The Nation's Report Card

Science 2011

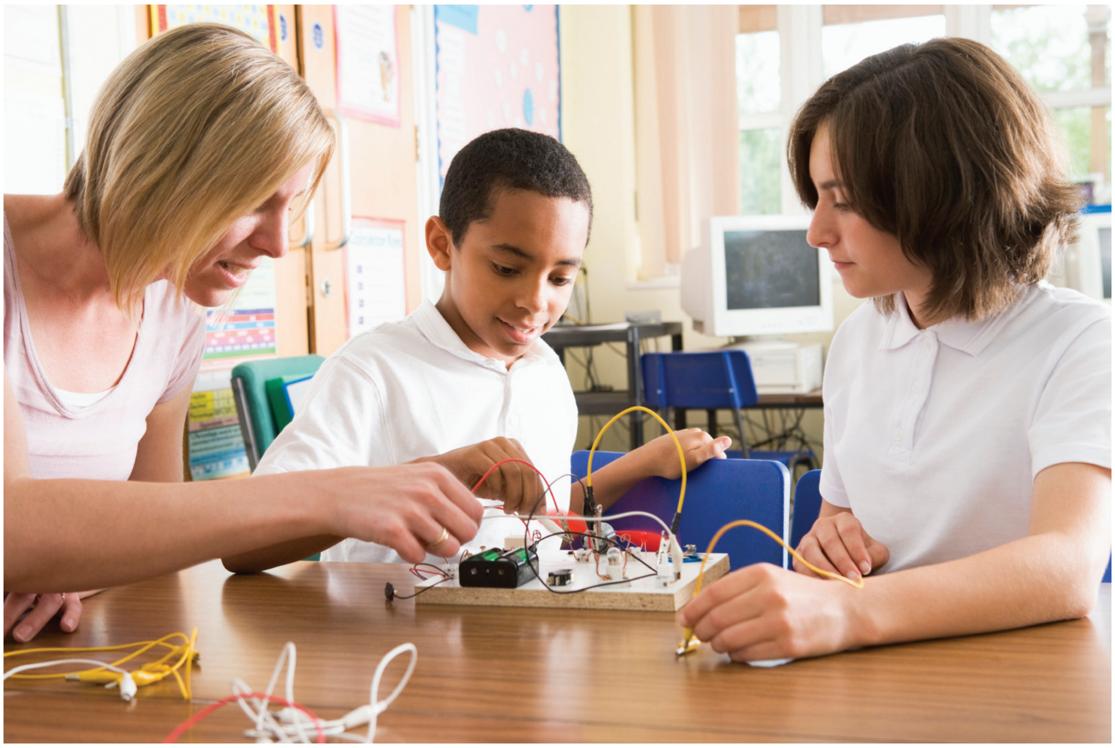
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS AT GRADE 8

Embargoed Until Release

DO NOT CITE

ies NATIONAL CENTER FOR EDUCATION STATISTICS
Institute of Education Sciences
U.S. Department of Education
NCES 2012-465

Contents



What Is The Nation's Report Card™?

The Nation's Report Card™ informs the public about the academic achievement of elementary and secondary students in the United States. Report cards communicate the findings of the National Assessment of Educational Progress (NAEP), a continuing and nationally representative measure of achievement in various subjects over time.

Since 1969, NAEP assessments have been conducted periodically in reading, mathematics, science, writing, U.S. history, civics, geography, and other subjects. NAEP collects and reports information on student performance at the national and state levels, making the assessment an integral part of our nation's evaluation of the condition and progress of education. Only academic achievement data and related background information are collected. The privacy of individual students and their families is protected.

NAEP is a congressionally authorized project of the National Center for Education Statistics (NCES) within the Institute of Education Sciences of the U.S. Department of Education. The Commissioner of Education Statistics is responsible for carrying out the NAEP project. The National Assessment Governing Board oversees and sets policy for NAEP.

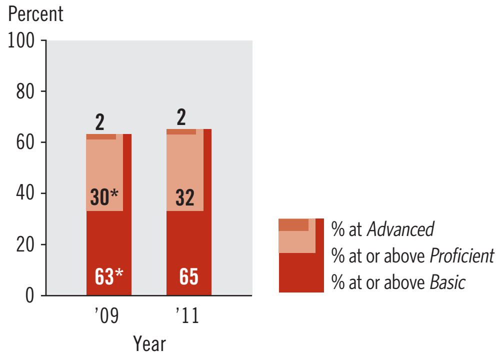
Executive Summary

A representative sample of 122,000 eighth-graders participated in the 2011 National Assessment of Educational Progress (NAEP) science assessment, which is designed to measure students' knowledge and abilities in the areas of physical science, life science, and Earth and space sciences.

Eighth-grade performance in science improves from 2009

The average eighth-grade science score increased from 150 in 2009 to 152 in 2011. The percentages of students performing at or above the *Basic* and *Proficient* levels were higher in 2011 than in 2009 (**figure A**). There was no significant change from 2009 to 2011 in the percentage of students at the *Advanced* level.

Figure A. Achievement-level results in eighth-grade NAEP science: 2009 and 2011



* Significantly different ($p < .05$) from 2011.

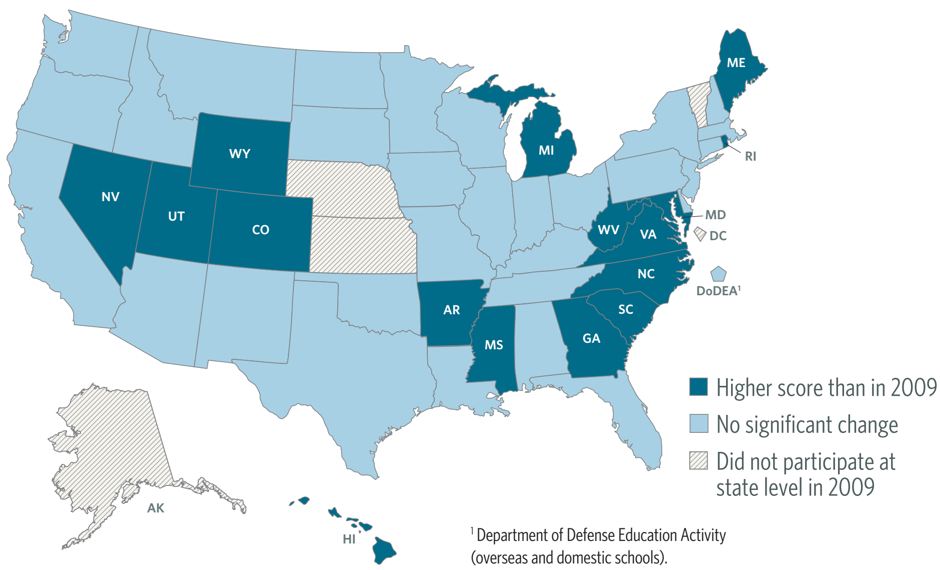
Racial/ethnic gaps narrow: Score gaps between White and Black students and between White and Hispanic students narrowed from 2009 to 2011. In comparison to 2009, average science scores in 2011 were 1 point higher for White students, 3 points higher for Black students, and 5 points higher for Hispanic students. There were no significant changes from 2009 to 2011 in the scores for Asian/Pacific Islander or American Indian/Alaska Native students.

No significant change in gender gap: Average scores for both male and female students were higher in 2011 than in 2009. Male students scored 5 points higher on average than female students in 2011, which was not significantly different from the 4-point gap in 2009.

Public school students score higher than in 2009 but private – public gap persists: The average science score for public school students was higher in 2011 than in 2009, while there was no significant change in the score for private school students. Private school students scored 12 points higher on average than public school students in 2011, which was not significantly different from the 15-point score gap in 2009.

Eighth-grade public school students in 16 states score higher in 2011 than in 2009

- Among the 47 states that chose to participate in both years, scores were higher in 2011 than in 2009 in Arkansas, Colorado, Georgia, Hawaii, Maine, Maryland, Michigan, Mississippi, Nevada, North Carolina, Rhode Island, South Carolina, Utah, Virginia, West Virginia, and Wyoming.
- No state scored lower in 2011 than in 2009.



[1] Department of Defense Education Activity (overseas and domestic schools).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 and 2011 Science Assessments.

Introduction

The National Assessment of Educational Progress (NAEP) in science measures the knowledge and skills students have acquired as part of their science education.

The Science Framework

The National Assessment Governing Board oversees the development of NAEP frameworks that describe the specific knowledge and skills to be assessed in each subject. Frameworks incorporate ideas and input from subject area experts, school administrators, policymakers, teachers, parents, and others. The *Science Framework for the 2011 National Assessment of Educational Progress* describes the types of questions to be included in the assessment and how they should be designed and scored. The 2009 and 2011 assessments were developed using the same framework, allowing the results from the two assessment years to be compared.

Science content

The framework organizes science content into three broad content areas: physical science, life science, and Earth and space sciences.

