

## Summary of Facts: 2013 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 2013 math assessment was administered to a representative sample of fourth and 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 math assessment window for Colorado students was January 28 – March 8, 2013.
- Each student received two 25-minute math tests, in addition to general background questions and math-specific background questions. The test requires about an hour per student to administer.

### Participation Facts:

- Nationwide: 186,500 fourth- grade students in 7,930 schools participated.
- Nationwide: 170,100 eighth-grade students in 6,520 schools participated.
- Colorado: 3,000 fourth- grade students in 118 schools participated.
- Colorado: 2,700 eighth-grade students in 111 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 2013 grades 4 and 8 math assessments are based on the 2013 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): <http://www.nagb.org/publications/frameworks/mathematics/2013-mathematics-framework.html>

#### Overall Key Findings for grade four

- In 2013, the average scale score for students in grade 4 math in Colorado was 247. This was significantly higher than the score for public school students across the nation (241).
- In 2013, there were 3 states that outperformed Colorado in average scale score (*Minnesota, New Hampshire, Massachusetts*), 15 states that were not significantly different than Colorado and 33 scored significantly lower than Colorado.
- The Colorado grade 4 math 2013 average scale score (247) has significantly risen by 26 points since the 1992 test administration (221).
- In 2013, the percentage of Colorado's grade 4 students who performed at or above NAEP *Proficient* level was 50 percent. This is significantly higher than the percentage of the nation's public school grade 4 students who performed at the same level (41 percent).
- The percentage of students in Colorado who performed at or above NAEP *Proficient* in 2013 (50 percent) was not significantly different than that in 2011 (47 percent).
- In 2013, the percentage of Colorado's students who performed at or above NAEP *Basic* level was 87 percent. This is significantly higher than the percentage of the nation's public school students who performed at the same level (82 percent).
- The percentage of students in Colorado who performed at or above *Basic* in 2013 (87 percent) was significantly higher than that that in 2011 (84 percent).
- The percentage of students in Colorado who performed at the *Advanced* level in 2013 (11 percent) was not significantly different than that in 2011 (10 percent).

#### Overall Key Findings for grade eight

- In 2013, the average scale score for students in grade 8 math in Colorado was 290. This was significantly higher than the score for public school students across the nation (284).

- In 2013, there were 5 states that outperformed Colorado in average scale score (*Minnesota, Vermont, New Hampshire, Massachusetts, New Jersey*), 15 states that were not significantly different than Colorado and 31 scored significantly lower than Colorado.
- The 2013 Colorado grade 8 math average scale score (290) is *not significantly different* than the 2011 score (292) and has *remained flat since the 2007 test* (286).
- The percentage of Colorado's students who performed at or above NAEP *Proficient* level was 42 percent in 2013. This is significantly higher than the percentage of the nation's public school students who performed at the same level (34 percent).
- The percentage of students in Colorado who performed at or above NAEP *Proficient* in 2013 (42 percent) was not significantly different than that in 2011 (43 percent).
- The percentage of Colorado's students who performed at or above the NAEP *Basic* level was 77 percent in 2013. This is significantly higher than the percentage of the nation's public school students who performed at the same level (73 percent).
- The percentage of students in Colorado who performed at or above *Basic* in 2013 (77 percent) was not significantly different than that in 2011 (80 percent).
- The percentage of students in Colorado who performed at the *Advanced* level in 2013 (12 percent) was not significantly different than that in 2011 (12 percent).

#### Trend Results: overall and by subgroups

##### Nation

- Compared to 1990, average scores are up 28 points at grade 4 and 22 points at grade 8, with 1-point gains since 2011 at both grades reflecting the steady progress students are making in mathematics.
- Hispanic students at both grades posted 2-point gains since 2011. Eighth-grade Asian/Pacific Islander students and American Indian/Alaska Native students made 4-point gains.
- Compared to 2011, higher percentages of students at both grades are performing at the *Advanced* level.

##### Colorado

- In grade four, Colorado is one of only 16 states that increased the average score since the 2011 test administration.
- Colorado grade 4 students who were eligible for free & reduced-price school lunch, an indicator of low family income, rose 18% for performance at or above the *NAEP Basic level* on the Math Assessment since the 2003 test (2003 = 58%, 2013 = 76%).

