students know and can do. The new cut scores and content descriptions were adopted by the Board in 1996.[14]

Achievement-Level Descriptions for Each Grade

The achievement-level descriptions for grades 4, 8, and 12 are presented in figures 1.4 through 1.6. As noted previously, the achievement levels are cumulative. Therefore, students performing at the *Proficient* level also display the competencies associated with the *Basic* level, and students at the *Advanced* level also demonstrate the knowledge and skills associated with both the *Basic* and *Proficient* levels. For each achievement level listed in figures 1.4 through 1.6, the scale score that corresponds to the beginning of that level is shown in parentheses. For example, in figure 1.4 the scale score of 138 corresponds to the beginning of the grade 4 *Basic* level of achievement.

[14] Bourque, M. L., Champagne, A. B., & Crissman, S, (1997). *1996 science performance standards: Achievement results for the nation and the states.* Washington, DC: National Assessment Governing Board.

Figure 1.4 Grade 4	NAEP Science Achievement Levels
Basic (138)	**Students performing at the *Basic* level demonstrate some of the knowledge and reasoning required for understanding Earth, physical, and life sciences at a level appropriate to grade 4. For example, they can carry out simple investigations and read uncomplicated graphs and diagrams. Students at this level also show a beginning understanding of classification, simple relationships, and energy.** Fourth-grade students performing at the *Basic* level are able to follow simple procedures, manipulate simple materials, make observations, and record data. They are able to read simple graphs and diagrams and draw reasonable but limited conclusions based on data provided to them. These students can recognize appropriate experimental designs, although they are unable to justify their decisions. When presented with diagrams, students at this level can identify seasons; distinguish between day and night; and place the position of the Earth, sun, and planets. They are able to recognize major energy sources and simple energy changes. In addition, they show an understanding of the relationships between sound and vibrations. These students are able to identify organisms by physical characteristics and group organisms with similar physical features. They can also describe simple relationships among structure, function, habitat, life cycles, and different organisms.
Proficient (170)	**Students performing at the *Proficient* level demonstrate the knowledge and reasoning required for understanding of the Earth, physical and life sciences at a level appropriate to grade 4. For example, they understand concepts relating to the Earth's features, physical properties, structure, and function. In addition, students can formulate solutions to familiar problems as well as show a beginning awareness of issues associated with technology.** Fourth-grade students performing at the *Proficient* level are able to provide an explanation of day and night when given a diagram. They can recognize major features of the Earth's surface and the impact of natural forces. They are also able to recognize water in its various forms in the water cycle and can suggest ways to conserve it. These students recognize that various materials possess different properties that make them useful. Students at this level are able to explain how structure and function help living things survive. They have a beginning awareness of the benefits and challenges associated with technology and recognize some human effects on the environment. They can also make straightforward predictions and justify their position.
Advanced (205)	**Students performing at the *Advanced* level demonstrate a solid understanding of the Earth, physical, and life sciences as well as the ability to apply their understanding to practical situations at a level appropriate to grade 4. For example, they can perform and critique simple investigations, make connections from one or more of the sciences to predict or conclude, and apply fundamental concepts to practical applications.** Fourth-grade students performing at the *Advanced* level are able to combine information, data, and knowledge from one or more of the sciences to reach a conclusion or to make a valid prediction. They can also recognize, design and explain simple experimental procedures. Students at this level recognize nonrenewable sources of energy. They also recognize that light and sound travel at different speeds. These students understand some principles of ecology and are able to compare and contrast life cycles of various common organisms. In addition, they have a developmental awareness of the benefits and challenges associated with technology.

SOURCE: National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress.* Washington, DC: Author.

Figure 1.5 Grade 8	NAEP Science Achievement Levels
Basic (143)	**Students performing at the *Basic* level demonstrate some of the knowledge and reasoning required for understanding of the Earth, physical, and life sciences at a level appropriate to grade 8. For example, they can carry out investigations and obtain information from graphs, diagrams, and tables. In addition, they demonstrate some understanding of concepts relating to the solar system and relative motion. Students at this level also have a beginning understanding of cause-and-effect relationships.** Eighth-grade students performing at the *Basic* level are able to observe, measure, collect, record, and compute data from investigations. They can read simple graphs and tables and are able to make simple data comparisons. These students are able to follow directions and use basic science equipment to perform simple experiments. In addition, they have an emerging ability to design experiments. Students at this level have some awareness of causal relationships. They recognize the position of planets and their movement around the sun and know basic weather-related phenomena. These students can explain changes in position and motion such as the movement of a truck in relation to that of a car. They also have an emerging understanding of the interrelationships among plants, animals, and the environment.
Proficient (170)	**Students performing at the *Proficient* level demonstrate much of the knowledge and many of the reasoning abilities essential for understanding of the Earth, physical, and life sciences at a level appropriate to grade 8. For example, students can interpret graphic information, design simple investigations, and explain such scientific concepts as energy transfer. Students at this level also show an awareness of environmental issues, especially those addressing energy and pollution.** Eighth-grade students performing at the *Proficient* level are able to create, interpret, and make predictions from charts, diagrams, and graphs based on information provided to them or from their own investigations. They have the ability to design an experiment and have an emerging understanding of variables and controls. These students are able to read and interpret geographic and topographic maps. In addition, they have an emerging ability to use and understand models, can partially formulate explanations of their understanding of scientific phenomena, and can design plans to solve problems. Students at this level can begin to identify forms of energy and describe the role of energy transformation in living and nonliving systems. They have knowledge of organization, gravity, and motion within the solar system and can identify some factors that shape the surface of the Earth. These students have some understanding of properties of materials and have an emerging understanding of the particulate nature of matter, especially the effect of temperature on states of matter. They also know that light and sound travel at different speeds and can apply their knowledge of force, speed, and motion. These students demonstrate a developmental understanding of the flow of energy from the sun through living systems, especially plants. They know that organisms reproduce and that characteristics are inherited from previous generations. These students also understand that organisms are made up of cells and that cells have subcomponents with different functions. In addition, they are able to develop their own classification system based on physical characteristics. These students can list some effects of air and water pollution as well as demonstrate knowledge of the advantages and disadvantages of different energy sources in terms of how they affect the environment and the economy.

Figure 1.5
Grade 8 (continued)

NAEP Science Achievement Levels

Advanced (208)	**Students performing at the *Advanced* level demonstrate a solid understanding of the Earth, physical, and life sciences as well as the abilities required to apply their understanding in practical situations at a level appropriate to grade 8. For example, students can perform and critique the design of investigations, relate scientific concepts to each other, explain their reasoning, and discuss the impact of human activities on the environment.** Eighth-grade students performing at the *Advanced* level are able to provide an explanation for scientific results. They have a modest understanding of scale and are able to design a controlled experiment. These students have an understanding of models as representations of natural systems and can describe energy transfer in living and nonliving systems. Students at this level are able to understand that present physical clues, including fossils and geological formations, are indications that the Earth has not always been the same and that the present is a key to understanding the past. They have a solid knowledge of forces and motions within the solar system and an emerging understanding of atmospheric pressure. These students can recognize a wide range of physical and chemical properties of matter and some of their interactions and understand some of the properties of light and sound. Also, they can infer relationships between structure and function. These students know the difference between plant and animal cells and can apply their knowledge of food as a source of energy to a practical situation. In addition, they are able to explain the impact of human activities on the environment and the economy.

SOURCE: National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress.* Washington, DC: Author.

Figure 1.6

Grade 12

NAEP Science Achievement Levels

Basic (146)

Students performing at the *Basic* level demonstrate some knowledge and certain reasoning abilities required for understanding of the Earth, physical, and life sciences at a level appropriate to grade 12. In addition, they demonstrate knowledge of the themes of science (models, systems, and patterns of change) required for understanding the most basic relationships among the Earth, physical, and life sciences. They are able to conduct investigations, critique the design of investigations, and demonstrate a rudimentary understanding of the scientific principles.

Twelfth-grade students performing at the *Basic* level are able to select and use appropriate simple laboratory equipment and write down simple procedures that others can follow. They also have a developmental ability to design complex experiments. These students are able to make classifications based on definitions such as physical properties and characteristics.

Students at this level demonstrate a rudimentary understanding of basic models and can also identify some parts of physical and biological systems. They are also able to identify some patterns in nature and rates of change over time. These students have the ability to identify basic scientific facts and terminology and have a rudimentary understanding of the scientific principles underlying such phenomena as volcanic activity, disease transmission, and energy transformation. In addition, they have some familiarity with the application of technology.

Proficient (178)

Students performing at the *Proficient* level demonstrate the knowledge and reasoning abilities required for understanding of the Earth, physical, and life sciences at a level appropriate to grade 12. In addition, they demonstrate knowledge of the themes of science (models, systems, and patterns of change) required for understanding how these themes illustrate essential relationships among the Earth, physical, and life sciences. They are able to analyze data and apply scientific principles to everyday situations.

Twelfth-grade students performing at the *Proficient* level are able to demonstrate a working ability to design and conduct scientific investigations. They are able to analyze data in various forms and utilize information to provide explanations and to draw reasonable conclusions.

Students at this level have a developmental understanding of both physical and conceptual models and are able to compare various models. They recognize some inputs and outputs, causes and effects, and interactions of a system. In addition, they can correlate structure to function for the parts of a system that they can identify. These students also recognize that rate of change depends on initial conditions and other factors. They are able to apply scientific concepts and principles to practical applications and solutions for problems in the real world and show developmental understanding of technology, its uses, and its applications.

Figure 1.6 Grade 12 (continued)	NAEP Science Achievement Levels
Advanced (210)	**Students performing at the *Advanced* level demonstrate the knowledge and reasoning abilities required for a solid understanding of the Earth, physical, and life sciences at a level appropriate to grade 12. In addition, they demonstrate knowledge of the themes of science (models, systems, and patterns of change) required for integrating knowledge and understanding of scientific principles from Earth, physical, and life sciences. Students can design investigations that answer questions about real-world situations and use their reasoning abilities to make predictions.** Twelfth-grade students performing at the *Advanced* level are able to design scientific investigations to solve complex, real-world situations. They can integrate, interpolate, and extrapolate information embedded in data to draw well-formulated explanations and conclusions. They are also able to use complex reasoning skills to apply scientific knowledge to make predictions based on conditions, variables, and interactions. Students at this level recognize the inherent strengths and limitations of models and can revise models based on additional information. They are able to recognize cause-and-effect relationships within systems and can utilize this knowledge to make reasonable predictions of future events. These students are able to recognize that patterns can be constant, exponential, or irregular and can apply this recognition to make predictions. They can also design a technological solution for a given problem.

SOURCE: National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress.* Washington, DC: Author.

The Developmental Status of Achievement Levels

The 1994 NAEP reauthorization law requires that the achievement levels be used on a developmental basis until the Commissioner of Education Statistics determines that the achievement levels are 'reasonable, valid, and informative to the public." [15] Until the determination is made, the law requires the Commissioner and NAGB to state clearly the developmental status of the achievement levels in all NAEP reports.

In 1993, the first of several congressionally mandated evaluations of the achievement-level-setting process concluded that the procedures used to set the achievement levels were flawed and that the percentage of students at or above any particular achievement level cutpoint may be underestimated.[16] Others have asserted that the weight of the empirical evidence does not support such conclusions.[17]

[15] Improving America's Schools Act of 1994 (20 USC 9010) requires that the Commissioner base his determination on a congressionally mandated evaluation by one or more nationally recognized evaluation organizations.

[16] United States General Accounting Office. (1993). *Education achievement standards: NAGB's approach yields misleading interpretations*, U.S. General Accounting Office Report to Congressional Requestors. Washington, DC: Author.

National Academy of Education. (1993). *Setting performance standards for achievement: A report of the National Academy of Education panel on the evaluations of the NAEP trial state assessment: An evaluation of the 1992 achievement levels*. Stanford, CA: Author.

[17] Cizek, G (1993). *Reactions to National Academy of Education report*. Washington, DC: National Assessment Governing Board.

Kane, M. (1993). *Comments on the NAE evaluation of the NAGB achievement levels.* Washington, DC: National Assessment Governing Board.

The most recent congressionally mandated evaluation conducted by the National Academy of Sciences (NAS) relied on prior studies of achievement levels, rather than carrying out new evaluations, on the grounds that the process has not changed substantially since the initial problems were identified. Instead, the NAS Panel studied the development of the 1996 science achievement levels. The NAS Panel basically concurred with earlier congressionally mandated studies. The Panel concluded that "NAEP's current achievement level setting procedures remain fundamentally flawed. The judgment tasks are difficult and confusing; raters' judgments of different item types are internally inconsistent; appropriate validity evidence for the cut scores is lacking; and the process has produced unreasonable results." [18]

A proven alternative to the current process has not yet been identified. The Deputy Commissioner of Education Statistics and the Board continue to call on the research community to assist in finding ways to improve standard setting for reporting NAEP results. The NAS Panel accepted the continuing use of achievement levels in reporting NAEP results, until such time as better procedures can be developed. Specifically, the NAS Panel concluded that "...tracking changes in the percentages of students performing at or above those cut scores (or, in fact, any selected cut scores) can be of use in describing changes in student performance over time."[19] The National Assessment Governing Board urges all who are concerned about student performance levels to recognize that the use of these achievement levels is a developing process and is subject to various interpretations. The Board and the Deputy Commissioner believe that the achievement levels are useful for reporting trends in the educational achievement of students in the United States. However, based on the congressionally mandated evaluations so far, the Deputy Commissioner agrees with the National Academy's recommendation that caution needs to be exercised in the use of the current achievement levels. Therefore, the Deputy Commissioner concludes that these achievement levels should continue to be considered developmental and continue to be interpreted and used with caution.

[18] Pellegrino, J.W., Jones, L.R., & Mitchell, K.J. (Eds.). (1999). *Grading the nation's report card:Evaluating NAEP and transforming the assessment of educational progress.* Committee on the Evaluation of National Assessments of Educational Progress, Board on Testing and Assessment, Commission on Behavioral and Social Sciences and Education, National Research Council. (pp.182). Washington, DC: National Academy Press.

[19] Ibid., 176.

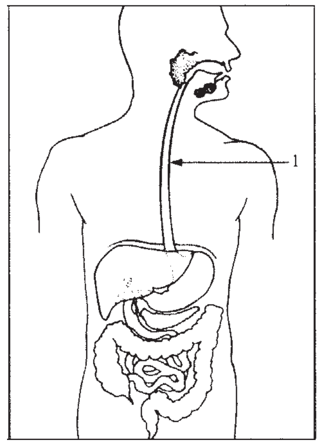
Sample Assessment Questions

Three blocks of questions at each grade were released to the public following the administration of the NAEP 2000 science assessment and three blocks at each grade were released following the 1996 administration. All these questions can be found on the NAEP web site.[20] The questions released from the 2000 assessment were also administered in the 1996 science assessment. Results for nine of the released questions, three from each of grades 4, 8, and 12, are presented in tables 1.1 through 1.9. These questions illustrate the types of questions included in the assessment.

The first three sample questions were administered at grade 4. Sample question 1 is a life science question that asked students to recognize the function of the esophagus. Sample question 2 is an Earth science question that asked students to explain why the Earth never runs out of rain. Sample question 3 is a physical science question that required students to explain how they could find out which of the three differently shaped bottles would hold the most water.

[20] http://nces.ed.gov/nationsreportcard

Grade 4 Sample Question 1:



Look at the picture above, which shows some of the organs that can be found inside the human body. What is the main job of the organ labeled 1 ?

- (A) Carrying air
- ● Carrying food
- (C) Carrying blood
- (D) Carrying messages from the brain

Table 1.1 Sample Question 1 Results (Multiple-Choice)

Overall percentage correct and percentages correct within each achievement-level range: 2000

Grade 4	Percentage correct within achievement-level intervals		
Overall percentage correct †	*Basic* 138–169*	*Proficient* 170–204*	*Advanced* 205 and above*
55	55	75	90

†Includes fourth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Grade 4 Sample Question 2:

Think about where rain comes from and explain why the Earth never runs out of rain.

Responses to this question were scored according to a three-level rubric as Unsatisfactory/Incorrect, Partial, or Complete.

Sample "Complete" Response:

When we get rain it evaprates and rains again.

Earth never runs out of rain because the water from the ocean keeps evaporating.

Table 1.2 Sample Question 2 Results (Short Constructed-Response)

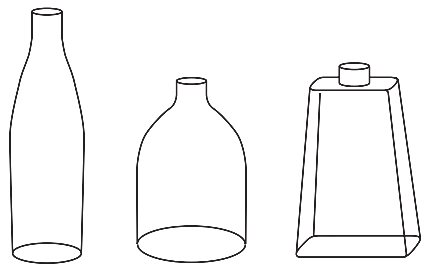
Overall percentage "Complete" and percentages "Complete" within each achievement-level range: 2000

Grade 4	Percentage "Complete" within achievement-level intervals		
Overall percentage "Complete" †	*Basic* 138–169*	*Proficient* 170–204*	*Advanced* 205 and above*
28	26	45	65

† Includes fourth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Grade 4 Sample Question 3:

You are going to the park on a hot day and need to take some water with you. You have three different bottles, as shown in the picture below. You want to choose the bottle that will hold the most water. Explain how you can find out which bottle holds the most water.



Responses to this question were scored according to a three-level rubric as Unsatisfactory/Incorrect, Partial, or Complete.

Sample "Complete" Response:

You can get a couple cups that are the same size, poor water in the cups and poor the water in the jugs and wich ever one takes the most cups can fit more water.

Table 1.3 Sample Question 3 Results (Short Constructed-Response)

Overall percentage "Complete" and percentages "Complete" within each achievement-level range: 2000

Grade 4	Percentage "Complete" within achievement-level intervals		
Overall percentage "Complete" †	*Basic* 138–169*	*Proficient* 170–204*	*Advanced* 205 and above*
5	4	10	23

† Includes fourth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

The next three sample questions were administered at grade 8. Sample question 4 is a physical science question that asked students to recognize that a magnet would not be helpful in separating a mixture of sand and salt. Sample question 5 assessed the domain of Earth science. It required students to state what they thought caused a monument to crumble and how to prevent further damage to the stone. Sample question 6 asked students to place 8 animals into two groups based on a physical characteristic. They were also asked to name a second physical characteristic they could have used. This was a life science question.

Grade 8 Sample Question 4:

All of the following would be helpful in separating a mixture of sand and salt EXCEPT

- (A) a magnet
- (B) a glass cup
- (C) a filter paper and funnel
- (D) water

Table 1.4 Sample Question 4 Results (Multiple-Choice)

Overall percentage correct and percentages correct within each achievement-level range: 2000

Grade 8	Percentage correct within achievement-level intervals		
Overall percentage correct †	*Basic* 143–169*	*Proficient* 170–207*	*Advanced* 208 and above*
59	59	71	81

† Includes eighth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Grade 8 Sample Question 5:

Cleopatra's Needle is a large stone monument that stood in an Egyptian desert for thousands of years. Then it was moved to New York City's Central Park. After only a few years, its surface began crumbling.

What probably caused this crumbling?

____

____

New York City wants to keep Cleopatra's Needle in the same location in Central Park. How can the city prevent further damage to the stone?

____

____

Responses to this question were scored according to a three-level rubric as Unsatisfactory/Incorrect, Partial, or Complete.

Sample "Complete" Response:

What probably caused this crumbling?

Because of the polution and acid rian.

New York City wants to keep Cleopatra's Needle in the same location in Central Park. How can the city prevent further damage to the stone?

They could put roof over it or something to protect it from the rain

Table 1.5 Sample Question 5 Results (Short Constructed-Response)

Overall percentage "Complete" and percentages "Complete" within each achievement-level range: 2000

Grade 8	Percentage "Complete" within achievement-level intervals		
Overall percentage "Complete" †	*Basic* 143–169*	*Proficient* 170–207*	*Advanced* 208 and above*
28	28	47	71

†Includes eighth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Grade 8 Sample Question 6:

Classify each of the eight living things listed below into one of two groups according to an important physical characteristic.

Gorilla
Parrot
Snake
Earthworm
Jellyfish
Sponge
Fish
Fly

Group 1 | *Group 2*

What physical characteristic did you use in your classification?

____

____

Name a different physical characteristic that you could have used.

____

____

Responses to this question were scored according to a four-level rubric as Unsatisfactory/Incorrect, Partial, Essential, or Complete.

Sample "Complete" Response:

Classify each of the eight living things listed below into one of two groups according to an important physical characteristic.

Group 1		Group 2
Gorilla	Gorilla	
Parrot	Parrot	Snake
Sponge	Snake	fish
earthworm	Earthworm	
fly	Jellyfish	
	Sponge	
	Fish	
	Fly	

What physical characteristic did you use in your classification?

I characterized them by having scales & not having scales

Name a different physical characteristic that you could have used.

having wings and not having wings

Table 1.6 Sample Question 6 Results (Extended Constructed-Response)

Overall percentage "Essential" and percentages "Essential" within each achievement-level range: 2000

Grade 8	Percentage "Essential" or better within achievement-level intervals		
Overall percentage "Essential" or better †	*Basic* 143–169*	*Proficient* 170–207*	*Advanced* 208 and above*
24	23	40	67

†Includes eighth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

The last three sample questions were administered at grade 12. The earth science question shown in sample 7 required students to decide which of four statements most likely explained the observation that the Sun appears to be slightly larger in January than in July. Sample question 8 required students to describe a procedure for determining the density of a ring. It was classified as a physical science question. Sample 9, a life science question, was one of a set of 8 questions that probed students' understanding of genetics and genetic engineering. Students were first asked to read an article about the use of viruses in genetic engineering and then asked to use the information in the article plus their own knowledge of genetics to answer the series of questions. The first question in the set asked students to state what a gene is, what it is made of, and its function.

Grade 12 Sample Question 7:

As observed with special instruments from Earth, the Sun appears in the sky to be slightly larger in January than in July. Which of the following accounts for this observation?

- (A) The Earth moves in an orbit that is not circular but is closer to the Sun in January than in July.
- (B) The diameter of the Earth is not constant, but bulges slightly at the Equator and contracts slightly during the winter.
- (C) The Earth's orbit is not in the same plane as the orbits of the other planets.
- (D) The axis of rotation of the Earth is not perpendicular to the plane of its orbit but instead is tilted at an angle.

Table 1.7 Sample Question 7 Results (Multiple-Choice)

Overall percentage correct and percentages correct within each achievement-level range: 2000

Grade 12	Percentage correct within achievement-level intervals		
Overall percentage correct †	*Basic* 146–177*	*Proficient* 178–209*	*Advanced* 210 and above*
41	43	60	75

†Includes twelfth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Grade 12 Sample Question 8:

One characteristic that can be used to identify pure metals is density. If you determine the density of a pure metal, you can determine what the metal is, as shown in the table below.

Metal	Gold	Lead	Silver	Copper	Tin
Density (gram/cm^3)	19.3	11.3	10.5	8.9	7.3

Suppose that you have been given a ring and want to determine if it is made of pure gold. Design a procedure for determining the density of the ring. Explain the steps you would follow, including the equipment that you would use, and how you would use this equipment to determine the ring's density.

Responses to this question were scored according to a four-level rubric as Unsatisfactory/Incorrect, Partial, Essential, or Complete.

Sample "Complete" Response:

I would ~~a~~ determine the objects mass by using a scale. Then I would drop the object into a beaker of water and measure its displacement, which is its volume. I would the divide the mass by the volume

Sample "Essential" Response:

I would weigh it on a scale in grams. I would also place it in a beaker filled with water and see the displacement when it is added compared to the other rings.

Table 1.8 Sample Question 8 Results (Extended Constructed-Response)

Overall percentage "Essential" or better and percentages "Essential" or better within each achievement-level range: 2000

Grade 12	Percentage "Essential" or better within achievement-level intervals		
Overall percentage "Essential" or better †	*Basic* 146–177*	*Proficient* 178–209*	*Advanced* 210 and above*
19	18	58	89

†Includes twelfth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Grade 12 Sample Question 9:

Based on your knowledge of genetics and the information in the preceding passage, answer the following questions.

What is a gene? What is it made of? What is the major function of a gene?

Responses to this question were scored according to a four-level rubric as Unsatisfactory/Incorrect, Partial, Essential, or Complete.

Sample "Complete" Response:

What is a gene? What is it made of? What is the major function of a gene?

a gene is a portion of DNA that codes for a particular trait or characteristic. a Gene is made of Deoxyribose Nucleic Acid. The major function of a gene is to code for particular protiens that are to be produced in a cell.

Sample "Essential" Response:

What is a gene? What is it made of? What is the major function of a gene?

Genes determine our characteristics and our traits. They are made up of strands of DNA.

Table 1.9 Sample Question 9 Results (Extended Constructed-Response)

Overall percentage "Essential" or better and percentages "Essential" or better within each achievement-level range: 2000

Grade 12	Percentage "Essential" or better within achievement-level intervals		
Overall percentage "Essential" or better †	*Basic* 146–177*	*Proficient* 178–209*	*Advanced* 210 and above*
22	24	44	56

†Includes twelfth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Maps of Selected Item Descriptions

The science performance of fourth-, eighth-, and twelfth-graders can be illustrated by maps that position questions from the assessment onto the 0-to-300 scale. The resulting item maps are visual representations of how the difficulty of each question compares with a student's performance on the entire test.[21] The descriptions used on these maps focus on the science knowledge or skill needed to answer the question. For multiple-choice questions, the description indicates the knowledge or skill demonstrated by selection of the correct option; for constructed-response questions, the description takes into account the knowledge or skill specified by the different levels of scoring criteria for that question. Seven of the questions described on the item maps are included among the sample questions in the preceding section. Each of these sample questions is identified as such on the item map.

Figures 1.7 through 1.9 are item maps for grades 4, 8, and 12, respectively. For each question indicated on the map, students who scored above the scale point had a higher probability of successfully answering the question, and students who scored below the scale point had a lower probability of successfully answering the questions. The map location for each question identifies where that question was answered successfully by at least 65 percent of students for constructed-response questions and at least 74 percent of students for a four-option multiple-choice question.

As an example of how to interpret the item maps, consider the multiple-choice question in figure 1.7 that maps at score point 188. Fourth-graders were required to identify the function of a labeled human organ. Students who scored at or above 188 on the NAEP scale had a 74 percent chance of answering this question correctly. Students who scored below 188 had less than a 74 percent chance of doing so. This does not mean that all students scoring 188 or above always answered the question correctly, or that students scoring below 188 always answered the question incorrectly. Rather, the item map indicates a higher or lower probability of answering the question successfully depending on students' overall science knowledge and skills as measured by the NAEP scale.

[21] Details on the procedures used to develop item maps are provided in appendix A, pp. 174–175.

As another example of how to interpret the item maps, consider the question in figure 1.8 that maps at score point 194. Eighth-graders were asked to classify eight different organisms into two groups based on a physical characteristic. They were also asked to name a second physical characteristic they could have used. Students' responses to this constructed-response question were rated according to a four-level scoring guide that distinguished between "Unsatisfactory," "Partial," "Essential," and "Complete." As with all constructed-response questions portrayed on the item maps, the description of this item takes into account the requirements for a response to be rated at a certain level according to the scoring criteria for that question. With this question, the description is based on the level of performance required for a score of "Essential" or better. Students who scored at or above 194 on the NAEP scale had at least a 65 percent chance of demonstrating the knowledge and skill required to receive a rating of "Essential" or better on this question. Students who scored below 194 had less than a 65 percent chance of doing so.

NAEP Science Scale

Figure 1.7

Grade 4 Item Map

Map of selected item descriptions on the National Assessment of Educational Progress science scale for grade 4

This map describes the knowledge or skills associated with answering individual science questions. The map identifies the score point at which students had a high probability of successfully answering the question.*

300

260

256 Predict and explain the effect of fertilizer on algae growth in pond

250

250 *Recognize source of stored energy in beans*

240

242 Draw part of the food web of an ecosystem

235 Predict and explain cause of temperature increase in buckets of water left in sunlight

230

227 State and explain features of houses that combat heat or cold from weather

226 Explain roughly how to determine which of three bottles holds the most water—**Sample Question 3**

220

210

***Advanced* 205**

200

195 Recognize likelihood of rain based on type of cloud

190

188 *Identify function of labeled human organ*—**Sample Question 1**

185 Predict effect of one magnet on another

180

182 *Identify which animals produce very large number of offspring*

176 Recognize safest place to go in case one hears thunder and explain why

175 *Explain how bicycle reflectors work*

***Proficient* 170**

170

167 Explain the good and bad points of some given methods of garbage disposal

162 *Identify producer in given ecosystem*

160 *Identify forms of precipitation*

160

160 *Recognize cause of window rattling due to thunder*

150

151 *Recognize vibrations being common to several actions*

140

140 Name and explain some of the survival features of deer's body

***Basic* 138**

136 *Recognize best information for identifying a rock*

130

120

110

100

101 *Recognize instrument used to see stars*

90

93 Name one of the predators in given ecosystem

0

NOTE: Regular type denotes a constructed-response question. Italic type denotes a multiple-choice question.

* Each grade 4 science question in the 2000 assessment was mapped onto the NAEP 0–300 science scale. The position of the question on the scale represents the scale score attained by students who had a 65 percent probability of successfully answering a constructed-response question or a 74 percent probability of correctly answering a four-option multiple-choice question. Only selected questions from among those that were released after the 2000 assessment are presented. Scale score ranges for science achievement levels are referenced on the map.

To interpret the item map, consider, for example, the multiple-choice question that maps at a scale score of 250 for grade 4. This question concerns the source of stored energy in beans. Mapping the question at the 250 scale score indicates that at least 74 percent of the students performing at this point answered the question correctly. Among students with lower scores, less than 74 percent answered this question correctly.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

NAEP Science Scale

Figure 1.8

Grade 8 Item Map

Map of selected item descriptions on the National Assessment of Educational Progress science scale for grade 8

This map describes the knowledge or skills associated with answering individual science questions. The map identifies the score point at which students had a high probability of successfully answering the question.*

300

260

250
- **251** Explain cause of echo in auditorium

240
- **241** Describe part of test to investigate behavior of paramecia
- **237** *Recognize reason for controlling air pressure in airplane*
- **235** State that length of shadow at noon is different in summer and winter

230
- **233** Identify top carnivore in pond ecosystem

220

210

***Advanced* 208**

200
- **204** *Recognize tools useful for separating sand and salt mixture*—**Sample Question 4**
- **203** *Recognize appliance that converts energy to mechanical work*
- **197** *Recognize location of Moon with respect to Sun and Earth*

190
- **194** Classify living organisms based on physical characteristic—**Sample Question 6**
- **187** *Identify direction of river flow on contour map*

180
- **184** *Identify place in human body where digestion of protein occurs*

170

***Proficient* 170**

- **166** Explain cause or effect of competition in pond ecosystem

160
- **160** Describe either production mechanism or method of travel of sound
- **156** *Identify why water is most important to living organisms*
- **155** *Identify effect of acid rain on pond ecosystem*

150
- **155** Explain that length of shadow relates to position of Sun in the sky

***Basic* 143**

140
- **144** Explain reason or prevention methods of monument crumbling—**Sample Question 5**
- **137** Explain part of procedure of measuring change in length of shadow throughout the day

130
- **133** Discuss a factor to be considered in deciding to use ethyl alcohol as automobile fuel

120
- **121** Name some things that animals get from food for survival
- **117** Give partial explanation of how color of clothing relates to coolness on sunny day

110
- **111** *Identify organisms most likely to live in tropical rain forest*

100

0

NOTE: Regular type denotes a constructed-response question. Italic type denotes a multiple-choice question.

* Each grade 8 science question in the 2000 assessment was mapped onto the NAEP 0–300 science scale. The position of the question on the scale represents the scale score attained by students who had a 65 percent probability of successfully answering a constructed-response question or a 74 percent probability of correctly answering a four-option multiple-choice question. Only selected questions from among those that were released after the 2000 assessment are presented. Scale score ranges for science achievement levels are referenced on the map.

To interpret the item map, consider, for example, the constructed-response question that maps at a scale score of 194 at grade 8. This question concerns the classification of living organisms. Scoring of responses to this question allowed for partial credit by using a four-level scoring guide. Mapping the question at the 194 scale score indicates that at least 65 percent of the students performing at this point achieved a score of 2 ("Partial") on the question. Among students with lower scores, less than 65 percent received a score of 2 on the question.

SOURCE: National Center for Education Statistics. National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

NAEP Science Scale

Figure 1.9

Grade 12 Item Map

Map of selected item descriptions on the National Assessment of Educational Progress science scale for grade 12

This map describes the knowledge or skills associated with answering individual science questions. The map identifies the score point at which students had a high probability of successfully answering the question.*

Scale	Achievement level	Score	Item description
300			
260			
250		252	*Identify relationships from given evolutionary tree*
240			
230		232	*Predict volume of O_2 given parameters*
220		223	*Explain why Sun appears larger in January than in July*—**Sample Question 7**
		219	*Name plants present when first amphibians appeared*
		213	*Predict length of year on Mars*
210	**Advanced 210**	212	*Estimate age of wood using radioactive dating*
200		199	*Explain cause of convection in atmosphere*
		194	Make determination about composition of ring based on its density—**Sample Question 8**
190		187	Discuss cause or effect of genetic mutation
		186	Name a disadvantage of using recombinant DNA technology
		185	Explain how mountain forms near continental plate boundary
180	**Proficient 178**	181	*Identify source of energy released in nuclear decay*
170		169	Describe similarities and differences between models of atom and solar system
		166	*Name difference between offspring of sexually and asexually reproducing animals*
160		163	Draw simplified model of solar system
150	**Basic 146**	153	Predict distance of new planet from given and derived information
140			
130		126	Plot period v. distance from Sun for planets given data table
		122	Name a way that the real solar system is different from the model drawn by the student
120		121	State cause and effect of AIDS
110		110	*Identify planet with longest year from data table*
100			
90			
80		80	Describe some modes of AIDS transmission
0			

NOTE: Regular type denotes a constructed-response question. Italic type denotes a multiple-choice question.

* Each grade 12 science question in the 2000 assessment was mapped onto the NAEP 0–300 science scale. The position of the question on the scale represents the scale score attained by students who had a 65 percent probability of successfully answering a constructed-response question or a 74 percent probability of correctly answering a four-option multiple-choice question. Only selected questions from among those that were released after the 2000 assessment are presented. Scale score ranges for science achievement levels are referenced on the map.

To interpret the item map, consider, for example, the constructed-response question that maps at a scale score of 163 at grade 12. This question asked students to draw a simplified model of the solar system. Scoring of responses to this question allows for partial credit by using a three-level scoring guide. Mapping the question at the 163 scale score indicates that at least 65 percent of the students performing at this point achieved a score of 3 ("Complete") on the question. Among students with lower scores, less than 65 percent received a score of 3 on the question.

SOURCE: National Center for Education Statistics. National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Interpreting NAEP Results

The average scores and percentages presented in this report are based on representative samples of students rather than on the entire population of students. Moreover, the collection of questions used at each grade level is but a sample of the many questions that could have been asked that measure the content and skills outlined in the NAEP science framework. As such, the results are subject to a measure of uncertainty, reflected in the standard error of the estimates. The standard errors for the estimated scale scores and percentages in this report are provided in appendix B.

The differences between scale scores and between percentages discussed in the following chapters take into account the standard errors associated with the estimates. Comparisons are based on statistical tests that consider both the magnitude of the difference between the group average scores or percentages and the standard errors of those statistics. Throughout this report, differences between scores and between percentages are pointed out only when they are significant from a statistical perspective. All differences reported are significant at the 0.05 level with appropriate adjustments for multiple comparisons. The term "significant" is not intended to imply a judgment about the absolute magnitude of the educational relevance of the differences. It is intended to identify statistically dependable population differences to help inform dialogue among policymakers, educators, and the public.

Readers are cautioned against interpreting NAEP results in a causal sense. Inferences related to subgroup performance or to the effectiveness of public and nonpublic schools, for example, should take into consideration the many socioeconomic and educational factors that may also impact on science performance.

Overview of Remaining Chapters

The results in chapters 2 and 3 of the report are based on a set of data with no accommodations offered to students. Findings are presented for the nation, for regions, for participating jurisdictions, and for the major reporting subgroups included in all NAEP report cards. Changes since the 1996 assessment are noted where the data permit comparisons. State-by-state results are included for the states and jurisdictions that participated in the science assessment at grades 4 and 8. Chapter 4 presents an overview of the second set of results—those that include students who were provided accommodations during the test administration. By including these results in the nation's science report card, the NAEP program continues a phased transition toward a more inclusive reporting sample. Future assessment results will be based solely on a student and school sample in which accommodations are permitted.

Chapter 5, which is based on the data with no accommodations offered, looks at factors that may influence teaching and learning, such as teacher certification and classroom practices. It includes information on the types of science courses students were taking at the time of the assessment.

This report also contains appendices that support or augment the results presented. Appendix A contains an overview of the NAEP science framework and specifications, information on the national and state samples, and a more detailed description of the major reporting subgroups featured in chapters 2 and 3. Appendix B contains the full data with standard errors for all tables and figures in this report. Appendix C presents selected state-level contextual variables from non-NAEP sources that may be associated with student performance. Appendix D contains a list of the NAEP science committee members.

Detailed information about the measurement methodology and data analysis techniques is available in the *NAEP 2000 Technical Report*.

2 Average Scale Score and Achievement-Level Results for the Nation and States

Chapter Focus

Are the nation's and states' fourth-, eighth-, and twelfth-graders making progress in science?

Chapter Contents

Overview

National Scale Scores and Achievement Levels

Percentile Comparisons

State Scale Scores and Achievement Levels

Cross-State Comparisons

The extent to which the nation is realizing one of the goals set at the National Education Summit in 1989—to ensure that students leaving the fourth, eighth, and twelfth grades demonstrate competency in core subjects—can now be examined in light of results obtained from two administrations of the National Assessment of Educational Progress (NAEP) science assessment.[1] The results of the science assessment administered in 1996 showed 29 percent of fourth- and eighth-graders, and 21 percent of twelfth-graders demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.[2] Given the extensive push within the United States in the past decade to reform science teaching and learning, there is an interest in determining if the results of the NAEP 2000 science assessment, compared to the results from 1996, would positively reflect these reforms by showing an increase in the percentage of students demonstrating competency over challenging material.

This chapter presents the NAEP 2000 science results for the nation at grades 4, 8, and 12 and for participating states and jurisdictions at grades 4 and 8. Student performance on

1 U.S. Department of Education. (1991). *America 2000: An education strategy.* Washington, DC: Author.

2 Bourque, M. L., Champagne, A. B., & Crissman, S. (1997). *1996 science performance standards: Achievement results for the nation and the states.* Washington, DC: National Assessment Governing Board.

NAEP is reported in two ways: one, as average scores on the NAEP science composite scale, which ranges from 0 to 300, and two, as percentages of students who attained each of the three science achievement levels: *Basic, Proficient,* and *Advanced*. Discussion of students' progress over time is based on a comparison of the results in 2000 to those from the 1996 assessment. This comparison is possible because the assessments shared a common set of science questions based on the current science framework and because the populations of students were sampled and assessed using comparable procedures.

Readers are reminded that differences between scale scores and percentages discussed in this chapter take into account the standard errors associated with the estimates. Thus, a small difference between scores in one comparison may be significant while a similar or larger difference between scores in another comparison may not be statistically significant.

The results presented in this chapter are based on a representative sample of students assessed under conditions that did not permit accommodations for special-needs students. These were the same conditions under which the 1996 science assessment was administered, thus making it possible to report changes in student performance across the assessment years. A second set of results that reflect part of a phased transition toward a more inclusive reporting sample in which accommodations were permitted is presented in chapter 4.

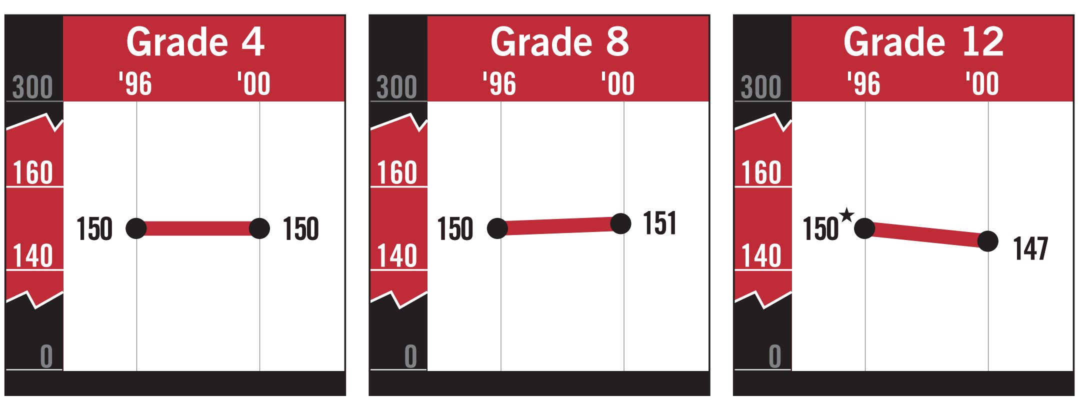
National Scale Score Results

Figure 2.1 presents the average science scale scores of fourth-, eighth-, and twelfth-grade students attending both public and nonpublic schools in 1996 and 2000. There were no statistically significant differences observed in average science scores from 1996 to 2000 at grades 4 and 8, and a decrease at grade 12 from an average score of 150 to 147.

Figure 2.1

National Scale Score Results

National average science scale scores, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

National Percentile Score Results

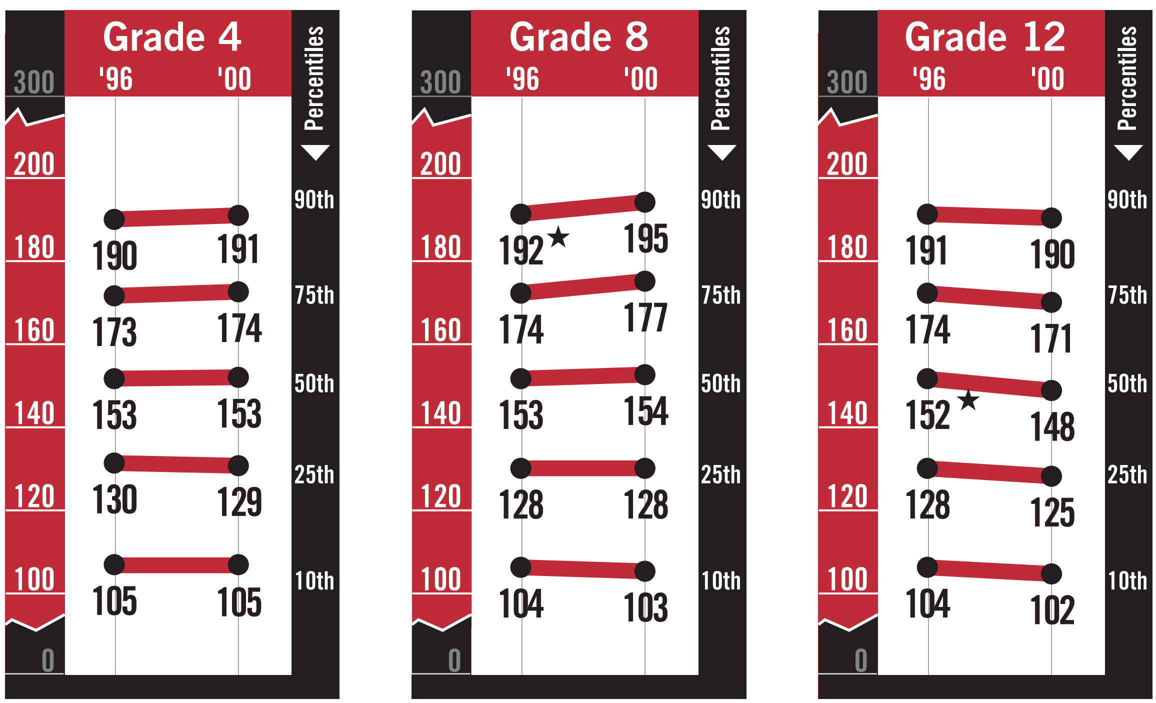
Changes in student performance can also be examined by looking at the percentile scores on the NAEP science scale across assessment years. The advantage of looking at data in this way is that it shows whether changes in the national average scores are reflected in scores across the performance distribution.

Figure 2.2 shows the science scores for grades 4, 8, and 12 at the 10th, 25th, 50th, 75th, and 90th percentiles in both 1996 and 2000. At grade 4, there was no significant difference observed in the percentile scores since 1996. Although there was no significant difference observed in the national average score at grade 8 between 1996 and 2000, there was an increase in the scale score at the 90th percentile—from 192 in 1996 to 195 in 2000—indicating improvement for the highest-performing students. At grade 12, the score at the 50th percentile declined between 1996 and 2000, indicating that the recent performance decline was primarily focused in the middle of the score distribution.

Figure 2.2

National Performance Distribution

National science scale score percentiles, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Achievement-Level Results for the Nation

The science achievement levels—*Basic, Proficient,* and *Advanced*—used to report NAEP results were established by the National Assessment Governing Board (NAGB) in 1996. A discussion of the achievement-setting process can be found in chapter 1 of this report together with descriptions of what students in grades 4, 8, and 12 know and can do at each of the three achievement levels.

Achievement-level results for the nation's fourth-, eighth-, and twelfth-grade students are presented in figure 2.3. Results are presented in two ways: as the percentage of students within each achievement level interval, and as the percentage of students at or above the *Basic* and *Proficient* levels. It is necessary to keep in mind that the percentages at or above specific achievement levels are cumulative. Therefore, included among the percentage of students at or above the *Basic* level are also those who have achieved the *Proficient* and *Advanced* levels of performance, and included among students at or above the *Proficient* level are also those who have attained the *Advanced* level of performance.

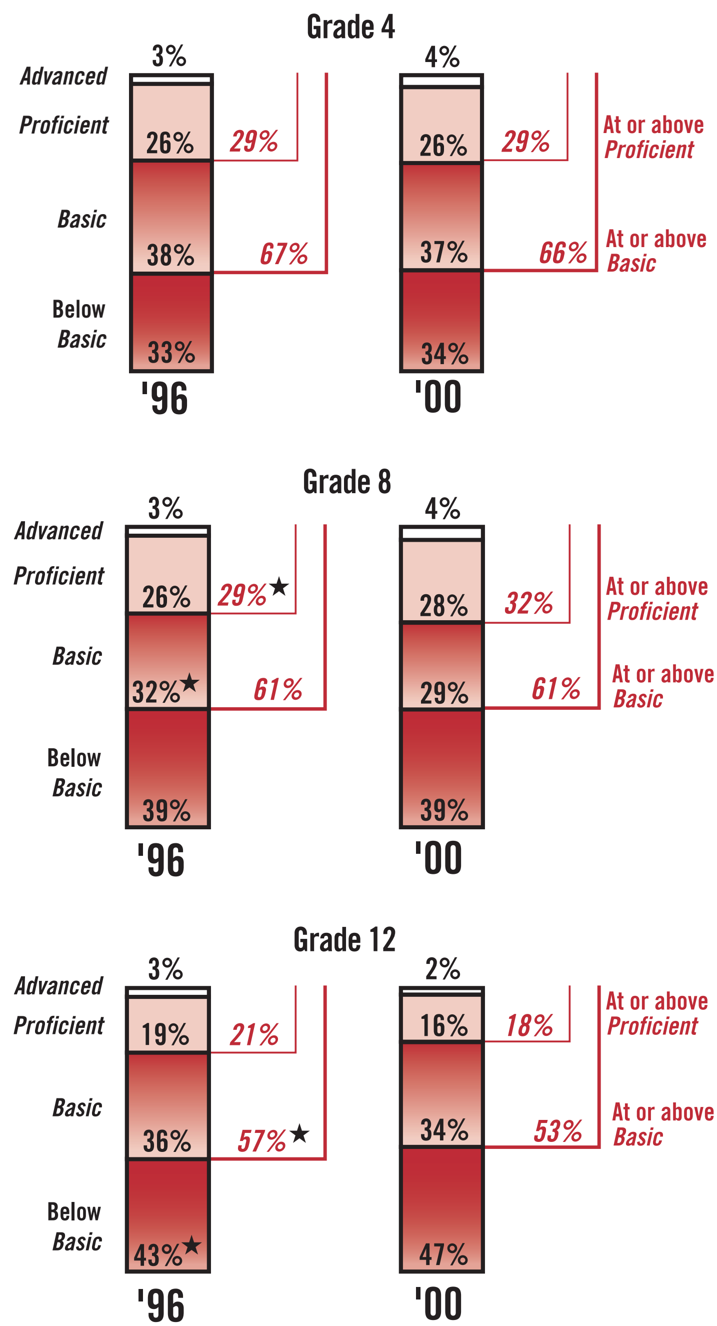
As shown in figure 2.3, performance at or above the *Proficient* level—the achievement level identified by NAGB as the level that all students should reach—was attained by 29 percent of fourth-graders, 32 percent of eighth-graders, and 18 percent of twelfth-graders in 2000.

No statistically significant differences were detected on the NAEP measure at grade 4 (29 percent were at or above the *Proficient* level in both 1996 and 2000). However, at the eighth-grade level, some progress as demonstrated on the NAEP measure has been made. More students demonstrated competency over challenging science material; 32 percent were at or above the *Proficient* level in 2000 compared to 29 percent in 1996. At grade 12, the percentage of students at or above *Basic* declined between 1996 and 2000, from 57 percent to 53 percent. The apparent decline in the percentage of twelfth-graders at or above the *Proficient* level was not found to be statistically significant.

Figure 2.3

National Achievement-Level Results

Percentage of students within each science achievement-level range and at or above achievement levels, grades 4, 8, and 12: 1996 and 2000



How to read these figures:

- The italicized percentages to the right of the shaded bars represent the percentages of students at or above *Basic* and *Proficient*.
- The percentages in the shaded bars represent the percentages of students within each achievement level.

★ Significantly different from 2000.

NOTE: Percentages within each science achievement level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Results for Regions of the Country

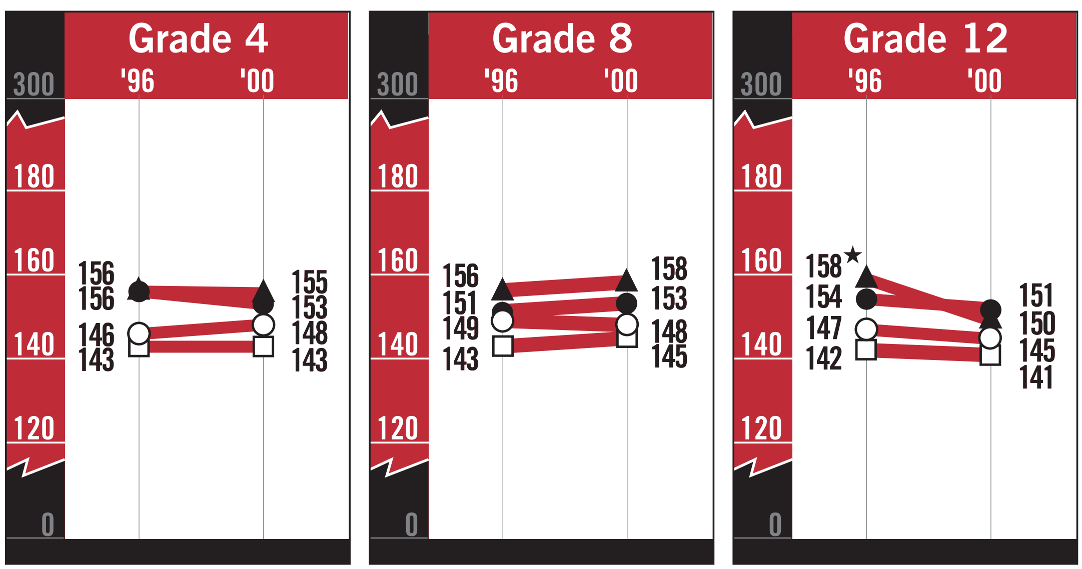
This section examines results for four regions of the country: Northeast, Southeast, Central, and West. A listing of the states and other jurisdictions within these regions is provided in appendix A. Figure 2.4 presents scale score results by region. At grades 4 and 8, there were no statistically significant differences in the performance of students attending schools in the Northeast, Southeast, Central, and West regions between 1996 and 2000. At grade 12, however, the average science score for students attending schools in the Central region was lower in 2000 than in 1996.

Comparisons between the regions in the 2000 assessment show that fourth-grade students attending schools in the Northeast and Central regions outperformed their peers in the West and Southeast. In addition, grade 4 students in the West had higher scores than students in the Southeast. Eighth-grade students attending schools in the Northeast and Central regions had higher average scores than their peers in the West and Southeast. Twelfth-grade students attending schools in the Southeast were outperformed by their peers in the Northeast and Central regions.

Figure 2.4

National Scale Score Results by Region

National science scale score results by region of the country, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

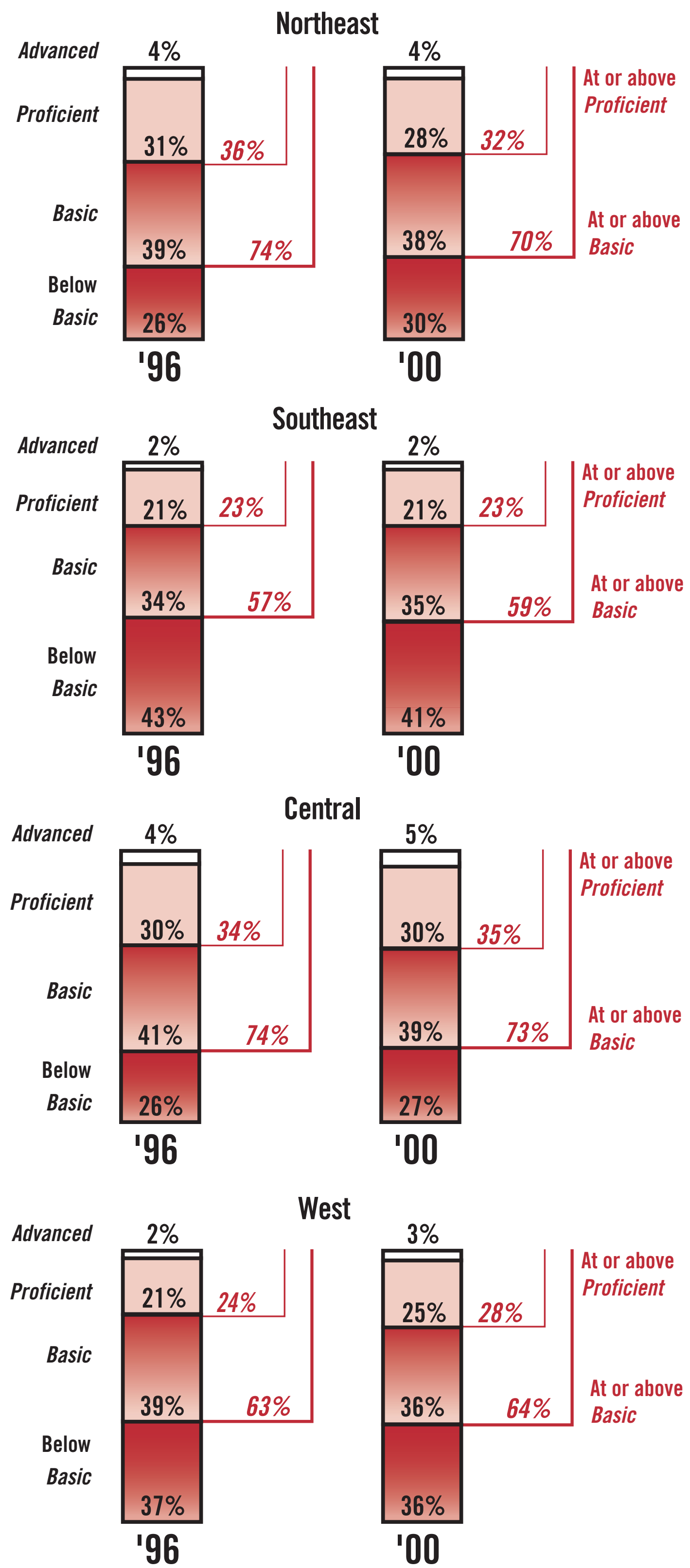
Figure 2.5 presents the achievement-level results by region. At grades 4 and 8, there were no statistically significant changes in the percentages of students at or above the *Basic* and *Proficient* levels between 1996 and 2000 in any of the four regions. The one percentage point increase at the *Advanced* level in the Southeast at grade 8 was, however, statistically significant. At grade 12, the percentage of students at or above the *Basic* and *Proficient* levels decreased in the Central region between 1996 and 2000.

A number of differences can be seen when the results for each of the three grades in 2000 are compared between the regions. At grade 4, both the Northeast and Central regions had higher percentages of students at or above the *Basic* level than in the Southeast and West, and higher percentages at or above *Proficient* than in the Southeast. At grade 8, both the Northeast and the Central regions had higher percentages of students at or above the *Basic* and *Proficient* levels than did the Southeast and West. In addition, the percentage of eighth-graders at or above the *Basic* level in the Central region was higher than the percentage of eighth-graders in the Northeast. At grade 12, the Northeast and Central regions had higher percentages of students at or above the *Basic* level than did the Southeast. There was no statistically significant difference between the regions in the percentage of students at or above the *Proficient* level at grade 12.

Figure 2.5a

National Achievement-Level Results by Region

Percentage of students within each science achievement-level range and at or above achievement levels, by region of the country, grade 4: 1996 and 2000

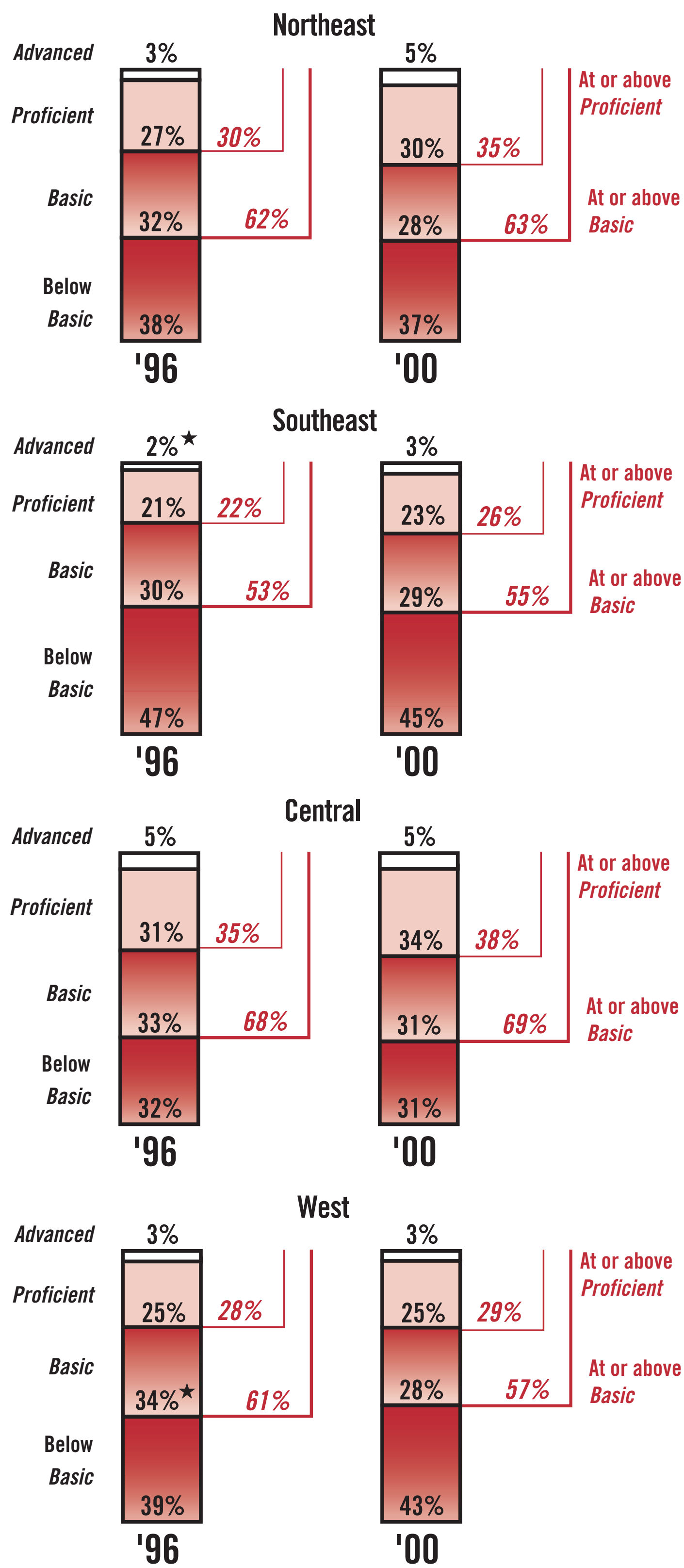


See footnotes at end of figure. ▶

Figure 2.5b

National Achievement-Level Results by Region (continued)

Percentage of students within each science achievement-level range and at or above achievement levels, by region of the country, grade 8: 1996 and 2000

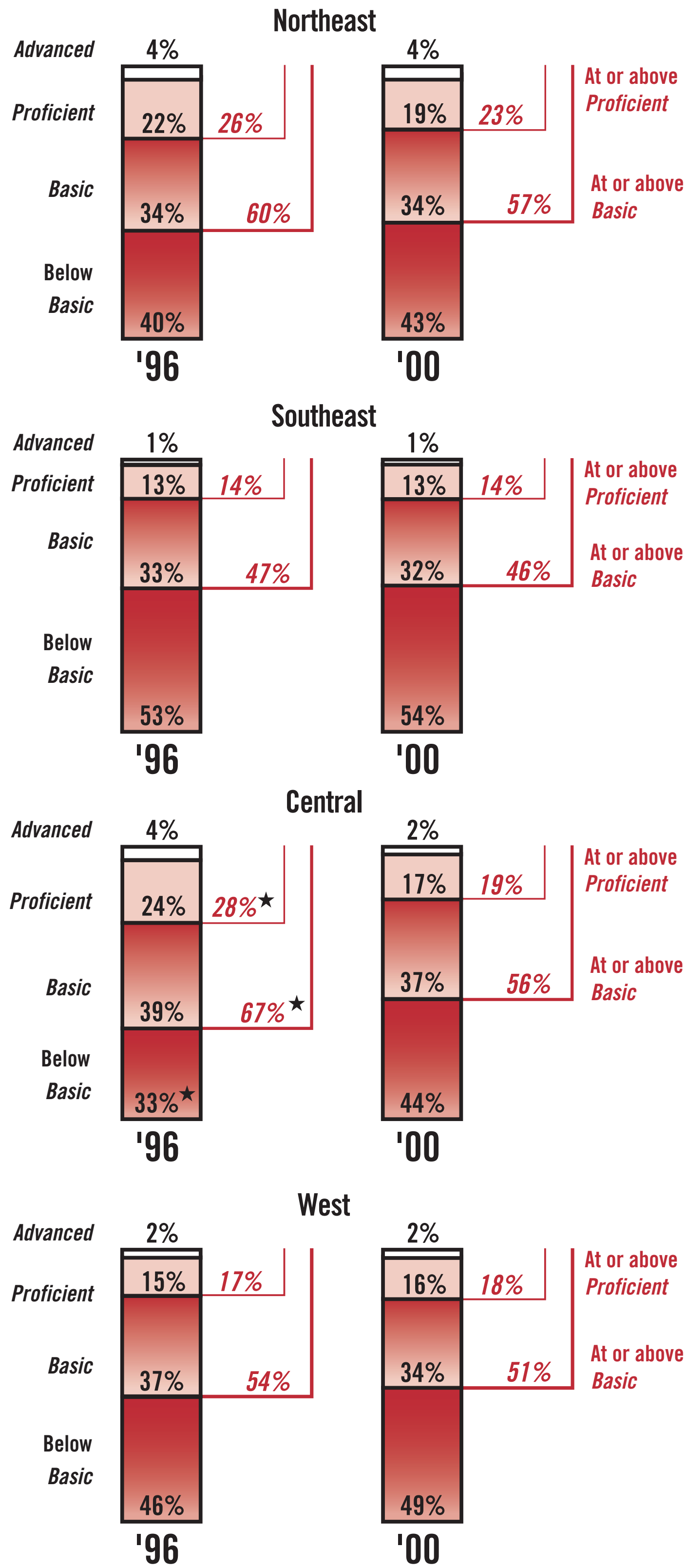


See footnotes at end of figure. ▶

Figure 2.5c

National Achievement-Level Results by Region (continued)

Percentage of students within each science achievement-level range and at or above achievement levels, by region of the country, grade 12: 1996 and 2000



★ Significantly different from 2000.

NOTE: Percentages within each science achievement level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

State Results

In addition to the national results, science performance data were also collected for students in grades 4 and 8 who attended public schools in states and other jurisdictions that chose to participate in the assessment. Although 45 states and jurisdictions participated at grade 4, and 44 states and jurisdictions participated at grade 8, not all met minimum school participation guidelines for reporting their results in 2000. (See appendix A for details on participation and reporting guidelines.) Results from the 2000 assessment for grades 4 and 8 in Wisconsin and for grade 8 in the Virgin Islands are not included in this report because they failed to meet the minimum public school participation rate of 70 percent. Jurisdictions that failed to meet one or more of the other participation guidelines are noted in each of the tables. Results from both the 1996 and 2000 state assessments are presented for grade 8, but results from 2000 only are reported at grade 4 since there was no state-level assessment administered to fourth-graders in 1996. Tables presenting state-level results at grade 8, indicate statistically significant changes across years when examining only one jurisdiction at a time (*), and when using a multiple comparison procedure based on all the jurisdictions that participated (‡). Only those differences based on the multiple comparison procedure are discussed.

In examining the "accommodations-not-permitted" results for jurisdictions presented in this chapter, it should be noted that schools participating in the NAEP assessments under these conditions were permitted to exclude those students who could not be assessed meaningfully without accommodations. Exclusion rates vary across jurisdictions not only because of differences in the implementation of the Individuals with Disabilities Education Act (IDEA), but also because of population shifts in the percentage of students classified with disabilities (SD) and, especially, limited English proficient (LEP) students. Therefore, comparisons of assessment results across jurisdictions and within jurisdictions across years should be made with caution. The percentage of students excluded from the assessment has implications for the representativeness of the sample assessed within a jurisdiction. No adjustments have been made for differing exclusion rates across jurisdictions or across years. Thus, a comparison within a jurisdiction across years or between two jurisdictions may be based on samples with exclusion rates that differ considerably. The exclusion rates for each jurisdiction are presented in appendix A.

Scale Score Results by Jurisdiction

The average scale scores of public school students for participating jurisdictions are presented in table 2.1 for grade 4 and table 2.2 for grade 8. Whereas the national results shown in previous sections of this chapter represent both public and nonpublic schools combined, the national average scores shown in each of these tables represent the performance of public school students only. Of the 36 jurisdictions that participated in both the 1996 and 2000 state level assessments at grade 8, three showed score gains in 2000: Missouri and the Department of Defense domestic schools and overseas schools (DDESS and DoDDS).

Table 2.1 State Average Score Results, Grade 4

Average science scale score results by state for grade 4 public schools: 2000

Nation	148
Alabama	143
Arizona	141
Arkansas	144
California †	131
Connecticut	156
Georgia	143
Hawaii	136
Idaho †	153
Illinois †	151
Indiana †	155
Iowa †	160
Kentucky	152
Louisiana	139
Maine †	161
Maryland	146
Massachusetts	162
Michigan †	154
Minnesota †	157
Mississippi	133
Missouri	156
Montana †	160
Nebraska	150
Nevada	142
New Mexico	138
New York †	149
North Carolina	148
North Dakota	160
Ohio †	154
Oklahoma	152
Oregon †	150
Rhode Island	148
South Carolina	141
Tennessee	147
Texas	147
Utah	155
Vermont †	159
Virginia	156
West Virginia	150
Wyoming	158
Other Jurisdictions	
American Samoa	51
DDESS	157
DoDDS	156
Guam	110
Virgin Islands	116

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: National results are based on the national sample, not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 2.2 State Average Score Results, Grade 8

Average science scale score results by state for grade 8 public schools: 1996 and 2000

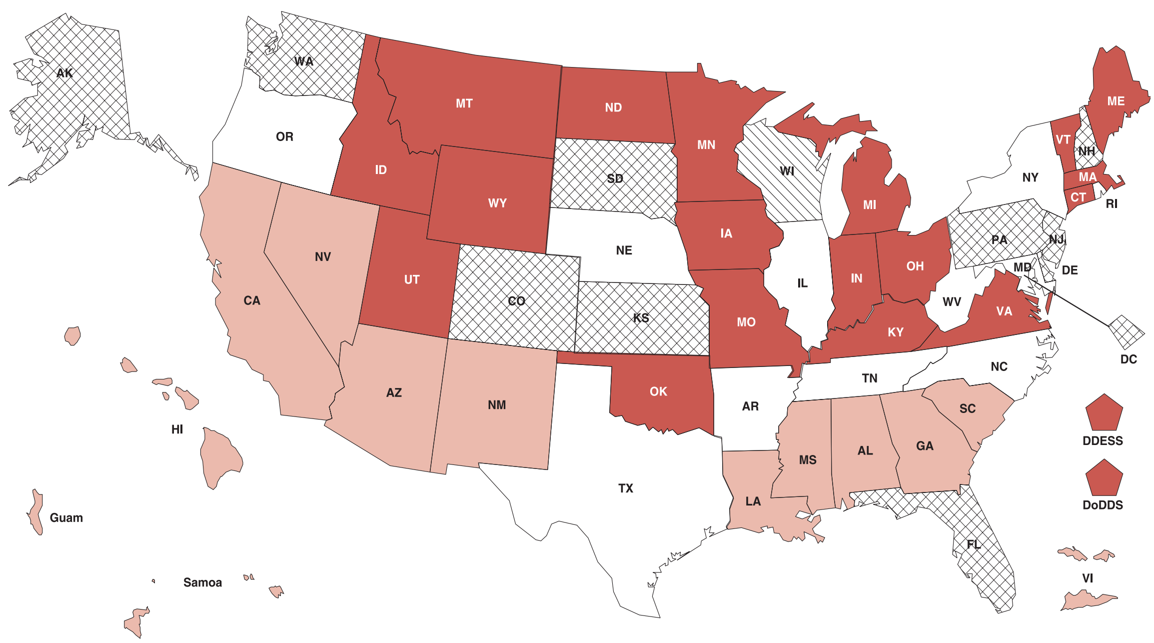
	1996	2000
Nation	148	149
Alabama	139	141
Arizona †	145	146
Arkansas	144	143
California †	138 *	132
Connecticut	155	154
Georgia	142	144
Hawaii	135	132
Idaho †	—	159
Illinois †	—	150
Indiana †	153	156
Kentucky	147 *	152
Louisiana	132	136
Maine †	163 *	160
Maryland	145	149
Massachusetts	157	161
Michigan †	153	156
Minnesota †	159	160
Mississippi	133	134
Missouri	151 ‡	156
Montana †	162	165
Nebraska	157	157
Nevada	—	143
New Mexico	141	140
New York †	146	149
North Carolina	147	147
North Dakota	162	161
Ohio	—	161
Oklahoma	—	149
Oregon †	155	154
Rhode Island	149	150
South Carolina	139	142
Tennessee	143	146
Texas	145	144
Utah	156	155
Vermont †	157 *	161
Virginia	149	152
West Virginia	147	150
Wyoming	158	158
Other Jurisdictions		
American Samoa	—	72
DDESS	153 ‡	159
DoDDS	155 ‡	159
Guam	120	114

* Significantly different from 2000 if only one jurisdiction or the nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: National results are based on the national sample, not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

The maps in figures 2.6 and 2.7 compare state and national average scores at grades 4 and 8, respectively. At grade 4, 20 jurisdictions had scores that were higher than the national average score, 13 had scores that were lower than the national average, and no statistically significant differences were detected between the state and national average for 11 states. At grade 8, 18 jurisdictions had scores that were higher than the national average score, 13 had scores that were lower than the national average, and no significant differences were detected between the state and national average for 11 states.

Figure 2.6
State v. National Scale Score, Grade 4

Comparison results of state and national average science scale scores for grade 4: 2000



- State has higher average scale score than nation.
- State average score was not found to be significantly different from the nation.
- State has lower average scale score than nation.
- State did not meet the minimum participation rate guidelines (see technical notes).
- State did not participate in the NAEP 2000 science state assessment.

NOTE: Caution should be exercised when interpreting comparisons among states and other jurisdictions. NAEP performance estimates are not adjusted to account for the socioeconomic or demographic, differences among states and jurisdictions.

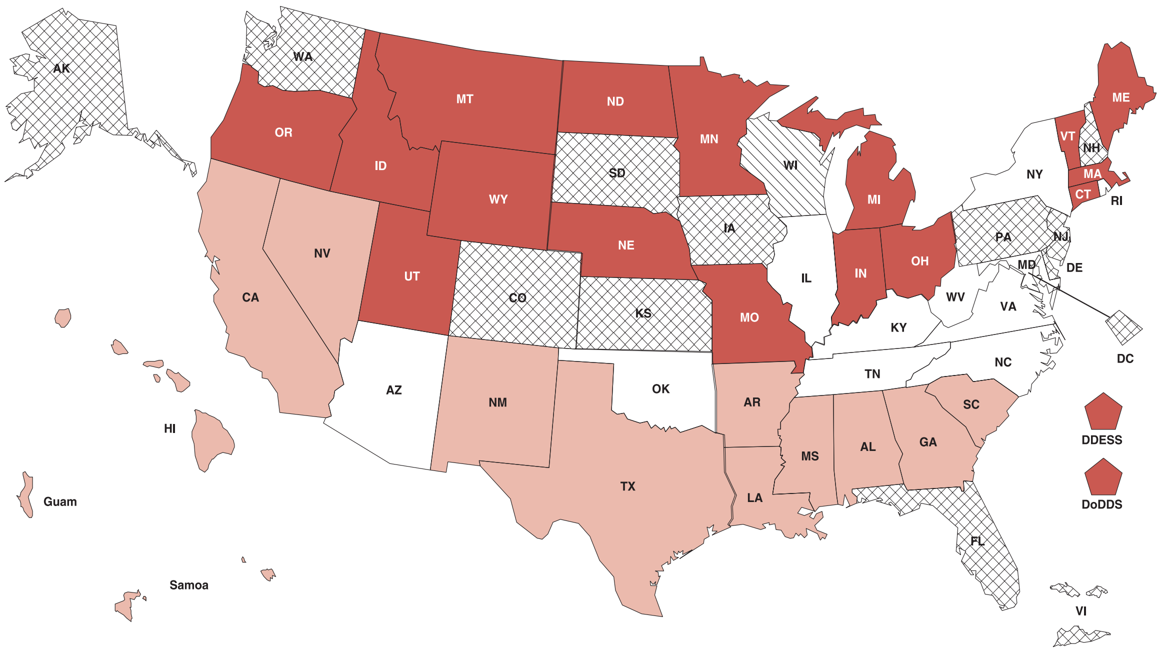
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Figure 2.7
State v. National Scale Score, Grade 8

Comparison results of state and national average science scale scores for grade 8: 2000



State has higher average scale score than nation.

State average score was not found to be significantly different from the nation.

State has lower average scale score than nation.

State did not meet the minimum participation rate guidelines (see technical notes).

State did not participate in the NAEP 2000 science state assessment.

NOTE: Caution should be exercised when interpreting comparisons among states and other jurisdictions. NAEP performance estimates are not adjusted to account for the socioeconomic or demographic, differences among states and jurisdictions.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

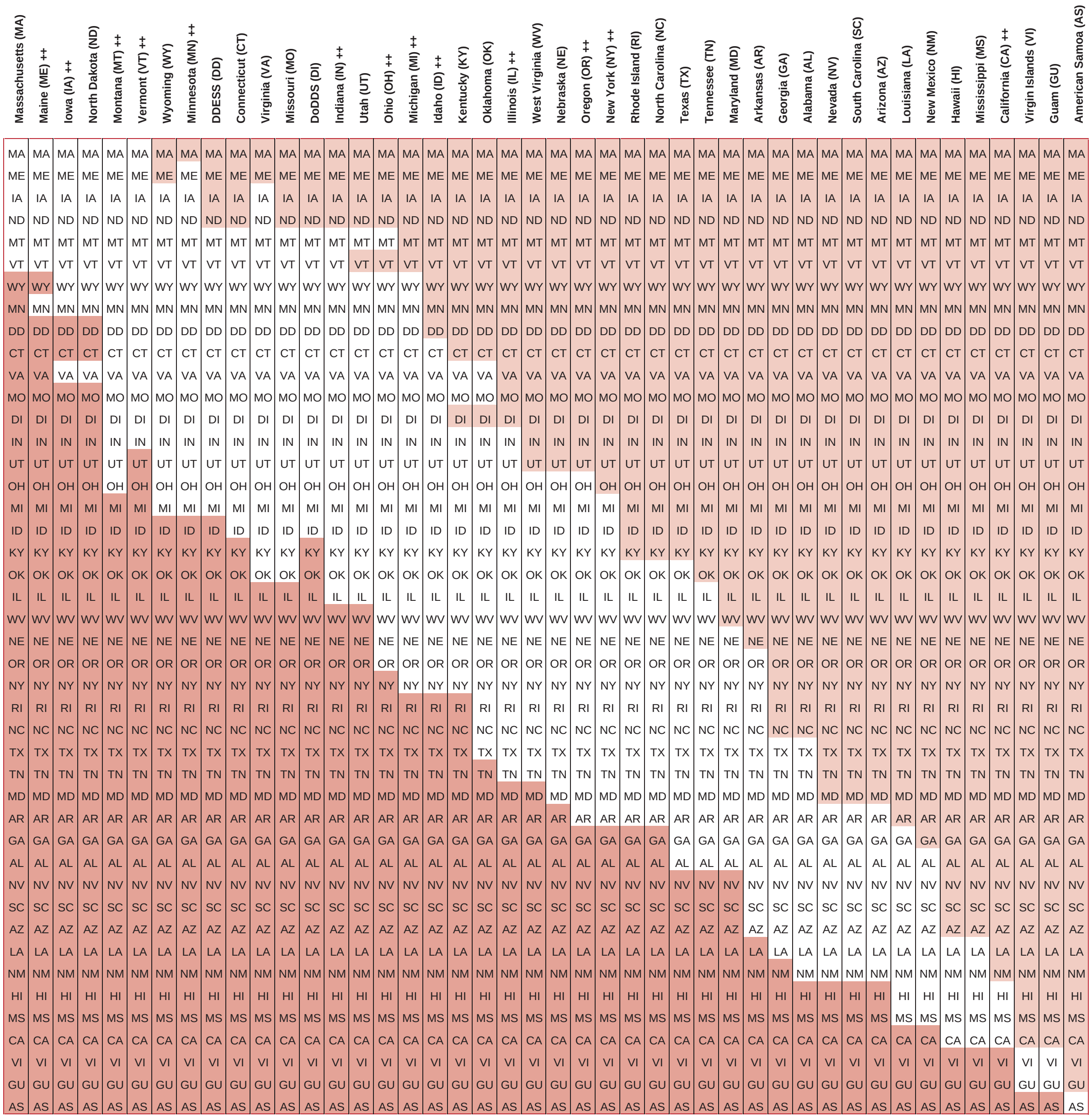
Cross-State Scale Score Comparisons

Figures 2.8 and 2.9 display the differences between the scale scores for all possible pairings of participating jurisdictions at grades 4 and 8, respectively. The variation in shading indicates whether a jurisdiction listed across the top of the figure had a score that was higher than, lower than, or not significantly different from other jurisdictions. Within each figure, jurisdictions are ranked from highest to lowest average scale score, both from left to right across the columns and down the rows. For example in figure 2.8, the first cell in the second row compares the average score at grade 4 in Massachusetts (MA) to the average score in Maine (ME). The lack of shading in this cell indicates that there was no statistically significant difference found between the scores in these two states. Moving down the first column to Wyoming (WY), the shading changes to indicate that the average score in Massachusetts was higher than that in Wyoming. At grade 4, the top 6 states had average scores that were not found to differ significantly from one another. These states were Iowa, Maine, Massachusetts, Montana, North Dakota, and Vermont. At grade 8, Idaho, Maine, Massachusetts, Minnesota, North Dakota, Ohio, Vermont, and the Department of Defense domestic schools and overseas schools all performed similarly (i.e., no significant differences were detected in the average scores of these 9 jurisdictions) and were only outperformed by Montana.

Figure 2.8: Cross-State Scale Score Comparisons, Grade 4

Comparisons of average science scale scores for grade 4 public schools: 2000

Instructions: Read <u>down</u> the column directly under a jurisdiction name listed in the heading at the top of the figure. Match the shading intensity surrounding a jurisdiction's abbreviation to the key below to determine whether the average science scale score of this jurisdiction is higher than, the same as, or lower than the jurisdiction in the column heading. For example, in the column under Wyoming, Wyoming's score was lower than Massachusetts and Maine, about the same as all the states from Iowa through Michigan, and higher than the remaining states down the column.



Jurisdiction has statistically significantly higher average scale score than the jurisdiction listed at the top of the figure.

No statistically significant difference detected from the jurisdiction listed at the top of the figure.

Jurisdiction has statistically significantly lower average scale score than the jurisdiction listed at the top of the figure.

The between jurisdiction comparisons take into account sampling and measurement error and that each jurisdiction is being compared with every other jurisdiction. Significance is determined by an application of a multiple comparison procedure (see appendix A).

++Indicates that the jurisdiction did not satisfy one or more of the guidelines for school participation rates (see appendix A).

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).

NOTE: Differences between states and jurisdictions may be partially explained by other factors not included in this figure.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Figure 2.9: Cross-State Scale Score Comparisons, Grade 8

Comparisons of average science scale scores for grade 8 public schools: 2000

Instructions: Read down the column directly under a jurisdiction name listed in the heading at the top of the figure. Match the shading intensity surrounding a jurisdiction's abbreviation to the key below to determine whether the average science scale score of this jurisdiction is higher than, the same as, or lower than the jurisdiction in the column heading. For example, in the column under Indiana, Indiana's score was lower than Montana, Massachusetts, Vermont, and North Dakota, about the same as all the states from Ohio through Kentucky, and higher than the remaining states down the column.