Physical science includes concepts related to properties and changes of matter, forms of energy, energy transfer and conservation, position and motion of objects, and forces affecting motion.

Life science includes concepts related to organization and development, matter and energy transformations, interdependence, heredity and reproduction, and evolution and diversity.

Earth and space sciences include concepts related to objects in the universe, the history of the Earth, properties of Earth materials, tectonics, energy in Earth systems, climate and weather, and biogeochemical cycles.

Science practices

Four science practices are defined in the framework in addition to the science content areas. These four practices—identifying science principles, using science principles, using scientific inquiry, and using technological design—describe *how* students use their science knowledge by measuring what they *are able to do* with the science content. In 2011, the proportion of assessment time devoted to each science practice at grade 8 was: 25 percent identifying science principles, 35 percent using science principles, 30 percent using scientific inquiry, and 10 percent using technological design.

Assessment Design

Because the 2011 science assessment covered a breadth of content and included more questions than any one student could answer, each student took just a portion of the assessment. The 144 questions that made up the entire eighth-grade assessment were divided into nine 25-minute sections, each containing between 14 and 18 questions, depending on the balance between multiple-choice and constructed-response (i.e., open-ended) questions. Each student responded to questions in two sections. The results presented in this report are based on students' responses to both types of questions. No hands-on or interactive computer tasks were administered as part of the eighth-grade science assessment in 2011.

The proportion of assessment time devoted to each of the three science content areas reflects the emphasis in each area at grade eight: 30 percent physical science, 30 percent life science, and 40 percent Earth and space sciences.

Reporting NAEP Results

A nationally representative sample of 122,000 eighth-graders from 7,290 schools participated in the 2011 NAEP science assessment. Results for the nation reflect the performance of students attending public schools, private schools, Bureau of Indian Education schools, and Department of Defense schools. Results for states and other jurisdictions reflect the performance of students in public schools only and are reported along with the results for public school students in the nation.

Not all of the results from the NAEP science assessment are presented in this report. Additional results (including average scores in each of the three science content areas) can be found on the Nation's Report Card website at http://nationsreportcard.gov/science_2011/ and in the NAEP Data Explorer at http://nces.ed.gov/nationsreportcard/naepdata/.

Scale scores

NAEP science results are reported as average scores on a 0–300 scale. Because NAEP scales are developed independently for each subject, scores cannot be compared across subjects.

In addition to reporting an overall science score, NAEP also reports scores at five percentiles to show student performance at lower (10th and 25th percentiles), middle (50th percentile), and higher (75th and 90th percentiles) levels.

Achievement levels

Based on recommendations from policymakers, educators, and members of the general public, the Governing Board sets specific achievement levels for each subject area and grade assessed. Achievement levels are performance standards showing what students should know and be able to do. NAEP results are reported as percentages of students performing at or above the *Basic* and *Proficient* levels and at the *Advanced* level.

Basic denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.

Proficient represents solid academic performance. Students reaching this level have demonstrated competency over challenging subject matter.

Advanced represents superior performance.

As provided by law, the National Center for Education Statistics (NCES), upon review of congressionally mandated evaluations of NAEP, has determined that achievement levels are to be used on a trial basis and should be interpreted with caution. The NAEP achievement levels have been widely used by national and state officials.

Science Framework for the 2011 National Assessment of Educational Progress

The 2011 science framework carries forward changes that were made in 2009 to include the three content areas: physical science, life science, and Earth and space sciences; a greater emphasis on Earth and space sciences at grade 8; and the definition of four science practices—identifying science principles, using science principles, using scientific inquiry, and using technological design. Results from special analyses conducted in 2009 determined that, because of the changes to the assessment, results from 2009 could not be compared to those from earlier assessment years. The complete science framework for the 2011 assessment is available at http://www.nagb.org/publications/frameworks/science-2011.pdf.

Interpreting the Results

NAEP reports results using widely accepted statistical standards; findings are reported based on a statistical significance level set at .05 with appropriate adjustments for multiple comparisons (see the Technical Notes for more information). An asterisk (*) is used in tables and figures to indicate that an earlier year's score or percentage is significantly different from the 2011 results. Only those differences that are found to be statistically significant are discussed as higher or lower. The same standard applies when comparing the performance of one student group to another.

A score that is significantly higher or lower in comparison to an earlier assessment year is reliable evidence that student performance has changed. However, NAEP is not designed to identify the causes of these changes. Although comparisons are made in students' performance based on demographic characteristics, the results cannot be used to establish a cause-and-effect relationship between student characteristics and achievement. Many factors may influence student achievement, including educational policies and practices, available resources, and the demographic characteristics of the student body. These factors may change over time and vary among student groups.

Accommodations and exclusions in NAEP

It is important to assess all selected students from the population, including students with disabilities (SD) and English language learners (ELL). To accomplish this goal, many of the same accommodations that students use on other tests (e.g., extra testing time or individual rather than group administration) are provided for SD and ELL students participating in NAEP.

Even with the availability of accommodations, some students may be excluded. Differences in student populations and in state policies and practices for identifying and including SD and ELL students should be considered when comparing variations in exclusion and accommodation rates. States and jurisdictions also vary in their proportions of special-needs students, especially ELL students.

The National Assessment Governing Board has been exploring ways to reduce variation in exclusion rates for SD and ELL students across states and districts, and has established inclusion goals for NAEP samples (see the Governing Board's policy on *NAEP Testing and Reporting on Students with Disabilities and English Language Learners* at http://www.nagb.org/policies/PoliciesPDFs/Reporting%20and%20Dissemination/naep_testandreport_studentswithdisabilities.pdf).

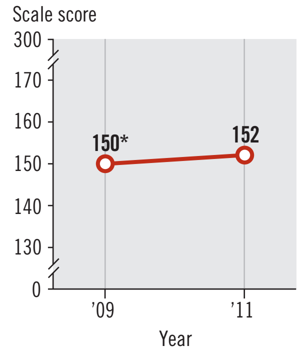
In 2011, all states met the goal of including 95 percent of all students selected for the NAEP science samples, and all but three states (Kentucky, Michigan, and North Dakota) met the goal of including 85 percent of those students identified as SD or ELL selected for the samples. The percentages of students accommodated and excluded for the nation and the states are available at http://nationsreportcard.gov/science_2011/inclusion.asp.

National Results

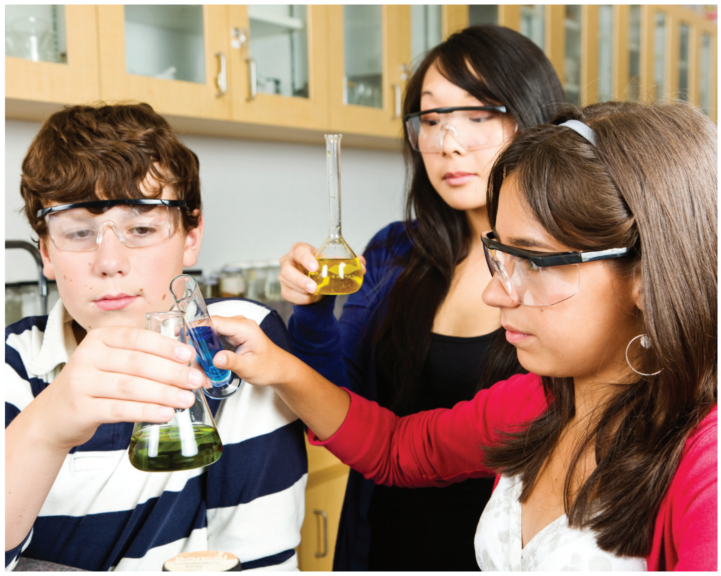
Scores higher than in 2009 for all but the highest-performing students

The average science score for eighth-grade students was 2 points higher in 2011 than in 2009 (**figure 1**).

Figure 1. Average scores in eighth-grade NAEP science: 2009 and 2011

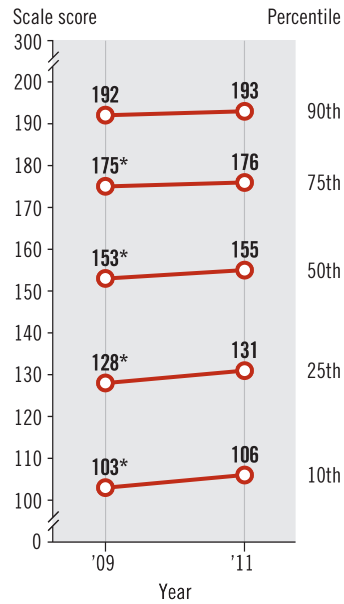


* Significantly different ($p < .05$) from 2011.



Scores were higher in 2011 than in 2009 for students at the 10th, 25th, 50th, and 75th percentiles (**figure 2**). There was no significant change from 2009 in the score for students at the 90th percentile.

