



Mapping State Proficiency Standards Onto the NAEP Scales

Results From the 2019 NAEP Reading and Mathematics Assessments





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What is NAEP?

The National Assessment of Educational Progress (NAEP), also known as The Nation's Report Card™, is an assessment program conducted by the National Center for Education Statistics (NCES) to inform the public of what elementary and secondary students in the United States know and can do in various subject areas, including reading, mathematics, and science.

Since 1969, NAEP has been a common measure of student achievement across the country. The NAEP program includes long-term trend NAEP and main NAEP. The long-term trend NAEP monitors trends and reports student performance based on nationally representative samples of 9-, 13-, and 17-year-olds. The main NAEP reflects current educational content and assessment methodology and measures performance of students in grades 4, 8, and 12 at the national level. The main NAEP also reports results of grades 4 and 8 reading and mathematics for participating states and selected large urban school districts.

The National Assessment Governing Board oversees and sets policy for the NAEP program.

Additional information about main NAEP is available at https://nces.ed.gov/nationsreportcard/.

An Overview of the Study

NCES has periodically published reports using results from NAEP to compare the proficiency standards states set for their students. Since standards vary across states, the results of the various state assessments cannot be used to directly compare students' progress. However, by placing a state standard onto the NAEP scale, a common metric for all states, a NAEP equivalent score of that standard is produced, which can be compared across states. The last mapping study report released by NCES (NCES 2019-040) compared state proficiency standards for school year 2016–17.

This report highlights the results of mapping state proficiency standards onto the NAEP scales using state assessment results from the 2018–19 school year and the 2019 NAEP assessments for public schools. The study focuses on the reading and mathematics standards that states set for grades 4 and 8. For each state, the report displays the NAEP equivalent scores with a range of 0–500. The NAEP equivalent scores are shown with respect to the NAEP achievement levels: *NAEP Basic* and *NAEP Proficient*.

As is typical in NAEP reporting, 2019 results are compared with 2017 results to show more recent changes and with 2009 results to show longer-term change.

The analyses conducted for this edition of the study address the following questions:

- What are the 2019 NAEP equivalent scores for the states?
- How do the 2019 NAEP equivalent scores compare with those from 2017 and 2009?

Overall, in 2019, state standards for proficient performance mapped at the *NAEP Basic* achievement level for most states in both grades and subjects. In addition, for states with all 3 years of data, the differences between the highest and lowest NAEP equivalent scores of the state standards were larger in 2019 compared to 2017 in grade 4 mathematics and grade 8 reading, and smaller in grade 8 mathematics. In all grades and subjects, the differences were smaller in 2019 than in 2009.

The mapping study has contributed to the discussion on achievement standards for the nation's students since 2003. The study is intended to help readers understand the myriad state assessment results that are otherwise difficult to compare and to serve a policy need for reliable information that compares state standards. The study is not an evaluation of the various state assessments or of the quality of the states' achievement standards, and the findings should not be interpreted as evidence of deficiencies in state assessments or in NAEP. It should be noted that state assessments and NAEP may vary in format and administration because they have different goals and are developed for different purposes. The mapping of the state standards for proficient performance does not imply that the NAEP achievement levels are more valid than the state standards or that states should emulate NAEP standards. A wide range of policy considerations are involved in setting achievement standards, and what is appropriate for NAEP may not be the best fit for a given state. Please see the 2013 report (NCES 2015-046) for a more complete discussion of the study's limitations. NAEP's achievement levels are used in this study to interpret the meaning of the NAEP scale scores. As provided by law, NAEP achievement levels are to be used on a trial basis and should be interpreted with caution.¹

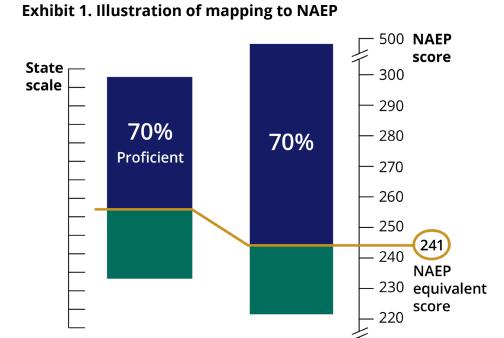
¹ For more information on the NAEP achievement levels and their trial status, see https://nces.ed.gov/nationsreportcard/guides/scores_achv.aspx.