Montana (MT) ++	Massachusetts (MA)	Vermont (VT) ++	North Dakota (ND)	Ohio (OH)	Minnesota (MN) ++	Maine (ME) ++	DoDDS (DI)	Idaho (ID) ++	DDESS (DD)	Wyoming (WY)	Nebraska (NE)	Missouri (MO)	Michigan (MI) ++	Indiana (IN) ++	Utah (UT)	Oregon (OR) ++	Connecticut (CT)	Virginia (VA)	Kentucky (KY)	Illinois (IL) ++	Rhode Island (RI)	West Virginia (WV)	Oklahoma (OK)	Maryland (MD)	New York (NY) ++	North Carolina (NC)	Tennessee (TN)	Arizona (AZ) ++	Texas (TX)	Georgia (GA)	Nevada (NV)	Arkansas (AR)	South Carolina (SC)	Alabama (AL)	New Mexico (NM)	Louisiana (LA)	Mississippi (MS)	Hawaii (HI)	California (CA) ++	Guam (GU)	American Samoa (AS)
MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT
MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA
VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT	VT
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
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MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN	MN
ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME	ME
DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID
DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD	DD
WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY	WY
NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
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MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI	MI
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OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT	CT
VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA	VA
KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY	KY
IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL
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WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV	WV
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MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD
NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN
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TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX	TX
GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA
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NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
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CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA
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AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS

Jurisdiction has statistically significantly higher average scale score than the jurisdiction listed at the top of the figure.

No statistically significant difference detected from the jurisdiction listed at the top of the figure.

Jurisdiction has statistically significantly lower average scale score than the jurisdiction listed at the top of the figure.

The between jurisdiction comparisons take into account sampling and measurement error and that each jurisdiction is being compared with every other jurisdiction. Significance is determined by an application of a multiple comparison procedure (see appendix A).

++Indicates that the jurisdiction did not satisfy one or more of the guidelines for school participation rates (see appendix A).

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

NOTE: Differences between states and jurisdictions may be partially explained by other factors not included in this figure.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Achievement-Level Results by Jurisdiction

Like the national results, achievement-level results for jurisdictions are presented in two ways: the percentage of students within each science achievement-level range, and the percentage of students at or above the *Proficient* level. The percentage of students within each science achievement-level range in 2000 by jurisdiction is presented in figure 2.10 for grade 4 and figure 2.11 for grade 8. The shaded bars represent the proportion of students in each of the three achievement levels (*Basic, Proficient,* and *Advanced)* as well as the proportion of students who are below *Basic.* Each population of students is aligned at the point where the *Proficient* level begins, so that scanning down the horizontal bars allows for easy comparison of the percentages of students who were at or above *Proficient*. Jurisdictions are listed in the figures in three clusters based on a statistical comparison of the percentage of students at or above *Proficient* in each jurisdiction with the national percentage of public school students who were at or above *Proficient*. The cluster of jurisdictions at the top of each figure had a higher percentage of students at or above the *Proficient* level compared to the nation. For jurisdictions in the middle cluster, the percentages of students did not differ significantly from the national percentage. Jurisdictions in the bottom cluster had percentages lower than the national percentage. Within each cluster, jurisdictions are listed in alphabetical order.

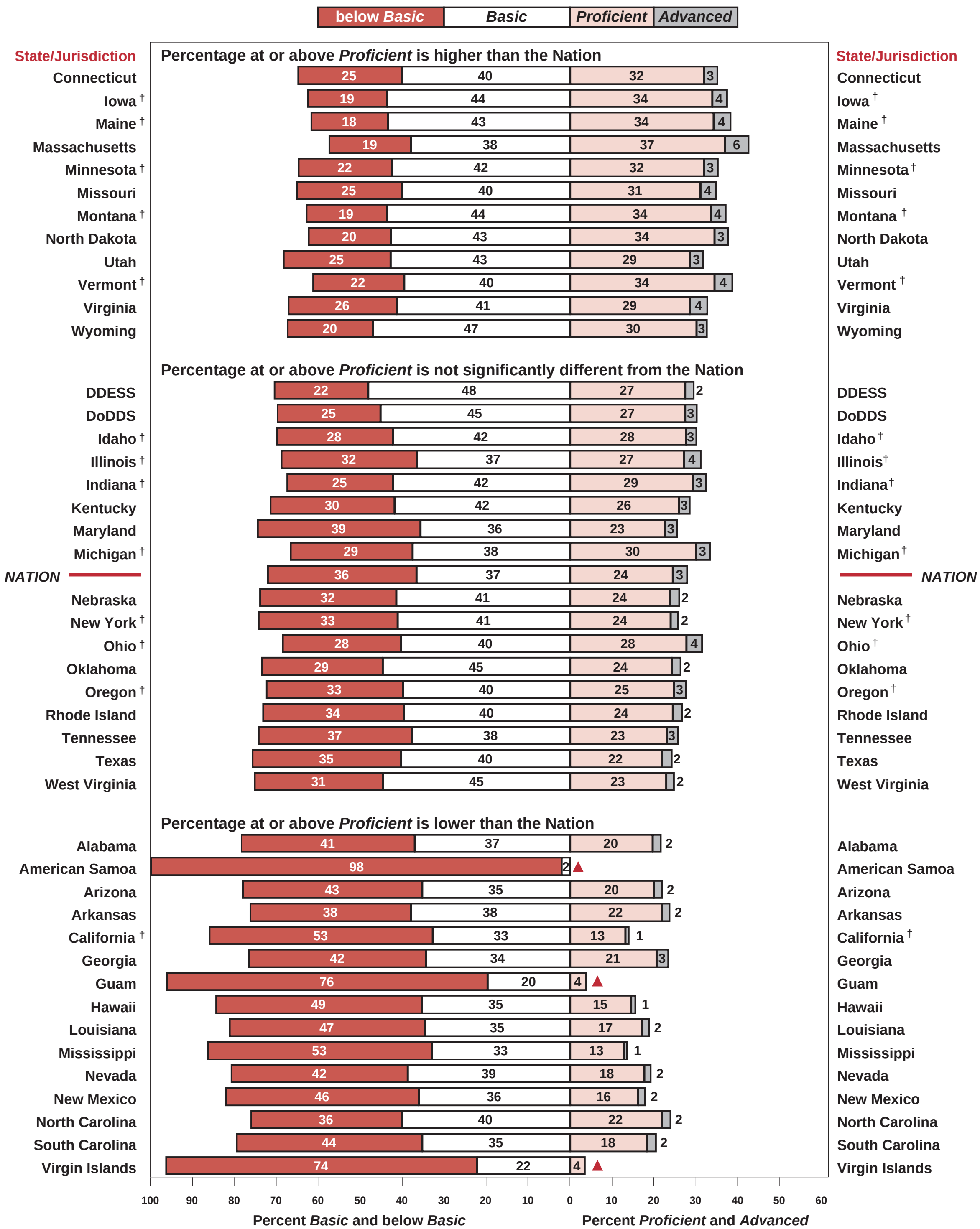
Figure 2.10 shows that at grade 4, 12 jurisdictions had higher percentages of students at or above *Proficient* than the nation, 17 had percentages that were not different from the nation, and 15 had percentages that were lower than the nation. In figure 2.11, the results for grade 8 show 17 jurisdictions with higher percentages of students at or above *Proficient* than the nation, 8 with percentages that were not different from the nation, and 17 with percentages that were lower than the nation.

Figure 2.10

State Achievement-Level Results, Grade 4

Percentage of students within each science achievement-level range by state for grade 4 public schools: 2000

The bars below indicate the percentages of students in each NAEP science achievement level. Each population of students is aligned at the point where the *Proficient* level begins, so that they may be compared at *Proficient* and above. States are listed alphabetically within three groups: the percentage at or above *Proficient* is higher than, not significantly different from, or lower than the nation.



† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

▲ Percentage is between 0.0 and 0.5.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).

NOTE: Numbers may not add to 100 due to rounding. National results are based on the national sample, not on aggregated state assessment samples.

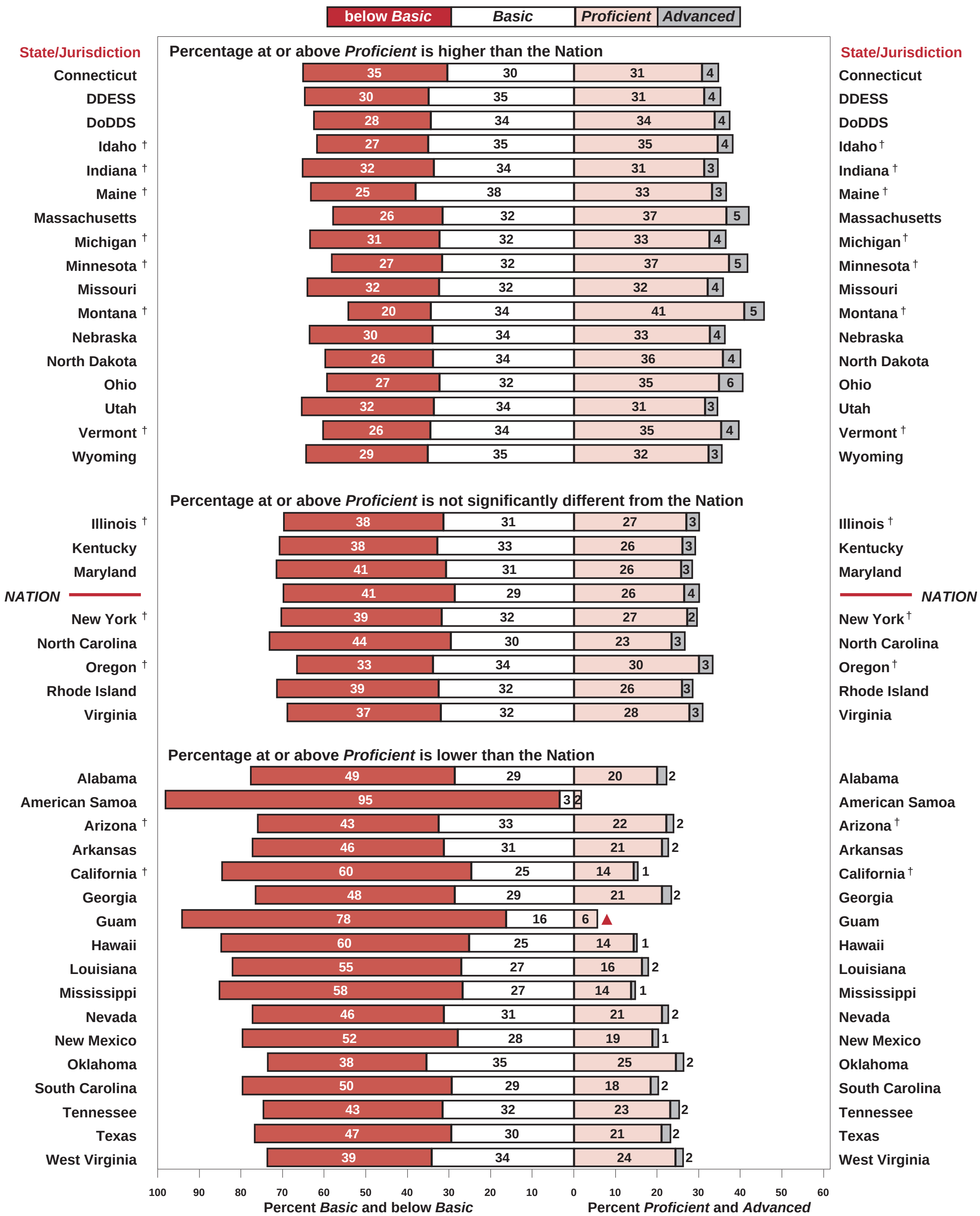
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Figure 2.11

State Achievement-Level Results, Grade 8

Percentage of students within each science achievement-level range by state for grade 8 public schools: 2000

The bars below indicate the percentages of students in each NAEP science achievement level. Each population of students is aligned at the point where the *Proficient* level begins, so that they may be compared at *Proficient* and above. States are listed alphabetically within three groups: the percentage at or above *Proficient* is higher than, not significantly different from, or lower than the nation.



† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

▲ Percentage is between 0.0 and 0.5.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).

NOTE: Numbers may not add to 100 due to rounding. National results are based on the national sample, not on aggregated state assessment samples.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Tables 2.3 and 2.4 present the percentages of students performing at or above the *Proficient* level by jurisdiction for grades 4 and 8, respectively. At grade 4, the percentage of students at or above *Proficient* ranged from less than 1 percent to 43 percent of students in 2000. At grade 8, the percentage of students at or above the *Proficient* level ranged from 2 percent to 46 percent in 2000. Of the 36 jurisdictions that participated in both 1996 and 2000 at grade 8, 6 made gains in the percentage of students at or above *Proficient*: Kentucky, Missouri, Vermont, West Virginia, and the Department of Defense domestic schools and overseas schools (DDESS and DoDDS).

Table 2.3 State *Proficient* Level Results, Grade 4

Percentage of students at or above the *Proficient* level in science by state for grade 4 public schools: 2000

Nation	28
Alabama	22
Arizona	22
Arkansas	24
California †	14
Connecticut	35
Georgia	23
Hawaii	16
Idaho †	30
Illinois †	31
Indiana †	32
Iowa †	37
Kentucky	29
Louisiana	19
Maine †	38
Maryland	26
Massachusetts	43
Michigan †	33
Minnesota †	35
Mississippi	14
Missouri	35
Montana †	37
Nebraska	26
Nevada	19
New Mexico	18
New York †	26
North Carolina	24
North Dakota	38
Ohio †	31
Oklahoma	26
Oregon †	28
Rhode Island	27
South Carolina	21
Tennessee	26
Texas	24
Utah	32
Vermont †	39
Virginia	33
West Virginia	25
Wyoming	33
Other Jurisdictions	
American Samoa	▲
DDESS	29
DoDDS	30
Guam	4
Virgin Islands	4

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: National results are based on the national sample and not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 2.4 State *Proficient* Level Results, Grade 8

Percentage of students at or above the *Proficient* level in science by state for grade 8 public schools: 1996 and 2000

	1996	2000
Nation	27	30
Alabama	18 *	22
Arizona †	23	24
Arkansas	22	23
California †	20	15
Connecticut	36	35
Georgia	21	23
Hawaii	15	15
Idaho †	—	38
Illinois †	—	30
Indiana †	30	35
Kentucky	23 ‡	29
Louisiana	13 *	18
Maine †	41	37
Maryland	25	28
Massachusetts	37 *	42
Michigan †	32	37
Minnesota †	37	42
Mississippi	12	15
Missouri	28 ‡	36
Montana †	41	46
Nebraska	35	36
Nevada	—	23
New Mexico	19	20
New York †	27	30
North Carolina	24	27
North Dakota	41	40
Ohio	—	41
Oklahoma	—	26
Oregon †	32	33
Rhode Island	26	29
South Carolina	17	20
Tennessee	22	25
Texas	23	23
Utah	32	34
Vermont †	34 ‡	40
Virginia	27	31
West Virginia	21 ‡	26
Wyoming	34	36
Other Jurisdictions		
American Samoa	—	2
DDESS	27 ‡	35
DoDDS	31 ‡	37
Guam	7	6

* Significantly different from 2000 if only one jurisdiction or the nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
— Indicates that the jurisdiction did not participate.
NOTE: National results are based on the national sample and not on aggregated state assessment samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Cross-State Achievement Level Comparisons

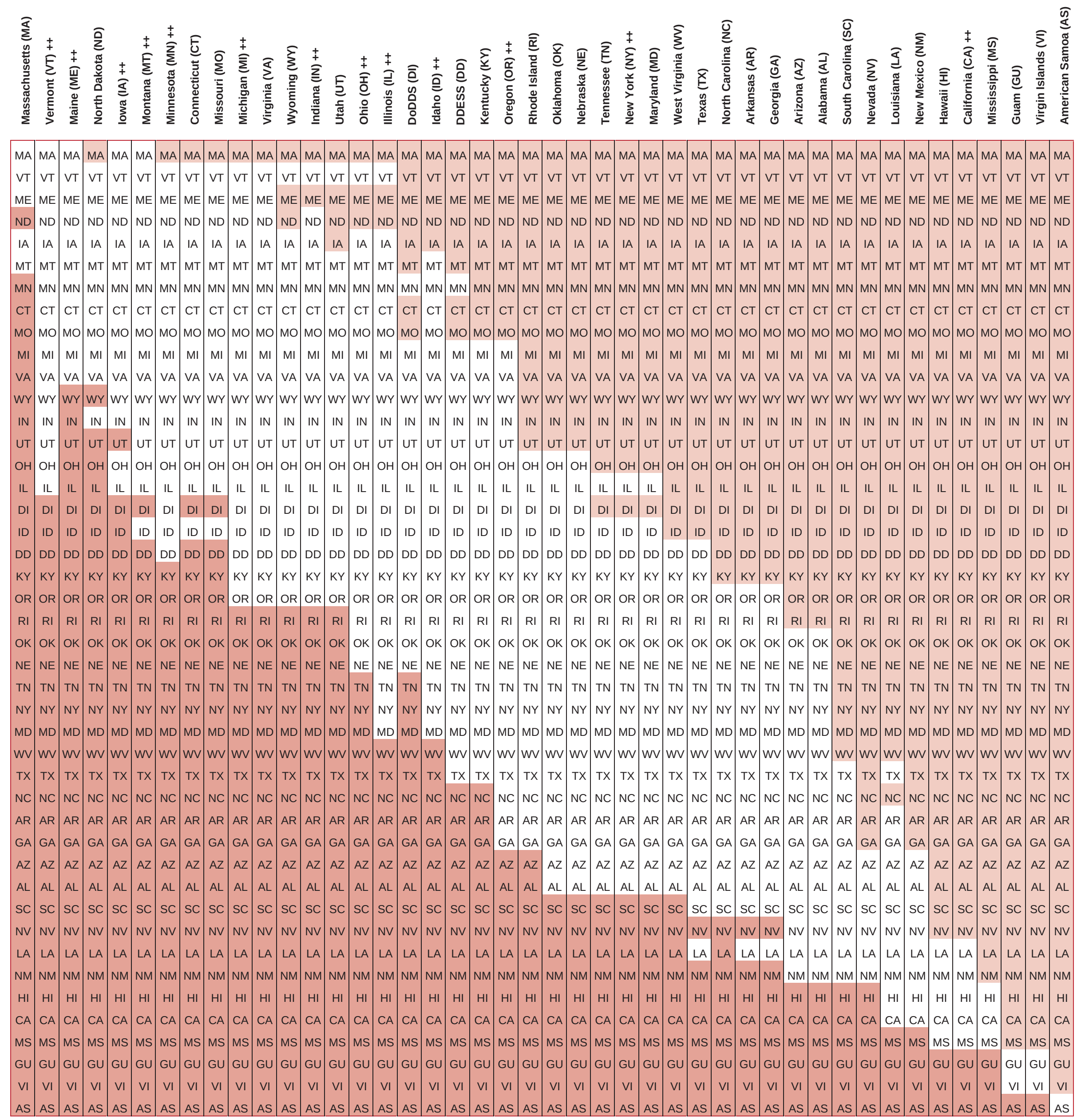
Figures 2.12 and 2.13 display the same type of state comparisons presented earlier for scale score results, but this time the performance measure being compared is the percentage of students at or above the *Proficient* achievement level for grades 4 and 8, respectively.

At grade 4, there were five states that had higher percentages of students at or above *Proficient* than the other states, but for which no significant differences were observed between them: Iowa, Maine, Massachusetts, Montana, and Vermont. At grade 8, the highest percentages of students at or above *Proficient* were in Massachusetts, Minnesota, Montana, and Ohio, which were not found to differ significantly from one another.

Figure 2.12: Cross-State Achievement Level Comparisons, Grade 4

Comparisons of percentage of students at or above *Proficient* in science for grade 4 public schools: 2000

Instructions: Read down the column directly under a jurisdiction name listed in the heading at the top of the figure. Match the shading intensity surrounding a jurisdiction's abbreviation to the key below to determine whether the percentage of students at or above *Proficient* in this jurisdiction is higher than, or lower than the jurisdiction in the column heading. For example, in the column under Michigan, the percentage of students in Michigan was lower than Massachusetts, all the states from Vermont through Oregon, and higher than the remaining states down the column.



Jurisdiction has statistically significantly higher percentage than the jurisdiction listed at the top of the figure.

No statistically significant difference detected from the jurisdiction listed at the top of the figure.

Jurisdiction has statistically significantly lower percentage than the jurisdiction listed at the top of the figure.

The between jurisdiction comparisons take into account sampling and measurement error and that each jurisdiction is being compared with every other jurisdiction. Significance is determined by an application of a multiple comparison procedure (see appendix A).

++Indicates that the jurisdiction did not satisfy one or more of the guidelines for school participation rates (see appendix A).

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

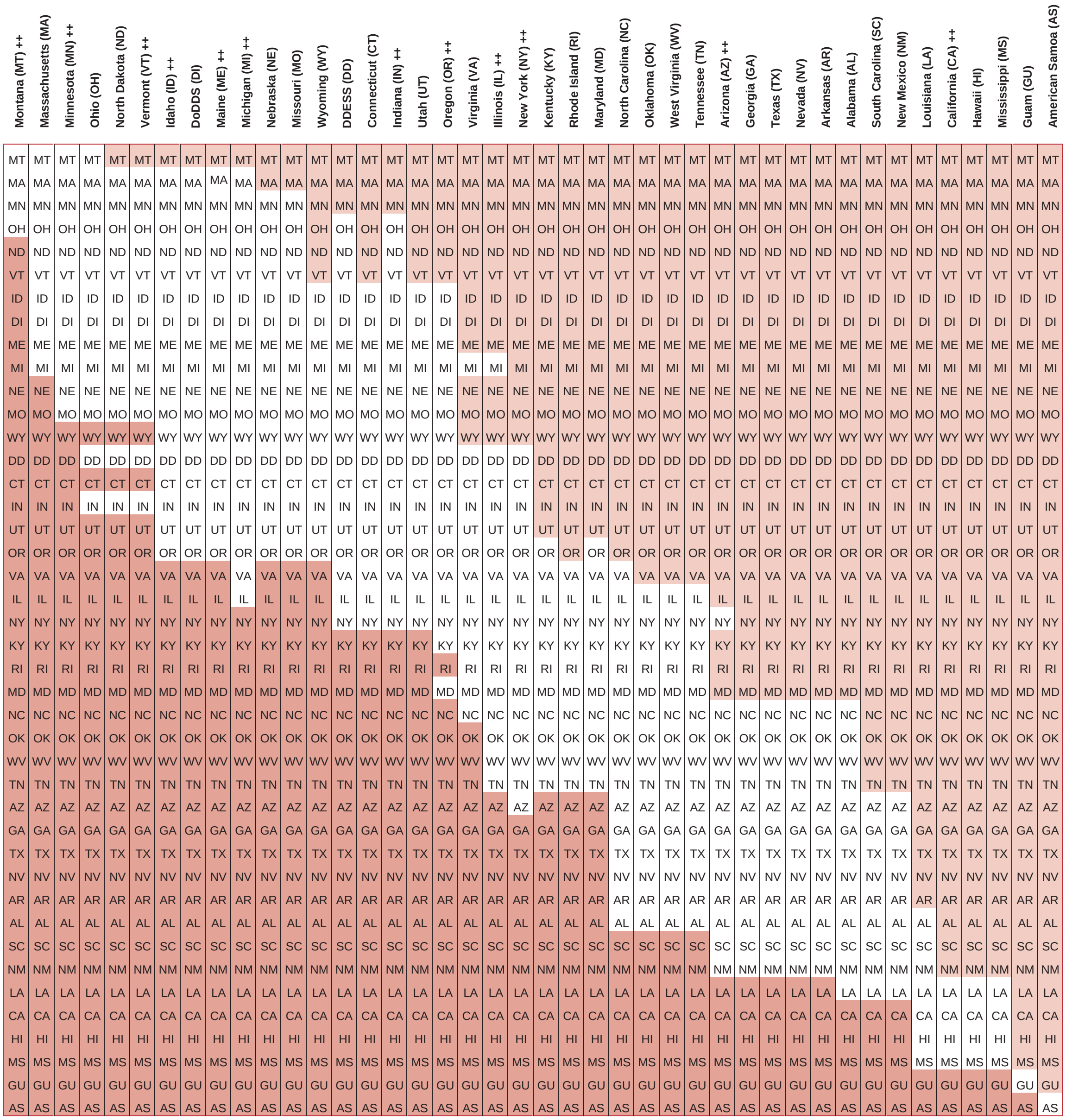
NOTE: Differences between states and jurisdictions may be partially explained by other factors not included in this figure.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Figure 2.13: Cross-State Achievement Level Comparisons, Grade 8

Comparisons of percentage of students at or above *Proficient* in science for grade 8 public schools: 2000

Instructions: Read down the column directly under a jurisdiction name listed in the heading at the top of the figure. Match the shading intensity surrounding a jurisdiction's abbreviation to the key below to determine whether the percentage of students at or above *Proficient* in this jurisdiction is higher than, or lower than the jurisdiction in the column heading. For example, in the column under Michigan, the percentage of students in Michigan was lower than Montana, all the states from Massachusetts through Illinois, and higher than the remaining states down the column.



Jurisdiction has statistically significantly higher percentage than the jurisdiction listed at the top of the figure.

No statistically significant difference detected from the jurisdiction listed at the top of the figure.

Jurisdiction has statistically significantly lower percentage than the jurisdiction listed at the top of the figure.

The between jurisdiction comparisons take into account sampling and measurement error and that each jurisdiction is being compared with every other jurisdiction. Significance is determined by an application of a multiple comparison procedure (see appendix A).

++Indicates that the jurisdiction did not satisfy one or more of the guidelines for school participation rates (see appendix A).

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).

NOTE: Differences between states and jurisdictions may be partially explained by other factors not included in this figure.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

3 Subgroup Results for the Nation and the States

This chapter presents the NAEP 2000 science results for various subgroups of students at both the national and state levels. National average scale score and achievement-level results are presented by six demographic characteristics: gender, race/ethnicity, parents' education level, type of school, school location, and eligibility for the federal free/reduced-price school lunch program. State results at grades 4 and 8 are presented for gender, race/ethnicity, and eligibility for the free/reduced-price school lunch program. Additional information by subgroup for each jurisdiction that participated in the 2000 science assessment is available on the NAEP web site at http://nces.ed.gov/nationsreportcard.

Chapter Focus

Are selected subgroups of students making progress in science?

Chapter Contents

The differences that are reported in this chapter for demographic subgroups are based on statistical tests that consider both the magnitude of the difference between group average scores or percentages and the standard error of those statistics. Differences between groups and between assessment years are discussed only if they have been determined to be statistically significant. Within the sections summarizing achievement level results, only significant differences detected at or above *Basic* and *Proficient* are discussed in the text. Significant differences detected within achievement levels are not discussed, although they are shown in the figures. The reader should bear in mind that differences in science performance most likely reflect a range of socioeconomic and educational factors that are not addressed in this report or by NAEP.

National Results: Performance of Selected Subgroups

Gender

Gender differences in science achievement on large-scale school assessments have been examined at the international, national, and state level. The Third International Mathematics and Science Study (TIMSS) that was conducted in 1995 reported that, at the fourth-grade level, males outperformed females in about one-half of the countries that participated including the U.S. At the eighth-grade level, while many of the countries that participated showed males outperforming females, this was not true for the U.S.; no difference in performance was seen.[1] At the twelfth-grade level, however, where mathematics and science literacy were tested, males outperformed females in most countries including the U.S.[2] A repeat of TIMSS at the eighth-grade in 1999 (TIMSS-R) showed that males outperformed females in nearly half of the 38 countries, including the United States.[3]

In addition to international data about the performance of male and female students on science assessments, national studies such as NAEP also show male and female differences. For example, the 1990 NAEP science assessment reported that males outperformed females at grade 8 and 12; but found no difference at grade 4.[4] In 1996, when a new NAEP science assessment was administered, these results showed that males outperformed females at the twelfth-grade level only.[5] The NAEP science assessment administered in 1996 was also administered in 2000; thus a measure of performance by males and females on the same assessment can be obtained.

Figure 3.1 presents the average science scores in 1996 and 2000 for male and female students at grades 4, 8, and 12. While average scores for males at grade 8 were higher in 2000 than in 1996, average scores for twelfth-grade males were lower in 2000. None of the apparent changes across years in females' average scores were statistically significant at any grade. In 2000, males had higher scores than females at grades 4 and 8, but the apparent difference between male and female students at grade 12 was not statistically significant.

---

[1] Mullis, I.V.S., Martin, M.O., Fierros, E.G., Goldberg, A.L., & Stemler, S.E. (2000). *Gender differences in achievement*. Chestnut Hill, MA: International Study Center, Lynch School of Education, Boston College.

[2] Mullis, I.V.S., Martin, M.O., Beaton, A., Gonzalez, E.J., Kelly, D., & Smith, T.A. (1998). *Mathematics and science achievement in the final year of secondary school*. Chestnut Hill, MA: International Study Center, Lynch School of Education, Boston College.

[3] Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., Gregory, K.D., Smith, T.A., Chrostowski, S.J., Garden, R.A., & O'Connor, K.M. (2000). *TIMSS 1999 international science report; Findings from IEA's repeat of the Third International Mathematics and Science Study at the eighth grade.* Chestnut Hill, MA: International Study Center, Lynch School of Education, Boston College.

Gonzales, P., Calsyn, C., Jocelyn, L., Mak, K., Kastberg, D., Arafeh, S., Williams, T., & Tsen, W. (2000). *Pursuing excellence: Comparisons of international eighth-grade mathematics and science achievement from a U.S. perspective, 1995 and 1999* (NCES Publication No. 2001-028). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

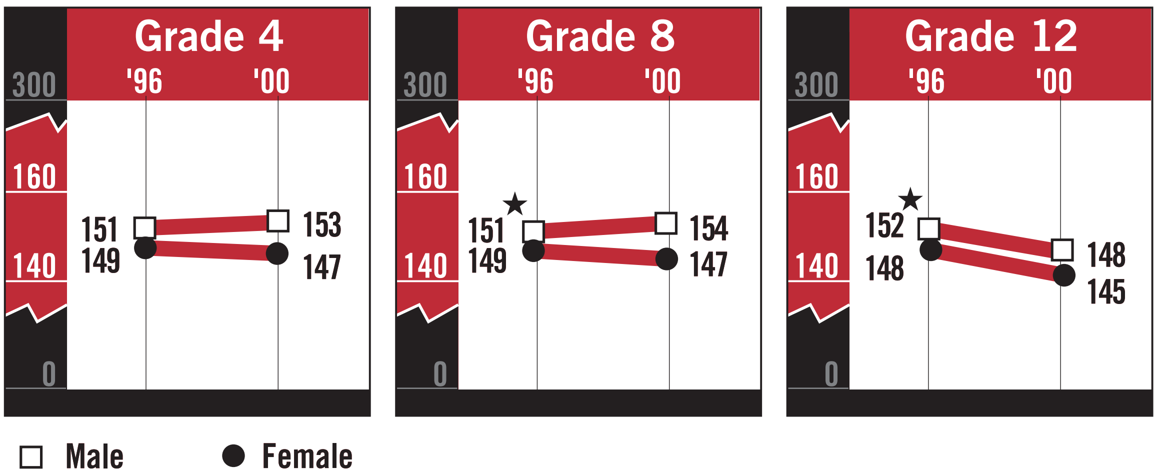
[4] Jones, L.R., Mullis, I.V.S., Raizen, S.A., Weiss, I.R., & Weston, E.A. (1992). *The 1990 science report card*. Washington, DC: Office of Educational Research and Improvement.

[5] O'Sullivan, C.Y., Reese, C.M., & Mazzeo, J. (1997). *NAEP 1996 science report card for the nation and the states*. Washington, DC: Office of Educational Research and Improvement.

Figure 3.1

National Scale Score Results by Gender

Average science scale scores by gender, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

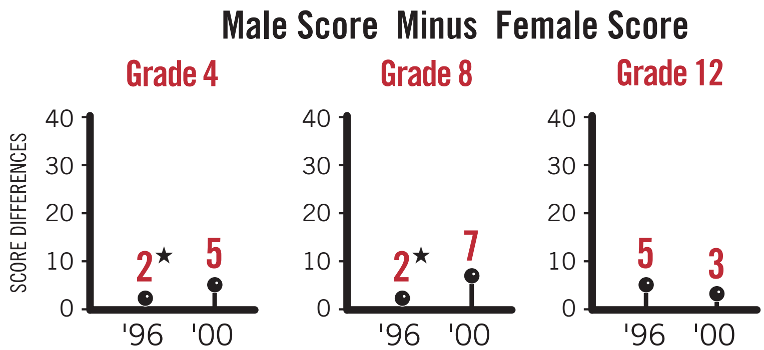
Figure 3.2 provides a display of the science score gap between male and female students in 1996 and 2000. Even though the individual changes in average scores for male and female students at grade 4 were not statistically significant, taken together they created a significant difference favoring males over females. The increase in average scores among male students at grade 8 contributed to the creation of a similar difference favoring males at this grade level. Although the apparent narrowing of the gap between male and female twelfth-graders' science scores was not statistically significant, their average scores in 2000 did not differ significantly as they did in 1996.

These score gaps, and the score gaps presented in the following section between selected racial/ethnic subgroups, should be interpreted with caution. The average score of a selected subgroup does not represent the entire range of performance within that group. Furthermore, differences between groups of students cannot be attributed solely to group identification, as a variety of educational and social factors can affect student performance.

Figure 3.2

National Scale Score Differences by Gender

Differences in average science scale scores by gender, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.
NOTE: Score differences are calculated based on differences between unrounded average scale scores.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

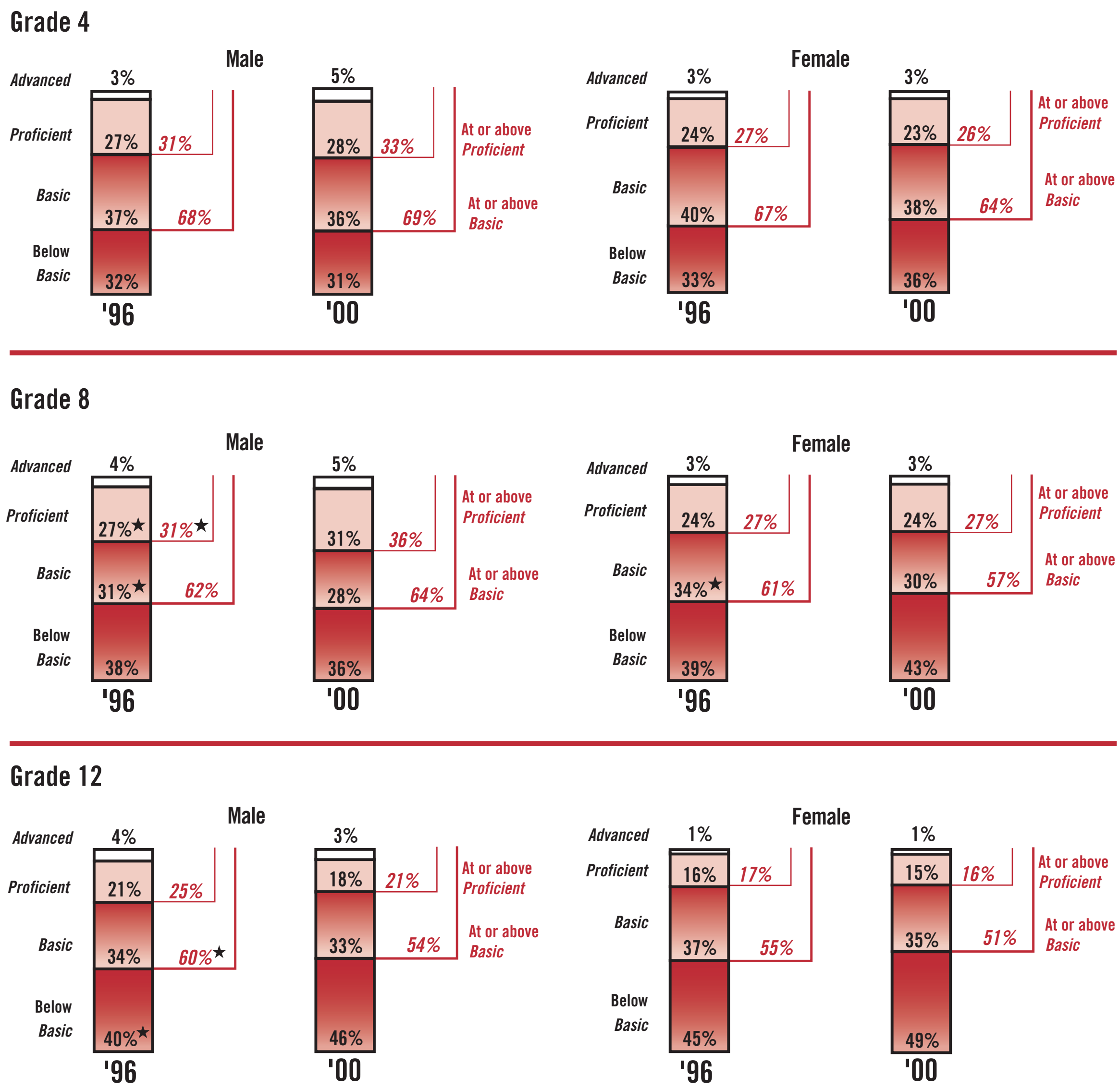
Another way of looking at student performance is to examine the percentages of male and female students at or above each science achievement level. These results are presented in figure 3.3. At grade 4, none of the apparent changes between 1996 and 2000 in the percentages of male or female students at or above any of the achievement levels was statistically significant. At grade 8, the percentage of male students at or above *Proficient* increased from 31 percent in 1996 to 36 percent in 2000. At grade 12, the percentage of male students at or above *Basic* decreased from 60 percent in 1996 to 54 percent in 2000.

Comparing the performance of males and females on the 2000 assessment shows a higher percentage of males than females at or above *Proficient* at all three grade levels, and a higher percentage of males at or above *Basic* at grades 4 and 8.

Figure 3.3

National Achievement-Level Results by Gender

Percentages of students within each science achievement-level range and at or above achievement levels by gender, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.

NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Race/Ethnicity

NAEP assessments in all subject areas consistently report student achievement by race/ethnicity as well as by differences in performances among various racial/ethnic groups.

The differences provide important information about the progress being made to ensure that all students are making progress in a particular subject area. In order to collect data for this analysis, students who participated in the assessment were asked to indicate which of the following racial/ethnic subgroups best described them: White, Black, Hispanic, Asian/Pacific Islander, or American Indian (including Alaskan Native). Figure 3.4 presents average scale scores for students by these subgroups at grades 4, 8, and 12. Data for Asian/Pacific Islander students were not reported for the 2000 science assessment at grade 4 because special analyses raised concerns about the accuracy and precision of these results.[6]

At grade 4, none of the apparent changes between 1996 and 2000 in the average scores of each racial/ethnic subgroup were statistically significant. At grade 8, American Indian students' average scores declined. At grade 12, White students had lower average scores in 2000 than in 1996.

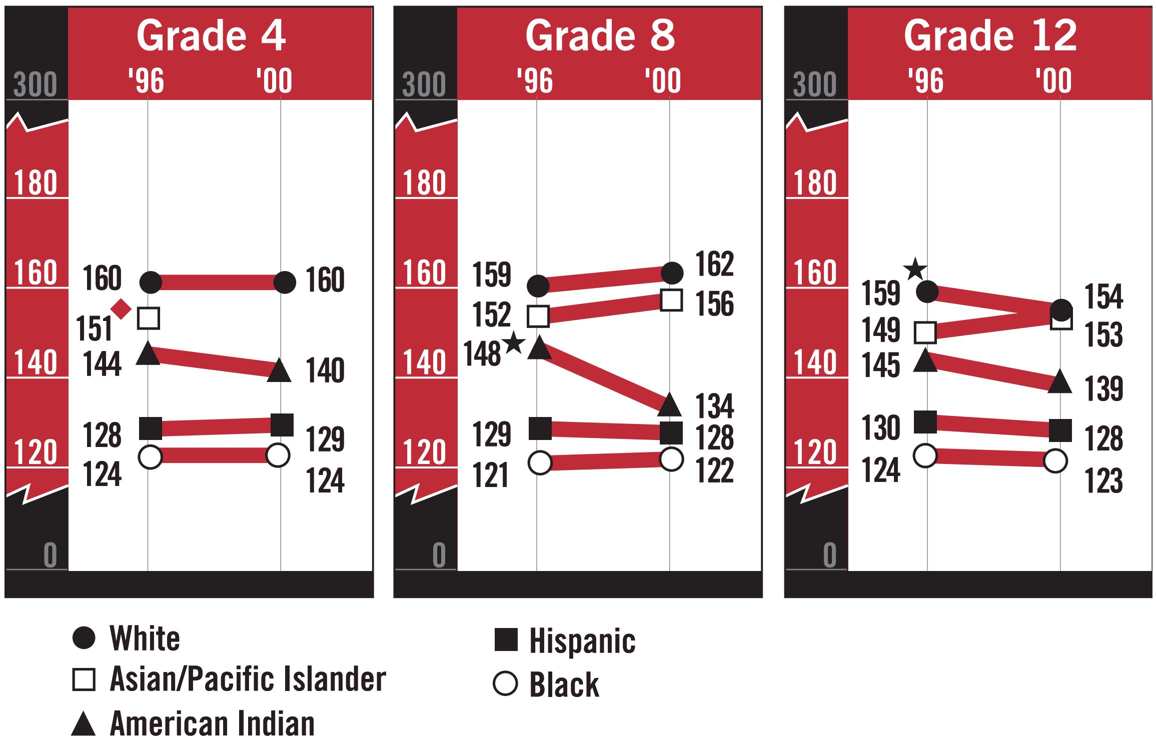
When students' performance in 2000 was compared across subgroups, differences in average scores were found at all three grade levels. At grade 4, White students scored higher, on average, than American Indian, Hispanic, or Black students. In addition, American Indian students scored higher on average than Hispanic or Black students. At grade 8, White students had higher average scores than any of the other subgroups. Eighth-grade Asian/Pacific Islanders scored higher, on average, than American Indian, Hispanic, or Black students. American Indian and Hispanic eighth-graders scored higher on average than Black eighth-graders. At grade 12, White and Asian/Pacific Islander students both had higher average scores than American Indian, Hispanic, or Black students. American Indian students had a higher average score than that of either Hispanic or Black students.

[6] See appendix A.

Figure 3.4

National Scale Score Results by Race/ Ethnicity

Average science scale scores by race/ethnicity, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.

◆ Special analyses raised concerns about the accuracy and precision of national grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.

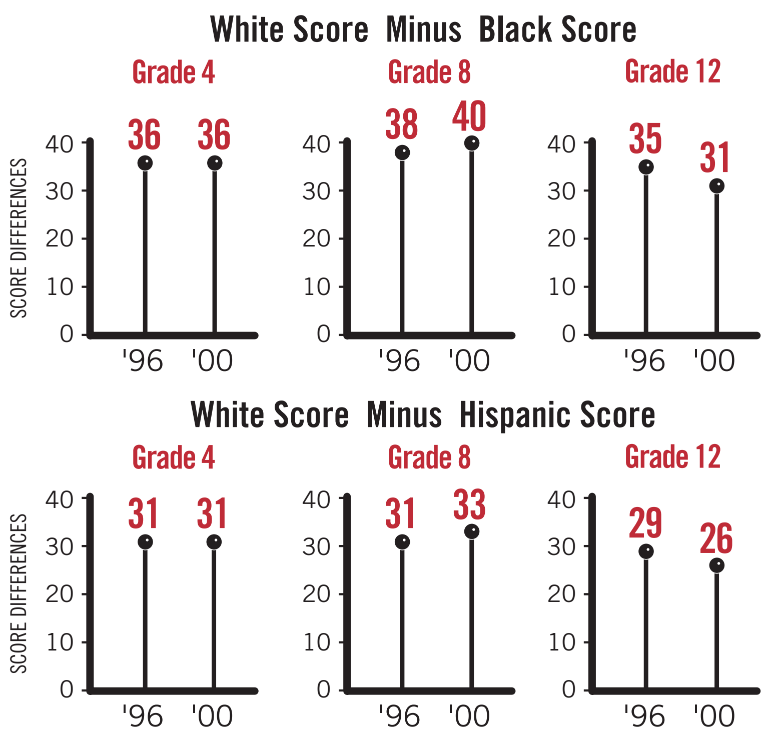
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

The average score gaps between White and Black students and between White and Hispanic students are shown in figure 3.5. Unlike the small gaps seen between male and female students, the size of the score gaps between these racial/ethnic subgroups are much larger. None of the apparent differences in these gaps between 1996 and 2000 were found to be statistically significant.

Figure 3.5

National Scale Score Differences by Race/ Ethnicity

Differences in average science scale scores by race/ethnicity, grades 4, 8, and 12: 1996 and 2000



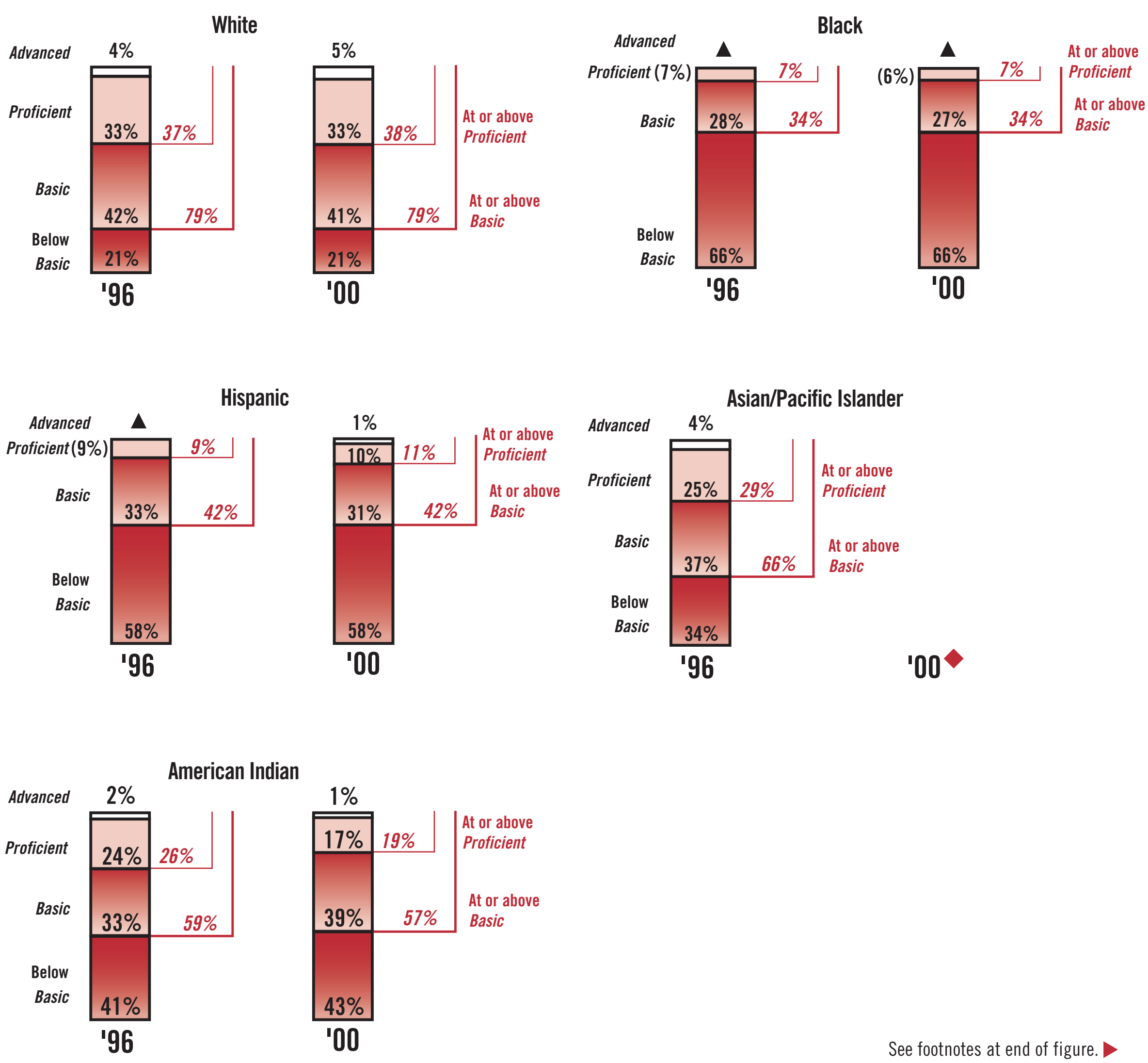
NOTE: Score differences are calculated based on differences between unrounded average scale scores.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Achievement-level results for the racial/ethnic groups are presented in figure 3.6. Although White twelfth-graders did show a decline in the percentage of students at or above *Basic* between 1996 and 2000, none of the apparent changes in the percentages of other racial/ethnic subgroups at or above the *Basic* or *Proficient* levels were found to be statistically significant. When the performance of students in different racial/ethnic subgroups was compared in 2000, a higher percentage of White and Asian/Pacific Islander students were found to be at or above *Basic* and *Proficient*, compared to the other subgroups. This finding was consistent across the three grades.

Figure 3.6a

National Achievement-Level Results by Race/Ethnicity

Percentages of students within each science achievement-level range and at or above achievement levels by race/ethnicity, grade 4: 1996 and 2000

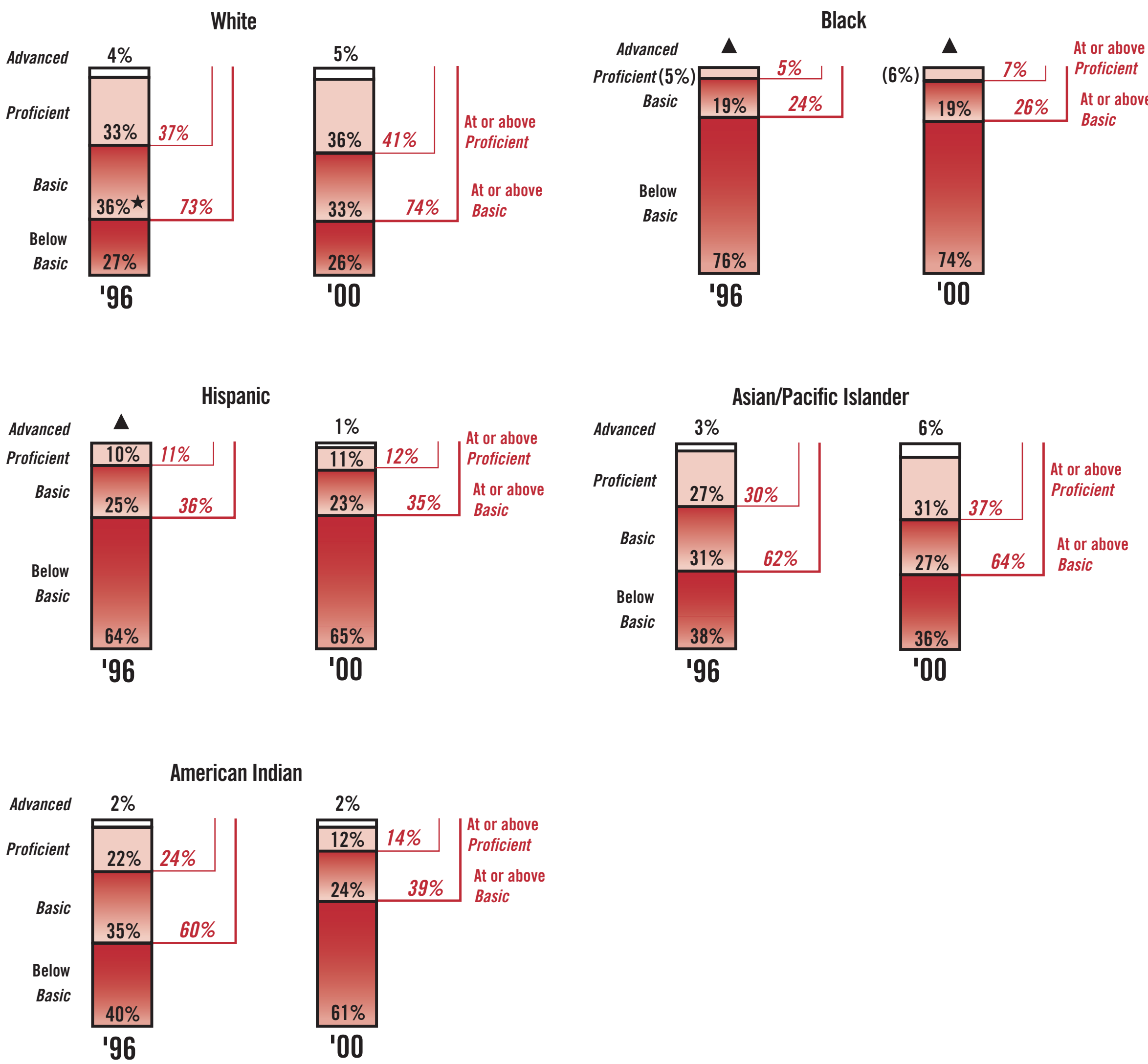


See footnotes at end of figure.

Figure 3.6b

National Achievement-Level Results by Race/Ethnicity (continued)

Percentages of students within each science achievement-level range and at or above achievement levels by race/ethnicity, grade 8: 1996 and 2000

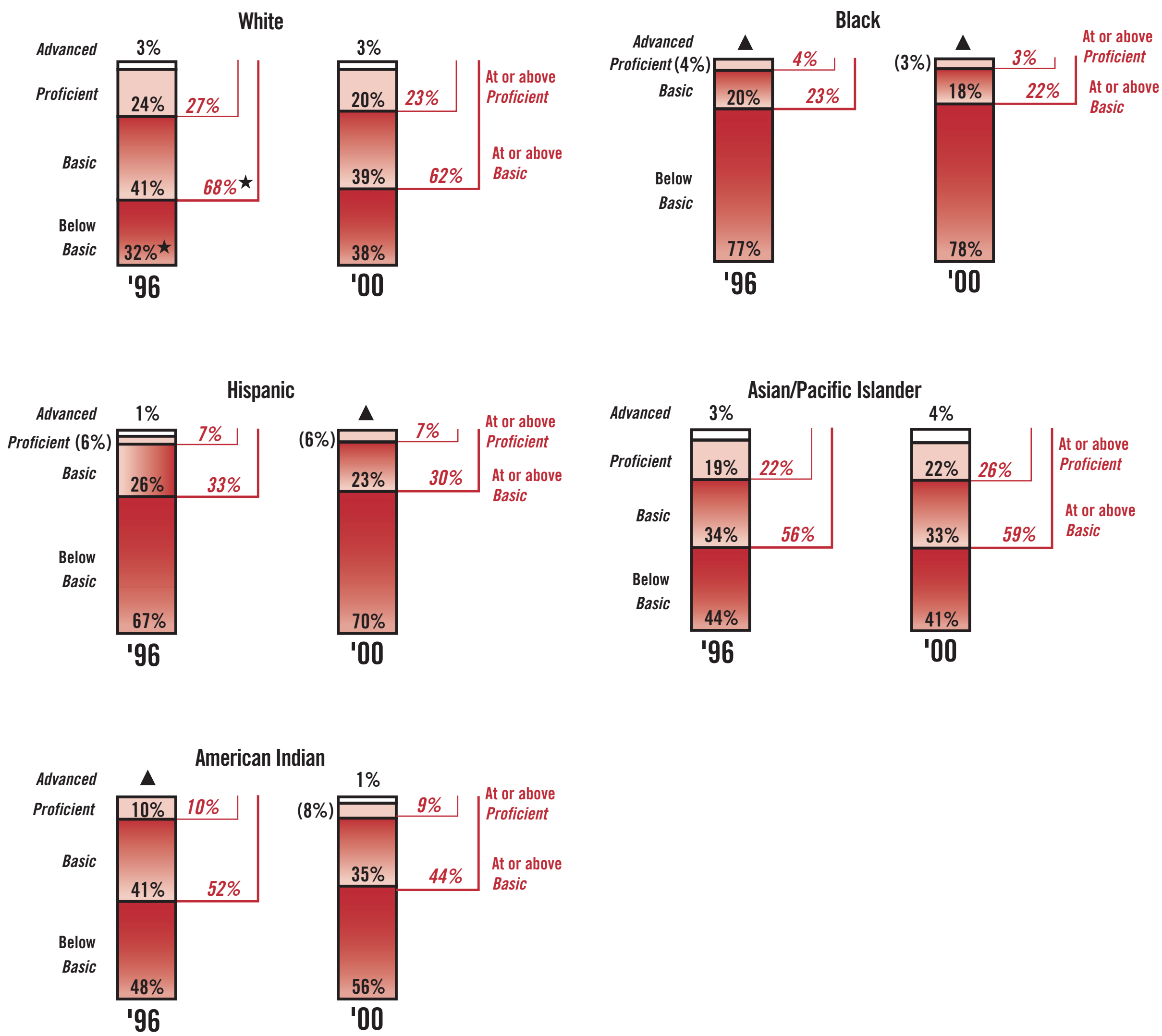


See footnotes at end of figure. ▶

Figure 3.6c

National Achievement-Level Results by Race/Ethnicity (continued)

Percentages of students within each science achievement-level range and at or above achievement levels by race/ethnicity, grade 12: 1996 and 2000



★ Significantly different from 2000.

▲ Percentage is between 0.0 and 0.5.

NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.

◆ Special analyses raised concerns about the accuracy and precision of national grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Parents' Highest Level of Education

It has been documented that, in general, higher levels of parental education are associated with higher levels of student performance.[7] This has been noted not only in the U.S., but also in a number of other countries around the world.[8]

Students who participated in the NAEP science assessment were asked to indicate the highest level of education completed by each parent. Four levels of education were identified: did not finish high school, graduated from high school, some education after high school, and graduated from college. Students could also choose the response, "I don't know." For this analysis, the highest education level reported for either parent was used. Data are presented for students in grades 8 and 12 only. Data were not collected at grade 4 because in previous NAEP assessments fourth-graders' responses about their parents' education were highly variable and contained a large percentage of "I don't know" responses.

The average science score results for all levels of student-reported parent education are presented in figure 3.7. Almost one-half of both eighth-graders and twelfth-graders (47 and 48 percent, respectively) reported that at least one parent had graduated from college, whereas only 6 percent of both eighth- and twelfth-graders reported that their parents had not graduated from high school. Additional information on the percentages of students reporting different levels of parents' education is available in appendix B.

Comparisons of average scores by parental education across years show a decline between 1996 and 2000 among twelfth-grade students whose parents' highest level of education was high school graduation or some education after high school. Comparing students' performance by level of parents' education in 2000 showed that eighth- and twelfth-graders whose parents graduated from college had higher scores, on average, than their peers whose parents had lower levels of education. In general, students who reported higher levels of parental education had higher average scores than their peers who reported lower levels of parental education. These results are consistent with the results from other studies.

7 Braswell, J.S., Lutkus, A.D., Grigg, W.S., Santapau, S.L., Tay-Lim, B. S.-H., & Johnson, M.S. (2001). *The nation's report card: Mathematics 2000* (NCES Publication No. 2001–517). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

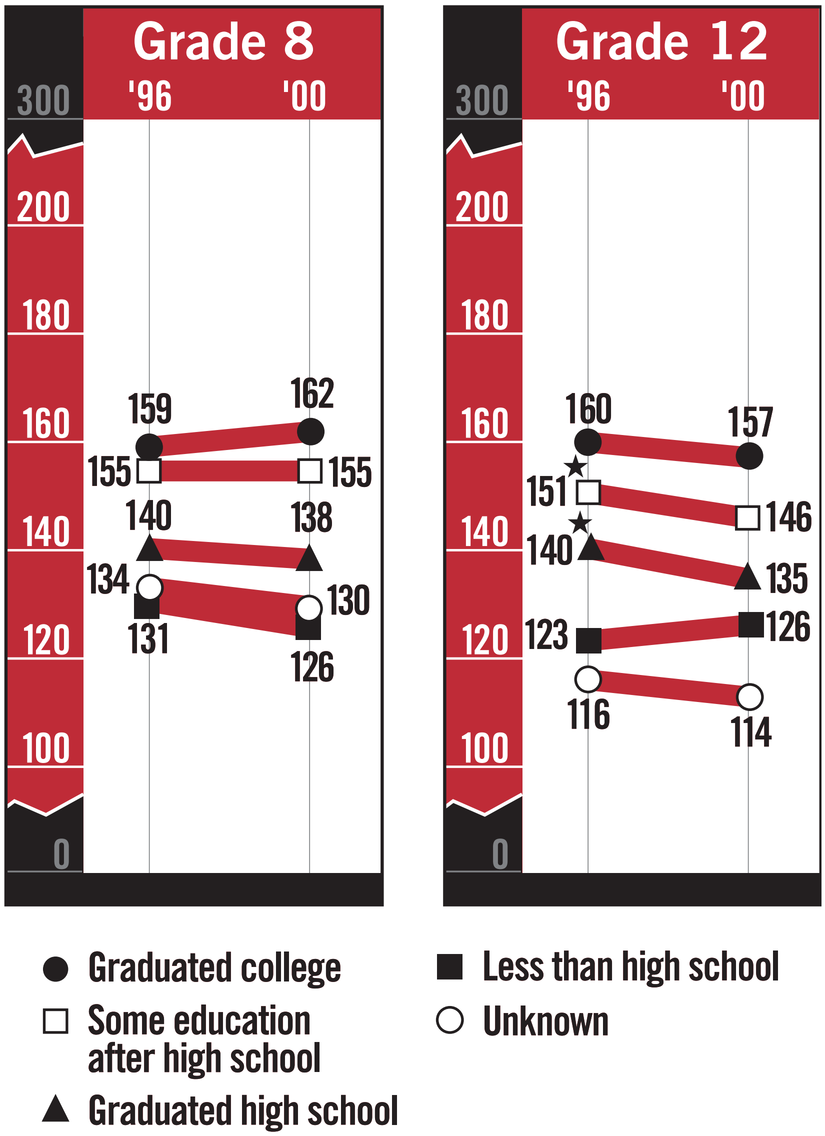
Donahue, P. L., Voelkl, K.E., Campbell, J.R., & Mazzeo, J. (1999). *NAEP 1998 reading report card for the nation and the states* (NCES Publication No. 1999–500). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

8 Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., Gregory, K.D., Smith, T.A., Chrostowski, S.J., Garden, R.A., & O'Connor, K.M. (2000). *TIMSS 1999 international science report: Findings from IEA's repeat of the Third International Mathematics and Science Study at the eighth grade.* Chestnut Hill, MA: International Study Center, Lynch School of Education, Boston College.

Figure 3.7

National Scale Score Results by Parents' Education

Average science scale scores by student-reported parents' highest level of education, grades 8 and 12: 1996 and 2000



★ Significantly different from 2000.

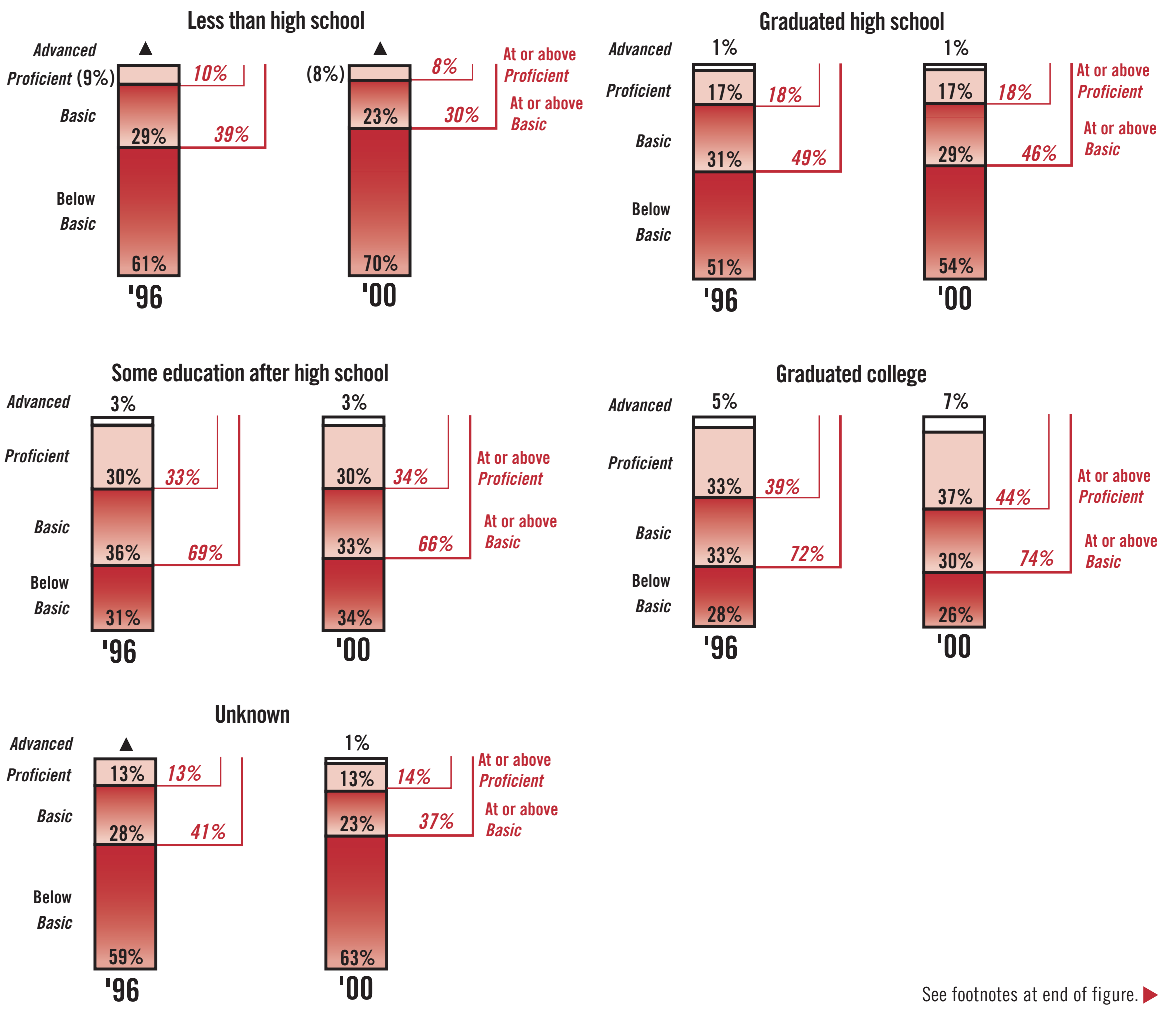
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Achievement-level results across years by level of parental education are presented in figure 3.8 and show patterns similar to those found for average scale scores. None of the apparent changes between 1996 and 2000 in percentages of eighth-grade students attaining achievement levels were statistically significant at any level of parental education. Among twelfth-graders, however, a drop in performance is evident at the two highest levels of parental education. The percentage of twelfth-graders at or above *Basic* decreased between 1996 and 2000 among those students whose parents' highest level of education was some education after high school and among those students with at least one parent who graduated from college.

Comparing students' performance by parents' level of education in 2000 shows a consistent pattern at grades 8 and 12. At both grades, the level of parents' education had a positive relationship to the percentage of students at or above *Basic* and *Proficient*.

Figure 3.8a
National Achievement-Level Results by Parents' Education

Percentage of students within each science achievement-level range and at or above achievement levels by parents' highest level of education, grade 8: 1996 and 2000

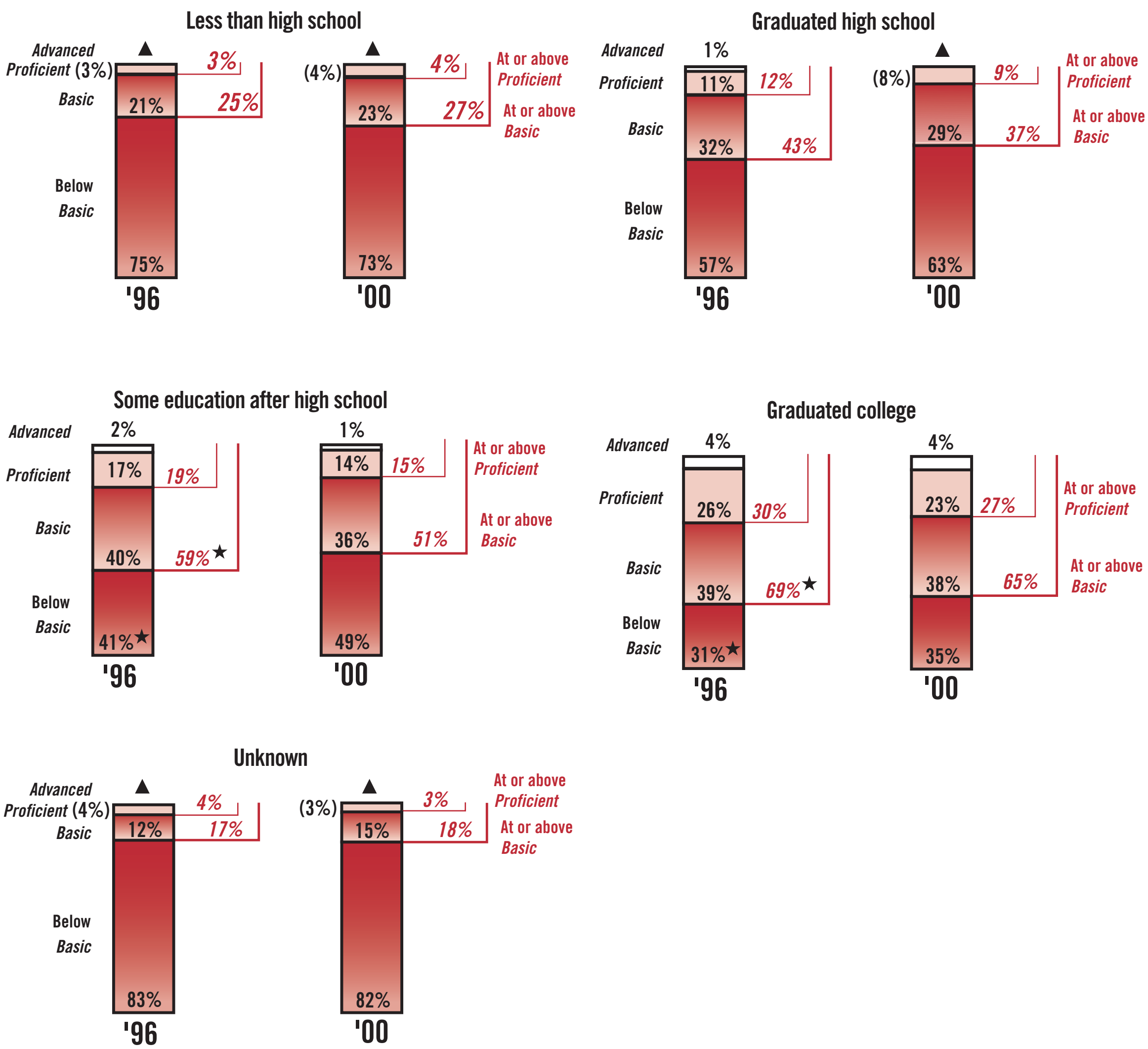


See footnotes at end of figure. ▶

Figure 3.8b

National Achievement-Level Results by Parents' Education
(continued)

Percentage of students within each science achievement-level range and at or above achievement levels by parents' highest level of education, grade 12: 1996 and 2000



★ Significantly different from 2000.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Type of School

The schools that participate in the NAEP assessment are classified as either public or nonpublic.[9] Differences in performance on NAEP science assessments between students attending public and nonpublic schools typically show students attending nonpublic schools outperforming their public school peers, on average.[10] It is worth noting, however, that results from a special study of twelfth-grade students taking advanced science courses showed that the performance of twelfth-graders in public schools who were enrolled in an advanced science course was not found to be significantly different from that of twelfth-graders taking advanced science courses in nonpublic schools.[11] Despite the general pattern of nonpublic school students outperforming public school students, readers are cautioned to consider the possibility that socioeconomic and sociological factors related to type of school enrollment may affect student performance. These factors are not accounted for in the NAEP assessment results.

Nine out of ten students who participated in the 2000 NAEP science assessment attended public schools (89 percent at grade 4, 90 percent at grade 8, and 91 percent at grade 12). Additional information on the percentages of students attending public and nonpublic schools can be found in appendix B. Figure 3.9 presents the average science scores by type of school. None of the apparent changes between 1996 and 2000 in average scores of fourth- and eighth-graders attending either public or nonpublic schools were statistically significant. At grade 12, however, average scores for students attending nonpublic schools increased from 155 in 1996 to 161 in 2000, while scores for students attending public schools decreased from 149 to 145.

A comparison of students' average score by type of school attended in 2000 continues the trend found in other NAEP assessments; fourth- eighth-, and twelfth-graders who attended nonpublic schools had higher scores, on average, than their peers who attended public schools.

[9] More details on results by school type including additional breakouts by types of nonpublic schools are available at the NAEP web site (http://nces.ed.gov/nationsreportcard).

[10] Campbell, J.R., Voelkl, K.E., & Donahue, P.L. (1997). *NAEP 1996 trends in academic progress* (NCES Publication No. 97–985). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

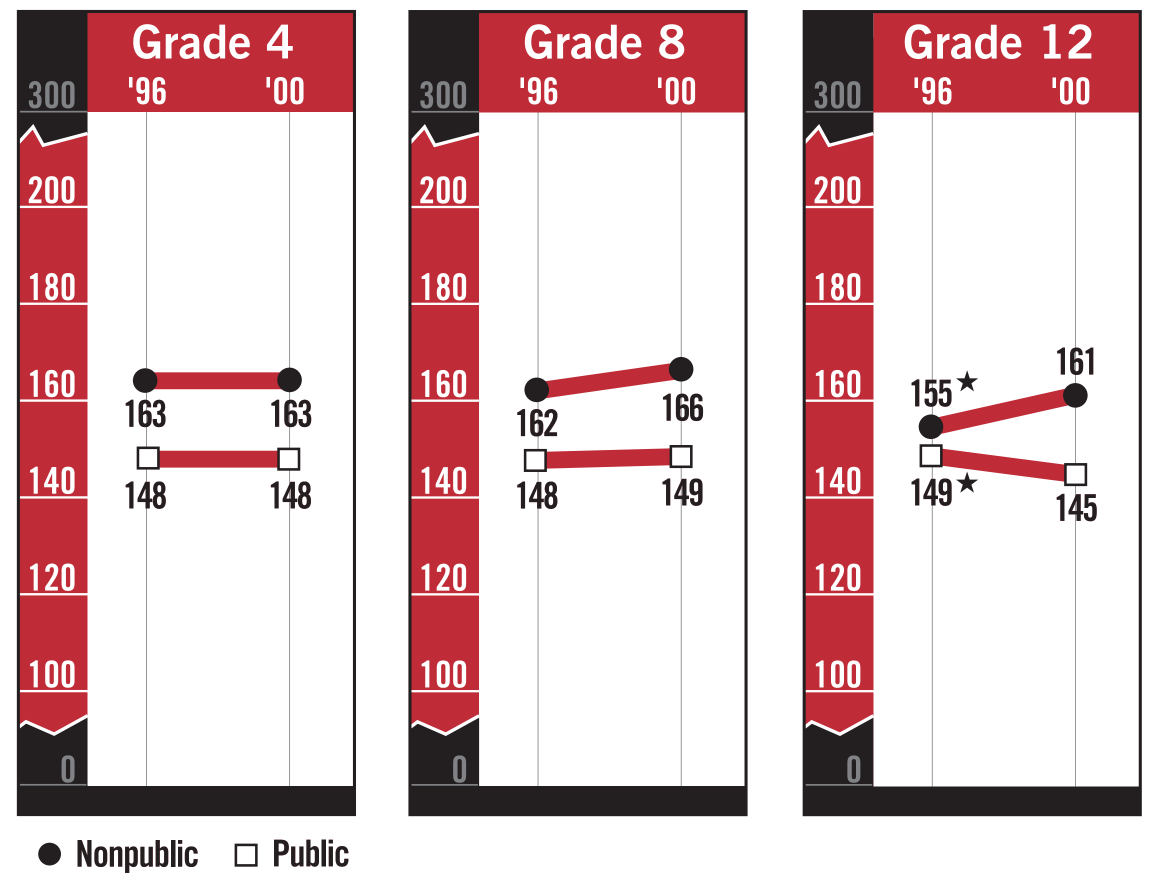
Campbell, J.R., Hombo, C.M., & Mazzeo, J. (2000). *NAEP 1999 trends in academic progress: Three decades of student performance* (NCES Publication No. 2000–469). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

[11] O'Sullivan, C.Y., & Grigg, W.S. (2001). *Assessing the best: NAEP's 1996 assessment of twelfth-graders taking advanced science courses* (NCES Publication No. 2001–451). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Figure 3.9

National Scale Score Results by Type of School

Average science scale scores by type of school, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

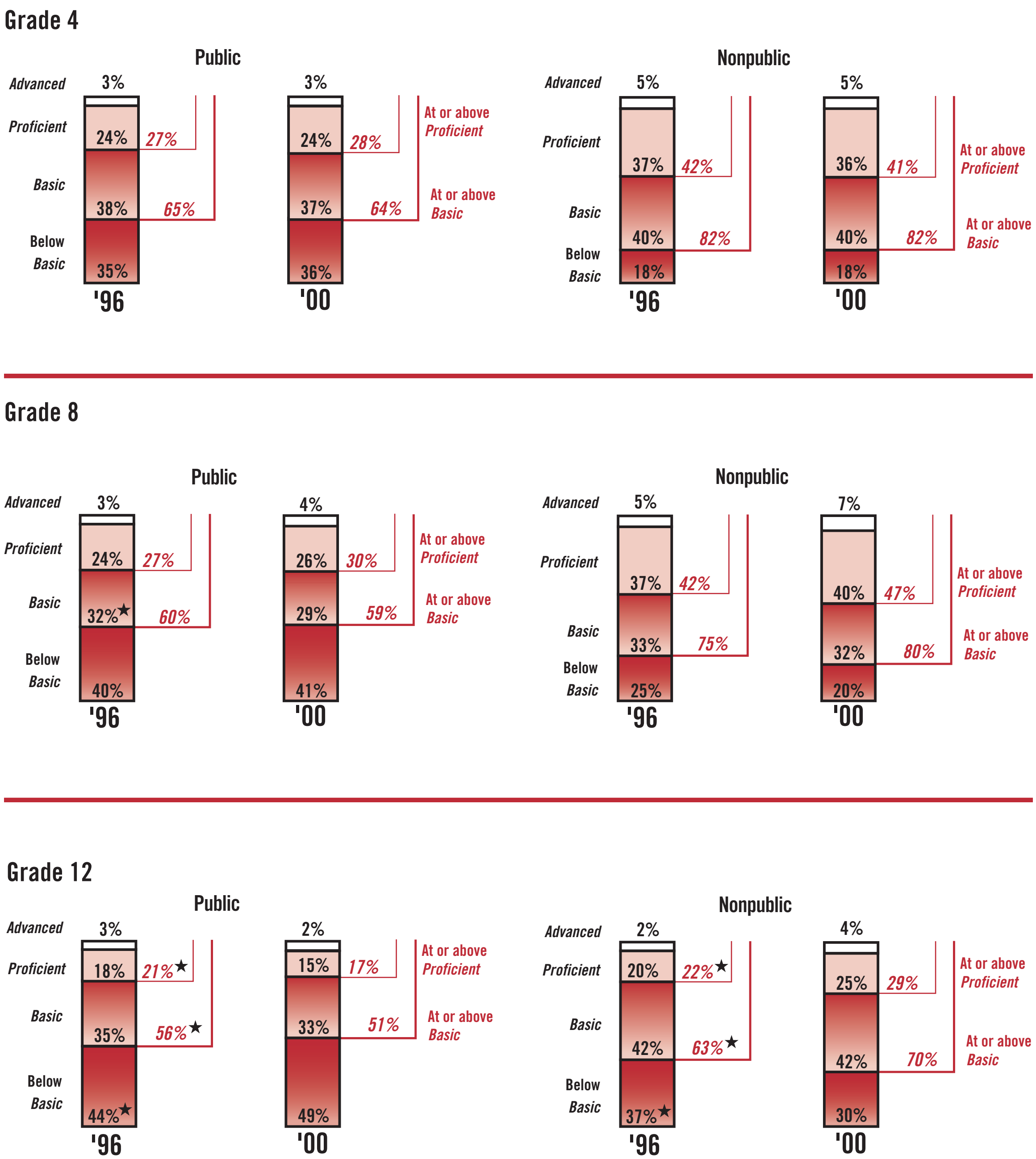
Achievement-level results by school type are presented in figure 3.10. At grades 4 and 8, none of the apparent changes between 1996 and 2000 in percentages of either public or nonpublic school students at or above *Basic*, at or above *Proficient*, or at *Advanced* were statistically significant. At grade 12, however, the results for public school and nonpublic school students show opposite trends in attainment of the *Basic* and *Proficient* achievement levels. Between 1996 and 2000, the percentage of public school twelfth-graders at or above *Basic* and at or above *Proficient* decreased, while the percentages of their nonpublic school peers attaining these achievement levels increased.

Comparing students' performance by type of school in 2000 shows a consistent pattern at grades 4, 8, and 12. At all three grades, a greater percentage of nonpublic school students than public school students were at or above *Basic*, at or above *Proficient*, or at *Advanced*.

Figure 3.10

National Achievement-Level Results by Type of School

Percentage of students within each science achievement-level range and at or above achievement levels by type of school, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.

NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Type of Location

The schools from which NAEP draws its samples of students are classified according to their type of location. Based on Census Bureau definitions of metropolitan statistical areas, including population size and density, the three mutually exclusive categories are: central city, rural/small town, and urban fringe/large town. Because of slight changes by the Census Bureau in the definitions of these categories, schools were not classified in exactly the same way in 2000 as in previous years in terms of location type. Therefore, comparisons to previous years are not possible, and only the data for the 2000 assessment are reported. More information on the definitions of the 2000 assessment classifications of location type is given in appendix A.