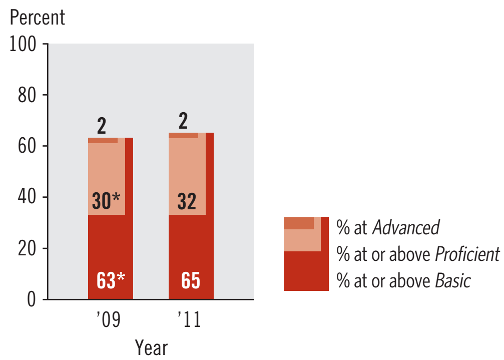
Figure 2. Percentile scores in eighth-grade NAEP science: 2009 and 2011



* Significantly different ($p < .05$) from 2011.

Sixty-five percent of eighth-graders performed at or above *Basic* in 2011, thirty-two percent performed at or above *Proficient*, and 2 percent of students performed at the *Advanced* level (**figure 3**). The percentages at or above *Basic* and *Proficient* were higher in 2011 than in 2009. There was no significant change from 2009 to 2011 in the percentage of students at *Advanced*.

Figure 3. Achievement-level results in eighth-grade NAEP science: 2009 and 2011



* Significantly different ($p < .05$) from 2011.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 and 2011 Science Assessments.

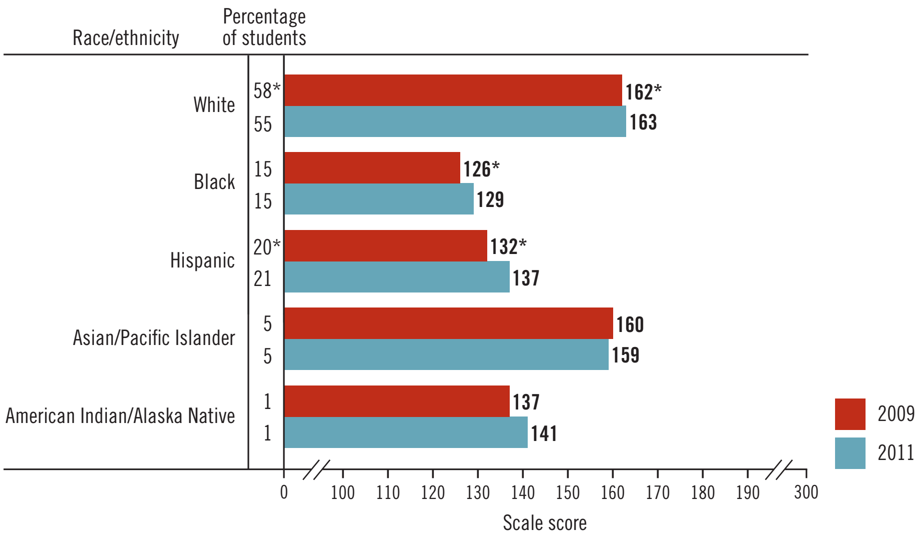
Racial/ethnic gaps narrow in 2011

In 2011, White students scored higher on average than all other racial/ethnic groups (**figure 4**). Asian/Pacific Islander and American Indian/Alaska Native students scored higher on average than Black and Hispanic students, and Hispanic students scored higher than Black students.

The 5-point gain from 2009 to 2011 for Hispanic students was larger than the 1-point gain for White students, narrowing the score gap from 30 points to 27 points.[1] Black students scored 3 points higher in 2011 than in 2009. The 35-point[1] score gap between White and Black students in 2011 was smaller than the 36-point gap in 2009. The average scores of Asian/Pacific Islander and American Indian/Alaska Native students were not significantly different in 2011 from their scores in 2009.

[1] The score-point difference is based on the difference between the unrounded scores as opposed to the rounded scores shown in the figure.

Figure 4. Percentage of students and average scores in eighth-grade NAEP science, by race/ethnicity: 2009 and 2011



* Significantly different ($p < .05$) from 2011.

NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Detail may not sum to totals because results are not shown for students whose race/ethnicity was unclassified or two or more races.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 and 2011 Science Assessments.

NAEP Results for Newly Reported Racial/Ethnic Groups

In compliance with standards from the U.S. Office of Management and Budget for collecting and reporting data on race/ethnicity, additional information on students' race/ethnicity was collected in 2011. This change makes it possible for results to be reported separately for Asian students, Native Hawaiian/Other Pacific Islander students, and students categorized as being of two or more races (multiracial). See the Technical Notes for more information.

In 2011, the average score for White students was higher than the score for the combined category of Asian and Pacific Islander students (**table 1**). When results for Asian students are reported separately, there is no significant difference between the scores of Asian and White students. In 2011, White and Asian students scored higher than all other reported racial/ethnic groups. Native Hawaiian/Other Pacific Islander students scored higher on average than Black students; lower than White, Asian, and multiracial students; and not significantly different from Hispanic and American Indian/Alaska Native students. The score for multiracial students was higher on average than the scores for Black, Hispanic, American Indian/Alaska Native, and Native Hawaiian/Other Pacific Islander students, but lower than the scores for Asian and White students.

Table 1. Percentage of students and average scores in eighth-grade NAEP science, by race/ethnicity: 2011

Race/ethnicity	Percentage of students	Average scale score
White	55	163
Black	15	129
Hispanic	21	137
Asian/Pacific Islander	5	159
Asian	5	161
Native Hawaiian/Other Pacific Islander	#	139
American Indian/Alaska Native	1	141
Two or more races	2	156

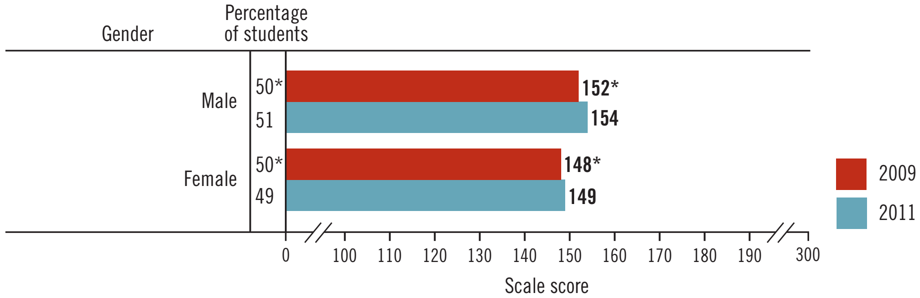
Rounds to zero.
NOTE: Black includes African American, Hispanic includes Latino, and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Male students score higher than female students in 2011

Average scores for male and female students were higher in 2011 than in 2009 (**figure 5**). In 2011, male students scored 5 points higher on average in science than female students, which was not significantly different from the 4-point gap in 2009.

Figure 5. Percentage of students and average scores in eighth-grade NAEP science, by gender: 2009 and 2011



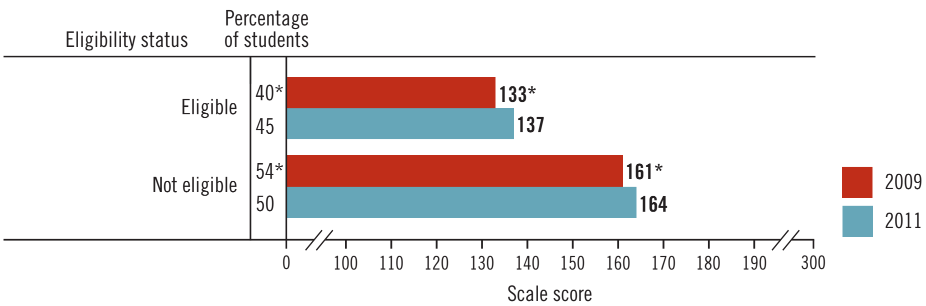
* Significantly different ($p < .05$) from 2011.
NOTE: Detail may not sum to totals because of rounding.

Students across income levels score higher than in 2009

Student eligibility for the National School Lunch Program (NSLP) is used in NAEP as an indicator of family income. Students from lower-income families are eligible for either free or reduced-price school lunch, while students from higher-income families are not (see the Technical Notes for eligibility criteria). Forty-five percent of eighth-graders were eligible for free/reduced-priced school lunch in 2011, which was higher than the 40 percent eligible in 2009 (**figure 6**).

Average science scores were higher in 2011 than in 2009 for eligible students, as well as for students who were not eligible. The 27-point score gap between the two groups in 2011 was not significantly different from the 28-point gap in 2009. Results for both students eligible for free school lunch and for those eligible for reduced-price lunch are available separately in the NAEP Data Explorer at http://nces.ed.gov/nationsreportcard/naepdata/.