Mapping State Standards Onto the NAEP Scales

This mapping report displays the NAEP equivalent score for each state, which is the placement of state standards for proficient performance in reading and mathematics onto the 0–500 NAEP scale. **Exhibit 1** illustrates the process for estimating a NAEP equivalent score. The bar on the left

shows performance on the state assessment for a given grade and subject, where 70 percent of students in the state met the state standard for proficiency. The bar on the right shows performance on NAEP. It shows that the top 70 percent of students in that state performed at or above the NAEP score of 241. The score 241 is the estimated NAEP score equivalent to the state standard for proficient performance.

While some states created their own assessment programs, other states participated in one of two testing programs: the Partnership for Assessment of Readiness for College and Careers or the Smarter Balanced



Performance

on NAEP

- 0

Assessment Consortium (referred to as PARCC and SBAC, respectively; see **table 2**). For those states, NAEP equivalent scores were estimated in two ways. First, the NAEP equivalent scores were estimated for the testing program as a whole by considering the participating states as one single jurisdiction. The figures in the main report show these estimates. Second, the NAEP equivalent scores were estimated for each state individually, and these estimates are found in **tables A-1** and **A-2** in the **Technical Notes** available at https://nces.ed.gov/nationsreportcard/subject/publications/studies/pdf/2021036a.pdf. The Technical Notes (NCES 2021-036-A) also provide additional details on the mapping methodology.

Performance on

state assessment

Data Sources

The analyses in this report are based on NAEP and state assessment results for public schools that participated in the grades 4 and 8 NAEP assessments in reading and mathematics, weighted to represent the state's public school students. The analyses used data from (a) NAEP data files for the states (including the District of Columbia and Puerto Rico,² which are referred to as states in this report) that participated in the 2019 assessments and (b) state assessment 2018–19 school-level achievement data from EDFacts and, in some cases, directly from the states. In addition, this report includes results from earlier mapping studies in 2009 (NCES 2011-458) and 2017 (NCES 2019-040) to make comparisons with 2019 results.

Data availability

For 2019, New Hampshire was not included in the mapping study because the state did not use the same assessment for all students in either of the grades or subjects. West Virginia was not included for grades 4 and 8 reading because the data were not available. Puerto Rico was not included for grades 4 and 8 reading because the NAEP reading assessments were not administered in the jurisdiction.

Furthermore, some states were not included in the analyses for grade 8 because of differences in the population and content assessed by NAEP and the state assessments. In 2009, 2017, and 2019, some states did not require all grade 8 students to take the state's general assessments. For example, some students took an end-of-course assessment in advanced English language arts, algebra I, or geometry in place of the general reading or mathematics assessment. As a result, the student populations assessed by the state and by NAEP may not necessarily be the same. Other states administered assessments focused on specific content within reading/English language arts or mathematics.

For these states, the differing content assessed by NAEP and the state assessment precluded the state standard from being mapped onto the NAEP scale. In 2019, the PARCC standard for grade 8 mathematics was not estimated because the states participating in PARCC did not require all grade 8 students to take a general mathematics assessment (e.g., some students took an algebra I exam).

To determine if the mapping was appropriate, NCES surveyed the states on their assessment practices in each school year and followed up with each state to resolve unexplained discrepancies identified during the data review process. **Table 1** lists the states not included in the analyses. Note that not being able to map these states onto the NAEP scale does not suggest a problem with the quality of the state assessment or performance standard; rather, it indicates that these state standards could not be meaningfully mapped onto the NAEP scale.

² Mathematics only. In Puerto Rico, NAEP mathematics assessments are translated into Spanish.

Data Sources—Continued

Table 1. States that were not included in the mapping study, by grade and subject: 2019

Subject	Grade 4	Grade 8
Reading	New Hampshire, Puerto Rico, and West Virginia (3 states)	Delaware, Georgia, New Hampshire, Puerto Rico, Texas, and West Virginia (6 states)
Mathematics	New Hampshire (1 state)	Arizona, District of Columbia, Delaware, Florida, Georgia, Louisiana, Maryland, Missouri, North Carolina, New Hampshire, New Jersey, New Mexico, New York, Ohio, Tennessee, Texas, and Virginia (17 states)

NOTE: New Hampshire was not included in the study for either grade or subject because the state did not use the same assessment for all students in either of the grades or subjects. West Virginia was not included for grades 4 and 8 reading because the data were not available. Puerto Rico was not included for grades 4 and 8 reading because the NAEP reading assessments were not administered in the jurisdiction. The remaining states were not included in the study because their state assessment did not include a general reading or mathematics assessment for all students.

SOURCE: State education agencies.

