

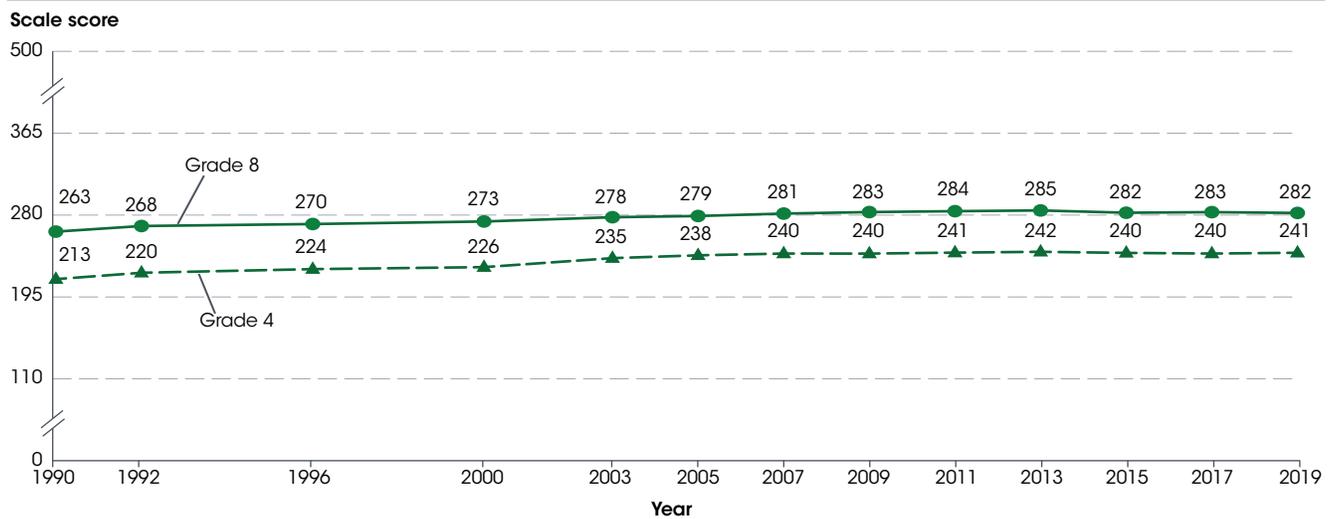
Mathematics Performance

At grade 4, the average mathematics score in 2019 (241) was higher than the scores in both 2017 (240), when the assessment was last administered, and 1990 (213). At grade 8, the mathematics score in 2019 (282) was lower than the score in 2017 (283), but it was higher than the score in 1990 (263). There was no measurable difference between average math scores for males and females at grade 8 in 2019.

The National Assessment of Educational Progress (NAEP) assesses student performance in mathematics at grades 4, 8, and 12 in both public and private schools across the nation. NAEP mathematics scale scores range from 0 to 500 for grades 4 and 8 and from 0 to 300 for grade 12.¹ NAEP achievement levels define what students should know and be able to do: *NAEP Basic* indicates partial mastery of fundamental skills, *NAEP Proficient* indicates solid academic performance and demonstrated competency over challenging subject matter, and

NAEP Advanced indicates superior performance beyond proficient.² NAEP mathematics assessments have been administered periodically since 1990, more frequently in grades 4 and 8 than in grade 12.³ The most recent mathematics assessments were conducted in 2019 for grades 4, 8, and 12; however, data for grade 12 in 2019 were not available in time for publication. In this indicator, data for grade 12 come from the 2015 assessment, the most recent NAEP assessment year with available data.⁴

Figure 1. Average National Assessment of Educational Progress (NAEP) mathematics scale scores of 4th- and 8th-grade students: Selected years, 1990–2019