Figure 6. Percentage of students and average scores in eighth-grade NAEP science, by eligibility for National School Lunch Program: 2009 and 2011



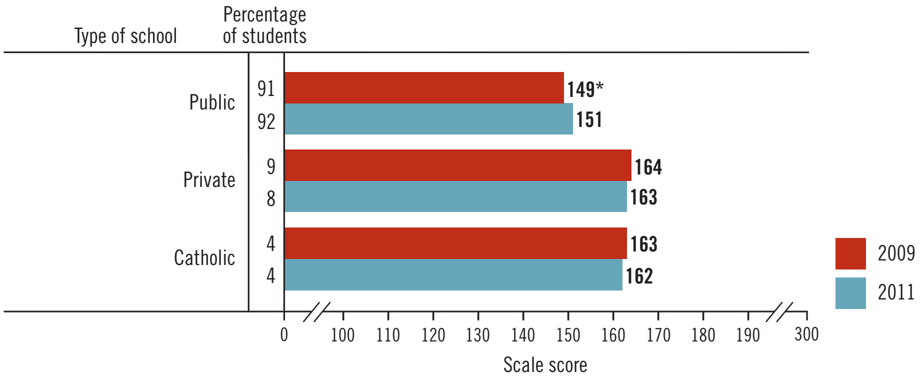
* Significantly different ($p < .05$) from 2011.
NOTE: Detail may not sum to totals because results are not shown for the "Information not available" category.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 and 2011 Science Assessments.

Public school students score higher than in 2009 but private – public gap persists

The average score for public school students was 2 points higher in 2011 than in 2009, while there was no significant change over the same period in the average score for students attending private schools or for private school students attending Catholic schools (**figure 7**). Private school students scored 12 points higher on average than public school students in 2011, which was not significantly different from the 15-point score gap in 2009.

Figure 7. Percentage of students and average scores in eighth-grade NAEP science, by type of school: 2009 and 2011



* Significantly different ($p < .05$) from 2011.
NOTE: Private schools include Catholic, other religious, and nonsectarian private schools. Detail may not sum to totals because of rounding.

Additional Results for Student Groups

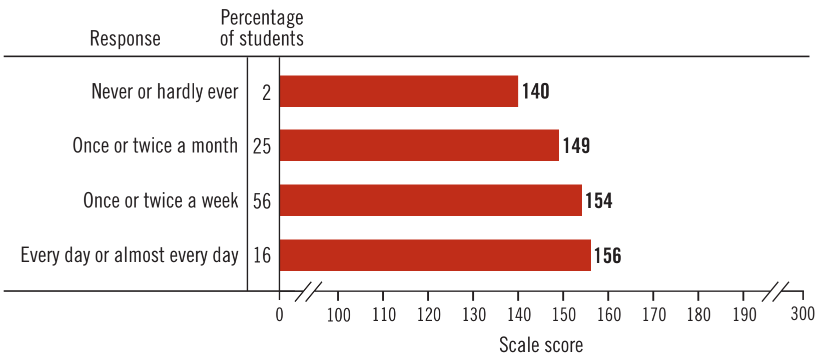
Achievement-level results and percentile scores provide additional insight into the performance of student groups. Find more NAEP results for student groups at http://nationsreportcard.gov/science_2011/.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 and 2011 Science Assessments.

Students doing hands-on projects in class more frequently score higher

As part of the eighth-grade teacher questionnaire, teachers were asked about how frequently their science students did hands-on activities or investigations in science. Teachers selected one of four responses: "never or hardly ever," "once or twice a month," "once or twice a week," or "every day or almost every day." In 2011, students whose teachers reported that their students do hands-on projects every day or almost every day scored higher on average than students whose teachers reported students did hands-on projects in class less frequently (**figure 8**). Fifty-six percent of students in 2011 had teachers who reported students do hands-on projects once or twice a week.

Figure 8. Percentage of students and average scores in eighth-grade NAEP science, by teachers' responses to a question about how often their science students do hands-on activities or investigations in science: 2011

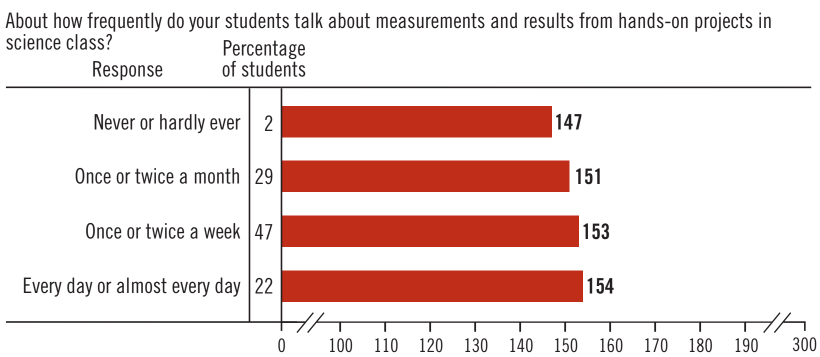


NOTE: Detail may not sum to totals because of rounding.

About two-thirds of students work together on science projects at least weekly

Teachers were also asked about how frequently their science students work with other students on a science activity or project. Teachers selected one of four responses: "never or hardly ever," "once or twice a month," "once or twice a week," or "every day or almost every day." In 2011, students whose teachers reported that their students work together on science projects weekly or daily scored higher on average than students whose teachers reported that students did so monthly or never (**figure 9**). Forty-seven percent of students in 2011 had teachers who reported students worked together on science activities or projects once or twice a week.

Figure 9. Percentage of students and average scores in eighth-grade NAEP science, by teachers' responses to a question about how often their science students work with other students on a science activity or project: 2011



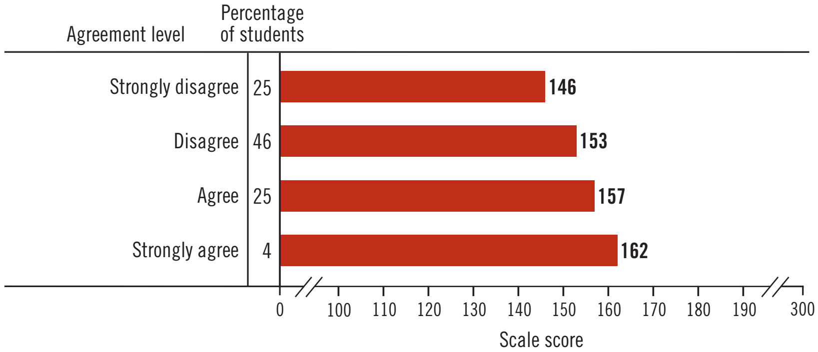
NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Students who report doing science-related activities that are not for schoolwork score higher

As part of the eighth-grade student questionnaire, students were asked to indicate the extent to which they disagreed or agreed with the statement, "I do science-related activities that are not for schoolwork." Students selected one of four responses indicating "strongly disagree," "disagree," "agree," or "strongly agree." In 2011, students who agreed or strongly agreed with the statement, "I do science-related activities that are not for schoolwork" had higher scores than students who disagreed or strongly disagreed (**figure 10**). In 2011, twenty-five percent of eighth-graders agreed with the statement, and 4 percent strongly agreed.

Figure 10. Percentage of students and average scores in eighth-grade NAEP science, by student-reported level of agreement with the statement, "I do science-related activities that are not for schoolwork": 2011



NOTE: Detail may not sum to totals because of rounding.

Explore Additional Results

Results for student groups in the nation and states on the background questions highlighted in this report and on additional questions from the eighth-grade student, teacher, and school questionnaires are available at http://nationsreportcard.gov/science_2011/context_1.asp.

A Closer Look at Some of the Background Characteristics of Lower- and Higher-Performing Students

Profiles of students scoring at the lower end of the scale (below the 25th percentile) and those scoring at the higher end (above the 75th percentile) show how the two groups differed in regard to demographic characteristics and experiences.

Among eighth-graders who scored **below the 25th percentile** (i.e., below a score of 131) in 2011,

- **27%** were White, **31%** were Black, and **35%** were Hispanic;
- **72%** were eligible for free/reduced-price school lunch;
- **55%** agreed or strongly agreed that they liked science;
- **25%** agreed or strongly agreed that they do science-related activities that are not for schoolwork; and
- **68%** had teachers who reported students do hands-on activities in science class once a week or more.

Among eighth-graders who scored **above the 75th percentile** (i.e., above a score of 176) in 2011,

- **76%** were White, **4%** were Black, and **10%** were Hispanic;
- **21%** were eligible for free/reduced-price school lunch;
- **83%** agreed or strongly agreed that they liked science;
- **38%** agreed or strongly agreed that they do science-related activities that are not for schoolwork; and
- **77%** had teachers who reported students do hands-on activities in science class once a week or more.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

State Results

State participation in the NAEP science assessment is voluntary and while most states participated in the 2009 assessment at grade 8, all 50 states, the District of Columbia, and Department of Defense schools elected to participate in 2011. These 52 states and jurisdictions are all referred to as "states" in the following summary of results. Results for the 47 states that participated in the 2009 assessment are also available.

The results presented in this section for the nation and states are for public school students only and may differ from the national results presented earlier that are based on data for both public and private school students.

Students in 16 states score higher in 2011 than in 2009

Among the 47 states that participated in both years, scores were higher in 2011 than in 2009 for Arkansas, Colorado, Georgia, Hawaii, Maine, Maryland, Michigan, Mississippi, Nevada, North Carolina, Rhode Island, South Carolina, Utah, Virginia, West Virginia, and Wyoming (**table 2**). No state scored lower in 2011 than in 2009.