Testing programs

Each state determines the assessment to measure its students' progress in relation to the standards it sets. Information about the state assessment program is confirmed by the NAEP State Coordinators. Some states use the same set of standards and testing program. As noted in the section Mapping State Standards Onto the NAEP Scales, for states that belong to a testing program, the mapping results are reported for the standards from the testing program on the NAEP scale found within this report and for the individual states on the NAEP scale found in **tables A-1** and **A-2** in the **Technical Notes** available at https://nces.ed.gov/nationsreportcard/subject/publications/studies/pdf/2021036a.pdf. **Table 2** lists the states and their respective testing programs for 2019.

Table 2. States and their testing program: 2019

	<u> </u>
Testing program	States
Partnership for Assessment of Readiness for College and Careers (PARCC)	District of Columbia, Louisiana, and Maryland (3 states)
Smarter Balanced Assessment Consortium (SBAC)	California, Connecticut, ¹ Delaware, Hawaii, Idaho, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington (11 states)
Individual state program	Alabama, Alaska, Arizona, Arkansas, Colorado, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, and Wyoming (38 states)

¹ Connecticut was not included when estimating the SBAC reading standard because the state did not use all SBAC reading assessment components. NOTE: This current report did not include a group estimate for the ACT Aspire testing program because only one state, Arkansas, used the program in school year 2018–19 and the state is included as an individual state testing program. An estimate for ACT Aspire was included in the 2015 and 2017 mapping reports because more than one state used the program, Alabama and South Carolina in school year 2014–15 and Alabama and Arkansas in 2016–17. SOURCE: State education agencies.

Note that there may be different cut points mapped onto the NAEP scales for states sharing the same tests and achievement standard, as well as for year-to-year changes in the estimates of the same states that did not change tests or standards. The different cut points on the NAEP scale could be due to various reasons, such as curricular differences that affect what students learn; differences in student populations assessed; or changes in policies related to test administration practices.

Interpreting the Results

For each grade (4 and 8) and subject (reading and mathematics), there are three sets of results with an accompanying figure:

- The first figure shows the estimates of the 2019 NAEP equivalent score for proficient performance on a state standard for each state. States are displayed in ascending order based on their NAEP equivalent score (i.e., from lowest to highest). States participating in PARCC and SBAC are shown in alphabetical order.
- ◆ The second figure describes the number of states whose standards for proficient performance can be classified into each range of NAEP achievement levels (below NAEP Basic, NAEP Basic, and NAEP Proficient) for 2009, 2017, and 2019.
- The third figure presents the range between the highest and lowest NAEP equivalent scores of state standards for proficient performance in 2009, 2017, and 2019.

Only states with all 3 years of data are included in the second and third figures. Therefore, results presented in this report may not necessarily match those in the earlier reports (NCES 2011-458 or NCES 2019-040).

Figures showing the NAEP equivalent scores of state standards for proficient performance have vertical lines around each state's NAEP equivalent score, which indicate the margin of error associated with the estimate. If the lower or upper limit of the margin of error crosses a line associated with a NAEP achievement level, the state standard is classified in the higher level. When shown, a black triangle under a state indicates that the relative error of the NAEP equivalent score of that state's standard is large and that results should be interpreted with caution. More details on the results can be found in the **Technical Notes** (NCES 2021-036-A).

Although NAEP results are reported on a 0–500 scale for different grades and subjects, they do not have the same meaning across grades or subjects. Therefore, results shown in figures or tables are not comparable across grades or subjects.

Table 3 displays the cut score for each achievement level in reading and mathematics for grades 4 and 8.

Table 3. NAEP achievement level cut scores by subject and grade

	Rea	ding	Mathematics				
NAEP achievement level	Grade 4	Grade 8	Grade 4	Grade 8			
NAEP Basic	208	243	214	262			
NAEP Proficient	238	281	249	299			
NAEP Advanced	268	323	282	333			

NOTE: The NAEP scales in reading and mathematics range of 0–500. NAEP achievement levels are performance standards that describe what students should know and be able to do. Students performing at or above the *NAEP Proficient* level on NAEP assessments demonstrate solid academic performance and competency over challenging subject matter. *NAEP Proficient* does not represent grade-level proficiency as determined by other assessment standards (e.g., state or district assessments). NAEP scores do not have the same meaning across grades or subjects, and cut scores are not comparable across grades or subjects. The NAEP achievement level cut scores shown in the table are maintained with no changes since their establishment in the early 1990s. Learn more about the <u>NAEP</u> achievement levels.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), retrieved from https://nces.ed.gov/nationsreportcard/reading/achieveall.aspx (for reading) and https://nces.ed.gov/nationsreportcard/mathematics/achieveall.aspx (for mathematics).

