

Summary of Facts: 2011 NAEP Science Grade 8

Background Knowledge

- NAEP was established in 1969 and is a project of the National Center for Education Statistics (NCES) under the U.S. Department of Education.
- NAEP provides national and state achievement results of elementary and secondary students in the United States in eight subject areas, including mathematics, reading, writing and science.
- It is the only federal nationally representative assessment of what young students know and can do in key subject areas. Commonly referred to as the “Nation’s Report Card,” it is used to provide a point of reference for comparisons between states and to provide an accurate and representative picture of student performance over time.
- The NAEP 2011 Science Assessment was administered to a representative sample of eighth-graders at the national level and at the state level.
- The assessments are not designed to produce individual district, school or student data.
- The President and Congress use NAEP results in setting education policy. States are neither rewarded nor sanctioned based on their results. The Nation’s Report Card is produced by the U.S. Department of Education and has generated more than 600 reports in its history.
- The NAEP science assessment window for Colorado students was January 31 – February 25, 2011.
- Each student received two 25-minute science tests, in addition to general background questions and science-specific background questions. The test requires about an hour per student to administer.

Participation Facts:

- Nationwide: 7,300 schools participated; 122,000 students participated
- Colorado: 102 schools participated; 1,900 students participated
- All 50 states, the District of Columbia and Department of Defense schools participated.

Scoring:

- The NAEP grade 8 science scale ranges from 0 to 300.
- Achievement levels correspond to the following points on the NAEP science scales: below *Basic*, 140 or lower; *Basic*, 141–169; *Proficient*, 170–214; and *Advanced*, 215 and above.
- At or above *Basic* includes *Basic*, *Proficient*, and *Advanced*. At or above *Proficient* includes *Proficient* and *Advanced*.
- In addition, the scores are reported by three fields of science: earth science, life science and physical science.
- NAEP only reports scores as higher or lower if they are statistically significantly different.

Frameworks

- The 2011 grade 8 science assessment is based on the 2009 NAEP new framework that was approved by the National Assessment Governing Board which oversees NAEP, <http://www.nagb.org/>. This replaces the framework that has been used in NAEP since 1996 and started a new trend.
- Colorado did participate in NAEP grade 8 science in 1996 and 2005 but those results cannot be compared with the '09 and '11 results as they were based on a different framework.
- Link to Frameworks (standards): <http://www.nagb.org/publications/frameworks/science-09.pdf>

Overall Key Findings

- In 2011, the average science score for eighth-grade students in Colorado was 161. This was higher than that of the nation's public schools (151).
- The average score for students in Colorado in 2011 (161) was higher than that in 2009 (156).
- In 2011, the percentage of students in Colorado who performed at or above *Proficient* was 42 percent. This was greater than that for the nation's public schools (31 percent).
- The percentage of students in Colorado who performed at or above *Proficient* in 2011 (42 percent) was greater than that in 2009 (36 percent).
- In 2011, the percentage of students in Colorado who performed at or above *Basic* was 75 percent. This was greater than that for the nation's public schools (64 percent).
- The percentage of students in Colorado who performed at or above *Basic* in 2011 (75 percent) was greater than that in 2009 (70 percent).

Trend Results: overall and by subgroups

- Colorado grade 8 students received an average scale score of 161 in 2011 (161) which is five points higher than the 2009 score of 156.
- Colorado eighth- grade students score in earth science had no significant change from 2009 to 2011. However, the CO scores increased for both life science and physical science.

Colorado Grade 8 Average Score	2009	2011
Earth science	156	159
Life science	155	160*
Physical science	156	162*

*Significantly higher score than 2009

- The gap between Colorado male and female students was closed in 2011 and both groups had higher average scores. Colorado male students scored 162 compared to the female score of 159 which is the same due to the variability of the sample of students tested. In the 2009 test, Colorado males scored significantly higher than females; males had 158 compared to the females' score of 153.

- The national public score for male students was five points higher than female students and the gap is about the same as in 2009 (four points).
- In 2011, Colorado Black students had an average score that was 22 points lower than Colorado White students. This performance gap was not significantly different from that in 2009 (32 points). This change in gap between 2009 and 2011 is a reduction of 10 points, but is not statistically significant due to the small group size of the Black students; 5 percent in 2011 and 6 percent in 2009.
- In 2011, Colorado Hispanic students had an average score that was 30 points lower than Colorado White students. This performance gap was not significantly different from that in 2009 (29 points).
- In 2011, Colorado students who were eligible for free/reduced-price school lunch, an indicator of low family income, had an average score (144) that was 27 points lower than Colorado students who were not eligible for free/reduced-price school lunch (171). This performance gap was not significantly different from that in 2009 (24 points).
- Colorado students eligible for free/reduced-price school lunch have not improved since the 2009 test whereas those who are not eligible had a higher average score than 2009.
- In 2011, the average scale score of Colorado students attending public schools in cities was lower than the scores of students in suburban and rural schools, but was not significantly different from the scores of students in town schools. More detail on classification of location type can be found at: http://nces.ed.gov/ccd/Rural_Locales.asp

State Comparisons

- Only one state, North Dakota, scored higher than Colorado in the 2011 science assessment; Colorado scored 161 and North Dakota scored 164.
- In 2009, students in seven states scored significantly higher than Colorado (Montana, Wyoming, North Dakota, South Dakota, Minnesota, Massachusetts and New Hampshire) and so did students attending schools run by the U.S. Department of Defense.
- Colorado outperformed 36 states and was not significantly different than 14 states.
- Colorado was one of only 16 states that improved their score since 2009. States that also improved are Arkansas, Georgia, Hawaii, Maine, Maryland, Michigan, Mississippi, Nevada, North Carolina, Rhode Island, South Carolina, Utah, Virginia, West Virginia, and Wyoming.
- In 2011, eighth-grade Colorado students fared better than the nation in all three of the science areas: earth, life and physical. Colorado eighth-grade students scored 159 in earth science, 160 in life science, and 162 in physical science. All these scores are significantly higher than the national scores of 150 for earth science, 151 for life science and 151 for physical science.
- Out of all the states/jurisdictions only the National sample and New York narrowed the White-Black gap from 2009 to 2011.
- Only Iowa, New Mexico and South Dakota narrowed the White-Hispanic gap from 2009 to 2011.
- Colorado White students were the highest scoring in the nation (171).
- Only two states outperformed Colorado male students (162): North Dakota (167) and Montana (166).

- Colorado female students were the highest scoring in the nation (159).
- In 2011, Black students in Colorado and the Department of Defense schools have the highest average scores. Colorado scored 148 and Department of Defense schools scored 143. No other state had a higher average scale score than Colorado for Blacks in the 2011 science test.
- Only three states outperformed Colorado Hispanic students (141): Department of Defense schools (158), Kentucky (149) and Texas (146).
- Colorado Asian students were the highest scoring in the nation (161).
- Only three states outperformed Colorado students with disabilities (128): Massachusetts (143), Maine (142) and New Hampshire (141).
- Only three states outperformed Colorado English language learners (114): South Carolina (133), Arkansas (129) and Virginia (126).

Links for further information

- For more information about the Colorado 2011 NAEP science results go to the state profile site:
<http://nces.ed.gov/nationsreportcard/states>
- Link to the Colorado 2011 NAEP grade 8 Science Snapshot Report:
<http://nces.ed.gov/nationsreportcard/pdf/stt2011/2012467CO8.pdf>

- **Additional Important Information**

Colorado eighth-graders also participated in the 2011 Trends in International Mathematics and Science Study (TIMSS) and those results are expected to be released in December of 2012.