

Summary of Facts: 2015 National Assessment of Educational Progress (NAEP) Math Grades 4 and 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 2015 math assessment was a paper-pencil assessment administered to a representative sample of fourth and eighth-graders at the national level and at the state level.
- Every two years (odd years) NAEP provides state results for grades four and eight in math.
- The assessments are not designed to provide 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 math assessment window for Colorado students was January 26 – March 6, 2015.
- Each student received two twenty-five minute cognitive math tests, in addition to general background questions and math-specific background questions. The test requires about 90 minutes per student to administer.

Participation Facts:

- Nationwide: 137,400 public school fourth- grade students in 7,230 schools participated.
- Nationwide: 135,100 public school eighth-grade students in 5,670 schools participated.
- Colorado: 2,200 public school fourth- grade students in 98 schools participated.
- Colorado: 2,300 public school eighth-grade students in 94 schools participated.
- All 50 states, the District of Columbia and Department of Defense schools participated.

Scoring:

- Both the NAEP grade 4 and 8 math scales range from 0 to 500.
- Achievement levels for grade 4 correspond to the following points on the NAEP math scales: below *Basic*, 213 or lower; *Basic*, 214–248; *Proficient*, 249–281; and *Advanced*, 282 and above.
- Achievement levels for grade 8 correspond to the following points on the NAEP math scales: below *Basic*, 261 or lower; *Basic*, 262–298; *Proficient*, 299–332; and *Advanced*, 333 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 five fields of math: algebra, data analysis, statistics, and probability, geometry, measurement, number process and operations.
- NAEP only reports scores as higher or lower if they are statistically significantly different.

Frameworks

- The 2015 grades 4 and 8 math assessments are based on the 2009 NAEP framework that was approved by the National Assessment Governing Board which oversees NAEP, <http://www.nagb.org/>. These frameworks have been used in NAEP since 2009 and replace the 2005 frameworks which started a new trend line.
- Link to Frameworks (standards):
<https://www.nagb.org/content/nagb/assets/documents/publications/frameworks/mathematics/2015-mathematics-framework-abridged.pdf>

Overall Key Findings for grade four

- In 2015, the average scale score for students in grade 4 math in Colorado was 242. This was not significantly different than the score for public school students across the nation (240).
- In 2015, there were 9 states/jurisdictions that outperformed Colorado in average scale score (Massachusetts, Minnesota, New Hampshire, Indiana, Department of Defense, Wyoming, Virginia, New Jersey and North Dakota); 22 states that were not significantly different than Colorado and 20 scored significantly lower than Colorado.
- The Colorado grade 4 math 2015 average scale score (242) is significantly lower than the 2013 score (247) and the score has significantly risen by 21 points since the 1992 test (221).
- In 2015, the percentage of Colorado grade 4 students who performed at or above NAEP *Proficient* level was 43 percent. This is significantly higher than the percentage of the nation's public school grade 4 students who performed at the same level (39 percent).
- The percentage of students in Colorado who performed at or above NAEP *Proficient* in 2015 (43 percent) was smaller than that in 2013 (50 percent).
- In 2015, the percentage of Colorado students who performed at or above NAEP *Basic* level was 82 percent. This is not significantly different than the percentage of the nation's public school students who performed at the same level (81 percent).
- The percentage of students in Colorado who performed at or above *Basic* in 2015 (82 percent) was smaller in comparison to 2013 (87 percent).
- The percentage of students in Colorado who performed at the *Advanced* level in 2015 (8 percent) was not significantly different in comparison to 2013 (11 percent).

Overall Key Findings for grade eight

- In 2015, the average scale score for students in grade 8 math in Colorado was 286. This was significantly higher in comparison to the score for public school students across the nation (281).
- In 2015, there were 6 states/jurisdictions that outperformed Colorado in average scale score (Massachusetts, New Hampshire, Minnesota, New Jersey, Department of Defense and Vermont), 23 states that were not significantly different than Colorado and 22 scored significantly lower than Colorado.

