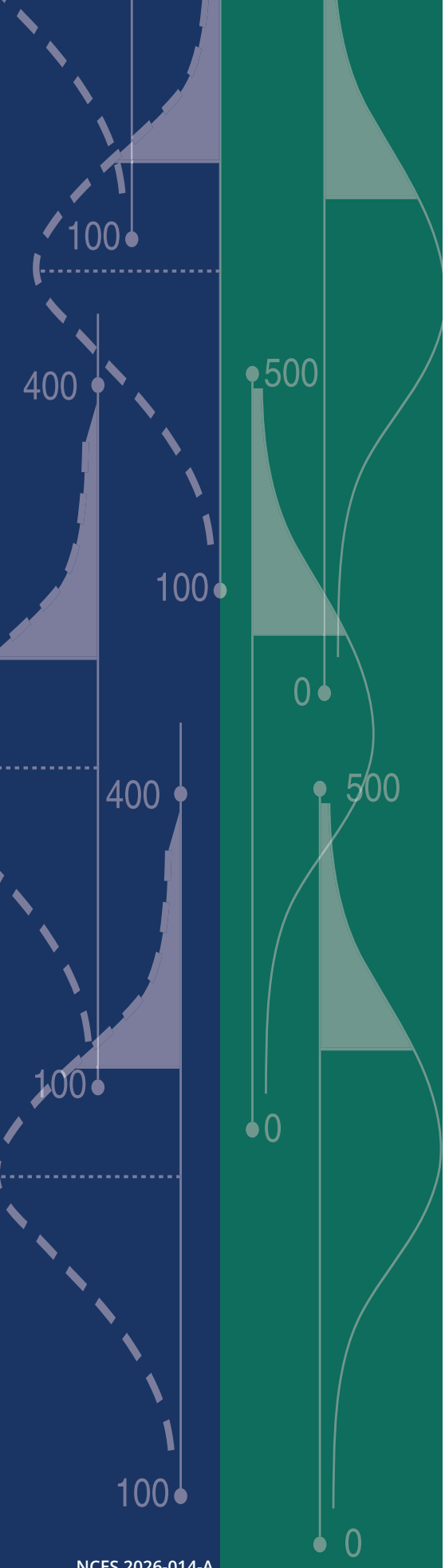

IES Institute of Education Sciences

Mapping State Proficiency Standards Onto the NAEP Scales

Results From the 2022 NAEP Reading and Mathematics Assessments

Technical Notes

NAEP
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

NCES 2026-014-A
U.S. DEPARTMENT OF EDUCATION

Technical Notes

Mapping states' proficiency standards onto the NAEP scales

Under the 2001 and 2015 reauthorizations of the Elementary and Secondary Education Act of 1965, states are required to define and report their standards of reading and mathematics for grades 4 and 8. Because each state sets its own standards, students who meet the standards set by one state may not be able to meet the standards set by another state. Comparing the stringency of the standards set by the states is possible because Congress mandated states to participate in the National Assessment of Educational Progress (NAEP). NAEP provides a common scale on which the stringency of the various state criteria for proficiency can be compared.

The NAEP equivalent score—that is, the NAEP score that corresponds to a state's standard—is determined by a direct application of equipercentile mapping. For a given grade and subject, the percentage of students in each NAEP school who met the state assessment standard is matched to the point on the NAEP scale corresponding to that percentage. For example, if 70 percent of the students in grade 4 in a particular school are meeting the state reading achievement standard and 70 percent of the students in the NAEP achievement distribution in that school are at or above 241 on the NAEP scale, then the best estimate using the results from that school is that the state's standard is equivalent to 241 on the NAEP scale. Results are then aggregated over all schools in the state that are participating in NAEP to provide an estimate of the NAEP score that is equivalent to the state's threshold for its standard. By extension, when estimating the NAEP scores equivalent to the standard of a common assessment shared by a group of states, all schools participating in NAEP in those states are included in the estimation.