Average science scale scores for fourth-, eighth-, and twelfth-grade students attending schools in the three different types of location are presented in table 3.1. At grades 4 and 8, students in central city locations had lower average scores than students in urban fringe/large town or rural/small town locations. At grade 12, there was no statistically significant relationship between school location and student performance.

Table 3.1 National Scale Score Results by Type of Location

Average science scale scores by type of location, grades 4, 8, and 12: 2000

	Central city	Urban fringe/large town	Rural/small town
Grade 4	140	155	152
Grade 8	142	156	152
Grade 12	144	149	145

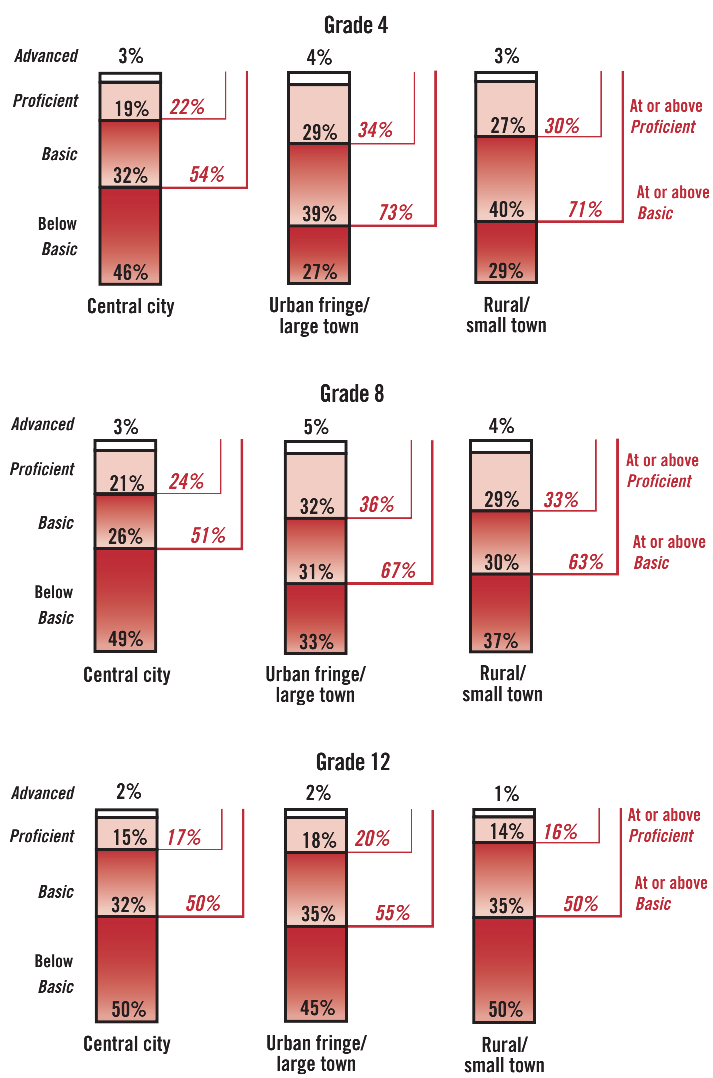
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Percentages of students within and at or above each achievement level by type of school location are presented in figure 3.11. At grades 4 and 8, the percentages of students at or above *Basic* and *Proficient* were higher in urban fringe/large town and rural/small town locations than central city locations. The percentage of fourth-graders at *Advanced* was also higher among students in urban fringe locations than in central cities. At grade 12, there were no statistically significant differences in the percentages of students at or above *Basic* or *Proficient* or at *Advanced* based on the school's location.

Figure 3.11

National Achievement-Level Results by Type of Location

Percentage of students within each science achievement-level range and at or above achievement levels by type of location, grades 4, 8, and 12: 2000



NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Free/Reduced-Price School Lunch Eligibility

Funded by the U.S. Department of Agriculture (USDA) as part of the National School Lunch program, the free/reduced-price school lunch program is designed to assure that children at, near, or below the poverty line receive nourishing meals. Eligibility guidelines for the lunch program are based on the Federal income poverty guidelines and are stated by household size.[12] NAEP began collecting data on student eligibility for this program in 1996.

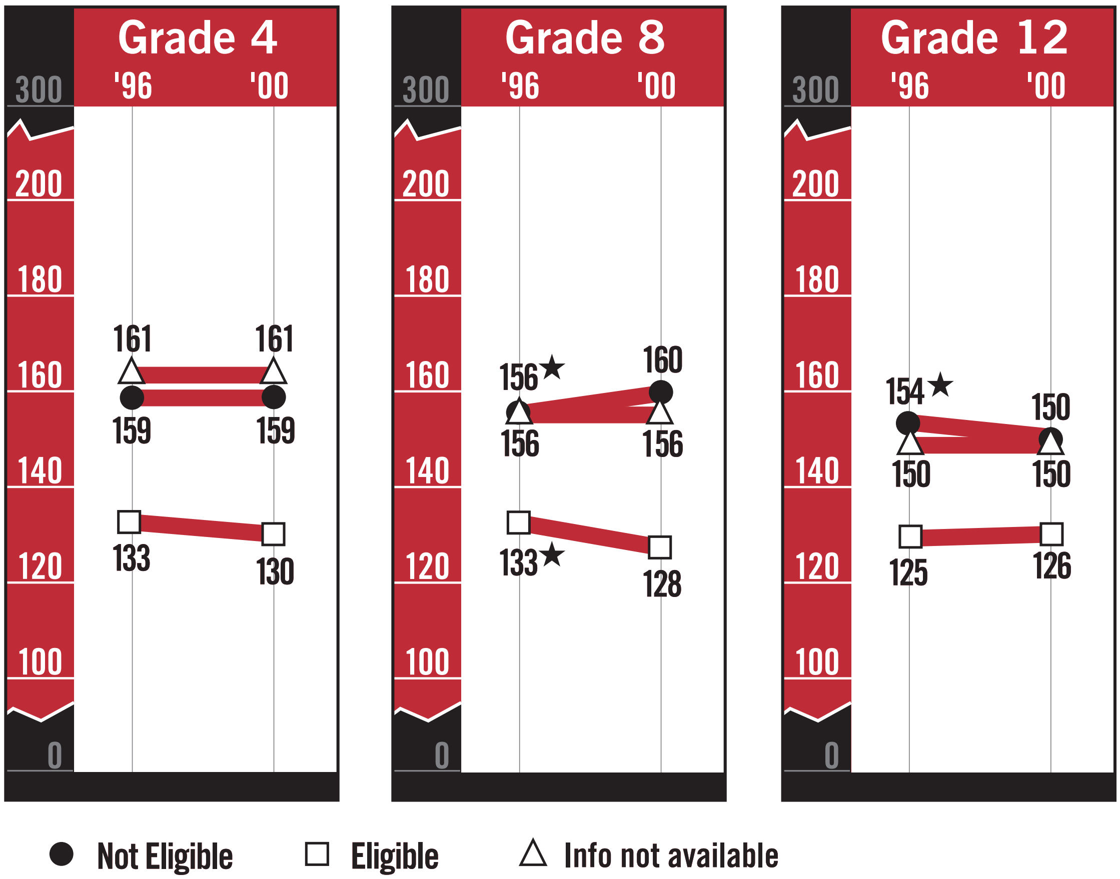
As shown in figure 3.12, average science scores for students who were not eligible for the free/reduced-price school lunch program (i.e., those above the poverty guidelines) were higher than the scores for students who were eligible for the program. Since information on eligibility is not available for a substantial percentage of the students at each grade, scale score averages for this group of students are also provided. It should be noted that students for whom the information was not available (which included students from schools that did not offer free/reduced-price school lunches) also had higher average scores at each of the three grades than the students who were eligible for the free/reduced-price school lunch program.

Comparisons across years show lower average scores in 2000 than in 1996 among eighth-graders who were eligible for the program and higher scores among students who were not eligible. At grade 12, students who were not eligible for the program had lower average scores in 2000 than in 1996.

[12] U.S. General Services Administration. (1999). *Catalogue of federal domestic assistance.* Washington, DC: Executive Office of the President, Office of Management and Budget.

Figure 3.12
National Scale Score Results by Free/Reduced-Price School Lunch Eligibility

Average science scale scores by student eligibility for free/reduced-price school lunch program, grades 4, 8, and 12: 1996 and 2000



★ Significantly different from 2000.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

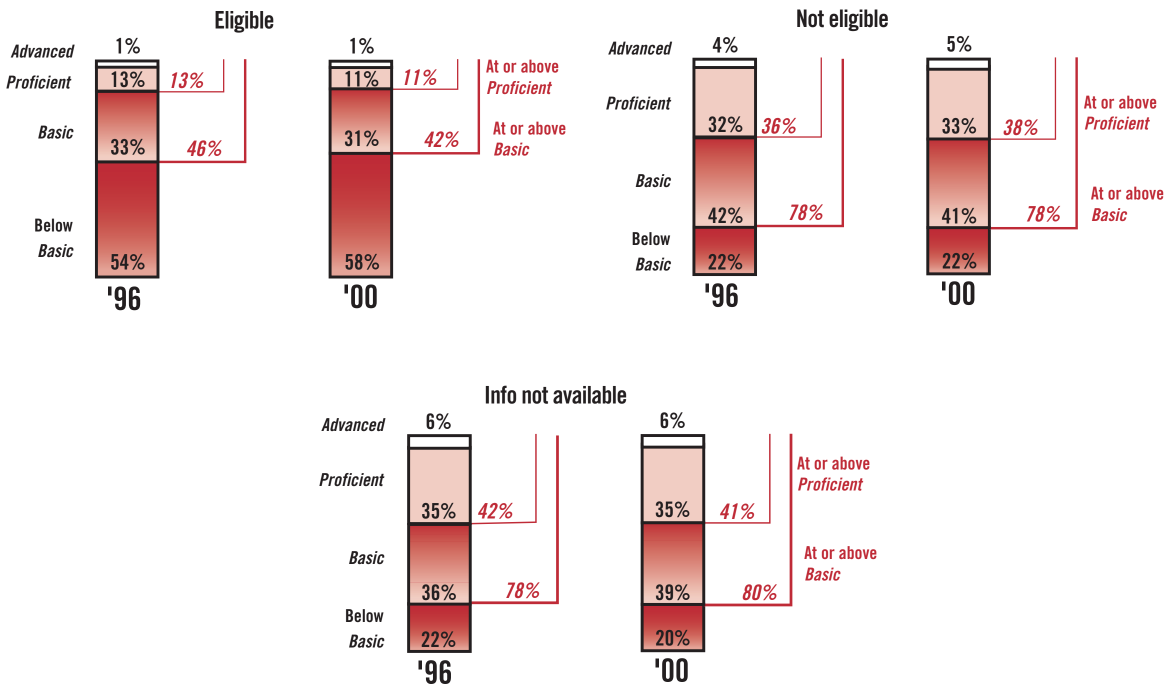
Achievement-level results by students' eligibility for the free/reduced-price school lunch program are displayed in figure 3.13. At grade 4, there were no statistically significant changes between 1996 and 2000 in the percentages of students at or above achievement levels among students who were either eligible or not eligible for the free/reduced-price school lunch program. At grade 8, the percentage of students at or above *Proficient* increased between 1996 and 2000 for those students who were not eligible for the free/reduced-price school lunch program. At grade 12, the percentages of students at or above *Basic* decreased between 1996 and 2000 for those students who were not eligible for the free/reduced-price school lunch program. Similar to the pattern observed for scale score results in 2000, there were higher percentages of fourth-, eighth-, and twelfth-graders at or above *Basic* and *Proficient* among those students who were not eligible for the program than among those who were.

Figure 3.13

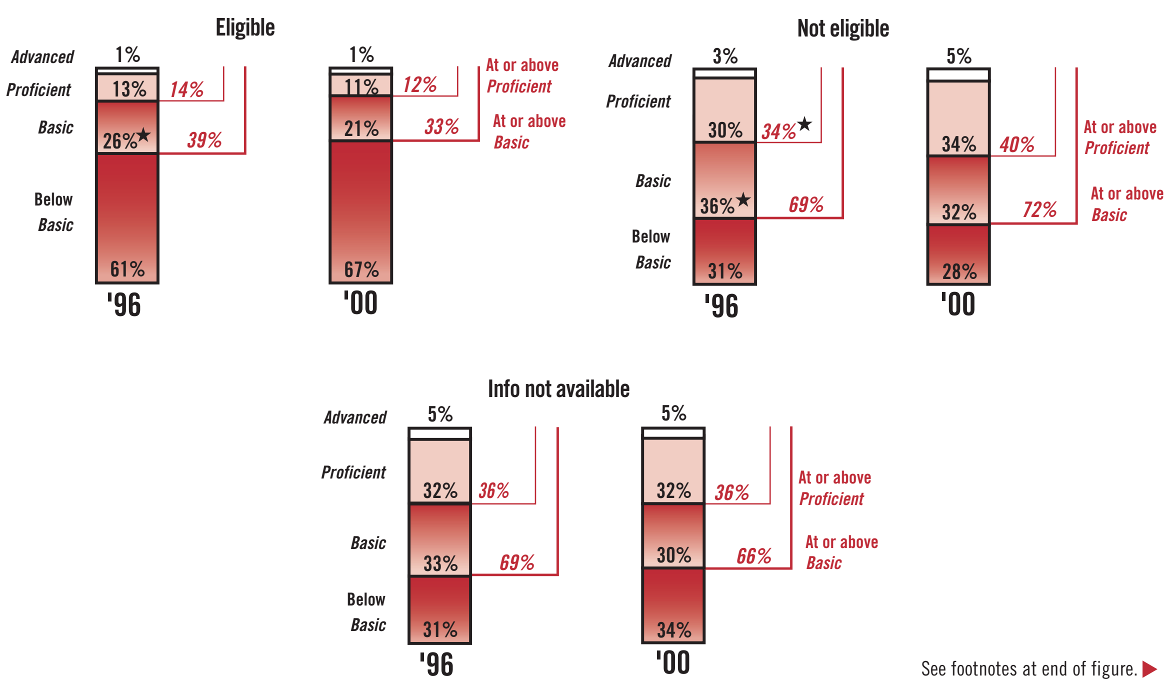
National Achievement-Level Results by Free/Reduced-Price School Lunch Program Eligibilty

Percentage of students within each science achievement-level range and at or above achievement levels by student eligibility for the free/reduced-price school lunch program, grades 4, 8, and 12: 1996 and 2000

Grade 4



Grade 8

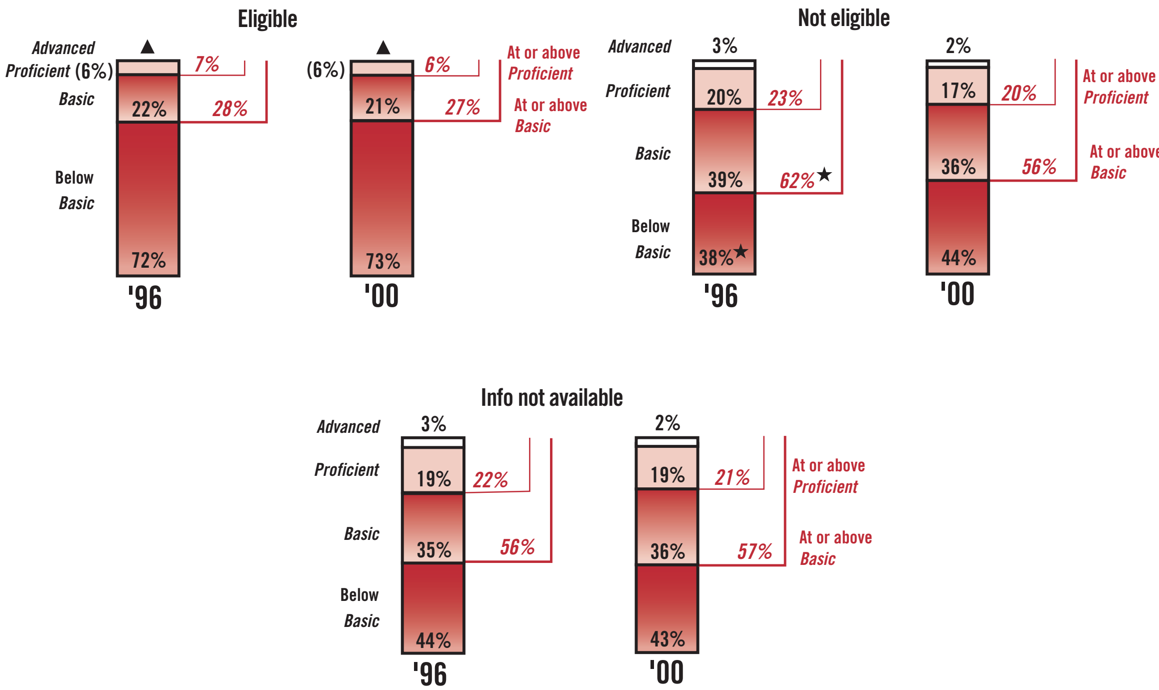


See footnotes at end of figure. ▶

Figure 3.13
National Achievement-Level Results by Free/Reduced-Price School Lunch Program Eligibilty (continued)

Percentage of students within each science achievement-level range and at or above achievement levels by student eligibility for the free/reduced-price school lunch program, grades 4, 8, and 12: 1996 and 2000

Grade 12



★ Significantly different from 2000.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

State Results: Performance of Selected Subgroups

Results for public schools in participating states and jurisdictions are presented in this section by gender, race/ethnicity, and eligibility for free/reduced-price school lunch. Complete data for participating jurisdictions are available on the NAEP web site at http://nces.ed.gov/nationsreportcard.

Nonpublic schools were not included in the state NAEP assessments for 2000, but were included in the national samples. While the national results shown in the previous sections of this chapter represented both public and nonpublic school students combined, the national data shown for comparison at the top of the following state tables are based on the national sample—not on aggregated state samples—of students from public schools only.

In addition to results from the 2000 state assessment, results are also available from 1996 for many of the jurisdictions at grade 8. Not all jurisdictions, however, met minimum school participation guidelines in every NAEP assessment. (See appendix A for details on the participation and reporting guidelines.) In 2000, results for grades 4 and 8 in Wisconsin and grade 8 in the Virgin Islands are not included in the relevant tables because they did not meet the criteria.

The state results presented here were obtained by assessing a representative sample of students in each state under conditions that did not permit accommodations for special-needs students. These were the same conditions under which results were obtained in previous state assessments. Consequently, it is possible to report changes in student performance across the assessment years at grade 8. In 2000, a separate representative sample was assessed in each participating jurisdiction for which accommodations were offered to special-needs students. Those results are presented in chapter 4, along with a comparison of "accommodations-permitted" and "accommodations-not-permitted" results in each state. Subgroup "accommodations-permitted" results by state are available on the NAEP web site.

In examining the state results presented in this section, it should be noted that schools participating in the NAEP assessments under these conditions are permitted to exclude those students who cannot be assessed meaningfully without accommodations. Exclusion rates vary considerably across years in many jurisdictions. In 2000, in the sample that did not permit accommodations, the pattern in most jurisdictions was for more special-needs students to be excluded from the assessment than in 1996.

In addition to changes across years in exclusion rates for a particular jurisdiction, there is considerable variation in exclusion rates across jurisdictions. Comparisons of assessment results across jurisdictions and within jurisdictions across years should be made with caution. No adjustments have been made for differing exclusion rates across jurisdictions or across years. Thus, a comparison within a jurisdiction across years or between two jurisdictions may be based on samples with exclusion rates that differ considerably. The exclusion rates for each jurisdiction are presented in appendix A. Tables presenting state-level results at grade 8 indicate statistically significant changes across years when examining only one jurisdiction at a time (*), and when using a multiple comparison procedure based on all the jurisdictions that participated (‡). Only those differences based on the multiple comparison procedure are discussed.

Gender Results by State

Table 3.2 presents the results for the grade 4 male and female average science scores for each jurisdiction that participated in the 2000 assessment. Since this was the first time the assessment was given at the state level, there are no comparisons to other years. At grade 4, the average score of male students was higher than that of female students in 7 states and other jurisdictions—Connecticut, Georgia, Maine, North Dakota, Utah, Wyoming, and the Department of Defense Dependents Schools (Overseas) (DoDDS).

Table 3.3 presents the results for the grade 8 male and female average science scores for each jurisdiction that participated in the 2000 assessment. For both males and females the 2000 average score is compared to scores from 1996, where available. The following discussion of changes in subgroup performance within jurisdictions is based only on results of the statistical testing using a multiple-comparison procedure. At grade 8, in 2000, the average score

Table 3.2 State Scale Score Results by Gender, Grade 4

State average science scale scores by gender for grade 4 public schools: 2000

	Male	Female
Nation	151	146
Alabama	143	143
Arizona	142	140
Arkansas	145	143
California †	132	130
Connecticut	160	153
Georgia	147	140
Hawaii	138	135
Idaho †	155	150
Illinois †	154	148
Indiana †	157	153
Iowa †	163	158
Kentucky	155	150
Louisiana	141	136
Maine †	165	158
Maryland	148	144
Massachusetts	164	159
Michigan †	156	151
Minnesota †	159	155
Mississippi	135	132
Missouri	159	153
Montana †	163	157
Nebraska	153	148
Nevada	142	142
New Mexico	140	136
New York †	151	147
North Carolina	150	146
North Dakota	164	156
Ohio †	156	152
Oklahoma	153	150
Oregon †	151	148
Rhode Island	151	145
South Carolina	143	139
Tennessee	150	145
Texas	150	145
Utah	157	152
Vermont †	161	157
Virginia	157	155
West Virginia	152	149
Wyoming	162	153
Other Jurisdictions		
American Samoa	52	49
DDESS	158	155
DoDDS	159	153
Guam	108	113
Virgin Islands	118	113

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 3.3 State Scale Score Results by Gender, Grade 8

State average science scale scores by gender for grade 8 public schools: 1996 and 2000

	1996		2000	
	Male	Female	Male	Female
Nation	149 *	148	153	146
Alabama	138	139	144	139
Arizona †	147	143	150	142
Arkansas	147	142	144	142
California †	140	136 *	136	129
Connecticut	156	155	158	150
Georgia	144	139	147	140
Hawaii	135	135	133	131
Idaho †	—	—	162	155
Illinois †	—	—	153	148
Indiana †	154	152	158	154
Kentucky	148 ‡	147	155	148
Louisiana	136	129	138	134
Maine †	165	161 *	163	157
Maryland	146 *	145	152	147
Massachusetts	159	154 *	162	160
Michigan †	156	150	158	154
Minnesota †	161	157	162	158
Mississippi	134	132	136	132
Missouri	152 ‡	150 *	159	154
Montana †	164	160	169	161
Nebraska	160	155	160	154
Nevada	—	—	145	142
New Mexico	143	139	144	137
New York †	148	143	151	147
North Carolina	149	145	151	144
North Dakota	163	161	163	159
Ohio	—	—	164	157
Oklahoma	—	—	152	146
Oregon †	157	153	155	153
Rhode Island	150	148	152	147
South Carolina	141	136	145	139
Tennessee	144	142	149	143
Texas	147	143	147	141
Utah	159	154	158	153
Vermont †	158 *	156	163	159
Virginia	150 *	148	156	148
West Virginia	148 *	147	153	147
Wyoming	159	156	159	156
Other Jurisdictions				
American Samoa	—	—	70	75
DDESS	157	149 ‡	160	157
DoDDS	157 ‡	154	162	156
Guam	120	120	116	112

* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.

‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.

— Indicates that the jurisdiction did not participate.

NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

of male students was higher than that of female students in 23 jurisdictions. Between 1996 and 2000 gains were evident for males in three jurisdictions—Kentucky, Missouri, and the Department of Defense Dependents School (Overseas) (DoDDS). Gains were made by females in only one jurisdiction between 1996 and 2000—the Department of Defense Domestic Dependent Elementary and Secondary Schools (DDESS).

Tables 3.4 and 3.5 present the percentage of males and females at or above *Proficient* for the participating jurisdictions at grades 4 and 8 respectively. At grade 4, the percentage of students at or above *Proficient* in 2000 was higher for male students than for female students in 7 jurisdictions—Connecticut, Maine, North Dakota, Rhode Island, Utah, Wyoming, and the Department of Defense Dependents School (Overseas). At grade 8, the percentage of students at or above *Proficient* in 2000 was higher for male students than for female students in 29 jurisdictions. When results from 1996 were compared to those of 2000, the percentage of male students at or above *Proficient* was higher in 2000 in 4 jurisdictions—Kentucky, Missouri, West Virginia, and the Department of Defense Dependents School (Overseas) (DoDDS). There were no statistically significant changes between 1996 and 2000 among female eighth-graders in any of the jurisdictions.

Table 3.4 State *Proficient* Level Achievement Results by Gender, Grade 4

State percentages of students at or above the *Proficient* level in science by gender for grade 4 public schools: 2000

	Male	Female
Nation	31	24
Alabama	23	21
Arizona	24	20
Arkansas	26	21
California †	16	12
Connecticut	40	30
Georgia	27	20
Hawaii	18	14
Idaho †	35	25
Illinois †	34	28
Indiana †	37	28
Iowa †	42	33
Kentucky	32	25
Louisiana	22	16
Maine †	43	34
Maryland	29	23
Massachusetts	46	38
Michigan †	37	29
Minnesota †	38	32
Mississippi	16	12
Missouri	39	31
Montana †	43	32
Nebraska	29	23
Nevada	21	17
New Mexico	20	16
New York †	28	24
North Carolina	26	22
North Dakota	44	32
Ohio †	34	29
Oklahoma	29	24
Oregon †	29	26
Rhode Island	31	23
South Carolina	24	17
Tennessee	29	23
Texas	28	21
Utah	36	27
Vermont †	41	36
Virginia	35	30
West Virginia	26	23
Wyoming	39	27
Other Jurisdictions		
American Samoa	▲	▲
DDESS	33	26
DoDDS	35	26
Guam	4	4
Virgin Islands	4	3

▲ Percentage is between 0.0 and 0.5.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 3.5 State *Proficient* Level Achievement Results by Gender, Grade 8

State percentages of students at or above the *Proficient* level in science by gender for grade 8 public schools: 1996 and 2000

	1996		2000	
	Male	Female	Male	Female
Nation	29 *	26	35	26
Alabama	19	17	24	20
Arizona †	25	20	29	19
Arkansas	26	18	25	21
California †	21	18	18	13
Connecticut	37	35	39	30
Georgia	24	17	27	20
Hawaii	16	14	17	14
Idaho †	—	—	44	32
Illinois †	—	—	34	26
Indiana †	32	28	38	32
Kentucky	25 ‡	21	34	24
Louisiana	17	10 *	21	15
Maine †	45	38	42	32
Maryland	26	24	32	25
Massachusetts	40	33	44	40
Michigan †	36	29	38	35
Minnesota †	40	33	45	38
Mississippi	14	11	17	12
Missouri	31 ‡	25 *	40	32
Montana †	44	37	52	39
Nebraska	39	30	41	31
Nevada	—	—	25	20
New Mexico	23	16	25	16
New York †	31	23	32	27
North Carolina	26	22	31	23
North Dakota	44	37	44	36
Ohio	—	—	46	36
Oklahoma	—	—	31	22
Oregon †	35	29	37	30
Rhode Island	28	24	31	26
South Carolina	20	15	23	18
Tennessee	24	20	29	21
Texas	27	20	27	20
Utah	37	27	39	30
Vermont †	36 *	32	43	36
Virginia	28	26	35	27
West Virginia	22 ‡	19	30	22
Wyoming	35	32	39	32
Other Jurisdictions				
American Samoa	—	—	3	1
DDESS	32	21 *	38	33
DoDDS	33 ‡	29	42	33
Guam	8	7	7	5

* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.

‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.

— Indicates that the jurisdiction did not participate.

NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Race/Ethnicity Results by State

Tables 3.6 and 3.7 display the average science scores for each of the racial/ethnic groups by jurisdiction in 2000 for grade 4, and in 1996 and 2000 for grade 8. In every state and other jurisdiction where sample sizes were large enough for reliable statistical comparisons, White students outperformed Black and Hispanic students at both grades. There were no statistically significant differences detected between 1996 and 2000 in any state or jurisdiction in the average scores of eighth-graders in the different racial/ethnic subgroups.

Table 3.6 State Scale Score Results by Race/Ethnicity, Grade 4

State average science scale scores by race/ethnicity for grade 4 public schools: 2000

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Nation	159	124	127	~	139
Alabama	158	125	117	****	****
Arizona	157	128	123	****	115
Arkansas	156	117	121	****	144
California †	151	119	115	142	****
Connecticut	166	127	133	****	****
Georgia	160	124	128	162	****
Hawaii	148	125	119	138	****
Idaho †	158	****	126	****	****
Illinois †	166	127	129	****	****
Indiana †	160	132	130	****	****
Iowa †	162	****	141	****	****
Kentucky	156	129	138	****	****
Louisiana	156	121	126	****	****
Maine †	163	****	144	****	****
Maryland	162	125	133	164	134
Massachusetts	169	137	130	161	****
Michigan †	164	121	132	****	****
Minnesota †	163	126	136	134	148
Mississippi	153	117	114	****	****
Missouri	164	131	129	****	152
Montana †	164	****	147	****	145
Nebraska	155	125	136	****	****
Nevada	152	121	127	147	145
New Mexico	155	129	129	****	123
New York †	163	131	132	156	****
North Carolina	159	128	133	****	132
North Dakota	163	****	145	****	136
Ohio †	161	129	141	****	****
Oklahoma	159	133	136	****	148
Oregon †	156	****	123	****	148
Rhode Island	159	121	116	143	****
South Carolina	157	123	128	****	****
Tennessee	157	122	128	****	****
Texas	162	134	135	158	****
Utah	160	****	135	147	138
Vermont †	160	****	****	****	****
Virginia	166	139	140	176	****
West Virginia	152	132	135	****	****
Wyoming	161	****	142	****	149
Other Jurisdictions					
American Samoa	****	****	36	58	****
DDESS	166	145	154	157	****
DoDDS	163	141	151	156	153
Guam	112	****	88	116	****
Virgin Islands	****	119	106	****	****

**** Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
~ Special analyses raised concerns about the accuracy and precision of the National grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 3.7 State Scale Score Results by Race/Ethnicity, Grade 8

State average science scale scores by race/ethnicity for grade 8 public schools: 1996 and 2000

	White		Black		Hispanic		Asian/Pacific Islander		American Indian	
	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
Nation	159	160	120	121	127	127	150	154	148 *	132
Alabama	151	154	117	116	107	106	****	****	****	****
Arizona †	157	159	124	127	129	126	****	****	121	137
Arkansas	154	154	116	113	122	118	****	****	****	****
California †	156	150	121	120	121	117	148	147	****	****
Connecticut	165	166	121	122	122	129	163	160	****	****
Georgia	155	159	122	123	128	124	****	****	****	****
Hawaii	146	149	128	128	119	119	136 *	132	****	****
Idaho †	—	162	—	****	—	135	—	****	—	****
Illinois †	—	165	—	123	—	131	—	162	—	****
Indiana †	158	161	125	127	139	132	****	****	****	****
Kentucky	151 *	155	127	126	113	****	****	****	****	****
Louisiana	148 *	154	113	113	104	119	****	****	****	****
Maine †	164 *	161	****	****	141	****	****	****	****	****
Maryland	160	163	124	127	121 *	135	161	170	****	****
Massachusetts	163 *	168	126	134	126	128	152	165	****	****
Michigan †	161	164	122	120	134	137	****	****	****	****
Minnesota †	162	165	130	122	134	136	152	****	****	****
Mississippi	149	150	119 *	114	105	113	****	****	****	****
Missouri	158 *	162	120	125	130	141	****	****	****	****
Montana †	166	168	****	****	147	151	****	****	139	143
Nebraska	161	162	130	129	134	132	****	****	****	****
Nevada	—	154	—	125	—	126	—	148	—	134
New Mexico	159	160	****	****	130	130	****	****	126	124
New York †	161	165	120	128	116	125	155	151	****	****
North Carolina	157	158	126	123	123 *	139	****	158	136	****
North Dakota	164	164	****	****	137	139	****	****	137	133
Ohio	—	165	—	131	—	147	—	****	—	****
Oklahoma	—	156	—	127	—	123	—	****	—	145
Oregon †	158	160	****	131	133	128	157	157	142	144
Rhode Island	155	156	130	128	118	127	142	143	****	****
South Carolina	153	155	122	122	122	123	****	****	****	****
Tennessee	151	155	117	118	104	123	****	****	****	****
Texas	161	159	127	122	129	132	157	162	****	****
Utah	159	159	****	****	133	135	143	152	****	****
Vermont †	159	162	****	****	136	****	****	****	****	****
Virginia	158	161	126	130	132	138	165	169	****	****
West Virginia	149	151	127	125	122	****	****	****	****	****
Wyoming	161	161	****	****	140	139	****	****	138	141
Other Jurisdictions										
American Samoa	—	****	—	****	—	55	—	90	—	****
DDESS	162 *	169	137	140	149	156	****	****	****	****
DoDDS	164	168	140	142	146	153	156	160	****	****
Guam	138	****	****	****	106	97	122	119	****	****

* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.
**** Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

The percentages of students in the different racial/ethnic subgroups across jurisdictions who were at or above *Proficient* are presented in table 3.8 (grade 4) and table 3.9 (grade 8). The patterns seen in the grade 4 results are very similar to those found in the average score results. White students outperformed Black and Hispanic students in jurisdictions where sample sizes were large enough for reliable statistical comparisons.

At grade 8, the percentage of White students in most states and jurisdictions at or above *Proficient* was on average higher than the percentage of Black or Hispanic students in jurisdictions where a comparison was possible. There were no statistically significant changes between 1996 and 2000 in any state or jurisdiction in the percentages of eighth-graders in the different racial/ethnic subgroups who were at or above *Proficient*.

Table 3.8 State *Proficient* Level Achievement Results by Race/Ethnicity, Grade 4

State percentages of students at or above the *Proficient* level in science by race/ethnicity for grade 4 public schools: 2000

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Nation	37	6	10	~	17
Alabama	34	5	8	****	****
Arizona	34	9	7	****	7
Arkansas	32	3	9	****	22
California †	27	4	5	19	****
Connecticut	45	4	12	****	****
Georgia	39	6	12	39	****
Hawaii	25	8	7	16	****
Idaho †	35	****	8	****	****
Illinois †	46	7	10	****	****
Indiana †	37	9	12	****	****
Iowa †	40	****	16	****	****
Kentucky	32	5	15	****	****
Louisiana	31	5	17	****	****
Maine †	40	****	16	****	****
Maryland	40	6	13	44	18
Massachusetts	50	13	11	41	****
Michigan †	43	6	12	****	****
Minnesota †	41	7	14	11	18
Mississippi	26	2	7	****	****
Missouri	42	9	20	****	35
Montana †	41	****	23	****	19
Nebraska	31	5	12	****	****
Nevada	27	4	8	21	20
New Mexico	33	9	10	****	6
New York †	40	6	9	36	****
North Carolina	35	6	11	****	10
North Dakota	41	****	23	****	13
Ohio †	38	7	17	****	****
Oklahoma	34	9	11	****	22
Oregon †	32	****	10	****	26
Rhode Island	35	5	4	18	****
South Carolina	34	4	11	****	****
Tennessee	34	6	9	****	****
Texas	39	10	12	38	****
Utah	36	****	13	21	16
Vermont †	40	****	****	****	****
Virginia	44	12	17	58	****
West Virginia	26	8	12	****	****
Wyoming	37	****	15	****	22
Other Jurisdictions					
American Samoa	****	****	0	▲	****
DDESS	42	15	26	25	****
DoDDS	41	12	23	30	24
Guam	7	****	▲	4	****
Virgin Islands	****	4	1	****	****

**** Sample size is insufficient to permit a reliable estimate. † Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
~ Special analyses raised concerns about the accuracy and precision of the National grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 3.9 State *Proficient* Level Achievement Results by Race/Ethnicity, Grade 8

State percentages of students at or above the *Proficient* level in science by race/ethnicity for grade 8 public schools: 1996 and 2000

	White		Black		Hispanic		Asian/Pacific Islander		American Indian	
	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
Nation	36	40	4	6	10	11	27	36	24	14
Alabama	25	31	4	4	7	7	****	****	****	****
Arizona †	33	35	7	8	8	8	****	****	6	9
Arkansas	29	30	3	2	9	8	****	****	****	****
California †	33	26	5	6	6	5	27	29	****	****
Connecticut	44	45	5	6	7	11	45	44	****	****
Georgia	31	36	5	6	14	13	****	****	****	****
Hawaii	23	29	9	10	7	7	15	14	****	****
Idaho †	—	42	—	****	—	12	—	****	—	****
Illinois †	—	44	—	5	—	12	—	42	—	****
Indiana †	34	40	8	6	15	12	****	****	****	****
Kentucky	25 *	32	6	7	9	****	****	****	****	****
Louisiana	21 *	29	3	3	7	11	****	****	****	****
Maine †	43 *	38	****	****	16	****	****	****	****	****
Maryland	38	41	5	8	8	16	38	47	****	****
Massachusetts	41 *	49	9	12	11	12	38	46	****	****
Michigan †	39	43	6	6	14	20	****	****	****	****
Minnesota †	40	46	9	11	13	21	30	****	****	****
Mississippi	22	24	3	2	3	7	****	****	****	****
Missouri	34 *	42	3	7	12	19	****	****	****	****
Montana †	45	49	****	****	19	29	****	****	12	25
Nebraska	38	40	7	10	16	16	****	****	****	****
Nevada	—	31	—	7	—	9	—	25	—	14
New Mexico	36	39	****	****	9	10	****	****	8	7
New York †	39	44	4	8	7	11	37	29	****	****
North Carolina	33	37	6	6	8	19	****	36	14	****
North Dakota	43	44	****	****	16	21	****	****	12	12
Ohio	—	45	—	11	—	30	—	****	—	****
Oklahoma	—	32	—	7	—	10	—	****	—	19
Oregon †	34	38	****	8	13	10	35	38	21	22
Rhode Island	31	34	7	6	4	9	16	26	****	****
South Carolina	29	31	4	5	7	11	****	****	****	****
Tennessee	26	31	5	6	3	13	****	****	****	****
Texas	38	36	6	7	8	12	34	40	****	****
Utah	34	38	****	****	13	15	17	32	****	****
Vermont †	36 *	41	****	****	16	****	****	****	****	****
Virginia	36	39	6	9	12	18	41	49	****	****
West Virginia	22 *	28	4	7	3	****	****	****	****	****
Wyoming	37	39	****	****	14	17	****	****	8	21
Other Jurisdictions										
American Samoa	—	****	—	****	—	0	—	3	—	****
DDESS	39	48	8	13	20	31	****	****	****	****
DoDDS	42 *	50	13	16	20	28	33	37	****	****
Guam	23	****	****	****	4	2	6	7	****	****

* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.

**** Sample size is insufficient to permit a reliable estimate.

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.

— Indicates that the jurisdiction did not participate.

NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Scale Score Differences Between Selected Subgroups by State

Similar to results for the nation, changes in the score differences or "gaps" between male and female students were relatively small across states, and were not found to be significantly different across assessment years at grade 8. Also similar to the national data, the score gaps between male and female students are generally much smaller than those seen between racial/ethnic subgroups. None of the apparent changes in racial/ethnic score gaps across years at grade 8 were statistically significant. The gender and racial/ethnic score gap results for jurisdictions are provided in appendix B.

Free/Reduced-Price School Lunch Eligibility Results by State

NAEP collects data on students' eligibility for the federal free/reduced-price school lunch program as an indicator of economic status in both the national and state (or jurisdiction) samples. Tables 3.10 and 3.11 present the results by state and jurisdiction for grades 4 and 8, respectively. As previously noted, comparison data for grade 4 do not exist because the science assessment was only offered state-by-state at the eighth-grade level in 1996.

At grade 4, in all jurisdictions where sample sizes were large enough for reliable statistical comparisons, students who were not eligible for the free/reduced-price school lunch program outperformed students who were. A similar result was seen at grade 8. When data were compared across years, eighth-graders in five jurisdictions who were not eligible for the program had higher average scores in 2000 than in 1996. They are: Louisiana, Missouri, Vermont, West Virginia, and DoDDS.

The percentage of students at or above *Proficient* by free/reduced-price school lunch eligibility in 2000 are presented for participating jurisdiction in tables 3.12 and 3.13 for grades 4 and 8, respectively. There were higher percentages of eighth-graders who were not eligible for the program at or above *Proficient* in 2000 than in 1996 in Lousiana, Missouri, and West Virginia. Additional data for these subgroups are included in appendix B.

Table 3.10 State Scale Score Results by Free/Reduced-Price School Lunch Eligibility, Grade 4

State scale score results by student eligibility for free/reduced-price school lunch for grade 4 public schools: 2000

	Eligible	Not eligible	Information not available
Nation	129	159	160
Alabama	128	159	146
Arizona	125	155	136
Arkansas	131	157	****
California †	115	150	137
Connecticut	135	165	144
Georgia	124	159	151
Hawaii	125	147	132
Idaho †	142	159	163
Illinois †	132	163	157
Indiana †	138	162	153
Iowa †	153	163	159
Kentucky	142	161	156
Louisiana	128	159	133
Maine †	150	166	161
Maryland	126	158	137
Massachusetts	139	171	155
Michigan †	134	163	131
Minnesota †	141	163	166
Mississippi	122	153	132
Missouri	141	165	145
Montana †	147	167	162
Nebraska	135	159	151
Nevada	128	150	137
New Mexico	126	154	146
New York †	133	163	158
North Carolina	131	158	155
North Dakota	150	164	159
Ohio †	136	164	158
Oklahoma	144	162	149
Oregon †	136	158	147
Rhode Island	125	162	138
South Carolina	128	157	138
Tennessee	132	159	153
Texas	132	160	151
Utah	142	160	161
Vermont †	145	165	155
Virginia	138	164	163
West Virginia	143	158	152
Wyoming	148	162	155
Other Jurisdictions			
American Samoa	51	****	****
DDESS	152	160	160
DoDDS	150	158	156
Guam	101	121	****
Virgin Islands	115	****	****

**** Sample size is insufficient to permit a reliable estimate.

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 3.11 State Scale Score Results by Free/Reduced-Price School Lunch Eligibility, Grade 8

State scale score results by student eligibility for free/reduced-price school lunch for grade 8 public schools: 1996 and 2000

	Eligible		Not eligible		Information not available	
	1996	2000	1996	2000	1996	2000
Nation	133 *	127	155 *	160	154	151
Alabama	121	124	150	153	151	152
Arizona †	127	127	155	156	144	148
Arkansas	128	127	152	153	155	139
California †	120 *	113	152 *	145	137	135
Connecticut	127	125	163	163	154	147
Georgia	124	125	151	155	146	145
Hawaii	125	119	141	142	115 ‡	139
Idaho †	—	149	—	164	—	155
Illinois †	—	126	—	162	—	152
Indiana †	136	139	158	161	****	149
Kentucky	135	139	155 *	160	142	****
Louisiana	121	122	145 ‡	155	128	133
Maine †	152	150	167	163	164	155
Maryland	122	127	154	158	143	138
Massachusetts	133	134	164	168	149	164
Michigan †	139	134	159	164	144	152
Minnesota †	145	141	162	165	162	164
Mississippi	121	120	148	149	134	138
Missouri	138	140	157 ‡	164	144	153
Montana †	150	155	166	170	165	168
Nebraska	144	142	162	162	161	161
Nevada	—	126	—	150	—	144
New Mexico	130	130	151	152	143	142
New York †	124	132	159	161	153	147
North Carolina	128	128	156	155	144	150
North Dakota	157 *	149	165	166	155	158
Ohio	—	144	—	166	—	151
Oklahoma	—	137	—	158	—	148
Oregon †	145	138	159	160	151	159
Rhode Island	131	130	157	158	125	136
South Carolina	126	126	149 *	155	****	****
Tennessee	125	129	151	155	144	147
Texas	130	128	157	156	127	137
Utah	149 *	142	158	159	157	158
Vermont †	146	144	160 ‡	165	157	163
Virginia	125	130	157	159	150	150
West Virginia	138	138	152 ‡	158	151	151
Wyoming	148	147	160	161	155	159
Other Jurisdictions						
American Samoa	—	72	—	****	—	****
DDESS	148	153	158	163	150	158
DoDDS	146 *	155	156 ‡	161	156	158
Guam	101	96	125	119	****	104

* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
**** Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table 3.12 State *Proficient* Level Achievement Results by Free/Reduced-Price School Lunch Eligibility, Grade 4

State percentages of students at or above the *Proficient* level in science by student eligibility for free/reduced-price school lunch program for grade 4 public schools: 2000

	Eligible	Not eligible	Information not available
Nation	11	37	39
Alabama	9	36	23
Arizona	8	34	19
Arkansas	13	35	****
California †	4	26	16
Connecticut	12	44	26
Georgia	7	37	27
Hawaii	8	23	11
Idaho †	19	36	41
Illinois †	12	42	42
Indiana †	14	40	31
Iowa †	26	41	36
Kentucky	17	38	35
Louisiana	10	36	13
Maine †	23	46	36
Maryland	7	36	19
Massachusetts	16	53	37
Michigan †	15	43	12
Minnesota †	17	41	49
Mississippi	6	28	12
Missouri	19	44	29
Montana †	23	46	41
Nebraska	11	35	29
Nevada	8	26	13
New Mexico	9	30	26
New York †	11	39	36
North Carolina	9	34	29
North Dakota	26	43	38
Ohio †	12	43	32
Oklahoma	17	39	23
Oregon †	15	35	30
Rhode Island	8	38	19
South Carolina	9	34	16
Tennessee	12	36	36
Texas	9	37	30
Utah	19	37	40
Vermont †	22	45	34
Virginia	12	42	43
West Virginia	17	33	26
Wyoming	21	38	30
Other Jurisdictions			
American Samoa	▲	****	****
DDESS	23	35	32
DoDDS	22	33	31
Guam	2	6	****
Virgin Islands	3	****	****

**** Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 3.13 State *Proficient* Level Achievement Results by Free/Reduced-Price School Lunch Eligibility, Grade 8

State percentages of students at or above the *Proficient* level in science by student eligibility for free/reduced-price school lunch program for grade 8 public schools: 1996 and 2000

	Eligible		Not eligible		Information not available	
	1996	2000	1996	2000	1996	2000
Nation	14	12	32 *	39	34	31
Alabama	7	9	24	31	33	31
Arizona †	9	10	31	31	18	25
Arkansas	10	12	28	30	30	22
California †	6	4	31	23	15	17
Connecticut	10	7	43	43	38	29
Georgia	6	9	29	33	25	23
Hawaii	9	7	18	20	5 *	20
Idaho †	—	27	—	44	—	36
Illinois †	—	10	—	40	—	28
Indiana †	12	16	35	41	****	28
Kentucky	11	16	31 *	38	16	****
Louisiana	7	8	20 ‡	32	16	13
Maine †	27	25	46	41	41	28
Maryland	8	9	32	37	16	17
Massachusetts	13	14	44	49	29	46
Michigan †	17	16	38	44	26	32
Minnesota †	22	21	40	47	42	45
Mississippi	5	6	22	24	9	17
Missouri	15	18	34 ‡	44	25	32
Montana †	25	34	46	51	43	48
Nebraska	20	21	40	41	38	44
Nevada	—	10	—	28	—	17
New Mexico	10	11	28	29	19	24
New York †	10	14	37	41	36	28
North Carolina	7	9	33	34	17	35
North Dakota	33	26	44	47	33	36
Ohio	—	22	—	46	—	33
Oklahoma	—	16	—	33	—	27
Oregon †	20	17	37	39	30	38
Rhode Island	10	10	32	36	10	14
South Carolina	7	8	26	31	****	****
Tennessee	9	11	28	33	23	26
Texas	9	9	34	33	14	21
Utah	25	23	34	38	32	37
Vermont †	22	22	38 *	44	30 *	43
Virginia	6	11	34	37	27	29
West Virginia	12	14	26 ‡	35	23	25
Wyoming	22	24	37	40	32	33
Other Jurisdictions						
American Samoa	—	2	—	****	—	****
DDESS	20	29	32	40	25	35
DoDDS	20 *	33	33 *	39	31	37
Guam	▲	3	9	7	****	5

* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate. ▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

4 Becoming a More Inclusive National Assessment

Chapter Contents

Chapter Focus

How would the NAEP results differ if accommodations were permitted for special-needs students?

Legislation at the federal level now mandates the inclusion of all students in large-scale academic assessments.[1] As a consequence, most states have assessment programs that must make provisions for special-needs students—those with disabilities or limited English proficient students—that include the allowance of testing accommodations when appropriate. Assessing as representative a sample of the nation's students as possible is particularly important for NAEP's mission to serve as a key indicator of the academic achievement of the nation's students. This mission can be satisfactorily accomplished only if the assessment results include data gathered from all groups of students, including those classified as having special needs.

Although the intent of NAEP has consistently been to include special-needs students in its assessments to the fullest degree possible, the implementation of the assessment has always resulted in some exclusion of students who could not be assessed meaningfully without accommodations. Participating schools have been permitted to exclude certain students who have been classified as having a disability under the Individuals with Disabilities Education Act, based upon their Individualized Education Programs (IEP) and Section 504 of the Rehabilitation Act of 1973.

1 Public Law 105–17. (1997). Individuals with Disabilities Education Act (IDEA). See also: Title VI of the Civil Rights Act, Equal Educational Opportunities Act, Section 504 of the Rehabilitation Act.

Similarly, schools have been permitted to exclude some students they identify as being limited-English proficient. Exclusion decisions are made in accordance with explicit criteria provided by the NAEP program.

In order to move the NAEP assessments toward more inclusive samples, the NAEP program began to explore the use of accommodations with special-needs students during the 1996 science assessment. An additional impetus for this change was the attempt to keep NAEP consistent with state and district testing policies that increasingly offered accommodations so that more special-needs students could be assessed. In 1996, the national NAEP sample was split so that some of the schools sampled were permitted to provide accommodations to special-needs students and the other schools were not. This sample design made it possible to study the effects on NAEP results of including special-needs students in the assessments under alternate testing conditions. Technical research papers have been published with the results of these comparisons.[2] Based on the outcomes of these analyses, the 1998 results of those NAEP assessments that used new test frameworks (writing and civics), and hence also began new trend lines, were reported with the inclusion of data from accommodated special-needs students.

The results presented in the NAEP 1996 science report card included the performance of those students with disabilities (SD) or limited English proficient students (LEP) who were assessed without the possibility of accommodations. They did not include results on the performance of students for whom accommodations were permitted. However, in both the 1996 and 2000 science assessments, NAEP used the split-sample design so that changes in students' science achievement could be reported across the two assessment years and, at the same time, the program could continue to examine the effects of including students assessed with accommodations.

Two Sets of 2000 NAEP Science Results

This report card is the first to display two different sets of NAEP science results based on the split-sample design: 1) those that reflect the performance of regular and special-needs students when accommodations were not permitted, and 2) those that reflect the performance of regular and special-needs students—both those who were accommodated and those who were tested without accommodations—when accommodations were permitted. It should be noted that accommodated students make up a small proportion of the total weighted number of students assessed (see table A.9, in appendix A for details). Mak-

[2] Olson, J. F., & Goldstein, A. A. (1997). *The inclusion of students with disabilities and limited English proficient students in large-scale assessments: A summary of recent progress*. (NCES Publication No. 97–482). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Mazzeo, J., Carlson, J. E., Voelkl, K. E., & Lutkus, A. D. (1999). *Increasing the participation of special needs students in NAEP: A report on 1996 research activities*. (NCES Publication No. 2000–473). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Lutkus, A. D., & Mazzeo, J. *Including special-needs students in the NAEP 1998 reading assessment: Part I, comparison of overall results with and without accommodations.* Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (forthcoming).

Lutkus, A. D. *Including special-needs students in the NAEP 1998 reading assessment: Part II, results for students with disabilities and limited English proficient students.* Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (forthcoming).

ing accommodations available may change the overall assessment results in subtle and different ways. For example, when accommodations are permitted, there may be some occurrences of students being accommodated who might have taken the test under standard conditions if accommodations were not permitted. This could lead to an overall increase in the average assessment results, if accommodations were to increase special-needs students' performance. Conversely, when accommodations are permitted, many special-needs students who could not have been tested without accommodations could be included in the sample. Assuming that these are generally lower-performing students, their inclusion in the sample—even with accommodations—could result in an overall lower average score.

Chapters 1, 2, 3, and 5 of this report are based on the first set of results (i.e., no accommodations offered). This chapter presents an overview of the second set of results—those that include students who were provided with accommodations during the assessment administration. By including these results, the NAEP program begins a phased transition toward a more inclusive reporting sample. Future assessment results will be based solely on student and school samples in which accommodations are permitted.

The two sets of results presented in this chapter were obtained by administering the assessment to a nationally representative sample of students and schools. In one part of the schools sampled, no accommodations were permitted: all students were assessed under the same conditions that were the basis for reporting results from the 1996 NAEP science assessments. In another part of the schools sampled, accommodations were permitted for SD and LEP students who normally receive accommodations in their district or state assessment programs. Most accommodations that schools routinely provide for their own testing programs were permitted. Such permitted accommodations included, but were not limited to the following:

- one-on-one testing,
- bilingual dictionary,
- large print book,
- small-group testing,
- extended time,
- oral reading of directions, and
- use of an aide for transcribing responses.

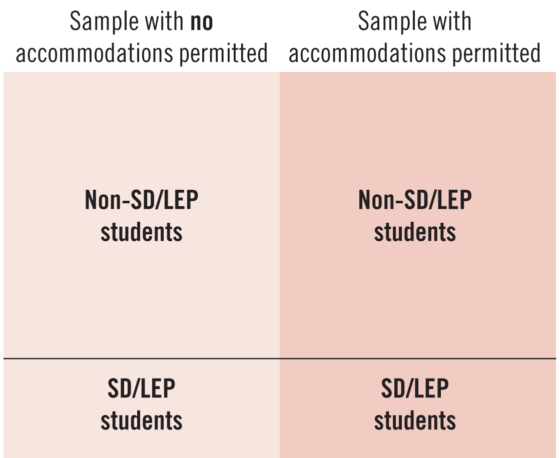
(See appendix A, table A.11, for greater detail on the numbers and percentages of students accommodated by accommodation type in the 1996 and 2000 science assessments.)

Figure 4.1 provides a visual representation of how the two sets of results were based on the two samples in 1996 and 2000. Included in both sets of results (accommodations not permitted and accommodations permitted) are those students from both samples of schools who were not identified as either SD or LEP. In addition, the first set of results (accommodations not permitted) includes SD and LEP students from the sample of schools where accommodations were not permitted (see middle portion of figure 4.1). This is the set of results that allowed for comparisons to 1996 and that are presented in the other chapters of this report.

The second set of results, accommodations permitted (see bottom portion of figure 4.1), includes SD and LEP students from the sample of schools where accommodations were permitted. This is the set

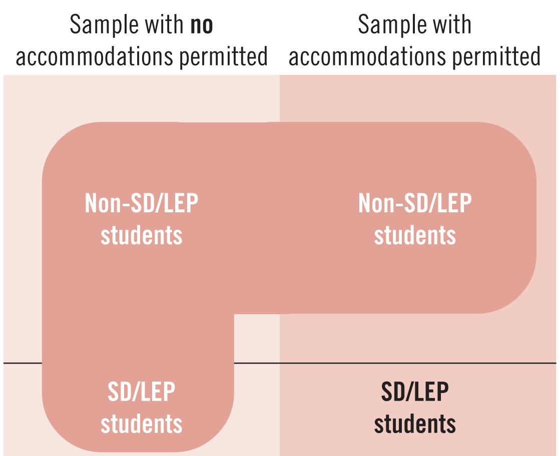
Figure 4.1 Split-Sample Design

The two sets of NAEP results based on a split-sample design



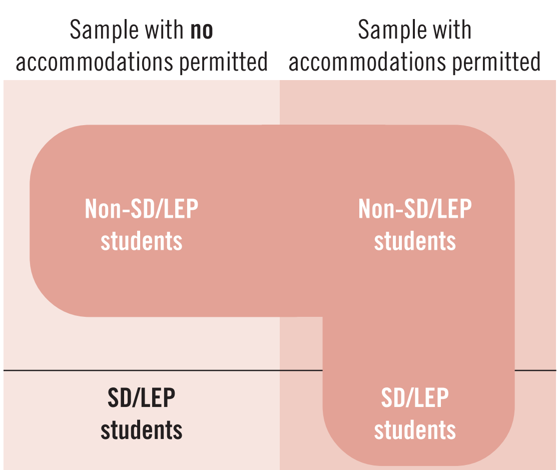
Split-sample design

The national sample was split. In part of the schools, accommodations were not permitted for students with disabilities (SD) and limited English proficient students (LEP). In the other schools, accommodations were permitted for SD and LEP students who routinely received them in their school assessments.



Accommodations-not-permitted results

The accommodations-not-permitted results include the performance of students from both samples who were not classified as SD or LEP and the performance of SD and LEP students from the sample in which no accommodations were permitted.



Accommodations-permitted results

The accommodations-permitted results also include the performance of students from both samples who were not classified as SD or LEP; however, the SD and LEP students whose performance is included in this set of results were from the sample in which accommodations were permitted. Since students who required testing accommodations could be assessed and represented in the overall results, it was anticipated that these results would include more special-needs students and reflect a more inclusive sample.

of results that form the new, more inclusive baseline for future reporting of trend comparisons for the NAEP science assessment.

In the NAEP 2000 national sample where accommodations were not permitted, 14 percent of fourth-graders, 14 percent of eighth-graders, and 9 percent of twelfth-graders, were identified by their schools as having special needs (i.e., either as SD or LEP students). In the other national sample where accommodations were offered, 16 percent of fourth-graders, 13 percent of eighth-graders, and 9 percent of twelfth-graders were identified as having special needs. In the sample where accommodations were not permitted, 48 percent of the special-needs students at fourth and twelfth grade, and 49 percent at eighth grade (between 4 and 7 percent of all students—see appendix A, table A.7) were excluded from NAEP testing by their schools. In the sample where accommodations were offered, 28 percent of the special-needs students at each of the three grade levels were excluded from the assessment (between 2 and 4 percent of the total sample).

The focus of this chapter is a comparison of data from the two sets of results: 1) accommodations not permitted, and 2) accommodations permitted. Because the split-sample design was used in both 1996 and 2000 for the NAEP national science assessment, both sets of results are presented for both years. The split-sample design was first used in the NAEP state science assessment in 2000. Overall results are provided for the nation and for participating states and other jurisdictions. In addition, national results are presented by gender and by race/ethnicity. These results are discussed in terms of statistically significant differences between the two sets of results in each year, changes between assessment years, and differences between subgroups of students within each set of results. Throughout this chapter, the assessment results that include SD and LEP students for whom accommodations were not permitted will be referred to as the "accommodations-not-permitted" results. The set of results that includes SD and LEP students for whom accommodations were permitted will be referred to as the "accommodations-permitted" results.

Results for the Nation

Accommodations Not Permitted and Accommodations Permitted

Table 4.1 displays the average science scale scores for the nation in 1996 and 2000 for two sets of results: 1) accommodations not permitted, and 2) accommodations permitted. At grade 4, the accommodations-permitted average score in 2000 was two points lower than the accommodations-not-permitted average score. The small difference between the two sets of results in 1996 was not statistically significant. At grades 8 and 12 the apparent differences between the two average scores in either 1996 or 2000 were not found to be statistically significant. The decline in the average twelfth-grade score between 1996 and 2000 is evident in both sets of results.

Table 4.1 Comparison of Two Sets of National Scale Score Results

National average science scale scores by type of results, grades 4, 8, and 12: 1996 and 2000

	Accommodations not permitted	Accommodations permitted
Grade 4		
1996	150	149
2000	150	148 †
Grade 8		
1996	150	150
2000	151	151
Grade 12		
1996	150 *	150 *
2000	147	146

* Significantly different from 2000.
† Significantly different from the result where accommodations were not permitted.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

As noted in the introduction to this chapter, NAEP has always sought to include special-needs students proportionate to their representation in the U.S. population. Offering accommodations tends to reduce exclusion rates for special-needs students and therefore allows NAEP to offer a fairer and more accurate picture of the status of American education. Because special-needs students are typically classified as eligible for special educational services after having shown some difficulty in the regular learning environment, the academic achievement of special-needs students might be expected to be lower than that of students without such needs. This only appeared to be the case in the observed difference between the two sets of grade 4 science results in 2000, where the accommodations-permitted results, which included slightly more special-needs students because of the availability of accommodations, were lower than the accommodations-not-permitted results. It is important to examine the percentages of students attaining the NAEP achievement levels, however, to see if there were higher percentages at the lower achievement levels (i.e., below *Basic* and *Basic*), when students were assessed with accommodations.

Table 4.2 shows the percentages of students attaining each of the achievement levels. The percentages are similar across the two sets of 1996 results for grades 8 and 12: apparent differences between the accommodations-not-permitted and the accommodations-permitted results were not found to be significantly different. At grade 4, however, the percentage of students below *Basic* in both years was higher when accommodations were permitted than when they were not.

Table 4.2 Comparison of Two Sets of National Achievement-Level Results

Percentage of students within each science achievement-level range and at or above achievement levels by type of results, grades 4, 8, and 12: 1996 and 2000

	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4						
1996: Accommodations were						
not permitted	33	38	26	3	67	29
permitted	35 †	36 †	25	4	65 †	29
2000: Accommodations were						
not permitted	34	37	26	4	66	29
permitted	36 †	36	25	3	64 †	29
Grade 8						
1996: Accommodations were						
not permitted	39	32 *	26	3	61	29 *
permitted	39	31 *	26	3 *	61	29
2000: Accommodations were						
not permitted	39	29	28	4	61	32
permitted	39	29	27	4	61	32
Grade 12						
1996: Accommodations were						
not permitted	43 *	36	19	3	57 *	21
permitted	43 *	35	19 *	3	57 *	21 *
2000: Accommodations were						
not permitted	47	34	16	2	53	18
permitted	48	34	16	2	52	18

* Significantly different from 2000.
† Significantly different from the result where accommodations were not permitted.
NOTE: Percentages within each science achievement-level range may not add to 100 or to the exact percentages at or above achievement levels due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

National Results by Gender
Accommodations Not Permitted and Accommodations Permitted

The average science scale scores by gender for both sets of results in 1996 and 2000 are provided in table B.67 in appendix B. In 2000, male students at grade 4 had higher science scores when accommodations were not permitted than when accommodations were permitted.

At grades 4 and 8, male students outperformed female students in 2000 regardless of whether or not accommodations were permitted. At grade 12, the apparent difference in scores between male and female students was not statistically significant in either set of results.

There was no variation in the two sets of results with respect to differences in the performance of male and female students between 1996 and 2000. In both sets of results, male students had higher average scores in 2000 than in 1996 at grade 8, and lower average scores in 2000 at grade 12. The performance among female students also remained stable between 1996 and 2000 at all three grades, with no statistically significant differences observed over time in either set of results.

The percentages of male and female students attaining the *Basic, Proficient,* and *Advanced* levels are provided in table B.68 in appendix B. Comparing the two sets of results both in 1996 and 2000, a higher percentage of fourth-grade males were below *Basic* when accommodations were permitted in 2000 than when they were not. No statistically significant differences were found in the percentages of students attaining each of the achievement levels at grades 8 or 12.

National Results by Race/Ethnicity

Accommodations Not Permitted and Accommodations Permitted

NAEP assessments across academic subjects have typically reported large score differences between different racial and ethnic subgroups. If students with disabilities (SD) or limited English proficient (LEP) students are overrepresented in a particular racial or ethnic group, that group's assessment scores may decrease. Table B.69 in appendix B provides the average science scale scores for each of the race/ethnicity categories for the two sets of results in 1996 and in 2000. There were no statistically significant differences observed between the average scores when accommodations were not permitted and when accommodations were permitted for any of the race/ethnicity categories in either 1996 or 2000.

As noted in chapter 3, a pattern of performance differences by race/ethnicity can be seen in the accommodations-not-permitted results in 2000. Similar patterns were observed in the accommodations-permitted results with three exceptions. American Indian eighth-graders scored higher than Hispanic eighth-graders when accommodations were permitted, while the apparent difference was not statistically significant when accommodations were not permitted. Hispanic twelfth-graders scored higher than Black twelfth-graders when accommodations were permitted but not significantly different from each other when accommodations were not permitted. Finally, the difference in average science scores between Asian/Pacific Islander and American Indian twelfth-graders was not significantly different when accommodations were permitted, while Asian/Pacific Islander students outperformed American Indian students when accommodations were not permitted.

At grade 8, American Indian students scored lower in 2000 than in 1996 when accommodations were not permitted, while the apparent decrease was not statistically significant when accommodations were permitted.

The percentages of students in each race/ethnicity category who attained the *Basic, Proficient,* and *Advanced* levels are provided in table B.70 in appendix B. No statistically significant differences were found between the accommodations-not-permitted results and the accommodations-permitted results for the percentages of students attaining any of the achievement levels at any of the grade levels in 1996 and 2000.

State Results

Accommodations Not Permitted and Accommodations Permitted

While the split-sample design was used for both the 1996 and 2000 national assessments, it was used for the first time in the state assessment of science in 2000. The two sets of average scale scores for the jurisdictions that participated in 2000 are presented in tables 4.3 and 4.4 for grades 4 and 8, respectively. As with the presentation of results for jurisdictions in previous chapters, two types of statistical tests are indicated in these tables—one that involves a multiple-comparison procedure based on all jurisdictions that participated, and one that examines each jurisdiction separately. The following discussion of differences between the accommodations-not-permitted results and the accommodations-permitted results is based solely on the multiple-comparison procedure.

None of the apparent differences between the accommodations-not-permitted results and the accommodations-permitted results for either grade 4 or grade 8 were found to be statistically significant.

Figures 4.3 and 4.4 show comparisons of scale scores across states when accommodations were permitted for fourth- and eighth-grade students, respectively. Six states were included among the highest-performing jurisdictions at grade 4: Iowa, Maine, Massachusetts, Montana, North Dakota and Vermont. These states were also included among the highest-performing jurisdictions when accommodations were not permitted. At grade 8, a cluster of high-performing jurisdictions when accommodations were permitted included Department of Defense Dependents Schools (Overseas), Idaho, Maine, Massachusetts, Michigan, Minnesota, Nebraska, North Dakota, Ohio, and Vermont. This cluster of 10 states was outperformed only by Montana. Most of these states were also among the higher-performing jurisdictions when accommodations were not permitted. Michigan had lower average scores than Massachusetts, Vermont, and North Dakota, and scores in Nebraska were lower than in Vermont and North Dakota when accommodations were not permitted. A listing of these jurisdictions by type of results is presented in figure 4.2.

Figure 4.2 Highest Performing Jurisdictions by Type of Results

States with highest average science scale scores that did not differ from each other by type of results for grades 4 and 8: 2000

Grade 4		Grade 8	
Accommodations not permitted	**Accommodations permitted**	**Accommodations not permitted**	**Accommodations permitted**
Iowa	Iowa	Idaho	Idaho
Maine	Maine	Maine	Maine
Massachusetts	Massachusetts	Massachusetts	Massachusetts
Montana	Montana	Minnesota	Michigan
North Dakota	North Dakota	*Montana	Minnesota
Vermont	Vermont	North Dakota	* Montana
		Ohio	Nebraska
		Vermont	North Dakota
		DDESS	Ohio
		DoDDS	Vermont
			DoDDS

* Average science scores in Montana were higher than the other states listed for grade 8.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 4.3 Comparison of Two Sets of State Scale Score Results, Grade 4

State average science scale scores by type of results for grade 4 public schools: 2000

	Accommodations not permitted	Accommodations permitted
Nation	148	147
Alabama	143	143
Arizona	141	140
Arkansas	144	145
California †	131	129
Connecticut	156	156
Georgia	143	142
Hawaii	136	136
Idaho †	153	152
Illinois †	151	150
Indiana †	155	154
Iowa †	160	159
Kentucky	152	152
Louisiana	139	139
Maine †	161	161
Maryland	146	145
Massachusetts	162	161
Michigan †	154	152
Minnesota †	157	157
Mississippi	133	133
Missouri	156	157
Montana †	160	160
Nebraska	150	150
Nevada	142	142
New Mexico	138	140
New York †	149	148
North Carolina	148	147
North Dakota	160	160
Ohio †	154	155
Oklahoma	152	151
Oregon †	150	148
Rhode Island	148	148
South Carolina	141	140
Tennessee	147	145
Texas	147	145
Utah	155	154
Vermont †	159	160
Virginia	156	155
West Virginia	150	149
Wyoming	158	156
Other Jurisdictions		
American Samoa	51	54
DDESS	157	157
DoDDS	156	155
Guam	110	114
Virgin Islands	116	116

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 4.4 Comparison of Two Sets of State Scale Score Results, Grade 8

State average science scale scores by type of results for grade 8 public schools: 2000

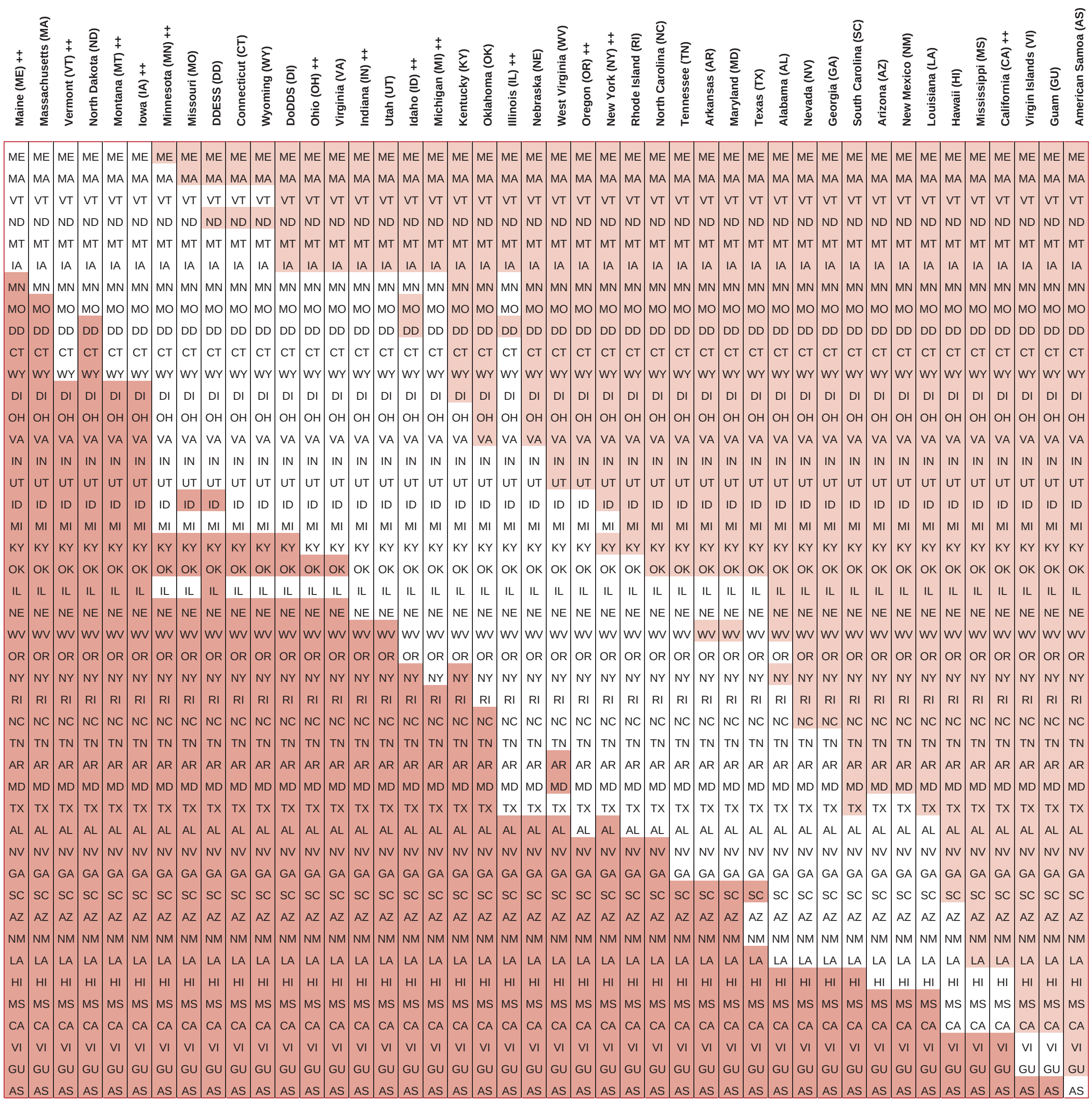
	Accommodations not permitted	Accommodations permitted
Nation	149	149
Alabama	141	143
Arizona †	146	145
Arkansas	143	142
California †	132	129
Connecticut	154	153
Georgia	144	142
Hawaii	132	130
Idaho †	159	158
Illinois †	150	148
Indiana †	156	154
Kentucky	152	150
Louisiana	136	134
Maine †	160	158
Maryland	149	146
Massachusetts	161	158
Michigan †	156	155
Minnesota †	160	159
Mississippi	134	134
Missouri	156	154
Montana †	165	164
Nebraska	157	158
Nevada	143	141
New Mexico	140	139
New York †	149	145
North Carolina	147	145
North Dakota	161	159
Ohio	161	159
Oklahoma	149	149
Oregon †	154	154
Rhode Island	150	148
South Carolina	142	140
Tennessee	146	145
Texas	144	143
Utah	155	154
Vermont †	161	159
Virginia	152	151
West Virginia	150	146 *
Wyoming	158	156
Other Jurisdictions		
American Samoa	72	74
DDESS	159	155
DoDDS	159	159
Guam	114	114

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
* Significantly different from the result where accommodations were not permitted when examining only one jurisdiction.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Figure 4.3 Cross-State Scale Score Comparisons for Accommodations-Permitted Results, Grade 4

Comparisons of average science scale scores for grade 4 public schools: 2000 sample where accommodations were permitted

Instructions: Read down the column directly under a jurisdiction name listed in the heading at the top of the figure. Match the shading intensity surrounding a jurisdiction's abbreviation to the key below to determine whether the average science scale score of this jurisdiction is higher than, the same as, or lower than the jurisdiction in the column heading. For example, in the column under Indiana, Indiana's score was lower than Maine, Massachusetts, Vermont, North Dakota, Montana, and Iowa, about the same as all the states from Minnesota through Nebraska, and higher than the remaining states down the column.



Jurisdiction has statistically significantly higher average scale score than the jurisdiction listed at the top of the figure.

No statistically significant difference detected from the jurisdiction listed at the top of the figure.

Jurisdiction has statistically significantly lower average scale score than the jurisdiction listed at the top of the figure.

The between jurisdiction comparisons take into account sampling and measurement error and that each jurisdiction is being compared with every other jurisdiction. Significance is determined by an application of a multiple comparison procedure (see appendix A).

++Indicates that the jurisdiction did not satisfy one or more of the guidelines for school participation rates (see appendix A).

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).

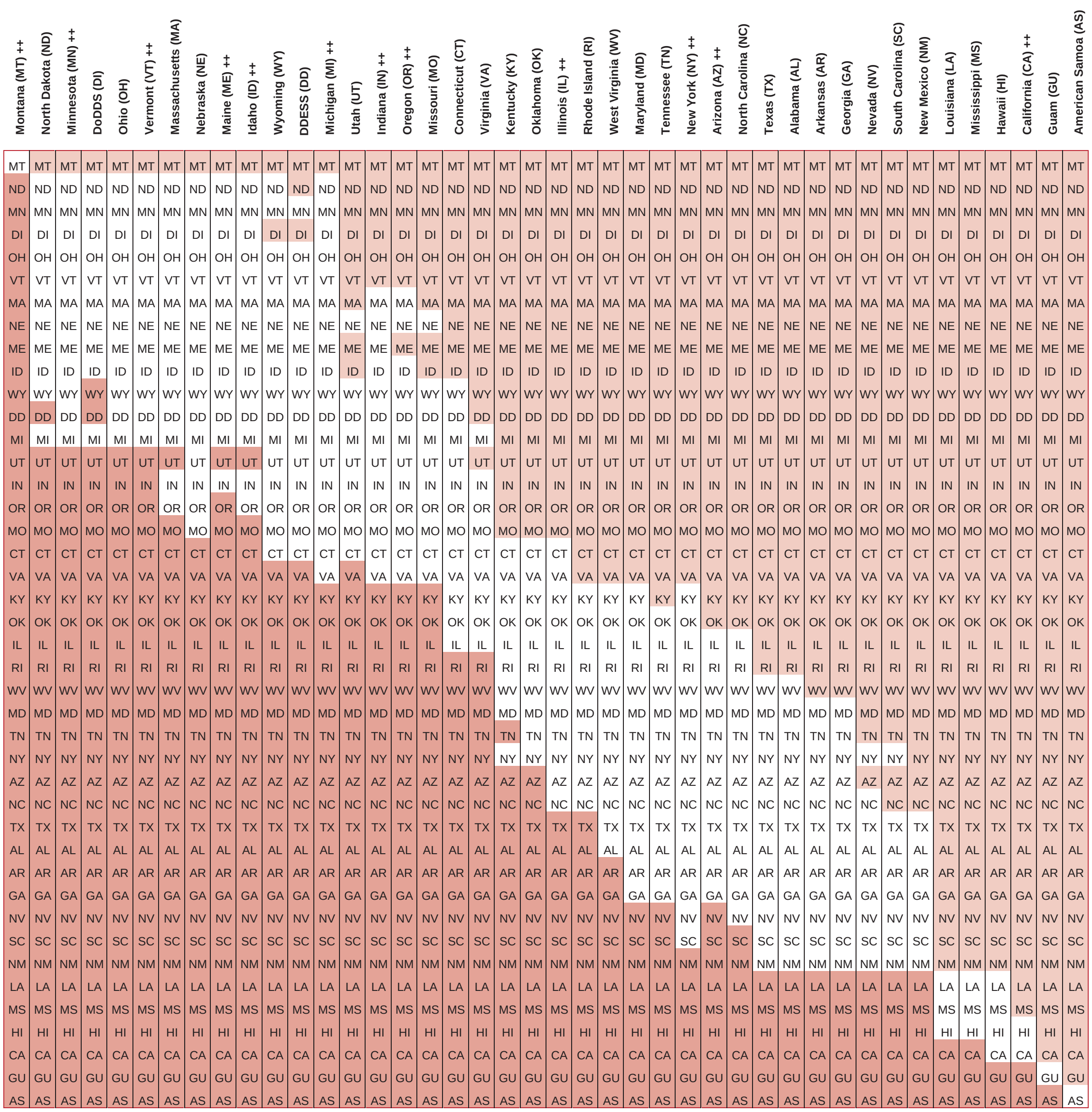
NOTE: Differences between states and jurisdictions may be partially explained by other factors not included in this figure.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Figure 4.4 Cross-State Scale Score Comparisons for Accommodations-Permitted Results, Grade 8

Comparisons of average science scale scores for grade 8 public schools: 2000 sample where accommodations were permitted

Instructions: Read down the column directly under a jurisdiction name listed in the heading at the top of the figure. Match the shading intensity surrounding a jurisdiction's abbreviation to the key below to determine whether the average science scale score of this jurisdiction is higher than, the same as, or lower than the jurisdiction in the column heading. For example, in the column under Ohio, Ohio's score was lower than Montana, about the same as all the states from North Dakota through Michigan, and higher than the remaining states down the column.



Jurisdiction has statistically significantly higher average scale score than the jurisdiction listed at the top of the figure.

No statistically significant difference detected from the jurisdiction listed at the top of the figure.

Jurisdiction has statistically significantly lower average scale score than the jurisdiction listed at the top of the figure.

The between jurisdiction comparisons take into account sampling and measurement error and that each jurisdiction is being compared with every other jurisdiction. Significance is determined by an application of a multiple comparison procedure (see appendix A).

++Indicates that the jurisdiction did not satisfy one or more of the guidelines for school participation rates (see appendix A).

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).

NOTE: Differences between states and jurisdictions may be partially explained by other factors not included in this figure.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Tables 4.5 and 4.6 show the percentages of students in each jurisdiction who were at or above the *Proficient* level when accommodations were not permitted and when accommodations were permitted. Again, no statistically significant differences were observed between the two sets of results at both grades 4 and 8.

Figures 4.5 and 4.6 indicate whether differences in the percentages of students at or above *Proficient* between pairs of participating jurisdictions were statistically significant when accommodations were permitted. At grade 4, the cluster of four states with the highest percentage at or above the *Proficient* level included Maine, Massachusetts, Montana, and Vermont. The same four states were also included among the jurisdictions clustered at the top when accommodations were not permitted (see chapter 2). At grade 8, Massachusetts, Minnesota, Montana, North Dakota, Ohio, and Vermont, had the highest percentages of students at or above *Proficient* when accommodations were permitted. Only four of these six states were among those with the highest percentage at or above the *Proficient* level (Massachusetts, Minnesota, Montana, and Ohio), in the accommodations-not-permitted results for grade 8.