- The 2015 Colorado grade 8 math average scale score (286) is lower in comparison to the 2013 score (290) and not significantly different from the average score in 2003 (283).
- The percentage of Colorado students who performed at or above NAEP *Proficient* level was 37 percent in 2015. This is significantly higher than the percentage of the nation's public school students who performed at the same level (32 percent).
- The percentage of students in Colorado who performed at or above NAEP *Proficient* in 2015 (37 percent) was smaller than that in 2013 (42 percent).
- The percentage of Colorado students who performed at or above the NAEP *Basic* level was 73 percent in 2015. This is not significantly different compared to the percentage of the nation's public school students who performed at the same level (70 percent).
- The percentage of students in Colorado who performed at or above *Basic* in 2015 (73 percent) was not significantly different compared to 2013 (77 percent).
- The percentage of students in Colorado who performed at the *Advanced* level in 2015 (10 percent) was not significantly different compared to 2013 (12 percent).

Trend Results: overall and subgroups

Nation

- In 2015, students had an average score in mathematics of 240 points at grade 4 and 282 points at grade 8 on separate 0-500 point scales.
- The 2015 math average scores were 1 and 2 points lower in grades 4 and 8, respectively, than the average scores in 2013.
- 2015 math scores at both grades were higher than those from the earliest mathematics assessments in 1990 by 27 points at grade 4 and 20 points at grade 8.
- In 2015, the average mathematics score for White fourth-grade students was lower compared to 2013. The average mathematics score for female students was also lower compared to 2013.
- In 2015, average mathematics scores for White, Black, and Hispanic eighth-grade students were lower compared to 2013.
- In comparison to 2013, the eighth-grade average mathematics scores decreased both for students eligible and students not eligible for free/reduced-price school lunch.

Colorado

- In Colorado, the 2015 math average scores were 5 and 4 points lower in grades 4 and 8, respectively, than the average scores in 2013.
- The 2015 Colorado fourth-grade math score was 7 points higher than the 2003 mathematics assessment.
- The 2015 Colorado eighth-grade math score was not significantly different than the 2003 mathematics assessment.
- In comparison to 2013, Colorado average math scores decreased in fourth-grade for the following groups of students: Whites, Hispanic, students who are eligible for free/reduced-price school lunch, students identified as having disabilities, males and females. Colorado fourth-grade Black students scored the same in the 2013 and 2015 math assessments.

- In comparison to 2013, average math scores for eighth graders in 2015 were the same for White, Black, and Hispanic eighth-grade students as well as for males, students who are eligible for free/reduced-price school lunch and students identified as having disabilities.
- The Colorado eighth grade average math score for females decreased by 6 points from 2013 to 2015.
- There has been a 9 percent increase from 2003 to 2015 of Colorado fourth-graders that scored at or above NAEP Proficient. In 2003, 34 percent scored at or above Proficient; in 2015, 43 percent scored at or above Proficient which is a 9 percent increase.
- 2015 score gaps for grade 4 and grade 8 math for White/Hispanic groups and White/Black groups did not differ significantly in comparison to 2003.
- Colorado grade 8 students who were eligible for free & reduced-price school lunch, an indicator of low family income, rose 8 points for performance at or above the *NAEP Basic level* on the math assessment since the 2003 test (2003 = 50%, 2015 = 58%).

Colorado NAEP Math Grade 8: Low Family Income Students % At or Above Basic	
2003	50
2015	58 ↑ 8 points significant increase

- The CO grade 8 Former English Language Learner students (those who have exited English language support services) have significantly increased 17 points in the math scale score since the administration of the 2009 test. (2009 = 276, 2015 = 294).

CO Math Grade 8 Former English Language Learner Students		
Year	Average scale score	Change
2009	276.4	
2015	293.5	↑ 17 points Significant increase

NOTE: Statistical comparisons are calculated on the basis of unrounded scale scores or percentages.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003, 2005, 2007, 2009, 2011, 2013 and 2015 Mathematics Assessments.

Links for further information

- Links to the 2015 Colorado NAEP grades 4 and 8 Math Snapshot Reports:
<http://www.cde.state.co.us/assessment/naep2015gr48math>
- Link to Item Maps:
<http://nces.ed.gov/nationsreportcard/itemmaps/index.asp>
- NAEP 101 Video:
http://youtu.be/J6Zml8b_EKI