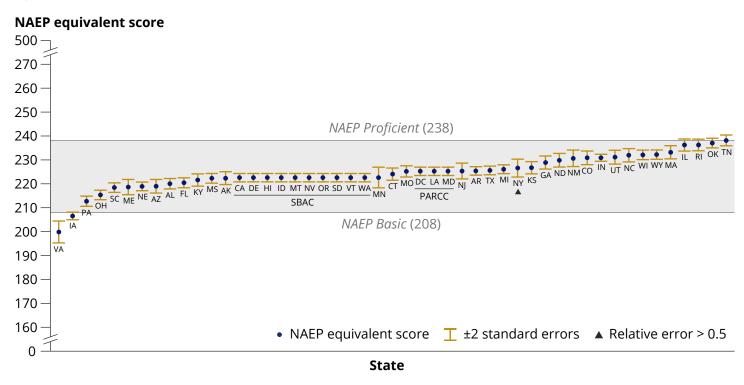


2019 Grade 4 Reading

Overall, state standards for proficient performance mapped at a higher NAEP achievement level in 2019 than in 2009. In addition, the difference between the highest and lowest standards was unchanged compared to 2017 but smaller than in 2009. The following figures present results for grade 4 reading.

For the first figure with 2019 data only, 49 states are included in the analysis; for the second and third figures with data from 2009, 2017, and 2019, the set of 48 states with all 3 years of data available is used in both analyses.

NAEP equivalent scores of state grade 4 reading standards for proficient performance, by state: 2019



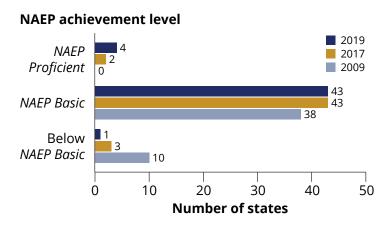
- In grade 4 reading, 48 of the 49 states included in the study had standards at or above the *NAEP Basic* level. Four states—Illinois, Rhode Island, Oklahoma, and Tennessee—had standards at the *NAEP Proficient* level, while one state—Virginia—had standards below the *NAEP Basic* level.
- Both testing programs—PARCC and SBAC—had standards that mapped at the NAEP Basic level.

NOTE: New Hampshire was not included in the study because the state did not use the same assessment for all students in grade 4 reading. Puerto Rico was not included because the NAEP grade 4 reading assessment was not administered in the jurisdiction. West Virginia was not included because state data were not available. Connecticut was not included in estimating the SBAC reading standard because the state did not use all SBAC reading assessment components. PARCC refers to Partnership for Assessment of Readiness for College and Careers, and SBAC refers to Smarter Balanced Assessment Consortium. The classification of NAEP equivalent scores into NAEP achievement levels accounts for the margin of error associated with each estimate. The standard of a state or testing program is assigned the highest NAEP achievement level for which the upper bound of the margin of error of its NAEP equivalent score equals or exceeds the cut score of the achievement level.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Reading Assessment.

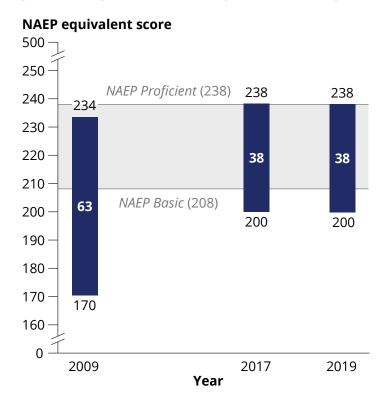


Number of states, by state standards for proficient performance in grade 4 reading classified into NAEP achievement levels: 2009, 2017, and 2019



- Of the 48 states with all 3 years of data, 47 states had grade 4 reading standards at or above the NAEP Basic level in 2019, an increase from 45 states in 2017 and 38 states in 2009.
- Four states had grade 4 reading standards at the NAEP Proficient level in 2019, an increase from two states in 2017 and no states in 2009.
- One state had grade 4 reading standards that were below the NAEP Basic level in 2019, a decrease from three states in 2017 and 10 states in 2009.

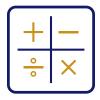
Range between the highest and lowest NAEP equivalent scores of state standards for proficient performance in grade 4 reading: 2009, 2017, and 2019



- In 2019, the difference between the highest and lowest NAEP equivalent scores for grade 4 reading was 38 points, which is smaller than the 63-point difference in 2009.
- The 38-point difference between the highest and lowest mapped standards in 2019 is larger than the difference between the grade 4 reading cut scores for the NAEP Basic and NAEP Proficient levels (see table 3).