CO NAEP Math Grade 4: Low Family Income Students % At or Above Basic	
2003	58
2011	76↑

- The CO grade 4 English Language Learners have increased 15 points in the scale score since the administration of the 2003 test. (2003 = 206, 2013 = 221) and that is with a 98% inclusion rate of the selected English Language Learners.
- In 2013 NAEP math, there is no achievement gap in scale score between CO grade 4 males and females (males = 248, females = 246).
- Colorado has remained flat in grade 8 math since the 2007 test administration (2013 = 290; 2007 = 286).
- The Colorado grade eight student population that qualifies for free and reduced lunch in the National School Lunch Program has increased from 29% of the total population in 1996 to 42% in 2013.
- Both the CO eligible and non-eligible students for the National School Lunch Program (indicator of family income) have improved their scale scores since the administration of the 2003 test although the gap has not narrowed ('13 gap = 30 points, '03 gap = 30 points).

Year	Eligible for NSLP- low family income		Not eligible for NSLP- high family income		Gap
	Average scale score	Change	Average scale score	Change	
2013	272	↑	302	↑	30 points
2003	262		292		30 points

- In 2013 NAEP math, there is no achievement gap between the Colorado grade 8 males and females (males = 289, females = 290). There has not been a performance gap between these groups since the 2003 test.
- In the 2013 test, there is a 40 points achievement gap in average scale score between the Colorado eighth grade White and Black students (*Whites* = 300, *Blacks* = 260). This gap was not significantly different than that in 1990 (36 points).
- In the 2013 test, there is a 40 points achievement gap in average scale score between the Colorado eighth grade White and Hispanic students (*Whites* = 300, *Hispanics* = 273). This gap was not significantly different than that in 1990 (27 points).

#### State Comparisons

- Three states, Minnesota, New Hampshire and Massachusetts scored higher than Colorado in the 2013 grade 4 math assessment (MN = 253, NH = 253, MA = 253, CO = 244).

- In the 2013 grade 4 math test, Colorado outperformed 33 states and was not significantly different than 15 states.
- In the 2013 grade 4 math test, Colorado was one of only 16 states that improved their average scale score since 2011. States that also improved are Arizona, Delaware, District of Columbia, Hawaii, Indiana, Iowa, Minnesota, Nebraska, New York, North Dakota, Tennessee, Washington, West Virginia, Wyoming and Department of Defense schools.
- In 2013, five states, Massachusetts, Minnesota, New Hampshire, New Jersey and Vermont scored higher than Colorado in the 2013 grade 8 math assessment (MA = 301, MN = 295, NH = 296, NJ = 296, VT = 295, CO = 290).
- In 2013, eighth-grade Colorado students fared better than the nation in all five of the math areas: algebra, data analysis, statistics, and probability, geometry, measurement and number properties and operations.
- In 2013, only two states/jurisdictions had higher performing 8<sup>th</sup> grade White students than Colorado (DC = 317, Maryland = 307, CO = 300).
- In 2013, only one state, North Dakota, had higher performing 4<sup>th</sup> grade Black males than Colorado (North Dakota = 242, CO = 227).
- In 2013, only three states had higher performing 4<sup>th</sup> grade females than Colorado (Minnesota = 253, Massachusetts = 253, New Hampshire = 251, CO = 246)
- In 4<sup>th</sup> grade, out of all the states/jurisdictions, only Maine narrowed the White-Black gap from 2011 to 2013. Iowa, Ohio and Oklahoma widened the gap. All other states had no significant change in the White-Black gap.
- In 4<sup>th</sup> grade, no state narrowed the White-Hispanic gap from 2011 to 2013. Maryland and Tennessee widened the gap.
- In 8<sup>th</sup> grade, no state narrowed the White-Black gap from 2011 to 2013. No states widened the gap.
- In 8<sup>th</sup> grade, Hawaii, Maryland, Nevada, New Jersey and Wyoming narrowed the White-Hispanic gap from 2011 to 2013. Michigan widened the gap.

#### Links for further information

- For more information about the 2013 Colorado NAEP math results go to the state profile site:  
<http://nces.ed.gov/nationsreportcard/states>
- Links to the 2013 Colorado NAEP grades 4 and 8 Math Snapshot Reports:  
<https://publicsite.naepdev.org/nationsreportcard/pdf/stt2013/2014465CO4.pdf>  
<https://publicsite.naepdev.org/nationsreportcard/pdf/stt2013/2014465CO8.pdf>
- Link to Item Maps:  
<https://publicsite.naepdev.org/nationsreportcard/itemmaps/>
- Sample NAEP questions/released items:  
<http://nces.ed.gov/nationsreportcard/itmrlsx/>