Table 4.5 Comparisons of Two Sets of State *Proficient* Level Results, Grade 4

Percentage of students at or above the *Proficient* level in science by state and type of results for grade 4 public schools: 2000

	Accommodations not permitted	Accommodations permitted
Nation	28	27
Alabama	22	22
Arizona	22	22
Arkansas	24	23
California †	14	13
Connecticut	35	35
Georgia	23	23
Hawaii	16	16
Idaho †	30	29
Illinois †	31	31
Indiana †	32	32
Iowa †	37	36
Kentucky	29	28
Louisiana	19	18
Maine †	38	37
Maryland	26	24
Massachusetts	43	42
Michigan †	33	32
Minnesota †	35	34
Mississippi	14	13
Missouri	35	34
Montana †	37	36
Nebraska	26	26
Nevada	19	19
New Mexico	18	17
New York †	26	24
North Carolina	24	23
North Dakota	38	36
Ohio †	31	31
Oklahoma	26	26
Oregon †	28	27
Rhode Island	27	25
South Carolina	21	20
Tennessee	26	24
Texas	24	23
Utah	32	31
Vermont †	39	38
Virginia	33	32
West Virginia	25	24
Wyoming	33	31
Other Jurisdictions		
American Samoa	▲	▲
DDESS	29	30
DoDDS	30	30
Guam	4	4
Virgin Islands	4	4

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: National results are based on the national sample, not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 4.6 Comparisons of Two Sets of State *Proficient* Level Results, Grade 8

Percentage of students at or above the *Proficient* level in science by state and type of results for grade 8 public schools: 2000

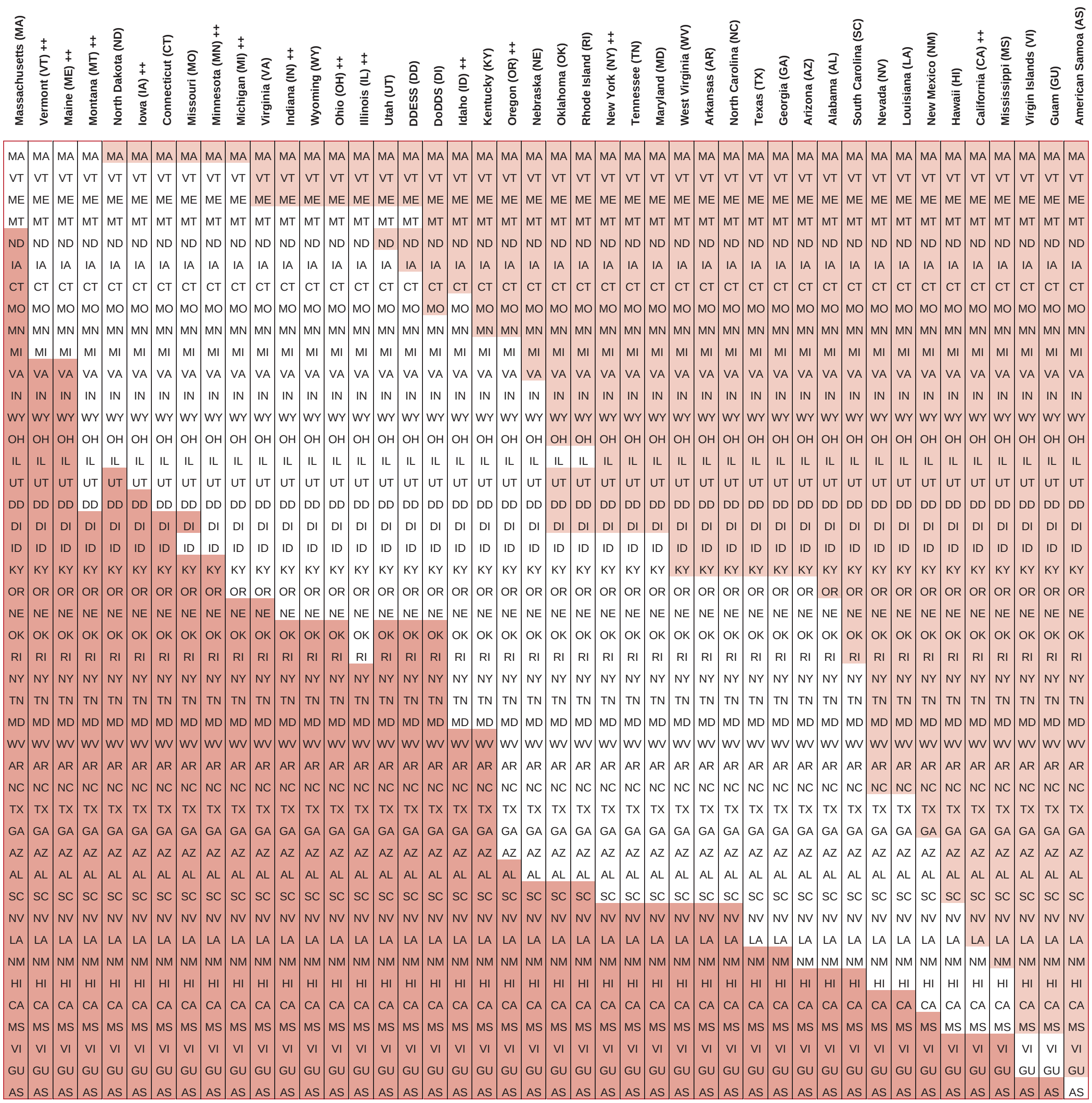
	Accommodations not permitted	Accommodations permitted
Nation	30	30
Alabama	22	23
Arizona †	24	23
Arkansas	23	22
California †	15	14
Connecticut	35	35
Georgia	23	23
Hawaii	15	14
Idaho †	38	37
Illinois †	30	29
Indiana †	35	33
Kentucky	29	28
Louisiana	18	18
Maine †	37	35
Maryland	28	27
Massachusetts	42	39
Michigan †	37	35
Minnesota †	42	41
Mississippi	15	15
Missouri	36	33
Montana †	46	44
Nebraska	36	38
Nevada	23	22
New Mexico	20	20
New York †	30	28
North Carolina	27	25
North Dakota	40	38
Ohio	41	39
Oklahoma	26	25
Oregon †	33	34
Rhode Island	29	27
South Carolina	20	20
Tennessee	25	24
Texas	23	23
Utah	34	34
Vermont †	40	39
Virginia	31	29
West Virginia	26	24
Wyoming	36	34
Other Jurisdictions		
American Samoa	2	2
DDESS	35	33
DoDDS	37	38
Guam	6	6

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: National results are based on the national sample, not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Figure 4.5 Cross-State *Proficient* Level Comparisons for Accommodations-Permitted Results, Grade 4

Comparisons of percentage of students at or above *Proficient* in science for grade 4 public schools: 2000 sample where accommodations were permitted

Instructions: Read down the column directly under a jurisdiction name listed in the heading at the top of the figure. Match the shading intensity surrounding a jurisdiction's abbreviation to the key below to determine whether the percentage of students at or above *Proficient* in this jurisdiction is higher than, the same as, or lower than the jurisdiction in the column heading. For example, in the column under Virginia, the percentage of students at or above *Proficient* in Virginia was lower than Massachusetts, Vermont, and Maine, about the same as all the states from Montana through Oregon, and higher than the remaining states down the column.



Jurisdiction has statistically significantly higher percentage than the jurisdiction listed at the top of the figure.

No statistically significant difference detected from the jurisdiction listed at the top of the figure.

Jurisdiction has statistically significantly lower percentage than the jurisdiction listed at the top of the figure.

The between jurisdiction comparisons take into account sampling and measurement error and that each jurisdiction is being compared with every other jurisdiction. Significance is determined by an application of a multiple comparison procedure (see appendix A).

++Indicates that the jurisdiction did not satisfy one or more of the guidelines for school participation rates (see appendix A).

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).

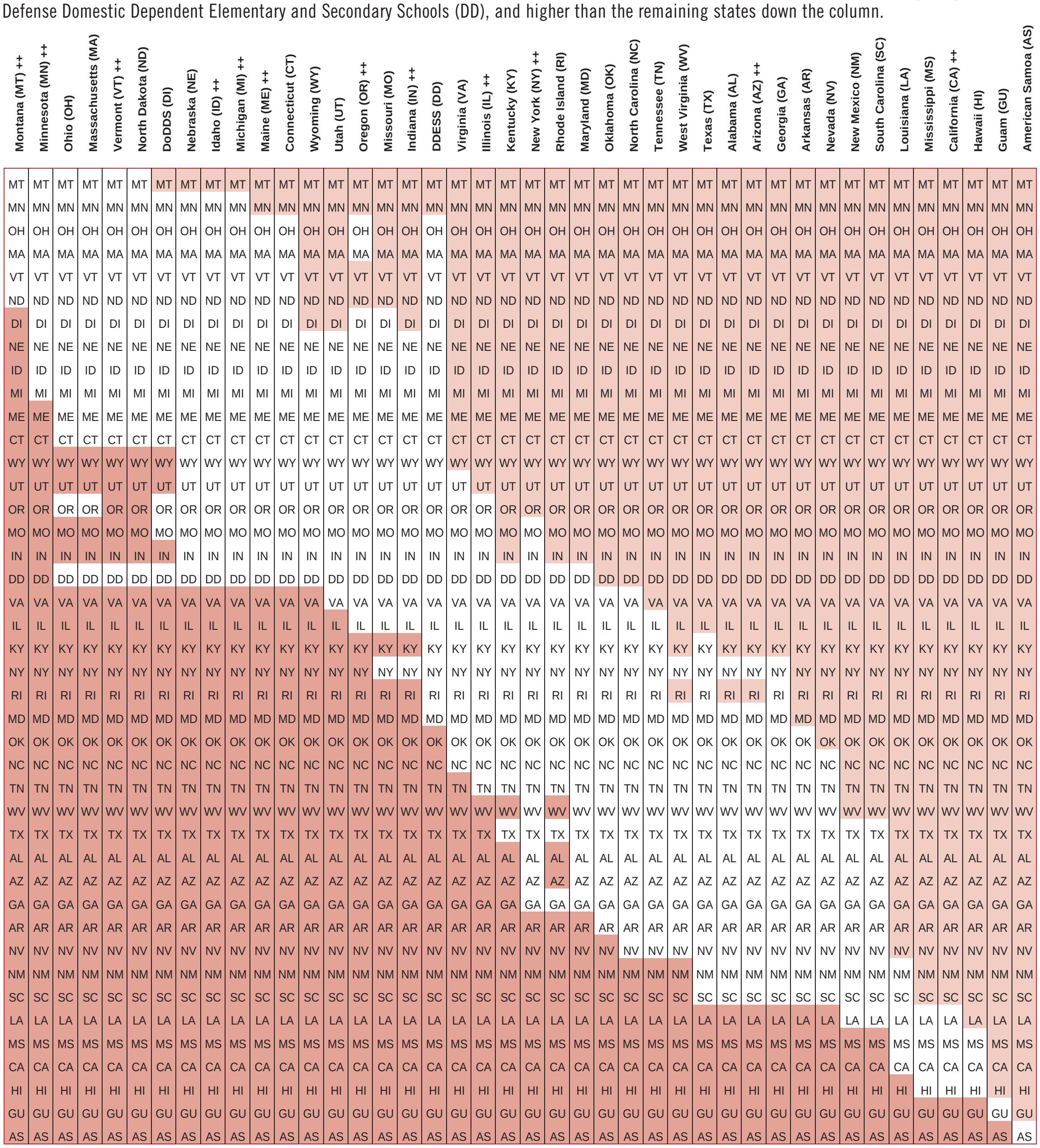
NOTE: Differences between states and jurisdictions may be partially explained by other factors not included in this figure.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Figure 4.6 Cross-State *Proficient* Level Comparisons for Accommodations-Permitted Results, Grade 8

Comparisons of percentage of students at or above *Proficient* in science for grade 8 public schools: 2000 sample where accommodations were permitted

Instructions: Read down the column directly under a jurisdiction name listed in the heading at the top of the figure. Match the shading intensity surrounding a jurisdiction's abbreviation to the key below to determine whether the percentage of students at or above *Proficient* in this jurisdiction is higher than, the same as, or lower than the jurisdiction in the column heading. For example, in the column under Maine, the percentage of students at or above *Proficient* in Maine was lower than Montana and Minnesota, about the same as all the states from Ohio through Department of Defense Domestic Dependent Elementary and Secondary Schools (DD), and higher than the remaining states down the column.



Jurisdiction has statistically significantly higher percentage than the jurisdiction listed at the top of the figure.

No statistically significant difference detected from the jurisdiction listed at the top of the figure.

Jurisdiction has statistically significantly lower percentage than the jurisdiction listed at the top of the figure.

The between jurisdiction comparisons take into account sampling and measurement error and that each jurisdiction is being compared with every other jurisdiction. Significance is determined by an application of a multiple comparison procedure (see appendix A).

++Indicates that the jurisdiction did not satisfy one or more of the guidelines for school participation rates (see appendix A).

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

NOTE: Differences between states and jurisdictions may be partially explained by other factors not included in this figure.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

5

Teaching and Learning Science

During the past 15 to 20 years science education has undergone a number of reforms that were spurred on initially by the 1983 report entitled *A Nation at Risk*. This report raised the concern that national student achievement across core subjects was eroding.[1] Publications by organizations such as the American Association for the Advancement of Science (AAAS), the National Research Council of the Academy of Sciences (NRC), and the National Science Teachers Association helped focus attention on a number of critical issues in science education that ranged from what science content to teach to how learning should be assessed.[2] These publications, especially *Benchmarks for Science Literacy* and *The National Science Education Standards*, have been extensively used by some states as they have revised or created new science standards.[3] Some recent publications written by the AAAS and NRC build on the information contained in *Benchmarks* and the *National Standards*, addressing in more detail such topics as curriculum design, how learning should be assessed, and how inquiry-based learning

Chapter Contents

Chapter Focus

What teacher factors are related to science achievement?

How does technology use and student course work relate to achievement?

[1] National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform*. Washington DC: Author.

[2] American Association for the Advancement of Science. (1993). *Benchmarks for science literacy*. Washington, DC: Author.

National Research Council of the Academy of Sciences. (1995). *National science education standards*. Washington, DC: Author.

National Science Teachers Association. (1992). *The content core: Scope, sequence, and coordination guide*. Washington, DC: Author

[3] For examples
http://www.dpi.state.wi.us/standards
http://www.isbe.state.il.us/ils/science
http://www.state.nj.us/njded/cccs

helps students learn science content.[4] However, the fact that a wealth of information on science teaching and learning is available to teachers does not necessarily mean that teachers incorporate such information into their daily classroom activities. Furthermore, there is a lack of information concerning the efficacy of certain teaching and learning strategies as they relate to what students know and can do in science. Thus, the results of the NAEP science assessment are very important since they give valuable information about teacher practices in the classroom, and may help to elucidate the relationship between those practices and student achievement.

This chapter considers school factors related to teaching and learning, as reported by teachers and students and examines their relationship to students' average scale scores on the NAEP 2000 science assessment. The information is based on responses to questionnaires answered both by teachers of students who participated in the assessment and by the students who took the assessment. Data based on teachers' responses are presented for grades 4 and 8 only. Grade 12 teachers were not administered a questionnaire because it is difficult to link students to teachers across the many different science courses taught at this grade level.

The information presented in this chapter may help readers interpret some of the findings found in earlier chapters of this report. The contexts for teaching and learning explore two areas: computer availability and use, and students' course-taking practices. As with all NAEP data, the unit of analysis in this chapter is the student. Although some of the data reported here are based on teachers' responses to the questionnaires, the results are reported in terms of percentages of students whose teachers responded to each question in a particular manner. The results for each of the factors described in this chapter include the percentages of students and their corresponding average scale scores. Results from the 2000 assessment are compared to 1996 for those questions that were asked of students or teachers in both assessment years. In some cases, data are available only from the 2000 assessment.

Readers of this report are reminded that the relationship between a contextual variable and science performance is not necessarily causal, and that different interpretations may apply to a given finding of association between a variable and average science scores. For example, one finding reported in this chapter is that twelfth-graders who used computers to collect data at least once a month outperformed their peers who did so less frequently. One possible interpretation of this finding is that the experience of using a computer in this manner for science learning may help students achieve in science. Conversely, it may also be possible that teachers of students who are already high achievers

[4] National Research Council of the Academy of Sciences. (2001). *Classroom assessment and the national science education standards*. Washington, DC: Author.

National Research Council of the Academy of Sciences. (2000). *Inquiry and the national science education standards: A guide to teaching and learning*. Washington, DC: Author.

American Association for the Advancement of Science. (2001). *Designs for science literacy*. Washington, DC: Author.

American Association for the Advancement of Science. (2001). *Atlas of science literacy*. Washington, DC: Author.

may be more likely to allow their students to spend time collecting data with computers than are teachers of lower-achieving students. Without further study, the exact cause for the relationship between this instructional practice and students' average science scores cannot be determined.

Technology Use: Availability of Computers for Science Classes

How to best use computers for teaching and learning is an ongoing discussion among educators. There are many issues associated with effective use of technology in the classroom that range from computer access to teachers' expertise in building the tools computers offer into their teaching and learning plans.[5] This multitude of factors makes it difficult to assess the effectiveness of computers vis-à-vis student learning. While the data on computers that were collected as part of the NAEP 2000 science assessment do not pretend to answer the questions these issues raise, the data do give an indication of how teachers are using computers. The following section reports some of these findings. Other data about computer availability and use can be found on the NAEP web site at http://nces.ed.gov/nationsreportcard.

Teachers of students in grades 4 and 8 were asked which best described the availability of computers for use by their science students. The response options are shown in table 5.1, together with the percentage of students whose teachers chose each response option and students' average science scores. In 2000, only 11 percent of fourth-graders and 10 percent of eighth-graders were taught by teachers who reported that no computers were available for use by the science students. Approximately 24 percent of fourth-graders and 41 percent of eighth-graders were taught by teachers who indicated that, although computers were available in a laboratory, they may not have had computers in their classrooms. Between 1996 and 2000, none of the apparent changes in the availability of computers at grades 4 and 8 were found to be statistically significant.

At both grades 4 and 8 in 2000, students who could access computers in laboratories scored higher, on average, than their peers who had no access at all to computers. Regardless of the number of computers teachers reported having in their classrooms, there was no statistically significant difference detected in the average scores of students who had no access to computers and those who had one or more computers available in their classrooms.

[5] National Science Teachers Association. (1992). *NSTA position statement: The use of computers in science education* [Online]. Available: http://www.nsta.org/159&id=4

Mayer, D.P., Mullens, J.E., Moore, M.T., & Mathematics Policy Research, Inc. (2000). *Monitoring school quality: An indicators report*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Table 5.1

Percentage of fourth- and eighth-graders and average scale score by teachers' reports on availability of computers for use by their science students:1996 and 2000

Grades 4&8

Availability of Computers

	1996	2000
Grade 4		
None available	15 143	11 143
One within the classroom	26 149	27 147
Two to three within the classroom	17 150	23 148
Four or more within the classroom	10 155	15 151
Available in computer laboratory but difficult to access or schedule	15 161	8 158
Available in a computer laboratory and easy to access or schedule	17 148	16 156
Grade 8		
None available	16 149	10 142
One within the classroom	22 151	29 149
Two to three within the classroom	9 157	11 150
Four or more within the classroom	7 159	9 146
Available in computer laboratory but difficult to access or schedule	32 150	23 155
Available in a computer laboratory and easy to access or schedule	14 151	18 159

At both grades 4 and 8, students whose teachers said that computers were available in a laboratory had higher average scores than students whose teachers said that no computers were available for science instruction.

The percentage of students is listed first with the corresponding average scale score presented below.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Technology Use: Computers for Instruction in Science, Grades 4 and 8

Teachers whose students participated in the science assessment were asked how they used the computer for instruction in science. Since they could identify more than one type of computer use, the results are reported in terms of a "yes" or "no response" for each type of computer use. Table 5.2 shows the percentages and average scores of students whose teachers reported using the computer for drill and practice, playing science/learning games, simulations and modeling, data analysis and other applications, and word processing. It also provides the data for students whose teachers stated that they did not use computers for science instruction. It is important to note that any apparent relationship between computer use and student performance may reflect the influence of factors other than the type of computer use in and of itself.

In 2000, 43 percent of fourth-graders and 26 percent of eighth-graders had teachers who did not use computers for science instruction. At grade 4, students whose teachers indicated that they did not use computers for science instruction scored lower, on average, than did students whose teachers did use computers. (Note that a "no response" to this option in the table indicates that computers were used by teachers for science instruction.)

In 2000, fourth-graders whose teachers indicated that they used computers for playing science/learning games scored higher, on average, than fourth-graders whose teachers indicated that they did not use computers in this manner during science instruction. Eighth-graders whose teachers indicated using computers for simulations and modeling, and data analysis and other applications scored higher, on average, than eighth-graders whose teachers did not indicate doing so.

The results presented in table 5.2 also indicate an overall increase between 1996 and 2000 in the percentage of both fourth- and eighth-graders whose teachers reported using computers for science instruction. The percentage of students whose teachers indicated using computers increased from 47 to 57 percent at grade 4, and from 54 to 74 percent at grade 8. Also at grade 8, there was an increase in the percentage of students whose teachers said they used computers for data analysis and other applications, and for word processing, as a part of science instruction.

Table 5.2

Percentage of fourth- and eighth-graders and average scale score by teachers' reports on how they use computers for science instruction: 1996 and 2000

Grades 4&8

Computer Use

	1996 Yes	1996 No Response	2000 Yes	2000 No Response
Grade 4				
Drill and practice	5 149	95 151	3 149	97 150
Playing science/learning games	30 154	70 149	28 153	72 149
Simulations and modeling	18 * 155	82 150	11 152	89 150
Data analysis and other applications	6 149	94 151	9 153	91 150
Word processing	10 159	90 150	13 153	87 150
Do not use computers for science instruction	53 * 148	47 154	43 148	57 153
Grade 8				
Drill and practice	8 156	92 151	8 147	92 152
Playing science/learning games	21 152	79 152	15 151	85 152
Simulations and modeling	25 155	75 151	23 155	77 151
Data analysis and other applications	19 * 152	81 152	33 156	67 150
Word processing	22 * 154	78 151	35 154	65 151
Do not use computers for science instruction	46 * 150	54 153	26 150	74 152

Fourth-graders whose teachers used computers for playing science/learning games had higher average scores than fourth-graders whose teachers did not use computers in this manner.

Eighth-graders whose teachers used computers for simulations and modeling, and for data analysis and other applications, as a part of science instruction had higher average scores than eighth-graders whose teachers did not use computers in this manner.

The percentage of students is listed first with the corresponding average scale score presented below.
* Significantly different from 2000. Although not marked in the table, the difference in the percentage of students not responding in 1996 is significantly different from 2000 in all instances where the corresponding percentage of students responding yes is significantly different.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Technology Use: Computers for Instruction in Science, Grade 12

In 2000, twelfth-grade students were asked how frequently they used computers in their science classes for collecting data using lab equipment that interfaces with computers; downloading data and related information from the Internet; analyzing data using the computer; and using the Internet to exchange information with other students or scientists about science experiments or investigations. The results are shown in table 5.3.

Thirty-four percent of twelfth-graders reported that they were not taking a science course, and between 42 and 54 percent of students stated that they never used computers to do the listed activities. The remaining percentage of students were fairly evenly split between those who indicated that they used the computer for each of the listed activities at least once a month and those who did so less than once a month.

With one exception, students who reported that they were not taking a science course were outperformed by their peers who were, even when their peers were not using computers for the listed activities. Average scores for students who reported using the Internet to exchange information with other students once a month or more were not found to be significantly different from those of students who were not taking science. Twelfth-graders who reported collecting data and who reported analyzing data with computers at least once a month outperformed their peers who reported doing so less frequently. Students who said they never downloaded data and related information from the Internet scored lower, on average, than their peers who indicated doing so at least sometimes.

Table 5.3

Percentage of twelfth-graders and average scale score by students reports on how they use computers in science classes: 2000

Grade 12

Computer Use

	2000
Collect data using lab equipment that interfaces with computers	
I am not taking science	34 141
Once a month or more	13 158
Sometimes but less than once a month	11 154
Never	42 148
Download data and related information from the Internet	
I am not taking science	34 142
Once a month or more	9 155
Sometimes but less than once a month	13 158
Never	45 148
Analyze data using the computer	
I am not taking science	34 142
Once a month or more	11 163
Sometimes but less than once a month	11 157
Never	44 147
Use the Internet to exchange information with other students or scientists about science experiments or investigations	
I am not taking science	34 142
Once a month or more	4 146
Sometimes but less than once a month	7 151
Never	54 151

Twelfth-graders who said they used computers to collect data or to analyze data at least once a month had higher average scores than twelfth-graders who did so less frequently.

The percentage of students is listed first with the corresponding average scale score presented below.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Student Coursework: Grade 4 Science Courses

Students in grade 4 tend to take a science course that incorporates a mixture of topics in science. While increasing emphasis on state standards and state assessments may have led to the topics covered in the early grades becoming more formalized, the topics taught in fourth-grade science classes are not necessarily unified across the nation.[6] Since the instructional information that can be collected from teachers on a questionnaire is somewhat limited, information collected by NAEP on science course work for fourth-graders was confined to asking teachers how much time was spent on the broad domains of life science, Earth science, and physical science. Teachers responding to this question could choose from the options "a lot," "some," "little," and "none." It is important to note that the responses did not refer to minutes or hours spent on the domain, but rather to time spent in relation to the other areas. Thus, teachers may have spent only 10 minutes a week on life science and still have indicated that they devoted "a lot" of time to this domain. The results for this question are presented in table 5.4.

In 2000, teachers of 31 percent of fourth-graders reported spending a lot of time on life science and Earth science, and teachers of 22 percent of fourth-graders reported spending a lot of time on physical science. A very small percentage of fourth-graders were taught by teachers who said they actually devoted no time to any of these three science domains—only 1 to 2 percent. The amount of time teachers devoted to life science and to Earth science displayed a fairly positive relationship with average NAEP science scores. In both cases, students whose teachers indicated that they devoted a lot or some time on these science domains outperformed their peers whose teachers indicated spending little time.

The percentage of students whose teachers reported spending a lot of time on Earth science increased from 19 percent in 1996 to 31 percent in 2000. At the same time, the percentage of students whose teachers reported spending only some time on the Earth science domain decreased from 76 to 62 percent.

[6] Council of Chief State School Officers, Wisconsin Center for Education Research, Eleven State Collaborative. (2000). *Using data on enacted curriculum in mathematics & science: Sample results from a study of classroom practices and subject content*. *Summary report from Survey of Enacted Curriculum Project*. Washington, DC: Council of Chief State School Officers.

National Committee on Science Education Standards and Assessment, National Research Council. (1996). *National science education standards.* Washington, DC: National Academy Press.

O'Sullivan, C.Y., Weiss, A.R., Askew, J.M. (1998). *Students learning science.* Washington, DC: U.S. Department of Education. Office of Educational Research and Improvement. National Center for Education Statistics.

Table 5.4

Percentage of fourth-graders and average scale score by teachers' reports on how much time is spent on certain science domains: 1996 and 2000

Grade 4

Time Spent Teaching Certain Science Domains

	1996	2000
Life science		
A lot	28 150	31 151
Some	65 151	60 152
Little	6 150	7 138
None	1 —	2 147
Earth science		
A lot	19 * 151	31 152
Some	76 * 151	62 151
Little	5 151	6 136
None	▲ —	1 143
Physical science		
A lot	16 154	22 151
Some	73 * 151	65 151
Little	9 145	11 145
None	2 137	2 142

Fourth-graders whose teachers spent at least some time on life science and earth science had higher average scores than fourth-graders whose teachers spent only a little time on these science domains.

The percentage of students is listed first with the corresponding average scale score presented below.
* Significantly different from 2000.
— Sample size is insufficient to permit a reliable estimate.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Student Coursework: Grade 8 Science Courses

By the time students reach middle school, science is being taught as a core content area. There is, however, no consensus as to the order in which the key domains should be taught.[7] As part of the NAEP science assessment, eighth-grade teachers were asked the same question that was asked of teachers of fourth-graders, namely to indicate how much time they spent on certain science domains. Readers are reminded that the NAEP assessment surveys the content domains of Earth, physical, and life science; thus, if students are to do well on NAEP, breadth of coverage may be important in middle school.

Table 5.5 presents the percentages of eighth-graders and their average scores by teachers' reports on how much time they spent on various science domains. In 2000, 45 and 47 percent of eighth-graders were taught by teachers who spent a lot of time on Earth science and physical science, respectively. Twenty-one percent of eighth-graders were taught by teachers who indicated spending a lot of time on life science. None of the apparent changes between 1996 and 2000 in eighth-grade teachers' reports of amount of time devoted to any of the science domains were statistically significant.

In 2000, the relationship between teachers' reports on the amount of time devoted to the various science domains and eighth-graders' average science scores was somewhat different than that observed at the fourth grade. For both life science and Earth science, the students whose teachers reported spending no time on these domains outperformed their peers whose teachers reported spending a lot or some time.

[7] Council of Chief State School Officers, Wisconsin Center for Education Research, Eleven State Collaborative. (2000). *Using data on enacted curriculum in mathematics & science: Sample results from a study of classroom practices and subject content. Summary report from Survey of Enacted Curriculum Project.* Washington, DC: Council of Chief State School Officers.

National Committee on Science Education Standards and Assessment, National Research Council. (1996). *National science education standards.* Washington, DC: National Academy Press.

O'Sullivan, C.Y., Weiss, A.R., & Askew, J.M. (1998). *Students learning science.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Table 5.5

Percentage of eighth-graders and average scale score by teachers' reports on how much time is spent on certain science domains: 1996 and 2000

Grade 8

Time Spent Teaching Certain Science Domains

	1996	2000
Life science		
A lot	19 149	21 147
Some	40 150	36 150
Little	23 156	22 153
None	18 157	20 156
Earth science		
A lot	41 151	45 152
Some	39 151	33 148
Little	11 155	13 154
None	9 157	9 161
Physical science		
A lot	49 153	47 153
Some	35 153	36 150
Little	12 154	11 153
None	4 144	6 151

Eighth-graders whose teachers said they spent no time on life science or Earth science had higher average scores than eighth-graders whose teachers spent at least some time on these science domains.

The percentage of students is listed first with the corresponding average scale score presented below.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Student Coursework: Grade 12 Science Courses

Most states have science coursework requirements for graduation; however, in some states the requirements are determined at the local level. In 2000, according to a Council of Chief State School Officers report, 4 states required four credits for graduation, 15 states and the Department of Defense schools required three credits, 21 required two credits, and 2 required only one credit.[8] The number of science credits required in the remaining states were either determined by a local board or were included as part of combined credits in mathematics and science. Some states required that students take specific courses such as life science and physical science, while other states made no such demands. Some states required that students take courses in specific areas such as life science and physical science. However, course requirements in life science and physical science can often be fulfilled without taking a core course in biology, chemistry, or physics. While seven states did require at least one of the core science courses, no state required all three for graduation.[9]

Twelfth-grade students in the NAEP science assessment responded to several questions about their science studies. They were asked whether they were currently taking a science class and then asked to indicate which courses they had taken from the eighth grade to the present. The list of courses included Earth and space science, life science (other than biology), physical science (other than physics and chemistry), general science, integrated science, biology, chemistry, physics, and science and technology. Students were also asked if they were currently enrolled in or had taken Advanced Placement courses in biology, chemistry, and physics. The data collected from these questions are presented on the following pages.

[8] Council of Chief State School Officers. (2000). *Key state education policies on K-12 education: 2000: Time and attendance, graduation, content standards, teacher & school licensure, student assessment.* Washington, DC: Author.

[9] Ibid.

Table 5.6

Percentage of twelfth-graders and average scale score by students' reports on whether or not taking a science course this year: 1996 and 2000

Grade 12

Science Course Taking

	1996	2000
Are you taking a science course this year?		
Yes	54 160	53 157
No	46 140	47 137

Twelfth-graders who were enrolled in a science course had higher average scores than twelfth-graders who were not.

The percentage of students is listed first with the corresponding average scale score presented below.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Current Science Course Enrollment

Table 5.6 shows the percentages of students who were enrolled in a science course in 2000 and in 1996. As can be seen from the data, in 2000, 53 percent of students reported currently taking a science course, whereas 47 percent reported not taking one. This was similar to the results in 1996. Students who reported that they were currently taking a science course in 2000 outperformed their counterparts who reported that they were not taking a science course at the time of the assessment.

Science Courses Taken Since Eighth Grade

Table 5.7 presents the results for a question that asked students in which grade they had taken certain science courses. The grades covered were 8 through 12. Students were also asked to indicate if they had not taken a specific course. The actual list presented to students included more courses than are listed in the table; for example second year biology was included on the list that was presented to students, but is not presented in table 5.7. A complete listing can be found on the NAEP web site.

Table 5.7

Percentage of twelfth-graders and average scale score by students' reports on science courses taken since eighth grade: 2000

Grade 12

Science Course Taken

	Not taken	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
Earth (and space) science	26 148	49 150	19 146	5 135	4 140	3 144
First-year biology	8 126	2 138	31 156	54 149	5 134	1 125
First-year chemistry	30 128	1 128	2 144	21 166	40 155	7 145
First-year physics	64 139	1 128	2 153	2 159	12 167	19 167
Life science (other than biology)	46 151	22 152	18 139	10 131	6 141	5 157
Physical science (other than chemistry and physics)	36 151	12 159	36 147	11 135	6 132	3 141
General science	47 148	37 152	14 145	4 129	2 134	1 144
Integrated science	85 149	5 147	7 149	3 132	1 135	1 142
Science and technology	86 148	4 154	4 154	3 147	4 148	4 149

The percentage of students is listed first with the corresponding average scale score presented below.
NOTE: Row percentages may not add to 100 because some students indicated taking a course in more than one grade.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

The table shows that 26 percent of students reported not taking Earth and space science in grades 8 through 12. This does not mean that they never had a course in earth and space science. They may have taken it in grade 7, or even in grade 6. Almost one-half of the twelfth-grade student population did report taking the course during eighth grade. While almost all students had taken biology at some point since the eighth grade, the most popular grade for taking the course was tenth. Two-thirds of twelfth-graders reported taking chemistry. Forty percent of students took the course in the eleventh grade. Thirty-six percent of twelfth-graders reported taking physics—most typically in the eleventh or twelfth grade.

Enrollment in Advanced Placement Science Courses

Many schools offer higher-level courses that allow students to accumulate college credits. Table 5.8 displays the percentage of students in 2000 who reported that they were currently enrolled in or had taken an Advanced Placement course in the three core sciences—biology, chemistry, and physics. Students' average scores are also presented.

The results show that 10 percent of twelfth-graders had taken or were enrolled in biology, and that 6 and 5 percent had taken or were enrolled in chemistry and physics, respectively. Students who had taken or were enrolled in AP biology, chemistry, or physics scored higher, on average, than those students who said they had not taken and were not enrolled in these courses.

Table 5.8

Percentage of twelfth-graders and average scale score by students' reports on whether they are currently enrolled in or have taken an Advanced Placement course: 2000

Grade 12

Students' Reports on Advanced Placement Courses

	Yes	No response
AP Biology	10 166	90 145
AP Chemistry	6 169	94 145
AP Physics	5 173	95 145

Twelfth-graders who had taken an AP course in biology, chemistry, or physics had higher average scores than twelfth-graders who had not taken one of these courses.

The percentage of students is listed first with the corresponding average scale score presented below.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Appendix A

The NAEP 2000 Science Assessment

The design of the NAEP 2000 science assessment followed the guidelines provided in the framework developed for the 1996 assessment. While maintaining some conceptual continuity with the NAEP 1990 science assessment, the 1996 framework took into account the current reforms in science education, as well as documents such as the science framework used for the 1991 International Assessment of Educational Progress. In addition, the Framework Steering Committee recommended that a variety of strategies be used for assessing students' performance. These included:

- performance tasks that allow students to manipulate physical objects and draw scientific understanding from the materials before them;
- constructed-response questions that provide insight into students' levels of understanding and ability to communicate in the sciences as well as their ability to generate, rather than simply recognize, information related to scientific concepts and their interconnections; and
- multiple-choice questions that probe students' conceptual understanding and ability to connect ideas in a scientifically sound way.

Samples of each type of task and question are available in the "NAEP Questions" section of the NAEP web site http://nces.ed.gov/nationsreportcard. The framework for the 1996 and 2000 science assessments is represented as a matrix with two dimensions: 1) fields of science (Earth,

Appendix Focus

Technical aspects of the NAEP 2000 science assessment

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physical, and life) and 2) elements of knowing and doing science (conceptual understanding, scientific investigation, and practical reasoning). The fields-of-science dimension is used to create three subscales at each grade. Subscales are not created based on the elements of knowing and doing science. In addition there are two overarching domains that describe science: 1) nature of science and 2) themes. [These overarching domains provide additional guidance to the development of assessment questions and tasks, ensuring that the assessment also integrates the three fields of science rather than only represents three separate content areas.] Figures A.1a, A.1b, and A.1c describe, respectively, the fields of science, the elements of knowing and doing science, and the overarching domains that guided the development of the 1996 and 2000 science assessments.

Figure A.1a Descriptions of the Three Fields of Science

Earth Science	The content of Earth science falls under the general headings of the solid Earth (lithosphere), water (hydrosphere), air (atmosphere), and the Earth in space. Topics related to the solid Earth include the composition of the earth; forces that alter its surface; the formation, characteristics and uses of rocks; the changes and uses of soil; natural resources used by humankind; and natural forces within the Earth. Topics related to water include the water cycle; the nature of oceans and their effects on water and climate; and the location of water, its distribution, characteristics, and effect of and influence on human activity. Topics related to air include the composition and structure of the atmosphere (including energy transfer); the nature of weather; common weather hazards; and air quality and climate. Topics related to the Earth in space include the setting of the Earth in the solar system; the setting and evolution of the solar system in the universe; tools and technology that are used to gather information about space; the apparent daily motions of the Sun, the Moon, the planets and the stars; the rotation of the Earth about its axis, and the Earth's revolution around the Sun; and the tilt of the Earth's axis that produces seasonal variations in the climate.
Physical Science	The physical science component covers basic knowledge and understanding concerning the structure of the universe as well as the physical principles that operate within it. The major topics are matter and its transformations, energy and its transformations, and the motion of things. Matter and its transformations are described by diversity of materials (classification and types and the particulate nature of matter); temperature and states of matter; properties and uses of material (modifying properties, synthesis of materials with new properties); and resource management. Energy and its transformations includes different forms of energy; energy transformations in living systems, natural physical systems, and artificial systems constructed by humans; and energy sources and use, including distribution, energy conversion, and energy costs and depletion. Motion includes frames of reference; force and changes in position and motion; action and reaction; vibrations and waves as motion; general wave behavior; electromagnetic radiation; and the interactions of electromagnetic radiation with matter.
Life Science	The fundamental goal of life science is to understand and explain the nature and function of living things. The major concepts assessed in life science are change and evolution, cells and their functions (not at grade 4), organisms, and ecology. Change and evolution includes diversity of life on Earth; genetic variation within a species; theories of adaptation and natural selection; and changes in diversity over time. Cells and their functions covers information transfer; energy transfer for the construction of proteins; and communication among cells. Organisms covers reproduction, growth and development; life cycles; and functions and interactions of systems within organisms. Ecology focuses on the interdependence of life—populations, communities, and ecosystems.

SOURCE: National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress.* Washington, DC: Author.

Figure A.1b **Descriptions of Knowing and Doing Science**

Conceptual Understanding	Conceptual understanding includes the body of scientific knowledge that students draw upon when conducting a scientific investigation or engaging in practical reasoning. Essential scientific concepts involve a variety of information including facts and events the student learns from science instruction and experiences with the natural environment and scientific concepts, principles, laws, and theories that scientists use to explain and predict observations of the natural world.
Scientific Investigation	Scientific investigation probes students' abilities to use the tools of science, including both cognitive and laboratory tools. Students should be able to acquire new information, plan appropriate investigations, use a variety of scientific tools, and communicate the results of their investigations.
Practical Reasoning	Practical reasoning assesses students' ability to use and apply science understanding in new, real-world applications.

SOURCE: National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress.* Washington, DC: Author.

Figure A.1c **Description of Overarching Domains**

The Nature of Science	The nature of science incorporates the historical development of science and technology, the habits of mind that characterize these fields, and methods of inquiry and problem-solving. It also encompasses the nature of technology and includes issues of design, application of science to real-world problems, and trade-offs or compromises that need to be made.
Themes	Themes are the "big ideas" of science that transcend the various scientific disciplines and enable students to consider problems with global implications. The NAEP science assessment focuses on three themes: systems, models, and patterns of change. • Systems are complete, predictable cycles, structures, or processes occurring in natural phenomena. Students should understand that a system is an artificial construction created to represent or explain a natural occurrence. Students should be able to identify and define the system boundaries, identify the components and their interrelationships, and note the inputs and outputs to the system. • Models of objects and events in nature are ways to understand complex or abstract phenomena. As such they have limits and involve simplifying assumptions but also possess generalizability and often predictive power. Students need to be able to distinguish the idealized model from the phenomenon itself and to understand the limitations and simplified assumptions that underlie scientific models. • Patterns of change require students to recognize patterns of similarity and differences and to recognize how these patterns change over time. In addition, students should be able to remember common types of patterns and transfer their understanding of a familiar pattern of change to a new and unfamiliar one.

SOURCE: National Assessment Governing Board. (2000). *Science Framework for the 1996 and 2000 National Assessment of Educational Progress.* Washington, DC: Author.

Table A.1a summarizes the distribution of assessment time across the three fields of science—Earth, physical, and life. These fields provide the basis for the content area scales. Care was taken to ensure congruence between the percentages used in the assessment (actual) and those indicated in the assessment specifications (target). The classification of items by field of science was overseen and approved by a committee of expert science educators.

Table A.1a

Distribution of assessment time by field of science: 1996 and 2000

	Earth			Physical			Life		
	Target	Actual 1996	Actual 2000	Target	Actual 1996	Actual 2000	Target	Actual 1996	Actual 2000
Grade 4	33%	33%	33%	33%	34%	33%	33%	33%	33%
Grade 8	30%	30%	31%	30%	30%	34%	40%	40%	35%
Grade 12	33%	33%	33%	33%	33%	31%	33%	34%	37%

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table A.1b shows the distribution of assessment time across the second dimension: knowing and doing science. This dimension includes conceptual understanding, scientific investigation, and practical reasoning. As with the above classification of items, an expert committee of science educators oversaw the categorization of items by this dimension. In both this table and the table above, variation is evident across the two assessment years in percentages of questions within categories. Such variation is the result of releasing several blocks of questions from the 1996 assessment and replacing them with newly developed questions in 2000. In addition, one of the four hands-on blocks administered at each grade in 1996 was released,

Table A.1b

Distribution of assessment time by knowing and doing science: 1996 and 2000

	Conceptual understanding			Scientific investigation			Practical reasoning		
	Target	Actual 1996	Actual 2000	Target	Actual 1996	Actual 2000	Target	Actual 1996	Actual 2000
Grade 4	45%	45%	56%	45%	38%	27%	10%	17%	17%
Grade 8	45%	45%	59%	30%	29%	18%	25%	26%	24%
Grade 12	45%	44%	56%	30%	28%	24%	25%	28%	20%

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

and no replacement block was developed for 2000. This resulted in a smaller proportion of scientific investigation questions at each grade in 2000 than in 1996. The reporting of changes in student performance is not affected by these variations because trend reporting is based upon the underlying scale, which uses the common blocks (i.e., those used in both assessment years), but maintains its stability even if some blocks are dropped or replaced.

The Assessment Design

One-half of the students who participated in the science assessment received a booklet containing six sections; the other half, five sections. All the booklets contained either two or three sections that were blocks of cognitive questions assessing knowledge and skills outlined in the framework. In addition, each booklet contained two sections that were sets of background questions. Each booklet had two cognitive sections containing only paper-and-pencil questions. The booklets with three blocks of cognitive questions also contained a hands-on task with related paper-and-pencil questions. The booklets with two blocks of cognitive questions did not contain a hands-on task. Thus, one-half of the students who participated in the assessment performed a hands-on task.

At each grade level there were 14 different sections or blocks of cognitive questions usually consisting of both multiple-choice and constructed-response questions.[1] Short constructed-response questions required a few words or a sentence or two for an answer (e.g., briefly stating why a potted plant can survive in a sealed container much longer than a mouse), while extended constructed-response questions generally required a paragraph or more (e.g., outlining an experiment to find the density of a metal ring). Some extended constructed-response questions also required diagrams, graphs, or calculations. It was expected that students could adequately answer the short constructed-response questions in about two to three minutes and the extended constructed-response questions in about five minutes.

Other features were built into the blocks of questions. Three of the blocks at each grade level were hands-on tasks where students were given a set of equipment and asked to conduct an investigation and answer questions relating to the investigation. One-half of the students conducted a hands-on task that was always presented as the third cognitive section. A second feature was the inclusion of theme blocks at each grade level—one assessing systems, one assessing models, and one assessing patterns of change. A theme block contains a set of questions that all focus on a particular theme, and requires students to engage more thoroughly in the topics related to that theme. For example, students were asked to make drawings and graphs based on data given about the solar system and then answer a number of questions. Theme blocks were placed randomly in the student booklets, but did not appear in every booklet. No student received more than one theme block.

1 These 14 blocks were distributed across the student booklets in a Balanced Incomplete Block (BIB) design that is described later in this section.

The data in table A.2 display the number of questions by type and by grade level for the 1996 and 2000 assessments. Some of these questions were used at more than one grade level; thus, the sum of the questions that appear at each grade level is greater than the total number of unique questions. The total number of questions at each grade level in 2000 is up from 1996. This increase was possible because more multiple-choice questions that take less time were used in 2000. This increase in multiple-choice questions across the entire assessment was due to the fact that the blocks developed for 2000 to replace those released from the 1996 assessment contained a greater proportion of multiple-choice questions. In addition, as mentioned earlier, one of four hands-on blocks at each grade in 1996 was released and not replaced for 2000. These hands-on blocks contain only constructed-response questions. As a consequence, the total number of constructed-response questions in 2000 was less than that in 1996. It should be noted that these variations across years do not affect the ability of NAEP to report trends in students' performance across years. Trend reporting is based on those blocks that were common across the two years.

The assessment design allowed for maximum coverage of science content at grades 4, 8, and 12, while minimizing the time burden for any one student. This was accomplished through the use of matrix sampling of questions, in which representative samples of students took various portions of the entire pool of assessment questions. Individual students were required to take only a small portion of the assessment, but the aggregate results across the entire assessment allowed for broad reporting of science abilities for the targeted population.

Table A.2

Distribution of questions administered by question type: 1996 and 2000

		Grade 4 only		Grade 4 and 8 overlap		Grade 8 only		Grade 8 and 12 overlap		Grade 12 only		Total by grade	
		1996	2000	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
Grade 4	MC[1]	42	62	9	9							51	71
	SCR[2]	57	49	16	16							73	65
	ECR[3]	12	3	4	4							16	7
Grade 8	MC[1]			9	9	44	65	21	21			74	95
	SCR[2]			16	16	58	49	26	26			100	91
	ECR[3]			4	4	13	3	3	3			20	10
Grade 12	MC[1]							21	21	49	70	70	91
	SCR[2]							26	26	62	57	88	83
	ECR[3]							3	3	27	18	30	21

[1] Multiple-choice questions.
[2] Short constructed-response questions.
[3] Extended constructed-response questions.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

In addition to matrix sampling, the Balanced Incomplete Block (BIB) design also balances the order of presentation of the blocks of questions, except for the hands-on blocks, which always appear in position three of a booklet. Furthermore, the design was set up to ensure that no student answered more than one theme-based block (though some students did not receive any). This design allows for some balancing of the impact of context and fatigue effects to be measured and reported, but makes allowance for the difficulties and disruption of administering hands-on blocks. It also takes into account the limited breadth of content coverage included in the theme blocks.[2]

Each booklet in the assessment also included two sections of student background questions. The first section, consisting of general background questions, asked students about their race/ethnicity, mother's and father's level of education, reading materials in the home, homework, school attendance, and, at grade 12, academic expectations.[3] The second section asked students questions about their science classroom activities (e.g., hands-on exercises, courses taken, and use of specialized resources such as computers).

In addition to the student assessment booklets, four other instruments provided data relating to the assessment: a teacher questionnaire, a school characteristics and policy questionnaire, a questionnaire designed to gather information about students with disabilities (SD) and/or limited English proficient (LEP) students, and a department chair/lead teacher questionnaire at grade 12.

The teacher questionnaire was administered to the science teachers of the fourth- and eighth-grade students participating in the assessment. The questionnaire consisted of three sections and took approximately 20 minutes to complete. The first section focused on the teacher's general background and experience; the second section, on the teacher's background related to science; and the third section, on classroom information about science instruction.

The school characteristics and policy questionnaire was given to the principal or other administrator in each participating school and took about 20 minutes to complete. The questions asked about school policies, programs, facilities, and the demographic composition and background of the student body.

The SD and/or LEP student questionnaire was completed by a school staff member knowledgeable about those students who were selected to participate in the assessment and who were identified as: 1) having an Individualized Education Program (IEP) or equivalent program (for reasons other than being gifted and talented) or 2) being limited English proficient (LEP). A questionnaire was completed for each SD and/or LEP student sampled regardless of whether the student participated in the assessment. Each questionnaire took approximately three minutes to complete and asked about the student and the special programs in which he or she participated.

2 For further details on the booklet design, see the forthcoming *NAEP 2000 Technical Report*.

3 Some questions, such as those referring to parental education, were not asked of fourth-graders.

The department chair/lead teacher questionnaire was given to the high school science department chair or lead teacher in each participating high school. Previous to the 2000 assessment, NAEP had not attempted to collect information from teachers of twelfth-grade science, partly due to the difficulty in identifying the science teachers of assessed twelfth-graders. The questionnaire took about 20 minutes to complete. The questions asked about the certification of the teachers, science courses offered, use of computers in the classroom, teacher preparation time, and frequency of textbook replacement. As this was NAEP's first attempt to collect information from department chairs or lead teachers, an official report of those data is not currently planned. The data are available on NAEP's web site at http://nces.ed.gov/nationsreportcard through the data tool function.

National and State Samples

National Sample

The national results presented in this report are based on a nationally representative probability sample of fourth-, eighth-, and twelfth-grade students.[4] The sample was chosen using a multistage design that involved sampling students from selected schools within selected geographic areas across the country. The sample design had the following stages:

1) selection of geographic areas (a county, group of counties, or metropolitan statistical area);
2) selection of schools (public and nonpublic) within the selected areas; and
3) selection of students within selected schools.

Each selected school that participated in the assessment and each student assessed represents a portion of the population of interest. Sampling weights are needed to make valid inferences between the student samples and the respective populations from which they were drawn. Sampling weights account for disproportionate representation due to the oversampling of students who attend schools with high concentrations of black and/or Hispanic students and students who attend nonpublic schools. Among other uses, sampling weights also account for lower sampling rates for very small schools and are used to adjust for school and student nonresponse.[5]

A special feature of the 1996 and 2000 national assessments of science was the collection of data from samples of students where assessment accommodations for special-needs students were not permitted and from samples of students where accommodations for special-needs students were permitted. NAEP inclusion rules were applied, and accommodations were offered only when a student had an Individualized Education Program (IEP) because of a disability and/or was identified as being a limited English proficient student (LEP); all other students were asked to participate in the assessment under standard conditions.

4 The student samples from American Samoa, Department of Defense Domestic Dependent Elementary and Secondary Schools, Department of Defense Dependents Schools (Overseas), Guam, and the Virgin Islands are not included in the national sample.

5 Additional details regarding the design and structure of the national and state samples will be included in the forthcoming *NAEP 2000 Technical Report*. In addition, the reader may consult the *NAEP 1998 Technical Report* for a discussion of sampling procedures that are mostly common to all NAEP assessments.

Table A.3 shows the number of students included in the national samples for the NAEP science assessments at each grade level. For the 1996 and 2000 assessments, the table includes the number of students in the sample where accommodations were not permitted and the number of students in the sample where accommodations were permitted. The table shows that the same non-SD and/or LEP students were included in both samples in 2000; only the SD and/or LEP students differed between the two samples. The 1996 design differed somewhat, in that the two samples did not include all the same non-SD and/or LEP students. As indicated in the table, additional non-SD and/or LEP students were included in the accommodations-permitted sample.

Table A.3

National student sample size, grades 4,8, and 12 (public and nonpublic schools combined):1996 and 2000

	1996		2000	
	Accommodations-not-permitted sample	Accommodations-permitted sample	Accommodations-not-permitted sample	Accommodations-permitted sample
Grade 4				
Non-SD and/or LEP students assessed	6,704	3,780*	15,068	
SD and/or LEP students assessed without accommodations	601	319	652	750
SD and/or LEP students assessed with accommodations	NA	174	NA	279
Total students assessed	7,305	10,977	15,720	16,097
Grade 8				
Non-SD and/or LEP students assessed	7,122	3,670*	14,905	
SD and/or LEP students assessed without accommodations	652	364	882	798
SD and/or LEP students assessed with accommodations	NA	163	NA	252
Total students assessed	7,774	11,319	15,787	15,955
Grade 12				
Non-SD and/or LEP students assessed	7,128	3,621*	14,555	
SD and/or LEP students assessed without accommodations	409	285	554	607
SD and/or LEP students assessed with accommodations	NA	75	NA	163
Total students assessed	7,537	11,109	15,109	15,325

* The 1996 accommodations-permitted sample included additional non-SD and/or LEP students.
SD = Students with Disabilities.
LEP = Limited-English-Proficient students.
NA = Not applicable. No accommodations were permitted in this sample.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table A.4 provides a summary of the national school and student participation rates for the science assessment samples where accommodations were not permitted and where accommodations were permitted. Participation rates are presented for public and nonpublic schools, individually and combined. The first rate is the weighted percentage of schools participating in the assessment before substitution of demographically similar schools.[6] This rate is based only on the sample of schools that was initially selected for the assessment. The numerator of this rate is the sum of the estimated number of students represented by each initially selected school that participated in the assessment. The denominator is the sum of the estimated number of students represented by each of the initially selected schools that had eligible students enrolled.

The second school participation rate is the weighted participation rate after substitution. The numerator of this rate is the sum of the estimated number of students represented by each of the participating schools, whether originally selected or selected as a substitute for a school that chose not to participate. The denominator is the sum of the estimated number of students represented by each of the initially selected schools that had eligible students enrolled (this is the same as that for the weighted participation rate for the sample of schools before substitution). The denominator for these two rates is an estimate of the number of students eligible for the assessment, from all schools in the nation with eligible students enrolled. Because of the common denominators, the weighted participation rate after substitution is at least as great as the weighted participation rate before substitution.

Also presented in table A.4 are weighted student participation rates. The numerator of this rate is the sum across all students assessed (in either an initial session or a makeup session) of the number of students that each represents. The denominator of this rate is the sum of the number of students represented in the sample, across all eligible sampled students in participating schools. The overall participation rate is calculated as the product of the weighted percentage of school participation before (or after) substitution, and the weighted percentage of student participation after makeup sessions.

For the grade 12 national sample, where school and student response rates did not meet NCES standards, an extensive analysis was conducted that examined, among other factors, the potential for nonresponse bias at both the school and student level. No evidence of any significant potential for either school or student nonresponse bias was found. Results of these analyses, as well as nonresponse bias analyses for the grade 4 and grade 8 national samples, will be included in the forthcoming *NAEP 2000 Technical Report.*

[6] The initial base sampling weights were used in weighting the percentages of participating schools and students. An attempt was made to preselect (before field processes began) a maximum of two substitute schools for each sampled public school (one in-district and one out-of-district) and each sampled Catholic school, and one for each sampled nonpublic school (other than Catholic). To minimize bias, a substitute school resembled the original selection as much as possible on affiliation, estimated number of grade-eligible students, and minority composition.

Table A.4

National school and student participation rates for public schools, nonpublic schools, and public and nonpublic schools combined, grades 4, 8, and 12: 2000

	Weighted school participation			Samples where accommodations were not permitted				Samples where accommodations were permitted			
				Student participation		Overall participation rate		Student participation		Overall participation rate	
	Percentage before substitution	Percentage after substitution	Total number of schools	Weighted percentage student participation	Total number of students assessed	Before substitution	After substitution	Weighted percentage student participation	Total number of students assessed	Before substitution	After substitution
Grade 4											
Public	85	88	414	96	9,144	81	85	95	9,484	81	84
Nonpublic	85	88	363	96	6,576	82	85	96	6,613	82	85
Combined	85	88	777	96	15,720	81	85	96	16,097	81	85
Grade 8											
Public	83	85	385	92	9,443	76	78	91	9,617	76	78
Nonpublic	81	84	366	96	6,344	77	81	96	6,338	77	81
Combined	82	85	751	92	15,787	76	78	92	15,955	76	78
Grade 12											
Public	78	82	243	75	8,562	58	61	75	8,727	58	61
Nonpublic	73	80	307	89	6,547	65	71	89	6,598	65	71
Combined	77	82	550	76	15,109	59	62	76	15,325	59	62

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

State Samples

The results of the 2000 state assessment program in science provided in this report are based on state-level samples of fourth- and eighth-grade public school students independent of the national samples. The samples were selected using a two-stage sample design that first selected schools within participating jurisdictions and then students within schools. As with the national samples, the jurisdiction samples were weighted to allow for valid inferences about the populations of interest. Tables A.5a and A.5b contain the unweighted number of participating schools and students, as well as weighted school and student participation rates for state samples where accommodations were not permitted and where accommodations were permitted. Participation rates for the states were calculated the same way rates were computed for the nation.

Table A.5a

State school and student participation rates, grade 4 (public schools only): 2000

	Weighted school participation			Samples where accommodations were not permitted				Samples where accommodations were permitted			
						Overall participation rate				Overall participation rate	
	Percentage before substitution	Percentage after substitution	Total number of schools	Weighted percentage student participation	Total number of students assessed	Before substitution	After substitution	Weighted percentage student participation	Total number of students assessed	Before substitution	After substitution
Nation	85	88	414	96	9,144	81	85	95	9,484	81	84
Alabama	87	94	109	96	2,526	83	91	96	2,552	83	91
Arizona	87	87	95	93	2,080	81	81	93	2,068	81	81
Arkansas	85	85	93	95	2,175	81	81	95	2,214	81	81
California †	76	76	81	94	1,682	72	72	94	1,714	71	71
Connecticut	100	100	107	96	2,493	96	96	95	2,550	95	95
Georgia	99	99	107	95	2,640	94	94	94	2,687	94	94
Hawaii	98	98	106	95	2,425	94	94	95	2,439	93	93
Idaho †	75	75	78	95	1,717	71	71	95	1,750	71	71
Illinois †	73	73	77	95	1,596	70	70	95	1,671	70	70
Indiana †	70	70	78	95	1,812	66	66	95	1,870	67	67
Iowa †	71	71	89	96	1,887	68	68	95	1,951	67	67
Kentucky	92	94	105	95	2,248	87	89	95	2,311	87	89
Louisiana	100	100	108	95	2,452	95	95	95	2,538	95	95
Maine †	85	85	107	95	2,094	81	81	94	2,184	81	81
Maryland	100	100	110	95	2,648	95	95	94	2,737	94	94
Massachusetts	99	99	106	95	2,274	94	94	95	2,351	94	94
Michigan †	71	83	83	94	1,875	67	78	94	1,922	67	78
Minnesota †	83	83	78	95	1,853	79	79	95	1,894	78	78
Mississippi	98	98	106	95	2,776	93	93	95	2,799	93	93
Missouri	96	96	103	95	2,367	91	91	94	2,473	91	91
Montana †	76	77	67	95	1,176	72	74	95	1,201	72	74
Nebraska	96	96	73	94	1,289	90	90	95	1,315	91	91
Nevada	100	100	109	94	2,526	94	94	94	2,619	94	94
New Mexico	93	93	98	94	1,895	87	87	94	1,999	87	87
New York †	72	72	79	93	1,764	67	67	93	1,848	67	67
North Carolina	100	100	108	95	2,374	95	95	95	2,482	95	95
North Dakota	89	89	129	96	2,338	86	86	97	2,400	86	86
Ohio †	82	82	85	93	1,887	76	76	93	1,922	76	76
Oklahoma	99	99	120	95	2,377	93	93	94	2,475	93	93
Oregon †	73	74	79	94	1,625	69	70	95	1,686	69	70
Rhode Island	100	100	110	95	2,395	95	95	95	2,500	95	95
South Carolina	97	97	103	96	2,448	93	93	96	2,495	93	93
Tennessee	97	97	105	95	2,496	92	92	95	2,522	92	92
Texas	97	99	100	96	2,125	93	95	96	2,229	93	95
Utah	100	100	110	95	2,652	95	95	95	2,694	95	95
Vermont †	75	75	66	95	1,237	71	71	95	1,312	71	71
Virginia	100	100	108	96	2,502	96	96	96	2,615	96	96
West Virginia	100	100	126	95	2,522	95	95	95	2,639	95	95
Wisconsin †	65	67	69	95	1,393	62	64	96	1,474	62	64
Wyoming	100	100	93	95	1,745	95	95	95	1,821	95	95
Other Jurisdictions											
American Samoa	100	100	17	93	453	93	93	93	475	93	93
DDESS	100	100	39	95	1,295	95	95	96	1,300	96	96
DoDDS	100	100	84	95	2,790	95	95	96	2,825	96	96
Guam	96	96	23	95	996	90	90	95	1,064	91	91
Virgin Islands	100	100	22	96	690	96	96	96	698	96	96

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table A.5b

State school and student participation rates, grade 8 (public schools only): 2000

	Weighted school participation			Samples where accommodations were not permitted				Samples where accommodations were permitted			
						Overall participation rate				Overall participation rate	
	Percentage before substitution	Percentage after substitution	Total number of schools	Weighted percentage student participation	Total number of students assessed	Before substitution	After substitution	Weighted percentage student participation	Total number of students assessed	Before substitution	After substitution
Nation	83	85	385	92	9,443	76	78	91	9,617	76	78
Alabama	82	92	102	94	2,400	77	86	93	2,382	77	86
Arizona †	76	76	80	91	1,783	69	69	91	1,822	69	69
Arkansas	87	87	92	92	2,115	80	80	92	2,140	80	80
California †	72	72	76	93	1,650	67	67	93	1,723	67	67
Connecticut	100	100	104	91	2,506	91	91	91	2,551	91	91
Georgia	99	99	102	92	2,550	91	91	92	2,578	91	91
Hawaii	91	91	50	90	2,268	82	82	91	2,285	83	83
Idaho †	78	78	63	93	1,973	73	73	93	2,003	73	73
Illinois †	75	75	80	94	1,753	70	70	93	1,808	70	70
Indiana †	73	73	76	93	1,878	68	68	93	1,904	68	68
Kentucky	94	95	96	94	2,303	89	90	94	2,383	89	90
Louisiana	100	100	104	91	2,373	91	91	90	2,393	90	90
Maine †	83	85	86	94	2,156	78	79	94	2,254	78	79
Maryland	97	97	103	89	2,336	86	86	89	2,434	87	87
Massachusetts	99	99	99	93	2,277	92	92	92	2,389	91	91
Michigan †	72	81	86	91	2,024	65	74	91	2,047	65	73
Minnesota †	73	73	59	92	1,435	68	68	92	1,458	68	68
Mississippi	98	98	101	93	2,495	91	91	93	2,514	91	91
Missouri	92	94	104	93	2,320	86	88	93	2,415	86	87
Montana †	73	74	62	92	1,692	68	69	93	1,745	68	69
Nebraska	98	98	87	91	1,898	90	90	90	1,863	89	89
Nevada	100	100	64	92	2,694	92	92	91	2,733	91	91
New Mexico	91	91	85	89	1,903	81	81	89	1,981	81	82
New York †	71	71	74	89	1,616	63	63	89	1,697	63	63
North Carolina	98	98	103	92	2,342	90	90	91	2,452	90	90
North Dakota	91	91	93	93	2,194	84	84	92	2,221	84	84
Ohio	91	91	88	92	2,122	83	83	91	2,169	83	83
Oklahoma	100	100	114	92	2,452	92	92	93	2,515	93	93
Oregon †	74	74	78	90	1,751	67	67	90	1,780	67	67
Rhode Island	100	100	52	91	2,360	91	91	90	2,440	90	90
South Carolina	91	92	95	93	2,298	85	86	93	2,336	85	86
Tennessee	90	92	97	91	2,227	82	83	91	2,257	82	84
Texas	91	94	100	93	2,302	85	88	92	2,331	84	87
Utah	100	100	95	92	2,446	92	92	92	2,475	92	92
Vermont †	80	80	74	93	1,966	74	74	92	2,021	74	74
Virginia	100	100	105	91	2,435	91	91	90	2,508	90	90
West Virginia	100	100	102	93	2,436	93	93	92	2,567	92	92
Wisconsin †	66	75	80	91	1,811	61	68	91	1,883	60	68
Wyoming	100	100	64	93	2,560	93	93	93	2,575	93	93
Other Jurisdictions											
American Samoa	96	96	16	97	445	93	93	97	471	93	93
DDESS	100	100	14	94	650	94	94	95	701	95	95
DoDDS	100	100	53	94	1,962	94	94	94	1,999	94	94
Guam	100	100	7	90	945	90	90	90	921	90	90
Virgin Islands †	100	100	7	90	606	90	90	89	619	89	89

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.

DoDDS: Department of Defense Dependents Schools (Overseas).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Asian/Pacific Islander Samples

National scale score and achievement-level results for fourth-grade Asian/Pacific Islander students in 2000 are not reported. Table A.6 contains average science scale score estimates, and their standard errors, for the nation and for the Asian/Pacific Islander subgroup for the 1996 and 2000 assessment years. In 2000, the average scale score for Asian/Pacific Islanders at grade 4 was 8 points higher than in 1996. However, this cross-year difference was not statistically significant.

It is important to note that all NAEP results are estimates and are subject to some degree of sampling variability. If different samples of schools or students had been obtained, results for some subgroups would be higher than reported here and some would be lower. In most subgroups, particularly large subgroups or subgroups for which special sampling procedures are employed, estimates of performance are likely to remain similar from one sample to another. However, the national population of Asian/Pacific Islander students is small (about 3 percent of the national population), heterogeneous with respect to academic achievement, and highly clustered in certain locations and schools. These factors are associated with large sampling variability in survey results and are reflected in the large standard errors associated with performance estimates for this subgroup. Furthermore, the sampling plan for the national assessment does not include explicit stratification procedures designed to mitigate these factors. The occurrence of the large, but statistically nonsignificant, change in the 2000 grade 4 Asian/Pacific Islander results was a likely consequence of these factors: 1) the heterogeneous nature of the Asian/Pacific Islander population; 2) the current NAEP sampling design; and 3) the sample sizes that were assessed.

Table A.6

Average science scale scores for the Asian/Pacific Islander subgroup, grade 4 (public and nonpublic schools combined): 1996 and 2000

	1996		2000	
	Percentage	Average score	Percentage	Average score
All students at grade 4	100	150 (0.8)	100	150 (0.7)
Asian/ Pacific Islander at grade 4	3 (0.2)	151 (3.6)	3 (0.2)	159 (4.1)

NOTE: The standard errors of the estimated percentages and average scale scores appear in parentheses.
Results are based on administration procedures that did not permit accommodations.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Standards for State Sample Participation and Reporting of Results

In carrying out the 2000 state assessment program, the National Center for Education Statistics (NCES) established participation rate standards that jurisdictions were required to meet in order for their results to be reported. NCES also established additional standards that required the annotation of published results for jurisdictions whose sample participation rates were low enough to raise concerns about their representativeness. The NCES guidelines used to report results in the state assessments, and the guidelines for notation when there is some risk of nonresponse bias in the reported results, are presented in this section.

Guideline 1

The publication of NAEP results

The conditions that will result in the publication of a jurisdiction's results are presented below.

Guideline 1–Publication of Public School Results

A jurisdiction will have its public school results published in the 2000 NAEP Science results (or in other reports that include all state-level results) if and only if its weighted participation rate for the initial sample of public schools is greater than or equal to 70 percent. Similarly, a jurisdiction will receive a separate NAEP state report if and only if its weighted participation rate for the initial sample of public schools is greater than or equal to 70 percent.

Discussion: If a jurisdiction's public school participation rate for the initial sample of schools is below 70 percent, there is a substantial possibility that bias will be introduced into the assessment results. This possibility remains even after making statistical adjustments to compensate for school nonparticipation. There remains the likelihood that, in aggregate, the substitute schools are sufficiently dissimilar from the originals that they are replacing and represent too great a proportion of the population to discount such a difference. Similarly, the assumptions underlying the use of statistical adjustments to compensate for nonparticipation are likely to be significantly violated if the initial response rate falls below the 70 percent level. Guideline 1 takes this into consideration. This guideline is congruent with current NAGB policy, which requires that data for jurisdictions that do not have a 70 percent before-substitution participation rate be reported "in a different format," and with the Education Information Advisory Committee (EIAC) resolution, which calls for data from such jurisdictions not to be published.

The following guidelines concerning school and student participation rates in the NAEP state assessment program were established to address four significant ways in which nonresponse bias could be introduced into the jurisdiction sample estimates. Presented on the following pages are the conditions that will result in a jurisdiction's receiving a notation in the 2000 reports. Note that in order for a jurisdiction's results to be published with no notations, that jurisdiction must satisfy all guidelines.

Guideline 2

Reporting school and student participation rates with possible bias due to school nonresponse

Guideline 2–Notation for Overall Public School Participation Rate

A jurisdiction that meets Guideline 1 will receive a notation if its weighted participation rate for the initial sample of public schools was below 85 percent, and the weighted public school participation rate after substitution was below 90 percent.

Discussion: For jurisdictions that did not use substitute schools, the participation rates are based on participating schools from the original sample. In these situations, the NCES standards specify weighted school participation rates of at least 85 percent to guard against potential bias due to school nonresponse. Thus the first part of these guidelines, referring to the weighted school participation rate for the initial sample of schools, is in direct accordance with NCES standards.

To help ensure adequate sample representation for each jurisdiction participating in the NAEP 2000 state assessments, NAEP provided substitutes for nonparticipating public schools. For jurisdictions that used substitute schools, the assessment results will be based on the student data from all schools participating from both the original sample and the list of substitutes (unless both an initial school and its substitute eventually participated, in which case only the data from the initial school will be used).

The NCES standards do not explicitly address the use of substitute schools to replace initially selected schools that decide not to participate in the assessment. However, considerable technical consideration was given to this issue. Even though the characteristics of the substitute schools were matched as closely as possible to the characteristics of the initially selected schools, substitution does not entirely eliminate bias due to the nonparticipation of initially selected schools. Thus, for the weighted school participation rates including substitute schools, the guidelines were set at 90 percent.

If a jurisdiction meets either standard (i.e., 85 percent or higher prior to substitution or 90 percent or higher after substitution), there will be no notation for the relevant overall school participation rate.

Guideline 3

Important segments of the jurisdiction's student population that must be adequately represented to avoid possible nonresponse bias

Guideline 3–Notation for Strata-Specific Public School Participation Rates

A jurisdiction that is not already receiving a notation under Guideline 2 will receive a notation if the sample of public schools included a class of schools with similar characteristics that had a weighted participation rate (after substitution) of below 80 percent, and from which the nonparticipating schools together accounted for more than five percent of the jurisdiction's total weighted sample of public schools. The classes of schools from each of which a jurisdiction needed minimum school participation levels were determined by degree of urbanization, minority enrollment, and median household income of the area in which the school is located.

Discussion: The NCES standards specify that attention should be given to the representativeness of the sample coverage. Thus, if some important segment of the jurisdiction's population is not adequately represented, it is of concern, regardless of the overall participation rate.

If nonparticipating schools are concentrated within a particular class of schools, the potential for substantial bias remains, even if the overall level of school participation appears to be satisfactory. Nonresponse adjustment cells for public schools have been formed within each jurisdiction, and the schools within each cell are similar with respect to minority enrollment, degree of urbanization, and/or median household income, as appropriate for each jurisdiction.

If the weighted response rate, after substitution, for a single adjustment cell falls below 80 percent, and more than five percent (weighted) of the sampled schools are nonparticipants from such a cell, the potential for nonresponse bias is too great. This guideline is based on the NCES standard for stratum-specific school response rates.

Guideline 4

Possible student nonresponse bias

Guideline 4–Notation for Overall Student Participation Rate in Public Schools

A jurisdiction that meets Guideline 1 will receive a notation if the weighted student response rate within participating public schools was below 85 percent.

Discussion: This guideline follows the NCES standard of 85 percent for overall student participation rates. The weighted student participation rate is based on all eligible students from initially selected or substitute schools who participated in the assessment in either an initial session or a makeup session. If the rate falls below 85 percent, the potential for bias due to students' nonresponse is too great.

Guideline 5

Possible nonresponse bias from inadequately represented strata

Guideline 5–Notation for Strata-Specific Student Participation Rates in Public Schools

A jurisdiction that is not already receiving a notation under Guideline 4 will receive a notation if the sampled students within participating public schools included a class of students with similar characteristics that had a weighted student response rate of below 80 percent, and from which the nonresponding students together accounted for more than 5 percent of the jurisdiction's weighted assessable public school student sample. Student groups from which a jurisdiction needed minimum levels of participation were determined by the age or grade of the student, whether or not the student was classified as a student with a disability (SD) or of limited English proficiency (LEP), and the type of assessment session (monitored or unmonitored),[7] as well as school level of urbanization, minority enrollment, and median household income of the area in which the school is located.

Discussion: This guideline addresses the fact that if nonparticipating students are concentrated within a particular class of students, the potential for substantial bias remains, even if the overall student participation level appears to be satisfactory. Student nonresponse adjustment cells have been formed using the school-level nonresponse adjustment cells, together with the student's age and the nature of the assessment session (unmonitored or monitored).

If the weighted response rate for a single adjustment cell falls below 80 percent, and more than five percent (weighted) of the invited students who do not participate in the assessment are from such a cell, the potential for nonresponse bias is too great. This guideline is based on the NCES standard for stratum-specific student response rates.

7 In the state assessments, 25 percent of the administration sessions were observed by quality control monitors.

At both fourth- and eighth-grade, one state, Wisconsin, failed to meet the initial public school participation rate of 70 percent and, at eighth grade, the Virgin Islands failed to meet this standard. Results for these jurisdictions are not included with the findings reported for the state NAEP 2000 science assessment.

At grade 4, there were 12 jurisdictions (California, Idaho, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, New York, Ohio, Oregon, and Vermont) that failed to meet the required weighted participation rate of 85 percent for the initial sample of schools and their weighted school sample rate after substitution was below 90 percent. At grade 8, 12 jurisdictions (Arizona, California, Idaho, Illinois, Indiana, Maine, Michigan, Minnesota, Montana, New York, Oregon, and Vermont) failed to meet this guideline as well. At grade 4, Maine failed to meet Guideline 3 indicating that the sample of public schools included a class of schools with similar characteristics that had a weighted participation rate (after substitution) of below 80 percent, and from which the nonparticipating schools together accounted for more than 5 percent of the jurisdiction's total weighted sample of public schools. Results for each of these states at the appropriate grade level are shown with a notation indicating possible bias related to nonresponse.

Students with Disabilities (SD) and/or Limited English Proficient (LEP) Students

It is NAEP's intent to assess all selected students from the target population. Therefore, every effort is made to ensure that all selected students who are capable of participating in the assessment are assessed. Some students sampled for participation in NAEP can be excluded from the sample according to carefully defined criteria. These criteria were revised in 1996 to communicate more clearly a presumption of inclusion except under special circumstances. According to these criteria, students with Individualized Education Programs (IEPs) were to be included in the NAEP assessment except in the following cases:

1) The school's IEP team determined that the student could not participate, OR,
2) The student's cognitive functioning was so severely impaired that she or he could not participate, OR,
3) The student's IEP required that the student had to be tested with an accommodation or adaptation and that the student could not demonstrate his or her knowledge without that accommodation.[8]

All LEP students receiving academic instruction in English for three years or more were to be included in the assessment. Those LEP students receiving instruction in English for fewer than three years were to be included unless school staff judged them to be incapable of participating in the assessment in English.

Participation of SD and/or LEP Students in the Two NAEP Samples

Testing all sampled students is the best way for NAEP to ensure that the statistics generated by the assessment are as representative as possible of the performance of the entire national population and the populations of participating jurisdictions. However, all groups of students include

8 As described in the following section, a second sample in the 1996 national and the 2000 national and state assessments was assessed that included students who required and were provided with accommodations.

certain proportions that cannot be tested in large-scale assessments (such as students who have profound mental disabilities), or who can only be tested through the use of "accommodations" such as extra time, one-on-one administration, or use of magnifying equipment. Some students with disabilities and some LEP students cannot show on a test what they know and can do unless they are provided accommodations. When such accommodations are not allowed, students requiring such adjustments are often excluded from large-scale assessments such as NAEP. This phenomenon has become more common in the last decade and gained momentum with the passage of the Individuals with Disabilities Education Act (IDEA), which led schools and states to identify increasing proportions of students as needing accommodations on assessments to best show what they know and can do.[9] Furthermore, Section 504 of the Rehabilitation Act of 1973 requires that, when students with disabilities are tested, schools must provide them with appropriate accommodations so that the test results accurately reflect what the students know and are able to do.[10] In addition, as the proportion of English language learners in the population has increased, some states have started offering accommodations, such as translated versions of assessments or the use of bilingual dictionaries as part of assessments.

Before 1996, NAEP did not allow any testing under nonstandard conditions (i.e., accommodations were not permitted). At that time, NAEP samples were able to include almost all sampled students in "standard" assessment sessions. However, as the influence of IDEA grew more widespread, the failure to provide accommodations led to increasing levels of exclusion in the assessment. Such increases posed two threats to the program: 1) they threatened the stability of trend lines (because excluding more students in one year than the next might lead to apparent rather than real gains), and 2) they made NAEP samples less than optimally representative of target populations.

NAEP reacted to this challenge by adopting a multipart strategy. It became clear that to ensure that NAEP samples were as inclusive as possible, the program had to move toward allowing the same assessment accommodations that were afforded students in state and district testing programs. However, allowing accommodations represents a change in testing conditions that may affect trend. Therefore, beginning with the 1996 national assessments and the 1998 state assessments, NAEP has assessed a series of parallel samples of students. In one set of samples, testing accommodations were not permitted; this has allowed NAEP to maintain the measurement of achievement trends on an assessment that was, throughout its existence, administered under common conditions. In addition to the samples where accommodations were not permitted, parallel samples in which accommodations were permitted were also assessed. By having two overlapping samples and two sets of related data points, NAEP could

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9 Office of Special Education Programs. (1997). *Nineteenth annual report to Congress on the implementation of the individuals with disabilities education act*. Washington, DC: U. S. Department of Education.

10 Section 504 of the Rehabilitation Act of 1973 is a civil rights law designed to prohibit discrimination on the basis of disability in programs and activities, including education, that receive federal financial assistance.

meet two core program goals.[11] First, data trends could be maintained. Second, parallel trend lines could be set in ways that ensure that in future years the program will be able to use the most inclusive practices possible and mirror the procedures used by most state and district assessments. Beginning in 2002, NAEP will use only the more inclusive samples in which assessment accommodations are permitted.

In science, national and state data from 1996 and 2000 are reported for the sample in which accommodations were not permitted. National data for the second sample, in which accommodations were permitted, are reported at all grades for 1996 and 2000. State data on this more inclusive sample are reported for 2000 only.

In order to make it possible to evaluate both the impact of increasing exclusion rates in some jurisdictions and differences between jurisdictions, complete data on exclusion in both assessment years are included in this appendix. Since the exclusion rates may affect trend measurement within a jurisdiction, readers should consider the magnitude of exclusion rate changes when interpreting score changes in jurisdictions. In addition, different rates of exclusion may influence the meaning of state comparisons. Thus, exclusion data should be reviewed in this context as well.

Participation rates across the assessment years for students with disabilities (SD) and/or limited English proficient (LEP) students for the national sample where accommodations were not permitted are presented in table A.7. The data in this table include the percentages of students *identified* as SD and/or LEP, the percentage of students *excluded*, and the percentage of *assessed* SD and/or LEP students. Tables A.8a and A.8b show similar information by jurisdiction for grades 4 and 8 (only 2000 data are presented for grade 4 since there was no fourth-grade state science assessment in 1996). Participation rates for the national sample where accommodations were permitted are presented in table A.9, and state results where accommodations were permitted are shown in tables A.10a and A.10b. The data in these tables include the percentages of students *identified* as SD and/or LEP, the percentage of students *excluded*, the percentage of *assessed* SD and/or LEP students, the percentage *assessed without accommodations*, and the percentage *assessed with accommodations*. Expanded state-level data are available on the NAEP web site (http://nces.ed.gov/nationsreportcard) that break out these percentages for SD students and LEP students separately.

In the 2000 accommodations-not-permitted national sample, 7 percent of students at grades 4 and 8 and 4 percent of students at grade 12 were excluded from the assessment. The comparable percentages in the 2000 accommodations-permitted national sample were 4 percent at grade 4, 3 percent at grade 8, and 2 percent at grade 12. This comparison would suggest that allowing accommodations did help to decrease the percentage of students excluded from the assessment. A similar pattern is evident in the various jurisdictions that participated in the 2000 state assessment. Across the jurisdictions, the percentage of students excluded in the accommodations-not-permitted sample ranged from 4 to 15 percent at grade 4, and from 4 to 14 percent at grade 8. In the

[11] The two samples are described as "overlapping" because in 2000 the same group of non-SD and/or LEP students were included in both samples. In 1996, all of the non-SD and/or LEP students in the sample that did not permit accommodations were included in the analysis of results for the sample that did permit accommodations, with the inclusion of additional non-SD and/or LEP students selected for the accommodations-permitted sample only.

Table A.7

Percentage of students identified as SD and/or LEP where accommodations were not permitted (public and nonpublic schools combined): 1996 and 2000

	1996		2000	
	Number of students sampled	Weighted percentage of students	Number of students sampled	Weighted percentage of students
Grade 4				
SD and/or LEP students				
Identified	1,357	16	1,248	14
Excluded	756	8	596	7
Assessed	601	7	652	7
SD students only				
Identified	773	11	782	10
Excluded	425	6	453	6
Assessed	348	5	329	4
LEP students only				
Identified	654	5	557	5
Excluded	393	3	225	2
Assessed	261	2	332	3
Grade 8				
SD and/or LEP students				
Identified	1,078	12	1,728	14
Excluded	426	4	846	7
Assessed	652	7	882	8
SD students only				
Identified	763	10	1,306	12
Excluded	314	4	711	6
Assessed	449	6	595	6
LEP students only				
Identified	373	3	530	4
Excluded	156	1	217	1
Assessed	217	2	313	2
Grade 12				
SD and/or LEP students				
Identified	834	8	1,066	9
Excluded	425	3	512	4
Assessed	409	4	554	5
SD students only				
Identified	530	5	843	8
Excluded	321	3	449	4
Assessed	209	3	394	4
LEP students only				
Identified	340	3	282	2
Excluded	136	1	111	1
Assessed	204	2	171	1

SD = Students with Disabilities.