Thirty-one percent of eighth-grade public school students in the nation performed at or above the *Proficient* level in 2011, with percentages ranging from 8 percent in the District of Columbia to 45 percent in North Dakota (**figure 11**).

Compare Results Among Participating States

The NAEP State Comparison Tool (http://nces.ed.gov/nationsreportcard/statecomparisons/) provides tables and maps showing how the average scores in states overall and for selected student groups compare, or how the change in performance between two assessment years compares across states.

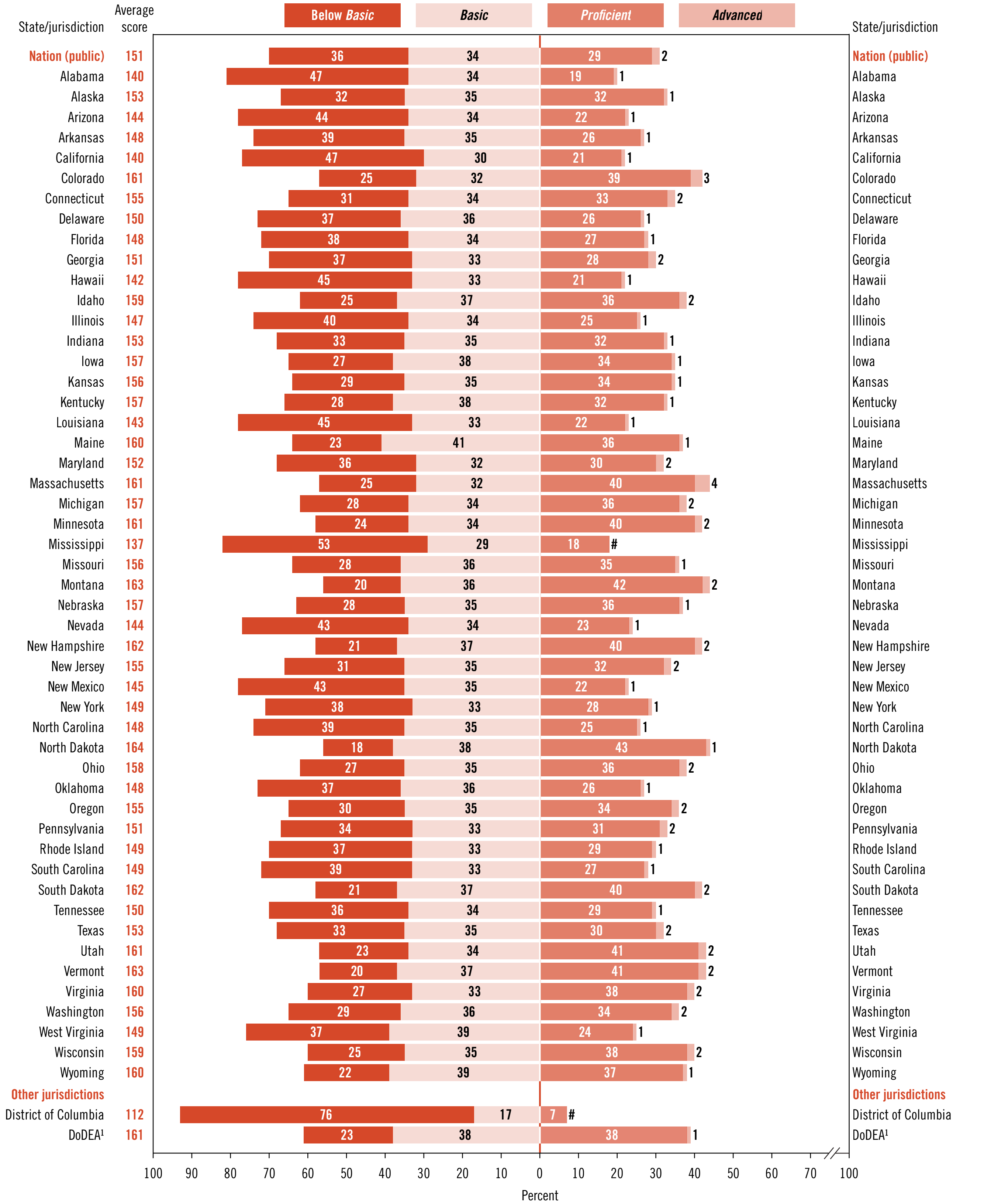
Table 2. Average scores in NAEP science for eighth-grade public school students, by state/jurisdiction: 2009 and 2011

State/jurisdiction	2009	2011
Nation (public)	**149***	**151**
Alabama	139	140
Alaska	—	153
Arizona	141	144
Arkansas	144*	148
California	137	140
Colorado	156*	161
Connecticut	155	155
Delaware	148	150
Florida	146	148
Georgia	147*	151
Hawaii	139*	142
Idaho	158	159
Illinois	148	147
Indiana	152	153
Iowa	156	157
Kansas	—	156
Kentucky	156	157
Louisiana	139	143
Maine	158*	160
Maryland	148*	152
Massachusetts	160	161
Michigan	153*	157
Minnesota	159	161
Mississippi	132*	137
Missouri	156	156
Montana	162	163
Nebraska	—	157
Nevada	141*	144
New Hampshire	160	162
New Jersey	155	155
New Mexico	143	145
New York	149	149
North Carolina	144*	148
North Dakota	162	164
Ohio	158	158
Oklahoma	146	148
Oregon	154	155
Pennsylvania	154	151
Rhode Island	146*	149
South Carolina	143*	149
South Dakota	161	162
Tennessee	148	150
Texas	150	153
Utah	158*	161
Vermont	—	163
Virginia	156*	160
Washington	155	156
West Virginia	145*	149
Wisconsin	157	159
Wyoming	158*	160
Other jurisdictions		
District of Columbia	—	112
DoDEA[1]	162	161

— Not available. Did not participate at state level in 2009.
* Significantly different ($p < .05$) from 2011.
[1] Department of Defense Education Activity (overseas and domestic schools).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 and 2011 Science Assessments.

Figure 11. Average scores and achievement-level results in NAEP science for eighth-grade public school students, by state/jurisdiction: 2011



Rounds to zero.

[1] Department of Defense Education Activity (overseas and domestic schools).

NOTE: The bars in this figure were graphed using unrounded numbers. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Assessment Content

Additional insight into students' performance on the NAEP science assessment can be obtained by examining what eighth-graders are expected to know and be able to do and how they performed on some of the assessment questions designed to measure their knowledge and skills.

Achievement Levels

Basic denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.

Proficient represents solid academic performance. Students reaching this level have demonstrated competency over challenging subject matter.

Advanced represents superior performance.

NAEP Science Achievement-Level Descriptions for Grade 8

The specific descriptions of what eighth-graders should know and be able to do at the *Basic*, *Proficient*, and *Advanced* science achievement levels are presented below. NAEP achievement levels are cumulative; therefore, student performance at the *Proficient* level includes the competencies associated with the *Basic* level, and the *Advanced* level also includes the skills and knowledge associated with both the *Basic* and the *Proficient* levels. The cut score indicating the lower end of the score range for each level is noted in parentheses.

Basic (141)

Science Practices: Students performing at the *Basic* level should be able to state or recognize correct science principles; explain and predict observations of natural phenomena at multiple scales, from microscopic to global, using evidence to support their explanations and predictions; design investigations employing appropriate tools for measuring variables; and propose and critique the scientific validity of alternative individual and local community responses to design problems.

In the physical sciences, students at the *Basic* level should be able to recognize a class of chemical compounds by its properties; design an investigation to show changes in properties of reactants and products in a chemical process such as burning or rusting; describe the changes in kinetic and potential energy of an object such as a swinging pendulum; describe and compare the motions of two objects moving at different speeds from a table of their position and time data; describe the direction of all forces acting on an object; and suggest an example of a system in which forces are acting on an object but the motion of the object does not change.

In the life sciences, students at the *Basic* level should be able to identify levels of organization within cells, multicellular organisms, and ecosystems; describe how changes in an environment relate to an organism's survival; describe types of interdependence in ecosystems; identify related organisms based on hereditary traits; discuss the needs of animals and plants to support growth and metabolism; and analyze and display data showing simple patterns in population growth.

In the Earth and space sciences, students at the *Basic* level should be able to describe a Sun-centered model of the solar system that illustrates how gravity keeps the objects in regular motion; describe how fossils and rock formations can be used as evidence to infer events in Earth's history; relate major geologic events, such as earthquakes, volcanoes, and mountain building to the movement of lithospheric plates; use weather data to identify major weather events; and describe the processes of the water cycle including changes in the physical state of water.

Proficient (170)

Science Practices: Students performing at the *Proficient* level should be able to demonstrate relationships among closely related science principles; explain and predict observations of phenomena at multiple scales, from microscopic to macroscopic and local to global, and to suggest examples of observations that illustrate a science principle; design investigations requiring control of variables to test a simple model, employing appropriate sampling techniques and data quality review processes, and use the evidence to communicate an argument that accepts, revises, or rejects the model; and propose and critique solutions and predict the scientific validity of alternative individual and local community responses to design problems.

