

Background Information

- NAEP provides national and state achievement results of elementary and secondary students in the United States for 4th and 8th grade math every 2 years.
- NAEP was established in 1969 and is a project of the National Center for Education Statistics (NCES) under the U.S. Department of Education.
- The assessments are not designed to provide individual student, school, or district results with the exception of districts participating in NAEP's Trial Urban District Assessment (TUDA) program.
- 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.
- NAEP results are used in setting education policy at a National level. 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 2019 math assessment was administered to a representative sample of fourth and eighth-graders at the national level and at the state level.
- In 2019, the NAEP mathematics assessment was administered as a digitally based assessment (DBA) at grades 4 and 8; prior to 2017, paper-based assessments (PBA) were administered.
- The results from the 2019 assessment can be compared to those from previous years, showing how students' performance in mathematics has changed over time.
- The student survey is no longer administered in Colorado.
- Including transition time, and directions, it takes approximately 90 minutes for students to complete the math assessment.
- The NAEP math assessment window for Colorado students was January 30, 2019 through March 10, 2019.

Participation

All 50 states, the District of Columbia and Department of Defense schools participated.

Nationwide

- Nationwide: 144,700 public school fourth- grade students in 7,830 schools participated.
- Nationwide: 138,100 public school eighth-grade students in 6,550 schools participated.

Colorado

- Colorado: 3,200 public school fourth- grade students in 170 schools participated.
- Colorado: 3,100 public school eighth-grade students in 150 schools participated.

Frameworks

- For grades 4 and 8, the mathematics framework for the 2019 assessment is similar to earlier versions that guided the 1990, 1992, 1996, 2000, 2003, 2005, 2007, 2009, 2011, 2013, 2015 and 2017 mathematics assessments allowing students' performance in 2019 to be compared with previous years.
- Link to Frameworks (standards): <https://www.nagb.gov/naep-frameworks/mathematics.html>
- The 2019 mathematics framework classifies assessment questions in two dimensions, content area and mathematical complexity

Content

- Number properties and operations measures students' understanding of ways to represent, calculate, and estimate with numbers.
- Measurement assesses students' knowledge of measurement for such attributes as capacity, length, area, volume, time, angles, and rates.
- Geometry measures students' knowledge and understanding of shapes in two and three dimensions and relationships between shapes such as symmetry and transformations.
- Data analysis, statistics, and probability measures students' understanding of data representation, characteristics of data sets, experiments and samples, and probability.
- Algebra measures students' understanding of patterns, using variables, algebraic representation, and functions.

Mathematical Complexity

- Low complexity questions typically specify what a student is to do, which is often to carry out a routine mathematical procedure.
- Moderate complexity questions involve more flexibility of thinking and often require a response with multiple steps.
- High complexity questions make heavier demands and often require abstract reasoning or analysis in a novel situation.

Scoring

Scale Scores

- Both the NAEP grade 4 and 8 math scales range from 0 to 500.
- The assessments are not designed to provide individual student, school, or district results.

Math Achievement Levels

	Grade 4	Grade 8
Below Basic	0–213	0–261
Basic	214–248	262–298
Proficient	249–281	299–332
Advanced	282–500	333–500

- At or above Basic includes Basic, Proficient, and Advanced. At or above Proficient includes Proficient and Advanced.
- NAEP scores are only reported as “higher” or “lower” if the difference is statistically significant ($p < 0.05$).

Key Findings for Colorado NAEP 2019 Mathematics

Overall Key Findings for Grade Four Math

- In 2019, the average mathematics score for fourth-grade students in Colorado was 242. This was not significantly different from that for the nation's public schools (240).
- In 2019, 7 states/jurisdictions outperformed Colorado in average scale score (Department of Defense, Minnesota, Massachusetts, Virginia, Florida, New Jersey, and Wyoming), 24 states were not significantly different than Colorado, and 20 scored lower than Colorado.
- In 2019, the average score for students in Colorado (242) was not significantly different from that in 2017 (241) and was lower than that in 2011 (244).
- In 2019, the percentage of students in Colorado who performed at or above Proficient was 44 percent. This was significantly different from that for the nation's public schools (40 percent).
- In 2019, the percentage of students in Colorado who performed at or above Proficient (44 percent) was not significantly different from that in 2017 (42 percent) or in 2015 (43 percent).
- In 2019, the percentage of students in Colorado who performed at or above Basic was 80 percent. This was the same as the nation's public schools (80 percent).
- In 2019, the percentage of students in Colorado who performed at or above Basic (80 percent) was the same as that in 2017 (80 percent) and was lower than that in 2011 (84 percent).