LEP = Limited-English-Proficient students.

NOTE: Within each grade level, the combined SD and/or LEP portion of the table is not a sum of the separate SD and LEP portions because some students were identified as both SD and LEP. Such students would be counted separately in the bottom portions, but counted only once in the top portion.

Within each portion of the table, percentages may not sum properly due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table A.8a

State percentage of students identified as SD and/or LEP where accommodations were not permitted, grade 4 (public schools only): 2000

	Identified	Excluded	Assessed
Nation	16	8	8
Alabama	12	6	7
Arizona	24	11	12
Arkansas	13	6	6
California †	33	11	22
Connecticut	15	10	5
Georgia	11	8	4
Hawaii	19	9	10
Idaho †	16	6	10
Illinois †	16	9	7
Indiana †	12	7	5
Iowa †	14	10	5
Kentucky	12	8	4
Louisiana	16	8	8
Maine †	18	11	7
Maryland	13	9	3
Massachusetts	20	11	9
Michigan †	11	9	2
Minnesota †	16	7	9
Mississippi	6	4	2
Missouri	15	10	5
Montana †	13	5	7
Nebraska	16	6	11
Nevada	20	11	9
New Mexico	30	13	17
New York †	17	13	4
North Carolina	17	14	2
North Dakota	14	6	7
Ohio †	12	10	2
Oklahoma	20	10	10
Oregon †	18	8	10
Rhode Island	23	12	11
South Carolina	17	8	9
Tennessee	11	4	7
Texas	26	15	11
Utah	14	7	7
Vermont †	15	11	5
Virginia	15	10	5
West Virginia	13	10	3
Wisconsin †	20	13	7
Wyoming	14	6	8
Other Jurisdictions			
American Samoa	17	15	2
DDESS	11	7	4
DoDDS	11	5	6
Guam	26	10	17
Virgin Islands	7	5	2

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
SD = Students with Disabilities.
LEP = Limited-English-Proficient students.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: Percentages may not sum properly due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table A.8b

State percentage of students identified as SD and/or LEP where accommodations were not permitted, grade 8 (public schools only): 1996 and 2000

	1996			2000		
	Identified	Excluded	Assessed	Identified	Excluded	Assessed
Nation	13	5	8	16	7	8
Alabama	13	8	5	13	4	8
Arizona †	15	6	9	18	9	9
Arkansas	12	7	5	15	8	7
California †	21	9	12	26	9	16
Connecticut	15	9	6	14	9	5
Georgia	10	5	5	11	7	4
Hawaii	13	5	7	20	8	12
Idaho †	—	—	—	14	5	9
Illinois †	—	—	—	15	11	5
Indiana †	11	6	5	11	6	5
Kentucky	9	4	5	13	9	3
Louisiana	11	6	5	13	5	8
Maine	13	7	6	16	9	7
Maryland	12	6	7	14	10	4
Massachusetts	17	7	10	20	13	7
Michigan †	10	5	4	11	8	3
Minnesota †	11	4	7	15	5	10
Mississippi	11	6	5	8	5	3
Missouri	13	6	7	13	8	5
Montana †	9	3	6	13	6	6
Nebraska	11	4	7	15	4	11
Nevada	13	9	5	14	9	6
New Mexico	20	9	11	26	13	13
New York †	15	9	6	18	14	4
North Carolina	10	5	5	15	12	2
North Dakota	9	2	7	13	4	9
Ohio	—	—	—	11	8	3
Oklahoma	—	—	—	14	8	7
Oregon †	12	5	7	17	6	11
Rhode Island	17	7	10	19	10	9
South Carolina	10	7	4	14	8	6
Tennessee	12	4	8	14	6	8
Texas	17	8	9	19	9	11
Utah	9	4	5	12	6	6
Vermont †	14	6	8	19	11	9
Virginia	12	7	6	15	10	5
West Virginia	12	7	5	16	11	4
Wisconsin †	11	7	4	15	9	6
Wyoming	10	4	6	12	4	8
Other Jurisdictions						
American Samoa	—	—	—	15	12	3
DDESS	10	6	3	15	13	3
DoDDS	8	3	5	8	4	4
Guam	9	7	2	17	5	12

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
SD = Students with Disabilities.
LEP = Limited-English-Proficient students.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: Percentages may not sum properly due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table A.9

Percentage of students identified as SD and/or LEP where accommodations were permitted (public and nonpublic schools combined): 1996 and 2000

		1996		2000	
		Number of students sampled	Weighted percentage of students	Number of students sampled	Weighted percentage of students
Grade 4					
SD and/or LEP students	Identified	820	16	1,427	16
	Excluded	327	6	398	4
	Assessed	493	10	1,029	12
	Assessed without accommodations	319	6	750	8
	Assessed with accommodations	174	4	279	4
SD students only	Identified	496	12	860	11
	Excluded	145	4	257	3
	Assessed	351	8	603	8
	Assessed without accommodations	192	4	367	5
	Assessed with accommodations	159	4	236	3
LEP students only	Identified	370	5	649	6
	Excluded	196	2	193	1
	Assessed	174	3	456	4
	Assessed without accommodations	138	2	402	4
	Assessed with accommodations	36	1	54	1
Grade 8					
SD and/or LEP students	Identified	850	11	1,468	13
	Excluded	323	4	418	3
	Assessed	527	7	1,050	9
	Assessed without accommodations	364	5	798	7
	Assessed with accommodations	163	3	252	2
SD students only	Identified	604	8	1,094	10
	Excluded	244	3	354	3
	Assessed	360	6	740	7
	Assessed without accommodations	223	3	511	5
	Assessed with accommodations	137	2	229	2
LEP students only	Identified	283	3	427	3
	Excluded	101	1	88	1
	Assessed	182	2	339	2
	Assessed without accommodations	147	1	303	2
	Assessed with accommodations	35	▲	36	▲
Grade 12					
SD and/or LEP students	Identified	596	7	1,065	9
	Excluded	236	3	295	2
	Assessed	360	5	770	7
	Assessed without accommodations	285	4	607	5
	Assessed with accommodations	75	1	163	2
SD students only	Identified	395	5	726	7
	Excluded	203	2	257	2
	Assessed	192	3	469	5
	Assessed without accommodations	119	2	329	3
	Assessed with accommodations	73	1	140	2
LEP students only	Identified	228	2	385	2
	Excluded	52	▲	75	▲
	Assessed	176	2	310	2
	Assessed without accommodations	171	2	286	2
	Assessed with accommodations	5	▲	24	▲

▲ Percentage is between 0.0 and 0.5.
SD = Students with Disabilities.
LEP = Limited-English-Proficient students.
NOTE: Within each grade level, the combined SD and/or LEP portion of the table is not a sum of the separate SD and LEP portions because some students were identified as both SD and LEP. Such students would be counted separately in the bottom portions but counted only once in the top portion.
Within each portion of the table, percentages may not sum properly due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table A.10a

State percentage of students identified as SD and/or LEP where accommodations were permitted, grade 4 (public schools only): 2000

	Identified SD and/or LEP		Assessed SD and/or LEP			
	Total	Excluded	Total	Assessed under standard conditions	Assessed with accommodations	All students assessed under standard conditions
Nation	18	5	13	9	4	91
Alabama	12	4	8	6	3	93
Arizona	24	6	18	11	7	87
Arkansas	13	4	9	5	4	92
California †	33	5	28	19	9	86
Connecticut	15	5	10	5	5	90
Georgia	11	3	8	5	3	93
Hawaii	19	8	11	9	2	89
Idaho †	16	2	13	8	6	92
Illinois †	16	4	12	6	6	90
Indiana †	12	3	8	4	4	92
Iowa †	14	3	12	4	7	90
Kentucky	12	4	9	4	5	91
Louisiana	16	2	13	2	11	86
Maine †	18	4	14	5	8	87
Maryland	13	3	9	4	6	91
Massachusetts	20	4	16	6	10	87
Michigan †	11	3	8	4	3	93
Minnesota †	16	3	13	6	7	90
Mississippi	6	2	4	2	2	95
Missouri	15	1	13	5	8	90
Montana †	13	3	10	5	5	93
Nebraska	16	5	12	8	3	92
Nevada	20	7	14	9	5	89
New Mexico	30	6	23	17	7	87
New York †	17	4	12	3	10	86
North Carolina	17	6	11	4	8	87
North Dakota	14	1	12	8	4	94
Ohio †	12	4	8	3	5	91
Oklahoma	20	4	16	11	5	91
Oregon †	18	4	14	7	7	90
Rhode Island	23	4	19	9	10	86
South Carolina	17	5	11	7	5	90
Tennessee	11	2	9	7	2	96
Texas	26	8	18	14	5	87
Utah	14	4	10	6	4	92
Vermont †	15	3	13	4	9	88
Virginia	15	5	10	5	5	90
West Virginia	13	3	10	3	7	90
Wisconsin †	20	5	16	6	10	85
Wyoming	14	1	13	6	7	92
Other Jurisdictions						
American Samoa	17	7	10	10	0	93
DDESS	11	5	7	3	4	92
DoDDS	11	2	8	4	4	94
Guam	26	6	20	15	6	88
Virgin Islands	7	4	2	2	0	96

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
SD = Students with Disabilities.
LEP = Limited-English-Proficient students.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: Percentages may not sum properly due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table A.10b

State percentage of students identified as SD and/or LEP where accommodations were permitted, grade 8 (public schools only): 2000

	Identified SD and/or LEP		Assessed SD and/or LEP			
	Total	Excluded	Total	Assessed under standard conditions	Assessed with accommodations	All students assessed under standard conditions
Nation	14	4	10	7	3	93
Alabama	13	5	7	7	1	94
Arizona †	18	4	14	9	5	92
Arkansas	15	5	10	7	3	92
California †	26	4	22	18	4	92
Connecticut	14	6	8	6	3	91
Georgia	11	4	7	4	3	93
Hawaii	20	5	15	13	2	93
Idaho †	14	3	11	8	3	94
Illinois †	15	5	10	6	4	90
Indiana †	11	3	9	5	4	93
Kentucky	13	3	10	5	5	92
Louisiana	13	3	10	6	5	93
Maine †	16	2	13	7	6	91
Maryland	14	3	11	7	4	93
Massachusetts	20	4	16	8	8	88
Michigan †	11	5	6	4	2	93
Minnesota †	15	4	11	10	2	95
Mississippi	8	4	4	2	1	94
Missouri	13	2	11	6	5	93
Montana †	13	1	11	8	3	95
Nebraska	15	4	11	10	1	95
Nevada	14	4	10	7	3	93
New Mexico	26	6	20	18	3	91
New York †	18	7	11	3	8	85
North Carolina	15	5	10	4	5	90
North Dakota	13	1	12	8	4	94
Ohio	11	4	8	4	4	92
Oklahoma	14	4	11	9	2	95
Oregon †	17	4	13	9	4	92
Rhode Island	19	4	15	12	3	93
South Carolina	14	6	8	7	1	93
Tennessee	14	4	10	10	1	95
Texas	19	6	13	11	2	92
Utah	12	3	9	6	3	94
Vermont †	19	3	17	10	6	91
Virginia	15	5	10	5	5	89
West Virginia	16	3	13	5	8	89
Wisconsin †	15	4	11	7	5	92
Wyoming	12	1	11	8	3	96
Other Jurisdictions						
American Samoa	15	3	12	10	2	96
DDESS	15	2	13	8	5	93
DoDDS	8	1	7	5	2	97
Guam	17	9	8	4	4	87

† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
SD = Students with Disabilities.
LEP = Limited-English-Proficient students.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: Percentages may not sum properly due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

accommodations-permitted sample, the percentages of students excluded ranged from 1 to 8 percent at grade 4, and from 1 to 9 percent at grade 8. As with the national exclusion rates, most states and jurisdictions excluded a smaller percentage of students when accommodations were permitted.

Investigating the Effects of Exclusion Rates on Assessment Results

As indicated by the data in the previous section, exclusion rates have tended to increase across assessment years in the samples that did not permit accommodations, particularly within certain states. In considering the effects of exclusion rates on assessment results, at least two major issues become evident. First, if exclusion rates vary substantially across assessment years, then the ability to report trends (i.e., compare results between years) may be threatened by the fact that the results from different years are based on different proportions of the population. Second, the variation in exclusion rates among states and jurisdictions may threaten the comparison of state-by-state results within a given year, again because the results for different states or jurisdictions are based on different proportions of the populations.

As a consequence, NCES investigated the possibility of establishing criteria for including cautionary notations based on excessive or increased exclusion rates (similar to those based on overall participation rates) in the reporting of national and state-by-state results. This investigation, however, did not reveal a consistent relationship between levels of exclusion, or degrees of change in inclusion rates, and overall results. There were several reasons for this.

First of all, real demographic differences influence exclusion rates in states and, thus, some differences may be unavoidable. Second, program research conducted by NCES and Educational Testing Service (ETS) was unable to identify a particular level of exclusion increase that seemed to affect scores. Third, since excluded students were not tested, NAEP has no direct information about how those students *would* have done had they been tested. Given these realities and uncertainties, the best approach seemed to be to supply all data about student exclusion and allow readers to consider it as they interpret the achievement data. However, it is important to remember that the main solutions to this issue lie not in flagging results, but in ensuring that all sampled students participate in assessments. The new, more inclusive samples that will become NAEP's main samples in 2002 are intended to accomplish this goal.

The move to more inclusive samples, however, will not be a perfect solution. For example, even within the context of the samples in which accommodations are permitted, there is still some student exclusion (albeit at a far lower level, as the data in tables A.8 and A.9a/b show). In addition, the assessment accommodations may not have an entirely neutral impact on scores. In other words, it is possible that changes in the percentages of students receiving assessment accommodations may influence scores. It is also possible that differences in state and local accommodations policies will affect state comparisons.

Because of these remaining issues, NCES has funded several major research studies. These activities have been organized around two distinct questions. First, as was mentioned above, some students are excluded from even the more inclusive NAEP. Therefore, NCES has funded research into ways excluded students might be included in the estimation of scores for overall populations. In other words, research is being conducted to investigate weighting procedures that might be used to ensure the final NAEP estimates include data for all students in a sampled population. There are two general approaches that have been investigated. The first is an idea championed by Albert Beaton of Boston College. Beaton recommends making a simple assumption about excluded students: he would assume that, had these students been tested, they would have performed below some predefined level (for example, the median score or the lowest score in the *basic* achievement range). This statistic (whether median or some other level) would be adjusted to take account of excluded students.

The second approach to obtaining full population estimates has been recommended by Donald McLaughlin of the American Institutes for Research (AIR). His approach involves using background data about excluded students to estimate how they, as a group, would have performed had they been assessed. This approach is based on different and stronger assumptions than Beaton's. It would have the advantage of allowing NAEP to continue to report all the types of statistics currently in use (including average scores).

The results from an initial examination of the 1996 and 2000 NAEP science data using McLaughlin's approach indicated that the reported average score gains from 1996 to 2000 in many jurisdictions would be somewhat smaller if full-population estimates were used. This is apparently due to the increase in exclusion rates between years within these states. It should be noted that using such full-population estimates may not only alter the estimates of score gains, but may also alter the rank ordering of states within a given year.

NCES has not yet judged either statistical adjustment approach ready for operational use. Therefore, these "full population reporting" approaches may or may not be used in future years. Results of the studies produced by McLaughlin may be obtained from NCES, as can copies of an Educational Testing Service (ETS) study that implemented Beaton's methodology.

In addition to full population reporting research, NCES has commissioned studies of the impact of assessment accommodations on overall scores. Specifically, ETS has conducted differential item functioning (DIF) studies of items assessed with accommodation in the 1996 assessment.[12] In these studies, ETS researchers found little evidence that accommodations changed the functioning of test questions.

Types of Accommodations Permitted

Table A.11 displays the number and the percentages of SD and/or LEP students assessed with the variety of available accommodations. It should be noted that students assessed with accommodations typically received some combination of accommodations. The numbers and percentages presented in the table reflect only

12 For information on DIF studies of items assessed with accommodations in the 1996 mathematics and science assessments, see Mazzeo, J. M., Carlson, J. E., Voelkl, K. E., & Lutkus, A. D. (1999). *Increasing the participation of special needs students in NAEP: A report on 1996 NAEP research activities*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

the primary accommodation provided. For example, students assessed in small groups (as compared to standard NAEP sessions of about 30 students) usually received extended time. In one-on-one administrations, students often received assistance in recording answers and were afforded extra time. Extended time was considered the primary accommodation only when it was the sole accommodation provided.

Table A.11

Percentage of students in national sample identified as SD and/or LEP by type of accommodation where accommodations were permitted (public and nonpublic schools combined): 1996 and 2000

	Grade 4				Grade 8				Grade 12			
	1996		2000		1996		2000		1996		2000	
	Number of students sampled	Weighted percentage of students	Number of students sampled	Weighted percentage of students	Number of students sampled	Weighted percentage of students	Number of students sampled	Weighted percentage of students	Number of students sampled	Weighted percentage of students	Number of students sampled	Weighted percentage of students
SD and/or LEP students												
Science glossary	0	0.00	37	0.45	13	0.10	13	0.11	0	0.00	2	0.01
Bilingual dictionary	NA	NA	0	0.00	NA	NA	2	0.01	NA	NA	10	0.11
Glossary/dictionary	16	0.23	NA	NA	14	0.15	NA	NA	2	0.02	NA	NA
Large-print book	0	0.00	1	0.01	0	0.00	2	0.04	0	0.00	0	0.00
Extended time	28	0.69	50	0.56	29	0.47	54	0.35	30	0.32	64	0.51
Read aloud	17	0.56	17	0.29	10	0.19	22	0.24	3	0.07	4	0.06
Small group	99	2.37	137	1.69	89	1.66	140	1.54	26	0.35	68	0.93
One-on-one	11	0.22	35	0.69	7	0.08	11	0.11	12	0.18	8	0.10
Scribe/computer	NA	NA	0	0.00	NA	NA	5	0.08	NA	NA	4	0.03
Other	3	0.07	2	0.01	1	0.01	3	0.04	2	0.02	3	0.04
SD students only												
Science glossary	0	0.00	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00
Bilingual dictionary	NA	NA	0	0.00	NA	NA	1	0.00	NA	NA	0	0.00
Glossary/dictionary	1	0.02	NA	NA	1	0.01	NA	NA	0	0.00	NA	NA
Large-print book	0	0.00	1	0.01	0	0.00	2	0.04	0	0.00	0	0.00
Extended time	28	0.69	49	0.55	29	0.47	52	0.34	30	0.32	54	0.47
Read aloud	17	0.56	17	0.29	10	0.19	18	0.19	3	0.07	4	0.06
Small group	99	2.37	131	1.64	89	1.66	137	1.52	26	0.35	68	0.93
One-on-one	11	0.22	35	0.69	7	0.08	11	0.11	12	0.18	8	0.10
Scribe/computer	NA	NA	0	0.00	NA	NA	5	0.08	NA	NA	4	0.03
Other	3	0.07	2	0.01	1	0.01	3	0.04	2	0.02	2	0.03
LEP students only												
Science glossary	0	0.00	36	0.44	13	0.10	13	0.11	0	0.00	2	0.01
Bilingual dictionary	NA	NA	0	0.00	NA	NA	2	0.01	NA	NA	10	0.11
Glossary/dictionary	16	0.23	NA	NA	14	0.15	NA	NA	2	0.02	NA	NA
Large-print book	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Extended time	3	0.04	1	0.01	2	0.03	3	0.01	2	0.02	10	0.04
Read aloud	2	0.08	1	0.00	4	0.06	6	0.06	0	0.00	0	0.00
Small group	14	0.18	16	0.18	2	0.02	11	0.09	1	0.02	0	0.00
One-on-one	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00
Scribe/computer	NA	NA	0	0.00	NA	NA	0	0.00	NA	NA	0	0.00
Other	0	0.00	0	0.00	0	0.00	1	0.01	0	0.00	1	0.01

SD = Students with Disabilities. LEP = Limited-English-Proficient students.

NA = Not Applicable. Accommodation was not offered.

NOTE: The combined SD and/or LEP portion of the table is not a sum of the separate SD and LEP portions because some students were identified as both SD and LEP. Such students would be counted separately in the bottom portions, but counted only once in the top portion.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Data Collection and Scoring

The 2000 science assessment was conducted from January through March 2000, with some makeup sessions in early April. As with all NAEP assessments, data collection for the 2000 assessment was conducted by a trained field staff. For the national assessment, this was accomplished by staff from Westat, Inc.

For the state assessment, testing sessions were conducted and administered by employees of state and local educational agencies and institutions. These employees were carefully trained in assessment procedures by Westat. In addition, Westat employed quality control monitors who observed 25 percent of the sessions in state assessments.

Materials from the 2000 assessment were shipped to National Computer Systems, where trained staff evaluated the responses to the constructed-response questions using scoring rubrics or guides prepared by Educational Testing Service. Each constructed-response question had a unique scoring rubric that defined the criteria used to evaluate students' responses. The extended constructed-response questions were evaluated with four- and five-level rubrics, and many of the short constructed-response questions were rated according to three-level rubrics that permitted partial credit. Other short constructed-response questions were scored as either acceptable or unacceptable.

For the 2000 science assessment, approximately 4.5 million constructed responses were scored. This number includes rescoring to monitor inter-rater reliability. The within-year average percentage of exact agreement for the 2000 national reliability sample was 95 percent at grade 4, 96 percent at grade 8, and 96 percent at grade 12.

Data Analysis and IRT Scaling

Subsequent to the professional scoring, all information was transcribed to the NAEP database at ETS. Each processing activity was conducted with rigorous quality control. After the assessment information was compiled in the database, the data were weighted according to the population structure. The weighting for the national sample reflected the probability of selection for each student as a result of the sampling design, adjusted for nonresponse. Through post-stratification, the weighting assured that the representation of certain subpopulations corresponded to figures from the U.S. Census and the Current Population Survey.[13]

The procedure used for sample weighting in the state assessments is similar to that used in national samples. However, there are two important differences. First, because there is no oversampling of high-minority schools in state samples, the weighting process does not need to adjust for such a procedure. Second, Current Population Survey target totals are not available or stable on a state-by-state basis. Therefore, the post-stratification process described above is not utilized in the state program.

13 These procedures are described more fully in the "Weighting and Variance Estimation" section later in this document. For additional information about the use of weighting procedures, see the forthcoming *NAEP 2000 Technical Report.* In addition, the reader may consult the *NAEP 1998 Technical Report* for a discussion of weighting procedures that are common to all NAEP assessments.

Analyses were then conducted to determine the percentages of students who gave various responses to each cognitive and background question. In determining these percentages for the cognitive questions, a distinction was made between missing responses at the end of a block (i.e., missing responses subsequent to the last question the student answered) and missing responses prior to the last observed response. Missing responses before the last observed response were considered intentional omissions. In analysis, omitted responses to multiple-choice items were scored as fractionally correct.[14] For constructed-response items, omitted responses were placed into the lowest score category. Missing responses at the end of the block were considered "not reached" and treated as if the questions had not been presented to the student. In calculating response percentages for each question, only students classified as having been presented the question were included in the denominator of the statistic.

It is standard NAEP practice to treat all nonrespondents to the last question in a block as if they had not reached the question. For multiple-choice and short constructed-response questions, this practice produces a reasonable pattern of results in that the proportion reaching the last question is not dramatically smaller than the proportion reaching the next-to-last question. However, for science blocks that ended with extended constructed-response questions, the standard practice would result in extremely large drops in the proportion of students attempting the final question. Therefore, for blocks ending with an extended constructed-response question, students who answered the next-to-last question but did not respond to the extended constructed-response question were classified as having intentionally omitted the last question.

Item Response Theory (IRT) was used to estimate average science scale scores for the nation and for various subgroups of interest within the nation. IRT models the probability of answering a question in a certain way as a mathematical function of proficiency or skill. The main purpose of IRT analysis is to provide a common scale on which performance can be compared across groups such as those defined by characteristics including gender and race/ethnicity.

In producing the science scales, three distinct IRT models were used. Multiple-choice questions were scaled using the three-parameter logistic (3PL) model; short constructed-response questions rated as acceptable or unacceptable were scaled using the two-parameter logistic (2PL) model; and short constructed-response questions rated according to a three-level rubric, as well as extended constructed-response questions rated on a four- or five-level rubric, were scaled using a Generalized Partial-Credit (GPC) model.[15] Developed by ETS and first used in 1992, the GPC model permits the scaling of questions scored according to multipoint rating

14 Lord, F. M. (1980). *Applications of item response theory to practical testing problems.* Hillsdale, NJ: Lawrence Erlbaum Associates.

15 Muraki, E. (1992). A generalized partial credit model: Application of an EM algorithm. *Applied Psychological Measurement* (*16)*2, 159–176.

schemes. The model takes full advantage of the information available from each of the student response categories used for these more complex constructed-response questions.[16]

The science scale is composed of three types of questions: multiple-choice, short constructed-response (scored either dichotomously or allowing for partial credit), and extended constructed response (scored according to a partial-credit model). One question about the science scales concerns the amount of information contributed by each type of question. Unfortunately, this question has no simple answer for the NAEP science assessment, due to the procedures used to form the composite science scale. The information provided by a given question is determined by the IRT model used to scale the question. It is a function of the item parameters and varies by level of science proficiency.[17] Thus, the answer to the query "How much information do the different types of questions provide?" will differ for each level of science performance. When considering the composite science scale, the answer is even more complicated. The science data are scaled separately by the three fields of science (Earth, physical, and life), resulting in three separate subscales at each grade. The composite scale is a weighted combination of these subscales. IRT information functions are only strictly comparable when the item parameters are estimated together. Because the composite scale is based on three separate estimation runs, there is no direct way to compare the information provided by the questions on the composite scale.

Because of the BIB-spiraling design used by NAEP, students do not receive enough questions about a specific topic to provide reliable information about individual performance. (For more information on BIB-spiraling, see "The Assessment Design" section earlier in this document.) Traditional test scores for individual students, even those based on IRT, would lead to misleading estimates of population characteristics, such as subgroup means and percentages of students at or above a certain scale-score level. Consequently, NAEP constructs sets of plausible values designed to represent the distribution of performance in the population. A plausible value for an individual is not a scale score for that individual, but may be regarded as a representative value from the distribution of potential scale scores for all students in the population with similar characteristics and identical patterns of item response. Statistics describing performance on the NAEP science scale are based on the plausible values. Under the assumptions of the scaling models, these population estimates will be consistent, in the sense that the estimates approach the model-based population values as the sample size increases, which would not be the case for population estimates obtained by aggregating optimal estimates of individual performance.[18]

16 More detailed information regarding the IRT analyses used in NAEP assessments will be provided in a forthcoming technical report on the 2000 NAEP assessments. In addition, the reader may consult the *NAEP 1998 Technical Report* for a discussion of analysis procedures that are common to all NAEP assessments.

17 Donoghue, J. R. (1994). An empirical examination of the IRT information of polytomously scored reading items under the generalized partial credit model. *Journal of Educational Measurement (31)*4, 295–311.

18 For theoretical and empirical justification of the procedures employed, see Mislevy, R. J. (1988). Randomization-based inferences about latent variables from complex samples. *Psychometrika (56)*2, 177–196.

For computational details, see the forthcoming *NAEP 2000 Technical Report*.

Item Mapping Procedures

The science performance of fourth-, eighth-, and twelfth-graders can be illustrated by maps that position question or "item" descriptions along the NAEP science scale at each grade where questions are likely to be answered successfully by students. The descriptions used on these maps focus on the science knowledge or skill needed to answer the question. For multiple-choice questions, the description indicates the knowledge or skill demonstrated by selection of the correct option; for constructed-response questions, the description takes into account the knowledge or skill specified by the different levels of scoring criteria for that question.

To map questions to particular points on the NAEP science scale, a response probability convention was adopted that would divide those who had a higher probability of success from those who had a lower probability. Establishing a response probability convention has an impact on the mapping of the test questions onto the science scale. A lower boundary convention maps the science questions at lower points along the scale, and a higher boundary convention maps the same questions at higher points on the scale. The underlying distribution of science skills in the population does not change, but the choice of a response probability convention does have an impact on the proportion of the student population that is reported as "able to do" the questions on the science scales.

There is no obvious choice of a point along the probability scale that is clearly superior to any other point. If the convention were set with a boundary at 50 percent, those above the boundary would be more likely to get a question right than get it wrong, while those below the boundary would be more likely to get the question wrong than right. Although this convention has some intuitive appeal, it was rejected on the grounds that having a 50/50 chance of getting the question right shows an insufficient degree of mastery. If the convention were set with a boundary at 80 percent, students above the criterion would have a high probability of success with an question. However, many students below this criterion show some level of science ability that would be ignored by such a stringent criterion. In particular, those in the range between 50 and 80 percent correct would be more likely to get the question right than wrong, yet would not be in the group described as "able to do" the question.

In a compromise between the 50 percent and the 80 percent conventions, NAEP has adopted two related response probability conventions: 74 percent for multiple-choice questions with four response options (to correct for the possibility of answering correctly by guessing), and 65 percent for constructed-response questions (where guessing is not a factor). These probability conventions were established, in part, based on an intuitive judgment that they would provide the best picture of students' science skills.

Some additional support for the dual conventions adopted by NAEP was provided by Huynh.[19] He examined the IRT information provided by items, according to the IRT model used in scaling NAEP questions. ("Information" is used here in a technical sense. See the forthcoming *NAEP 2000 Technical Report* for details.) Following Bock, Huynh decomposed the item information into that provided by a correct response [P(q) I(q)] and that provided by an incorrect response [(1- P(q)) I(q)].[20] Huynh showed that the item information provided by a correct response to a constructed-response item is maximized at the point along the science scale at which the probability of a correct response is two-thirds (for multiple-choice items, the information provided by a correct response is maximized at the point at which the probability of getting the item correct is 0.74). It should be noted, however, that maximizing the item information I(q), rather than the information provided by a correct response [P(q) I(q)], would imply an item mapping criterion closer to 50 percent.

Results are presented in terms of the composite science scale. However, the science assessment was scaled separately for the three fields of science at grades 4, 8, and 12. The composite scale is a weighted combination of the three subscales for the three fields of science. To obtain item map information, a procedure developed by Donoghue was used.[21] This method models the relationship between the item response function for the subscale and the subscale structure to derive the relationship between the item score and the composite scale (i.e., an item response function for the composite scale). This item response function is then used to derive the probability used in the mapping.

Weighting and Variance Estimation

A multistage sampling design was used to select the students who were assessed. The properties of a sample selected through such a design could be very different from those of a simple random sample, in which every student in the target population has an equal chance of selection and in which the observations from different sampled students can be considered to be statistically independent of one another. Therefore, the properties of the sample for the data collection design were taken into account during the analysis of the assessment data.

One way that the properties of the sample design were addressed was by using sampling weights to account for the fact that the probabilities of selection were not identical for all students. All population and subpopulation characteristics based on the assessment data were estimated using sampling weights. These weights included adjustments for school and student nonresponse.

Not only must appropriate estimates of population characteristics be derived, but appropriate measures of the degree of uncertainty must be obtained for those statistics. Two components of uncertainty

[19] Huynh, H. (1994, October). *Some technical aspects of standard setting.* Paper presented at the Joint Conference on Standard Setting for Large-Scale Assessment, Washington, DC.

[20] Bock, R. D. (1972). Estimating item parameters and latent ability when responses are scored in two or more latent categories. *Psychometrika*, 37, 29–51.

[21] Donoghue, J. R. (1997, March). *Item mapping to a weighted composite scale.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

are accounted for in the variability of statistics based on student ability: 1) the uncertainty due to sampling only a relatively small number of students, and 2) the uncertainty due to sampling only a relatively small number of cognitive questions. The first component accounts for the variability associated with the estimated percentages of students who had certain background characteristics or who answered a certain cognitive question correctly.

Because NAEP uses multistage sampling procedures, conventional formulas for estimating sampling variability that assume simple random sampling are inappropriate. NAEP uses a jackknife replication procedure to estimate standard errors. The jackknife standard error provides a reasonable measure of uncertainty for any student information that can be observed without error. However, because each student typically responds to only a few questions within any field of science, the scale score for any single student would be imprecise. In this case, plausible values methodology can be used to describe the performance of groups and subgroups of students, but the underlying imprecision involved in this step adds another component of variability to statistics based on NAEP scale scores.[22]

Typically, when the standard error is based on a small number of students or when the group of students is enrolled in a small number of schools, the amount of uncertainty associated with the estimation of standard errors may be quite large. Estimates of standard errors subject to a large degree of uncertainty are followed by the "!" symbol to indicate that the nature of the sample does not allow accurate determination of the variability of the statistic. In such cases, the standard errors—and any confidence intervals or significance tests involving these standard errors—should be interpreted cautiously. Additional details concerning procedures for identifying such standard errors are discussed in the forthcoming *NAEP 2000 Technical Report*.

The reader is reminded that, as with findings from all surveys, NAEP results are subject to other kinds of error, including the effects of imperfect adjustment for student and school nonresponse and unknowable effects associated with the particular instrumentation and data collection methods. Nonsampling errors can be attributed to a number of sources—inability to obtain complete information about all selected schools in the sample (some students or schools refused to participate, or students participated but answered only certain questions); ambiguous definitions; differences in interpreting questions; inability or unwillingness to give correct background information; mistakes in recording, coding, or scoring data; and other errors in collecting, processing, sampling, and estimating missing data. The extent of nonsampling error is difficult to estimate and, because of their nature, the impact of such errors cannot be reflected in the data-based estimates of uncertainty provided in NAEP reports.

22 For further details, see Johnson, E. G., & Rust, K. F. (1992). Population inferences and variance estimation for NAEP data. *Journal of Educational Statistics* (*17*)2, 175–190.

Drawing Inferences from the Results

The reported statistics are estimates and are therefore subject to a measure of uncertainty. There are two sources of such uncertainty. First, NAEP uses a sample of students rather than testing all students. Second, all assessments have some amount of uncertainty related to the fact that they cannot ask all questions that might be asked in a content area. The magnitude of this uncertainty is reflected in the standard error of each of the estimates. When the percentages or average scale scores of certain groups are compared, the standard error should be taken into account, and observed similarities or differences should not be relied on solely. Therefore, the comparisons are based on statistical tests that consider the standard errors of those statistics and the magnitude of the difference among the averages or percentages.

Using confidence intervals based on the standard errors provides a way to take into account the uncertainty associated with sample estimates and to make inferences about the population averages and percentages in a manner that reflects that uncertainty. An estimated sample average scale score plus or minus 1.96 standard errors approximates a 95 percent confidence interval for the corresponding population quantity. This statement means that one can conclude with approximately a 95 percent level of confidence that the average performance of the entire population of interest (e.g., all fourth-grade students in public and nonpublic schools) is within plus or minus 1.96 standard errors of the sample average.

As an example, suppose that the average science scale score of the students in a particular group was 156 with a standard error of 1.2. A 95 percent confidence interval for the population quantity would be as follows:

$$\text{Average} \pm 1.96 \text{ standard errors}$$
$$156 \pm 1.96 \times 1.2$$
$$156 \pm 2.35$$
$$(153.65, 158.35)$$

Thus, one can conclude with a 95 percent level of confidence that the average scale score for the entire population of students in that group is between 153.65 and 158.35. It should be noted that this example, and the examples in the following sections are illustrative. More precise estimates carried out to one or more decimal places are used in the actual analyses.

Similar confidence intervals can be constructed for percentages, if the percentages are not extremely large or extremely small. Extreme percentages should be interpreted with caution. Adding or subtracting the standard errors associated with extreme percentages could cause the confidence interval to exceed 100 percent or go below 0 percent, resulting in numbers that are not meaningful. The forthcoming *NAEP 2000 Technical Report* will contain a more complete discussion of extreme percentages.

Analyzing Group Differences in Averages and Percentages

Statistical tests determine whether the evidence, based on the data from the groups in the sample, is strong enough to conclude that the averages or percentages are actually different for those groups in the population. If the evidence is strong (i.e., the difference is statistically significant), the report describes the group averages or percentages as being different (e.g., one group performed higher than or lower than another group), regardless of whether the sample averages or percentages appear to be approximately the same.

The reader is cautioned to rely on the results of the statistical tests rather than on the apparent magnitude of the difference between sample averages or percentages when determining whether the sample differences are likely to represent actual differences among the groups in the population.

To determine whether a real difference exists between the average scale scores (or percentages of a certain attribute) for two groups in the population, one needs to obtain an estimate of the degree of uncertainty associated with the difference between the averages (or percentages) of these groups for the sample. This estimate of the degree of uncertainty, called the "standard error of the difference" between the groups, is obtained by taking the square of each group's standard error, summing the squared standard errors, and taking the square root of that sum.

Standard Error of the Difference =

$$SE_{A-B} = \sqrt{(SE_A{}^2 + SE_B{}^2)}$$

Similar to how the standard error for an individual group average or percentage is used, the standard error of the difference can be used to help determine whether differences among groups in the population are real. The difference between the averages or percentages of the two groups plus or minus 1.96 standard errors of the difference represents an approximate 95 percent confidence interval. If the resulting interval includes zero, there is insufficient evidence to claim a real difference between the groups in the population. If the interval does not contain zero, the difference between the groups is statistically significant (different) at the 0.05 level.

As an example of comparing groups, consider the problem of determining whether the average science scale score of group A is higher than that of group B. Suppose that the sample estimates of the average scale scores and standard errors were as follows:

Group	Average Scale Score	Standard Error
A	218	0.9
B	216	1.1

The difference between the estimates of the average scale scores of groups A and B is two points (218 - 216). The standard error of this difference is

$$\sqrt{(0.9^2 + 1.1^2)} = 1.4$$

Thus, an approximate 95 percent confidence interval for this difference is plus or minus two standard errors of the difference

$$2 \pm 1.96 \times 1.4$$

$$2 \pm 2.74$$

$$(-0.74, 4.74)$$

The value zero is within the confidence interval; therefore, there is insufficient evidence to claim that group A outperformed group B.

Conducting Multiple Tests

The procedures in the previous section and the certainty ascribed to intervals (e.g., a 95 percent confidence interval) are based on statistical theory that assumes that only one confidence interval or test of statistical significance is being performed. However, many different groups are being compared (i.e., multiple sets of confidence intervals are being analyzed). In sets of confidence intervals, statistical theory indicates that the certainty associated with the entire set of intervals is less than that attributable to each individual comparison from the set. To hold the significance level for the set of comparisons at a particular level (e.g., 0.05), adjustments (called "multiple comparison procedures"[23]) must be made to the methods described in the previous section. One such procedure, the False Discovery Rate (FDR) procedure[24] was used to control the certainty level.

Unlike the other multiple comparison procedures (e.g., the Bonferroni procedure) that control the familywise error rate (i.e., the probability of making even one false rejection in the set of comparisons), the FDR procedure controls the expected proportion of falsely rejected hypotheses. Furthermore, familywise procedures are considered conservative for large families of comparisons.[25] Therefore, the FDR procedure is more suitable for multiple comparisons in NAEP than other procedures. A detailed description of the FDR procedure appears in the forthcoming *NAEP 2000 Technical Report*.

To illustrate how the FDR procedure is used, consider the comparisons of current and previous years' average science scale scores for the five groups presented in table A.12. Note that the difference in average scale scores and the standard error of the difference are calculated in a way comparable with that of the example in the previous section. The test statistic shown is the difference in average scale scores divided by the standard error of the difference.

The difference in average scale scores and its standard error can be used to find an approximate 95 percent confidence interval as in the example in the previous section or they can be used to identify a confidence percentage. In the example in the previous section, because an approximate 95 percent confidence interval was desired, the number 1.96 was used to multiply the standard error of the difference to create the approximate confidence interval. In the current example, the confidence interval for the test statistics is identified from statistical tables. Instead of checking to see if zero is within the 95 percent confidence interval about the mean, the significance level from the statistical tables can be directly compared to 100-95 = 5 percent.

If the comparison of average scale scores across two years were made for only one of the five groups, there would be a significant difference between the average scale scores for the two years if the significance level were less than 5 percent. However, because

23 Miller, R. G. (1966). *Simultaneous statistical inference*. New York, NY: Wiley.

24 Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society, Series B, No. 1.*, pp 289–300.

25 Williams, V. S. L., Jones, L. V., & Tukey, J. W. (1994, December). *Controlling error in multiple comparisons with special attention to the National Assessment of Educational Progress.* Research Triangle Park, NC: National Institute of Statistical Sciences.

we are interested in the difference in average scale scores across the two years for all five of the groups, comparing each of the significance levels to 5 percent is not adequate. Groups of students defined by shared characteristics, such as race/ethnicity groups, are treated as sets or families when making comparisons. However, comparisons of average scale scores for each pair of years were treated separately. So the steps described in this example would be replicated for the comparison of other current and previous year average scale scores.

To use the FDR procedure to take into account that all comparisons are of interest to us, the percents of confidence in the example are ordered from largest to smallest: 62, 35, 20, 4, and 1. In the FDR procedure, 62 percent confidence for the Group 4 comparison would be compared to 5 percent, 35 percent for the Group 5 comparison would be compared to 0.05*(5-1)/5 = 0.04 = 4 percent,[26] 20 percent for the Group 1 comparison would be compared to 0.05*(5-2)/5 = 0.03 = 3 percent, 4 percent for the Group 3 comparison would be compared to 0.05*(5-3)/5 = 0.02 = 2 percent, and 1 percent for the Group 2 comparison (actually slightly smaller than 1 prior to rounding) would be compared to 0.05*(5-4)/5 = 0.01 = 1 percent. The last of these comparisons is the only one for which the percent confidence is smaller than the FDR procedure value. The difference in the current year and previous years' average scale scores for the Group 2 students is significant; for all of the other groups, average scale scores for current and previous year are not significantly different from one another. In practice, a very small number of counterintuitive results occur when using the FDR procedures to examine between-year differences in subgroup results by jurisdiction. In those cases, results were not included in this report. NCES is continuing to evaluate the use of FDR and multiple-comparison procedures for future reporting.

Table A.12

FDR comparisons of average scale scores for different groups of students

	Previous year		Current year		Previous year and current year			
	Average scale score	Standard error	Average scale score	Standard error	Difference in averages	Standard error of difference	Test statistic	Percent confidence*
Group 1	224	1.3	226	1.0	2.08	1.62	1.29	20
Group 2	187	1.7	193	1.7	6.31	2.36	2.68	1
Group 3	191	2.6	197	1.7	6.63	3.08	2.15	4
Group 4	229	4.4	232	4.6	3.24	6.35	.51	62
Group 5	201	3.4	196	4.7	-5.51	5.81	-.95	35

* The percent confidence is 2(1−F(x)) where F(x) is the cumulative distribution of the t-distribution with the degrees of freedom adjusted to reflect the complexities of the sample design.

[26] The level of confidence times the number of comparisons minus one divided by the number of comparisons is 0.05*(5–1)/5 = 0.04 = 4 percent.

NAEP Reporting Groups

Results are provided for groups of students defined by shared characteristics—region of the country, gender, race or ethnicity, school's type of location, eligibility for the free/reduced-price school lunch program, and type of school. Based on participation rate criteria, results are reported for subpopulations only when sufficient numbers of students and adequate school representation are present. The minimum requirement is at least 62 students in a particular subgroup from at least five primary sampling units (PSUs).[27] However, the data for all students, regardless of whether their subgroup was reported separately, were included in computing overall results. Definitions of the subpopulations are presented below.

Region

Results in NAEP are reported for four regions of the nation: Northeast, Southeast, Central, and West. Figure A.2 shows how states are subdivided into these NAEP regions. All 50 states and the District of Columbia are listed. Other jurisdictions, including territories and the two Department of Defense Educational Activities jurisdictions are not assigned to any region.

Figure A.2

States included in the four NAEP regions

Northeast	Southeast	Central	West
Connecticut	Alabama	Illinois	Alaska
Delaware	Arkansas	Indiana	Arizona
District of Columbia	Florida	Iowa	California
Maine	Georgia	Kansas	Colorado
Maryland	Kentucky	Michigan	Hawaii
Massachusetts	Louisiana	Minnesota	Idaho
New Hampshire	Mississippi	Missouri	Montana
New Jersey	North Carolina	Nebraska	Nevada
New York	South Carolina	North Dakota	New Mexico
Pennsylvania	Tennessee	Ohio	Oklahoma
Rhode Island	*Virginia	South Dakota	Oregon
Vermont	West Virginia	Wisconsin	Texas
*Virginia			Utah
			Washington
			Wyoming

* The part of Virginia that is included in the Northeast region is the Washington, DC metropolitan area; the remainder of the state is included in the Southeast region.

27 For the national assessment, a PSU is a selected geographic region (a county, group of counties, or metropolitan statistical area). For the state assessment program, a PSU is most often a single school. Further details about the procedure for determining minimum sample size appear in the *NAEP 1996 Technical Report* and the forthcoming *NAEP 2000 Technical Report*.

Gender

Results are reported separately for males and females.

Race/Ethnicity

The race/ethnicity variable is derived from two questions asked of students and from school records, and it is used for race/ethnicity subgroup comparisons. Two questions from the set of general student background questions were used to determine race/ethnicity:

If you are Hispanic, what is your Hispanic background?

- ❏ I am not Hispanic
- ❏ Mexican, Mexican American, or Chicano
- ❏ Puerto Rican
- ❏ Cuban
- ❏ Other Spanish or Hispanic background

Students who responded to this question by filling in the second, third, fourth, or fifth oval were considered Hispanic. For students who filled in the first oval, did not respond to the question, or provided information that was illegible or could not be classified, responses to the following question were examined to determine their race/ethnicity.

Which best describes you?

- ❏ White (not Hispanic)
- ❏ Black (not Hispanic)
- ❏ Hispanic ("Hispanic" means someone who is Mexican, Mexican American, Chicano, Puerto Rican, Cuban, or other Spanish or Hispanic background)
- ❏ Asian or Pacific Islander ("Asian or Pacific Islander" means someone who is from a Chinese, Japanese, Korean, Filipino, Vietnamese, Asian American or some other Asian or Pacific Islander background.)
- ❏ American Indian or Alaskan Native ("American Indian or Alaskan Native" means someone who is from one of the American Indian tribes or one of the original people of Alaska.)
- ❏ Other (specify) ____________________

Students' race/ethnicity was then assigned on the basis of their responses. For students who filled in the sixth oval ("Other"), provided illegible information or information that could not be classified, or did not respond at all, race/ethnicity was assigned as determined by school records.

Race/ethnicity could not be determined for students who did not respond to either of the demographic questions and whose schools did not provide information about race/ethnicity.

Also, some students indicated that they were from a Hispanic background (e.g., Puerto Rican or Cuban) and that a racial/ethnic category other than Hispanic best described them. These students were classified as Hispanic based on the rules described above.

Type of Location

Results from the 2000 assessment are reported for students attending schools in three mutually exclusive location types: central city, urban fringe/large town, and rural/small town:

Central City: This category includes central cities of all Standard Metropolitan Statistical Areas (SMSA) as defined by the Office of Management and Budget. Central City is a geographical term and is not synonymous with "inner city."

Urban Fringe/Large Town: The urban fringe category includes all densely settled places and areas within SMSA's that are classified as urban by the Bureau of the Census, but which do not qualify as Central City. A Large Town is defined as a place outside a SMSA with a population greater than or equal to 25,000.

Rural/Small Town: Rural includes all places and areas with populations of less than 2,500 that are classified as rural by the Bureau of the Census. A Small Town is defined as a place outside a SMSA with a population of less than 25,000, but greater than or equal to 2,500.

Results for each type of location are not compared across years. This was due to new methods used by NCES to identify the type of location assigned to each school in the Common Core of Data (CCD). The new methods were put into place by NCES in order to improve the quality of the assignments and they take into account more information about the exact physical location of the school.

Eligibility for the Free/Reduced-Price School Lunch Program

Based on available school records, students were classified as either currently eligible for the free/reduced-price school lunch component of the Department of Agriculture's National School Lunch Program or not eligible. Eligibility for the program is determined by students' family income in relation to the federally established poverty level. Free lunch qualification is set at 130 percent of the poverty level, and reduced-price lunch qualification is set at 170 percent of the poverty level. The classification applies only to the school year when the assessment was administered (i.e., the 1999–2000 school year) and is not based on eligibility in previous years. If school records were not available, the student was classified as "Information not available." If the school did not participate in the program, all students in that school were classified as "Information not available."

Type of School

Results are reported by the type of school that the student attends—public or nonpublic. Nonpublic schools include Catholic and other private schools.[28] Because they are funded by federal authorities, not state/local governments, Bureau of Indian Affairs (BIA) schools and Department of Defense Domestic Dependent Elementary and Secondary Schools (DDESS) are not included in either the public or nonpublic categories; they are included in the overall national results.

Grade 12 Participation Rates and Motivation

NAEP has been described as a "low-stakes" assessment. That is, students receive no individual scores, and their NAEP performance has no effect on their grades, promotions, or graduation. There has been continued concern that this lack of consequences affects participation rates of students and schools, as well as the motivation of students to perform well on NAEP. Of particular concern has been the performance of twelfth-graders, who typically have lower student participation rates than fourth- and eighth-graders, and who are more likely to omit responses compared to the younger cohorts.

Participation Rates

In NAEP, there has been a consistent pattern of lower participation rates for older students. In the 2000 NAEP assessments, for example, the student participation rates were 96 percent and 92 percent at grades 4 and 8, respectively. At grade 12, however, the participation rate was 76 percent. School participation rates (the percentage of sampled schools that participated in the assessment) have also typically decreased with grade level. Again citing the 2000 assessments, the school participation rate was 88 percent for the fourth grade, 85 percent for the eighth grade, and 82 percent for the twelfth grade.

The effect of participation rates on student performance, however, is unclear. Students may choose not to participate in NAEP for many reasons, such as desire to attend regular classes so as not to miss important instruction or conflict with other school-based activities. Similarly, there are a variety of reasons for which various schools do not participate. The sampling weights and nonresponse adjustments, described earlier in this document, provide an approximate statistical adjustment for nonparticipation. However, the effect of some school and student nonparticipation may have some undetermined effect on results.

28 Through a pilot study, more detailed breakdowns of nonpublic school results are available on the NAEP web site (http://nces.ed.gov/nationsreportcard/science/results/index.asp).

Motivation

To the extent that students in the NAEP sample are not trying their hardest, NAEP results may underestimate student performance. The concern increases as students get older, and may be particularly pronounced for twelfth-graders. The students themselves furnish some evidence about their motivation. As part of the background questions, students were asked how important it was to do well on the NAEP science assessment. They were asked to indicate whether it was very important, important, somewhat important, or not very important to them. The percentage of students indicating they thought it was either important or very important to do well was 89 percent for fourth-graders, 58 percent for eighth-graders, and 31 percent for twelfth-graders.

It is also interesting to note that students who indicated it was very important for them to do well on NAEP did not have the highest average scores. In fact, at grades 8 and 12, students who reported it was not very important to do well also had higher average scores than those who reported it was very important to do well. These data further cloud the relationship between motivation and performance on NAEP.

Need for Future Research

More research is needed to delineate the factors that contribute to nonparticipation and lack of motivation. To that end, NCES is currently investigating how various types of incentives can be effectively used to increase participation in NAEP. One report that examines the impact of monetary incentives on student effort and performance is available on the NCES web site at http://nces.ed.gov/pubsearch/. Enter NCES#: 2001024.

Cautions in Interpretations

As described earlier, the NAEP science scale makes it possible to examine relationships between students' performance and various background factors measured by NAEP. However, a relationship that exists between achievement and another variable does not reveal its underlying cause, which may be influenced by a number of other variables. Similarly, the assessments do not capture the influence of unmeasured variables. The results are most useful when they are considered in combination with other knowledge about the student population and the educational system, such as trends in instruction, changes in the school-age population, and societal demands and expectations.

Appendix B
Data Appendix

This appendix contains complete data for all the tables and figures presented in this report, including average scores, achievement-level results, and percentages of students. In addition, standard errors appear in parentheses next to each scale score and percentage. The comparisons presented in this report are based on statistical tests that consider the magnitude of the difference between group averages or percentages and the standard errors of those statistics. Because NAEP scores and percentages are based on samples rather than the entire population(s), the results are subject to a measure of uncertainty reflected in the standard errors of the estimates. It can be said with 95 percent certainty that for each population of interest, the value for the whole population is approximately within plus or minus two standard errors of the estimate for the sample. As with the figures and tables in the chapters, significant differences between results of previous assessments and the 2000 assessment are highlighted.

Appendix Focus

Complete data for all tables and figures.

Appendix Contents

Average Scores

Achievement-level results

Percentages of Students

Standard Errors

Table B.1: Data for Table 1.1 Sample Question 1 Results (Multiple-Choice)

Overall percentage correct and percentages correct within each achievement-level range: 2000

Grade 4	Percentage correct within achievement-level intervals		
Overall percentage correct †	*Basic* 138–169*	*Proficient* 170–204*	*Advanced* 205 and above*
55 (1.5)	55 (3.1)	75 (2.7)	90 (4.7)

† Includes fourth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.2: Data for Table 1.2 Sample Question 2 Results (Short Constructed-Response)

Overall percentage "Complete" and percentages "Complete" within each achievement-level range: 2000

Grade 4	Percentage "Complete" within achievement-level intervals		
Overall percentage "Complete" †	*Basic* 138–169*	*Proficient* 170–204*	*Advanced* 205 and above*
28 (1.5)	26 (2.3)	45 (3.8)	65 (12.2)

† Includes fourth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.3: Data for Table 1.3 Sample Question 3 Results (Short Constructed-Response)

Overall percentage "Complete" and percentages "Complete" within each achievement-level range: 2000

Grade 4	Percentage "Complete" within achievement-level intervals		
Overall percentage "Complete" †	*Basic* 138–169*	*Proficient* 170–204*	*Advanced* 205 and above*
5 (0.5)	4 (0.9)	10 (2.1)	23 (7.6)

† Includes fourth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.4: Data for Table 1.4 Sample Question 4 Results (Multiple-Choice)

Overall percentage correct and percentages correct within each achievement-level range: 2000

Grade 8	Percentage correct within achievement-level intervals		
Overall percentage correct †	*Basic* 143–169*	*Proficient* 170–207*	*Advanced* 208 and above*
59 (1.5)	59 (3.1)	71 (2.7)	81 (6.1)

†Includes eighth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.5: Data for Table 1.5 Sample Question 5 Results (Short Constructed-Response)

Overall percentage "Complete" and percentages "Complete" within each achievement-level range: 2000

Grade 8	Percentage "Complete" within achievement-level intervals		
Overall percentage "Complete" †	*Basic* 143–169*	*Proficient* 170–207*	*Advanced* 208 and above*
28 (1.3)	28 (2.8)	47 (2.8)	71 (8.7)

†Includes eighth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.6: Data for Table 1.6 Sample Question 6 Results (Extended Constructed-Response)

Overall percentage "Essential" or better and percentages "Essential" or better within each achievement-level range: 2000

Grade 8	Percentage "Essential" or better within achievement-level intervals		
Overall percentage "Essential" or better†	*Basic* 143–169*	*Proficient* 170–207*	*Advanced* 208 and above*
24 (1.0)	23 (2.4)	40 (2.9)	67 (7.9)

†Includes eighth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.7: Data for Table 1.7 Sample Question 7 Results (Multiple-Choice)

Overall percentage correct and percentages correct within each achievement-level range: 2000

Grade 12	Percentage correct within achievement-level intervals		
Overall percentage correct †	*Basic* 146–177*	*Proficient* 178–209*	*Advanced* 210 and above*
41 (1.3)	43 (2.6)	60 (3.3)	75 (10.6)

†Includes twelfth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.8: Data for Table 1.8 Sample Question 8 Results (Extended Constructed-Response)

Overall percentage "Essential" or better and percentages "Essential" or better within each achievement-level range: 2000

Grade 12	Percentage "Essential" or better within achievement-level intervals		
Overall percentage "Essential" or better †	*Basic* 146–177*	*Proficient* 178–209*	*Advanced* 210 and above*
19 (1.5)	18 (1.9)	58 (4.3)	89 (7.7)

†Includes twelfth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.9: Data for Table 1.9 Sample Question 9 Results (Extended Constructed-Response)

Overall percentage "Essential" or better and percentages "Essential" or better within each achievement level range: 2000

Grade 12	Percentage "Essential" or better within achievement-level intervals		
Overall percentage "Essential" or better †	*Basic* 146–177*	*Proficient* 178–209*	*Advanced* 210 and above*
22 (1.5)	24 (2.7)	44 (3.7)	56 (13.7)

†Includes twelfth-grade students who were below the *Basic* level.
*NAEP Science composite scale range.
Standard errors of the estimated percentages appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.10: Data for Figure 2.1 National Scale Score Results

National average science scale scores, grades 4, 8, and 12: 1996 and 2000

	Grade 4	Grade 8	Grade 12
1996	150 (0.8)	150 (0.9)	150 (0.9)*
2000	150 (0.7)	151 (0.6)	147 (1.0)

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.11: Data for Figure 2.2: National Performance Distribution

National science scale score percentiles, grades 4, 8, and 12: 1996 and 2000

		Mean	10th	25th	50th	75th	90th
Grade 4	1996	150 (0.8)	105 (2.2)	130 (1.2)	153 (0.9)	173 (0.7)	190 (1.7)
	2000	150 (0.7)	105 (1.2)	129 (0.7)	153 (0.8)	174 (0.8)	191 (0.8)
Grade 8	1996	150 (0.9)	104 (1.0)	128 (1.0)	153 (1.2)	174 (1.5)	192 (1.5) *
	2000	151 (0.6)	103 (1.2)	128 (0.8)	154 (1.0)	177 (0.8)	195 (0.6)
Grade 12	1996	150 (0.9) *	104 (1.1)	128 (1.2)	152 (1.1) *	174 (1.2)	191 (1.2)
	2000	147 (1.0)	102 (1.2)	125 (1.1)	148 (1.0)	171 (1.3)	190 (1.1)

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.12: Data for Figure 2.3: National Achievement-Level Results

Percentage of students within each science achievement-level range and at or above achievement levels, grades 4, 8, and 12: 1996 and 2000

		Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4	1996	33 (1.2)	38 (0.8)	26 (0.9)	3 (0.4)	67 (1.2)	29 (0.9)
	2000	34 (0.8)	37 (0.7)	26 (0.7)	4 (0.3)	66 (0.8)	29 (0.8)
Grade 8	1996	39 (1.1)	32 (0.7) *	26 (1.1)	3 (0.5)	61 (1.1)	29 (1.2) *
	2000	39 (0.8)	29 (0.5)	28 (0.7)	4 (0.4)	61 (0.8)	32 (0.8)
Grade 12	1996	43 (1.1) *	36 (1.0)	19 (1.0)	3 (0.3)	57 (1.1) *	21 (1.1)
	2000	47 (1.1)	34 (0.7)	16 (0.9)	2 (0.3)	53 (1.1)	18 (1.0)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.13: Data for Figure 2.4 National Scale Score Results by Region

Percentage of students and average science scale score results by region of the country, grades 4, 8, and 12: 1996 and 2000

		Northeast	Southeast	Central	West
Grade 4	1996	22 (1.5) 156 (1.8)	22 (1.7) 143 (2.0)	26 (1.3) 156 (2.1)	30 (1.9) 146 (2.0)
	2000	23 (0.8) 153 (1.1)	23 (1.2) 143 (1.7)	24 (0.5) 155 (1.8)	30 (1.2) 148 (1.5)
Grade 8	1996	22 (1.6) 151 (2.6)	22 (2.2) 143 (1.9)	24 (0.5) 156 (2.5)	32 (2.4) 149 (2.2)
	2000	22 (0.5) 153 (1.5)	21 (0.5) 145 (1.4)	25 (0.4) 158 (1.6)	32 (0.7) 148 (1.3)
Grade 12	1996	22 (1.3) 154 (2.8)	21 (1.8) 142 (1.4)	24 (0.9) 158 (2.0) *	33 (1.8) 147 (2.3)
	2000	21 (1.2) 151 (2.9)	22 (1.5) 141 (1.6)	26 (0.5) 150 (1.7)	32 (1.4) 145 (1.9)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
* Significantly different from 2000.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.14: Data for Figure 2.5: National Achievement-Level Results by Region

Percentage of students within each science achievement-level range and at or above achievement levels, by region of the country, grades 4, 8, and 12: 1996 and 2000

			Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4	Northeast	1996	26 (2.4)	39 (1.6)	31 (2.3)	4 (0.9)	74 (2.4)	36 (2.3)
		2000	30 (1.4)	38 (1.3)	28 (1.9)	4 (0.8)	70 (1.4)	32 (1.7)
	Southeast	1996	43 (2.5)	34 (1.6)	21 (1.5)	2 (0.5)	57 (2.5)	23 (1.8)
		2000	41 (1.9)	35 (1.6)	21 (1.3)	2 (0.5)	59 (1.9)	23 (1.2)
	Central	1996	26 (3.2)	41 (2.5)	30 (2.0)	4 (0.6)	74 (3.2)	34 (2.0)
		2000	27 (1.9)	39 (2.0)	30 (2.1)	5 (0.9)	73 (1.9)	35 (2.4)
	West	1996	37 (3.0)	39 (1.7)	21 (2.0)	2 (0.6)	63 (3.0)	24 (2.2)
		2000	36 (1.8)	36 (1.5)	25 (1.7)	3 (0.5)	64 (1.8)	28 (1.8)
Grade 8	Northeast	1996	38 (3.2)	32 (1.9)	27 (2.7)	3 (1.1)	62 (3.2)	30 (3.5)
		2000	37 (1.8)	28 (1.6)	30 (1.7)	5 (0.9)	63 (1.8)	35 (1.9)
	Southeast	1996	47 (2.6)	30 (1.4)	21 (1.7)	2 (0.3) *	53 (2.6)	22 (1.8)
		2000	45 (1.8)	29 (1.1)	23 (1.3)	3 (0.5)	55 (1.8)	26 (1.4)
	Central	1996	32 (2.8)	33 (1.7)	31 (2.7)	5 (1.1)	68 (2.8)	35 (3.1)
		2000	31 (2.2)	31 (1.8)	34 (1.5)	5 (0.8)	69 (2.2)	38 (1.9)
	West	1996	39 (2.5)	34 (1.3) *	25 (2.0)	3 (1.0)	61 (2.5)	28 (2.3)
		2000	43 (1.6)	28 (1.1)	25 (1.3)	3 (0.5)	57 (1.6)	29 (1.3)
Grade 12	Northeast	1996	40 (3.5)	34 (1.6)	22 (2.4)	4 (0.8)	60 (3.5)	26 (2.8)
		2000	43 (3.6)	34 (2.4)	19 (2.2)	4 (0.9)	57 (3.6)	23 (3.0)
	Southeast	1996	53 (1.8)	33 (1.5)	13 (1.2)	1 (0.4)	47 (1.8)	14 (1.3)
		2000	54 (1.9)	32 (1.2)	13 (1.2)	1 (0.3)	46 (1.9)	14 (1.2)
	Central	1996	33 (2.4) *	39 (2.1)	24 (2.1)	4 (0.6)	67 (2.4) *	28 (2.2) *
		2000	44 (2.2)	37 (1.5)	17 (1.9)	2 (0.7)	56 (2.2)	19 (1.9)
	West	1996	46 (2.8)	37 (2.3)	15 (1.7)	2 (0.7)	54 (2.8)	17 (2.3)
		2000	49 (2.1)	34 (1.3)	16 (1.3)	2 (0.4)	51 (2.1)	18 (1.5)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.15: Data for Table 2.1 State Average Score Results, Grade 4

Average science scale score results by state for grade 4 public schools: 2000

Nation	148 (0.8)
Alabama	143 (1.7)
Arizona	141 (1.4)
Arkansas	144 (1.7)
California †	131 (2.0)
Connecticut	156 (1.3)
Georgia	143 (1.4)
Hawaii	136 (1.4)
Idaho †	153 (1.5)
Illinois †	151 (1.6)
Indiana †	155 (1.6)
Iowa †	160 (1.4)
Kentucky	152 (1.1)
Louisiana	139 (1.9)
Maine †	161 (1.0)
Maryland	146 (1.3)
Massachusetts	162 (1.2)
Michigan †	154 (1.8)
Minnesota †	157 (1.5)
Mississippi	133 (1.4)
Missouri	156 (1.6)
Montana †	160 (2.1)
Nebraska	150 (1.8)
Nevada	142 (1.3)
New Mexico	138 (2.0)
New York †	149 (1.4)
North Carolina	148 (1.4)
North Dakota	160 (0.8)
Ohio †	154 (1.6)
Oklahoma	152 (1.4)
Oregon †	150 (1.9)
Rhode Island	148 (1.5)
South Carolina	141 (1.2)
Tennessee	147 (1.5)
Texas	147 (1.6)
Utah	155 (1.1)
Vermont †	159 (1.7)
Virginia	156 (1.6)
West Virginia	150 (1.1)
Wyoming	158 (1.1)
Other Jurisdictions	
American Samoa	51 (1.7)
DDESS	157 (0.7)
DoDDS	156 (0.5)
Guam	110 (2.3)
Virgin Islands	116 (1.1)

Standard errors of the estimated scale scores appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: National results are based on the national sample, not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.16: Data for Table 2.2 State Average Score Results, Grade 8

Average science scale score results by state for grade 8 public schools: 1996 and 2000

	1996	2000
Nation	148 (0.9)	149 (0.7)
Alabama	139 (1.6)	141 (1.9)
Arizona †	145 (1.6)	146 (1.6)
Arkansas	144 (1.3)	143 (1.3)
California †	138 (1.7) *	132 (1.5)
Connecticut	155 (1.3)	154 (1.4)
Georgia	142 (1.4)	144 (1.5)
Hawaii	135 (0.7)	132 (1.2)
Idaho †	—	159 (1.1)
Illinois †	—	150 (1.9)
Indiana †	153 (1.4)	156 (1.7)
Kentucky	147 (1.2) *	152 (1.3)
Louisiana	132 (1.6)	136 (1.7)
Maine †	163 (1.0) *	160 (1.0)
Maryland	145 (1.5)	149 (1.3)
Massachusetts	157 (1.4)	161 (1.6)
Michigan †	153 (1.4)	156 (1.7)
Minnesota †	159 (1.3)	160 (2.1)
Mississippi	133 (1.4)	134 (1.2)
Missouri	151 (1.2) ‡	156 (1.1)
Montana †	162 (1.2)	165 (1.2)
Nebraska	157 (1.0)	157 (1.0)
Nevada	—	143 (1.1)
New Mexico	141 (1.0)	140 (1.6)
New York †	146 (1.6)	149 (2.4)
North Carolina	147 (1.2)	147 (1.5)
North Dakota	162 (0.8)	161 (0.9)
Ohio	—	161 (1.5)
Oklahoma	—	149 (1.2)
Oregon †	155 (1.6)	154 (1.6)
Rhode Island	149 (0.8)	150 (1.3)
South Carolina	139 (1.5)	142 (1.3)
Tennessee	143 (1.8)	146 (1.5)
Texas	145 (1.8)	144 (1.5)
Utah	156 (0.8)	155 (0.9)
Vermont †	157 (1.0) *	161 (0.9)
Virginia	149 (1.6)	152 (1.2)
West Virginia	147 (0.9)	150 (1.1)
Wyoming	158 (0.6)	158 (1.0)
Other Jurisdictions		
American Samoa	—	72 (2.3)
DDESS	153 (1.1) ‡	159 (1.2)
DoDDS	155 (0.7) ‡	159 (0.8)
Guam	120 (1.1)	114 (4.5)

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000 if only one jurisdiction or the nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: National results are based on the national sample, not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.17: Data for Figure 2.10 State Achievement-Level Results, Grade 4

Percentage of students within each science achievement-level range by state for grade 4 public schools: 2000

	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*
Nation	36 (0.9)	37 (0.7)	24 (0.8)	3 (0.3)
Alabama	41 (2.1)	37 (1.5)	20 (1.2)	2 (0.4)
Arizona	43 (1.7)	35 (1.6)	20 (1.4)	2 (0.4)
Arkansas	38 (2.1)	38 (1.4)	22 (1.5)	2 (0.6)
California †	53 (2.4)	33 (1.8)	13 (1.5)	1 (0.2)
Connecticut	25 (1.7)	40 (1.2)	32 (1.6)	3 (0.6)
Georgia	42 (1.8)	34 (1.4)	21 (1.2)	3 (0.4)
Hawaii	49 (1.5)	35 (1.1)	15 (1.0)	1 (0.3)
Idaho †	28 (2.1)	42 (1.7)	28 (1.9)	3 (0.6)
Illinois †	32 (2.1)	37 (1.8)	27 (2.1)	4 (0.9)
Indiana †	25 (1.9)	42 (1.4)	29 (1.8)	3 (0.5)
Iowa †	19 (2.2)	44 (1.6)	34 (1.8)	4 (0.6)
Kentucky	30 (1.5)	42 (1.5)	26 (1.4)	3 (0.4)
Louisiana	47 (2.3)	35 (1.7)	17 (1.7)	2 (0.4)
Maine †	18 (1.4)	43 (1.6)	34 (1.6)	4 (0.7)
Maryland	39 (1.5)	36 (1.2)	23 (1.4)	3 (0.5)
Massachusetts	19 (1.4)	38 (1.6)	37 (1.7)	6 (0.7)
Michigan †	29 (2.1)	38 (1.7)	30 (2.1)	3 (0.7)
Minnesota †	22 (1.8)	42 (1.5)	32 (2.0)	3 (0.5)
Mississippi	53 (1.9)	33 (1.3)	13 (1.1)	1 (0.3)
Missouri	25 (1.8)	40 (1.5)	31 (1.6)	4 (0.5)
Montana †	19 (2.7)	44 (2.6)	34 (2.8)	4 (0.8)
Nebraska	32 (2.1)	41 (2.0)	24 (2.0)	2 (0.8)
Nevada	42 (1.9)	39 (1.6)	18 (0.9)	2 (0.4)
New Mexico	46 (2.3)	36 (1.9)	16 (1.1)	2 (0.6)
New York †	33 (2.0)	41 (1.5)	24 (1.2)	2 (0.3)
North Carolina	36 (1.9)	40 (1.7)	22 (1.3)	2 (0.5)
North Dakota	20 (1.2)	43 (1.3)	34 (1.2)	3 (0.5)
Ohio †	28 (1.9)	40 (1.7)	28 (1.5)	4 (0.7)
Oklahoma	29 (2.1)	45 (2.0)	24 (1.8)	2 (0.4)
Oregon †	33 (2.4)	40 (1.7)	25 (1.6)	3 (0.7)
Rhode Island	34 (2.0)	40 (1.4)	24 (1.3)	2 (0.4)
South Carolina	44 (1.5)	35 (1.7)	18 (1.1)	2 (0.3)
Tennessee	37 (1.9)	38 (1.7)	23 (1.5)	3 (0.5)
Texas	35 (2.1)	40 (1.4)	22 (1.5)	2 (0.4)
Utah	25 (1.5)	43 (1.1)	29 (1.1)	3 (0.5)
Vermont †	22 (1.9)	40 (2.4)	34 (2.6)	4 (1.1)
Virginia	26 (1.9)	41 (1.6)	29 (1.8)	4 (0.6)
West Virginia	31 (1.7)	45 (1.6)	23 (1.3)	2 (0.3)
Wyoming	20 (1.9)	47 (1.7)	30 (1.5)	3 (0.5)
Other Jurisdictions				
American Samoa	98 (0.9)	2 (0.9)	▲ (****)	0 (****)
DDESS	22 (1.3)	48 (2.1)	27 (1.8)	2 (0.5)
DoDDS	25 (0.8)	45 (1.0)	27 (1.0)	3 (0.4)
Guam	76 (2.0)	20 (1.6)	4 (0.9)	▲ (****)
Virgin Islands	74 (1.9)	22 (2.0)	4 (0.8)	▲ (****)

Standard errors of the estimated percentages appear in parentheses.
(****) Standard error estimates cannot be accurately determined.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: Percentages within each science achievement-level range may not add to 100 due to rounding.
National results are based on the national sample and not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.18: Data for Figure 2.11 State Achievement-Level Results, Grade 8

Percentage of students within each science achievement-level range by state for grade 8 public schools: 2000

	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*
Nation	41 (0.9)	29 (0.6)	26 (0.8)	4 (0.4)
Alabama	49 (2.2)	29 (1.4)	20 (1.4)	2 (0.5)
Arizona †	43 (2.2)	33 (1.6)	22 (1.5)	2 (0.4)
Arkansas	46 (1.6)	31 (1.4)	21 (1.3)	2 (0.4)
California †	60 (2.2)	25 (1.9)	14 (1.2)	1 (0.4)
Connecticut	35 (1.8)	30 (1.4)	31 (1.4)	4 (0.6)
Georgia	48 (2.0)	29 (1.3)	21 (1.4)	2 (0.6)
Hawaii	60 (1.3)	25 (1.5)	14 (1.0)	1 (0.3)
Idaho †	27 (1.2)	35 (1.1)	35 (1.6)	4 (0.5)
Illinois †	38 (2.5)	31 (1.8)	27 (1.8)	3 (0.8)
Indiana †	32 (2.3)	34 (1.6)	31 (1.7)	3 (0.6)
Kentucky	38 (1.8)	33 (1.5)	26 (1.4)	3 (0.4)
Louisiana	55 (2.1)	27 (1.7)	16 (1.2)	2 (0.4)
Maine †	25 (1.3)	38 (1.5)	33 (1.7)	3 (0.4)
Maryland	41 (1.7)	31 (1.3)	26 (1.4)	3 (0.4)
Massachusetts	26 (2.0)	32 (1.6)	37 (1.8)	5 (0.6)
Michigan †	31 (2.0)	32 (1.3)	33 (2.0)	4 (0.8)
Minnesota †	27 (2.5)	32 (2.2)	37 (2.0)	5 (0.8)
Mississippi	58 (1.5)	27 (1.3)	14 (1.1)	1 (0.3)
Missouri	32 (1.5)	32 (1.5)	32 (1.5)	4 (0.5)
Montana †	20 (1.7)	34 (1.7)	41 (1.7)	5 (0.8)
Nebraska	30 (1.6)	34 (1.7)	33 (1.5)	4 (0.5)
Nevada	46 (1.4)	31 (1.4)	21 (1.2)	2 (0.3)
New Mexico	52 (1.9)	28 (1.9)	19 (1.4)	1 (0.3)
New York †	39 (2.7)	32 (1.6)	27 (2.1)	2 (0.6)
North Carolina	44 (1.9)	30 (1.4)	23 (1.3)	3 (0.6)
North Dakota	26 (1.2)	34 (1.5)	36 (1.9)	4 (0.7)
Ohio	27 (1.8)	32 (1.3)	35 (1.8)	6 (0.7)
Oklahoma	38 (1.5)	35 (1.4)	25 (1.3)	2 (0.4)
Oregon †	33 (2.1)	34 (1.9)	30 (1.7)	3 (0.6)
Rhode Island	39 (1.3)	32 (1.3)	26 (1.1)	3 (0.4)
South Carolina	50 (1.8)	29 (1.2)	18 (1.4)	2 (0.3)
Tennessee	43 (2.2)	32 (1.5)	23 (1.3)	2 (0.4)
Texas	47 (1.9)	30 (1.3)	21 (1.4)	2 (0.4)
Utah	32 (1.2)	34 (1.3)	31 (1.4)	3 (0.5)
Vermont †	26 (1.5)	34 (1.5)	35 (1.4)	4 (0.7)
Virginia	37 (1.6)	32 (1.2)	28 (1.2)	3 (0.6)
West Virginia	39 (1.5)	34 (1.4)	24 (1.3)	2 (0.3)
Wyoming	29 (1.6)	35 (1.2)	32 (1.1)	3 (0.5)
Other Jurisdictions				
American Samoa	95 (1.2)	3 (1.0)	2 (0.7)	0 (****)
DDESS	30 (1.9)	35 (2.0)	31 (2.1)	4 (1.0)
DoDDS	28 (1.2)	34 (1.2)	34 (1.3)	4 (0.8)
Guam	78 (2.7)	16 (2.3)	6 (1.4)	▲ (****)

Standard errors of the estimated percentages appear in parentheses.
(****) Standard error estimates cannot be accurately determined.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: Percentages within each science achievement-level range may not add to 100 due to rounding.
National results are based on the national sample and not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.19: Data for Table 2.3 State *Proficient* Level Results, Grade 4

Percentage of students at or above the *Proficient* level in science by state for grade 4 public schools: 2000

	2000
Nation	28 (0.9)
Alabama	22 (1.4)
Arizona	22 (1.5)
Arkansas	24 (1.5)
California †	14 (1.6)
Connecticut	35 (1.7)
Georgia	23 (1.4)
Hawaii	16 (1.1)
Idaho †	30 (2.0)
Illinois †	31 (2.2)
Indiana †	32 (2.0)
Iowa †	37 (2.1)
Kentucky	29 (1.5)
Louisiana	19 (1.8)
Maine †	38 (1.7)
Maryland	26 (1.4)
Massachusetts	43 (1.9)
Michigan †	33 (2.4)
Minnesota †	35 (2.2)
Mississippi	14 (1.2)
Missouri	35 (1.7)
Montana †	37 (2.6)
Nebraska	26 (2.2)
Nevada	19 (1.0)
New Mexico	18 (1.5)
New York †	26 (1.3)
North Carolina	24 (1.4)
North Dakota	38 (1.3)
Ohio †	31 (1.9)
Oklahoma	26 (1.9)
Oregon †	28 (1.8)
Rhode Island	27 (1.4)
South Carolina	21 (1.3)
Tennessee	26 (1.7)
Texas	24 (1.8)
Utah	32 (1.3)
Vermont †	39 (3.0)
Virginia	33 (2.0)
West Virginia	25 (1.4)
Wyoming	33 (1.5)
Other Jurisdictions	
American Samoa	▲ (****)
DDESS	29 (1.8)
DoDDS	30 (1.0)
Guam	4 (0.9)
Virgin Islands	4 (0.8)

Standard errors of the estimated percentages appear in parentheses.
(****) Standard error estimates cannot be accurately determined.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: National results are based on the national sample and not on aggregated state assessment samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.20: Data for Table 2.4 State *Proficient* Level Results, Grade 8

Percentage of students at or above the *Proficient* level in science by state for grade 8 public schools: 1996 and 2000

	1996	2000
Nation	27 (1.3)	30 (0.9)
Alabama	18 (1.5) *	22 (1.6)
Arizona †	23 (1.7)	24 (1.5)
Arkansas	22 (1.5)	23 (1.5)
California †	20 (1.7)	15 (1.4)
Connecticut	36 (1.7)	35 (1.5)
Georgia	21 (1.7)	23 (1.6)
Hawaii	15 (1.0)	15 (1.0)
Idaho †	—	38 (1.7)
Illinois †	—	30 (2.1)
Indiana †	30 (1.9)	35 (1.9)
Kentucky	23 (1.3) ‡	29 (1.5)
Louisiana	13 (1.2) *	18 (1.4)
Maine †	41 (1.8)	37 (1.8)
Maryland	25 (1.8)	28 (1.4)
Massachusetts	37 (1.7) *	42 (1.9)
Michigan †	32 (2.0)	37 (2.2)
Minnesota †	37 (1.7)	42 (2.3)
Mississippi	12 (1.0)	15 (1.3)
Missouri	28 (1.3) ‡	36 (1.5)
Montana †	41 (2.1)	46 (1.8)
Nebraska	35 (1.5)	36 (1.6)
Nevada	—	23 (1.2)
New Mexico	19 (0.7)	20 (1.5)
New York †	27 (1.7)	30 (2.3)
North Carolina	24 (1.4)	27 (1.6)
North Dakota	41 (1.5)	40 (1.7)
Ohio	—	41 (2.0)
Oklahoma	—	26 (1.4)
Oregon †	32 (1.8)	33 (1.8)
Rhode Island	26 (1.5)	29 (1.1)
South Carolina	17 (1.4)	20 (1.5)
Tennessee	22 (1.7)	25 (1.4)
Texas	23 (1.5)	23 (1.6)
Utah	32 (1.2)	34 (1.4)
Vermont †	34 (1.6) ‡	40 (1.4)
Virginia	27 (2.1)	31 (1.4)
West Virginia	21 (1.1) ‡	26 (1.4)
Wyoming	34 (1.3)	36 (1.1)
Other Jurisdictions		
American Samoa	—	2 (0.7)
DDESS	27 (2.2) ‡	35 (1.9)
DoDDS	31 (1.3) ‡	37 (1.2)
Guam	7 (1.0)	6 (1.4)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000 if only one jurisdiction or the nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
— Indicates that the jurisdiction did not participate.
NOTE: National results are based on the national sample and not on aggregated state assessment samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.21: Data for Figure 3.1 National Scale Score Results by Gender

Percentage of students and average science scale scores by gender, grades 4, 8, and 12: 1996 and 2000

		Male	Female
Grade 4	1996	50 (0.6) 151 (0.9)	50 (0.6) 149 (0.9)
	2000	50 (0.5) 153 (0.8)	50 (0.5) 147 (0.8)
Grade 8	1996	51 (1.0) 151 (1.0) *	49 (1.0) 149 (1.1)
	2000	51 (0.5) 154 (0.7)	49 (0.5) 147 (0.8)
Grade 12	1996	48 (0.9) 152 (1.2) *	52 (0.9) 148 (0.9)
	2000	49 (0.6) 148 (1.1)	51 (0.6) 145 (1.0)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
* Significantly different from 2000.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.22: Data for Figure 3.2 National Scale Score Differences by Gender

Differences in average science scale scores by gender, grades 4, 8, and 12: 1996 and 2000

		Male-Female
Grade 4	1996	2 (1.2) *
	2000	5 (1.1)
Grade 8	1996	2 (1.5) *
	2000	7 (1.1)
Grade 12	1996	5 (1.5)
	2000	3 (1.5)

Standard errors of the estimated difference in scale scores appear in parentheses.
Score differences are calculated based on differences between unrounded average scale scores.
* Significantly different from 2000.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP) 1996 and 2000 Science Assessments.

