

National Assessment of Educational Progress
NAEP 2011 Science Grade 8 National and State Results
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Introduction

Good morning. I am here to share with you the results of the NAEP 2011 science assessment that were released today in the Science Report Card.

Overview of the 2011 Science Assessment

Students were assessed at the 8th grade only, with a sample of 122,000 students. We have national results for public and private school students, along with results for public school students only in all 50 states, the District of Columbia, and the Department of Defense schools. This was the first time all 50 states and the District of Columbia agreed to participate in the NAEP science assessment.

The National Assessment Governing Board added grade 8 science to the assessment schedule in 2011 to create an opportunity for studying the relationship between the NAEP science assessment and the Trends in International Mathematics and Science Study (TIMSS). In addition, the Governing Board scheduled the next assessment of science at grades 4, 8, and 12 for 2015 to align the NAEP science assessment with TIMSS in the future.

The 2011 science assessment was based on the framework first introduced in 2009, which means that the 2011 results can only be compared to the 2009 assessment.

Results are reported in two ways: as average scale scores on a 0–300 scale, and as percentages of students at or above three achievement levels: *Basic*, *Proficient*, and *Advanced*.

The achievement levels were developed by the National Assessment Governing Board. They set standards for what students should know and be able to do. The Governing Board has established standards for *Basic*, *Proficient*, and *Advanced* performance for each subject and for each grade. Ultimately, the goal is to have all students performing at or above the *Proficient* level.

Because NAEP results are based on samples, there is a margin of error associated with each score or percentage. Therefore, we only report those differences in scores or percentages that meet our standards for statistical significance.

Overview of Science Content

The three content areas for the science assessment are:

- physical science, which includes properties and changes of matter, forms of energy, energy transfer and conservation, position and motion of objects, and forces affecting motion;
- life science, which includes concepts related to organization and development, matter and energy transformations, interdependence, heredity and reproduction, and evolution and diversity; and
- Earth and space sciences, which includes concepts related to objects in the universe, the history of the Earth, properties of Earth materials, tectonics, energy in Earth systems, climate and weather, as well as biogeochemical cycles.

At grade 8, students spent 30% of their assessment time on physical science, 30% on life science, and 40% on Earth and space sciences. Students were asked questions within each content area and were also asked questions that cut across the content areas.

The 2009 framework also emphasized four science practices: identifying science principles, using science principles, using scientific inquiry, and using technological design.

National Results

In 2011, the score for eighth-graders overall rose from 150 to 152. Scores also rose for students at the 10th, 25th, 50th, and 75th percentiles. At the 90th percentile, however, there was no significant increase.

National Results, Achievement Levels

There were increases in the percentages of students performing at or above the NAEP achievement levels as well. Sixty-five percent of students performed at or above *Basic*, which includes students at the *Basic*, *Proficient*, and *Advanced* levels, up from 63 percent in 2009. Thirty-two percent scored at or above *Proficient*, up 2 points as well. There was no significant change in the percentage of students in the *Advanced* range, which remains at 2 percent.

White and Asian students score higher than other racial/ethnic groups

In 2011, NAEP reported separate scores for the following seven racial/ethnic groups: American Indian/Alaska Native, Asian, Black, Hispanic, Native Hawaiian/Other Pacific Islander, White, and two or more races. White students, with an average score of 163, and Asian students, with an

average score of 161, scored higher than the remaining five groups. Multiracial students—those in the last category—had a higher score than the other four groups.

The percentage of students in each category was: White: 55 percent, Black: 15 percent, Hispanic: 21 percent, Asian/Pacific Islander: 5 percent, American Indian/Alaska Native: 1 percent, and two or more races: 2 percent.

Some score gaps narrow from 2009

The White–Black score gap fell from 36 to 35 points. Scores increased since 2009 for both groups, but the increase for Black students was large enough to narrow the gap.

The White–Hispanic score gap also narrowed since 2009, dropping from 30 to 27 points. Again, the 5-point score increase for Hispanic students was large enough to narrow the gap despite an increase in the average score for White students.

There was no significant change in scores for Asian/Pacific Islander or American Indian/Alaska Native students.

Male students score higher than female students

The average score for male eighth-graders in 2011 was 154 points, 5 points higher than the average score for female eighth-graders. This represents an increase for both groups given that in 2009 the average score for male students was 152, and 148 for female students.

Students across income levels score higher than in 2009

Scores for students from both lower- and higher-income families rose from 2009 to 2011.

NAEP uses student eligibility for the National School Lunch Program as a measure of family income. Students whose families have an income that is less than 185 percent of the federal poverty level are eligible for free or reduced-price lunches, while those whose families are above 185 percent of the poverty level are not eligible.

In both assessments, students who were eligible for free or reduced-price lunches scored lower than students who were not eligible, and there was no significant change in the score gap between the two groups. The percentage of eligible students rose from 40 percent to 45 percent in 2011.

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

We have national results for public school students at grade 8, along with results for all private school students, and separate results for students attending Catholic schools, who constituted about one-half of all private school students in 2011. About 8 percent of eighth-grade students attended private schools during that year.

Scores rose for public school students in 2011, although the average scores for all private school students and for Catholic school students remained higher than the average for their public school peers.

Students in 16 states score higher in 2011 than in 2009

Comparing state performance in 2011 and 2009 for the 47 states that participated in both assessments, we see that sixteen states had higher scores in 2011, and no state declined since 2009.

Scores in 29 states higher than the national average

When we compare the average score for each participating state with the national average for public school students, we observe that 29 states had higher average scores than the nation. Sixteen states had lower scores than the nation, though the average scores for some of those states increased from 2009 to 2011.

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

When NAEP assessments are administered, we ask the teachers of the students being assessed to fill out questionnaires that provide information on classroom practices. Among other things, we asked teachers about the frequency with which they have students perform hands-on projects in class. The more often students performed hands-on projects, the higher the average NAEP score.

Two percent of students had teachers who said they never or hardly ever had students perform hands-on tasks, and these students had the lowest average score. Twenty-five percent had teachers who said they had students perform hands-on tasks once or twice a month, and 56 percent had teachers who said they had students perform hands-on tasks once or twice a week. Sixteen percent had teachers who said they had students perform hands-on tasks every day or almost every day.

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

We asked the students a number of questions about their interest and involvement in science. For example, we asked students how much they agreed with the following statement: “I do science-related activities that are not for schoolwork.” Those who said they agreed or strongly agreed with this statement had higher scores, on average. Twenty-five percent of students said they agreed, and 4 percent said they strongly agreed.

Conclusion

The 2011 Science Report Card provides all of this information and much more. In addition, the website <http://nationsreportcard.gov> gives extensive information on the performance of students. The website <http://nces.ed.gov/nationsreportcard> affords access to released assessment questions through NAEP’s Questions Tool, and the NAEP Data Explorer, our online data analysis tool.

In conclusion, I would like to offer my sincere thanks to all the students, teachers, and schools who participated in the 2011 science assessment.