In the physical sciences, students at the *Proficient* level should be able to demonstrate the relationship between the properties of chemical elements and their position on the periodic table; use empirical evidence to demonstrate that a chemical change has occurred; demonstrate the relationship of the motion of an object that experiences multiple forces with the representation of the motion on a position-time graph; predict the position of a moving object based on the position-time data presented in a table; and suggest examples of systems in which potential energy is converted into other forms of energy.

In the life sciences, students at the *Proficient* level should be able to explain metabolism, growth, and reproduction at multiple levels of living systems: cells, multicellular organisms, and ecosystems; predict the effects of heredity and environment on an organism's characteristics and survival; use sampling strategies to estimate population sizes in ecosystems; and suggest examples of sustainable systems for multiple organisms.

In the Earth and space sciences, students at the *Proficient* level should be able to explain how gravity accounts for the visible patterns of motion of the Earth, Sun, and Moon; explain how fossils and rock formations are used for relative dating; use models of Earth's interior to explain lithospheric plate movement; explain the formation of Earth materials using the properties of rocks and soils; identify recurring patterns of weather phenomena; and predict surface and groundwater movement in different regions of the world.

Advanced (215)

Science Practices: Students performing at the *Advanced* level should be able to demonstrate relationships among different representations of science principles. They should be able to explain and predict observations of phenomena at multiple scales, from microscopic to macroscopic and local to global, and develop alternative explanations of observations, using evidence to support their thinking. They should be able to design control of variable investigations employing appropriate sampling techniques and data quality review processes that strengthen the evidence used to argue for one alternate model over another. They should be able to propose and critique alternative solutions that reflect science-based trade-offs for addressing local and regional problems.

In the physical sciences, students at the *Advanced* level should be able to interpret diagrams, graphs, and data to demonstrate the relationship between the particulate nature of matter and state changes (for instance, melting and freezing); demonstrate relationships between position on the periodic table and the characteristics of families of the chemical elements; explain changes of state in terms of energy flow in and out of a system; identify possible scientific trade-offs in making decisions on the design of an electrical energy power plant; suggest examples of systems in which objects are undergoing transitional, vibrational, and rotational motion; and suggest examples of systems in which forces are acting both through contact and at a distance.

In the life sciences, students at the *Advanced* level should be able to explain movement and transformations of matter and energy in living systems at cellular, organismal, and ecosystem levels; predict changes in populations through natural selection and reproduction; and describe an ecosystem's populations and propose an analysis for changes based on energy flow through the system.

In the Earth and space sciences, students at the *Advanced* level should be able to explain the seasons, Moon phases, and lunar and solar eclipses; illustrate how fossils and rock formations can provide evidence of changes in environmental conditions over time; use lithospheric plate movement to explain geological phenomena; identify relationships among regional weather and atmospheric and ocean circulation patterns; and use the water cycle to propose and critique ways for obtaining drinkable water.

What Eighth-Graders Know and Can Do in Science

The item map below is useful for understanding performance at different levels on the NAEP scale. The scale scores on the left represent the scores for students who were likely to get the items correct or complete. The cut score at the lower end of the range for each achievement level is boxed. The descriptions of selected assessment questions indicating what students need to do to answer the question correctly, along with the corresponding science content areas, are listed on the right.

For example, the map on this page shows that eighth-graders performing at the *Basic* level with a score of 153 were likely to be able to predict a geological consequence of tectonic plate movement. Students performing at the *Proficient* level with a score of 190 were likely to be able to identify a source of energy for the Earth's water cycle. Students performing at the *Advanced* level with a score of 256 were likely to be able to explain the formation of a rock based on its features.

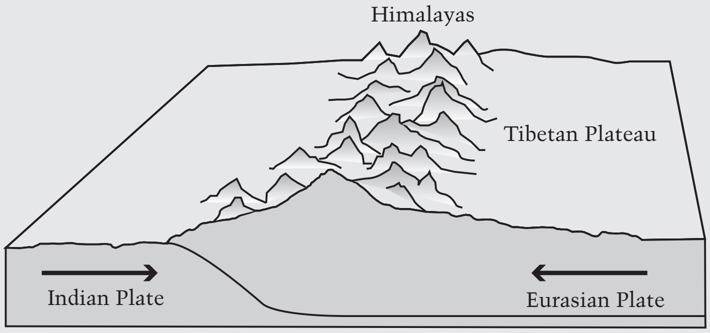
GRADE 8 NAEP SCIENCE ITEM MAP

	Scale score	Content area	Question description
Advanced	300		
	//		
	287	**Earth and space sciences**	Predict and explain a weather pattern due to collision of air masses
	269	**Physical science**	Describe the evidence for chemical change
	266	**Physical science**	*Identify chemically similar elements in the Periodic Table*
	264	**Life science**	Select and explain graph types and draw graphs from data that compare insect behaviors
	256	**Earth and space sciences**	Explain the formation of a rock based on its features
	247	**Life science**	Form a conclusion based on data about the behavior of an organism (**see pages 18–20**)
	224	**Physical science**	*Explain a change in energy due to friction*
	221	**Earth and space sciences**	Draw a conclusion about soil permeability using data
	215		
Proficient	214	**Earth and space sciences**	Explain the effects of human land use on wildlife
	213	**Earth and space sciences**	*Predict a lunar phenomenon*
	203	**Physical science**	Select and explain the useful properties of a material used in an industrial process
	201	**Earth and space sciences**	*Relate characteristics of air masses to global regions*
	200	**Life science**	*Identify the main source of energy for certain organisms*
	198	**Physical science**	*Identify the atomic components of the molecule* (**see page 21**)
	195	**Physical science**	*Determine a controlled variable in a chemistry investigation*
	190	**Earth and space sciences**	*Identify a source of energy for Earth's water cycle*
	187	**Earth and space sciences**	*Predict the long-term pattern in the volcanic activity of a region*
	184	**Physical science**	*Recognize an effect of electrical forces*
	183	**Life science**	*Recognize that plants produce their own food*
	174	**Life science**	Describe the competition between two species
	171	**Life science**	*Identify a function of a human organ system*
	171	**Earth and space sciences**	*Investigate the magnetic properties of some common objects*
	170		
Basic	165	**Physical science**	Describe the energy transfer between two systems
	162	**Physical science**	*Read a motion graph*
	157	**Earth and space sciences**	*Draw a conclusion based on fossil evidence*
	153	**Earth and space sciences**	*Predict a geological consequence of tectonic plate movement* (**see page 17**)
	151	**Earth and space sciences**	*Identify the mechanism of a weather pattern*
	148	**Life science**	*Recognize a factor that affects the success of a species*
	141		
	136	**Earth and space sciences**	*Identify the sequence of formation of the Earth's features*
	134	**Physical science**	*Identify an example of kinetic energy*
	131	**Life science**	*Predict the effect of an environmental change on an organism*
	128	**Life science**	*Explain an experimental setup to study populations of organisms*
	127	**Life science**	*Recognize how plants use sunlight*
	//		
	0		

NOTE: Regular type denotes a constructed-response question. *Italic* type denotes a multiple-choice question. The position of a 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. For constructed-response questions, the question description represents students' performance rated as completely correct. Scale score ranges for science achievement levels are referenced on the map.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Science Content Area: Earth and Space Sciences

The diagram below shows the collision of two tectonic plates in Asia.



What is a result of this collision?

- (A) Volcanoes erupt periodically.
- (B) The Tibetan Plateau slowly sinks.
- (C) The Himalayas increase in height each year.
- (D) Glaciers on the Tibetan Plateau melt.

Explore More NAEP Science Questions

More questions from the NAEP science assessment can be found in the NAEP Questions Tool at http://nces.ed.gov/nationsreportcard/itmrlsx/search.aspx?subject=science. See how well you perform on selected questions from the science assessment and how your answers compare with students' answers by trying out some sample questions at http://nationsreportcard.gov/science_2011/sample_quest.asp.

This multiple-choice question from the 2011 eighth-grade science assessment asks students to predict a geological consequence from the collision of two tectonic plates. Seventy-two percent of eighth-graders answered the question correctly (Choice C). The two most common incorrect answers (Choices A and B), which were selected by 14 percent and 9 percent of the students, respectively, represent conceptual misunderstandings that the collision of two tectonic plates would result in periodic volcanic eruptions or a lowering of the elevation of the Tibetan Plateau.

Percentage of eighth-grade students in each response category: 2011

Choice A	Choice B	**Choice C**	Choice D	Omitted
14	9	**72**	4	1

NOTE: Detail may not sum to totals because of rounding.

The table below shows the percentage of eighth-grade students performing at each achievement level who answered this question correctly. For example, 75 percent of eighth-graders at the *Basic* level selected the correct answer choice.