NOTE: For comparability, Nebraska, New Hampshire, Puerto Rico, and West Virginia were excluded from the counts. As a result, 48 states with all 3 years of data were used in the comparisons (see **table 4**). The classification of NAEP equivalent scores into NAEP achievement levels accounts for the margin of error associated with each estimate. Results shown in the figures are based on unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009, 2017, and 2019 Reading Assessments.



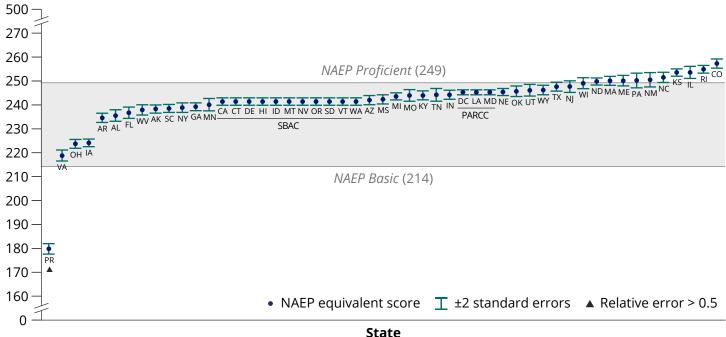
2019 Grade 4 Mathematics

Overall, state standards for proficient performance mapped at a higher NAEP achievement level in 2019 than in 2009. In addition, the difference between the highest and lowest standards was larger than in 2017 but smaller than in 2009. The following figures present results for grade 4 mathematics.

For the first figure with 2019 data only, 51 states are included in the analysis; for the second and third figures with data from 2009, 2017, and 2019, the set of 49 states with all 3 years of data available is used in both analyses.

NAEP equivalent scores of state grade 4 mathematics standards for proficient performance, by state: 2019





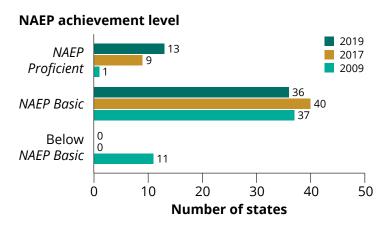
- In grade 4 mathematics, 50 of the 51 states included in the study had standards at or above the *NAEP Basic* level. Thirteen states—Texas, New Jersey, Wisconsin, North Dakota, Massachusetts, Maine, Pennsylvania, New Mexico, North Carolina, Kansas, Illinois, Rhode Island, and Colorado—had standards at the *NAEP Proficient* level.
- Both testing programs—PARCC and SBAC—had standards that mapped at the *NAEP Basic* level.

NOTE: New Hampshire was not included in the study because the state did not use the same assessment for all students in grade 4 mathematics. PARCC refers to Partnership for Assessment of Readiness for College and Careers, and SBAC refers to Smarter Balanced Assessment Consortium. The classification of NAEP equivalent scores into NAEP achievement levels accounts for the margin of error associated with each estimate. The standard of a state or testing program is assigned the highest NAEP achievement level for which the upper bound of the margin of error of its NAEP equivalent score equals or exceeds the cut score of the achievement level.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Mathematics Assessment.

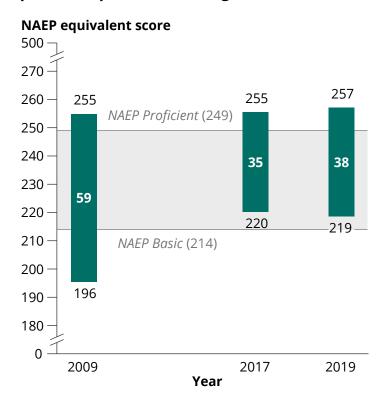


Number of states, by state standards for proficient performance in grade 4 mathematics classified into NAEP achievement levels: 2009, 2017, and 2019



- Of the 49 states with all 3 years of data, all had grade 4 mathematics standards at or above the NAEP Basic level in 2019 and in 2017, an increase from 38 states in 2009.
- Thirteen states had grade 4 mathematics standards at the NAEP Proficient level in 2019, an increase from nine states in 2017 and one state in 2009.
- None of the 49 states had grade 4 mathematics standards that were below the NAEP Basic level in 2019 or in 2017, a decrease from 11 states in 2009.