Overall Key Findings for Grade Eight Math

- In 2019, the average mathematics score for eighth-grade students in Colorado was 285. This was higher than that for the nation's public schools (281).
- In 2019, 5 states/jurisdictions outperformed Colorado in average scale score (Department of Defense, Minnesota, Massachusetts, and Wisconsin), 20 states were not significantly different than Colorado, and 26 scored lower than Colorado.
- In 2019, the average score for students in Colorado (285) was not significantly different from that in 2017 (286) and was lower than that in 2011 (292).
- In 2019, the percentage of students in Colorado who performed at or above Proficient was 37 percent. This was greater than that for the nation's public schools (33 percent).
- In 2019, the percentage of students in Colorado who performed at or above Proficient (37 percent) was not significantly different from that in 2017 (38 percent) and was lower than that in 2011 (43 percent).
- In 2019, the percentage of students in Colorado who performed at or above Basic was 73 percent. This was greater than that for the nation's public schools (68 percent).
- In 2019, the percentage of students in Colorado who performed at or above Basic (73 percent) was not significantly different from that in 2017 (74 percent) and was lower than that in 2011 (80 percent).

National Math Trend Results

- In 2019, students had an average score in mathematics of 241 points at grade 4 and 282 points at grade 8 on separate 0- 500 point scales.
- In grade 4, there was a one-point change in the average math scores from 2017 to 2019. In grade 8, there was a 1-point decrease in the average math score in 2019 compared to 2015.
- 2019 math average scores at grade 4 have been similar since 2005 and average math scores in grade 8 average scores been similar since 2007.
- In 2019, average grade 4 mathematics scores for Hispanic students, students who were eligible for the National School Lunch Program, and students attending public, non-charter schools student groups have significantly higher average scores in comparison to 2017.
- In 2019, average mathematics scores for most student groups at grade 8 has no changes in comparison to 2017, except for male students; and students attending public schools who showed decreases by 1-point.
- No significant changes in the 2019 White – Black and White – Hispanic score gaps in fourth-and eighth grade mathematics compared to 2017.

Colorado Grade Four Math Trend Results

Race/Ethnicity

- In 2019, the average scale scores of White students in Colorado were not significantly different from their respective average scale scores in 2007, 2009, 2011, 2015, and 2017 and were lower than their average scale score in 2013.
- In 2019, the average scale scores of Hispanic students in Colorado were not significantly different from their respective average scale scores in 2005, 2007, 2009, 2011, 2015, and 2017 and were lower than their average scale score in 2013.
- In 2019, the average scale scores of Black students in Colorado were not significantly different from their respective average scale scores in 2003, 2005, 2007, 2009, 2011, 2013, 2015, and 2017.
- In 2019, Hispanic students in Colorado had an average score that was lower than that of White students by 25 points. In 2011, the average score for Hispanic students was lower than that of White students by 24 points.
- In 2019, Black students in Colorado had an average score that was lower than that of White students by 28 points. In 2011, the average score for Black students was lower than that of White students by 29 points.
- In 2019, 2 state/jurisdiction had a higher White–Hispanic score gap than Colorado, 23 states/jurisdictions had a White–Hispanic score gap not significantly different from Colorado, and 24 states/jurisdictions had a lower White–Hispanic score gap.
- In 2019, 1 states/jurisdictions with a higher White–Black score gap than Colorado, 36 states/jurisdictions had a White–Black score gap not significantly different from Colorado, and 5 states/jurisdictions had a lower White–Black score gap.

Gender

- In 2019, male students in Colorado had an average score in mathematics (245) that was significantly higher from that of female students (239). In 2011, male students in Colorado had an average score in mathematics (246) that was not significantly different from that of female students (243).
- In 2019, male students in Colorado had an average scale score in mathematics (245) that was significantly higher than that of male students in public schools across the nation (242). However, female students in Colorado had an average scale score (239) that was not significantly different from that of female students across the nation (238).