Percentage of eighth-grade students responding correctly at each achievement level: 2011

Overall	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*
72	50	75	92	99

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

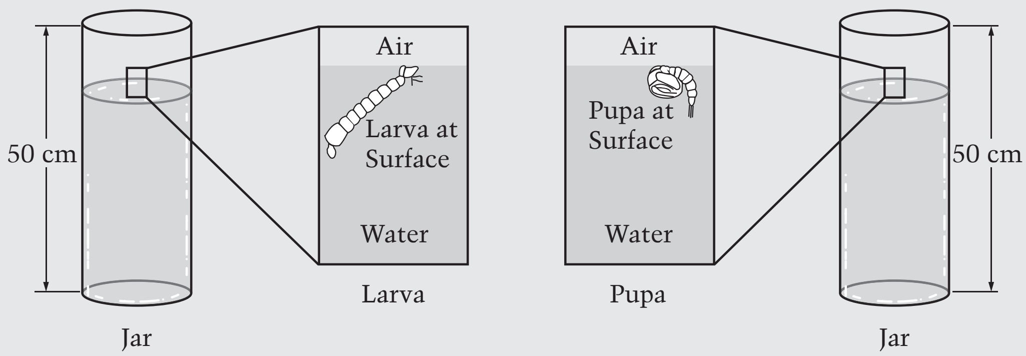
Science Content Area: Life Science

The question that follows refers to the investigation below.

Some students were studying the life cycle of mosquitoes. They learned that mosquito larvae and pupae spend part of their time at the surface of water.

The students wanted to find out how a larva and pupa behaved when the jars they were in were disturbed. They put one larva and one pupa in identical tall jars of water at 20°C as shown below.

JARS WITH LARVA AND PUPA



The students tapped on the jars when the larva and pupa were at the surface of the water. The larva and pupa dove down into the jars, and then slowly came to the surface.

The students measured the depth each larva and pupa reached and the amount of time each stayed underwater. The students repeated this step five times and calculated the average of each of their measurements.

Their results are summarized in the table below.

DATA TABLE

	Larva		**Pupa**	
Number of Trials	Average Depth Reached (centimeters)	Average Length of Time Underwater (seconds)	Average Depth Reached (centimeters)	Average Length of Time Underwater (seconds)
5	22	90	38	120

Which statement(s) is (are) supported by these data? You may fill in more than one oval.

- (A) The larva dives deeper than the pupa.
- (B) The larva stays underwater longer than the pupa.
- (C) The length of the larva affects the depth of its dive.
- (D) [filled] The pupa dives deeper than the larva.
- (E) [filled] The pupa stays underwater longer than the larva.
- (F) The shape of the pupa helps it dive deeper than the larva.

Explain why you selected the statement(s) you did, using the data in the table.

COMPLETE RESPONSE #1:

I picked that the pupa dives deeper than the larva because the pupa dives 38 (cm) and the larva dives 22 (cm). I also picked the pupa stays underwater longer than the larva because the pupa stays under-water 120 seconds and the larva stays underwater 90 seconds.

COMPLETE RESPONSE #2:

The pupa stays underwater longer than the larva does by 40 seconds. The pupa also dives deeper than the larva by 16 centimeters.

This extended constructed-response question requires students to draw a conclusion and to explain their reasoning based on the data in the table. Student responses to this question were rated using four scoring levels.

Complete responses selected only statements (D) and (E) and referred to the data in the table to correctly explain both selections. Student explanations cited numeric data from the table. No selections of statements (A), (B), (C), and (F) were included.

Essential responses selected only statements (D) and (E) and referred to the data to correctly explain one of the selections. No selections of statements (A), (B), (C), and (F) were included.

Partial responses either

- selected only statements (D) and (E) with an incomplete or no explanation. No selections of statements (A), (B), (C), and (F) were included, or
- selected statements (D) and (E) and referred to the data to explain the selections. One or more incorrect statements were also selected, or
- selected statements (D) or (E) and referred to the data to explain the selection. One or more incorrect statements might have also been selected, or
- selected statement (D) and referred to the data to explain statement (E) or selected statement (E) and referred to the data to explain statement (D). One or more incorrect statements might have also been selected, or
- made no selection and referred to the data to explain statements (D) and/or (E).

Unsatisfactory/Incorrect responses are inadequate or incorrect.

The sample student responses shown on the previous page were rated as "Complete" because both responses selected only statements (D) and (E) and provided correct explanations to support both statements. Fifteen percent of eighth-graders' responses to this question received a "Complete" rating.

Percentage of eighth-grade students in each response category: 2011

Complete	Essential	Partial	Unsatisfactory/ Incorrect	Omitted
15	2	32	50	1

NOTE: Detail may not sum to totals because the percentage of responses rated as "Off-task" is not shown. Off-task responses are those that do not provide any information related to the assessment task.

The table below shows the percentage of eighth-grade students performing at each achievement level whose responses to this question were rated as "Complete," "Essential," or "Partial." For example, 37 percent of eighth-graders at the *Advanced* level provided a response rated as "Complete."

Percentage of answers rated as "Complete," "Essential," or "Partial" for eighth-grade students at each achievement level: 2011

Scoring level	Overall	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*
Complete	15	4	14	27	37
Essential	2	1	2	2	2
Partial	32	18	34	44	46

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Science Content Area: Physical Science

What atoms combine to make up a molecule of water?

- (A) 1 hydrogen, 1 oxygen
- (B) 1 hydrogen, 2 oxygen
- (C) 2 hydrogen, 1 oxygen
- (D) 2 hydrogen, 2 oxygen

This multiple-choice question asks students to identify what atoms make up a water molecule. Fifty-four percent of eighth-graders answered the question correctly (Choice C). The most common incorrect answer (Choice B) was selected by 34 percent of the students who incorrectly recalled the chemical formula of the compound by associating two atoms with oxygen, rather than hydrogen.

Percentage of eighth-grade students in each response category: 2011

Choice A	Choice B	Choice C	Choice D	Omitted
8	34	54	4	#

Rounds to zero.
NOTE: Detail may not sum to totals because of rounding.

The table below shows the percentage of eighth-grade students performing at each achievement level who answered this question correctly. For example, 69 percent of eighth-graders at the *Proficient* level selected the correct answer choice.

Percentage of eighth-grade students responding correctly at each achievement level: 2011

Overall	Below *Basic*	At *Basic*	At *Proficient*	At *Advanced*
54	40	55	69	82

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Science Assessment.

Technical Notes

Sampling and Weighting

The schools and students participating in NAEP assessments are selected to be representative of all schools nationally and of public schools at the state level. Samples of schools and students are drawn from each state and from the District of Columbia and Department of Defense schools. The results from the assessed students are combined to provide accurate estimates of the overall performance of students in the nation and in individual states and other jurisdictions.

While national results reflect the performance of students in public, private, and other types of schools (i.e., Bureau of Indian Education schools and Department of Defense schools), state-level results reflect the performance of public school students only. More information on sampling can be found at http://nces.ed.gov/nationsreportcard/about/nathow.asp.

Because each school that participated in the assessment, and each student assessed, represents a portion of the population of interest, the results are weighted to account for the disproportionate representation of the selected sample. This includes oversampling of schools with high concentrations of students from certain racial/ethnic groups and the lower sampling rates of students who attend schools with fewer than 20 students.

School and Student Participation

National participation

To ensure unbiased samples, NAEP statistical standards require that participation rates for the original school samples be 70 percent or higher to report national results separately for public and private schools. In instances where participation rates meet the 70 percent criterion but fall below 85 percent, a nonresponse bias analysis is conducted to determine if the responding school sample is not representative of the population, thereby introducing the potential for nonresponse bias.

The weighted national school participation rate for the 2011 science assessment at grade 8 was 97 percent (100 percent for public schools and 74 percent for private schools). The weighted student participation rate was 93 percent.

A nonresponse bias analysis was conducted for the grade 8 private school sample. The results of the nonresponse bias analysis showed that, while the original responding school samples may have been somewhat different from the entire sample of eligible schools, including substitute schools and adjusting the sampling weights to account for school nonresponse were partially effective in reducing the potential for nonresponse bias. However, some variables examined in the analysis still indicated potential bias after nonresponse adjustments. For instance, smaller schools were somewhat overrepresented in the final private school sample, and the responding sample of private schools contained a higher percentage of Black students and a lower percentage of White students than the original sample of eligible private schools.

State participation

With one exception, participation rates for the original samples in the states and jurisdictions participating in the 2011 science assessment at grade 8 were 99 or 100 percent. The participation rate in Colorado was 84 percent.

A nonresponse bias analysis was conducted for the public school sample in Colorado. After sampling weights were adjusted to account for nonresponse, some school characteristics still indicated potential bias. For instance, White students were slightly underrepresented and Hispanic students were slightly overrepresented in the final responding sample. The remaining potential bias associated with student achievement was even larger, however, with the responding sample containing a higher percentage of low-achieving students than the original eligible sample.

Interpreting Statistical Significance

Comparisons over time or between groups are based on statistical tests that consider both the size of the differences and the standard errors of the two statistics being compared. Standard errors are margins of error, and estimates based on smaller groups are likely to have larger margins of error. The size of the standard errors may also be influenced by other factors such as how representative the assessed students are of the entire population.