Range between the highest and lowest NAEP equivalent scores of state standards for proficient performance in grade 4 mathematics: 2009, 2017, and 2019



- In 2019, the difference between the highest and lowest NAEP equivalent scores for grade 4 mathematics was 38 points, which is larger than the 35-point difference in 2017 and smaller than the 59-point difference in 2009.
- The 38-point difference between the highest and lowest mapped standards in 2019 is larger than the difference between the grade 4 mathematics cut scores for the *NAEP Basic* and *NAEP Proficient* levels (see **table 3**).

NOTE: For comparability, Nebraska, New Hampshire, and Puerto Rico were excluded from the counts. As a result, 49 states with all 3 years of data were used in the comparisons (see **table 4**). The classification of NAEP equivalent scores into NAEP achievement levels accounts for the margin of error associated with each estimate. Results shown in the figures are based on unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009, 2017, and 2019 Mathematics Assessments.

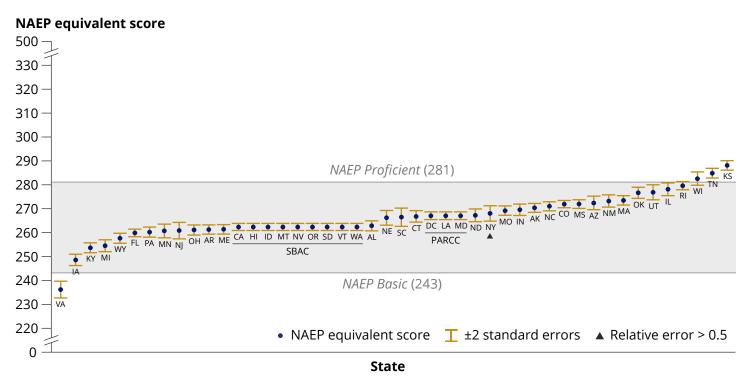


2019 Grade 8 Reading

Overall, state standards for proficient performance mapped at a higher NAEP achievement level in 2019 than in 2009. In addition, the difference between the highest and lowest standards was larger than in 2017 but smaller than in 2009. The following figures present results for grade 8 reading.

For the first figure with 2019 data only, 46 states are included in the analysis; for the second and third figures with data from 2009, 2017, and 2019, the set of 44 states with all 3 years of data available is used in both analyses.

NAEP equivalent scores of state grade 8 reading standards for proficient performance, by state: 2019



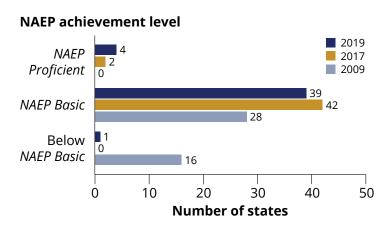
- In grade 8 reading, 45 of the 46 states included in the study had standards at or above the NAEP Basic level. Four states—Rhode Island, Wisconsin, Tennessee, and Kansas—had standards at the NAEP Proficient level, while one state—Virginia—had standards below the NAEP Basic level.
- Both testing programs—PARCC and SBAC—had standards that mapped at the *NAEP Basic* level.

NOTE: New Hampshire was not included in the study because the state did not use the same assessment for all students in grade 8 reading. Puerto Rico was not included because the NAEP grade 8 reading assessment was not administered in the jurisdiction. Delaware, Georgia, Texas, and West Virginia were not included in the study because the states did not require all eligible students to take a general grade 8 reading assessment. Connecticut was not included in estimating the SBAC reading standard because the state did not use all SBAC reading assessment components. PARCC refers to Partnership for Assessment of Readiness for College and Careers, and SBAC refers to Smarter Balanced Assessment Consortium. The classification of NAEP equivalent scores into NAEP achievement levels accounts for the margin of error associated with each estimate. The standard of a state or testing program is assigned the highest NAEP achievement level for which the upper bound of the margin of error of its NAEP equivalent score equals or exceeds the cut score of the achievement level.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Reading Assessment.

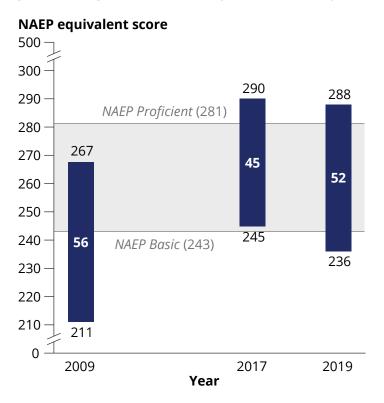


Number of states, by state standards for proficient performance in grade 8 reading classified into NAEP achievement levels: 2009, 2017, and 2019



- Of the 44 states with all 3 years of data, 43 had grade 8 reading standards at or above the NAEP Basic level in 2019, a decrease from 44 states in 2017 and an increase from 28 states in 2009.
- Four states had grade 8 reading standards at the NAEP Proficient level in 2019, an increase from two states in 2017 and no states in 2009.
- One state had grade 8 reading standards that were below the *NAEP Basic* level in 2019, an increase from no states in 2017 and a decrease from 16 states in 2009.