Student Eligibility for the National School Lunch Program

- In 2019, students in Colorado eligible for free/reduced-price lunch had an average mathematics scale score of 225. This was lower than that of students in Colorado not eligible for this program (254).
- In 2019, students in Colorado who were eligible for free/reduced-price school lunch had an average score that was lower than that of students who were not eligible by 29 points. In 2011, the average score for students in Colorado who were eligible for free/reduced-price school lunch was lower than the score of those not eligible by 25 points.
- In 2019, students in Colorado eligible for free/reduced-price lunch had an average scale score (225) that was significantly lower from that of students in the nation who were eligible (229).
- In 2019, no state/jurisdiction had a higher eligible/not eligible for free/reduced-price-lunch score gap than Colorado, 19 states/jurisdictions had an eligible/not eligible for free/reduced-price-lunch score gap not significantly different from Colorado, and 32 states/jurisdictions had a lower eligible/not eligible for free/reduced-price-lunch score gap.

Students with Disabilities

- In 2019, students with disabilities in Colorado had a lower average score (209) than the average score of students without disabilities (246) by 37 points. Colorado's 37 point students with disabilities – non-disabled students score gap was larger than the national 30 point score gap.

English Language Learners

- In 2019, English language learners in Colorado had a lower average score (213) than the average score of non-English language learners (247) by 34 points. Colorado's 34 point English language learners – non-English language learners score gap was larger than the national 24 point score gap.

Colorado Grade Eight Math Trend Results

Race/Ethnicity

- In 2019, the average scale scores of White students in Colorado were not significantly different from their respective scores in 2003, 2005, 2007, 2009, 2013, 2015, and 2017.
- In 2019, the average scale scores of Hispanic students in Colorado were not significantly different from their respective scores 2007, 2009, 2011, 2013, 2015, and 2017.
- In 2019, the average scale score of Black students in Colorado was not significantly different from their respective scores in 2003, 2005, 2009, 2013, 2015, and 2017.
- In 2019, Hispanic students in Colorado had an average score that was lower than that of White students by 27 points. In 2011, the average score for Hispanic students was lower than that of White students by 31 points.
- In 2019, Black students in Colorado had an average score that was lower than that of White students by 34 points. In 2011, the average score for Black students was lower than that of White students by 32 points.
- In 2019, 5 state/jurisdiction had a higher White–Hispanic score gap than Colorado, 21 states/jurisdictions had a White–Hispanic score gap not significantly different from Colorado, and 23 states/jurisdictions had a lower White–Hispanic score gap.
- In 2019, 3 state/jurisdiction had a higher White–Black score gap than Colorado, 36 states/jurisdictions had a White–Black score gap not significantly different from Colorado, and 4 states/jurisdictions had a lower White–Black score gap.

Gender

- In 2019, male students in Colorado had an average score in mathematics (285) that was significantly different from that of female students (284). In 2011, male students in Colorado had an average score in mathematics (291) that was not significantly different than that of female students (291).
- In 2019, male students in Colorado had an average scale score in mathematics (285) that was higher than that of male students in public schools across the nation (280). However, female students in Colorado had an average scale score (284) that was not significantly different from that of female students across the nation (282).

Student Eligibility for the National School Lunch Program

- In 2019, students in Colorado eligible for free/reduced-price lunch had an average mathematics scale score of 265. This was lower than that of students in Colorado not eligible for this program (297).
- In 2019, students in Colorado who were eligible for free/reduced-price school lunch had an average score that was lower than that of students who were not eligible by 32 points. This performance gap was not significantly different that of 2011 (30 points).
- In 2019, students in Colorado eligible for free/reduced-price lunch had an average scale score (265) that was not significantly different from that of students in the nation who were eligible (266).
- In 2019, 1 state/jurisdiction had a higher eligible/not eligible for free/reduced-price-lunch score gap than Colorado, 29 states/jurisdictions had an eligible/not eligible for free/reduced-price-lunch score gap not significantly different from Colorado, and 21 states/jurisdictions had a lower eligible/not eligible for free/reduced-price-lunch score gap.

Students with Disabilities

- In 2019, students with disabilities in Colorado had a lower average score (244) than the average score of students without disabilities (290) by 46 points. Colorado's 46 point students with disabilities – non-disabled students score gap is not significantly different from the national 40 point score gap.

English Language Learners

- In 2019, English language learners in Colorado had a lower average score (239) than the average score of non-English language learners (288) by 49 points. Colorado's 49-point students who are English language learner – not English language learner score gap was larger than the national 41-point score gap.



Links

- NAEP website: <http://nces.ed.gov/nationsreportcard/mathematics>
- Links to individual snapshot reports for each participating state and other jurisdictions: <http://nces.ed.gov/nationsreportcard/states/>
- Link to The NAEP Data Explorer interactive database: <http://nces.ed.gov/nationsreportcard/naepdata/>
- NAEP 101 Video: http://youtu.be/J6Zml8b_EKI