Table B.23: Data for Figure 3.3 National Achievement-Level Results by Gender

Percentage of students within each science achievement-level range and at or above achievement levels by gender, grades 4, 8, and 12: 1996 and 2000

			Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4	Male	1996	32 (1.4)	37 (1.3)	27 (1.1)	3 (0.5)	68 (1.4)	31 (1.1)
		2000	31 (0.9)	36 (1.2)	28 (1.0)	5 (0.4)	69 (0.9)	33 (1.1)
	Female	1996	33 (1.5)	40 (1.5)	24 (1.2)	3 (0.4)	67 (1.5)	27 (1.2)
		2000	36 (1.1)	38 (1.0)	23 (0.8)	3 (0.4)	64 (1.1)	26 (0.9)
Grade 8	Male	1996	38 (1.3)	31 (1.0) *	27 (1.2) *	4 (0.5)	62 (1.3)	31 (1.2) *
		2000	36 (0.8)	28 (0.6)	31 (0.8)	5 (0.6)	64 (0.8)	36 (0.8)
	Female	1996	39 (1.4)	34 (0.9) *	24 (1.5)	3 (0.6)	61 (1.4)	27 (1.7)
		2000	43 (1.1)	30 (0.9)	24 (1.1)	3 (0.4)	57 (1.1)	27 (1.1)
Grade 12	Male	1996	40 (1.3) *	34 (1.3)	21 (1.4)	4 (0.6)	60 (1.3) *	25 (1.6)
		2000	46 (1.4)	33 (1.1)	18 (1.1)	3 (0.5)	54 (1.4)	21 (1.1)
	Female	1996	45 (1.3)	37 (1.3)	16 (1.1)	1 (0.3)	55 (1.3)	17 (1.2)
		2000	49 (1.5)	35 (1.0)	15 (1.0)	1 (0.3)	51 (1.5)	16 (1.1)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.24: Data for Figure 3.4 National Scale Score Results by Race/Ethnicity

Percentage of students and average science scale scores by race/ethnicity, grades 4, 8, and 12: 1996 and 2000

		White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Grade 4	1996	69 (0.5)	15 (0.2)	12 (0.5)	3 (0.2)	2 (0.2)
		160 (0.9)	124 (1.9)	128 (1.7)	151 (3.6)	144 (3.8)
	2000	66 (0.3)	14 (0.2)	15 (0.3)	3 (0.2)	2 (0.1)
		160 (0.8)	124 (1.6)	129 (1.3)	~	140 (2.8)
Grade 8	1996	70 (0.2)	14 (0.1)	12 (0.2)	3 (0.3)	2 (0.2)
		159 (1.1)	121 (1.1)	129 (1.7)	152 (3.1)	148 (4.1) *
	2000	67 (0.2)	13 (0.1)	14 (0.2)	4 (0.2)	2 (0.2)
		162 (0.7)	122 (1.3)	128 (1.3)	156 (2.4)	134 (3.2)
Grade 12	1996	70 (0.4)	14 (0.4)	11 (0.3)	4 (0.2)	1 (0.2)
		159 (1.0) *	124 (1.5)	130 (2.3)	149 (2.9)	145 (4.7) !
	2000	71 (0.3)	13 (0.2)	11 (0.2)	4 (0.1)	1 (0.1)
		154 (1.2)	123 (1.4)	128 (1.9)	153 (2.5)	139 (3.6)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
* Significantly different from 2000.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
NOTE: Percentages may not add to 100 due to rounding.
~ Special analyses raised concerns about the accuracy and precision of the national grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.25: Data for Figure 3.5 National Scale Score Differences by Race/Ethnicity

Differences in average science scale scores by race/ethnicity, grades 4, 8, and 12: 1996 and 2000

		White-Black	White-Hispanic
Grade 4	1996	36 (2.1)	31 (1.9)
	2000	36 (1.8)	31 (1.5)
Grade 8	1996	38 (1.5)	31 (2.0)
	2000	40 (1.5)	33 (1.5)
Grade 12	1996	35 (1.8)	29 (2.5)
	2000	31 (1.8)	26 (2.3)

Standard errors of the estimated difference in scale scores appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP) 1996 and 2000 Science Assessments.

Table B.26: Data for Figure 3.6 National Achievement-Level Results by Race/Ethnicity

Percentage of students within each science achievement-level range and at or above achievement levels by race/ethnicity, grades 4, 8, and 12: 1996 and 2000

			Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4	White	1996	21 (1.3)	42 (1.1)	33 (1.3)	4 (0.5)	79 (1.3)	37 (1.3)
		2000	21 (0.9)	41 (0.8)	33 (1.0)	5 (0.4)	79 (0.9)	38 (1.1)
	Black	1996	66 (2.1)	28 (1.8)	7 (1.2)	▲ (****)	34 (2.1)	7 (1.3)
		2000	66 (1.9)	27 (1.8)	6 (0.8)	▲ (****)	34 (1.9)	7 (0.8)
	Hispanic	1996	58 (2.1)	33 (1.8)	9 (1.0)	▲ (0.2)	42 (2.1)	9 (1.2)
		2000	58 (1.5)	31 (1.4)	10 (0.8)	1 (0.4)	42 (1.5)	11 (0.9)
	Asian/Pacific Islander	1996	34 (4.8)	37 (3.5)	25 (4.6)	4 (1.4)	66 (4.8)	29 (4.8)
		2000	~	~	~	~	~	~
	American Indian	1996	41 (4.8)	33 (4.4)	24 (5.0)	2 (****)	59 (4.8)	26 (4.4)
		2000	43 (3.6)	39 (3.1)	17 (3.5)	1 (0.9)	57 (3.6)	19 (3.5)
Grade 8	White	1996	27 (1.3)	36 (0.9) *	33 (1.5)	4 (0.7)	73 (1.3)	37 (1.7)
		2000	26 (0.9)	33 (0.7)	36 (0.9)	5 (0.6)	74 (0.9)	41 (1.0)
	Black	1996	76 (1.7)	19 (1.6)	5 (0.8)	▲ (****)	24 (1.7)	5 (0.8)
		2000	74 (1.5)	19 (1.4)	6 (0.7)	▲ (0.2)	26 (1.5)	7 (0.7)
	Hispanic	1996	64 (2.2)	25 (1.8)	10 (1.1)	▲ (****)	36 (2.2)	11 (1.1)
		2000	65 (1.6)	23 (1.3)	11 (1.1)	1 (0.2)	35 (1.6)	12 (1.1)
	Asian/Pacific Islander	1996	38 (4.0)	31 (3.4)	27 (3.2)	3 (1.7)	62 (4.0)	30 (3.7)
		2000	36 (3.6)	27 (2.1)	31 (3.3)	6 (1.4)	64 (3.6)	37 (3.6)
	American Indian	1996	40 (6.7)	35 (6.4)	22 (4.9)	2 (****)	60 (6.7)	24 (5.7)
		2000	61 (5.6)	24 (5.6)	12 (3.4)	2 (1.2)	39 (5.6)	14 (3.5)
Grade 12	White	1996	32 (1.1) *	41 (1.2)	24 (1.3)	3 (0.5)	68 (1.1) *	27 (1.6)
		2000	38 (1.4)	39 (1.1)	20 (1.2)	3 (0.4)	62 (1.4)	23 (1.3)
	Black	1996	77 (2.0)	20 (2.0)	4 (0.8)	▲ (****)	23 (2.0)	4 (0.9)
		2000	78 (1.6)	18 (1.3)	3 (0.6)	▲ (****)	22 (1.6)	3 (0.6)
	Hispanic	1996	67 (3.0)	26 (2.6)	6 (1.2)	1 (0.5)	33 (3.0)	7 (1.3)
		2000	70 (2.1)	23 (1.7)	6 (0.8)	▲ (0.2)	30 (2.1)	7 (0.9)
	Asian/Pacific Islander	1996	44 (4.1)	34 (4.1)	19 (3.1)	3 (1.1)	56 (4.1)	22 (3.3)
		2000	41 (3.6)	33 (2.3)	22 (2.6)	4 (1.3)	59 (3.6)	26 (2.9)
	American Indian	1996	48 (9.8) !	41 (9.3) !	10 (5.1) !	▲ (****)	52 (9.8) !	10 (5.1) !
		2000	56 (5.7)	35 (6.3)	8 (3.4)	1 (****)	44 (5.7)	9 (3.5)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
(****) Standard error estimates cannot be accurately determined.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
~ Special analyses raised concerns about the accuracy and precision of the national grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.27: Data for Figure 3.7 National Scale Score Results by Parents' Education

Percentage of students and average science scale scores by student-reported parents' highest level of education, grades 8 and 12: 1996 and 2000

		Less than high school	Graduated high school	Some education after high school	Graduated college	Unknown
Grade 8	1996	6 (0.4)	20 (0.9)	20 (0.7)	45 (1.2)	9 (0.5)
		131 (1.9)	140 (1.5)	155 (1.1)	159 (1.2)	134 (2.4)
	2000	6 (0.2)	18 (0.5)	19 (0.5)	47 (0.9)	9 (0.3)
		126 (1.6)	138 (1.0)	155 (1.0)	162 (0.8)	130 (1.7)
Grade 12	1996	7 (0.5)	18 (0.8)	26 (0.7)	47 (1.4)	3 (0.3)
		123 (1.8)	140 (1.5) *	151 (1.1) *	160 (1.0)	116 (3.1)
	2000	6 (0.3)	17 (0.6)	27 (0.7)	48 (1.1)	3 (0.2)
		126 (1.9)	135 (1.3)	146 (1.1)	157 (1.1)	114 (3.0)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
* Significantly different from 2000.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.28: Data for Figure 3.8 National Achievement-Level Results by Parents' Education

Percentage of students within each science achievement-level range and at or above achievement levels by parents' highest level of education, grades 8 and 12: 1996 and 2000

		Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 8							
Less than high school	1996	61 (3.1)	29 (3.0)	9 (1.7)	▲ (****)	39 (3.1)	10 (1.8)
	2000	70 (2.4)	23 (1.9)	8 (1.5)	▲ (****)	30 (2.4)	8 (1.5)
Graduated high school	1996	51 (2.2)	31 (1.5)	17 (1.9)	1 (0.5)	49 (2.2)	18 (1.7)
	2000	54 (1.5)	29 (1.6)	17 (1.5)	1 (0.3)	46 (1.5)	18 (1.6)
Some education after high school	1996	31 (1.6)	36 (2.5)	30 (2.1)	3 (0.9)	69 (1.6)	33 (2.2)
	2000	34 (1.6)	33 (1.4)	30 (1.4)	3 (0.8)	66 (1.6)	34 (1.5)
Graduated college	1996	28 (1.4)	33 (1.3)	33 (1.4)	5 (0.8)	72 (1.4)	39 (1.7)
	2000	26 (0.9)	30 (1.0)	37 (1.2)	7 (0.7)	74 (0.9)	44 (1.2)
Unknown	1996	59 (4.0)	28 (3.4)	13 (2.6)	▲ (****)	41 (4.0)	13 (2.6)
	2000	63 (2.0)	23 (2.3)	13 (1.4)	1 (0.5)	37 (2.0)	14 (1.6)
Grade 12							
Less than high school	1996	75 (2.7)	21 (2.8)	3 (0.9)	▲ (****)	25 (2.7)	3 (0.9)
	2000	73 (2.7)	23 (2.8)	4 (0.9)	▲ (****)	27 (2.7)	4 (0.8)
Graduated high school	1996	57 (2.4)	32 (2.0)	11 (1.8)	1 (0.4)	43 (2.4)	12 (1.8)
	2000	63 (1.7)	29 (1.6)	8 (1.1)	▲ (0.2)	37 (1.7)	9 (1.0)
Some education after high school	1996	41 (1.4) *	40 (1.7)	17 (1.7)	2 (0.7)	59 (1.4) *	19 (1.8)
	2000	49 (1.6)	36 (1.3)	14 (1.3)	1 (0.4)	51 (1.6)	15 (1.3)
Graduated college	1996	31 (1.2) *	39 (1.6)	26 (1.5)	4 (0.5)	69 (1.2) *	30 (1.7)
	2000	35 (1.3)	38 (1.2)	23 (1.1)	4 (0.6)	65 (1.3)	27 (1.4)
Unknown	1996	83 (3.0)	12 (3.1)	4 (2.1)	▲ (****)	17 (3.0)	4 (2.1)
	2000	82 (3.8)	15 (3.5)	3 (1.3)	▲ (****)	18 (3.8)	3 (1.3)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
(****) Standard error estimates cannot be accurately determined.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.29: Data for Figure 3.9 National Scale Score Results by Type of School

Percentage of students and average science scale scores by type of school, grades 4, 8, and 12: 1996 and 2000

		Public	Nonpublic
Grade 4	1996	88 (1.7) 148 (0.9)	12 (1.7) 163 (1.8)
	2000	89 (0.6) 148 (0.8)	11 (0.6) 163 (0.9)
Grade 8	1996	89 (1.4) 148 (0.9)	11 (1.4) 162 (2.5)
	2000	90 (0.5) 149 (0.7)	10 (0.5) 166 (0.9)
Grade 12	1996	88 (1.7) 149 (1.0) *	12 (1.7) 155 (2.2) *
	2000	91 (0.5) 145 (1.1)	9 (0.5) 161 (1.0)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
* Significantly different from 2000.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.30: Data for Figure 3.10 National Achievement-Level Results by Type of School

Percentage of students within each science achievement-level range and at or above achievement levels by type of school, grades 4, 8, and 12: 1996 and 2000

			Below ***Basic***	At ***Basic***	At ***Proficient***	At ***Advanced***	At or above ***Basic***	At or above ***Proficient***
Grade 4	Public	1996	35 (1.3)	38 (0.9)	24 (1.1)	3 (0.4)	65 (1.3)	27 (1.1)
		2000	36 (0.9)	37 (0.7)	24 (0.8)	3 (0.3)	64 (0.9)	28 (0.9)
	Nonpublic	1996	18 (2.2)	40 (2.4)	37 (2.3)	5 (1.1)	82 (2.2)	42 (2.8)
		2000	18 (0.9)	40 (1.1)	36 (1.4)	5 (0.5)	82 (0.9)	41 (1.4)
Grade 8	Public	1996	40 (1.1)	32 (0.8) *	24 (1.1)	3 (0.5)	60 (1.1)	27 (1.3)
		2000	41 (0.9)	29 (0.6)	26 (0.8)	4 (0.4)	59 (0.9)	30 (0.9)
	Nonpublic	1996	25 (3.2)	33 (2.2)	37 (3.0)	5 (1.2)	75 (3.2)	42 (3.5)
		2000	20 (1.3)	32 (1.0)	40 (1.2)	7 (0.6)	80 (1.3)	47 (1.3)
Grade 12	Public	1996	44 (1.2) *	35 (1.1)	18 (1.1)	3 (0.4)	56 (1.2) *	21 (1.3) *
		2000	49 (1.2)	33 (0.8)	15 (1.0)	2 (0.3)	51 (1.2)	17 (1.1)
	Nonpublic	1996	37 (2.5) *	42 (1.9)	20 (1.9)	2 (0.8)	63 (2.5) *	22 (2.5) *
		2000	30 (1.4)	42 (1.2)	25 (1.1)	4 (0.4)	70 (1.4)	29 (1.3)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.31: Data for Table 3.1 National Scale Score Results by Type of Location

Percentage of students and average science scale scores by type of location, grades 4, 8, and 12: 2000

	Central city	Urban fringe/large town	Rural/small town
Grade 4	31 (1.5) 140 (1.7)	46 (2.2) 155 (1.2)	24 (1.9) 152 (1.7)
Grade 8	30 (1.2) 142 (1.6)	44 (2.0) 156 (1.1)	26 (1.7) 152 (1.7)
Grade 12	27 (2.1) 144 (1.9)	47 (3.4) 149 (1.3)	26 (3.0) 145 (2.0)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.32: Data for Figure 3.11 National Achievement-level results by Type of Location

Percentage of students within each science achievement-level range and at or above achievement levels by type of location, grades 4, 8, and 12: 2000

		Below ***Basic***	At ***Basic***	At ***Proficient***	At ***Advanced***	At or above ***Basic***	At or above ***Proficient***
Grade 4	Central city	46 (2.0)	32 (1.5)	19 (1.2)	3 (0.4)	54 (2.0)	22 (1.4)
	Urban fringe/large town	27 (1.3)	39 (0.9)	29 (1.2)	4 (0.4)	73 (1.3)	34 (1.4)
	Rural/small town	29 (2.0)	40 (1.8)	27 (1.9)	3 (0.7)	71 (2.0)	30 (2.1)
Grade 8	Central city	49 (1.8)	26 (1.1)	21 (1.2)	3 (0.5)	51 (1.8)	24 (1.4)
	Urban fringe/large town	33 (1.3)	31 (0.9)	32 (1.3)	5 (0.6)	67 (1.3)	36 (1.5)
	Rural/small town	37 (2.0)	30 (1.5)	29 (1.7)	4 (0.7)	63 (2.0)	33 (1.9)
Grade 12	Central city	50 (2.2)	32 (1.3)	15 (1.5)	2 (0.5)	50 (2.2)	17 (1.8)
	Urban fringe/large town	45 (1.5)	35 (1.2)	18 (1.3)	2 (0.5)	55 (1.5)	20 (1.4)
	Rural/small town	50 (2.4)	35 (1.7)	14 (1.7)	1 (0.5)	50 (2.4)	16 (1.8)

Standard errors of the estimated percentages appear in parentheses.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.33: Data for Figure 3.12 National Scale Score Results by Free/Reduced-Price School Lunch Eligibility

Percentage of students and average science scale scores by student eligibility for free/reduced-price school lunch program, grades 4, 8, and 12: 1996 and 2000

		Eligible	Not eligible	Info not available
Grade 4	1996	35 (1.8) 133 (1.3)	53 (2.2) 159 (0.9)	12 (1.9) 161 (3.5)
	2000	33 (1.0) 130 (1.2)	49 (1.8) 159 (1.0)	18 (1.9) 161 (1.5)
Grade 8	1996	26 (1.5) 133 (1.6) *	51 (3.3) 156 (1.2) *	23 (4.1) 156 (2.9)
	2000	25 (1.0) 128 (1.1)	53 (1.9) 160 (0.8)	22 (2.0) 156 (1.4)
Grade 12	1996	11 (1.2) 125 (1.9)	68 (3.9) 154 (0.9) *	21 (4.0) 150 (2.9)
	2000	13 (0.9) 126 (1.3)	60 (3.3) 150 (1.2)	28 (3.5) 150 (2.1)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
* Significantly different from 2000.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.34: Data for Figure 3.13 National Achievement-level results by Free/Reduced-Price School Lunch Eligibility

Percentage of students within each science achievement-level range and at or above achievement levels by student eligibility for free/reduced-price school lunch program, grades 4, 8, and 12: 1996 and 2000

			Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4	Eligible	1996	54 (2.0)	33 (1.9)	13 (1.2)	1 (0.2)	46 (2.0)	13 (1.1)
		2000	58 (1.3)	31 (1.2)	11 (0.7)	1 (0.2)	42 (1.3)	11 (0.7)
	Not eligible	1996	22 (1.4)	42 (1.3)	32 (1.3)	4 (0.5)	78 (1.4)	36 (1.4)
		2000	22 (1.1)	41 (1.0)	33 (1.2)	5 (0.5)	78 (1.1)	38 (1.4)
	Info not available	1996	22 (4.3)	36 (2.8)	35 (3.3)	6 (1.1)	78 (4.3)	42 (4.2)
		2000	20 (1.5)	39 (1.9)	35 (1.8)	6 (1.1)	80 (1.5)	41 (2.2)
Grade 8	Eligible	1996	61 (2.3)	26 (1.5) *	13 (1.4)	1 (0.5)	39 (2.3)	14 (1.6)
		2000	67 (1.4)	21 (1.4)	11 (0.9)	1 (0.3)	33 (1.4)	12 (1.0)
	Not eligible	1996	31 (1.5)	36 (1.2) *	30 (1.6)	3 (0.6)	69 (1.5)	34 (1.8) *
		2000	28 (1.1)	32 (0.7)	34 (1.1)	5 (0.7)	72 (1.1)	40 (1.1)
	Info not available	1996	31 (3.1)	33 (1.4)	32 (2.7)	5 (1.4)	69 (3.1)	36 (3.2)
		2000	34 (1.7)	30 (1.1)	32 (1.4)	5 (0.6)	66 (1.7)	36 (1.4)
Grade 12	Eligible	1996	72 (2.4)	22 (1.9)	6 (1.4)	▲ (****)	28 (2.4)	7 (1.4)
		2000	73 (1.9)	21 (1.7)	6 (0.9)	▲ (****)	27 (1.9)	6 (1.0)
	Not eligible	1996	38 (1.2) *	39 (1.2)	20 (1.2)	3 (0.4)	62 (1.2) *	23 (1.3)
		2000	44 (1.5)	36 (1.2)	17 (1.2)	2 (0.5)	56 (1.5)	20 (1.4)
	Info not available	1996	44 (3.7)	35 (2.1)	19 (2.2)	3 (0.8)	56 (3.7)	22 (2.8)
		2000	43 (2.5)	36 (1.7)	19 (1.6)	2 (0.5)	57 (2.5)	21 (1.7)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
(****) Standard error estimates cannot be accurately determined.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.35: Data for Table 3.2 State Scale Score Results by Gender, Grade 4

State average science scale scores by gender for grade 4 public schools: 2000

	Male	Female
Nation	151 (1.0)	146 (0.9)
Alabama	143 (2.3)	143 (1.8)
Arizona	142 (1.7)	140 (1.4)
Arkansas	145 (2.2)	143 (1.8)
California †	132 (2.1)	130 (2.5)
Connecticut	160 (1.5)	153 (1.4)
Georgia	147 (1.5)	140 (1.7)
Hawaii	138 (1.8)	135 (1.6)
Idaho †	155 (2.0)	150 (1.6)
Illinois †	154 (1.9)	148 (1.9)
Indiana †	157 (2.2)	153 (1.6)
Iowa †	163 (1.5)	158 (1.7)
Kentucky	155 (1.3)	150 (1.4)
Louisiana	141 (2.1)	136 (2.1)
Maine †	165 (1.1)	158 (1.2)
Maryland	148 (1.8)	144 (1.4)
Massachusetts	164 (1.5)	159 (1.5)
Michigan †	156 (1.9)	151 (2.1)
Minnesota †	159 (1.6)	155 (1.9)
Mississippi	135 (1.8)	132 (1.6)
Missouri	159 (1.7)	153 (1.8)
Montana †	163 (2.3)	157 (2.2)
Nebraska	153 (2.0)	148 (2.2)
Nevada	142 (1.7)	142 (1.3)
New Mexico	140 (2.4)	136 (2.3)
New York †	151 (1.6)	147 (1.7)
North Carolina	150 (1.5)	146 (1.6)
North Dakota	164 (1.1)	156 (1.1)
Ohio †	156 (1.8)	152 (1.8)
Oklahoma	153 (1.9)	150 (1.4)
Oregon †	151 (2.2)	148 (2.1)
Rhode Island	151 (1.9)	145 (1.6)
South Carolina	143 (1.5)	139 (1.3)
Tennessee	150 (1.8)	145 (1.7)
Texas	150 (1.9)	145 (1.9)
Utah	157 (1.5)	152 (1.2)
Vermont †	161 (2.0)	157 (2.0)
Virginia	157 (2.2)	155 (1.6)
West Virginia	152 (1.3)	149 (1.3)
Wyoming	162 (1.4)	153 (1.2)
Other Jurisdictions		
American Samoa	52 (2.3)	49 (3.4)
DDESS	158 (1.0)	155 (1.1)
DoDDS	159 (0.7)	153 (0.8)
Guam	108 (2.9)	113 (2.7)
Virgin Islands	118 (1.6)	113 (1.9)

Standard errors of the estimated scale scores appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.36: Data for Table 3.3 State Scale Score Results by Gender, Grade 8

State average science scale scores by gender for grade 8 public schools: 1996 and 2000

	1996		2000	
	Male	Female	Male	Female
Nation	149 (1.1) *	148 (1.2)	153 (0.8)	146 (0.9)
Alabama	138 (2.0)	139 (1.7)	144 (2.1)	139 (2.0)
Arizona †	147 (1.8)	143 (1.7)	150 (1.9)	142 (2.0)
Arkansas	147 (1.8)	142 (1.5)	144 (1.9)	142 (1.5)
California †	140 (2.0)	136 (1.9) *	136 (2.3)	129 (1.7)
Connecticut	156 (1.4)	155 (1.5)	158 (1.9)	150 (1.5)
Georgia	144 (1.8)	139 (1.5)	147 (1.9)	140 (1.4)
Hawaii	135 (1.0)	135 (1.0)	133 (1.6)	131 (1.4)
Idaho †	—	—	162 (1.3)	155 (1.5)
Illinois †	—	—	153 (2.6)	148 (1.8)
Indiana †	154 (1.7)	152 (1.5)	158 (1.8)	154 (1.8)
Kentucky	148 (1.5) ‡	147 (1.3)	155 (1.7)	148 (1.3)
Louisiana	136 (1.9)	129 (1.7)	138 (2.1)	134 (1.8)
Maine †	165 (1.2)	161 (1.2) *	163 (1.3)	157 (1.2)
Maryland	146 (1.9) *	145 (1.5)	152 (1.5)	147 (1.4)
Massachusetts	159 (1.7)	154 (1.5) *	162 (1.8)	160 (1.7)
Michigan †	156 (1.6)	150 (1.7)	158 (1.7)	154 (2.0)
Minnesota †	161 (1.4)	157 (1.5)	162 (2.6)	158 (2.4)
Mississippi	134 (1.8)	132 (1.3)	136 (1.3)	132 (1.4)
Missouri	152 (1.3) ‡	150 (1.3) *	159 (1.3)	154 (1.3)
Montana †	164 (1.7)	160 (1.3)	169 (1.5)	161 (1.4)
Nebraska	160 (1.2)	155 (1.3)	160 (1.4)	154 (1.6)
Nevada	—	—	145 (1.6)	142 (1.2)
New Mexico	143 (1.3)	139 (1.1)	144 (2.4)	137 (1.4)
New York †	148 (2.5)	143 (1.3)	151 (2.9)	147 (2.3)
North Carolina	149 (1.5)	145 (1.3)	151 (1.6)	144 (1.7)
North Dakota	163 (0.9)	161 (0.9)	163 (1.1)	159 (1.2)
Ohio	—	—	164 (1.8)	157 (1.7)
Oklahoma	—	—	152 (1.6)	146 (1.2)
Oregon †	157 (2.0)	153 (1.5)	155 (1.9)	153 (1.6)
Rhode Island	150 (1.1)	148 (1.2)	152 (1.1)	147 (2.1)
South Carolina	141 (1.9)	136 (1.5)	145 (1.6)	139 (1.5)
Tennessee	144 (2.0)	142 (2.1)	149 (1.9)	143 (1.7)
Texas	147 (1.6)	143 (2.4)	147 (1.7)	141 (1.7)
Utah	159 (1.2)	154 (0.8)	158 (1.5)	153 (1.0)
Vermont †	158 (1.3) *	156 (1.1)	163 (1.2)	159 (1.2)
Virginia	150 (1.7) *	148 (1.7)	156 (1.6)	148 (1.3)
West Virginia	148 (1.3) *	147 (1.1)	153 (1.4)	147 (1.2)
Wyoming	159 (1.0)	156 (0.9)	159 (1.4)	156 (1.2)
Other Jurisdictions				
American Samoa	—	—	70 (3.8)	75 (3.2)
DDESS	157 (1.6)	149 (1.6) ‡	160 (1.8)	157 (1.7)
DoDDS	157 (1.1) ‡	154 (0.9)	162 (1.3)	156 (1.0)
Guam	120 (1.6)	120 (1.6)	116 (4.7)	112 (4.7)

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.37: Data for Table 3.4 State *Proficient* Level Achievement Results by Gender, Grade 4

State percentages of students at or above the *Proficient* level in science by gender for grade 4 public schools: 2000

	Male	Female
Nation	31 (1.2)	24 (1.0)
Alabama	23 (2.2)	21 (1.8)
Arizona	24 (2.0)	20 (1.5)
Arkansas	26 (2.1)	21 (1.9)
California †	16 (2.1)	12 (2.4)
Connecticut	40 (2.2)	30 (1.8)
Georgia	27 (1.8)	20 (2.0)
Hawaii	18 (1.3)	14 (1.4)
Idaho †	35 (3.3)	25 (2.1)
Illinois †	34 (3.0)	28 (2.3)
Indiana †	37 (2.6)	28 (2.3)
Iowa †	42 (2.8)	33 (2.3)
Kentucky	32 (1.7)	25 (2.2)
Louisiana	22 (2.4)	16 (2.0)
Maine †	43 (2.3)	34 (1.9)
Maryland	29 (2.2)	23 (1.6)
Massachusetts	46 (2.5)	38 (1.8)
Michigan †	37 (2.7)	29 (2.7)
Minnesota †	38 (2.7)	32 (2.9)
Mississippi	16 (1.5)	12 (1.3)
Missouri	39 (2.0)	31 (2.2)
Montana †	43 (3.7)	32 (2.9)
Nebraska	29 (2.3)	23 (2.8)
Nevada	21 (1.9)	17 (1.7)
New Mexico	20 (2.0)	16 (1.8)
New York †	28 (2.2)	24 (1.8)
North Carolina	26 (1.8)	22 (1.8)
North Dakota	44 (2.0)	32 (1.7)
Ohio †	34 (2.1)	29 (2.3)
Oklahoma	29 (2.3)	24 (2.3)
Oregon †	29 (2.2)	26 (2.2)
Rhode Island	31 (1.8)	23 (1.5)
South Carolina	24 (1.7)	17 (1.8)
Tennessee	29 (2.2)	23 (2.0)
Texas	28 (2.4)	21 (1.7)
Utah	36 (1.9)	27 (1.8)
Vermont †	41 (3.6)	36 (3.5)
Virginia	35 (2.6)	30 (2.1)
West Virginia	26 (1.7)	23 (1.9)
Wyoming	39 (2.5)	27 (1.9)
Other Jurisdictions		
American Samoa	▲ (****)	▲ (****)
DDESS	33 (2.7)	26 (1.9)
DoDDS	35 (1.5)	26 (1.4)
Guam	4 (1.4)	4 (0.9)
Virgin Islands	4 (1.3)	3 (1.0)

Standard errors of the estimated percentages appear in parentheses.
(****) Standard error estimates cannot be accurately determined.
▲ Percentage is between 0.0 and 0.5.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.38: Data for Table 3.5 State *Proficient* Level Achievement Results by Gender, Grade 8

State percentages of students at or above the *Proficient* level in science by gender for grade 8 public schools: 1996 and 2000

	1996		2000	
	Male	Female	Male	Female
Nation	29 (1.3) *	26 (1.8)	35 (0.9)	26 (1.2)
Alabama	19 (1.9)	17 (1.7)	24 (1.9)	20 (1.9)
Arizona †	25 (2.0)	20 (1.8)	29 (2.2)	19 (2.2)
Arkansas	26 (2.3)	18 (1.4)	25 (2.1)	21 (1.7)
California †	21 (1.9)	18 (1.8)	18 (2.0)	13 (1.8)
Connecticut	37 (1.9)	35 (2.3)	39 (2.1)	30 (1.6)
Georgia	24 (2.0)	17 (1.7)	27 (2.0)	20 (1.6)
Hawaii	16 (1.2)	14 (1.5)	17 (1.6)	14 (1.3)
Idaho †	—	—	44 (2.0)	32 (2.2)
Illinois †	—	—	34 (3.1)	26 (2.0)
Indiana †	32 (2.3)	28 (2.2)	38 (2.3)	32 (2.2)
Kentucky	25 (1.6) ‡	21 (1.6)	34 (2.2)	24 (1.8)
Louisiana	17 (1.9)	10 (1.2) *	21 (1.7)	15 (1.6)
Maine †	45 (1.7)	38 (2.5)	42 (2.3)	32 (2.3)
Maryland	26 (2.2)	24 (2.2)	32 (1.7)	25 (1.8)
Massachusetts	40 (2.1)	33 (2.0)	44 (2.3)	40 (2.4)
Michigan †	36 (2.4)	29 (2.5)	38 (2.5)	35 (2.5)
Minnesota †	40 (2.0)	33 (2.0)	45 (3.1)	38 (2.6)
Mississippi	14 (1.4)	11 (1.1)	17 (1.6)	12 (1.7)
Missouri	31 (1.7) ‡	25 (1.7) *	40 (2.1)	32 (1.5)
Montana †	44 (2.9)	37 (2.3)	52 (2.6)	39 (2.4)
Nebraska	39 (1.9)	30 (1.9)	41 (2.2)	31 (2.2)
Nevada	—	—	25 (1.6)	20 (1.5)
New Mexico	23 (1.2)	16 (1.2)	25 (2.1)	16 (1.8)
New York †	31 (2.7)	23 (1.8)	32 (2.9)	27 (2.4)
North Carolina	26 (2.0)	22 (1.5)	31 (2.1)	23 (2.0)
North Dakota	44 (1.9)	37 (1.8)	44 (2.2)	36 (2.2)
Ohio	—	—	46 (2.5)	36 (2.4)
Oklahoma	—	—	31 (1.8)	22 (1.8)
Oregon †	35 (2.3)	29 (1.9)	37 (2.1)	30 (2.2)
Rhode Island	28 (1.6)	24 (2.0)	31 (1.7)	26 (1.5)
South Carolina	20 (2.2)	15 (1.3)	23 (1.8)	18 (1.6)
Tennessee	24 (1.9)	20 (2.1)	29 (1.8)	21 (1.5)
Texas	27 (1.9)	20 (1.8)	27 (2.1)	20 (1.5)
Utah	37 (1.6)	27 (1.6)	39 (2.2)	30 (1.4)
Vermont †	36 (2.3) *	32 (2.0)	43 (2.0)	36 (1.7)
Virginia	28 (2.4)	26 (2.5)	35 (2.0)	27 (1.6)
West Virginia	22 (1.7) ‡	19 (1.6)	30 (1.7)	22 (1.9)
Wyoming	35 (1.5)	32 (1.6)	39 (1.5)	32 (1.8)
Other Jurisdictions				
American Samoa	—	—	3 (1.1)	1 (0.9)
DDESS	32 (2.9)	21 (2.6) *	38 (3.4)	33 (3.0)
DoDDS	33 (1.9) ‡	29 (1.6)	42 (1.6)	33 (1.5)
Guam	8 (1.3)	7 (1.5)	7 (2.5)	5 (1.3)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
(****) Standard error estimates cannot be accurately determined.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.39: State Scale Score Differences by Gender, Grade 4

State differences in average science scale scores by gender, grade 4: 2000

	Male-Female
Nation	5 (1.3)
Alabama	▲(2.9)
Arizona	2 (2.2)
Arkansas	2 (2.8)
California †	2 (3.2)
Connecticut	7 (2.0)
Georgia	7 (2.3)
Hawaii	3 (2.4)
Idaho †	5 (2.5)
Illinois †	5 (2.7)
Indiana †	4 (2.7)
Iowa †	6 (2.3)
Kentucky	5 (1.9)
Louisiana	5 (2.9)
Maine †	7 (1.7)
Maryland	4 (2.3)
Massachusetts	5 (2.2)
Michigan †	4 (2.8)
Minnesota †	4 (2.5)
Mississippi	3 (2.4)
Missouri	5 (2.5)
Montana †	6 (3.2)
Nebraska	5 (3.0)
Nevada	▲ (2.2)
New Mexico	4 (3.3)
New York †	3 (2.3)
North Carolina	4 (2.2)
North Dakota	7 (1.5)
Ohio †	4 (2.5)
Oklahoma	3 (2.3)
Oregon †	4 (3.1)
Rhode Island	6 (2.5)
South Carolina	4 (2.0)
Tennessee	5 (2.5)
Texas	4 (2.7)
Utah	5 (1.9)
Vermont †	4 (2.8)
Virginia	3 (2.7)
West Virginia	3 (1.8)
Wyoming	8 (1.8)
Other Jurisdicitons	
American Samoa	2 (4.1)
DDESS	4 (1.5)
DoDDS	6 (1.1)
Guam	-5 (4.0)
Virgin Islands	5 (2.4)

Standard errors of the estimated difference in scale scores appear in parentheses.
Score differences are calculated based on differences between unrounded average scale scores.
▲ Difference is between –0.5 and 0.5.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.40: State Scale Score Differences by Gender, Grade 8

State differences in average science scale scores by gender, grade 8: 1996 and 2000

	Male-Female	
	1996	2000
Nation	1 (1.7) *	7 (1.2)
Alabama	▲ (2.6)	5 (2.9)
Arizona †	4 (2.5)	8 (2.8)
Arkansas	5 (2.3)	2 (2.4)
California †	3 (2.7)	7 (2.8)
Connecticut	1 (2.0)	7 (2.5)
Georgia	4 (2.3)	7 (2.4)
Hawaii	1 (1.5)	2 (2.2)
Idaho †	—	7 (2.0)
Illinois †	—	5 (3.2)
Indiana †	1 (2.3)	4 (2.6)
Kentucky	1 (2.0) *	7 (2.1)
Louisiana	6 (2.6)	4 (2.8)
Maine †	4 (1.7)	6 (1.8)
Maryland	▲ (2.5)	5 (2.1)
Massachusetts	5 (2.2)	3 (2.5)
Michigan †	6 (2.4)	3 (2.7)
Minnesota †	4 (2.1)	3 (3.6)
Mississippi	2 (2.2)	4 (1.9)
Missouri	2 (1.9)	5 (1.8)
Montana †	4 (2.1)	7 (2.1)
Nebraska	5 (1.8)	6 (2.1)
Nevada	—	3 (2.0)
New Mexico	5 (1.7)	7 (2.8)
New York †	5 (2.8)	4 (3.7)
North Carolina	4 (2.0)	7 (2.4)
North Dakota	2 (1.3)	4 (1.6)
Ohio	—	7 (2.5)
Oklahoma	—	6 (2.0)
Oregon †	5 (2.5)	2 (2.5)
Rhode Island	3 (1.6)	5 (2.4)
South Carolina	6 (2.4)	6 (2.2)
Tennessee	2 (2.9)	6 (2.6)
Texas	5 (2.9)	6 (2.4)
Utah	5 (1.4)	5 (1.8)
Vermont †	1 (1.7)	4 (1.7)
Virginia	2 (2.4)	8 (2.0)
West Virginia	1 (1.7)	6 (1.8)
Wyoming	2 (1.4)	2 (1.8)
Other Jurisdictions		
American Samoa	—	-4 (5.0)
DDESS	8 (2.3)	3 (2.5)
DoDDS	3 (1.4)	6 (1.6)
Guam	1 (2.2)	4 (6.7)

Standard errors of the estimated difference in scale scores appear in parentheses.
Score differences are calculated based on differences between unrounded average scale scores.
* Significantly different from 2000 if only one jurisdiction or the nation is being examined.
▲ Difference is between –0.5 and 0.5.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
— Indicates that the jurisdiction did not participate.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.41: State Percentages of Students by Gender, Grade 4

State percentages of students by gender for grade 4, public schools: 2000

	Male	Female
Nation	50 (0.5)	50 (0.5)
Alabama	51 (1.2)	49 (1.2)
Arizona	51 (1.2)	49 (1.2)
Arkansas	50 (1.1)	50 (1.1)
California †	50 (1.3)	50 (1.3)
Connecticut	50 (1.2)	50 (1.2)
Georgia	50 (1.0)	50 (1.0)
Hawaii	50 (1.1)	50 (1.1)
Idaho †	51 (1.1)	49 (1.1)
Illinois †	51 (1.5)	49 (1.5)
Indiana †	50 (1.1)	50 (1.1)
Iowa †	49 (1.1)	51 (1.1)
Kentucky	50 (1.0)	50 (1.0)
Louisiana	49 (1.0)	51 (1.0)
Maine †	47 (1.2)	53 (1.2)
Maryland	49 (0.8)	51 (0.8)
Massachusetts	52 (1.1)	48 (1.1)
Michigan †	49 (1.2)	51 (1.2)
Minnesota †	52 (1.0)	48 (1.0)
Mississippi	49 (1.1)	51 (1.1)
Missouri	50 (1.1)	50 (1.1)
Montana †	48 (1.4)	52 (1.4)
Nebraska	48 (1.4)	52 (1.4)
Nevada	51 (1.1)	49 (1.1)
New Mexico	48 (1.2)	52 (1.2)
New York †	47 (1.4)	53 (1.4)
North Carolina	49 (1.1)	51 (1.1)
North Dakota	48 (1.2)	52 (1.2)
Ohio †	52 (1.3)	48 (1.3)
Oklahoma	49 (1.2)	51 (1.2)
Oregon †	49 (1.3)	51 (1.3)
Rhode Island	49 (1.2)	51 (1.2)
South Carolina	51 (0.9)	49 (0.9)
Tennessee	50 (0.9)	50 (0.9)
Texas	49 (1.1)	51 (1.1)
Utah	51 (1.1)	49 (1.1)
Vermont †	53 (1.5)	47 (1.5)
Virginia	50 (1.0)	50 (1.0)
West Virginia	48 (1.0)	52 (1.0)
Wyoming	49 (1.2)	51 (1.2)
Other Jurisdictions		
American Samoa	53 (2.3)	47 (2.3)
DDESS	51 (1.3)	49 (1.3)
DoDDS	50 (0.9)	50 (0.9)
Guam	47 (1.6)	53 (1.6)
Virgin Islands	52 (2.0)	48 (2.0)

Standard errors of the estimated percentages appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Percentages may not add to 100 due to rounding.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.42: State Percentages of Students by Gender, Grade 8

State percentages of students by gender for grade 8, public schools: 1996 and 2000

	1996		2000	
	Male	Female	Male	Female
Nation	51 (1.2)	49 (1.2)	51 (0.5)	49 (0.5)
Alabama	49 (0.9)	51 (0.9)	51 (1.2)	49 (1.2)
Arizona †	50 (1.1)	50 (1.1)	51 (1.2)	49 (1.2)
Arkansas	50 (1.3)	50 (1.3)	50 (1.3)	50 (1.3)
California †	49 (0.9)	51 (0.9)	47 (1.5)	53 (1.5)
Connecticut	49 (0.9)	51 (0.9)	49 (1.0)	51 (1.0)
Georgia	50 (1.0)	50 (1.0)	49 (1.1)	51 (1.1)
Hawaii	52 (1.3)	48 (1.3)	50 (0.9)	50 (0.9)
Idaho †	—	—	51 (1.2)	49 (1.2)
Illinois †	—	—	50 (1.7)	50 (1.7)
Indiana †	50 (1.1)	50 (1.1)	51 (1.4)	49 (1.4)
Kentucky	50 (1.3)	50 (1.3)	51 (1.2)	49 (1.2)
Louisiana	50 (1.0)	50 (1.0)	49 (1.1)	51 (1.1)
Maine †	48 (1.0)	52 (1.0)	49 (1.4)	51 (1.4)
Maryland	51 (1.2)	49 (1.2)	49 (0.9)	51 (0.9)
Massachusetts	52 (1.0)	48 (1.0)	49 (1.0)	51 (1.0)
Michigan †	50 (1.2)	50 (1.2)	50 (1.2)	50 (1.2)
Minnesota †	50 (1.1)	50 (1.1)	53 (1.4)	47 (1.4)
Mississippi	50 (1.1)	50 (1.1)	50 (0.9)	50 (0.9)
Missouri	51 (1.1)	49 (1.1)	49 (1.2)	51 (1.2)
Montana †	49 (1.5)	51 (1.5)	55 (1.4)	45 (1.4)
Nebraska	50 (0.9)	50 (0.9)	53 (1.0)	47 (1.0)
Nevada	—	—	50 (1.1)	50 (1.1)
New Mexico	50 (1.0)	50 (1.0)	49 (1.2)	51 (1.2)
New York †	50 (1.0)	50 (1.0)	50 (1.4)	50 (1.4)
North Carolina	50 (1.0)	50 (1.0)	49 (1.4)	51 (1.4)
North Dakota	52 (0.9)	48 (0.9)	51 (1.2)	49 (1.2)
Ohio	—	—	49 (1.3)	51 (1.3)
Oklahoma	—	—	51 (1.0)	49 (1.0)
Oregon †	49 (1.2)	51 (1.2)	50 (1.1)	50 (1.1)
Rhode Island	50 (1.3)	50 (1.3)	50 (1.1)	50 (1.1)
South Carolina	49 (1.1)	51 (1.1)	48 (1.1)	52 (1.1)
Tennessee	52 (1.3)	48 (1.3)	51 (1.1)	49 (1.1)
Texas	50 (1.1)	50 (1.1)	50 (1.2)	50 (1.2)
Utah	48 (1.0)	52 (1.0)	48 (1.1)	52 (1.1)
Vermont †	49 (1.4)	51 (1.4)	50 (1.2)	50 (1.2)
Virginia	51 (1.1)	49 (1.1)	49 (1.1)	51 (1.1)
West Virginia	51 (0.9)	49 (0.9)	49 (1.2)	51 (1.2)
Wyoming	52 (1.1)	48 (1.1)	51 (1.1)	49 (1.1)
Other Jurisdictions				
American Samoa	—	—	52 (2.9)	48 (2.9)
DDESS	51 (1.9)	49 (1.9)	49 (1.9)	51 (1.9)
DoDDS	49 (1.0)	51 (1.0)	50 (1.1)	50 (1.1)
Guam	50 (1.4)	50 (1.4)	53 (1.9)	47 (1.9)

Standard errors of the estimated percentages appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
NOTE: Percentages may not add to 100 due to rounding.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.43: Data for Table 3.6 State Scale Score Results by Race/Ethnicity, Grade 4

State average science scale scores by race/ethnicity for grade 4 public schools: 2000

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Nation	159 (0.9)	124 (1.7)	127 (1.4)	~	139 (2.9)
Alabama	158 (1.5)	125 (1.6)	117 (5.1)	****(****)	****(****)
Arizona	157 (1.1)	128 (3.8)	123 (2.2)	****(****)	115 (3.8)
Arkansas	156 (1.3)	117 (2.9)	121 (4.7)	****(****)	144 (5.6)
California †	151 (2.1)	119 (4.3)	115 (2.5)	142 (3.1)	****(****)
Connecticut	166 (1.0)	127 (2.6)	133 (2.5)	****(****)	****(****)
Georgia	160 (1.6)	124 (1.4)	128 (3.3)	162 (5.5)	****(****)
Hawaii	148 (1.8)	125 (5.0)	119 (2.9)	138 (1.7)	****(****)
Idaho †	158 (1.4)	****(****)	126 (3.2)	****(****)	****(****)
Illinois †	166 (1.4)	127 (2.5)	129 (2.8)	****(****)	****(****)
Indiana †	160 (1.4)	132 (4.1) !	130 (4.4)	****(****)	****(****)
Iowa †	162 (1.3)	****(****)	141 (3.8)	****(****)	****(****)
Kentucky	156 (1.2)	129 (2.5)	138 (4.5)	****(****)	****(****)
Louisiana	156 (1.6)	121 (2.3)	126 (4.9)	****(****)	****(****)
Maine †	163 (1.0)	****(****)	144 (3.9)	****(****)	****(****)
Maryland	162 (1.5)	125 (1.8)	133 (3.1)	164 (4.6)	134 (5.2)
Massachusetts	169 (0.9)	137 (3.4)	130 (3.1)	161 (4.5)	****(****)
Michigan †	164 (1.6)	121 (2.9)	132 (4.0)	****(****)	****(****)
Minnesota †	163 (1.2)	126 (5.4)	136 (4.2)	134 (4.8)	148 (5.1)
Mississippi	153 (1.4)	117 (1.2)	114 (4.0)	****(****)	****(****)
Missouri	164 (1.1)	131 (2.6)	129 (7.0)	****(****)	152 (3.5)
Montana †	164 (1.5)	****(****)	147 (4.3)	****(****)	145 (5.2) !
Nebraska	155 (1.7)	125 (4.6) !	136 (3.7)	****(****)	****(****)
Nevada	152 (1.4)	121 (3.0)	127 (1.7)	147 (2.9)	145 (4.0)
New Mexico	155 (2.1)	129 (5.8)	129 (2.6)	****(****)	123 (4.5)
New York †	163 (1.2)	131 (2.3)	132 (2.7)	156 (4.6) !	****(****)
North Carolina	159 (1.1)	128 (1.7)	133 (4.1)	****(****)	132 (6.4) !
North Dakota	163 (0.8)	****(****)	145 (3.4)	****(****)	136 (5.5)
Ohio †	161 (1.4)	129 (3.2)	141 (3.9)	****(****)	****(****)
Oklahoma	159 (1.3)	133 (2.5)	136 (2.3)	****(****)	148 (2.9)
Oregon †	156 (1.7)	****(****)	123 (4.3)	****(****)	148 (3.7)
Rhode Island	159 (1.3)	121 (2.2)	116 (4.2)	143 (5.3)	****(****)
South Carolina	157 (1.2)	123 (1.9)	128 (4.2)	****(****)	****(****)
Tennessee	157 (1.3)	122 (2.5)	128 (4.6)	****(****)	****(****)
Texas	162 (1.2)	134 (3.4)	135 (2.3)	158 (6.0) !	****(****)
Utah	160 (1.0)	****(****)	135 (2.3)	147 (4.7)	138 (4.4)
Vermont †	160 (1.9)	****(****)	****(****)	****(****)	****(****)
Virginia	166 (1.3)	139 (2.6)	140 (7.3)	176 (3.9)	****(****)
West Virginia	152 (1.1)	132 (3.7) !	135 (4.3)	****(****)	****(****)
Wyoming	161 (1.1)	****(****)	142 (2.3)	****(****)	149 (4.2)
Other Jurisdictions					
American Samoa	****(****)	****(****)	36 (4.1)	58 (2.2)	****(****)
DDESS	166 (0.9)	145 (1.5)	154 (1.6)	157 (2.6)	****(****)
DoDDS	163 (0.8)	141 (0.9)	151 (1.4)	156 (1.8)	153 (2.4)
Guam	112 (5.8)	****(****)	88 (5.4)	116 (1.6)	****(****)
Virgin Islands	****(****)	119 (1.4)	106 (3.0)	****(****)	****(****)

Standard errors of the estimated scale scores appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
~ Special analyses raised concerns about the accuracy and precision of the National grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.44: Data for Table 3.7 State Scale Score Results by Race/Ethnicity, Grade 8

State average science scale scores by race/ethnicity for grade 8 public schools: 1996 and 2000

	White		Black		Hispanic		Asian/Pacific Islander		American Indian	
	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
Nation	159 (1.1)	160 (0.8)	120 (1.2)	121 (1.3)	127 (1.8)	127 (1.4)	150 (3.3)	154 (2.7)	148 (4.2) *	132 (3.4)
Alabama	151 (1.5)	154 (1.5)	117 (1.8)	116 (2.4)	107 (7.6)	106 (6.3)	****(****)	****(****)	****(****)	****(****)
Arizona †	157 (1.3)	159 (1.2)	124 (3.3)	127 (4.7)	129 (2.1)	126 (2.6)	****(****)	****(****)	121 (8.6) !	137 (4.0)
Arkansas	154 (1.5)	154 (1.3)	116 (2.5)	113 (2.2)	122 (5.8)	118 (5.2)	****(****)	****(****)	****(****)	****(****)
California †	156 (1.7)	150 (1.7)	121 (3.4)	120 (5.2)	121 (1.9)	117 (1.7)	148 (3.6)	147 (4.0)	****(****)	****(****)
Connecticut	165 (1.0)	166 (0.9)	121 (4.4)	122 (3.2)	122 (2.6)	129 (3.0)	163 (3.7)	160 (5.0)	****(****)	****(****)
Georgia	155 (1.2)	159 (1.7)	122 (1.4)	123 (1.5)	128 (4.2)	124 (4.1)	****(****)	****(****)	****(****)	****(****)
Hawaii	146 (1.8)	149 (2.5)	128 (4.4)	128 (3.5)	119 (2.6)	119 (2.7)	136 (1.0) *	132 (1.4)	****(****)	****(****)
Idaho †	—	162 (1.2)	—	****(****)	—	135 (2.6)	—	****(****)	—	****(****)
Illinois †	—	165 (1.5)	—	123 (3.4)	—	131 (3.2)	—	162 (3.7)	—	****(****)
Indiana †	158 (1.3)	161 (1.3)	125 (3.3)	127 (3.4) !	139 (2.1)	132 (6.4)	****(****)	****(****)	****(****)	****(****)
Kentucky	151 (1.1) *	155 (1.3)	127 (2.7)	126 (2.9)	113 (6.2)	****(****)	****(****)	****(****)	****(****)	****(****)
Louisiana	148 (1.3) *	154 (1.4)	113 (2.1)	113 (2.0)	104 (5.7)	119 (4.7)	****(****)	****(****)	****(****)	****(****)
Maine †	164 (0.9) *	161 (1.0)	****(****)	****(****)	141 (4.6)	****(****)	****(****)	****(****)	****(****)	****(****)
Maryland	160 (1.4)	163 (1.1)	124 (1.4)	127 (1.7)	121 (4.1) *	135 (3.3)	161 (3.6)	170 (3.2)	****(****)	****(****)
Massachusetts	163 (1.2) *	168 (1.1)	126 (3.3)	134 (4.0)	126 (3.9)	128 (4.0)	152 (7.3) !	165 (3.9)	****(****)	****(****)
Michigan †	161 (1.4)	164 (1.3)	122 (2.4)	120 (3.4)	134 (4.9)	137 (4.1)	****(****)	****(****)	****(****)	****(****)
Minnesota †	162 (1.2)	165 (1.3)	130 (4.4)	122 (9.0) !	134 (5.3)	136 (7.0)	152 (9.7) !	****(****)	****(****)	****(****)
Mississippi	149 (1.2)	150 (1.3)	119 (1.4) *	114 (1.2)	105 (3.8)	113 (4.6)	****(****)	****(****)	****(****)	****(****)
Missouri	158 (1.0) *	162 (1.1)	120 (2.8)	125 (2.8)	130 (5.0)	141 (4.4)	****(****)	****(****)	****(****)	****(****)
Montana †	166 (0.9)	168 (0.9)	****(****)	****(****)	147 (2.7)	151 (4.2)	****(****)	****(****)	139 (2.7)	143 (4.7)
Nebraska	161 (0.9)	162 (0.9)	130 (3.1)	129 (3.8)	134 (3.1)	132 (4.2)	****(****)	****(****)	****(****)	****(****)
Nevada	—	154 (0.8)	—	125 (3.0)	—	126 (2.4)	—	148 (2.5)	—	134 (4.5)
New Mexico	159 (1.0)	160 (1.5)	****(****)	****(****)	130 (1.1)	130 (1.9)	****(****)	****(****)	126 (2.4)	124 (5.3)
New York †	161 (1.4)	165 (1.7)	120 (1.9)	128 (4.1)	116 (2.7)	125 (5.6)	155 (5.4)	151 (5.4)	****(****)	****(****)
North Carolina	157 (1.1)	158 (1.5)	126 (1.4)	123 (1.9)	123 (3.6) *	139 (4.7)	****(****)	158 (5.7)	136 (4.1) !	****(****)
North Dakota	164 (0.8)	164 (0.9)	****(****)	****(****)	137 (4.5)	139 (4.5)	****(****)	****(****)	137 (6.9) !	133 (2.7)
Ohio	—	165 (1.3)	—	131 (3.6)	—	147 (4.5)	—	****(****)	—	****(****)
Oklahoma	—	156 (1.1)	—	127 (2.6)	—	123 (5.2)	—	****(****)	—	145 (2.2)
Oregon †	158 (1.4)	160 (1.4)	****(****)	131 (4.8)	133 (3.7)	128 (3.1)	157 (3.3)	157 (4.4)	142 (7.9)	144 (3.9)
Rhode Island	155 (0.9)	156 (0.8)	130 (2.8)	128 (3.3)	118 (1.8)	127 (5.7)	142 (3.1)	143 (4.0)	****(****)	****(****)
South Carolina	153 (1.6)	155 (1.7)	122 (1.6)	122 (1.5)	122 (4.1)	123 (5.2)	****(****)	****(****)	****(****)	****(****)
Tennessee	151 (1.7)	155 (1.2)	117 (3.1)	118 (2.3)	104 (6.2)	123 (6.3)	****(****)	****(****)	****(****)	****(****)
Texas	161 (1.2)	159 (2.0)	127 (2.4)	122 (3.2)	129 (2.7)	132 (1.9)	157 (3.6)	162 (5.4)	****(****)	****(****)
Utah	159 (0.7)	159 (0.9)	****(****)	****(****)	133 (2.9)	135 (3.0)	143 (3.2)	152 (5.4)	****(****)	****(****)
Vermont †	159 (0.9)	162 (1.0)	****(****)	****(****)	136 (3.4)	****(****)	****(****)	****(****)	****(****)	****(****)
Virginia	158 (1.4)	161 (1.3)	126 (2.3)	130 (1.9)	132 (4.2)	138 (3.0)	165 (3.2)	169 (3.9)	****(****)	****(****)
West Virginia	149 (0.9)	151 (1.1)	127 (3.2)	125 (3.6)	122 (4.3)	****(****)	****(****)	****(****)	****(****)	****(****)
Wyoming	161 (0.6)	161 (0.8)	****(****)	****(****)	140 (1.9)	139 (3.1)	****(****)	****(****)	138 (2.5)	141 (4.4) !
Other Jurisdictions										
American Samoa	—	****(****)	—	****(****)	—	55 (3.7)	—	90 (3.8)	—	****(****)
DDESS	162 (1.7) *	169 (2.0)	137 (2.5)	140 (2.6)	149 (2.4)	156 (2.7)	****(****)	****(****)	****(****)	****(****)
DoDDS	164 (1.2)	168 (1.1)	140 (1.2)	142 (1.5)	146 (1.6)	153 (2.5)	156 (1.4)	160 (2.1)	****(****)	****(****)
Guam	138 (4.6)	****(****)	****(****)	****(****)	106 (2.9)	97 (9.2)	122 (1.4)	119 (2.7)	****(****)	****(****)

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
**** (****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.45: Data for Table 3.8 State *Proficient* Level Achievement Results by Race/Ethnicity, Grade 4

State percentages of students at or above the *Proficient* level in science by race/ethnicity for grade 4 public schools: 2000

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Nation	37 (1.2)	6 (0.9)	10 (0.9)	~	17 (3.6)
Alabama	34 (2.1)	5 (1.1)	8 (4.0)	****(****)	****(****)
Arizona	34 (2.6)	9 (3.2)	7 (1.8)	****(****)	7 (2.9)
Arkansas	32 (1.8)	3 (1.1)	9 (2.9)	****(****)	22 (6.0)
California †	27 (3.1)	4 (1.8)	5 (1.0)	19 (3.9)	****(****)
Connecticut	45 (1.9)	4 (1.7)	12 (1.8)	****(****)	****(****)
Georgia	39 (2.3)	6 (1.0)	12 (2.4)	39 (9.1)	****(****)
Hawaii	25 (2.5)	8 (3.5)	7 (1.8)	16 (1.4)	****(****)
Idaho †	35 (2.0)	****(****)	8 (2.7)	****(****)	****(****)
Illinois †	46 (2.9)	7 (2.4)	10 (2.0)	****(****)	****(****)
Indiana †	37 (2.2)	9 (3.1) !	12 (2.8)	****(****)	****(****)
Iowa †	40 (2.0)	****(****)	16 (4.9)	****(****)	****(****)
Kentucky	32 (1.7)	5 (2.1)	15 (4.1)	****(****)	****(****)
Louisiana	31 (3.1)	5 (0.9)	17 (4.3)	****(****)	****(****)
Maine †	40 (1.9)	****(****)	16 (6.9)	****(****)	****(****)
Maryland	40 (2.3)	6 (1.1)	13 (3.3)	44 (7.2)	18 (5.7)
Massachusetts	50 (1.9)	13 (3.6)	11 (2.4)	41 (6.7)	****(****)
Michigan †	43 (2.8)	6 (2.0)	12 (5.1)	****(****)	****(****)
Minnesota †	41 (2.4)	7 (3.6)	14 (3.4)	11 (5.1)	18 (5.7)
Mississippi	26 (1.6)	2 (0.9)	7 (2.8)	****(****)	****(****)
Missouri	42 (1.8)	9 (2.0)	20 (4.8)	****(****)	35 (6.7)
Montana †	41 (2.6)	****(****)	23 (5.3)	****(****)	19 (5.8) !
Nebraska	31 (2.4)	5 (2.5) !	12 (3.0)	****(****)	****(****)
Nevada	27 (1.6)	4 (1.8)	8 (1.5)	21 (4.3)	20 (5.8)
New Mexico	33 (2.9)	9 (4.6)	10 (1.7)	****(****)	6 (3.1)
New York †	40 (2.0)	6 (2.2)	9 (1.9)	36 (6.7) !	****(****)
North Carolina	35 (1.8)	6 (1.0)	11 (3.6)	****(****)	10 (4.8) !
North Dakota	41 (1.4)	****(****)	23 (3.9)	****(****)	13 (4.6)
Ohio †	38 (2.1)	7 (1.6)	17 (3.6)	****(****)	****(****)
Oklahoma	34 (2.1)	9 (2.6)	11 (2.3)	****(****)	22 (3.8)
Oregon †	32 (2.1)	****(****)	10 (2.8)	****(****)	26 (5.9)
Rhode Island	35 (1.6)	5 (1.6)	4 (1.3)	18 (5.8)	****(****)
South Carolina	34 (2.1)	4 (1.2)	11 (2.6)	****(****)	****(****)
Tennessee	34 (2.0)	6 (1.4)	9 (2.7)	****(****)	****(****)
Texas	39 (2.7)	10 (2.8)	12 (1.5)	38 (9.1) !	****(****)
Utah	36 (1.4)	****(****)	13 (2.3)	21 (5.6)	16 (4.8)
Vermont †	40 (3.3)	****(****)	****(****)	****(****)	****(****)
Virginia	44 (2.4)	12 (2.0)	17 (4.4)	58 (8.7)	****(****)
West Virginia	26 (1.5)	8 (3.2) !	12 (4.4)	****(****)	****(****)
Wyoming	37 (1.7)	****(****)	15 (3.3)	****(****)	22 (5.5)
Other Jurisdictions					
American Samoa	****(****)	****(****)	0 (0.0)	▲ (0.3)	****(****)
DDESS	42 (2.2)	15 (2.7)	26 (4.3)	25 (8.1)	****(****)
DoDDS	41 (1.8)	12 (1.6)	23 (2.4)	30 (3.2)	24 (6.0)
Guam	7 (3.6)	****(****)	▲ (0.7)	4 (1.1)	****(****)
Virgin Islands	****(****)	4 (1.0)	1 (1.0)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
****(****) Sample size is insufficient to permit a reliable estimate. † Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
~ Special analyses raised concerns about the accuracy and precision of the National grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.46: State *Basic* Level Achievement Results by Race/Ethnicity, Grade 4

State percentages of students at or above the *Basic* level in science by race/ethnicity for grade 4 public schools: 2000

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Nation	78 (1.0)	33 (2.1)	40 (1.6)	~	56 (3.9)
Alabama	78 (2.0)	34 (2.7)	31 (4.1)	****(****)	****(****)
Arizona	76 (1.8)	38 (5.4)	35 (2.6)	****(****)	29 (4.5)
Arkansas	77 (1.8)	25 (3.1)	35 (4.8)	****(****)	62 (6.3)
California †	72 (2.6)	28 (3.8)	27 (2.5)	61 (6.4)	****(****)
Connecticut	88 (1.3)	35 (5.0)	46 (3.4)	****(****)	****(****)
Georgia	79 (2.1)	33 (2.1)	42 (4.0)	80 (6.7)	****(****)
Hawaii	66 (3.5)	39 (5.9)	31 (3.6)	52 (2.0)	****(****)
Idaho †	78 (2.0)	****(****)	40 (4.6)	****(****)	****(****)
Illinois †	87 (1.5)	37 (3.5)	42 (4.2)	****(****)	****(****)
Indiana †	81 (1.8)	42 (5.0) !	43 (5.5)	****(****)	****(****)
Iowa †	84 (1.9)	****(****)	56 (8.6)	****(****)	****(****)
Kentucky	76 (1.4)	38 (4.7)	51 (6.1)	****(****)	****(****)
Louisiana	76 (1.8)	30 (2.6)	41 (5.9)	****(****)	****(****)
Maine †	83 (1.3)	****(****)	65 (7.3)	****(****)	****(****)
Maryland	81 (1.6)	34 (1.8)	45 (3.8)	83 (7.0)	48 (8.1)
Massachusetts	90 (0.9)	47 (6.4)	40 (4.1)	80 (6.4)	****(****)
Michigan †	83 (1.6)	29 (5.1)	46 (5.3)	****(****)	****(****)
Minnesota †	84 (1.5)	39 (7.9)	53 (6.7)	50 (7.3)	69 (7.2)
Mississippi	73 (2.0)	23 (2.0)	25 (4.1)	****(****)	****(****)
Missouri	85 (1.3)	43 (4.3)	48 (6.3)	****(****)	70 (4.8)
Montana †	86 (2.1)	****(****)	64 (8.8)	****(****)	63 (9.6) !
Nebraska	75 (1.7)	35 (6.8) !	49 (6.1)	****(****)	****(****)
Nevada	71 (2.2)	29 (3.8)	40 (2.4)	62 (4.7)	62 (6.7)
New Mexico	74 (2.1)	42 (7.7)	44 (3.3)	****(****)	35 (5.7)
New York †	87 (1.5)	40 (4.1)	44 (3.6)	71 (7.7) !	****(****)
North Carolina	80 (1.9)	37 (2.1)	43 (6.5)	****(****)	42 (10.9) !
North Dakota	85 (1.3)	****(****)	60 (6.5)	****(****)	48 (8.1)
Ohio †	80 (1.6)	38 (5.1)	55 (6.3)	****(****)	****(****)
Oklahoma	81 (2.0)	43 (4.7)	50 (3.8)	****(****)	66 (4.8)
Oregon †	75 (2.2)	****(****)	39 (5.1)	****(****)	65 (9.3)
Rhode Island	80 (1.8)	27 (3.8)	29 (3.2)	58 (8.5)	****(****)
South Carolina	75 (1.4)	32 (2.8)	41 (5.6)	****(****)	****(****)
Tennessee	76 (1.5)	31 (3.7)	40 (6.3)	****(****)	****(****)
Texas	84 (1.6)	45 (5.0)	49 (3.0)	72 (6.4) !	****(****)
Utah	80 (1.3)	****(****)	52 (4.2)	64 (5.9)	57 (7.7)
Vermont †	80 (2.0)	****(****)	****(****)	****(****)	****(****)
Virginia	86 (1.7)	53 (3.3)	54 (10.0)	94 (3.7)	****(****)
West Virginia	72 (1.8)	40 (7.8) !	51 (6.1)	****(****)	****(****)
Wyoming	84 (1.8)	****(****)	59 (4.2)	****(****)	69 (8.8)
Other Jurisdictions					
American Samoa	****(****)	****(****)	▲ (0.4)	3 (1.2)	****(****)
DDESS	89 (1.7)	62 (4.0)	74 (3.2)	83 (4.3)	****(****)
DoDDS	85 (1.2)	56 (2.6)	71 (3.0)	78 (3.5)	78 (5.1)
Guam	24 (6.2)	****(****)	9 (2.8)	27 (2.2)	****(****)
Virgin Islands	****(****)	29 (2.2)	17 (4.6)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
~ Special analyses raised concerns about the accuracy and precision of the National grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.47: State Achievement-Level Results by Race/Ethnicity, Grade 4

State percentages of students at or above science achievement levels by race/ethnicity for grade 4 public schools: 2000

	White				Black				Hispanic			
	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*
Nation	22 (1.0)	78 (1.0)	37 (1.2)	5 (0.5)	67 (2.1)	33 (2.1)	6 (0.9)	▲ (****)	60 (1.6)	40 (1.6)	10 (0.9)	1 (0.4)
Alabama	22 (2.0)	78 (2.0)	34 (2.1)	3 (0.6)	66 (2.7)	34 (2.7)	5 (1.1)	▲ (****)	69 (4.1)	31 (4.1)	8 (4.0)	▲ (****)
Arizona	24 (1.8)	76 (1.8)	34 (2.6)	4 (0.7)	62 (5.4)	38 (5.4)	9 (3.2)	0 (****)	65 (2.6)	35 (2.6)	7 (1.8)	▲ (****)
Arkansas	23 (1.8)	77 (1.8)	32 (1.8)	3 (0.8)	75 (3.1)	25 (3.1)	3 (1.1)	▲ (****)	65 (4.8)	35 (4.8)	9 (2.9)	▲ (****)
California †	28 (2.6)	72 (2.6)	27 (3.1)	2 (0.6)	72 (3.8)	28 (3.8)	4 (1.8)	▲ (****)	73 (2.5)	27 (2.5)	5 (1.0)	▲ (****)
Connecticut	12 (1.3)	88 (1.3)	45 (1.9)	4 (0.8)	65 (5.0)	35 (5.0)	4 (1.7)	▲ (****)	54 (3.4)	46 (3.4)	12 (1.8)	1 (****)
Georgia	21 (2.1)	79 (2.1)	39 (2.3)	5 (0.8)	67 (2.1)	33 (2.1)	6 (1.0)	▲ (****)	58 (4.0)	42 (4.0)	12 (2.4)	1 (****)
Hawaii	34 (3.5)	66 (3.5)	25 (2.5)	1 (0.7)	61 (5.9)	39 (5.9)	8 (3.5)	1 (****)	69 (3.6)	31 (3.6)	7 (1.8)	▲ (****)
Idaho †	22 (2.0)	78 (2.0)	35 (2.0)	3 (0.7)	****(****)	****(****)	****(****)	****(****)	60 (4.6)	40 (4.6)	8 (2.7)	▲ (****)
Illinois †	13 (1.5)	87 (1.5)	46 (2.9)	6 (1.4)	63 (3.5)	37 (3.5)	7 (2.4)	▲ (****)	58 (4.2)	42 (4.2)	10 (2.0)	1 (0.6)
Indiana †	19 (1.8)	81 (1.8)	37 (2.2)	4 (0.7)	58 (5.0) !	42 (5.0) !	9 (3.1) !	0 (****) !	57 (5.5)	43 (5.5)	12 (2.8)	▲ (****)
Iowa †	16 (1.9)	84 (1.9)	40 (2.0)	4 (0.7)	****(****)	****(****)	****(****)	****(****)	44 (8.6)	56 (8.6)	16 (4.9)	0 (****)
Kentucky	24 (1.4)	76 (1.4)	32 (1.7)	3 (0.5)	62 (4.7)	38 (4.7)	5 (2.1)	0 (****)	49 (6.1)	51 (6.1)	15 (4.1)	1 (****)
Louisiana	24 (1.8)	76 (1.8)	31 (3.1)	3 (0.7)	70 (2.6)	30 (2.6)	5 (0.9)	▲ (****)	59 (5.9)	41 (5.9)	17 (4.3)	2 (1.3)
Maine †	17 (1.3)	83 (1.3)	40 (1.9)	4 (0.7)	****(****)	****(****)	****(****)	****(****)	35 (7.3)	65 (7.3)	16 (6.9)	0 (****)
Maryland	19 (1.6)	81 (1.6)	40 (2.3)	5 (0.9)	66 (1.8)	34 (1.8)	6 (1.1)	▲ (****)	55 (3.8)	45 (3.8)	13 (3.3)	▲ (****)
Massachusetts	10 (0.9)	90 (0.9)	50 (1.9)	7 (0.8)	53 (6.4)	47 (6.4)	13 (3.6)	1 (****)	60 (4.1)	40 (4.1)	11 (2.4)	1 (****)
Michigan †	17 (1.6)	83 (1.6)	43 (2.8)	5 (0.9)	71 (5.1)	29 (5.1)	6 (2.0)	▲ (****)	54 (5.3)	46 (5.3)	12 (5.1)	1 (****)
Minnesota †	16 (1.5)	84 (1.5)	41 (2.4)	4 (0.6)	61 (7.9)	39 (7.9)	7 (3.6)	0 (****)	47 (6.7)	53 (6.7)	14 (3.4)	1 (****)
Mississippi	27 (2.0)	73 (2.0)	26 (1.6)	2 (0.5)	77 (2.0)	23 (2.0)	2 (0.9)	▲ (****)	75 (4.1)	25 (4.1)	7 (2.8)	▲ (****)
Missouri	15 (1.3)	85 (1.3)	42 (1.8)	5 (0.6)	57 (4.3)	43 (4.3)	9 (2.0)	▲ (****)	52 (6.3)	48 (6.3)	20 (4.8)	▲ (****)
Montana †	14 (2.1)	86 (2.1)	41 (2.6)	4 (0.9)	****(****)	****(****)	****(****)	****(****)	36 (8.8)	64 (8.8)	23 (5.3)	2 (****)
Nebraska	25 (1.7)	75 (1.7)	31 (2.4)	3 (0.9)	65 (6.8) !	35 (6.8) !	5 (2.5) !	0 (****) !	51 (6.1)	49 (6.1)	12 (3.0)	1 (****)
Nevada	29 (2.2)	71 (2.2)	27 (1.6)	2 (0.5)	71 (3.8)	29 (3.8)	4 (1.8)	▲ (****)	60 (2.4)	40 (2.4)	8 (1.5)	▲ (****)
New Mexico	26 (2.1)	74 (2.1)	33 (2.9)	4 (1.5)	58 (7.7)	42 (7.7)	9 (4.6)	1 (****)	56 (3.3)	44 (3.3)	10 (1.7)	1 (0.4)
New York †	13 (1.5)	87 (1.5)	40 (2.0)	3 (0.5)	60 (4.1)	40 (4.1)	6 (2.2)	▲ (****)	56 (3.6)	44 (3.6)	9 (1.9)	▲ (****)
North Carolina	20 (1.9)	80 (1.9)	35 (1.8)	3 (0.9)	63 (2.1)	37 (2.1)	6 (1.0)	▲ (****)	57 (6.5)	43 (6.5)	11 (3.6)	0 (****)
North Dakota	15 (1.3)	85 (1.3)	41 (1.4)	4 (0.5)	****(****)	****(****)	****(****)	****(****)	40 (6.5)	60 (6.5)	23 (3.9)	1 (****)
Ohio †	20 (1.6)	80 (1.6)	38 (2.1)	5 (0.8)	62 (5.1)	38 (5.1)	7 (1.6)	▲ (****)	45 (6.3)	55 (6.3)	17 (3.6)	1 (****)
Oklahoma	19 (2.0)	81 (2.0)	34 (2.1)	3 (0.6)	57 (4.7)	43 (4.7)	9 (2.6)	1 (****)	50 (3.8)	50 (3.8)	11 (2.3)	1 (0.4)
Oregon †	25 (2.2)	75 (2.2)	32 (2.1)	3 (0.8)	****(****)	****(****)	****(****)	****(****)	61 (5.1)	39 (5.1)	10 (2.8)	▲ (****)
Rhode Island	20 (1.8)	80 (1.8)	35 (1.6)	3 (0.5)	73 (3.8)	27 (3.8)	5 (1.6)	1 (****)	71 (3.2)	29 (3.2)	4 (1.3)	▲ (****)
South Carolina	25 (1.4)	75 (1.4)	34 (2.1)	4 (0.6)	68 (2.8)	32 (2.8)	4 (1.2)	▲ (****)	59 (5.6)	41 (5.6)	11 (2.6)	2 (****)
Tennessee	24 (1.5)	76 (1.5)	34 (2.0)	4 (0.7)	69 (3.7)	31 (3.7)	6 (1.4)	▲ (****)	60 (6.3)	40 (6.3)	9 (2.7)	1 (****)
Texas	16 (1.6)	84 (1.6)	39 (2.7)	4 (0.8)	55 (5.0)	45 (5.0)	10 (2.8)	▲ (****)	51 (3.0)	49 (3.0)	12 (1.5)	1 (0.5)
Utah	20 (1.3)	80 (1.3)	36 (1.4)	4 (0.6)	****(****)	****(****)	****(****)	****(****)	48 (4.2)	52 (4.2)	13 (2.3)	1 (0.5)
Vermont †	20 (2.0)	80 (2.0)	40 (3.3)	4 (1.2)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Virginia	14 (1.7)	86 (1.7)	44 (2.4)	6 (0.9)	47 (3.3)	53 (3.3)	12 (2.0)	▲ (****)	46 (10.0)	54 (10.0)	17 (4.4)	1 (****)
West Virginia	28 (1.8)	72 (1.8)	26 (1.5)	2 (0.3)	60 (7.8) !	40 (7.8) !	8 (3.2) !	▲ (****) !	49 (6.1)	51 (6.1)	12 (4.4)	1 (****)
Wyoming	16 (1.8)	84 (1.8)	37 (1.7)	3 (0.6)	****(****)	****(****)	****(****)	****(****)	41 (4.2)	59 (4.2)	15 (3.3)	▲ (****)
Other Jurisdictions												
American Samoa	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	100 (****)	▲ (****)	0 (****)	0 (****)
DDESS	11 (1.7)	89 (1.7)	42 (2.2)	3 (0.7)	38 (4.0)	62 (4.0)	15 (2.7)	▲ (****)	26 (3.2)	74 (3.2)	26 (4.3)	2 (1.1)
DoDDS	15 (1.2)	85 (1.2)	41 (1.8)	5 (0.6)	44 (2.6)	56 (2.6)	12 (1.6)	▲ (****)	29 (3.0)	71 (3.0)	23 (2.4)	2 (0.8)
Guam	76 (6.2)	24 (6.2)	7 (3.6)	0 (****)	****(****)	****(****)	****(****)	****(****)	91 (2.8)	9 (2.8)	▲ (****)	0 (****)
Virgin Islands	****(****)	****(****)	****(****)	****(****)	71 (2.2)	29 (2.2)	4 (1.0)	▲ (****)	83 (4.6)	17 (4.6)	1 (****)	▲ (****)

See footnotes at end of table. ▶

Table B.47: State Achievement-level results by Race/Ethnicity, Grade 4 (continued)

State percentages of students at or above science achievement levels by race/ethnicity for grade 4 public schools: 2000

	Asian/Pacific Islander				American Indian			
	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*
Nation	~	~	~	~	44 (3.9)	56 (3.9)	17 (3.6)	1 (0.9)
Alabama	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Arizona	****(****)	****(****)	****(****)	****(****)	71 (4.5)	29 (4.5)	7 (2.9)	0 (****)
Arkansas	****(****)	****(****)	****(****)	****(****)	38 (6.3)	62 (6.3)	22 (6.0)	1 (****)
California †	39 (6.4)	61 (6.4)	19 (3.9)	1 (1.0)	****(****)	****(****)	****(****)	****(****)
Connecticut	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Georgia	20 (6.7)	80 (6.7)	39 (9.1)	6 (****)	****(****)	****(****)	****(****)	****(****)
Hawaii	48 (2.0)	52 (2.0)	16 (1.4)	1 (0.4)	****(****)	****(****)	****(****)	****(****)
Idaho †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Illinois †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Indiana †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Iowa †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Kentucky	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Louisiana	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Maine †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Maryland	17 (7.0)	83 (7.0)	44 (7.2)	7 (3.6)	52 (8.1)	48 (8.1)	18 (5.7)	1 (****)
Massachusetts	20 (6.4)	80 (6.4)	41 (6.7)	5 (3.0)	****(****)	****(****)	****(****)	****(****)
Michigan †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Minnesota †	50 (7.3)	50 (7.3)	11 (5.1)	1 (****)	31 (7.2)	69 (7.2)	18 (5.7)	▲ (****)
Mississippi	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Missouri	****(****)	****(****)	****(****)	****(****)	30 (4.8)	70 (4.8)	35 (6.7)	2 (****)
Montana †	****(****)	****(****)	****(****)	****(****)	37 (9.6) !	63 (9.6) !	19 (5.8) !	▲ (****) !
Nebraska	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Nevada	38 (4.7)	62 (4.7)	21 (4.3)	2 (****)	38 (6.7)	62 (6.7)	20 (5.8)	2 (****)
New Mexico	****(****)	****(****)	****(****)	****(****)	65 (5.7)	35 (5.7)	6 (3.1)	▲ (****)
New York †	29 (7.7) !	71 (7.7) !	36 (6.7) !	4 (****) !	****(****)	****(****)	****(****)	****(****)
North Carolina	****(****)	****(****)	****(****)	****(****)	58 (10.9) !	42 (10.9) !	10 (4.8) !	1 (****) !
North Dakota	****(****)	****(****)	****(****)	****(****)	52 (8.1)	48 (8.1)	13 (4.6)	1 (****)
Ohio †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Oklahoma	****(****)	****(****)	****(****)	****(****)	34 (4.8)	66 (4.8)	22 (3.8)	2 (1.1)
Oregon †	****(****)	****(****)	****(****)	****(****)	35 (9.3)	65 (9.3)	26 (5.9)	2 (****)
Rhode Island	42 (8.5)	58 (8.5)	18 (5.8)	3 (****)	****(****)	****(****)	****(****)	****(****)
South Carolina	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Tennessee	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Texas	28 (6.4) !	72 (6.4) !	38 (9.1) !	6 (****) !	****(****)	****(****)	****(****)	****(****)
Utah	36 (5.9)	64 (5.9)	21 (5.6)	1 (****)	43 (7.7)	57 (7.7)	16 (4.8)	1 (****)
Vermont †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Virginia	6 (3.7)	94 (3.7)	58 (8.7)	13 (4.1)	****(****)	****(****)	****(****)	****(****)
West Virginia	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Wyoming	****(****)	****(****)	****(****)	****(****)	31 (8.8)	69 (8.8)	22 (5.5)	1 (****)
Other Jurisdictions								
American Samoa	97 (1.2)	3 (1.2)	▲ (****)	0 (****)	****(****)	****(****)	****(****)	****(****)
DDESS	17 (4.3)	83 (4.3)	25 (8.1)	▲ (****)	****(****)	****(****)	****(****)	****(****)
DoDDS	22 (3.5)	78 (3.5)	30 (3.2)	2 (1.1)	22 (5.1)	78 (5.1)	24 (6.0)	1 (****)
Guam	73 (2.2)	27 (2.2)	4 (1.1)	▲ (****)	****(****)	****(****)	****(****)	****(****)
Virgin Islands	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
(****) Standard error estimates cannot be accurately determined.
**** (****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
~ Special analyses raised concerns about the accuracy and precision of the National grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.48: Data for Table 3.9 State *Proficient* Level Achievement Results by Race/Ethnicity, Grade 8