The classification of NAEP equivalent scores into NAEP achievement levels accounts for the error associated with the estimates. A state's NAEP equivalent score is assigned the highest NAEP achievement level for which the upper bound of the score's margin of error equals or exceeds cut score of the achievement level. For example, in grade 4 reading, a state with a NAEP equivalent score of 236 and a standard error of 1.5 would have an upper bound of 239, calculated by (236 + 2 x 1.5). Since 239 exceeds the *NAEP Proficient* cut score of 238 but does not exceed the *NAEP Advanced* cut score of 268, the state's standard would be classified as *NAEP Proficient*. However, if the score's standard error were 0.5, its upper bound would be 237, calculated by (236 + 2 x 0.5). Since 237 exceeds the *NAEP Basic* cut score of 208 but does not exceed the *NAEP Proficient* cut score of 238, the state's standard would be classified as *NAEP Basic*. NAEP achievement level cut scores for 2022 can be found in **table 3** in the main report (NCES 2026-014).

In reporting the mapping results, in addition to the NAEP equivalent scores, two types of error—*standard error* and *relative error*—are presented to describe the sources of variation in the mapping of state proficiency standards. The sources of random variation (measurement error and sampling variation) are accounted for by the *standard error* of the mapping, and the amount of error that is added to the placement of the standard, given the fact that NAEP and the state assessment may not measure exactly the same knowledge and skills, is captured in the *relative error*. This measure is based on the accuracy with which school-level percentages of students meeting the state standard are reproduced by applying the cut score indicated by the linkage to the NAEP results in each school, after taking into account measurement variation in NAEP and NAEP student sampling within each participating school.

A relative error greater than 0.5 (i.e., when the mapping error accounts for more than half of the total variation) indicates that the error is too large to support useful inferences from the placement of the state standard onto the NAEP scale without additional evidence. In the figures and tables in this report, a black triangle indicates that the relative error is greater than 0.5.

Additional details on the mapping methodology can be found in the previously published report NCES 2010-456.

Data Tables

This section provides two supporting data tables. **Tables A-1** and **A-2** display the NAEP equivalent scores for each state, and the last row shows the NAEP equivalent scores for the Smarter Balanced Assessment Consortium testing program when all participating states in that program are considered as one single jurisdiction. A black triangle indicates that the relative error is greater than 0.5, and the results should be interpreted with caution.

Data tables with the complete NAEP equivalent scores for state proficiency standards can be found at https://nces.ed.gov/nationsreportcard/studies/statemapping/data_tables.aspx for 2013 and 2019.

Table A-1. NAEP equivalent scores for state grade 4 reading and mathematics standards for proficient performance, by state and testing program: 2022

State	Testing program	Reading		Mathematics	
		NAEP equivalent score	Standard error	NAEP equivalent score	Standard error
Alabama		213	1.4	245	0.7
Alaska		236	2.1	254	1.7
Arizona		225	1.5	240	1.3
Arkansas		229	1.0	237	1.1
California	SBAC	224	1.3	241	0.8
Colorado		233	1.0	253	1.5
Connecticut[1]	SBAC	222	1.2	240	1.1
Delaware	SBAC	223	1.4	241	1.0
District of Columbia		233	2.7	252	1.4
Florida		221	1.0	232	1.0
Georgia		232	0.9	242	1.4
Hawaii		221	1.2	242	0.9
Idaho	SBAC	221	2.1	241	1.0
Illinois		237	2.1	257	1.8
Indiana		232	1.1	244	1.4
Iowa		197	2.1	226	1.4
Kansas		226	1.2	249	1.2
Kentucky		223	1.0	241	1.2
Louisiana		220	1.4	241	0.9
Maine[2]		—	†	—	†
Maryland		223	1.2	254	1.3
Massachusetts		242	1.6	249	1.4
Michigan		225	1.7	246	1.2
Minnesota		223	1.5	239	1.3
Mississippi		226	1.2	237	1.0
Missouri		224	1.8	242	1.0
Montana[1]	SBAC	228	1.0	246	1.3

See notes at end of table.