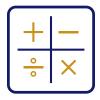
Range between the highest and lowest NAEP equivalent scores of state standards for proficient performance in grade 8 reading: 2009, 2017, and 2019



- In 2019, the difference between the highest and lowest NAEP equivalent scores for grade 8 reading was 52 points, which is larger than the 45-point difference in 2017 and smaller than the 56-point difference in 2009.
- The 52-point difference between the highest and lowest mapped standards in 2019 is larger than the difference between the grade 8 reading cut scores for the NAEP Basic and NAEP Proficient levels (see table 3).

NOTE: For comparability, Delaware, Georgia, Nebraska, Nevada, New Hampshire, Puerto Rico, Texas, and West Virginia were excluded from the counts. As a result, 44 states with all 3 years of data were used in the comparisons (see **table 4**). The classification of NAEP equivalent scores into NAEP achievement levels accounts for the margin of error associated with each estimate. Results shown in the figures are based on unrounded numbers.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009, 2017, and 2019 Reading Assessments.

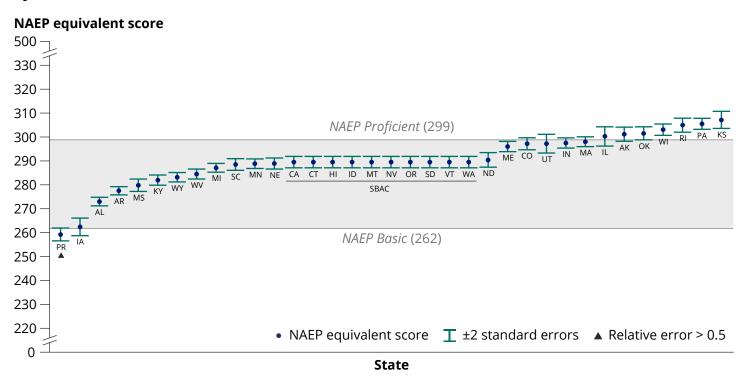


2019 Grade 8 Mathematics

Overall, state standards for proficient performance mapped at a higher NAEP achievement level in 2019 than in 2009. In addition, the differences between the highest and lowest standards have become smaller over time. The following figures present results for grade 8 mathematics.

For the first figure with 2019 data only, 35 states are included in the analysis; for the second and third figures with data from 2009, 2017, and 2019, the set of 27 states with all 3 years of data available is used in both analyses.

NAEP equivalent scores of state grade 8 mathematics standards for proficient performance, by state: 2019

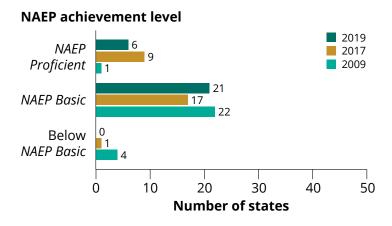


- For grade 8 mathematics, all states included in the study had standards at or above the NAEP Basic level. Eleven states—Colorado, Utah, Indiana, Massachusetts, Illinois, Alaska, Oklahoma, Wisconsin, Rhode Island, Pennsylvania, and Kansas—had standards at the NAEP Proficient level.
- The SBAC standard mapped at the *NAEP Basic* level. The PARCC standard was not estimated because the states participating in PARCC did not require all grade 8 students to take a general mathematics assessment.

NOTE: New Hampshire was not included in the study because the state did not use the same assessment for all students in grade 8 mathematics. There were 16 additional states that were not included in the study because they did not require all eligible students to take a general grade 8 mathematics assessment. SBAC refers to Smarter Balanced Assessment Consortium. The classification of NAEP equivalent scores into NAEP achievement levels accounts for the margin of error associated with each estimate. The standard of a state or testing program is assigned the highest NAEP achievement level for which the upper bound of the margin of error of its NAEP equivalent score equals or exceeds the cut score of the achievement level.