State percentages of students at or above the *Proficient* level in science by race/ethnicity for grade 8 public schools: 1996 and 2000

	White		Black		Hispanic		Asian/Pacific Islander		American Indian	
	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
Nation	36 (1.8)	40 (1.1)	4 (0.8)	6 (0.8)	10 (1.2)	11 (1.2)	27 (3.6)	36 (3.9)	24 (5.8)	14 (3.6)
Alabama	25 (2.0)	31 (1.9)	4 (1.1)	4 (1.0)	7 (3.2)	7 (3.8)	****(****)	****(****)	****(****)	****(****)
Arizona †	33 (1.9)	35 (1.9)	7 (3.5)	8 (4.2)	8 (1.9)	8 (1.4)	****(****)	****(****)	6 (3.9) !	9 (6.0)
Arkansas	29 (1.9)	30 (1.8)	3 (1.5)	2 (1.0)	9 (4.0)	8 (3.5)	****(****)	****(****)	****(****)	****(****)
California †	33 (2.7)	26 (2.7)	5 (2.5)	6 (2.5)	6 (1.5)	5 (1.1)	27 (3.6)	29 (5.9)	****(****)	****(****)
Connecticut	44 (2.0)	45 (1.3)	5 (2.9)	6 (1.3)	7 (1.8)	11 (2.5)	45 (6.3)	44 (6.3)	****(****)	****(****)
Georgia	31 (2.0)	36 (2.3)	5 (1.2)	6 (1.1)	14 (4.1)	13 (3.5)	****(****)	****(****)	****(****)	****(****)
Hawaii	23 (3.6)	29 (3.5)	9 (4.1)	10 (3.9)	7 (1.5)	7 (2.3)	15 (1.2)	14 (1.3)	****(****)	****(****)
Idaho †	—	42 (1.8)	—	****(****)	—	12 (3.4)	—	****(****)	—	****(****)
Illinois †	—	44 (2.9)	—	5 (2.2)	—	12 (2.5)	—	42 (6.1)	—	****(****)
Indiana †	34 (2.0)	40 (1.9)	8 (2.3)	6 (4.0) !	15 (3.2)	12 (3.7)	****(****)	****(****)	****(****)	****(****)
Kentucky	25 (1.3) *	32 (1.7)	6 (1.8)	7 (2.0)	9 (4.3)	****(****)	****(****)	****(****)	****(****)	****(****)
Louisiana	21 (1.6) *	29 (2.0)	3 (0.9)	3 (0.9)	7 (2.9)	11 (3.0)	****(****)	****(****)	****(****)	****(****)
Maine †	43 (1.7) *	38 (1.9)	****(****)	****(****)	16 (7.3)	****(****)	****(****)	****(****)	****(****)	****(****)
Maryland	38 (2.3)	41 (1.9)	5 (1.3)	8 (1.4)	8 (2.8)	16 (3.6)	38 (6.7)	47 (6.1)	****(****)	****(****)
Massachusetts	41 (1.8) *	49 (2.0)	9 (2.7)	12 (3.5)	11 (2.8)	12 (2.5)	38 (7.9) !	46 (6.2)	****(****)	****(****)
Michigan †	39 (2.3)	43 (2.1)	6 (1.5)	6 (1.7)	14 (4.4)	20 (5.1)	****(****)	****(****)	****(****)	****(****)
Minnesota †	40 (1.7)	46 (2.2)	9 (3.2)	11 (5.9) !	13 (5.7)	21 (6.5)	30 (10.8) !	****(****)	****(****)	****(****)
Mississippi	22 (1.5)	24 (2.0)	3 (0.6)	2 (0.5)	3 (1.7)	7 (3.0)	****(****)	****(****)	****(****)	****(****)
Missouri	34 (1.6) *	42 (1.8)	3 (1.3)	7 (1.8)	12 (3.6)	19 (5.0)	****(****)	****(****)	****(****)	****(****)
Montana †	45 (2.0)	49 (1.8)	****(****)	****(****)	19 (4.8)	29 (7.7)	****(****)	****(****)	12 (3.6)	25 (4.2)
Nebraska	38 (1.6)	40 (1.7)	7 (2.6)	10 (4.0)	16 (4.0)	16 (2.8)	****(****)	****(****)	****(****)	****(****)
Nevada	—	31 (1.6)	—	7 (2.4)	—	9 (1.4)	—	25 (3.9)	—	14 (5.6)
New Mexico	36 (1.4)	39 (3.0)	****(****)	****(****)	9 (0.8)	10 (1.4)	****(****)	****(****)	8 (1.6)	7 (2.1)
New York †	39 (2.2)	44 (2.7)	4 (1.2)	8 (2.9)	7 (2.3)	11 (2.8)	37 (8.3)	29 (6.9)	****(****)	****(****)
North Carolina	33 (1.7)	37 (2.1)	6 (1.0)	6 (1.3)	8 (3.2)	19 (4.8)	****(****)	36 (7.3)	14 (5.0) !	****(****)
North Dakota	43 (1.6)	44 (1.7)	****(****)	****(****)	16 (4.8)	21 (6.7)	****(****)	****(****)	12 (4.6) !	12 (3.5)
Ohio	—	45 (2.0)	—	11 (3.2)	—	30 (5.4)	—	****(****)	—	****(****)
Oklahoma	—	32 (1.8)	—	7 (2.2)	—	10 (2.9)	—	****(****)	—	19 (2.3)
Oregon †	34 (1.9)	38 (2.0)	****(****)	8 (3.8)	13 (2.7)	10 (2.7)	35 (5.2)	38 (6.1)	21 (6.9)	22 (8.0)
Rhode Island	31 (1.8)	34 (1.3)	7 (2.4)	6 (2.2)	4 (1.2)	9 (1.8)	16 (4.7)	26 (4.7)	****(****)	****(****)
South Carolina	29 (2.3)	31 (2.2)	4 (0.9)	5 (1.3)	7 (2.7)	11 (3.3)	****(****)	****(****)	****(****)	****(****)
Tennessee	26 (2.0)	31 (1.2)	5 (1.6)	6 (1.7)	3 (3.1)	13 (4.1)	****(****)	****(****)	****(****)	****(****)
Texas	38 (2.1)	36 (2.7)	6 (2.1)	7 (1.8)	8 (1.1)	12 (1.5)	34 (5.7)	40 (8.5)	****(****)	****(****)
Utah	34 (1.3)	38 (1.6)	****(****)	****(****)	13 (2.8)	15 (3.0)	17 (4.7)	32 (6.1)	****(****)	****(****)
Vermont †	36 (1.7) *	41 (1.5)	****(****)	****(****)	16 (6.2)	****(****)	****(****)	****(****)	****(****)	****(****)
Virginia	36 (2.4)	39 (1.8)	6 (1.4)	9 (1.3)	12 (4.1)	18 (4.0)	41 (7.1)	49 (5.9)	****(****)	****(****)
West Virginia	22 (1.1) *	28 (1.5)	4 (2.8)	7 (3.4)	3 (3.3)	****(****)	****(****)	****(****)	****(****)	****(****)
Wyoming	37 (1.4)	39 (1.2)	****(****)	****(****)	14 (2.3)	17 (2.6)	****(****)	****(****)	8 (3.2)	21 (4.4)!
Other Jurisdictions										
American Samoa	—	****(****)	—	****(****)	—	0 (0.0)	—	3 (1.3)	—	****(****)
DDESS	39 (4.1)	48 (3.1)	8 (2.7)	13 (3.7)	20 (3.7)	31 (4.8)	****(****)	****(****)	****(****)	****(****)
DoDDS	42 (2.0) *	50 (2.2)	13 (1.8)	16 (2.5)	20 (2.7)	28 (4.7)	33 (3.5)	37 (3.3)	****(****)	****(****)
Guam	23 (4.7)	****(****)	****(****)	****(****)	4 (1.5)	2 (2.9)	6 (1.1)	7 (1.4)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate in 2000.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.49: State *Basic* Level Achievement Results by Race/Ethnicity, Grade 8

State percentages of students at or above the *Basic* level in science by race/ethnicity for grade 8 public schools: 1996 and 2000

	White		Black		Hispanic		Asian/Pacific Islander		American Indian	
	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
Nation	72 (1.4)	72 (1.0)	23 (1.7)	24 (1.6)	35 (2.3)	33 (1.7)	59 (4.5)	62 (3.9)	59 (6.6)	37 (6.1)
Alabama	63 (2.1)	66 (2.0)	19 (1.9)	20 (2.5)	20 (7.7)	25 (5.6)	****(****)	****(****)	****(****)	****(****)
Arizona †	71 (2.1)	73 (2.3)	24 (6.3)	33 (7.1)	32 (2.3)	33 (2.7)	****(****)	****(****)	22 (7.8) !	40 (6.5)
Arkansas	67 (1.9)	67 (1.7)	17 (2.4)	17 (2.0)	32 (6.9)	34 (6.5)	****(****)	****(****)	****(****)	****(****)
California †	69 (2.5)	63 (2.6)	28 (4.6)	25 (5.5)	26 (2.0)	22 (2.5)	58 (4.5)	55 (5.6)	****(****)	****(****)
Connecticut	79 (1.4)	80 (1.4)	24 (4.8)	26 (3.7)	29 (3.4)	34 (4.3)	72 (7.1)	68 (6.7)	****(****)	****(****)
Georgia	67 (2.2)	71 (2.1)	24 (1.8)	25 (2.3)	36 (5.4)	32 (5.0)	****(****)	****(****)	****(****)	****(****)
Hawaii	55 (2.9)	61 (3.5)	37 (7.8)	33 (5.1)	25 (2.8)	27 (3.1)	43 (1.7)	39 (1.7)	****(****)	****(****)
Idaho †	—	77 (1.4)	—	****(****)	—	43 (6.1)	—	****(****)	—	****(****)
Illinois †	—	80 (1.8)	—	25 (3.2)	—	37 (5.2)	—	77 (5.6)	—	****(****)
Indiana †	71 (1.8)	76 (1.9)	27 (4.6)	25 (5.1) !	45 (4.4)	40 (6.8)	****(****)	****(****)	****(****)	****(****)
Kentucky	62 (1.7)	66 (1.7)	30 (3.5)	29 (4.5)	19 (5.9)	****(****)	****(****)	****(****)	****(****)	****(****)
Louisiana	58 (2.1) *	67 (2.1)	16 (2.0)	17 (2.0)	22 (4.5)	32 (5.2)	****(****)	****(****)	****(****)	****(****)
Maine †	79 (1.3)	76 (1.3)	****(****)	****(****)	47 (7.3)	****(****)	****(****)	****(****)	****(****)	****(****)
Maryland	74 (1.9)	77 (1.5)	26 (1.9)	31 (2.6)	28 (5.0)	41 (5.7)	73 (5.1)	84 (4.4)	****(****)	****(****)
Massachusetts	77 (1.5)	83 (1.9)	28 (4.9)	38 (5.2)	35 (5.6)	35 (4.5)	64 (8.0) !	72 (5.2)	****(****)	****(****)
Michigan †	75 (1.9)	79 (1.6)	23 (3.3)	25 (3.5)	43 (8.0)	44 (5.1)	****(****)	****(****)	****(****)	****(****)
Minnesota †	76 (1.6)	79 (2.2)	33 (8.2)	29 (8.9) !	42 (8.7)	46 (9.4)	60 (12.2) !	****(****)	****(****)	****(****)
Mississippi	60 (1.9)	62 (2.1)	19 (1.7)	16 (1.9)	13 (3.6)	25 (5.3)	****(****)	****(****)	****(****)	****(****)
Missouri	73 (1.6)	76 (1.6)	22 (3.0)	27 (2.9)	39 (6.1)	51 (8.5)	****(****)	****(****)	****(****)	****(****)
Montana †	83 (1.4)	84 (1.5)	****(****)	****(****)	56 (4.7)	64 (5.7)	****(****)	****(****)	44 (4.0)	49 (6.9)
Nebraska	76 (1.2)	76 (1.7)	30 (5.9)	35 (5.2)	42 (3.5)	40 (4.8)	****(****)	****(****)	****(****)	****(****)
Nevada	—	67 (1.3)	—	31 (4.7)	—	33 (2.4)	—	55 (4.0)	—	42 (6.3)
New Mexico	74 (1.7)	73 (2.1)	****(****)	****(****)	34 (1.6)	36 (2.5)	****(****)	****(****)	25 (4.7)	27 (4.4)
New York †	75 (2.3)	81 (2.0)	21 (2.7)	34 (5.5)	26 (3.2)	34 (4.8)	70 (6.2)	68 (5.8)	****(****)	****(****)
North Carolina	70 (1.6)	70 (1.9)	28 (1.9)	25 (3.2)	26 (6.2) *	52 (6.9)	****(****)	66 (6.5)	42 (7.7) !	****(****)
North Dakota	80 (1.3)	79 (1.1)	****(****)	****(****)	47 (7.9)	46 (7.4)	****(****)	****(****)	43 (7.4) !	37 (4.2)
Ohio	—	78 (1.4)	—	37 (6.1)	—	57 (6.2)	—	****(****)	—	****(****)
Oklahoma	—	70 (1.8)	—	28 (3.9)	—	32 (5.6)	—	****(****)	—	55 (4.0)
Oregon †	72 (1.9)	75 (2.1)	****(****)	36 (7.8)	38 (6.4)	32 (4.2)	72 (4.7)	71 (6.6)	50 (10.4)	48 (7.6)
Rhode Island	68 (1.8)	68 (1.5)	31 (5.9)	34 (5.4)	20 (2.5)	34 (4.2)	46 (6.3)	50 (5.5)	****(****)	****(****)
South Carolina	65 (2.3)	67 (2.5)	22 (2.1)	24 (1.6)	28 (4.5)	29 (6.0)	****(****)	****(****)	****(****)	****(****)
Tennessee	61 (2.5)	67 (2.0)	22 (3.4)	22 (3.6)	20 (5.7)	38 (7.0)	****(****)	****(****)	****(****)	****(****)
Texas	77 (1.9)	73 (2.7)	28 (3.9)	24 (3.8)	33 (2.6)	38 (2.5)	72 (7.0)	73 (6.9)	****(****)	****(****)
Utah	74 (1.1)	73 (1.2)	****(****)	****(****)	39 (4.4)	43 (3.2)	53 (7.8)	60 (9.7)	****(****)	****(****)
Vermont †	72 (1.6)	75 (1.7)	****(****)	****(****)	45 (7.0)	****(****)	****(****)	****(****)	****(****)	****(****)
Virginia	72 (1.9)	74 (1.7)	27 (2.8)	35 (3.1)	37 (5.8)	46 (4.3)	82 (4.8)	80 (4.6)	****(****)	****(****)
West Virginia	59 (1.5)	63 (1.5)	23 (4.4)	27 (5.4)	23 (9.1)	****(****)	****(****)	****(****)	****(****)	****(****)
Wyoming	77 (1.1)	75 (1.6)	****(****)	****(****)	45 (4.6)	49 (3.8)	****(****)	****(****)	38 (5.8)	47 (7.2)!
Other Jurisdictions										
American Samoa	—	****(****)	—	****(****)	—	▲ (0.7)	—	9 (2.3)	—	****(****)
DDESS	77 (3.0)	83 (3.1)	43 (6.0)	44 (4.4)	63 (5.0)	70 (5.4)	****(****)	****(****)	****(****)	****(****)
DoDDS	80 (1.7)	83 (1.3)	47 (2.7)	49 (3.1)	57 (3.0)	64 (4.2)	71 (2.9)	74 (4.1)	****(****)	****(****)
Guam	49 (6.7)	****(****)	****(****)	****(****)	17 (2.7)	14 (4.2)	28 (2.2)	25 (1.9)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000 if only one jurisdiction or the nation is being examined.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
**** (****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.50: State Achievement-level results by Race/Ethnicity, Grade 8

State percentages of students at or above science achievements levels by race/ethnicity for grade 8 public schools: 2000

	White				Black				Hispanic			
	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*
Nation	28 (1.0)	72 (1.0)	40 (1.1)	5 (0.7)	76 (1.6)	24 (1.6)	6 (0.8)	▲ (0.2)	67 (1.7)	33 (1.7)	11 (1.2)	1 (0.2)
Alabama	34 (2.0)	66 (2.0)	31 (1.9)	3 (0.8)	80 (2.5)	20 (2.5)	4 (1.0)	▲ (****)	75 (5.6)	25 (5.6)	7 (3.8)	1 (****)
Arizona †	27 (2.3)	73 (2.3)	35 (1.9)	3 (0.7)	67 (7.1)	33 (7.1)	8 (4.2)	▲ (****)	67 (2.7)	33 (2.7)	8 (1.4)	▲ (****)
Arkansas	33 (1.7)	67 (1.7)	30 (1.8)	2 (0.6)	83 (2.0)	17 (2.0)	2 (1.0)	0 (****)	66 (6.5)	34 (6.5)	8 (3.5)	▲ (****)
California †	37 (2.6)	63 (2.6)	26 (2.7)	2 (1.0)	75 (5.5)	25 (5.5)	6 (2.5)	1 (****)	78 (2.5)	22 (2.5)	5 (1.1)	▲ (****)
Connecticut	20 (1.4)	80 (1.4)	45 (1.3)	5 (0.7)	74 (3.7)	26 (3.7)	6 (1.3)	▲ (****)	66 (4.3)	34 (4.3)	11 (2.5)	1 (****)
Georgia	29 (2.1)	71 (2.1)	36 (2.3)	4 (1.0)	75 (2.3)	25 (2.3)	6 (1.1)	▲ (****)	68 (5.0)	32 (5.0)	13 (3.5)	1 (****)
Hawaii	39 (3.5)	61 (3.5)	29 (3.5)	3 (1.2)	67 (5.1)	33 (5.1)	10 (3.9)	1 (****)	73 (3.1)	27 (3.1)	7 (2.3)	▲ (****)
Idaho †	23 (1.4)	77 (1.4)	42 (1.8)	4 (0.6)	****(****)	****(****)	****(****)	****(****)	57 (6.1)	43 (6.1)	12 (3.4)	▲ (****)
Illinois †	20 (1.8)	80 (1.8)	44 (2.9)	5 (1.2)	75 (3.2)	25 (3.2)	5 (2.2)	▲ (****)	63 (5.2)	37 (5.2)	12 (2.5)	1 (****)
Indiana †	24 (1.9)	76 (1.9)	40 (1.9)	4 (0.6)	75 (5.1) !	25 (5.1) !	6 (4.0) !	0 (****) !	60 (6.8)	40 (6.8)	12 (3.7)	1 (****)
Kentucky	34 (1.7)	66 (1.7)	32 (1.7)	3 (0.5)	71 (4.5)	29 (4.5)	7 (2.0)	0 (****)	****(****)	****(****)	****(****)	****(****)
Louisiana	33 (2.1)	67 (2.1)	29 (2.0)	2 (0.6)	83 (2.0)	17 (2.0)	3 (0.9)	▲ (0.2)	68 (5.2)	32 (5.2)	11 (3.0)	1 (****)
Maine †	24 (1.3)	76 (1.3)	38 (1.9)	4 (0.4)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Maryland	23 (1.5)	77 (1.5)	41 (1.9)	4 (0.6)	69 (2.6)	31 (2.6)	8 (1.4)	▲ (****)	59 (5.7)	41 (5.7)	16 (3.6)	1 (****)
Massachusetts	17 (1.9)	83 (1.9)	49 (2.0)	6 (0.8)	62 (5.2)	38 (5.2)	12 (3.5)	2 (1.2)	65 (4.5)	35 (4.5)	12 (2.5)	1 (****)
Michigan †	21 (1.6)	79 (1.6)	43 (2.1)	5 (1.0)	75 (3.5)	25 (3.5)	6 (1.7)	▲ (****)	56 (5.1)	44 (5.1)	20 (5.1)	2 (****)
Minnesota †	21 (2.2)	79 (2.2)	46 (2.2)	5 (0.9)	71 (8.9) !	29 (8.9) !	11 (5.9) !	0 (****) !	54 (9.4)	46 (9.4)	21 (6.5)	▲ (****)
Mississippi	38 (2.1)	62 (2.1)	24 (2.0)	2 (0.5)	84 (1.9)	16 (1.9)	2 (0.5)	0 (****)	75 (5.3)	25 (5.3)	7 (3.0)	▲ (****)
Missouri	24 (1.6)	76 (1.6)	42 (1.8)	4 (0.5)	73 (2.9)	27 (2.9)	7 (1.8)	0 (****)	49 (8.5)	51 (8.5)	19 (5.0)	1 (****)
Montana †	16 (1.5)	84 (1.5)	49 (1.8)	5 (0.9)	****(****)	****(****)	****(****)	****(****)	36 (5.7)	64 (5.7)	29 (7.7)	▲ (****)
Nebraska	24 (1.7)	76 (1.7)	40 (1.7)	4 (0.6)	65 (5.2)	35 (5.2)	10 (4.0)	0 (****)	60 (4.8)	40 (4.8)	16 (2.8)	1 (****)
Nevada	33 (1.3)	67 (1.3)	31 (1.6)	2 (0.5)	69 (4.7)	31 (4.7)	7 (2.4)	▲ (****)	67 (2.4)	33 (2.4)	9 (1.4)	▲ (****)
New Mexico	27 (2.1)	73 (2.1)	39 (3.0)	3 (0.8)	****(****)	****(****)	****(****)	****(****)	64 (2.5)	36 (2.5)	10 (1.4)	▲ (****)
New York †	19 (2.0)	81 (2.0)	44 (2.7)	4 (0.9)	66 (5.5)	34 (5.5)	8 (2.9)	▲ (****)	66 (4.8)	34 (4.8)	11 (2.8)	▲ (****)
North Carolina	30 (1.9)	70 (1.9)	37 (2.1)	5 (0.9)	75 (3.2)	25 (3.2)	6 (1.3)	▲ (****)	48 (6.9)	52 (6.9)	19 (4.8)	2 (0.7)
North Dakota	21 (1.1)	79 (1.1)	44 (1.7)	5 (0.7)	****(****)	****(****)	****(****)	****(****)	54 (7.4)	46 (7.4)	21 (6.7)	▲ (****)
Ohio	22 (1.4)	78 (1.4)	45 (2.0)	7 (0.8)	63 (6.1)	37 (6.1)	11 (3.2)	1 (****)	43 (6.2)	57 (6.2)	30 (5.4)	2 (****)
Oklahoma	30 (1.8)	70 (1.8)	32 (1.8)	2 (0.5)	72 (3.9)	28 (3.9)	7 (2.2)	▲ (****)	68 (5.6)	32 (5.6)	10 (2.9)	1 (****)
Oregon †	25 (2.1)	75 (2.1)	38 (2.0)	4 (0.8)	64 (7.8)	36 (7.8)	8 (3.8)	2 (****)	68 (4.2)	32 (4.2)	10 (2.7)	▲ (****)
Rhode Island	32 (1.5)	68 (1.5)	34 (1.3)	3 (0.5)	66 (5.4)	34 (5.4)	6 (2.2)	0 (****)	66 (4.2)	34 (4.2)	9 (1.8)	▲ (****)
South Carolina	33 (2.5)	67 (2.5)	31 (2.2)	3 (0.6)	76 (1.6)	24 (1.6)	5 (1.3)	▲ (****)	71 (6.0)	29 (6.0)	11 (3.3)	1 (****)
Tennessee	33 (2.0)	67 (2.0)	31 (1.2)	3 (0.5)	78 (3.6)	22 (3.6)	6 (1.7)	▲ (****)	62 (7.0)	38 (7.0)	13 (4.1)	1 (****)
Texas	27 (2.7)	73 (2.7)	36 (2.7)	4 (0.7)	76 (3.8)	24 (3.8)	7 (1.8)	1 (****)	62 (2.5)	38 (2.5)	12 (1.5)	1 (0.4)
Utah	27 (1.2)	73 (1.2)	38 (1.6)	3 (0.6)	****(****)	****(****)	****(****)	****(****)	57 (3.2)	43 (3.2)	15 (3.0)	1 (****)
Vermont †	25 (1.7)	75 (1.7)	41 (1.5)	4 (0.7)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Virginia	26 (1.7)	74 (1.7)	39 (1.8)	4 (0.8)	65 (3.1)	35 (3.1)	9 (1.3)	▲ (****)	54 (4.3)	46 (4.3)	18 (4.0)	1 (****)
West Virginia	37 (1.5)	63 (1.5)	28 (1.5)	2 (0.3)	73 (5.4)	27 (5.4)	7 (3.4)	0 (****)	****(****)	****(****)	****(****)	****(****)
Wyoming	25 (1.6)	75 (1.6)	39 (1.2)	4 (0.6)	****(****)	****(****)	****(****)	****(****)	51 (3.8)	49 (3.8)	17 (2.6)	▲ (****)
Other Jurisdictions												
American Samoa	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	100 (****)	▲ (****)	0 (****)	0 (****)
DDESS	17 (3.1)	83 (3.1)	48 (3.1)	7 (2.0)	56 (4.4)	44 (4.4)	13 (3.7)	▲ (****)	30 (5.4)	70 (5.4)	31 (4.8)	2 (****)
DoDDS	17 (1.3)	83 (1.3)	50 (2.2)	6 (1.4)	51 (3.1)	49 (3.1)	16 (2.5)	▲ (****)	36 (4.2)	64 (4.2)	28 (4.7)	2 (****)
Guam	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	86 (4.2)	14 (4.2)	2 (****)	0 (****)

See footnotes at end of table. ▶

Table B.50: State Achievement-level results by Race/Ethnicity, Grade 8 (continued)

State percentages of students at or above science achievements levels by race/ethnicity for grade 8 public schools: 2000

	Asian/Pacific Islander				American Indian			
	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*
Nation	38 (3.9)	62 (3.9)	36 (3.9)	6 (1.5)	63 (6.1)	37 (6.1)	14 (3.6)	2 (1.2)
Alabama	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Arizona †	****(****)	****(****)	****(****)	****(****)	60 (6.5)	40 (6.5)	9 (6.0)	▲ (****)
Arkansas	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
California †	45 (5.6)	55 (5.6)	29 (5.9)	2 (1.0)	****(****)	****(****)	****(****)	****(****)
Connecticut	32 (6.7)	68 (6.7)	44 (6.3)	7 (3.8)	****(****)	****(****)	****(****)	****(****)
Georgia	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Hawaii	61 (1.7)	39 (1.7)	14 (1.3)	▲ (0.2)	****(****)	****(****)	****(****)	****(****)
Idaho †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Illinois †	23 (5.6)	77 (5.6)	42 (6.1)	2 (****)	****(****)	****(****)	****(****)	****(****)
Indiana †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Kentucky	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Louisiana	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Maine †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Maryland	16 (4.4)	84 (4.4)	47 (6.1)	9 (3.8)	****(****)	****(****)	****(****)	****(****)
Massachusetts	28 (5.2)	72 (5.2)	46 (6.2)	11 (2.8)	****(****)	****(****)	****(****)	****(****)
Michigan †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Minnesota †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Mississippi	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Missouri	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Montana †	****(****)	****(****)	****(****)	****(****)	51 (6.9)	49 (6.9)	25 (4.2)	2 (****)
Nebraska	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Nevada	45 (4.0)	55 (4.0)	25 (3.9)	2 (1.1)	58 (6.3)	42 (6.3)	14 (5.6)	2 (****)
New Mexico	****(****)	****(****)	****(****)	****(****)	73 (4.4)	27 (4.4)	7 (2.1)	▲ (****)
New York †	32 (5.8)	68 (5.8)	29 (6.9)	3 (****)	****(****)	****(****)	****(****)	****(****)
North Carolina	34 (6.5)	66 (6.5)	36 (7.3)	7 (4.0)	****(****)	****(****)	****(****)	****(****)
North Dakota	****(****)	****(****)	****(****)	****(****)	63 (4.2)	37 (4.2)	12 (3.5)	1 (****)
Ohio	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Oklahoma	****(****)	****(****)	****(****)	****(****)	45 (4.0)	55 (4.0)	19 (2.3)	1 (****)
Oregon †	29 (6.6)	71 (6.6)	38 (6.1)	5 (3.8)	52 (7.6)	48 (7.6)	22 (8.0)	1 (****)
Rhode Island	50 (5.5)	50 (5.5)	26 (4.7)	3 (1.5)	****(****)	****(****)	****(****)	****(****)
South Carolina	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Tennessee	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Texas	27 (6.9)	73 (6.9)	40 (8.5)	5 (2.5)	****(****)	****(****)	****(****)	****(****)
Utah	40 (9.7)	60 (9.7)	32 (6.1)	5 (3.4)	****(****)	****(****)	****(****)	****(****)
Vermont †	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Virginia	20 (4.6)	80 (4.6)	49 (5.9)	9 (3.8)	****(****)	****(****)	****(****)	****(****)
West Virginia	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
Wyoming	****(****)	****(****)	****(****)	****(****)	53 (7.2) !	47 (7.2) !	21 (4.4) !	▲ (****) !
Other Jurisdictions								
American Samoa	91 (2.3)	9 (2.3)	3 (1.3)	0 (****)	****(****)	****(****)	****(****)	****(****)
DDESS	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
DoDDS	26 (4.1)	74 (4.1)	37 (3.3)	4 (1.5)	****(****)	****(****)	****(****)	****(****)
Guam	75 (1.9)	25 (1.9)	7 (1.4)	▲ (****)	****(****)	****(****)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
(****) Standard error estimates cannot be accurately determined.
**** (****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.51: State Scale Score Differences by Race/Ethnicity, Grade 4

State differences in average science scale scores by race/ethnicity, grade 4: 2000

	White-Black	White-Hispanic
Nation	35 (1.9)	32 (1.6)
Alabama	33 (2.2)	41 (5.3)
Arizona	29 (4.0)	34 (2.5)
Arkansas	38 (3.2)	35 (4.9)
California †	32 (4.8)	36 (3.3)
Connecticut	39 (2.8)	32 (2.7)
Georgia	36 (2.1)	32 (3.6)
Hawaii	23 (5.3)	30 (3.4)
Idaho †	****(****)	32 (3.4)
Illinois †	39 (2.9)	37 (3.2)
Indiana †	28 (4.3)	30 (4.7)
Iowa †	****(****)	22 (4.0)
Kentucky	27 (2.7)	18 (4.7)
Louisiana	34 (2.8)	30 (5.1)
Maine †	****(****)	19 (4.0)
Maryland	36 (2.3)	28 (3.5)
Massachusetts	32 (3.5)	39 (3.2)
Michigan †	42 (3.3)	32 (4.3)
Minnesota †	37 (5.6)	27 (4.4)
Mississippi	36 (1.8)	39 (4.2)
Missouri	32 (2.8)	35 (7.1)
Montana †	****(****)	17 (4.6)
Nebraska	30 (4.9)	19 (4.0)
Nevada	31 (3.3)	25 (2.2)
New Mexico	26 (6.2)	26 (3.3)
New York †	32 (2.6)	32 (2.9)
North Carolina	31 (2.1)	27 (4.2)
North Dakota	****(****)	19 (3.5)
Ohio †	32 (3.5)	20 (4.2)
Oklahoma	26 (2.8)	23 (2.6)
Oregon †	****(****)	33 (4.6)
Rhode Island	38 (2.5)	43 (4.4)
South Carolina	34 (2.2)	29 (4.3)
Tennessee	35 (2.8)	29 (4.7)
Texas	28 (3.6)	27 (2.6)
Utah	****(****)	24 (2.5)
Vermont †	****(****)	****(****)
Virginia	27 (2.9)	26 (7.4)
West Virginia	20 (3.9)	17 (4.5)
Wyoming	****(****)	19 (2.5)
Other Jurisdictions		
American Samoa	****(****)	****(****)
DDESS	20 (1.8)	12 (1.9)
DoDDS	23 (1.2)	12 (1.6)
Guam	****(****)	25 (8.0)
Virgin Islands	****(****)	****(****)

Standard errors of the estimated difference in scale scores appear in parentheses.
****(****) Sample size is insufficient to permit a reliable estimate.
Score differences are calculated based on differences between unrounded average scale scores.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.52: State Scale Score Differences by Race/Ethnicity, Grade 8

State differences in average science scale scores by race/ethnicity, grade 8: 1996 and 2000

	White-Black		White-Hispanic	
	1996	2000	1996	2000
Nation	39 (1.6)	40 (1.5)	31 (2.1)	34 (1.6)
Alabama	34 (2.3)	38 (2.8)	45 (7.8)	48 (6.5)
Arizona †	33 (3.6)	32 (4.8)	29 (2.5)	33 (2.9)
Arkansas	37 (2.9)	42 (2.5)	32 (6.0)	36 (5.3)
California †	34 (3.9)	30 (5.4)	35 (2.5)	34 (2.4)
Connecticut	44 (4.6)	44 (3.4)	43 (2.8)	37 (3.1)
Georgia	33 (1.9)	35 (2.2)	27 (4.4)	35 (4.4)
Hawaii	18 (4.7)	21 (4.3)	27 (3.1)	30 (3.7)
Idaho †	—	**** (****)	—	27 (2.9)
Illinois †	—	42 (3.7)	—	33 (3.5)
Indiana †	33 (3.5)	34 (3.7)	19 (2.5)	29 (6.6)
Kentucky	24 (3.0)	29 (3.1)	37 (6.3)	**** (****)
Louisiana	35 (2.4)	42 (2.5)	43 (5.8)	35 (4.9)
Maine †	**** (****)	**** (****)	23 (4.7)	**** (****)
Maryland	37 (2.0)	36 (2.1)	39 (4.4) *	27 (3.5)
Massachusetts	37 (3.5)	34 (4.1)	36 (4.1)	40 (4.1)
Michigan †	39 (2.8)	44 (3.6)	27 (5.1)	27 (4.3)
Minnesota †	32 (4.6)	43 (9.1)	28 (5.4)	29 (7.1)
Mississippi	30 (1.8) *	36 (1.8)	44 (4.0)	37 (4.8)
Missouri	38 (2.9)	37 (3.0)	28 (5.1)	22 (4.5)
Montana †	**** (****)	**** (****)	19 (2.8)	17 (4.3)
Nebraska	31 (3.3)	32 (3.9)	27 (3.2)	30 (4.3)
Nevada	—	29 (3.1)	—	28 (2.6)
New Mexico	**** (****)	**** (****)	29 (1.5)	29 (2.4)
New York †	41 (2.3)	37 (4.4)	45 (3.0)	41 (5.8)
North Carolina	30 (1.7)	35 (2.5)	33 (3.8) *	19 (5.0)
North Dakota	**** (****)	**** (****)	27 (4.6)	25 (4.6)
Ohio	—	34 (3.8)	—	18 (4.7)
Oklahoma	—	29 (2.9)	—	33 (5.3)
Oregon †	**** (****)	29 (5.0)	24 (4.0)	32 (3.4)
Rhode Island	26 (2.9)	28 (3.4)	37 (2.0)	29 (5.7)
South Carolina	31 (2.3)	32 (2.3)	31 (4.4)	32 (5.4)
Tennessee	34 (3.6)	36 (2.6)	47 (6.4)	31 (6.4)
Texas	35 (2.7)	37 (3.8)	33 (2.9)	27 (2.8)
Utah	**** (****)	**** (****)	26 (3.0)	24 (3.1)
Vermont †	**** (****)	**** (****)	23 (3.6)	**** (****)
Virginia	32 (2.7)	31 (2.3)	27 (4.4)	23 (3.3)
West Virginia	22 (3.3)	26 (3.8)	27 (4.4)	**** (****)
Wyoming	**** (****)	**** (****)	21 (2.0)	22 (3.2)
Other Jurisdictions				
American Samoa	—	**** (****)	—	**** (****)
DDESS	25 (3.0)	29 (3.3)	13 (2.9)	13 (3.4)
DoDDS	24 (1.7)	27 (1.8)	18 (2.0)	16 (2.8)
Guam	**** (****)	**** (****)	32 (5.4)	**** (****)

Standard errors of the estimated difference in scale scores appear in parentheses.
Score differences are calculated based on differences between unrounded average scale scores.
* Significantly different from 2000 if only one jurisdiction or the nation is being examined.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
— Indicates that the jurisdiction did not participate.
**** (****) Sample size is insufficient to permit a reliable estimate.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.53: State Percentages of Students by Race/Ethnicity, Grade 4

State percentages of students by race/ethnicity for grade 4 public schools: 2000

	White	Black	Hispanic	Asian/ Pacific Islander	American Indian
Nation	64 (0.4)	15 (0.2)	16 (0.3)	3 (0.2)	2 (0.2)
Alabama	54 (2.6)	35 (2.2)	8 (0.8)	1 (0.2)	2 (0.5)
Arizona	52 (1.8)	5 (0.6)	33 (1.6)	2 (0.4)	7 (0.6)
Arkansas	66 (2.2)	21 (2.2)	8 (0.8)	2 (0.5)	4 (0.6)
California †	34 (2.4)	10 (1.7)	40 (2.3)	12 (1.4)	3 (0.5)
Connecticut	70 (1.8)	11 (1.2)	15 (0.9)	3 (0.4)	2 (0.3)
Georgia	48 (1.5)	38 (1.5)	10 (0.8)	2 (0.4)	2 (0.4)
Hawaii	17 (1.1)	5 (0.6)	12 (0.7)	62 (1.6)	2 (0.3)
Idaho †	79 (1.4)	2 (0.4)	13 (1.4)	3 (0.6)	3 (0.5)
Illinois †	56 (3.2)	18 (3.0)	22 (2.8)	3 (0.6)	1 (0.2)
Indiana †	80 (2.2)	8 (1.8)	8 (0.9)	1 (0.4)	2 (0.3)
Iowa †	87 (1.1)	3 (0.7)	6 (0.9)	1 (0.3)	2 (0.3)
Kentucky	81 (1.2)	9 (0.7)	5 (0.5)	2 (0.4)	3 (0.4)
Louisiana	47 (2.5)	43 (2.2)	7 (0.8)	1 (0.2)	3 (0.4)
Maine †	91 (1.0)	1 (0.3)	5 (0.6)	1 (0.3)	2 (0.4)
Maryland	51 (1.6)	33 (1.6)	9 (0.7)	3 (0.5)	3 (0.4)
Massachusetts	76 (1.7)	6 (1.0)	13 (1.0)	4 (0.6)	1 (0.2)
Michigan †	71 (2.2)	14 (2.0)	10 (1.2)	2 (0.6)	3 (0.5)
Minnesota †	80 (1.9)	5 (0.9)	7 (0.9)	4 (0.6)	4 (0.5)
Mississippi	45 (1.8)	44 (2.0)	8 (0.8)	1 (0.3)	2 (0.3)
Missouri	73 (1.3)	15 (1.0)	7 (0.9)	2 (0.4)	3 (0.4)
Montana †	79 (2.8)	2 (0.7)	9 (1.2)	1 (0.6)	9 (1.8)
Nebraska	75 (2.4)	6 (1.4)	12 (1.7)	2 (0.4)	4 (1.3)
Nevada	54 (1.4)	9 (1.0)	29 (1.3)	6 (0.6)	3 (0.4)
New Mexico	36 (2.1)	3 (0.6)	49 (2.3)	1 (0.3)	11 (1.7)
New York †	51 (2.1)	18 (1.8)	25 (1.7)	4 (1.0)	1 (0.4)
North Carolina	60 (1.9)	30 (1.5)	5 (0.6)	1 (0.2)	3 (1.0)
North Dakota	84 (1.4)	1 (0.4)	6 (0.6)	1 (0.3)	7 (1.1)
Ohio †	74 (1.8)	16 (1.6)	6 (0.6)	1 (0.3)	2 (0.4)
Oklahoma	62 (2.0)	9 (1.8)	15 (1.0)	1 (0.2)	13 (1.1)
Oregon †	75 (1.5)	3 (0.6)	14 (1.2)	3 (0.6)	5 (0.7)
Rhode Island	70 (1.8)	7 (0.7)	17 (1.4)	3 (0.6)	2 (0.3)
South Carolina	51 (1.9)	39 (1.9)	7 (0.9)	1 (0.2)	2 (0.3)
Tennessee	70 (1.7)	23 (1.3)	6 (0.7)	1 (0.2)	2 (0.3)
Texas	43 (2.2)	15 (1.8)	37 (2.0)	3 (0.7)	2 (0.3)
Utah	79 (1.2)	2 (0.3)	14 (1.0)	3 (0.3)	3 (0.3)
Vermont †	89 (1.3)	2 (0.4)	5 (0.8)	2 (0.6)	2 (0.5)
Virginia	59 (1.9)	27 (1.6)	9 (1.3)	3 (0.6)	2 (0.3)
West Virginia	87 (1.4)	5 (1.2)	5 (0.7)	1 (0.2)	2 (0.3)
Wyoming	78 (1.6)	1 (0.3)	14 (1.2)	2 (0.4)	5 (0.6)
Other Jurisdictions					
American Samoa	4 (0.9)	4 (1.1)	25 (2.4)	65 (2.4)	2 (0.7)
DDESS	41 (1.3)	27 (1.3)	21 (1.0)	6 (0.8)	3 (0.5)
DoDDS	45 (0.9)	19 (0.7)	16 (0.6)	15 (0.7)	3 (0.3)
Guam	7 (0.9)	4 (0.6)	14 (1.5)	73 (2.4)	2 (0.6)
Virgin Islands	3 (0.5)	71 (1.6)	25 (1.7)	1 (0.3)	1 (0.4)

Standard errors of the estimated percentages appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Percentages may not add to 100 due to rounding.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.54: State Percentages of Students by Race/Ethnicity, Grade 8

State percentages of students by race/ethnicity for grade 8 public schools: 1996 and 2000

	White		Black		Hispanic		Asian/Pacific Islander		American Indian	
	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
Nation	68 (0.4)	66 (0.3)	15 (0.3)	14 (0.2)	12 (0.3)	14 (0.2)	2 (0.3)	4 (0.2)	2 (0.3)	2 (0.2)
Alabama	61 (1.9)	65 (2.2)	33 (1.9)	28 (2.2)	4 (0.4)	4 (0.5)	1 (0.3)	1 (0.3)	2 (0.4)	2 (0.6)
Arizona †	57 (1.9)	56 (2.2)	4 (0.6)	4 (0.6)	31 (1.6)	33 (2.1)	2 (0.4)	3 (0.5)	6 (1.5)	4 (0.6)
Arkansas	73 (1.9)	69 (1.6)	20 (1.7)	22 (1.6)	4 (0.6)	5 (0.5)	1 (0.4)	1 (0.3)	1 (0.3)	2 (0.3)
California †	38 (2.1)	32 (2.5)	7 (1.0)	7 (1.1)	39 (1.8)	46 (2.4)	13 (1.4)	14 (1.6)	2 (0.3)	1 (0.3)
Connecticut	75 (1.4)	68 (2.2)	10 (1.3)	13 (1.4)	11 (0.9)	15 (1.5)	3 (0.4)	3 (0.3)	1 (0.2)	1 (0.2)
Georgia	56 (2.3)	55 (1.8)	36 (2.4)	37 (1.7)	5 (0.4)	6 (0.7)	2 (0.4)	2 (0.3)	1 (0.3)	1 (0.2)
Hawaii	17 (0.7)	15 (0.7)	3 (0.4)	4 (0.4)	15 (0.7)	14 (0.8)	60 (1.2)	65 (1.2)	2 (0.3)	2 (0.4)
Idaho †	—	84 (1.0)	—	1 (0.2)	—	11 (0.8)	—	2 (0.5)	—	2 (0.3)
Illinois †	—	57 (2.8)	—	20 (3.2)	—	17 (2.1)	—	5 (1.0)	—	1 (0.2)
Indiana †	81 (1.8)	82 (2.2)	11 (1.4)	9 (2.1)	5 (0.7)	7 (1.2)	1 (0.2)	1 (0.2)	2 (0.4)	1 (0.3)
Kentucky	86 (0.9)	86 (1.2)	9 (0.8)	10 (1.2)	3 (0.4)	2 (0.3)	1 (0.2)	1 (0.3)	1 (0.2)	1 (0.2)
Louisiana	55 (1.8)	52 (1.8)	37 (1.7)	39 (1.9)	6 (0.6)	6 (0.6)	1 (0.3)	1 (0.2)	1 (0.3)	1 (0.3)
Maine †	92 (0.7)	93 (0.7)	1 (0.2)	1 (0.2)	3 (0.5)	3 (0.4)	1 (0.3)	1 (0.3)	2 (0.3)	2 (0.5)
Maryland	56 (2.0)	55 (1.8)	32 (2.1)	32 (1.6)	6 (0.6)	7 (0.8)	4 (0.6)	5 (0.5)	2 (0.3)	1 (0.2)
Massachusetts	81 (1.7)	76 (1.7)	6 (1.0)	8 (0.9)	8 (0.7)	10 (1.2)	4 (0.8)	5 (0.6)	1 (0.2)	1 (0.2)
Michigan †	76 (2.0)	77 (2.0)	15 (1.9)	13 (1.7)	4 (0.4)	6 (0.7)	2 (0.5)	3 (0.3)	2 (0.3)	1 (0.3)
Minnesota †	86 (1.9)	84 (2.4)	4 (0.8)	6 (1.7)	4 (0.6)	5 (0.9)	4 (0.9)	3 (0.6)	2 (0.5)	2 (0.3)
Mississippi	50 (2.1)	53 (1.8)	44 (1.9)	41 (1.7)	6 (0.6)	4 (0.4)	▲ (0.1)	1 (0.3)	1 (0.2)	1 (0.1)
Missouri	78 (1.5)	79 (1.7)	13 (1.3)	14 (1.4)	5 (0.6)	4 (0.6)	1 (0.3)	2 (0.4)	2 (0.4)	1 (0.3)
Montana †	83 (1.9)	85 (1.5)	1 (0.1)	1 (0.2)	5 (0.5)	5 (0.5)	1 (0.2)	1 (0.2)	10 (1.7)	9 (1.4)
Nebraska	85 (1.2)	83 (1.4)	5 (0.6)	4 (0.5)	7 (0.9)	9 (1.2)	1 (0.2)	2 (0.5)	2 (0.3)	2 (0.4)
Nevada	—	57 (1.2)	—	7 (0.4)	—	26 (1.1)	—	7 (0.5)	—	3 (0.4)
New Mexico	38 (1.5)	34 (1.6)	3 (0.4)	2 (0.4)	51 (1.5)	52 (1.8)	1 (0.2)	1 (0.3)	8 (0.6)	11 (2.0)
New York †	60 (2.6)	54 (2.6)	17 (2.0)	19 (2.2)	16 (1.2)	19 (1.8)	5 (0.9)	6 (1.0)	2 (0.5)	1 (0.3)
North Carolina	65 (2.0)	63 (1.6)	27 (1.3)	28 (1.5)	4 (0.5)	4 (0.4)	1 (0.3)	3 (0.4)	3 (1.4)	2 (0.6)
North Dakota	92 (0.8)	87 (1.3)	1 (0.2)	1 (0.3)	4 (0.4)	4 (0.5)	1 (0.2)	1 (0.1)	3 (0.7)	7 (1.2)
Ohio	—	82 (1.5)	—	11 (1.3)	—	4 (0.6)	—	1 (0.3)	—	1 (0.2)
Oklahoma	—	70 (1.5)	—	9 (1.1)	—	9 (0.8)	—	2 (0.3)	—	11 (0.9)
Oregon †	82 (1.5)	77 (1.5)	2 (0.5)	3 (0.6)	8 (1.0)	12 (1.1)	4 (0.5)	4 (0.6)	4 (0.8)	4 (0.5)
Rhode Island	77 (0.8)	76 (1.2)	5 (0.5)	5 (0.5)	12 (0.5)	12 (1.1)	4 (0.4)	5 (0.6)	1 (0.2)	1 (0.2)
South Carolina	51 (1.9)	56 (1.8)	40 (1.9)	37 (1.7)	6 (0.6)	4 (0.4)	1 (0.3)	1 (0.3)	2 (0.3)	2 (0.3)
Tennessee	77 (1.5)	73 (2.0)	17 (1.5)	20 (1.9)	3 (0.5)	4 (0.5)	1 (0.2)	2 (0.3)	1 (0.3)	1 (0.2)
Texas	48 (1.9)	44 (1.8)	12 (1.3)	12 (1.2)	36 (2.1)	40 (2.0)	3 (0.5)	4 (0.6)	1 (0.2)	1 (0.3)
Utah	87 (1.0)	83 (1.0)	1 (0.2)	1 (0.2)	8 (0.7)	11 (0.8)	3 (0.4)	3 (0.3)	1 (0.3)	2 (0.4)
Vermont †	90 (0.9)	92 (0.6)	1 (0.3)	1 (0.2)	4 (0.5)	3 (0.4)	1 (0.3)	1 (0.3)	3 (0.5)	2 (0.4)
Virginia	64 (2.0)	62 (1.5)	24 (1.9)	24 (1.5)	5 (0.6)	7 (0.8)	5 (0.6)	6 (0.7)	1 (0.3)	1 (0.2)
West Virginia	90 (0.7)	90 (0.9)	4 (0.5)	4 (0.6)	3 (0.3)	2 (0.4)	1 (0.2)	1 (0.2)	2 (0.3)	2 (0.3)
Wyoming	84 (0.8)	82 (1.1)	1 (0.2)	1 (0.3)	11 (0.6)	12 (0.7)	1 (0.2)	1 (0.2)	4 (0.4)	3 (0.7)
Other Jurisdictions										
American Samoa	—	9 (1.3)	—	7 (1.3)	—	31 (3.1)	—	49 (3.2)	—	3 (0.9)
DDESS	47 (1.7)	39 (1.7)	22 (1.5)	23 (1.6)	24 (1.3)	25 (1.4)	3 (0.9)	9 (0.8)	2 (0.5)	3 (0.8)
DoDDS	45 (0.9)	47 (1.1)	19 (0.8)	19 (0.9)	17 (0.8)	13 (0.7)	14 (0.7)	18 (0.8)	2 (0.3)	2 (0.3)
Guam	8 (0.9)	4 (0.7)	3 (0.6)	2 (0.3)	19 (1.3)	20 (2.1)	69 (1.6)	73 (2.1)	▲ (0.2)	1 (0.4)

Standard errors of the estimated percentages appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate in 2000.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages may not add to 100 due to rounding.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.55: Data for Table 3.10 State Scale Score Results by Free/Reduced-Price School Lunch Eligibility, Grade 4

State scale score results by student eligibility for free/reduced-price school lunch for grade 4 public schools: 2000

	Eligible	Not eligible	Information not available
Nation	129 (1.2)	159 (1.0)	160 (2.4)
Alabama	128 (2.0)	159 (1.4)	146 (5.1) !
Arizona	125 (1.8)	155 (2.5)	136 (5.8) !
Arkansas	131 (2.2)	157 (1.6)	****(****)
California †	115 (2.4)	150 (1.9)	137 (6.4) !
Connecticut	135 (2.5)	165 (1.0)	144 (6.6) !
Georgia	124 (1.7)	159 (1.5)	151 (3.3) !
Hawaii	125 (2.3)	147 (1.5)	132 (2.8) !
Idaho †	142 (2.2)	159 (1.4)	163 (7.1) !
Illinois †	132 (2.0)	163 (1.6)	157 (8.6) !
Indiana †	138 (2.7)	162 (1.5)	153 (6.1) !
Iowa †	153 (2.4)	163 (1.4)	159 (4.9) !
Kentucky	142 (1.5)	161 (1.2)	156 (7.8) !
Louisiana	128 (2.1)	159 (1.7)	133 (4.5) !
Maine †	150 (1.7)	166 (1.0)	161 (3.7) !
Maryland	126 (2.1)	158 (1.6)	137 (6.3) !
Massachusetts	139 (2.6)	171 (0.9)	155 (8.0) !
Michigan †	134 (2.5)	163 (1.6)	131 (12.8) !
Minnesota †	141 (2.8)	163 (1.6)	166 (4.9) !
Mississippi	122 (1.4)	153 (1.4)	132 (6.0) !
Missouri	141 (2.8)	165 (1.1)	145 (9.5) !
Montana †	147 (4.0)	167 (1.5)	162 (3.7) !
Nebraska	135 (2.0)	159 (1.5)	151 (7.2) !
Nevada	128 (1.7)	150 (1.6)	137 (3.6) !
New Mexico	126 (2.6)	154 (2.5)	146 (7.7) !
New York †	133 (2.0)	163 (1.3)	158 (4.9) !
North Carolina	131 (2.0)	158 (1.2)	155 (3.6) !
North Dakota	150 (2.3)	164 (1.0)	159 (1.9)
Ohio †	136 (2.1)	164 (1.6)	158 (3.9) !
Oklahoma	144 (1.6)	162 (1.3)	149 (6.0) !
Oregon †	136 (2.7)	158 (1.8)	147 (5.1) !
Rhode Island	125 (2.7)	162 (1.2)	138 (9.2) !
South Carolina	128 (1.5)	157 (1.3)	138 (2.7) !
Tennessee	132 (1.9)	159 (1.6)	153 (6.7) !
Texas	132 (1.6)	160 (1.6)	151 (7.3) !
Utah	142 (1.8)	160 (1.1)	161 (4.4) !
Vermont †	145 (2.7)	165 (1.9)	155 (4.7) !
Virginia	138 (2.6)	164 (1.3)	163 (4.5) !
West Virginia	143 (1.3)	158 (1.3)	152 (3.3) !
Wyoming	148 (1.7)	162 (1.0)	155 (4.9) !
Other Jurisdictions			
American Samoa	51 (1.7)	****(****)	****(****)
DDESS	152 (1.1)	160 (1.2)	160 (4.2)
DoDDS	150 (1.3)	158 (0.9)	156 (1.0)
Guam	101 (2.6)	121 (2.7)	****(****)
Virgin Islands	115 (1.1)	****(****)	****(****)

Standard errors of the estimated scale scores appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.56: Data for Table 3.11 State Scale Score Results by Free/Reduced-Price School Lunch Eligibility, Grade 8

State scale score results by student eligibility for free/reduced-price school lunch for grade 8 public schools: 1996 and 2000

	Eligible		Not eligible		Information not available	
	1996	2000	1996	2000	1996	2000
Nation	133 (1.7) *	127 (1.1)	155 (1.3) *	160 (0.9)	154 (3.6) !	151 (2.1)
Alabama	121 (1.9)	124 (2.2)	150 (1.7)	153 (1.8)	151 (9.3) !	152 (4.7) !
Arizona †	127 (2.8)	127 (3.1)	155 (1.7)	156 (1.3)	144 (2.0)	148 (3.0) !
Arkansas	128 (1.7)	127 (2.4)	152 (1.3)	153 (1.4)	155 (9.0) !	139 (11.1) !
California †	120 (2.0) *	113 (2.3)	152 (2.0) *	145 (2.1)	137 (4.0)	135 (5.9) !
Connecticut	127 (3.3)	125 (3.5)	163 (1.1)	163 (1.3)	154 (10.9) !	147 (6.9) !
Georgia	124 (1.6)	125 (1.8)	151 (1.6)	155 (1.9)	146 (5.7) !	145 (3.5) !
Hawaii	125 (1.7)	119 (2.1)	141 (0.9)	142 (1.0)	115 (2.1) ‡	139 (4.3)
Idaho †	—	149 (2.1)	—	164 (1.1)	—	155 (3.9)
Illinois †	—	126 (2.6)	—	162 (1.6)	—	152 (5.5) !
Indiana †	136 (2.3)	139 (3.9)	158 (1.3)	161 (1.5)	****(****)	149 (4.6) !
Kentucky	135 (1.6)	139 (1.7)	155 (1.3) *	160 (1.2)	142 (3.3) !	****(****)
Louisiana	121 (1.9)	122 (2.2)	145 (1.5) ‡	155 (1.8)	128 (7.5) !	133 (4.0) !
Maine †	152 (1.7)	150 (2.1)	167 (1.0)	163 (1.1)	164 (3.4) !	155 (2.6) !
Maryland	122 (2.1)	127 (2.3)	154 (1.7)	158 (1.3)	143 (6.6) !	138 (4.5) !
Massachusetts	133 (1.8)	134 (3.8)	164 (1.2)	168 (1.3)	149 (6.8) !	164 (5.9) !
Michigan †	139 (1.9)	134 (3.3)	159 (1.5)	164 (1.6)	144 (8.3) !	152 (4.2) !
Minnesota †	145 (2.4)	141 (5.0)	162 (1.1)	165 (1.5)	162 (5.0)	164 (4.5) !
Mississippi	121 (1.5)	120 (1.3)	148 (1.5)	149 (1.4)	134 (5.6) !	138 (2.9) !
Missouri	138 (1.9)	140 (1.9)	157 (1.0) ‡	164 (1.2)	144 (8.0) !	153 (4.9) !
Montana †	150 (2.0)	155 (2.1)	166 (1.2)	170 (1.4)	165 (1.9)	168 (2.1)
Nebraska	144 (1.6)	142 (2.2)	162 (0.9)	162 (1.1)	161 (5.3) !	161 (2.8) !
Nevada	—	126 (1.9)	—	150 (0.9)	—	144 (4.2)
New Mexico	130 (1.5)	130 (1.9)	151 (1.1)	152 (1.6)	143 (2.4)	142 (4.1)
New York †	124 (1.9)	132 (4.4)	159 (1.8)	161 (2.3)	153 (7.1) !	147 (7.1)
North Carolina	128 (1.4)	128 (1.8)	156 (1.2)	155 (1.5)	144 (3.4) !	150 (10.6) !
North Dakota	157 (1.5) *	149 (2.1)	165 (0.7)	166 (1.0)	155 (3.6)	158 (1.4)
Ohio	—	144 (3.4)	—	166 (1.4)	—	151 (6.9) !
Oklahoma	—	137 (2.3)	—	158 (1.1)	—	148 (5.2) !
Oregon †	145 (2.0)	138 (2.7)	159 (1.5)	160 (1.6)	151 (5.6) !	159 (2.1) !
Rhode Island	131 (1.4)	130 (3.3)	157 (0.9)	158 (0.8)	125 (3.1)	136 (4.6)
South Carolina	126 (1.8)	126 (1.4)	149 (1.4) *	155 (1.6)	****(****)	****(****)
Tennessee	125 (2.4)	129 (2.0)	151 (2.0)	155 (1.7)	144 (5.3) !	147 (6.1) !
Texas	130 (1.7)	128 (1.8)	157 (1.3)	156 (1.9)	127 (15.1) !	137 (7.7) !
Utah	149 (1.7) *	142 (2.1)	158 (0.9)	159 (0.9)	157 (2.0)	158 (1.9)
Vermont †	146 (2.1)	144 (2.6)	160 (0.9) ‡	165 (0.9)	157 (2.9) !	163 (2.2) !
Virginia	125 (2.2)	130 (2.3)	157 (1.6)	159 (1.2)	150 (4.5) !	150 (5.4) !
West Virginia	138 (1.3)	138 (1.5)	152 (1.0) ‡	158 (1.0)	151 (4.8) !	151 (5.0) !
Wyoming	148 (1.2)	147 (2.2)	160 (0.8)	161 (0.9)	155 (4.8)	159 (3.6) !
Other Jurisdictions						
American Samoa	—	72 (2.3)	—	****(****)	—	****(****)
DDESS	148 (2.0)	153 (2.1)	158 (1.8)	163 (1.6)	150 (2.1)	158 (3.4)
DoDDS	146 (2.4) *	155 (2.4)	156 (0.9) ‡	161 (1.0)	156 (1.1)	158 (1.4)
Guam	101 (2.2)	96 (7.5)	125 (1.1)	119 (2.9)	****(****)	104 (12.8) !

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000 if only one jurisdiction or the Nation is being examined.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools. DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.57: Data for Table 3.12 State *Proficient* Level Achievement Results by Free/Reduced-Price School Lunch Eligibility, Grade 4

State percentages of students at or above the *Proficient* level in science by student eligibility for free/reduced-price school lunch program for grade 4 public schools: 2000

	Eligible	Not eligible	Information not available
Nation	11 (0.7)	37 (1.4)	39 (3.4)
Alabama	9 (1.5)	36 (2.0)	23 (6.1) !
Arizona	8 (1.0)	34 (2.7)	19 (4.4) !
Arkansas	13 (1.5)	35 (2.1)	****(****)
California †	4 (0.6)	26 (2.9)	16 (6.1) !
Connecticut	12 (1.9)	44 (1.8)	26 (7.3) !
Georgia	7 (1.0)	37 (2.3)	27 (3.9) !
Hawaii	8 (1.2)	23 (1.5)	11 (2.4) !
Idaho †	19 (2.3)	36 (2.2)	41 (11.6) !
Illinois †	12 (1.8)	42 (3.3)	42 (8.2) !
Indiana †	14 (2.0)	40 (2.4)	31 (8.3) !
Iowa †	26 (3.1)	41 (2.3)	36 (6.7) !
Kentucky	17 (1.5)	38 (2.3)	35 (11.8) !
Louisiana	10 (1.3)	36 (3.1)	13 (3.2) !
Maine †	23 (2.9)	46 (2.0)	36 (6.8) !
Maryland	7 (1.2)	36 (2.2)	19 (5.8) !
Massachusetts	16 (2.3)	53 (1.9)	37 (10.4) !
Michigan †	15 (2.3)	43 (2.9)	12 (8.3) !
Minnesota †	17 (2.3)	41 (2.9)	49 (7.1) !
Mississippi	6 (1.0)	28 (1.9)	12 (2.8) !
Missouri	19 (1.7)	44 (2.0)	29 (9.3) !
Montana †	23 (2.7)	46 (3.5)	41 (5.8) !
Nebraska	11 (1.8)	35 (2.7)	29 (5.7) !
Nevada	8 (1.0)	26 (1.6)	13 (3.4) !
New Mexico	9 (1.1)	30 (2.8)	26 (7.4) !
New York †	11 (1.9)	39 (2.3)	36 (8.5) !
North Carolina	9 (1.7)	34 (1.8)	29 (6.2) !
North Dakota	26 (3.0)	43 (1.6)	38 (3.6)
Ohio †	12 (1.7)	43 (2.7)	32 (5.8) !
Oklahoma	17 (1.8)	39 (2.6)	23 (6.1) !
Oregon †	15 (2.1)	35 (2.4)	30 (5.0) !
Rhode Island	8 (1.6)	38 (1.9)	19 (9.6) !
South Carolina	9 (1.4)	34 (2.4)	16 (5.8) !
Tennessee	12 (1.6)	36 (2.2)	36 (7.7) !
Texas	9 (1.3)	37 (2.6)	30 (8.2) !
Utah	19 (2.1)	37 (1.6)	40 (6.3) !
Vermont †	22 (3.4)	45 (3.9)	34 (4.7) !
Virginia	12 (2.2)	42 (2.3)	43 (7.8) !
West Virginia	17 (1.5)	33 (2.1)	26 (4.5) !
Wyoming	21 (2.1)	38 (1.8)	30 (8.7) !
Other Jurisdictions			
American Samoa	▲ (0.2)	****(****)	****(****)
DDESS	23 (2.0)	35 (3.0)	32 (8.5)
DoDDS	22 (2.3)	33 (1.8)	31 (2.0)
Guam	2 (0.7)	6 (1.7)	****(****)
Virgin Islands	3 (0.7)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses. ! The nature of the sample does not allow accurate determination of the variability of the statistic.
(****) Standard error estimates cannot be accurately determined. ****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.58: State *Basic* Level Achievement Results by Free/Reduced-Price School Lunch Eligibility, Grade 4

State percentage of students at or above the *Basic* level in science by student eligibility for free/reduced-price school lunch program for grade 4 public schools: 2000

	Eligible	Not eligible	Information not available
Nation	42 (1.3)	78 (1.1)	78 (2.4)
Alabama	41 (2.5)	78 (1.8)	64 (7.0) !
Arizona	37 (2.0)	75 (3.0)	53 (8.0) !
Arkansas	46 (2.4)	78 (2.4)	****(****)
California †	28 (1.9)	69 (2.4)	52 (9.5) !
Connecticut	50 (3.9)	86 (1.3)	56 (9.0) !
Georgia	35 (2.1)	76 (2.0)	67 (4.1) !
Hawaii	37 (2.3)	64 (1.9)	45 (6.1) !
Idaho †	59 (3.0)	80 (1.8)	84 (7.0) !
Illinois †	44 (3.4)	84 (2.6)	71 (10.7) !
Indiana †	55 (2.9)	84 (2.1)	68 (8.2) !
Iowa †	71 (4.5)	85 (2.2)	78 (7.5) !
Kentucky	57 (2.3)	82 (1.7)	74 (8.7) !
Louisiana	40 (2.4)	79 (2.2)	47 (6.5) !
Maine †	69 (2.7)	87 (1.4)	83 (5.2) !
Maryland	37 (2.5)	76 (2.0)	49 (8.4) !
Massachusetts	53 (3.4)	91 (1.0)	75 (9.4) !
Michigan †	47 (3.2)	83 (1.8)	42 (21.7) !
Minnesota †	58 (4.4)	85 (1.9)	85 (6.5) !
Mississippi	31 (2.2)	73 (2.1)	46 (7.0) !
Missouri	58 (3.3)	86 (1.1)	60 (11.6) !
Montana †	67 (4.9)	89 (1.8)	83 (5.4) !
Nebraska	48 (3.8)	79 (2.1)	69 (4.9) !
Nevada	41 (2.2)	68 (2.4)	51 (5.9) !
New Mexico	41 (2.6)	74 (3.3)	60 (9.6) !
New York †	45 (2.7)	87 (1.9)	77 (8.6) !
North Carolina	42 (2.9)	78 (1.9)	72 (4.8) !
North Dakota	68 (3.3)	86 (1.4)	79 (2.9)
Ohio †	48 (3.3)	85 (1.6)	78 (5.2) !
Oklahoma	61 (3.0)	84 (2.0)	69 (8.1) !
Oregon †	50 (3.7)	78 (2.2)	62 (6.9) !
Rhode Island	37 (2.9)	84 (1.6)	51 (12.0) !
South Carolina	39 (2.2)	76 (1.8)	54 (3.8) !
Tennessee	45 (2.6)	78 (1.8)	69 (7.5) !
Texas	45 (2.6)	81 (1.9)	69 (10.0) !
Utah	58 (2.6)	81 (1.2)	81 (6.3) !
Vermont †	63 (3.5)	84 (2.6)	75 (5.4) !
Virginia	52 (3.4)	85 (1.4)	81 (6.2) !
West Virginia	59 (2.3)	79 (1.8)	71 (4.8) !
Wyoming	67 (3.4)	86 (1.8)	76 (5.4) !
Other Jurisdictions			
American Samoa	2 (0.9)	****(****)	****(****)
DDESS	71 (2.4)	82 (1.3)	83 (6.9)
DoDDS	68 (2.1)	78 (1.3)	76 (1.4)
Guam	15 (2.4)	34 (3.9)	****(****)
Virgin Islands	25 (1.9)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.59: State Achievement-level results by Free/Reduced-Price School Lunch Eligibility, Grade 4

State percentages of students at or above science achievement levels by student eligibility for free/reduced-price school lunch program for grade 4 public schools: 2000

	Eligible				Not eligible				Information not available			
	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	Below *Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*
Nation	58 (1.3)	42 (1.3)	11 (0.7)	1 (0.2)	22 (1.1)	78 (1.1)	37 (1.4)	5 (0.5)	22 (2.4)	78 (2.4)	39 (3.4)	6 (1.7)
Alabama	59 (2.5)	41 (2.5)	9 (1.5)	▲ (0.2)	22 (1.8)	78 (1.8)	36 (2.0)	4 (0.7)	36 (7.0) !	64 (7.0) !	23 (6.1) !	1 (0.6) !
Arizona	63 (2.0)	37 (2.0)	8 (1.0)	▲ (****)	25 (3.0)	75 (3.0)	34 (2.7)	4 (0.8)	47 (8.0) !	53 (8.0) !	19 (4.4) !	2 (0.9) !
Arkansas	54 (2.4)	46 (2.4)	13 (1.5)	1 (0.4)	22 (2.4)	78 (2.4)	35 (2.1)	3 (1.1)	****(****)	****(****)	****(****)	****(****)
California †	72 (1.9)	28 (1.9)	4 (0.6)	▲ (****)	31 (2.4)	69 (2.4)	26 (2.9)	2 (0.5)	48 (9.5) !	52 (9.5) !	16 (6.1) !	1 (****) !
Connecticut	50 (3.9)	50 (3.9)	12 (1.9)	▲ (****)	14 (1.3)	86 (1.3)	44 (1.8)	4 (0.8)	44 (9.0) !	56 (9.0) !	26 (7.3) !	2 (1.2) !
Georgia	65 (2.1)	35 (2.1)	7 (1.0)	▲ (****)	24 (2.0)	76 (2.0)	37 (2.3)	5 (1.0)	33 (4.1) !	67 (4.1) !	27 (3.9) !	4 (1.3) !
Hawaii	63 (2.3)	37 (2.3)	8 (1.2)	▲ (****)	36 (1.9)	64 (1.9)	23 (1.5)	2 (0.5)	55 (6.1) !	45 (6.1) !	11 (2.4) !	1 (****) !
Idaho †	41 (3.0)	59 (3.0)	19 (2.3)	1 (0.7)	20 (1.8)	80 (1.8)	36 (2.2)	3 (0.6)	16 (7.0) !	84 (7.0) !	41 (11.6) !	5 (2.5) !
Illinois †	56 (3.4)	44 (3.4)	12 (1.8)	1 (0.5)	16 (2.6)	84 (2.6)	42 (3.3)	5 (1.2)	29 (10.7) !	71 (10.7) !	42 (8.2) !	9 (3.6) !
Indiana †	45 (2.9)	55 (2.9)	14 (2.0)	▲ (****)	16 (2.1)	84 (2.1)	40 (2.4)	4 (0.8)	32 (8.2) !	68 (8.2) !	31 (8.3) !	4 (1.3) !
Iowa †	29 (4.5)	71 (4.5)	26 (3.1)	2 (0.9)	15 (2.2)	85 (2.2)	41 (2.3)	4 (0.8)	22 (7.5) !	78 (7.5) !	36 (6.7) !	3 (2.2) !
Kentucky	43 (2.3)	57 (2.3)	17 (1.5)	1 (0.4)	18 (1.7)	82 (1.7)	38 (2.3)	4 (0.6)	26 (8.7) !	74 (8.7) !	35 (11.8) !	4 (****) !
Louisiana	60 (2.4)	40 (2.4)	10 (1.3)	▲ (0.2)	21 (2.2)	79 (2.2)	36 (3.1)	4 (1.1)	53 (6.5) !	47 (6.5) !	13 (3.2) !	1 (****) !
Maine †	31 (2.7)	69 (2.7)	23 (2.9)	1 (0.6)	13 (1.4)	87 (1.4)	46 (2.0)	5 (1.0)	17 (5.2) !	83 (5.2) !	36 (6.8) !	3 (1.2) !
Maryland	63 (2.5)	37 (2.5)	7 (1.2)	▲ (****)	24 (2.0)	76 (2.0)	36 (2.2)	4 (0.8)	51 (8.4) !	49 (8.4) !	19 (5.8) !	3 (1.9) !
Massachusetts	47 (3.4)	53 (3.4)	16 (2.3)	1 (0.8)	9 (1.0)	91 (1.0)	53 (1.9)	7 (0.9)	25 (9.4) !	75 (9.4) !	37 (10.4) !	3 (****) !
Michigan †	53 (3.2)	47 (3.2)	15 (2.3)	1 (0.7)	17 (1.8)	83 (1.8)	43 (2.9)	5 (0.8)	58 (21.7) !	42 (21.7) !	12 (8.3) !	▲ (****) !
Minnesota †	42 (4.4)	58 (4.4)	17 (2.3)	2 (0.9)	15 (1.9)	85 (1.9)	41 (2.9)	4 (0.7)	15 (6.5) !	85 (6.5) !	49 (7.1) !	5 (2.3) !
Mississippi	69 (2.2)	31 (2.2)	6 (1.0)	▲ (0.1)	27 (2.1)	73 (2.1)	28 (1.9)	2 (0.6)	54 (7.0) !	46 (7.0) !	12 (2.8) !	1 (0.6) !
Missouri	42 (3.3)	58 (3.3)	19 (1.7)	1 (0.5)	14 (1.1)	86 (1.1)	44 (2.0)	5 (0.7)	40 (11.6) !	60 (11.6) !	29 (9.3) !	2 (1.2) !
Montana †	33 (4.9)	67 (4.9)	23 (2.7)	1 (****)	11 (1.8)	89 (1.8)	46 (3.5)	5 (1.3)	17 (5.4) !	83 (5.4) !	41 (5.8) !	3 (1.7) !
Nebraska	52 (3.8)	48 (3.8)	11 (1.8)	▲ (****)	21 (2.1)	79 (2.1)	35 (2.7)	3 (1.5)	31 (4.9) !	69 (4.9) !	29 (5.7) !	4 (2.3) !
Nevada	59 (2.2)	41 (2.2)	8 (1.0)	▲ (****)	32 (2.4)	68 (2.4)	26 (1.6)	2 (0.6)	49 (5.9) !	51 (5.9) !	13 (3.4) !	1 (****) !
New Mexico	59 (2.6)	41 (2.6)	9 (1.1)	▲ (****)	26 (3.3)	74 (3.3)	30 (2.8)	3 (1.3)	40 (9.6) !	60 (9.6) !	26 (7.4) !	4 (1.8) !
New York †	55 (2.7)	45 (2.7)	11 (1.9)	▲ (0.2)	13 (1.9)	87 (1.9)	39 (2.3)	3 (0.6)	23 (8.6) !	77 (8.6) !	36 (8.5) !	4 (2.4) !
North Carolina	58 (2.9)	42 (2.9)	9 (1.7)	▲ (****)	22 (1.9)	78 (1.9)	34 (1.8)	3 (0.8)	28 (4.8) !	72 (4.8) !	29 (6.2) !	4 (2.3) !
North Dakota	32 (3.3)	68 (3.3)	26 (3.0)	1 (0.8)	14 (1.4)	86 (1.4)	43 (1.6)	4 (0.7)	21 (2.9)	79 (2.9)	38 (3.6)	2 (1.0)
Ohio †	52 (3.3)	48 (3.3)	12 (1.7)	1 (****)	15 (1.6)	85 (1.6)	43 (2.7)	5 (1.0)	22 (5.2) !	78 (5.2) !	32 (5.8) !	5 (1.9) !
Oklahoma	39 (3.0)	61 (3.0)	17 (1.8)	1 (0.3)	16 (2.0)	84 (2.0)	39 (2.6)	4 (0.9)	31 (8.1) !	69 (8.1) !	23 (6.1) !	1 (****) !
Oregon †	50 (3.7)	50 (3.7)	15 (2.1)	1 (****)	22 (2.2)	78 (2.2)	35 (2.4)	4 (0.9)	38 (6.9) !	62 (6.9) !	30 (5.0) !	4 (2.4) !
Rhode Island	63 (2.9)	37 (2.9)	8 (1.6)	▲ (****)	16 (1.6)	84 (1.6)	38 (1.9)	3 (0.6)	49 (12.0) !	51 (12.0) !	19 (9.6) !	▲ (****) !
South Carolina	61 (2.2)	39 (2.2)	9 (1.4)	1 (0.3)	24 (1.8)	76 (1.8)	34 (2.4)	4 (0.7)	46 (3.8) !	54 (3.8) !	16 (5.8) !	1 (****) !
Tennessee	55 (2.6)	45 (2.6)	12 (1.6)	1 (0.4)	22 (1.8)	78 (1.8)	36 (2.2)	4 (0.9)	31 (7.5) !	69 (7.5) !	36 (7.7) !	3 (****) !
Texas	55 (2.6)	45 (2.6)	9 (1.3)	▲ (****)	19 (1.9)	81 (1.9)	37 (2.6)	4 (0.7)	31 (10.0) !	69 (10.0) !	30 (8.2) !	3 (1.3) !
Utah	42 (2.6)	58 (2.6)	19 (2.1)	1 (0.6)	19 (1.2)	81 (1.2)	37 (1.6)	4 (0.7)	19 (6.3) !	81 (6.3) !	40 (6.3) !	5 (3.3) !
Vermont †	37 (3.5)	63 (3.5)	22 (3.4)	1 (****)	16 (2.6)	84 (2.6)	45 (3.9)	5 (1.4)	25 (5.4) !	75 (5.4) !	34 (4.7) !	3 (****) !
Virginia	48 (3.4)	52 (3.4)	12 (2.2)	1 (0.4)	15 (1.4)	85 (1.4)	42 (2.3)	6 (1.0)	19 (6.2) !	81 (6.2) !	43 (7.8) !	6 (1.7) !
West Virginia	41 (2.3)	59 (2.3)	17 (1.5)	1 (0.4)	21 (1.8)	79 (1.8)	33 (2.1)	3 (0.7)	29 (4.8) !	71 (4.8) !	26 (4.5) !	2 (****) !
Wyoming	33 (3.4)	67 (3.4)	21 (2.1)	1 (0.7)	14 (1.8)	86 (1.8)	38 (1.8)	3 (0.8)	24 (5.4) !	76 (5.4) !	30 (8.7) !	3 (1.5) !
Other Jurisdictions												
American Samoa	98 (0.9)	2 (0.9)	▲ (****)	0 (****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
DDESS	29 (2.4)	71 (2.4)	23 (2.0)	1 (0.6)	18 (1.3)	82 (1.3)	35 (3.0)	3 (0.9)	17 (6.9)	83 (6.9)	32 (8.5)	2 (****)
DoDDS	32 (2.1)	68 (2.1)	22 (2.3)	2 (0.6)	22 (1.3)	78 (1.3)	33 (1.8)	3 (0.6)	24 (1.4)	76 (1.4)	31 (2.0)	3 (0.6)
Guam	85 (2.4)	15 (2.4)	2 (0.7)	▲ (****)	66 (3.9)	34 (3.9)	6 (1.7)	0 (****)	****(****)	****(****)	****(****)	****(****)
Virgin Islands	75 (1.9)	25 (1.9)	3 (0.7)	▲ (****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)

Standard errors of the estimated percentages appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
(****) Standard error estimates cannot be accurately determined.
**** (****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.60: Data for Table 3.13 State *Proficient* Level Achievement Results by Free/Reduced-Price School Lunch Eligibility, Grade 8

State percentages of students at or above the *Proficient* level in science by student eligibility for free/reduced-price school lunch program for grade 8 public schools: 1996 and 2000

	Eligible		Not eligible		Information not available	
	1996	2000	1996	2000	1996	2000
Nation	14 (1.6)	12 (1.0)	32 (1.9) *	39 (1.2)	34 (3.9) !	31 (2.0)
Alabama	7 (1.0)	9 (1.3)	24 (2.2)	31 (2.2)	33 (9.9) !	31 (4.5) !
Arizona †	9 (1.5)	10 (2.1)	31 (2.4)	31 (2.1)	18 (2.2)	25 (3.7) !
Arkansas	10 (1.6)	12 (1.6)	28 (1.8)	30 (2.3)	30 (10.1) !	22 (6.0) !
California †	6 (1.2)	4 (1.3)	31 (2.5)	23 (2.5)	15 (2.3)	17 (6.2) !
Connecticut	10 (3.0)	7 (2.1)	43 (2.1)	43 (1.6)	38 (10.1) !	29 (6.9) !
Georgia	6 (1.0)	9 (1.4)	29 (2.3)	33 (2.4)	25 (5.9) !	23 (3.1) !
Hawaii	9 (1.5)	7 (1.1)	18 (1.3)	20 (1.6)	5 (2.0) *	20 (3.6)
Idaho †	—	27 (3.1)	—	44 (1.9)	—	36 (4.8)
Illinois †	—	10 (1.5)	—	40 (2.7)	—	28 (6.7) !
Indiana †	12 (2.7)	16 (3.2)	35 (1.9)	41 (2.1)	****(****)	28 (4.5) !
Kentucky	11 (1.5)	16 (1.6)	31 (1.6) *	38 (2.0)	16 (3.6) !	****(****)
Louisiana	7 (1.1)	8 (1.2)	20 (2.0) ‡	32 (2.5)	16 (4.1) !	13 (2.9) !
Maine †	27 (2.4)	25 (2.4)	46 (2.3)	41 (2.4)	41 (7.7) !	28 (4.1) !
Maryland	8 (1.2)	9 (1.6)	32 (2.4)	37 (1.9)	16 (7.3) !	17 (4.0) !
Massachusetts	13 (1.6)	14 (2.2)	44 (2.0)	49 (2.0)	29 (6.7) !	46 (8.7) !
Michigan †	17 (2.7)	16 (2.3)	38 (2.1)	44 (2.8)	26 (9.2) !	32 (4.2) !
Minnesota †	22 (1.9)	21 (4.4)	40 (1.9)	47 (2.4)	42 (6.5)	45 (5.7) !
Mississippi	5 (0.8)	6 (0.7)	22 (1.7)	24 (2.2)	9 (5.1) !	17 (3.5) !
Missouri	15 (1.8)	18 (2.4)	34 (1.6) ‡	44 (1.9)	25 (5.5) !	32 (5.7) !
Montana †	25 (2.9)	34 (3.2)	46 (2.4)	51 (2.2)	43 (4.9)	48 (4.0)
Nebraska	20 (2.3)	21 (2.5)	40 (1.7)	41 (2.0)	38 (8.6) !	44 (5.1) !
Nevada	—	10 (1.5)	—	28 (1.3)	—	17 (4.3)
New Mexico	10 (1.0)	11 (1.6)	28 (1.5)	29 (2.5)	19 (2.2)	24 (3.1)
New York †	10 (1.6)	14 (3.1)	37 (2.5)	41 (2.9)	36 (7.4) !	28 (6.5)
North Carolina	7 (0.8)	9 (1.3)	33 (1.8)	34 (2.0)	17 (2.7) !	35 (11.9) !
North Dakota	33 (2.9)	26 (3.2)	44 (1.7)	47 (2.1)	33 (3.9)	36 (3.2)
Ohio	—	22 (3.8)	—	46 (2.1)	—	33 (7.8) !
Oklahoma	—	16 (2.4)	—	33 (1.7)	—	27 (5.5) !
Oregon †	20 (2.2)	17 (2.6)	37 (1.8)	39 (2.2)	30 (6.3) !	38 (3.8) !
Rhode Island	10 (1.5)	10 (1.3)	32 (1.9)	36 (1.2)	10 (2.7)	14 (3.1)
South Carolina	7 (1.1)	8 (0.9)	26 (2.1)	31 (2.3)	****(****)	****(****)
Tennessee	9 (1.3)	11 (1.0)	28 (2.2)	33 (1.7)	23 (5.5) !	26 (6.4) !
Texas	9 (1.2)	9 (1.3)	34 (2.1)	33 (2.3)	14 (6.6) !	21 (5.2) !
Utah	25 (2.6)	23 (2.4)	34 (1.5)	38 (1.8)	32 (2.7)	37 (3.8)
Vermont †	22 (2.7)	22 (2.7)	38 (1.9) *	44 (1.7)	30 (3.7) !*	43 (3.5) !
Virginia	6 (1.2)	11 (1.7)	34 (2.5)	37 (1.6)	27 (6.0) !	29 (6.0) !
West Virginia	12 (1.0)	14 (1.7)	26 (1.4) ‡	35 (2.0)	23 (6.0) !	25 (4.5) !
Wyoming	22 (2.0)	24 (1.9)	37 (1.4)	40 (1.3)	32 (4.9)	33 (8.5) !
Other Jurisdictions						
American Samoa	—	2 (0.7)	—	****(****)	—	****(****)
DDESS	20 (3.4)	29 (3.6)	32 (3.1)	40 (2.9)	25 (3.5)	35 (4.6)
DoDDS	20 (4.1) *	33 (3.4)	33 (1.9) *	39 (1.6)	31 (2.2)	37 (2.6)
Guam	▲ (0.3)	3 (2.3)	9 (1.2)	7 (1.4)	****(****)	5 (4.3) !