Table A-1. NAEP equivalent scores for state grade 4 reading and mathematics standards for proficient performance, by state and testing program: 2022—Continued

State	Testing program	Reading		Mathematics	
		NAEP equivalent score	Standard error	NAEP equivalent score	Standard error
Nebraska		222	1.2	247	1.2
Nevada	SBAC	222	1.5	244	1.8
New Hampshire		228	1.3	243	0.8
New Jersey		229	1.4	249	1.9
New Mexico		222	2.0	245	1.4
New York		227	1.7	236	1.8
North Carolina		233	1.4	249	1.4
North Dakota		230	1.0	252	1.0
Ohio		208	2.1	225	1.6
Oklahoma		240	1.7	245	0.9
Oregon[1]	SBAC	223	2.0	242	1.3
Pennsylvania		220	1.4	247	1.2
Puerto Rico[3]		—	†	187 ▲	1.7
Rhode Island		242	1.5	250	0.9
South Carolina		218	2.1	241	1.8
South Dakota	SBAC	222	1.1	243	0.9
Tennessee		228	1.9	245	0.9
Texas		215	1.2	246	1.3
Utah		233	1.2	244	1.7
Vermont	SBAC	228	1.9	247	1.1
Virginia		193	1.7	224	1.5
Washington	SBAC	222	1.9	240	1.2
West Virginia		218	1.4	236	1.0
Wisconsin		228	1.5	246	1.1
Wyoming		231	1.4	242	1.2
SBAC		224	0.9	241	0.6

— Not available.
† Not applicable.
▲ Interpret data with caution. Relative error greater than 0.5.
[1] Connecticut, Montana, and Oregon were not included in estimating the SBAC reading standard because these states either did not use all SBAC reading assessment components or used a custom blueprint for their reading assessment.
[2] Maine was not included because the state administered an interim assessment in 2021–22.
[3] The NAEP equivalent score of Puerto Rico's reading standard is not available because the NAEP reading assessment was not administered in the jurisdiction.
NOTE: All jurisdictions, including the District of Columbia and Puerto Rico, are collectively referred to as states in the report. The NAEP scale in reading and mathematics ranges from 0 to 500. The numbers reported in this table are rounded. SBAC refers to Smarter Balanced Assessment Consortium. The row for SBAC provides the NAEP equivalent scores estimated for SBAC as a whole by considering the participating states as one single jurisdiction
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2022 Reading and Mathematics Assessments; and U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, EDFacts School Year 2021–22.

Table A-2. NAEP equivalent scores for state grade 8 reading and mathematics standards for proficient performance, by state and testing program: 2022

State	Testing program	Reading		Mathematics	
		NAEP equivalent score	Standard error	NAEP equivalent score	Standard error
Alabama		251	1.8	297	1.1
Alaska		279	0.9	315	1.3
Arizona		276	1.6	296	1.7
Arkansas		261	1.6	278	1.0
California	SBAC	265	1.5	289	1.4
Colorado		271	2.1	292	2.4
Connecticut[1]	SBAC	265	1.3	293	1.5
Delaware	SBAC	264	1.9	292	1.1
District of Columbia		269	1.1	—	†
Florida		265	1.4	—	†
Georgia		271	1.3	283	1.1
Hawaii		263	1.9	289	2.0
Idaho	SBAC	262	1.5	296 ▲	1.2
Illinois		285	1.3	304	1.4
Indiana		271	1.3	302	1.6
Iowa		238	2.2	262	1.6
Kansas		287	1.3	302	1.6
Kentucky		267	1.4	282	1.4
Louisiana		262	1.4	—	†
Maine[2]		—	†	—	†
Maryland		272	1.0	—	†
Massachusetts		279	1.3	297	1.1
Michigan		251	1.6	287	1.0
Minnesota		266	1.1	290	1.2
Mississippi		269	1.7	272	1.8
Missouri		268	1.7	283	1.1
Montana[1]	SBAC	269	1.0	299	1.4
Nebraska		266	1.2	289	1.2
Nevada	SBAC	267	1.0	297	1.7
New Hampshire		269	1.5	295	0.8
New Jersey		271	1.5	—	†
New Mexico		266	1.1	289	2.2
New York		263	1.8	—	†
North Carolina		277	1.4	—	†
North Dakota		266 ▲	1.3	293 ▲	1.4

See notes at end of table.