When an estimate has a large standard error, a numerical difference that seems large may not be statistically significant. Differences of the same magnitude may or may not be statistically significant depending upon the size of the standard errors of the estimates. For example, the 1-point change in the average score for White students was statistically significant, while the 4-point change for American Indian/Alaska Native students was not. Standard errors for the estimates presented in this report are available at http://nces.ed.gov/nationsreportcard/naepdata/.

To ensure that significant differences in NAEP data reflect actual differences and not mere chance, error rates need to be controlled when making multiple simultaneous comparisons. The more comparisons that are made (e.g., comparing the performance of White, Black, Hispanic, Asian/Pacific Islander, and American Indian/Alaska Native students), the higher the probability of finding significant differences by chance. In NAEP, the Benjamini-Hochberg False Discovery Rate (FDR) procedure is used to control the expected proportion of falsely rejected hypotheses relative to the number of comparisons that are conducted. A detailed explanation of this procedure can be found at http://nces.ed.gov/nationsreportcard/tdw/analysis/infer.asp. NAEP employs a number of rules to determine the number of comparisons conducted, which in most cases is simply the number of possible statistical tests. However, when comparing multiple years, the number of years does not count toward the number of comparisons.

Race/Ethnicity

Prior to 2011, student race/ethnicity was obtained from school records and reported for the following six mutually exclusive categories. Students identified with more than one racial/ethnic group were classified as "other" and were included as part of the "unclassified" category, along with students who had a background other than the ones listed or whose race/ethnicity could not be determined.

RACIAL/ETHNIC CATEGORIES PRIOR TO 2011

- White
- Black
- Hispanic
- Asian/Pacific Islander
- American Indian/Alaska Native
- Other or unclassified

In compliance with standards from the U.S. Office of Management and Budget for collecting and reporting data on race/ethnicity, additional information was collected in 2011. This allows results to be reported separately for Asian students, Native Hawaiian/Other Pacific Islander students, and students identifying with two or more races. Beginning in 2011, all of the students participating in NAEP were identified as belonging in one of the following seven racial/ethnic categories.

RACIAL/ETHNIC CATEGORIES BEGINNING IN 2011

- White
- Black
- Hispanic
- Asian
- Native Hawaiian/Other Pacific Islander
- American Indian/Alaska Native
- Two or more races

As in earlier years, students identified as Hispanic were classified as Hispanic in 2011 even if they were also identified with another racial/ethnic group. Students identified with two or more of the other racial/ethnic groups (e.g., White and Black) would have been classified as "other" and reported as part of the "unclassified" category prior to 2011, and were classified as "two or more races" in 2011.

When comparing the 2011 results for racial/ethnic groups with results from 2009, the 2011 data for Asian and Native Hawaiian/Other Pacific Islander students were combined into a single Asian/Pacific Islander category.

National School Lunch Program

NAEP collects data on student eligibility for the National School Lunch Program (NSLP) as an indicator of family income. Under the guidelines of NSLP, children from families with incomes below 130 percent of the poverty level are eligible for free meals. Those from families with incomes between 130 and 185 percent of the poverty level are eligible for reduced-price meals. (For the period July 1, 2010 through June 30, 2011, for a family of four, 130 percent of the poverty level was $28,665, and 185 percent was $40,793 in most states.)

Some schools provide free meals to all students regardless of individual eligibility, using their own funds to cover the costs of noneligible students. Under special provisions of the National School Lunch Act intended to reduce the administrative burden of determining student eligibility every year, schools can be reimbursed based on eligibility data for a single base year. Participating schools might have high percentages of eligible students and report all students as eligible for free lunch. For more information on NSLP, visit http://www.fns.usda.gov/cnd/lunch/.

Special Science Administration for International Comparisons

The 2011 NAEP science assessment for grade 8 was a special administration to permit comparisons with the Trends in International Mathematics and Science Study (TIMSS), a widely recognized international assessment. Historically the NAEP science assessment occurs every four years, but the last science administration was in 2009. The National Assessment Governing Board added grade 8 science to the assessment schedule in 2011 to create an opportunity for studying the relationship between TIMSS and the NAEP mathematics (also administered in 2011) and science assessments. For the first time with the voluntary science assessment, all 50 states and the District of Columbia agreed to participate. In addition, the Governing Board scheduled the next assessment of science at grades 4, 8, and 12 for 2015, which aligns with the TIMSS assessment schedule going forward.

U.S. Department of Education

The National Assessment of Educational Progress (NAEP) is a congressionally authorized project sponsored by the U.S. Department of Education. The National Center for Education Statistics, within the Institute of Education Sciences, administers NAEP. The Commissioner of Education Statistics is responsible by law for carrying out the NAEP project.

Arne Duncan
Secretary
U.S. Department of Education

John Q. Easton
Director
Institute of Education Sciences

Jack Buckley
Commissioner
National Center for Education Statistics

Peggy G. Carr
Associate Commissioner for Assessment
National Center for Education Statistics

The National Assessment Governing Board

In 1988, Congress created the National Assessment Governing Board to set policy for the National Assessment of Educational Progress, commonly known as The Nation's Report Card™. The Governing Board is an independent, bipartisan group whose members include governors, state legislators, local and state school officials, educators, business representatives, and members of the general public.

Honorable David P. Driscoll, Chair
Former Commissioner of Education
Melrose, Massachusetts

Mary Frances Taymans, Vice Chair
Nonpublic School Representative
Bethesda, Maryland

Andrés Alonso
Chief Executive Officer
Baltimore City Public Schools
Baltimore, Maryland

David J. Alukonis
Former Chairman
Hudson School Board
Hudson, New Hampshire

Louis M. Fabrizio
Data, Research and Federal Policy Director
North Carolina Department of Public Instruction
Raleigh, North Carolina

Honorable Anitere Flores
Senator
Florida State Senate
Miami, Florida

Alan J. Friedman
Consultant
Museum Development and Science Communication
New York, New York

Shannon Garrison
Fourth-Grade Teacher
Solano Avenue Elementary School
Los Angeles, California

Doris R. Hicks
Principal and Chief Executive Officer
Dr. Martin Luther King, Jr. Charter School for Science and Technology
New Orleans, Louisiana

Honorable Terry Holliday
Commissioner of Education
Kentucky Department of Education
Lexington, Kentucky

Richard Brent Houston
Principal
Shawnee Middle School
Shawnee, Oklahoma

Hector Ibarra
Middle School Science Teacher
Belin-Blank International Center and Talent Development
Iowa City, Iowa

Honorable Tom Luna
Idaho Superintendent of Public Instruction
Boise, Idaho

Honorable Jack Markell
Governor of Delaware
Wilmington, Delaware

Tonya Miles
General Public Representative
Mitchellville, Maryland

Dale Nowlin
Twelfth-Grade Teacher
Columbus North High School
Columbus, Indiana

Honorable Sonny Perdue
Former Governor of Georgia
Atlanta, Georgia

Susan Pimentel
Educational Consultant
Hanover, New Hampshire

W. James Popham
Professor Emeritus
Graduate School of Education and Information Studies
University of California, Los Angeles
Wilsonville, Oregon

Andrew C. Porter
Dean
Graduate School of Education
University of Pennsylvania
Philadelphia, Pennsylvania

B. Fielding Rolston
Chairman
Tennessee State Board of Education
Kingsport, Tennessee

Cary Sneider
Associate Research Professor
Portland State University
Portland, Oregon

Blair Taylor
President and CEO
Los Angeles Urban League
Los Angeles, California

Honorable Leticia Van de Putte
Senator
Texas State Senate
San Antonio, Texas

Eileen L. Weiser
General Public Representative
Ann Arbor, Michigan

John Q. Easton (Ex officio)
Director
Institute of Education Sciences
U.S. Department of Education
Washington, D.C.

Cornelia S. Orr
Executive Director
National Assessment Governing Board
Washington, D.C.

"The Department of Education's mission is to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access."

www.ed.gov

MORE INFORMATION

The report release site is http://nationsreportcard.gov. The NCES Publications and Products address is http://nces.ed.gov/pubsearch.

For ordering information, write to
ED Pubs
U.S. Department of Education
P.O. Box 22207
Alexandria, VA 22304

or call toll free 1-877-4-ED-Pubs

or order online at http://www.edpubs.gov.

THE NATION'S REPORT CARD

Science 2011

MAY 2012

SUGGESTED CITATION

National Center for Education Statistics (2012).
The Nation's Report Card: Science 2011
(NCES 2012-465).
Institute of Education Sciences, U.S. Department of Education, Washington, D.C.

CONTENT CONTACT

Emmanuel Sikali
202-502-7419
emmanuel.sikali@ed.gov

This report was prepared for the National Center for Education Statistics under Contract No. ED-07-CO-0107 with Educational Testing Service. Mention of trade names, commercial products, or organizations does not imply endorsement by the U.S. Government.