Standard errors of the estimated percentages appear in parentheses. * Significantly different from 2000 if only one jurisdiction or the nation is being examined.
! The nature of the sample does not allow accurate determination of the variability of the statistic. ****(****) Sample size is insufficient to permit a reliable estimate.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years. † Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate. ▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.61: State *Basic* Level Achievement Results by Free/Reduced-Price School Lunch Eligibility, Grade 8

State percentages of students at or above the *Basic* level in science by student eligibility for free/reduced-price school lunch program for grade 8 public schools: 1996 and 2000

	Eligible		Not eligible		Information not available	
	1996	2000	1996	2000	1996	2000
Nation	40 (2.3)	33 (1.4)	68 (1.6)	71 (1.2)	67 (3.8) !	60 (2.5)
Alabama	26 (2.1)	30 (2.6)	61 (2.2)	65 (2.5)	66 (12.0) !	62 (6.0) !
Arizona †	32 (2.8)	33 (3.6)	68 (2.4)	68 (2.5)	53 (3.8)	61 (4.0) !
Arkansas	33 (2.5)	35 (2.8)	66 (1.8)	66 (1.9)	67 (10.3) !	53 (10.6) !
California †	26 (2.4) *	19 (2.1)	64 (2.9) *	54 (2.9)	44 (5.1)	43 (7.2) !
Connecticut	34 (4.3)	31 (3.8)	77 (1.6)	76 (1.7)	71 (9.1) !	55 (8.2) !
Georgia	27 (2.2)	29 (2.3)	62 (2.2)	66 (2.4)	55 (8.1) !	53 (4.6) !
Hawaii	30 (2.3)	26 (1.8)	49 (1.5)	50 (1.7)	25 (5.5) *	50 (4.9)
Idaho †	—	62 (2.8)	—	79 (1.4)	—	70 (5.3)
Illinois †	—	30 (3.2)	—	76 (2.3)	—	64 (8.3) !
Indiana †	41 (3.7)	45 (4.7)	71 (1.8)	76 (2.4)	****(****)	56 (6.2) !
Kentucky	40 (2.2)	46 (2.4)	69 (1.9)	72 (1.8)	50 (5.3) !	****(****)
Louisiana	27 (1.8)	28 (2.7)	55 (2.2) ‡	68 (2.3)	36 (7.8) !	42 (4.9) !
Maine †	64 (2.7)	62 (2.7)	82 (1.6)	79 (1.6)	79 (5.1) !	71 (4.3) !
Maryland	27 (2.5)	33 (3.0)	66 (2.3)	70 (1.8)	50 (12.3) !	45 (6.4) !
Massachusetts	38 (2.3)	42 (4.6)	79 (1.5)	82 (1.9)	57 (9.9) !	74 (6.9) !
Michigan †	45 (3.5)	42 (3.9)	73 (2.0)	78 (1.9)	54 (10.4) !	65 (4.8) !
Minnesota †	53 (3.2)	53 (5.0)	77 (1.6)	79 (2.6)	74 (5.6)	77 (5.6) !
Mississippi	24 (1.7)	24 (1.8)	59 (2.4)	60 (1.9)	40 (7.8) !	45 (4.8) !
Missouri	46 (2.8)	48 (2.7)	72 (1.6) *	78 (1.7)	56 (10.2) !	62 (7.7) !
Montana †	61 (2.9)	67 (3.3)	83 (1.6)	86 (1.9)	83 (3.1)	82 (3.2)
Nebraska	53 (2.8)	54 (3.0)	78 (1.0)	76 (1.7)	77 (7.0) !	74 (5.8) !
Nevada	—	33 (2.4)	—	62 (1.2)	—	57 (8.3)
New Mexico	34 (2.0)	35 (2.5)	62 (2.3)	61 (2.5)	54 (4.0)	52 (4.4)
New York †	31 (2.5)	43 (4.4)	73 (2.6)	76 (2.8)	65 (9.8) !	57 (9.3)
North Carolina	31 (1.8)	32 (3.1)	69 (1.8)	67 (1.9)	53 (6.5) !	53 (12.0) !
North Dakota	72 (3.2) *	60 (3.3)	80 (1.3)	80 (1.4)	71 (4.6)	73 (1.7)
Ohio	—	52 (4.1)	—	79 (1.7)	—	62 (8.5) !
Oklahoma	—	46 (3.0)	—	72 (1.9)	—	61 (6.8) !
Oregon †	56 (2.9)	47 (3.5)	73 (2.0)	74 (2.1)	63 (6.8) !	73 (3.3) !
Rhode Island	35 (2.3)	37 (2.5)	69 (1.8)	70 (1.4)	29 (6.3)	46 (7.3)
South Carolina	28 (2.4)	30 (2.0)	60 (2.2)	66 (2.1)	****(****)	****(****)
Tennessee	31 (3.1)	35 (2.5)	62 (2.5)	69 (2.4)	58 (5.2) !	57 (10.1) !
Texas	34 (2.6)	34 (2.5)	71 (2.1)	67 (2.5)	36 (11.9) !	48 (8.1) !
Utah	61 (2.7) *	52 (2.6)	72 (1.5)	73 (1.5)	72 (3.9)	72 (3.1)
Vermont †	57 (4.0)	54 (4.6)	74 (1.4) *	80 (1.4)	73 (6.1) !	76 (3.9) !
Virginia	26 (2.8)	34 (3.0)	69 (1.9)	72 (1.5)	59 (6.6) !	59 (7.3) !
West Virginia	43 (2.7)	44 (2.5)	63 (1.6) ‡	72 (1.3)	62 (8.5) !	61 (8.6) !
Wyoming	58 (3.1)	57 (3.2)	75 (1.4)	75 (1.4)	67 (9.1)	71 (4.9) !
Other Jurisdictions						
American Samoa	—	5 (1.2)	—	****(****)	—	****(****)
DDESS	59 (5.7)	62 (3.6)	70 (3.5)	75 (2.4)	62 (4.2)	70 (5.6)
DoDDS	53 (3.8) *	65 (3.5)	69 (1.3) *	75 (1.6)	70 (1.7)	70 (2.1)
Guam	10 (2.6)	11 (3.2)	32 (1.8)	25 (2.5)	****(****)	18 (7.2) !

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
‡ Significantly different from 2000 when examining only one jurisdiction and when using a multiple comparison procedure based on all jurisdictions that participated both years.
****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000. — Indicates that the jurisdiction did not participate in 2000.
▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.62: State Achievement-level results by Free/Reduced-Price School Lunch Eligibility, Grade 8

State percentages of students at or above science achievement levels by student eligibility for free/reduced-price school lunch program for grade 8 public schools: 2000

	Eligible				Not eligible				Information not available			
	Below Basic	At or above *Basic*	At or above *Proficient*	*Advanced*	*Below Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*	*Below Basic*	At or above *Basic*	At or above *Proficient*	*Advanced*
Nation	67 (1.4)	33 (1.4)	12 (1.0)	1 (0.3)	29 (1.2)	71 (1.2)	39 (1.2)	5 (0.7)	40 (2.5)	60 (2.5)	31 (2.0)	3 (0.7)
Alabama	70 (2.6)	30 (2.6)	9 (1.3)	▲ (0.3)	35 (2.5)	65 (2.5)	31 (2.2)	3 (0.9)	38 (6.0) !	62 (6.0) !	31 (4.5) !	5 (2.2) !
Arizona †	67 (3.6)	33 (3.6)	10 (2.1)	▲ (****)	32 (2.5)	68 (2.5)	31 (2.1)	3 (0.7)	39 (4.0) !	61 (4.0) !	25 (3.7) !	2 (1.0) !
Arkansas	65 (2.8)	35 (2.8)	12 (1.6)	1 (****)	34 (1.9)	66 (1.9)	30 (2.3)	2 (0.7)	47 (10.6) !	53 (10.6) !	22 (6.0) !	1 (****) !
California †	81 (2.1)	19 (2.1)	4 (1.3)	0 (****)	46 (2.9)	54 (2.9)	23 (2.5)	2 (0.6)	57 (7.2) !	43 (7.2) !	17 (6.2) !	2 (****) !
Connecticut	69 (3.8)	31 (3.8)	7 (2.1)	▲ (****)	24 (1.7)	76 (1.7)	43 (1.6)	5 (0.9)	45 (8.2) !	55 (8.2) !	29 (6.9) !	5 (2.4) !
Georgia	71 (2.3)	29 (2.3)	9 (1.4)	▲ (****)	34 (2.4)	66 (2.4)	33 (2.4)	3 (1.1)	47 (4.6) !	53 (4.6) !	23 (3.1) !	3 (0.7) !
Hawaii	74 (1.8)	26 (1.8)	7 (1.1)	▲ (****)	50 (1.7)	50 (1.7)	20 (1.6)	1 (0.5)	50 (4.9)	50 (4.9)	20 (3.6)	1 (****)
Idaho †	38 (2.8)	62 (2.8)	27 (3.1)	2 (0.6)	21 (1.4)	79 (1.4)	44 (1.9)	5 (0.8)	30 (5.3)	70 (5.3)	36 (4.8)	3 (1.2)
Illinois †	70 (3.2)	30 (3.2)	10 (1.5)	▲ (****)	24 (2.3)	76 (2.3)	40 (2.7)	5 (1.2)	36 (8.3) !	64 (8.3) !	28 (6.7) !	2 (1.2) !
Indiana †	55 (4.7)	45 (4.7)	16 (3.2)	2 (1.0)	24 (2.4)	76 (2.4)	41 (2.1)	4 (0.7)	44 (6.2) !	56 (6.2) !	28 (4.5) !	4 (1.8) !
Kentucky	54 (2.4)	46 (2.4)	16 (1.6)	1 (0.3)	28 (1.8)	72 (1.8)	38 (2.0)	4 (0.6)	****(****)	****(****)	****(****)	****(****)
Louisiana	72 (2.7)	28 (2.7)	8 (1.2)	1 (0.3)	32 (2.3)	68 (2.3)	32 (2.5)	3 (0.9)	58 (4.9) !	42 (4.9) !	13 (2.9) !	▲ (****) !
Maine †	38 (2.7)	62 (2.7)	25 (2.4)	2 (0.8)	21 (1.6)	79 (1.6)	41 (2.4)	4 (0.6)	29 (4.3) !	71 (4.3) !	28 (4.1) !	2 (1.3) !
Maryland	67 (3.0)	33 (3.0)	9 (1.6)	▲ (****)	30 (1.8)	70 (1.8)	37 (1.9)	4 (0.6)	55 (6.4) !	45 (6.4) !	17 (4.0) !	1 (****) !
Massachusetts	58 (4.6)	42 (4.6)	14 (2.2)	1 (0.4)	18 (1.9)	82 (1.9)	49 (2.0)	7 (0.8)	26 (6.9) !	74 (6.9) !	46 (8.7) !	7 (2.4) !
Michigan †	58 (3.9)	42 (3.9)	16 (2.3)	1 (0.7)	22 (1.9)	78 (1.9)	44 (2.8)	5 (1.1)	35 (4.8) !	65 (4.8) !	32 (4.2) !	2 (1.3) !
Minnesota †	47 (5.0)	53 (5.0)	21 (4.4)	2 (1.0)	21 (2.6)	79 (2.6)	47 (2.4)	5 (0.9)	23 (5.6) !	77 (5.6) !	45 (5.7) !	4 (2.1) !
Mississippi	76 (1.8)	24 (1.8)	6 (0.7)	▲ (0.2)	40 (1.9)	60 (1.9)	24 (2.2)	2 (0.6)	55 (4.8) !	45 (4.8) !	17 (3.5) !	2 (1.0) !
Missouri	52 (2.7)	48 (2.7)	18 (2.4)	1 (0.5)	22 (1.7)	78 (1.7)	44 (1.9)	5 (0.7)	38 (7.7) !	62 (7.7) !	32 (5.7) !	5 (1.6) !
Montana †	33 (3.3)	67 (3.3)	34 (3.2)	2 (0.8)	14 (1.9)	86 (1.9)	51 (2.2)	6 (1.1)	18 (3.2)	82 (3.2)	48 (4.0)	7 (1.7)
Nebraska	46 (3.0)	54 (3.0)	21 (2.5)	2 (0.7)	24 (1.7)	76 (1.7)	41 (2.0)	5 (0.7)	26 (5.8) !	74 (5.8) !	44 (5.1) !	2 (1.6) !
Nevada	67 (2.4)	33 (2.4)	10 (1.5)	▲ (****)	38 (1.2)	62 (1.2)	28 (1.3)	2 (0.4)	43 (8.3)	57 (8.3)	17 (4.3)	1 (****)
New Mexico	65 (2.5)	35 (2.5)	11 (1.6)	1 (****)	39 (2.5)	61 (2.5)	29 (2.5)	2 (0.5)	48 (4.4)	52 (4.4)	24 (3.1)	2 (1.0)
New York †	57 (4.4)	43 (4.4)	14 (3.1)	1 (****)	24 (2.8)	76 (2.8)	41 (2.9)	3 (1.0)	43 (9.3)	57 (9.3)	28 (6.5)	3 (2.3)
North Carolina	68 (3.1)	32 (3.1)	9 (1.3)	▲ (0.2)	33 (1.9)	67 (1.9)	34 (2.0)	4 (0.9)	47 (12.0) !	53 (12.0) !	35 (11.9) !	8 (5.0) !
North Dakota	40 (3.3)	60 (3.3)	26 (3.2)	2 (0.7)	20 (1.4)	80 (1.4)	47 (2.1)	5 (1.1)	27 (1.7)	73 (1.7)	36 (3.2)	3 (0.8)
Ohio	48 (4.1)	52 (4.1)	22 (3.8)	3 (1.5)	21 (1.7)	79 (1.7)	46 (2.1)	7 (0.8)	38 (8.5) !	62 (8.5) !	33 (7.8) !	4 (1.6) !
Oklahoma	54 (3.0)	46 (3.0)	16 (2.4)	1 (****)	28 (1.9)	72 (1.9)	33 (1.7)	3 (0.6)	39 (6.8) !	61 (6.8) !	27 (5.5) !	1 (****) !
Oregon †	53 (3.5)	47 (3.5)	17 (2.6)	2 (0.8)	26 (2.1)	74 (2.1)	39 (2.2)	4 (0.8)	27 (3.3) !	73 (3.3) !	38 (3.8) !	4 (1.4) !
Rhode Island	63 (2.5)	37 (2.5)	10 (1.3)	1 (****)	30 (1.4)	70 (1.4)	36 (1.2)	3 (0.4)	54 (7.3)	46 (7.3)	14 (3.1)	1 (****)
South Carolina	70 (2.0)	30 (2.0)	8 (0.9)	▲ (****)	34 (2.1)	66 (2.1)	31 (2.3)	3 (0.6)	****(****)	****(****)	****(****)	****(****)
Tennessee	65 (2.5)	35 (2.5)	11 (1.0)	1 (0.3)	31 (2.4)	69 (2.4)	33 (1.7)	3 (0.6)	43 (10.1) !	57 (10.1) !	26 (6.4) !	1 (****) !
Texas	66 (2.5)	34 (2.5)	9 (1.3)	▲ (****)	33 (2.5)	67 (2.5)	33 (2.3)	3 (0.6)	52 (8.1) !	48 (8.1) !	21 (5.2) !	2 (****) !
Utah	48 (2.6)	52 (2.6)	23 (2.4)	2 (0.8)	27 (1.5)	73 (1.5)	38 (1.8)	3 (0.7)	28 (3.1)	72 (3.1)	37 (3.8)	3 (1.4)
Vermont †	46 (4.6)	54 (4.6)	22 (2.7)	1 (****)	20 (1.4)	80 (1.4)	44 (1.7)	5 (0.9)	24 (3.9) !	76 (3.9) !	43 (3.5) !	5 (2.5) !
Virginia	66 (3.0)	34 (3.0)	11 (1.7)	▲ (****)	28 (1.5)	72 (1.5)	37 (1.6)	4 (0.7)	41 (7.3) !	59 (7.3) !	29 (6.0) !	3 (2.1) !
West Virginia	56 (2.5)	44 (2.5)	14 (1.7)	1 (0.2)	28 (1.3)	72 (1.3)	35 (2.0)	3 (0.5)	39 (8.6) !	61 (8.6) !	25 (4.5) !	4 (1.8) !
Wyoming	43 (3.2)	57 (3.2)	24 (1.9)	1 (0.6)	25 (1.4)	75 (1.4)	40 (1.3)	4 (0.6)	29 (4.9) !	71 (4.9) !	33 (8.5) !	3 (****) !
Other Jurisdictions												
American Samoa	95 (1.2)	5 (1.2)	2 (0.7)	0 (****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)	****(****)
DDESS	38 (3.6)	62 (3.6)	29 (3.6)	2 (****)	25 (2.4)	75 (2.4)	40 (2.9)	6 (1.6)	30 (5.6)	70 (5.6)	35 (4.6)	3 (****)
DoDDS	35 (3.5)	65 (3.5)	33 (3.4)	2 (1.4)	25 (1.6)	75 (1.6)	39 (1.6)	4 (1.0)	30 (2.1)	70 (2.1)	37 (2.6)	4 (1.3)
Guam	89 (3.2)	11 (3.2)	3 (****)	0 (****)	75 (2.5)	25 (2.5)	7 (1.4)	▲ (****)	82 (7.2) !	18 (7.2) !	5 (****) !	0 (****) !

Standard errors of the estimated percentages appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
(****) Standard error estimates cannot be accurately determined.
****(****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
▲ Percentage is between 0.0 and 0.5.
NOTE: Comparative performance results may be affected by changes in exclusion rates for students with disabilities and limited English proficient students in the NAEP samples.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.63: State Percentages of Students by Free/Reduced-Price School Lunch Eligibility, Grade 4

State percentages of students by eligibility for free/reduced-price school lunch program for grade 4 public schools: 2000

	Eligible	Not eligible	Information not available
Nation	37 (1.1)	51 (1.9)	12 (2.1)
Alabama	50 (2.2)	43 (2.5)	7 (2.3)
Arizona	40 (2.7)	49 (2.8)	11 (3.1)
Arkansas	49 (2.2)	48 (2.2)	2 (1.5)
California †	50 (3.5)	40 (3.4)	11 (3.0)
Connecticut	22 (2.0)	69 (2.3)	8 (2.0)
Georgia	42 (2.0)	46 (2.8)	12 (3.2)
Hawaii	45 (2.1)	50 (2.3)	5 (2.2)
Idaho †	38 (2.5)	56 (2.9)	7 (3.0)
Illinois †	36 (3.5)	51 (4.2)	13 (3.9)
Indiana †	25 (2.3)	63 (3.8)	13 (4.2)
Iowa †	23 (1.6)	71 (2.3)	5 (2.0)
Kentucky	45 (2.1)	51 (2.3)	4 (1.8)
Louisiana	54 (3.2)	32 (2.6)	13 (3.5)
Maine †	30 (1.5)	64 (1.8)	6 (1.6)
Maryland	31 (2.3)	59 (2.2)	10 (2.6)
Massachusetts	26 (2.1)	70 (2.4)	5 (1.9)
Michigan †	30 (2.2)	67 (2.4)	3 (1.8)
Minnesota †	27 (2.3)	66 (2.8)	7 (2.7)
Mississippi	56 (2.0)	33 (2.3)	11 (3.1)
Missouri	34 (1.8)	61 (2.4)	5 (2.1)
Montana †	35 (3.1)	49 (3.5)	17 (3.5)
Nebraska	34 (3.0)	57 (3.6)	9 (3.3)
Nevada	33 (1.9)	60 (2.5)	7 (2.2)
New Mexico	55 (3.0)	33 (2.8)	12 (3.3)
New York †	47 (2.4)	49 (2.4)	4 (1.7)
North Carolina	38 (2.1)	56 (2.6)	6 (1.8)
North Dakota	25 (1.7)	56 (2.4)	19 (2.8)
Ohio †	34 (2.3)	58 (3.1)	8 (2.5)
Oklahoma	52 (2.8)	42 (2.7)	6 (1.8)
Oregon †	33 (3.1)	58 (3.3)	8 (2.8)
Rhode Island	35 (1.8)	62 (1.8)	3 (1.6)
South Carolina	52 (1.8)	45 (2.0)	3 (1.6)
Tennessee	44 (2.1)	53 (2.3)	3 (1.6)
Texas	43 (2.5)	49 (3.0)	8 (2.5)
Utah	29 (1.7)	65 (2.5)	6 (2.2)
Vermont †	25 (1.8)	68 (2.6)	7 (2.7)
Virginia	31 (2.3)	60 (2.7)	9 (2.9)
West Virginia	47 (1.9)	47 (2.1)	6 (2.1)
Wyoming	30 (2.0)	66 (2.7)	4 (1.9)
Other Jurisdictions			
American Samoa	100 (0.3)	**** (****)	▲ (0.3)
DDESS	44 (1.4)	46 (1.3)	11 (0.4)
DoDDS	23 (1.0)	49 (1.3)	29 (1.4)
Guam	53 (2.1)	42 (1.9)	6 (0.9)
Virgin Islands	99 (0.4)	▲ (****)	1 (0.4)

Standard errors of the estimated percentages appear in parentheses.
**** (****) Sample size is insufficient to permit a reliable estimate.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages may not add to 100 due to rounding.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.64: State Percentages of Students by Free/Reduced-Price School Lunch Eligibility, Grade 8

State percentages of students by eligibility for free/reduced-price school lunch program for grade 8 public schools: 1996 and 2000

	Eligible		Not eligible		Information not available	
	1996	2000	1996	2000	1996	2000
Nation	29 (1.6)	27 (1.1)	51 (3.6)	55 (2.0)	20 (4.4)	18 (2.1)
Alabama	39 (1.9)	40 (2.4)	58 (2.0)	51 (3.0)	3 (1.2)	9 (2.9)
Arizona †	28 (2.5)	31 (2.4)	52 (3.7)	55 (3.7)	20 (3.9)	15 (3.6)
Arkansas	33 (1.8)	36 (1.9)	60 (2.8)	58 (1.8)	6 (3.1)	6 (2.0)
California †	36 (2.6)	34 (3.5)	47 (3.0)	48 (4.4)	17 (3.1)	19 (5.0)
Connecticut	21 (1.5)	19 (3.0)	74 (2.1)	69 (3.2)	5 (1.6)	12 (3.2)
Georgia	32 (2.3)	30 (2.3)	54 (2.7)	48 (3.5)	14 (3.5)	22 (4.4)
Hawaii	29 (1.0)	40 (1.2)	66 (1.0)	52 (1.1)	5 (0.3)	8 (0.7)
Idaho †	—	29 (1.3)	—	61 (1.4)	—	9 (1.6)
Illinois †	—	31 (2.5)	—	65 (2.7)	—	4 (1.6)
Indiana †	21 (1.5)	18 (2.0)	79 (1.6)	70 (3.4)	1 (0.3)	11 (3.7)
Kentucky	34 (2.1)	37 (1.9)	59 (2.3)	62 (2.1)	7 (2.5)	2 (****)
Louisiana	48 (2.1)	47 (2.9)	45 (1.9)	37 (2.7)	7 (2.0)	16 (3.6)
Maine †	24 (1.3)	23 (1.3)	71 (1.8)	70 (1.9)	5 (1.8)	7 (2.0)
Maryland	26 (1.9)	20 (1.6)	69 (2.6)	67 (3.3)	5 (2.2)	13 (3.8)
Massachusetts	18 (1.5)	20 (1.9)	73 (3.0)	75 (2.6)	9 (2.8)	6 (1.9)
Michigan †	19 (1.8)	21 (2.1)	66 (3.8)	66 (3.3)	14 (4.2)	13 (3.3)
Minnesota †	20 (1.5)	21 (2.0)	64 (3.1)	73 (3.0)	16 (3.1)	5 (2.7)
Mississippi	52 (1.9)	48 (2.4)	42 (2.0)	42 (2.1)	6 (2.5)	10 (2.8)
Missouri	27 (1.6)	26 (1.7)	65 (2.6)	64 (2.5)	8 (2.7)	9 (2.5)
Montana †	25 (1.8)	28 (1.7)	60 (2.8)	56 (2.5)	16 (2.8)	17 (1.7)
Nebraska	27 (1.6)	26 (1.5)	69 (1.8)	67 (2.8)	5 (1.0)	8 (2.4)
Nevada	—	27 (1.0)	—	71 (1.1)	—	3 (0.3)
New Mexico	41 (1.5)	43 (1.9)	43 (1.9)	35 (2.3)	16 (1.5)	22 (2.6)
New York †	37 (2.3)	34 (2.4)	54 (2.8)	49 (3.1)	9 (2.6)	17 (3.0)
North Carolina	31 (1.8)	28 (1.5)	62 (2.1)	66 (2.0)	8 (2.4)	6 (2.0)
North Dakota	20 (1.1)	24 (1.3)	70 (1.7)	59 (1.9)	10 (1.6)	18 (2.0)
Ohio	—	16 (1.6)	—	74 (3.3)	—	10 (3.3)
Oklahoma	—	38 (1.7)	—	56 (2.1)	—	6 (2.1)
Oregon †	23 (1.5)	25 (2.1)	64 (3.0)	59 (3.0)	13 (3.0)	16 (3.8)
Rhode Island	25 (0.8)	25 (1.3)	71 (0.7)	71 (1.4)	4 (0.2)	4 (0.4)
South Carolina	45 (2.2)	44 (1.7)	54 (2.0)	55 (1.8)	1 (****)	1 (****)
Tennessee	28 (2.3)	34 (2.3)	64 (2.5)	63 (2.4)	8 (2.3)	4 (1.4)
Texas	37 (2.2)	39 (1.8)	56 (2.6)	54 (2.5)	6 (2.0)	6 (2.2)
Utah	20 (1.3)	21 (1.4)	69 (1.7)	68 (1.9)	11 (1.6)	10 (1.9)
Vermont †	20 (1.1)	20 (1.3)	73 (1.7)	70 (2.4)	7 (1.8)	10 (2.3)
Virginia	21 (1.7)	21 (1.4)	67 (2.8)	71 (2.6)	12 (3.0)	9 (2.6)
West Virginia	35 (1.5)	38 (2.0)	61 (2.0)	56 (1.9)	4 (1.9)	6 (1.9)
Wyoming	20 (0.8)	24 (1.3)	75 (0.8)	73 (1.4)	5 (0.4)	3 (1.0)
Other Jurisdictions						
American Samoa	—	100 (0.3)	—	****(****)	—	▲ (0.3)
DDESS	24 (1.9)	30 (1.7)	43 (1.9)	45 (1.6)	33 (0.8)	25 (1.6)
DoDDS	7 (0.5)	15 (0.8)	49 (0.7)	55 (1.0)	44 (0.4)	30 (0.7)
Guam	18 (1.2)	19 (1.3)	81 (1.3)	74 (2.1)	1 (0.2)	7 (1.4)

Standard errors of the estimated percentages appear in parentheses.
****(****) Sample size is insufficient to permit a reliable estimate.
(****) Standard error estimates cannot be accurately determined.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in 2000.
— Indicates that the jurisdiction did not participate.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages may not add to 100 due to rounding.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.65: Data for Table 4.1 Comparison of Two Sets of National Scale Score Results

National average science scale scores by type of results, grades 4, 8, and 12: 1996 and 2000

	Accommodations not permitted	Accommodations permitted
Grade 4		
1996	150 (0.8)	149 (0.8)
2000	150 (0.7)	148 (0.6) †
Grade 8		
1996	150 (0.9)	150 (0.7)
2000	151 (0.6)	151 (0.7)
Grade 12		
1996	150 (0.9) *	150 (0.7) *
2000	147 (1.0)	146 (0.9)

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000.
† Significantly different from the result where accommodations were not permitted.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.66: Data for Table 4.2 Comparison of Two Sets of National Achievement-Level Results

Percentage of students within each science achievement-level range and at or above achievement levels by type of results, grades 4, 8, and 12: 1996 and 2000

	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4						
1996: Accommodations were						
not permitted	33 (1.2)	38 (0.8)	26 (0.9)	3 (0.4)	67 (1.2)	29 (0.9)
permitted	35 (1.0) †	36 (0.6) †	25 (0.8)	4 (0.3)	65 (1.0) †	29 (0.9)
2000: Accommodations were						
not permitted	34 (0.8)	37 (0.7)	26 (0.7)	4 (0.3)	66 (0.8)	29 (0.8)
permitted	36 (0.8) †	36 (1.0)	25 (0.7)	3 (0.4)	64 (0.8) †	29 (0.8)
Grade 8						
1996: Accommodations were						
not permitted	39 (1.1)	32 (0.7) *	26 (1.1)	3 (0.5)	61 (1.1)	29 (1.2) *
permitted	39 (0.9)	31 (0.7) *	26 (0.8)	3 (0.3) *	61 (0.9)	29 (0.9)
2000: Accommodations were						
not permitted	39 (0.8)	29 (0.5)	28 (0.7)	4 (0.4)	61 (0.8)	32 (0.8)
permitted	39 (0.9)	29 (0.7)	27 (0.8)	4 (0.3)	61 (0.9)	32 (0.8)
Grade 12						
1996: Accommodations were						
not permitted	43 (1.1) *	36 (1.0)	19 (1.0)	3 (0.3)	57 (1.1) *	21 (1.1)
permitted	43 (1.0) *	35 (0.8)	19 (0.7) *	3 (0.3)	57 (1.0) *	21 (0.8) *
2000: Accommodations were						
not permitted	47 (1.1)	34 (0.7)	16 (0.9)	2 (0.3)	53 (1.1)	18 (1.0)
permitted	48 (1.2)	34 (0.8)	16 (0.8)	2 (0.3)	52 (1.2)	18 (0.9)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
† Significantly different from the result where accommodations were not permitted.
NOTE: Percentages within each science achievement-level range may not add to 100 or to the exact percentages at or above achievement levels due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.67: Comparison of Two Sets of National Scale Score Results by Gender

National average science scale scores by gender and type of results, grades 4, 8, and 12: 1996 and 2000

		Male		Female	
		Not permitted	Permitted	Not permitted	Permitted
Grade 4	1996	151 (0.9)	150 (1.0)	149 (0.9)	148 (0.8)
	2000	153 (0.8)	150 (0.7) †	147 (0.8)	146 (0.8)
Grade 8	1996	151 (1.0) *	151 (0.9) *	149 (1.1)	149 (0.9)
	2000	154 (0.7)	154 (0.9)	147 (0.8)	147 (0.8)
Grade 12	1996	152 (1.2) *	154 (1.0) *	148 (0.9)	147 (0.8)
	2000	148 (1.1)	148 (1.1)	145 (1.0)	145 (1.0)

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000.
† Significantly different from the result where accommodations were not permitted.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.68: Comparison of Two Sets of National Achievement-Level Results by Gender

Percentage of students within each science achievement-level range and at or above achievement levels by gender and type of results, grades 4, 8, and 12: 1996 and 2000

	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4						
Male						
1996: Accommodations were						
not permitted	32 (1.4)	37 (1.3)	27 (1.1)	3 (0.5)	68 (1.4)	31 (1.1)
permitted	34 (1.4)	35 (1.0)	27 (1.0)	4 (0.5)	66 (1.4)	31 (1.2)
2000: Accommodations were						
not permitted	31 (0.9)	36 (1.2)	28 (1.0)	5 (0.4)	69 (0.9)	33 (1.1)
permitted	33 (0.9) †	35 (1.0)	27 (0.9)	4 (0.5)	67 (0.9) †	32 (0.9)
Female						
1996: Accommodations were						
not permitted	33 (1.5)	40 (1.5)	24 (1.2)	3 (0.4)	67 (1.5)	27 (1.2)
permitted	36 (1.0)	37 (1.0)	24 (0.9)	3 (0.3)	64 (1.0)	27 (1.0)
2000: Accommodations were						
not permitted	36 (1.1)	38 (1.0)	23 (0.8)	3 (0.4)	64 (1.1)	26 (0.9)
permitted	38 (1.2)	37 (1.4)	23 (0.8)	2 (0.4)	62 (1.2)	25 (1.0)
Grade 8						
Male						
1996: Accommodations were						
not permitted	38 (1.3)	31 (1.0) *	27 (1.2) *	4 (0.5)	62 (1.3)	31 (1.2) *
permitted	39 (1.2)	30 (0.8)	28 (0.9)	4 (0.3) *	61 (1.2)	32 (1.0) *
2000: Accommodations were						
not permitted	36 (0.8)	28 (0.6)	31 (0.8)	5 (0.6)	64 (0.8)	36 (0.8)
permitted	36 (1.0)	28 (1.0)	30 (0.9)	5 (0.5)	64 (1.0)	35 (1.0)
Female						
1996: Accommodations were						
not permitted	39 (1.4)	34 (0.9) *	24 (1.5)	3 (0.6)	61 (1.4)	27 (1.7)
permitted	40 (1.1)	33 (1.0) *	25 (1.1)	3 (0.4)	60 (1.1)	27 (1.3)
2000: Accommodations were						
not permitted	43 (1.1)	30 (0.9)	24 (1.1)	3 (0.4)	57 (1.1)	27 (1.1)
permitted	43 (1.2)	30 (0.9)	25 (0.9)	3 (0.3)	57 (1.2)	28 (1.0)
Grade 12						
Male						
1996: Accommodations were						
not permitted	40 (1.3) *	34 (1.3)	21 (1.4)	4 (0.6)	60 (1.3) *	25 (1.6)
permitted	40 (1.1) *	34 (1.0)	22 (1.0) *	4 (0.5)	60 (1.1) *	26 (1.1) *
2000: Accommodations were						
not permitted	46 (1.4)	33 (1.1)	18 (1.1)	3 (0.5)	54 (1.4)	21 (1.1)
permitted	46 (1.4)	33 (1.1)	17 (1.0)	3 (0.5)	54 (1.4)	20 (1.1)
Female						
1996: Accommodations were						
not permitted	45 (1.3)	37 (1.3)	16 (1.1)	1 (0.3)	55 (1.3)	17 (1.2)
permitted	46 (1.2)	36 (1.1)	16 (0.8)	2 (0.2)	54 (1.2)	17 (0.9)
2000: Accommodations were						
not permitted	49 (1.5)	35 (1.0)	15 (1.0)	1 (0.3)	51 (1.5)	16 (1.1)
permitted	49 (1.4)	34 (1.1)	15 (0.9)	1 (0.3)	51 (1.4)	16 (1.0)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
† Significantly different from the result where accommodations were not permitted.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.69: Comparison of Two National Scale Score Results by Race/Ethnicity

National average science scale scores by race/ethnicity and type of results, grades 4, 8, and 12: 1996 and 2000

		White		Black		Hispanic		Asian/ Pacific Islander		American Indian	
		Not permitted	Permitted	Not permitted	Permitted	Not permitted	Permitted	Not permitted	Permitted	Not permitted	Permitted
Grade 4	1996	160 (0.9)	159 (0.9)	124 (1.9)	121 (1.7)	128 (1.7)	126 (2.1)	151 (3.6)	147 (3.3)	144 (3.8)	137 (7.7)
	2000	160 (0.8)	159 (0.6)	124 (1.6)	124 (1.0)	129 (1.3)	125 (1.6)	~	~	140 (2.8)	135 (2.9)
Grade 8	1996	159 (1.1)	160 (0.7)	121 (1.1)	121 (0.9)	129 (1.7)	126 (2.1)	152 (3.1)	153 (3.5)	148 (4.1) *	145 (3.6)
	2000	162 (0.7)	162 (0.8)	122 (1.3)	121 (1.3)	128 (1.3)	128 (1.3)	156 (2.4)	155 (2.5)	134 (3.2)	137 (3.0)
Grade 12	1996	159 (1.0) *	159 (0.9) *	124 (1.5)	123 (1.1)	130 (2.3)	132 (2.2)	149 (2.9)	150 (3.0)	145 (4.7) !	144 (4.7)!
	2000	154 (1.2)	154 (1.1)	123 (1.4)	122 (1.6)	128 (1.9)	128 (1.5)	153 (2.5)	149 (3.4)	139 (3.6)	142 (3.2)

Standard errors of the estimated scale scores appear in parentheses.
* Significantly different from 2000.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
~ Special analyses raised concerns about the accuracy and precision of the national grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.70: Comparison of Two Sets of National Achievement-Level Results by Race/Ethnicity

Percentage of students within each science achievement-level range and at or above achievement levels by race/ethnicity and type of results, grades 4, 8, and 12: 1996 and 2000

	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 4						
White						
1996 Accommodations were						
not permitted	21 (1.3)	42 (1.1)	33 (1.3)	4 (0.5)	79 (1.3)	37 (1.3)
permitted	23 (1.2)	40 (0.9)	33 (1.0)	5 (0.5)	77 (1.2)	37 (1.2)
2000 Accommodations were						
not permitted	21 (0.9)	41 (0.8)	33 (1.0)	5 (0.4)	79 (0.9)	38 (1.1)
permitted	22 (0.8)	40 (1.3)	33 (1.1)	5 (0.5)	78 (0.8)	38 (1.2)
Black						
1996 Accommodations were						
not permitted	66 (2.1)	28 (1.8)	7 (1.2)	▲ (****)	34 (2.1)	7 (1.3)
permitted	69 (1.8)	25 (1.5)	5 (0.8)	▲ (****)	31 (1.8)	6 (0.9)
2000 Accommodations were						
not permitted	66 (1.9)	27 (1.8)	6 (0.8)	▲ (****)	34 (1.9)	7 (0.8)
permitted	67 (1.5)	27 (1.6)	6 (0.7)	▲ (0.1)	33 (1.5)	6 (0.7)
Hispanic						
1996 Accommodations were						
not permitted	58 (2.1)	33 (1.8)	9 (1.0)	▲ (0.2)	42 (2.1)	9 (1.2)
permitted	62 (2.4)	29 (2.0)	9 (1.0)	1 (0.3)	38 (2.4)	9 (1.0)
2000 Accommodations were						
not permitted	58 (1.5)	31 (1.4)	10 (0.8)	1 (0.4)	42 (1.5)	11 (0.9)
permitted	62 (1.9)	28 (1.8)	9 (0.8)	1 (0.2)	38 (1.9)	9 (0.9)
Asian/Pacific Islander						
1996 Accommodations were						
not permitted	34 (4.8)	37 (3.5)	25 (4.6)	4 (1.4)	66 (4.8)	29 (4.8)
permitted	38 (5.2)	35 (4.0)	23 (2.8)	4 (2.0)	62 (5.2)	27 (3.0)
2000 Accommodations were						
not permitted	~	~	~	~	~	~
permitted	~	~	~	~	~	~
American Indian						
1996 Accommodations were						
not permitted	41 (4.8)	33 (4.4)	24 (5.0)	2 (****)	59 (4.8)	26 (4.4)
permitted	48 (8.7)	31 (6.5)	19 (3.3)	2 (0.8)	52 (8.7)	21 (3.6)
2000 Accommodations were						
not permitted	43 (3.6)	39 (3.1)	17 (3.5)	1 (0.9)	57 (3.6)	19 (3.5)
permitted	48 (4.4)	34 (5.0)	17 (2.8)	1 (****)	52 (4.4)	18 (2.9)

See footnotes at end of table. ▶

Table B.70: Comparison of Two Sets of National Achievement-Level Results by Race/Ethnicity (continued)

Percentage of students within each science achievement-level range and at or above achievement levels by race/ethnicity and type of results, grades 4, 8, and 12: 1996 and 2000

	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 8						
White						
1996 Accommodations were						
not permitted	27 (1.3)	36 (0.9) *	33 (1.5)	4 (0.7)	73 (1.3)	37 (1.7)
permitted	27 (1.0)	35 (0.8)	34 (1.0)	4 (0.4)	73 (1.0)	38 (1.1)
2000 Accommodations were						
not permitted	26 (0.9)	33 (0.7)	36 (0.9)	5 (0.6)	74 (0.9)	41 (1.0)
permitted	26 (1.1)	33 (1.0)	35 (1.1)	6 (0.4)	74 (1.1)	41 (1.2)
Black						
1996 Accommodations were						
not permitted	76 (1.7)	19 (1.6)	5 (0.8)	▲ (****)	24 (1.7)	5 (0.8)
permitted	77 (1.2)	18 (1.2)	5 (0.6)	▲ (0.1)	23 (1.2)	5 (0.6)
2000 Accommodations were						
not permitted	74 (1.5)	19 (1.4)	6 (0.7)	▲ (0.2)	26 (1.5)	7 (0.7)
permitted	75 (1.7)	18 (1.6)	6 (0.8)	▲ (0.2)	25 (1.7)	7 (0.8)
Hispanic						
1996 Accommodations were						
not permitted	64 (2.2)	25 (1.8)	10 (1.1)	▲ (****)	36 (2.2)	11 (1.1)
permitted	66 (2.4)	24 (1.8)	10 (1.3)	▲ (0.2)	34 (2.4)	10 (1.4)
2000 Accommodations were						
not permitted	65 (1.6)	23 (1.3)	11 (1.1)	1 (0.2)	35 (1.6)	12 (1.1)
permitted	65 (1.5)	23 (1.3)	11 (1.0)	1 (0.2)	35 (1.5)	11 (0.9)
Asian/Pacific Islander						
1996 Accommodations were						
not permitted	38 (4.0)	31 (3.4)	27 (3.2)	3 (1.7)	62 (4.0)	30 (3.7)
permitted	37 (4.0)	30 (3.0)	29 (3.8)	4 (1.3)	63 (4.0)	33 (4.2)
2000 Accommodations were						
not permitted	36 (3.6)	27 (2.1)	31 (3.3)	6 (1.4)	64 (3.6)	37 (3.6)
permitted	36 (3.2)	27 (2.7)	31 (3.1)	6 (1.3)	64 (3.2)	37 (3.1)
American Indian						
1996 Accommodations were						
not permitted	40 (6.7)	35 (6.4)	22 (4.9)	2 (****)	60 (6.7)	24 (5.7)
permitted	45 (5.0)	34 (5.4)	21 (5.8)	▲ (****)	55 (5.0)	21 (5.7)
2000 Accommodations were						
not permitted	61 (5.6)	24 (5.6)	12 (3.4)	2 (1.2)	39 (5.6)	14 (3.5)
permitted	58 (4.5)	26 (3.9)	14 (3.4)	2 (1.3)	42 (4.5)	16 (3.5)

See footnotes at end of table. ▶

Table B.70: Comparison of Two Sets of National Achievement-Level Results by Race/Ethnicity (continued)

Percentage of students within each science achievement-level range and at or above achievement levels by race/ethnicity and type of results, grades 4, 8, and 12: 1996 and 2000

	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*	At or above *Basic*	At or above *Proficient*
Grade 12						
White						
1996 Accommodations were						
not permitted	32 (1.1) *	41 (1.2)	24 (1.3)	3 (0.5)	68 (1.1) *	27 (1.6)
permitted	32 (1.3) *	40 (1.0)	24 (0.9) *	4 (0.4)	68 (1.3) *	27 (1.0) *
2000 Accommodations were						
not permitted	38 (1.4)	39 (1.1)	20 (1.2)	3 (0.4)	62 (1.4)	23 (1.3)
permitted	39 (1.4)	39 (1.1)	20 (1.0)	3 (0.4)	61 (1.4)	23 (1.2)
Black						
1996 Accommodations were						
not permitted	77 (2.0)	20 (2.0)	4 (0.8)	▲ (****)	23 (2.0)	4 (0.9)
permitted	77 (1.5)	20 (1.5)	3 (0.7)	▲ (****)	23 (1.5)	3 (0.6)
2000 Accommodations were						
not permitted	78 (1.6)	18 (1.3)	3 (0.6)	▲ (****)	22 (1.6)	3 (0.6)
permitted	78 (1.6)	19 (1.3)	3 (0.7)	▲ (0.1)	22 (1.6)	3 (0.7)
Hispanic						
1996 Accommodations were						
not permitted	67 (3.0)	26 (2.6)	6 (1.2)	1 (0.5)	33 (3.0)	7 (1.3)
permitted	66 (3.0)	26 (2.6)	7 (1.3)	1 (0.3)	34 (3.0)	8 (1.4)
2000 Accommodations were						
not permitted	70 (2.1)	23 (1.7)	6 (0.8)	▲ (0.2)	30 (2.1)	7 (0.9)
permitted	70 (2.1)	23 (1.7)	6 (1.0)	▲ (****)	30 (2.1)	7 (1.0)
Asian/Pacific Islander						
1996 Accommodations were						
not permitted	44 (4.1)	34 (4.1)	19 (3.1)	3 (1.1)	56 (4.1)	22 (3.3)
permitted	45 (3.6)	33 (2.5)	19 (2.9)	3 (1.5)	55 (3.6)	22 (2.8)
2000 Accommodations were						
not permitted	41 (3.6)	33 (2.3)	22 (2.6)	4 (1.3)	59 (3.6)	26 (2.9)
permitted	44 (3.6)	31 (2.4)	20 (2.4)	5 (1.4)	56 (3.6)	24 (3.2)
American Indian						
1996 Accommodations were						
not permitted	48 (9.8) !	41 (9.3) !	10 (5.1) !	▲ (****)	52 (9.8) !	10 (5.1) !
permitted	49 (8.1) !	39 (6.4) !	11 (6.1) !	1 (****)	51 (8.1) !	11 (6.5) !
2000 Accommodations were						
not permitted	56 (5.7)	35 (6.3)	8 (3.4)	1 (****)	44 (5.7)	9 (3.5)
permitted	52 (5.5)	37 (5.7)	10 (3.4)	1 (****)	48 (5.5)	11 (3.7)

Standard errors of the estimated percentages appear in parentheses.
* Significantly different from 2000.
~ Special analyses raised concerns about the accuracy and precision of the national grade 4 Asian/Pacific Islander results in 2000. As a result, they are omitted from the body of this report. See appendix A for a more detailed discussion.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
(****) Standard error estimates cannot be accurately determined.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages within each science achievement-level range may not add to 100, or to the exact percentages at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.71: Data for Table 4.3 Comparison of Two Sets of State Scale Score Results, Grade 4

State average science scale scores by type of results for grade 4 public schools: 2000

	Accommodations not permitted	Accommodations permitted
Nation	148 (0.8)	147 (0.7)
Alabama	143 (1.7)	143 (1.7)
Arizona	141 (1.4)	140 (1.8)
Arkansas	144 (1.7)	145 (1.3)
California †	131 (2.0)	129 (3.0)
Connecticut	156 (1.3)	156 (1.3)
Georgia	143 (1.4)	142 (1.4)
Hawaii	136 (1.4)	136 (1.4)
Idaho †	153 (1.5)	152 (1.4)
Illinois †	151 (1.6)	150 (2.4)
Indiana †	155 (1.6)	154 (1.5)
Iowa †	160 (1.4)	159 (1.3)
Kentucky	152 (1.1)	152 (1.2)
Louisiana	139 (1.9)	139 (1.8)
Maine †	161 (1.0)	161 (1.1)
Maryland	146 (1.3)	145 (1.3)
Massachusetts	162 (1.2)	161 (1.4)
Michigan †	154 (1.8)	152 (1.8)
Minnesota †	157 (1.5)	157 (1.6)
Mississippi	133 (1.4)	133 (1.4)
Missouri	156 (1.6)	157 (1.2)
Montana †	160 (2.1)	160 (1.5)
Nebraska	150 (1.8)	150 (1.8)
Nevada	142 (1.3)	142 (1.2)
New Mexico	138 (2.0)	140 (1.8)
New York †	149 (1.4)	148 (1.3)
North Carolina	148 (1.4)	147 (1.3)
North Dakota	160 (0.8)	160 (0.9)
Ohio †	154 (1.6)	155 (1.4)
Oklahoma	152 (1.4)	151 (1.3)
Oregon †	150 (1.9)	148 (2.0)
Rhode Island	148 (1.5)	148 (1.3)
South Carolina	141 (1.2)	140 (1.3)
Tennessee	147 (1.5)	145 (1.4)
Texas	147 (1.6)	145 (1.8)
Utah	155 (1.1)	154 (1.3)
Vermont †	159 (1.7)	160 (1.3)
Virginia	156 (1.6)	155 (1.4)
West Virginia	150 (1.1)	149 (1.3)
Wyoming	158 (1.1)	156 (1.3)
Other Jurisdictions		
American Samoa	51 (1.7)	54 (1.6)
DDESS	157 (0.7)	157 (0.9)
DoDDS	156 (0.5)	155 (0.8)
Guam	110 (2.3)	114 (1.2)
Virgin Islands	116 (1.1)	116 (1.7)

Standard errors of the estimated scale scores appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.72: Data for Table 4.4 Comparison of Two Sets of State Scale Score Results, Grade 8

State average science scale scores by type of results for grade 8 public schools: 2000

	Accommodations not permitted	Accommodations permitted
Nation	149 (0.7)	149 (0.8)
Alabama	141 (1.9)	143 (1.7)
Arizona †	146 (1.6)	145 (1.3)
Arkansas	143 (1.3)	142 (1.2)
California †	132 (1.5)	129 (1.8)
Connecticut	154 (1.4)	153 (1.6)
Georgia	144 (1.5)	142 (1.6)
Hawaii	132 (1.2)	130 (1.4)
Idaho †	159 (1.1)	158 (1.0)
Illinois †	150 (1.9)	148 (1.7)
Indiana †	156 (1.7)	154 (1.4)
Kentucky	152 (1.3)	150 (1.2)
Louisiana	136 (1.7)	134 (1.5)
Maine †	160 (1.0)	158 (0.9)
Maryland	149 (1.3)	146 (1.4)
Massachusetts	161 (1.6)	158 (1.1)
Michigan †	156 (1.7)	155 (1.8)
Minnesota †	160 (2.1)	159 (1.2)
Mississippi	134 (1.2)	134 (1.2)
Missouri	156 (1.1)	154 (1.2)
Montana †	165 (1.2)	164 (1.4)
Nebraska	157 (1.0)	158 (1.4)
Nevada	143 (1.1)	141 (1.0)
New Mexico	140 (1.6)	139 (1.5)
New York †	149 (2.4)	145 (2.1)
North Carolina	147 (1.5)	145 (1.4)
North Dakota	161 (0.9)	159 (1.1)
Ohio	161 (1.5)	159 (1.5)
Oklahoma	149 (1.2)	149 (1.1)
Oregon †	154 (1.6)	154 (1.3)
Rhode Island	150 (1.3)	148 (0.9)
South Carolina	142 (1.3)	140 (1.4)
Tennessee	146 (1.5)	145 (1.5)
Texas	144 (1.5)	143 (1.7)
Utah	155 (0.9)	154 (1.0)
Vermont †	161 (0.9)	159 (1.0)
Virginia	152 (1.2)	151 (1.0)
West Virginia	150 (1.1)	146 (1.1) *
Wyoming	158 (1.0)	156 (1.0)
Other Jurisdictions		
American Samoa	72 (2.3)	74 (4.2)
DDESS	159 (1.2)	155 (1.6)
DoDDS	159 (0.8)	159 (0.8)
Guam	114 (4.5)	114 (1.8)

Standard errors of the estimated scale scores appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
* Significantly different from the result where accommodations were not permitted when examining only one jurisdiction or the nation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.73: Data for Table 4.5 Comparisons of Two Sets of State *Proficient* Level Results, Grade 4

Percentage of students at or above the *Proficient* level in science by state and type of results for grade 4 public schools: 2000

	Accommodations not permitted	Accommodations permitted
Nation	28 (0.9)	27 (0.9)
Alabama	22 (1.4)	22 (1.6)
Arizona	22 (1.5)	22 (1.5)
Arkansas	24 (1.5)	23 (1.4)
California †	14 (1.6)	13 (1.8)
Connecticut	35 (1.7)	35 (1.5)
Georgia	23 (1.4)	23 (1.4)
Hawaii	16 (1.1)	16 (1.0)
Idaho †	30 (2.0)	29 (1.9)
Illinois †	31 (2.2)	31 (2.3)
Indiana †	32 (2.0)	32 (1.9)
Iowa †	37 (2.1)	36 (1.8)
Kentucky	29 (1.5)	28 (1.5)
Louisiana	19 (1.8)	18 (1.5)
Maine †	38 (1.7)	37 (1.7)
Maryland	26 (1.4)	24 (1.5)
Massachusetts	43 (1.9)	42 (1.7)
Michigan †	33 (2.4)	32 (2.1)
Minnesota †	35 (2.2)	34 (2.0)
Mississippi	14 (1.2)	13 (1.1)
Missouri	35 (1.7)	34 (1.5)
Montana †	37 (2.6)	36 (2.5)
Nebraska	26 (2.2)	26 (1.8)
Nevada	19 (1.0)	19 (1.2)
New Mexico	18 (1.5)	17 (1.5)
New York †	26 (1.3)	24 (1.3)
North Carolina	24 (1.4)	23 (1.5)
North Dakota	38 (1.3)	36 (1.7)
Ohio †	31 (1.9)	31 (1.7)
Oklahoma	26 (1.9)	26 (1.4)
Oregon †	28 (1.8)	27 (1.8)
Rhode Island	27 (1.4)	25 (1.4)
South Carolina	21 (1.3)	20 (1.4)
Tennessee	26 (1.7)	24 (1.7)
Texas	24 (1.8)	23 (1.8)
Utah	32 (1.3)	31 (1.4)
Vermont †	39 (3.0)	38 (2.1)
Virginia	33 (2.0)	32 (1.8)
West Virginia	25 (1.4)	24 (1.4)
Wyoming	33 (1.5)	31 (1.7)
Other Jurisdictions		
American Samoa	▲ (****)	▲ (****)
DDESS	29 (1.8)	30 (1.4)
DoDDS	30 (1.0)	30 (1.3)
Guam	4 (0.9)	4 (1.0)
Virgin Islands	4 (0.8)	4 (0.7)

Standard errors of the estimated percentages appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
(****) Standard error estimates cannot be accurately determined.
▲ Percentage is between 0.0 and 0.5.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.74: Data for Table 4.6 Comparisons of Two Sets of State *Proficient* Level Results, Grade 8

Percentage of students at or above the *Proficient* level in science by state and type of results for grade 8 public schools: 2000

	Accommodations not permitted	Accommodations permitted
Nation	30 (0.9)	30 (0.9)
Alabama	22 (1.6)	23 (1.6)
Arizona †	24 (1.5)	23 (1.5)
Arkansas	23 (1.5)	22 (1.3)
California †	15 (1.4)	14 (1.5)
Connecticut	35 (1.5)	35 (1.5)
Georgia	23 (1.6)	23 (1.8)
Hawaii	15 (1.0)	14 (1.1)
Idaho †	38 (1.7)	37 (1.6)
Illinois †	30 (2.1)	29 (1.8)
Indiana †	35 (1.9)	33 (1.7)
Kentucky	29 (1.5)	28 (1.4)
Louisiana	18 (1.4)	18 (1.2)
Maine †	37 (1.8)	35 (1.2)
Maryland	28 (1.4)	27 (1.8)
Massachusetts	42 (1.9)	39 (1.9)
Michigan †	37 (2.2)	35 (2.2)
Minnesota †	42 (2.3)	41 (1.7)
Mississippi	15 (1.3)	15 (1.1)
Missouri	36 (1.5)	33 (1.7)
Montana †	46 (1.8)	44 (2.0)
Nebraska	36 (1.6)	38 (1.6)
Nevada	23 (1.2)	22 (1.0)
New Mexico	20 (1.5)	20 (1.3)
New York †	30 (2.3)	28 (2.2)
North Carolina	27 (1.6)	25 (1.7)
North Dakota	40 (1.7)	38 (1.4)
Ohio	41 (2.0)	39 (2.1)
Oklahoma	26 (1.4)	25 (1.2)
Oregon †	33 (1.8)	34 (1.6)
Rhode Island	29 (1.1)	27 (1.0)
South Carolina	20 (1.5)	20 (1.3)
Tennessee	25 (1.4)	24 (1.5)
Texas	23 (1.6)	23 (1.8)
Utah	34 (1.4)	34 (1.2)
Vermont †	40 (1.4)	39 (1.6)
Virginia	31 (1.4)	29 (1.6)
West Virginia	26 (1.4)	24 (1.2)
Wyoming	36 (1.1)	34 (1.1)
Other Jurisdictions		
American Samoa	2 (0.7)	2 (0.9)
DDESS	35 (1.9)	33 (2.8)
DoDDS	37 (1.2)	38 (1.3)
Guam	6 (1.4)	6 (1.0)

Standard errors of the estimated percentages appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.
DDESS: Department of Defense Domestic Dependent Elementary and Secondary Schools.
DoDDS: Department of Defense Dependents Schools (Overseas).
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.75: Data for Table 5.1 Availability of Computers, Grades 4 and 8

Percentage of fourth- and eighth-graders and average scale score by teachers' reports on availability of computers for use by their science students:1996 and 2000

	1996	2000
Grade 4		
None available	15 (1.9) 143 (3.3)	11 (1.2) 143 (3.0)
One within the classroom	26 (3.6) 149 (2.2)	27 (2.1) 147 (1.6)
Two to three within the classroom	17 (2.2) 150 (2.6)	23 (1.9) 148 (1.6)
Four or more within the classroom	10 (2.2) 155 (4.7) !	15 (1.8) 151 (2.3)
Available in computer laboratory but difficult to access or schedule	15 (2.7) 161 (2.6)	8 (1.0) 158 (2.5)
Available in a computer laboratory and easy to access or schedule	17 (2.8) 148 (2.6)	16 (1.6) 156 (2.0)
Grade 8		
None available	16 (3.1) 149 (5.0) !	10 (1.4) 142 (3.4)
One within the classroom	22 (4.2) 151 (2.9)	29 (2.5) 149 (2.2)
Two to three within the classroom	9 (4.0) 157 (5.4) !	11 (1.3) 150 (2.5)
Four or more within the classroom	7 (2.7) 159 (2.6) !	9 (1.3) 146 (4.3)
Available in computer laboratory but difficult to access or schedule	32 (4.5) 150 (1.9)	23 (2.2) 155 (1.7)
Available in a computer laboratory and easy to access or schedule	14 (2.4) 151 (2.2)	18 (1.7) 159 (1.6)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.76: Data for Table 5.2 Teachers' Reports on Computer Use, Grades 4 and 8

Percentage of fourth- and eighth-graders and average scale score by teachers' reports on how they use computers for science instruction:1996 and 2000

	1996		2000	
	Yes	No response	Yes	No response
Grade 4				
Drill and practice	5 (1.5)	95 (1.5)	3 (0.7)	97 (0.7)
	149 (5.3) !	151 (1.0)	149 (3.8) !	150 (0.8)
Playing science/learning games	30 (2.6)	70 (2.6)	28 (1.6)	72 (1.6)
	154 (1.7)	149 (1.1)	153 (1.4)	149 (0.9)
Simulations and modeling	18 (2.8) *	82 (2.8)	11 (1.1)	89 (1.1)
	155 (1.8)	150 (1.1)	152 (2.8)	150 (0.8)
Data analysis and other applications	6 (1.2)	94 (1.2)	9 (1.4)	91 (1.4)
	149 (4.9) !	151 (1.0)	153 (3.2)	150 (0.8)
Word processing	10 (1.7)	90 (1.7)	13 (1.1)	87 (1.1)
	159 (2.9)	150 (1.0)	153 (2.2)	150 (0.8)
Do not use computers for	53 (3.0) *	47 (3.0)	43 (2.0)	57 (2.0)
science instruction	148 (1.3)	154 (1.1)	148 (1.2)	153 (1.0)
Grade 8				
Drill and practice	8 (3.9)	92 (3.9)	8 (1.1)	92 (1.1)
	156 (5.8) !	151 (1.2)	147 (3.1)	152 (0.8)
Playing science/learning games	21 (3.5)	79 (3.5)	15 (1.6)	85 (1.6)
	152 (3.2)	152 (1.3)	151 (1.9)	152 (0.8)
Simulations and modeling	25 (5.0)	75 (5.0)	23 (1.9)	77 (1.9)
	155 (2.2) !	151 (1.5)	155 (1.6)	151 (0.8)
Data analysis and other applications	19 (3.1) *	81 (3.1)	33 (2.2)	67 (2.2)
	152 (1.6)	152 (1.3)	156 (1.5)	150 (1.1)
Word processing	22 (3.1) *	78 (3.1)	35 (1.8)	65 (1.8)
	154 (1.9)	151 (1.2)	154 (1.2)	151 (1.0)
Do not use computers for	46 (3.9) *	54 (3.9)	26 (1.9)	74 (1.9)
science instruction	150 (1.9)	153 (1.3)	150 (1.8)	152 (0.8)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
* Significantly different from 2000. Although not marked in the table, the percentage of students not responding in 1996 is significantly different from 2000 in all instances where the corresponding percentage responding yes is significantly different.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.77: Data for Table 5.3 Students Reports on Computer Use, Grade 12

Percentage of twelfth-graders and average scale score by students reports on how they use computers in science classes: 2000

	2000
Collect data using lab equipment that interfaces with computers	
I am not taking science	34 (0.8) 141 (1.2)
Once a month or more	13 (0.7) 158 (1.5)
Sometimes but less than once a month	11 (0.4) 154 (1.4)
Never	42 (1.1) 148 (1.2)
Download data and related information from the Internet	
I am not taking science	34 (0.8) 142 (1.2)
Once a month or more	9 (0.4) 155 (1.8)
Sometimes but less than once a month	13 (0.5) 158 (1.5)
Never	45 (0.9) 148 (1.1)
Analyze data using the computer	
I am not taking science	34 (0.8) 142 (1.2)
Once a month or more	11 (0.9) 163 (1.7)
Sometimes but less than once a month	11 (0.5) 157 (1.5)
Never	44 (1.1) 147 (1.2)
Use the Internet to exchange information with other students or scientists about science experiments or investigations	
I am not taking science	34 (0.8) 142 (1.2)
Once a month or more	4 (0.3) 146 (2.1)
Sometimes but less than once a month	7 (0.4) 151 (2.4)
Never	54 (0.8) 151 (1.1)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.78: Data for Table 5.4 Time Spent On Certain Science Domains, Grade 4

Percentage of fourth-graders and average scale score by teachers' reports on how much time is spent on certain science domains:1996 and 2000

	1996	2000
Life science		
A lot	28 (2.7) 150 (1.5)	31 (1.7) 151 (1.5)
Some	65 (2.8) 151 (1.2)	60 (1.9) 152 (1.0)
Little	6 (1.4) 150 (3.8) !	7 (0.8) 138 (2.9)
None	1 (0.4) **** (****)	2 (0.6) 147 (4.2) !
Earth science		
A lot	19 (2.1) * 151 (2.3)	31 (2.1) 152 (1.5)
Some	76 (2.4) * 151 (1.0)	62 (1.9) 151 (0.9)
Little	5 (1.0) 151 (4.1) !	6 (0.8) 136 (3.2)
None	▲ (0.3) **** (****)	1 (0.4) 143 (7.2) !
Physical science		
A lot	16 (2.3) 154 (2.3)	22 (1.5) 151 (1.5)
Some	73 (2.5) * 151 (1.1)	65 (1.9) 151 (0.9)
Little	9 (1.5) 145 (3.5)	11 (1.1) 145 (2.7)
None	2 (0.5) 137 (7.4) !	2 (0.4) 142 (3.6)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
* Significantly different from 2000.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
**** (****) Sample size is insufficient to permit a reliable estimate.
▲ Percentage is between 0.0 and 0.5.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.79: Data for Table 5.5 Time Spent On Certain Science Domains, Grade 8

Percentage of eighth-graders and average scale score by teachers' reports on how much time is spent on certain science domains:1996 and 2000

	1996	2000
Life science		
A lot	19 (4.1) 149 (2.5) !	21 (1.8) 147 (2.2)
Some	40 (5.3) 150 (2.4)	36 (2.2) 150 (1.6)
Little	23 (3.6) 156 (2.7)	22 (1.7) 153 (2.4)
None	18 (4.5) 157 (4.0) !	20 (1.8) 156 (1.6)
Earth science		
A lot	41 (5.0) 151 (2.5)	45 (2.5) 152 (1.2)
Some	39 (4.5) 151 (2.1)	33 (2.4) 148 (1.5)
Little	11 (2.7) 155 (4.7) !	13 (1.6) 154 (2.5)
None	9 (1.9) 157 (3.5) !	9 (1.3) 161 (2.1)
Physical science		
A lot	49 (4.3) 153 (1.7)	47 (2.7) 153 (1.3)
Some	35 (4.4) 153 (2.7)	36 (2.3) 150 (1.9)
Little	12 (3.2) 154 (3.3) !	11 (1.6) 153 (2.3)
None	4 (1.2) 144 (6.4) !	6 (1.4) 151 (3.6) !

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
! The nature of the sample does not allow accurate determination of the variability of the statistic.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.80: Data for Table 5.6 Students' Reports on Science Course Taking, Grade 12

Percentage of twelfth-graders and average scale score by students' reports on whether or not taking a science course this year:1996 and 2000

	1996	2000
Are you taking a science course this year?		
Yes	54 (1.2) 160 (1.1)	53 (1.0) 157 (1.0)
No	46 (1.2) 140 (0.9)	47 (1.0) 137 (1.1)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Table B.81: Data for Table 5.7 Students' Reports on Science Courses Taken, Grade 12

Percentage of twelfth-graders and average scale score by students' reports on science courses taken since eighth-grade: 2000

	Not taken	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
Earth (and space) science	26 (0.9) 148 (1.6)	49 (1.8) 150 (0.9)	19 (1.8) 146 (1.9)	5 (0.4) 135 (2.0)	4 (0.5) 140 (2.3)	3 (0.3) 144 (2.6)
First-year biology	8 (0.6) 126 (3.5)	2 (0.3) 138 (4.1)	31 (1.7) 156 (1.5)	54 (2.0) 149 (0.9)	5 (0.3) 134 (2.2)	1 (0.2) 125 (5.3)
First-year chemistry	30 (1.3) 128 (1.2)	1 (0.1) 128 (5.6)	2 (0.2) 144 (4.6)	21 (1.4) 166 (1.5)	40 (1.3) 155 (1.0)	7 (0.4) 145 (1.8)
First-year physics	64 (1.5) 139 (1.0)	1 (0.1) 128 (5.7)	2 (0.4) 153 (5.6)	2 (0.3) 159 (4.5)	12 (1.0) 167 (1.8)	19 (1.0) 167 (1.0)
Life science (other than biology)	46 (1.3) 151 (1.1)	22 (0.8) 152 (1.2)	18 (0.8) 139 (1.7)	10 (0.4) 131 (1.8)	6 (0.4) 141 (3.2)	5 (0.3) 157 (2.4)
Physical science (other than chemistry and physics)	36 (2.0) 151 (1.5)	12 (0.6) 159 (1.5)	36 (2.4) 147 (1.2)	11 (0.8) 135 (1.5)	6 (0.3) 132 (1.8)	3 (0.3) 141 (2.5)
General science	47 (1.3) 148 (1.1)	37 (1.3) 152 (1.2)	14 (1.3) 145 (2.0)	4 (0.3) 129 (1.9)	2 (0.2) 134 (3.6)	1 (0.2) 144 (3.3)
Integrated science	85 (1.3) 149 (1.0)	5 (0.3) 147 (2.7)	7 (1.1) 149 (2.5)	3 (0.3) 132 (2.9)	1 (0.2) 135 (4.6)	1 (0.2) 142 (5.0)
Science and technology	86 (0.7) 148 (0.9)	4 (0.4) 154 (2.5)	4 (0.4) 154 (3.1)	3 (0.2) 147 (3.1)	4 (0.3) 148 (2.9)	4 (0.3) 149 (3.0)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
NOTE: Row percentages may not add to 100 because some students indicated taking a course in more than one grade.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table B.82: Data for Table 5.8 Students' Reports on Advanced Placement Courses, Grade 12

Percentage of twelfth-graders and average scale score by students' reports on whether they are currently enrolled in or have taken an Advanced Placement course: 2000

	Yes	No response
AP Biology	10 (0.6) 166 (2.1)	90 (0.6) 145 (0.9)
AP Environmental Science	2 (0.3) 145 (4.0)	98 (0.3) 147 (1.0)
AP Chemistry	6 (0.5) 169 (1.9)	94 (0.5) 145 (1.0)
AP Physics B or C	5 (0.4) 173 (2.7)	95 (0.4) 145 (0.9)
Have never taken an Advanced Placement science course	75 (0.8) 144 (0.9)	25 (0.8) 154 (1.6)

The percentage of students is listed first with the corresponding average scale score presented below.
Standard errors of the estimated percentages and scale scores appear in parentheses.
NOTE: Percentages may not add to 100 due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

C

Appendix C
State-Level Contextual Variables

To help better place results from the NAEP 2000 state assessment program into context, this appendix presents selected state-level data from sources other than NAEP. These data are taken from the *Digest of Education Statistics 2000.*

Appendix Contents

Appendix Focus

State school system characteristics

Table C.1a: School System Characteristics from Non-NAEP Sources

	Estimated total and school-age resident population: 1999 (estimates as of July 1)[1]		Enrollment in public elementary and secondary schools: Fall 1998[2]		
	Total, all ages (in thousands)	5- to 17-year olds (in thousands)	Total	Kindergarten through grade 8	Grades 9 to 12
Nation	272,691	51,257	46,534,687	33,343,787	13,190,900
Alabama	4,370	775	747,970	542,340	205,630
Alaska	620	147	135,373	96,979	38,394
Arizona	4,778	949	848,262	622,747	225,515
Arkansas	2,551	483	452,256	319,232	133,024
California	33,145	6,424	5,925,964	4,269,853	1,656,111
Colorado	4,056	777	699,135	501,449	197,686
Connecticut	3,282	610	544,698	399,381	145,317
Delaware	754	132	113,262	79,955	33,307
District of Columbia	519	68	71,889	56,712	15,177
Florida	15,111	2,618	2,337,633	1,704,024	633,609
Georgia	7,788	1,477	1,401,291	1,029,386	371,905
Hawaii	1,185	209	188,069	134,685	53,384
Idaho	1,252	258	244,722	168,604	76,118
Illinois	12,128	2,304	2,011,530	1,451,579	559,951
Indiana	5,943	1,115	988,094	696,832	291,262
Iowa	2,869	537	498,214	336,696	161,518
Kansas	2,654	515	472,353	327,474	144,879
Kentucky	3,961	706	655,687	464,567	191,120
Louisiana	4,372	876	768,734	558,473	210,261
Maine	1,253	223	210,503	150,860	59,643
Maryland	5,172	963	841,671	606,560	235,111
Massachusetts	6,175	1,076	962,317	704,624	257,693
Michigan	9,864	1,906	1,720,266	1,245,299	474,967
Minnesota	4,776	950	855,119	585,553	269,566
Mississippi	2,769	550	502,379	365,497	136,882
Missouri	5,468	1,036	912,445	650,545	261,900
Montana	883	171	159,988	109,535	50,453
Nebraska	1,666	329	291,140	199,754	91,386
Nevada	1,809	348	311,061	229,275	81,786
New Hampshire	1,201	231	204,713	146,722	57,991
New Jersey	8,143	1,460	1,268,996	936,428	332,568
New Mexico	1,740	364	328,753	232,485	96,268
New York	18,197	3,227	2,877,143	2,028,167	848,976
North Carolina	7,651	1,407	1,254,821	920,838	333,983
North Dakota	634	121	114,597	76,860	37,737
Ohio	11,257	2,104	1,842,559	1,301,438	541,121
Oklahoma	3,358	649	628,492	447,906	180,586
Oregon	3,316	608	542,809	379,770	163,039
Pennsylvania	11,994	2,140	1,816,414	1,267,226	549,188
Rhode Island	991	179	154,785	112,483	42,302
South Carolina	3,886	702	664,592	477,850	186,742
South Dakota	733	148	132,495	90,887	41,608
Tennessee	5,484	974	905,442	664,570	240,872
Texas	20,044	4,080	3,945,367	2,868,209	1,077,158
Utah	2,130	497	481,176	328,522	152,654
Vermont	594	107	105,120	73,257	31,863
Virginia	6,873	1,214	1,124,022	815,266	308,756
Washington	5,756	1,096	998,053	695,950	302,103
West Virginia	1,807	303	297,530	205,840	91,690
Wisconsin	5,250	1,016	879,542	600,703	278,839
Wyoming	480	96	95,241	63,940	31,301

[1] U.S. Department of Commerce, Bureau of Census, *Current Population Reports*, Series P-25, No. 1095 at the national level, CPH-L-74 (1990 data); and unpublished data.

[2] U.S. Department of Education, National Center for Education Statistics, Common Core of Data surveys.

Table C.1b: School System Characteristics from Non-NAEP Sources

	Poverty status of 5- to 17-year olds: 1998[1]		Number of children (birth to age 21) served under state-operated Individuals with Disabilities Education Act and Chapter 1of the Education Consolidation and Improvement Act Programs[2]	
	Number in Poverty (in thousands)	Percent in Poverty	1998-99 School Year	Percent Change: 1990-91 to 1998-99
Nation	9,167	17.8	6,055,343	27.2
Alabama	156	21.8	99,813	5.1
Alaska	13	9.0	17,712	20.1
Arizona	222	23.6	88,598	54.8
Arkansas	57	13.1	59,110	23.6
California	1,459	22.3	623,651	32.9
Colorado	93	12.5	75,037	31.4
Connecticut	82	13.4	76,740	18.9
Delaware	24	15.7	16,233	13.6
District of Columbia	33	46.0	8,162	29.8
Florida	474	20.5	345,171	46.3
Georgia	377	24.7	155,754	52.7
Hawaii	32	14.5	20,551	56.1
Idaho	50	17.4	27,553	25.1
Illinois	308	12.16	281,915	17.9
Indiana	140	12.6	146,559	27.8
Iowa	73	14.2	70,958	16.9
Kansas	59	13.26	58,425	29.2
Kentucky	118	16.7	87,973	10.8
Louisiana	244	29.8	95,245	29.3
Maine	27	12.0	34,294	22.5
Maryland	66	8.10	111,688	22.4
Massachusetts	163	15.0	168,964	9.3
Michigan	311	14.8	208,403	24.8
Minnesota	130	12.6	106,194	31.3
Mississippi	108	19.3	61,778	1.4
Missouri	136	14.4	131,565	29.0
Montana	42	21.2	18,797	9.7
Nebraska	54	14.8	43,400	32.5
Nevada	49	12.8	33,319	80.7
New Hampshire	34	13.3	27,502	39.9
New Jersey	194	13.2	210,114	15.9
New Mexico	101	23.5	52,113	44.6
New York	848	28.9	432,320	40.6
North Carolina	277	21.3	165,333	34.3
North Dakota	28	17.2	13,181	5.4
Ohio	339	16.0	230,155	12.0
Oklahoma	120	19.9	80,289	22.3
Oregon	121	19.4	69,919	26.8
Pennsylvania	382	18.0	227,771	3.8
Rhode Island	36	20.5	27,911	32.4
South Carolina	129	17.6	99,033	27.3
South Dakota	13	9.2	15,702	4.8
Tennessee	156	14.5	128,273	22.3
Texas	809	20.1	486,749	38.8
Utah	55	11.8	55,252	15.7
Vermont	13	12.2	12,709	3.6
Virginia	92	7.9	153,716	34.9
Washington	118	10.8	114,144	33.7
West Virginia	65	25.7	49,934	15.8
Wisconsin	109	11.5	116,328	33.8
Wyoming	13	13.0	13,333	19.0

[1] U.S. Department of Commerce, Bureau of the Census, *Decennial Census, Minority Economic Profiles,* unpublished data; and *Current Population Reports,* Series P-60, "Poverty in the United States," "Money Income of Households, Families, and Persons in the United States," and "Income, Poverty, and Valuation of Noncash Benefits," various years, and "Money Income in the U.S.: 1998," P60-201.

[2] U.S. Department of Education, Office of Special Education and Rehabilitative Services, *Annual Report to Congress on the Implementation of The Individuals with Disabilities Education Act,* various years, and unpublished tabulations.

Table C.1c: School System Characteristics from Non-NAEP Sources

	Elementary and secondary education expenditures per pupil: 1997-98[1]	Estimated annual salaries of teachers in public elementary and secondary schools by state: 1998-99[2]	Pupil-teacher ratios in public elementary and secondary schools: Fall 1998[3]
Nation	$6,189	$40,582	16.5 ‡
Alabama	4,849	35,820	15.7 ‡
Alaska	8,271	46,845	16.7
Arizona	4,595	35,025	20
Arkansas	4,708	32,350	16.2
California	5,644	45,400	21 ‡
Colorado	5,656	38,025	17.7
Connecticut	8,904	51,584	14
Delaware	7,420	43,164	16
District of Columbia	8,393	47,150	13.9
Florida	5,552	35,196	18.4
Georgia	5,647	39,675	15.8
Hawaii	5,858	40,377	17.7
Idaho	4,721	34,063	18.2
Illinois	6,242	45,569	16.5
Indiana	6,318	41,163	17
Iowa	5,998	34,927	15.2
Kansas	5,727	37,405	14.8
Kentucky	5,213	35,526	16.1
Louisiana	5,188	32,510	16.6
Maine	6,742	34,906	13.2
Maryland	7,034	42,526	16.9
Massachusetts	7,778	45,075	13.8
Michigan	7,050	48,207	18.5 ‡
Minnesota	6,388	39,458	16.9
Mississippi	4,288	29,530	16.1
Missouri	5,565	34,746	14.7
Montana	5,724	31,356	15.7
Nebraska	5,958	32,880	14.3
Nevada	5,295	38,883	18.9
New Hampshire	6,156	37,405	15.4
New Jersey	9,643	51,193	13.8
New Mexico	5,005	32,398	16.5
New York	8,852	49,437	14.6
North Carolina	5,257	36,098	15.8
North Dakota	5,056	28,976	14.4
Ohio	6,198	40,566	16.2
Oklahoma	5,033	31,149	15.4
Oregon	6,419	42,833	20
Pennsylvania	7,209	48,457	16.4
Rhode Island	7,928	45,650	13.9
South Carolina	5,320	34,506	15.2 ‡
South Dakota	4,669	28,552	14.3
Tennessee	4,937	36,500	15.3 ‡
Texas	5,444	35,041	15.2
Utah	3,969	32,950	22.4
Vermont	7,075	36,800	12.8
Virginia	6,067	37,475	14.2 ‡
Washington	6,040	38,692	20.1
West Virginia	6,323	34,244	14.2
Wisconsin	7,123	40,657	14.4
Wyoming	6,218	33,500	14.2

NOTE: Constant 1997-98 dollars based on the Consumer Price Index, prepared by the Bureau of Labor Statistics, U.S. Department of Labor, adjusted to a school year basis. These data do not reflect differences in inflation rates from state to state. Beginning in 1980-81, expenditures for state administration are excluded. Beginning in 1988-89, survey was expanded and coverage of state expenditures for public school districts was improved. Some data revised from previously published figures.

‡ Includes imputations for underreporting.

[1] U.S. Department of Education, National Center for Education Statistics, *Revenues and expenditures for public elementary and secondary schools, statistics of state school systems, and common core of data surveys.*

[2] National Education Association, *Estimates of School Statistics*; and unpublished data (© 2000 by the National Education Association. All rights reserved).

[3] U.S. Department of Education, National Center for Education Statistics, Common Core of Data surveys.

Appendix D
Members of the NAEP Science Standing Committee

Michael Burton
Discovery Junior High School
Fargo, ND

Lucy Caballero
Hereford Junior High School
Hereford, TX

Audrey Champagne
State University of New York
Albany, NY

Russ Conner
Cranbrook Kingswood School
Bloomfield Hills, MI

Patricia Dung
LA Educational Partnership
Los Angeles, CA

Ed Hendry
New Hampshire Department of Education
Concord, NH

Michael Jojola
Isleta Elementary School
Isleta, NM

Brett Moulding
Utah State Office of Education
Salt Lake City, UT

Kelly Poling
Logan-Hocking Local School District
Union Furnace, OH

Senta Raizen
National Center for Improving Science Education
Washington, DC

Realista Rodriguez
South Lakes High School
Reston, VA

Elise Russo
New York State Education Dept.
Albany, NY

Gerald Weaver
Philadelphia Federation of Teachers
Philadelphia, PA

Gerald Wheeler
National Science Teachers Association
Arlington, VA

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