Table A-2. NAEP equivalent scores for state grade 8 reading and mathematics standards for proficient performance, by state and testing program: 2022—Continued

State	Testing program	Reading		Mathematics	
		NAEP equivalent score	Standard error	NAEP equivalent score	Standard error
Ohio		262	1.5	—	†
Oklahoma		276	1.3	298	1.8
Oregon[1]	SBAC	268	0.9	297	2.0
Pennsylvania		256	1.3	304	1.3
Puerto Rico[3]		—	†	260 ▲	2.8
Rhode Island		283	1.2	303	1.0
South Carolina		261	1.5	289	1.3
South Dakota	SBAC	266	1.3	295	1.6
Tennessee		283	1.2	—	†
Texas		251	1.3	—	†
Utah		273	2.2	293	2.1
Vermont	SBAC	273	1.1	298	1.9
Virginia		238	1.8	—	†
Washington	SBAC	263	1.7	292	1.1
West Virginia		264	2.4	283	1.2
Wisconsin		281	0.9	302	1.2
Wyoming		256	1.2	283	1.3
SBAC		265	0.9	292	0.7

— Not available.
† Not applicable.
▲ Interpret data with caution. Relative error greater than 0.5.
[1] Connecticut, Montana, and Oregon were not included in estimating the SBAC reading standard because these states either did not use all SBAC reading assessment components or used a custom blueprint for their reading assessment.
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NOTE: All jurisdictions, including the District of Columbia and Puerto Rico, are collectively referred to as states in the report. The NAEP scale in reading and mathematics ranges from 0 to 500. The numbers reported in this table are rounded. SBAC refers to Smarter Balanced Assessment Consortium. The row for SBAC provides the NAEP equivalent scores estimated for SBAC as a whole by considering the participating states as one single jurisdiction.
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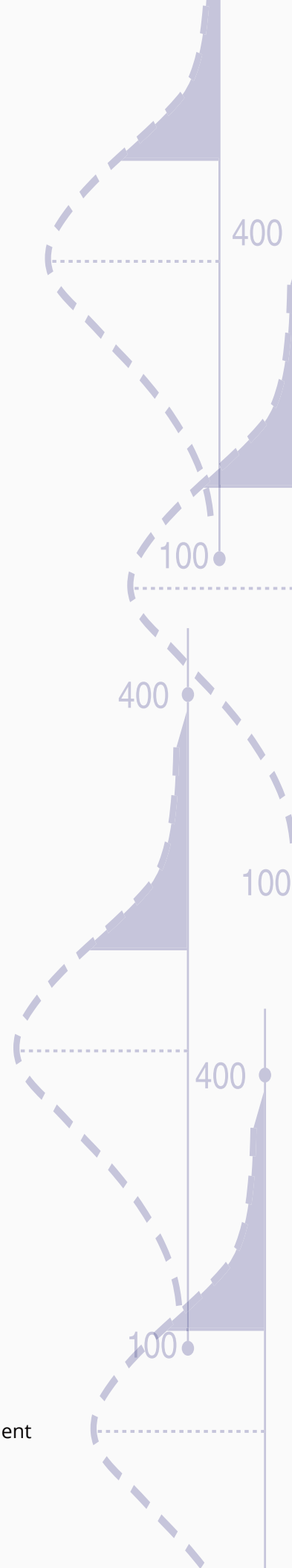

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