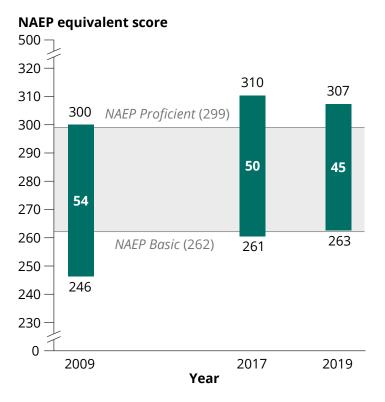
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Mathematics Assessment.

Number of states, by state standards for proficient performance in grade 8 mathematics classified into NAEP achievement levels: 2009, 2017, and 2019



- Of the 27 states with all 3 years of data, all had grade 8 mathematics standards at or above the NAEP Basic level in 2019, an increase from 26 states in 2017 and 23 states in 2009.
- Six states had grade 8 mathematics standards at the NAEP Proficient level in 2019, a decrease from nine states in 2017 and an increase from one state in 2009.
- None of the 27 states had standards that were below the NAEP Basic level in 2019, a decrease from one state in 2017 and four states in 2009.

Range between the highest and lowest NAEP equivalent scores of state standards for proficient performance in grade 8 mathematics: 2009, 2017, and 2019



- In 2019, the difference between the highest and lowest NAEP equivalent scores for grade 8 mathematics was 45 points, which is smaller than the 50-point difference in 2017 and the 54-point difference in 2009.
- The 45-point difference between the highest and lowest mapped standards in 2019 is larger than the difference between the grade 8 mathematics cut scores for the NAEP Basic and NAEP Proficient levels (see table 3).

NOTE: For comparability, Arizona, California, Colorado, Delaware, District of Columbia, Florida, Georgia, Illinois, Louisiana, Maryland, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Puerto Rico, Rhode Island, Tennessee, Texas, Utah, and Virginia were excluded from the counts. As a result, 27 states with all 3 years of data were used in the comparisons (see **table 4**). The classification of NAEP equivalent scores into NAEP achievement levels accounts for the margin of error associated with each estimate. Results shown in the figures are based on unrounded numbers. SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009, 2017, and 2019 Mathematics Assessments.

Appendix A

Table 4. State assessment data availability in grades 4 and 8, by subject and year: 2009, 2017, and 2019

	Grade 4						Grade 8					
	Reading			Mathematics			Reading			Mathematics		
State	2009	2017	2019	2009	2017	2019	2009	2017	2019	2009	2017	2019
Alabama	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Alaska	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Arizona	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	_
Arkansas	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
California	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	Υ	Υ
Colorado	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	Υ
Connecticut	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Delaware	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	Υ	Υ	_
District of Columbia	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	
Florida	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	
Georgia	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	Υ	_	
Hawaii	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Idaho	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Illinois	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	Υ
Indiana	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
lowa	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Kansas	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Kentucky	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Louisiana	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	
Maine	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Maryland	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	
Massachusetts	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Michigan	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Minnesota	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Mississippi	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Missouri	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	
Montana	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Nebraska	_	Υ	Υ	_	Υ	Υ	_	Υ	Υ	_	Υ	Υ
Nevada	Υ	Υ	Υ	Υ	Υ	Υ	Υ		Υ	Υ	_	Υ
New Hampshire	Υ	_	_	Υ	_	_	Υ	_	_	Υ	_	_
New Jersey	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	_
New Mexico	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	_
New York	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	_
North Carolina	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_
North Dakota	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ

See notes at end of table.

Table 4. State assessment data availability in grades 4 and 8, by subject and year: 2009, 2017, and 2019—Continued

	Grade 4						Grade 8					
	Reading			Mathematics			Reading			Mathematics		
State	2009	2017	2019	2009	2017	2019	2009	2017	2019	2009	2017	2019
Ohio	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	_
Oklahoma	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Oregon	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Pennsylvania	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Puerto Rico		_	_	_	Υ	Υ	_	_	_	_	Υ	Υ
Rhode Island	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	Υ
South Carolina	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
South Dakota	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Tennessee	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	_
Texas	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	_	Υ	_	_
Utah	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	Υ
Vermont	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Virginia	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	_	_	_
Washington	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
West Virginia	Υ	Υ		Υ	Υ	Υ	Υ	Υ	_	Υ	Υ	Υ
Wisconsin	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Wyoming	Υ	Υ	Υ	Υ	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ

Y Available.

NOTE: There are 48 states that have data available for all 3 years in grade 4 reading, 49 in grade 4 mathematics, 44 states in grade 8 reading, and 27 states in grade 8 mathematics.

SOURCE: State education agencies.

[—] Not available.