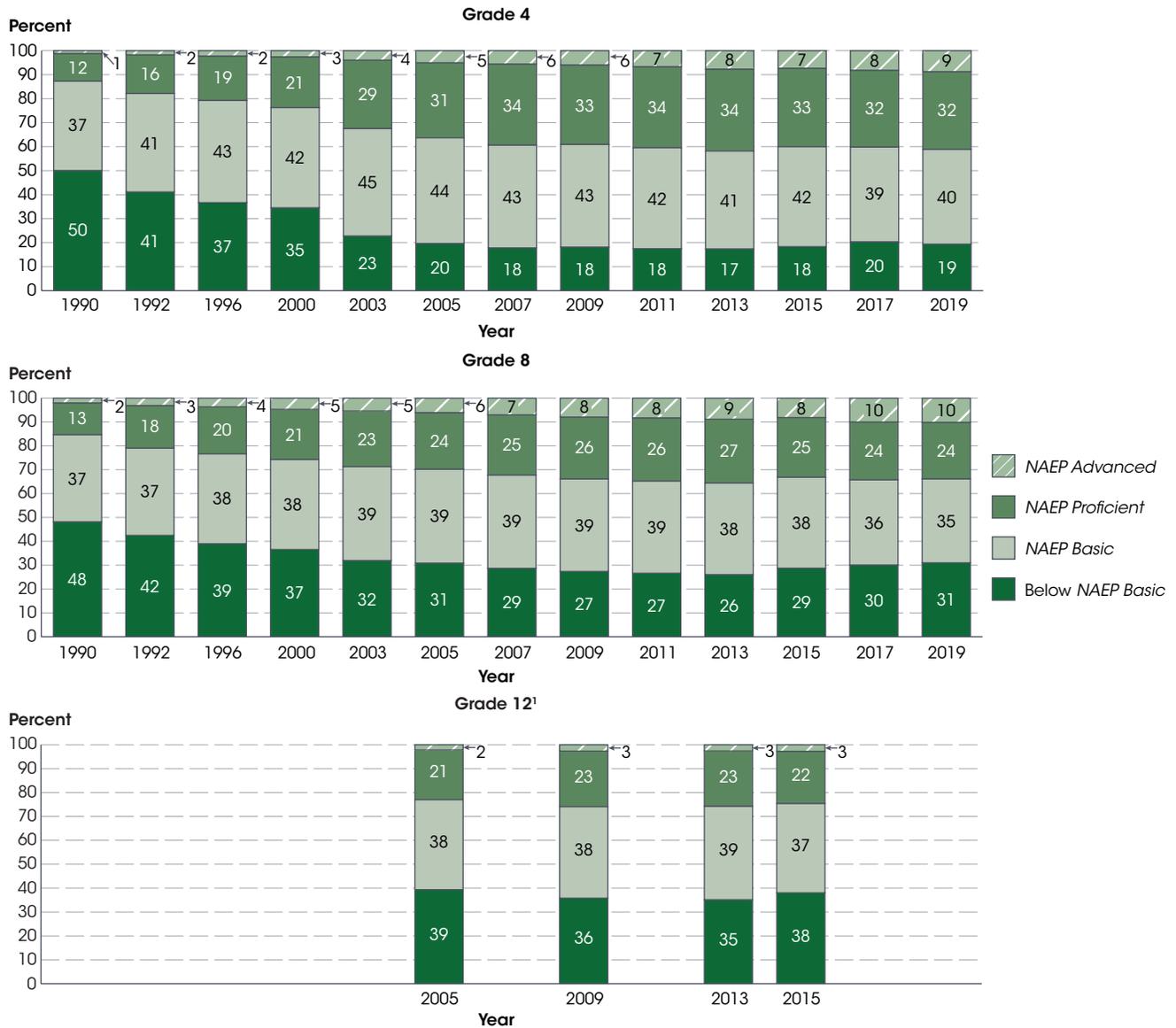
NOTE: Includes public and private schools. Average scores are reported on a 0–500 scale at grades 4 and 8; however, the scale scores were derived separately and therefore scores cannot be compared across grades. Grade 12 mathematics scores are not shown because they are reported on a scale of 0 to 300. Testing accommodations (e.g., extended time, small-group testing) for children with disabilities and English language learners were not permitted in 1990 and 1992.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), selected years, 1990–2019 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2019*, table 222.10.

The average mathematics score for 4th-grade students in 2019 (241) was higher than the scores in both 2017 (240) and 1990 (213). For 8th-grade students, the mathematics score in 2019 (282) was lower than the score in 2017 (283), but it was higher than the score in 1990 (263). The

mathematics score for 12th-grade students in 2015 (152) was lower than the score in 2013 (153), but it was not measurably different from the score in 2005, the earliest year with comparable data.⁵

Figure 2. Percentage distribution of 4th-, 8th-, and 12th-grade students, by National Assessment of Educational Progress (NAEP) mathematics achievement levels: Selected years, 1990–2019



¹ In 2005, there were major changes to the framework and content of the grade 12 assessment, and, as a result, scores from 2005 and later assessment years cannot be compared with scores and results from earlier assessment years. Assessment was not conducted for grade 12 in 2007, 2011, and 2017. Data for grade 12 in 2019 were not available in time for publication.

NOTE: Includes public and private schools. Achievement levels define what students should know and be able to do: *NAEP Basic* indicates partial mastery of fundamental skills, *NAEP Proficient* indicates demonstrated competency over challenging subject matter, and *NAEP Advanced* indicates superior performance beyond proficient. Testing accommodations (e.g., extended time, small-group testing) for children with disabilities and English language learners were not permitted in 1990 and 1992. Although rounded numbers are displayed, the figures are based on unrounded data. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), selected years, 1990–2019 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2019*, table 222.12.

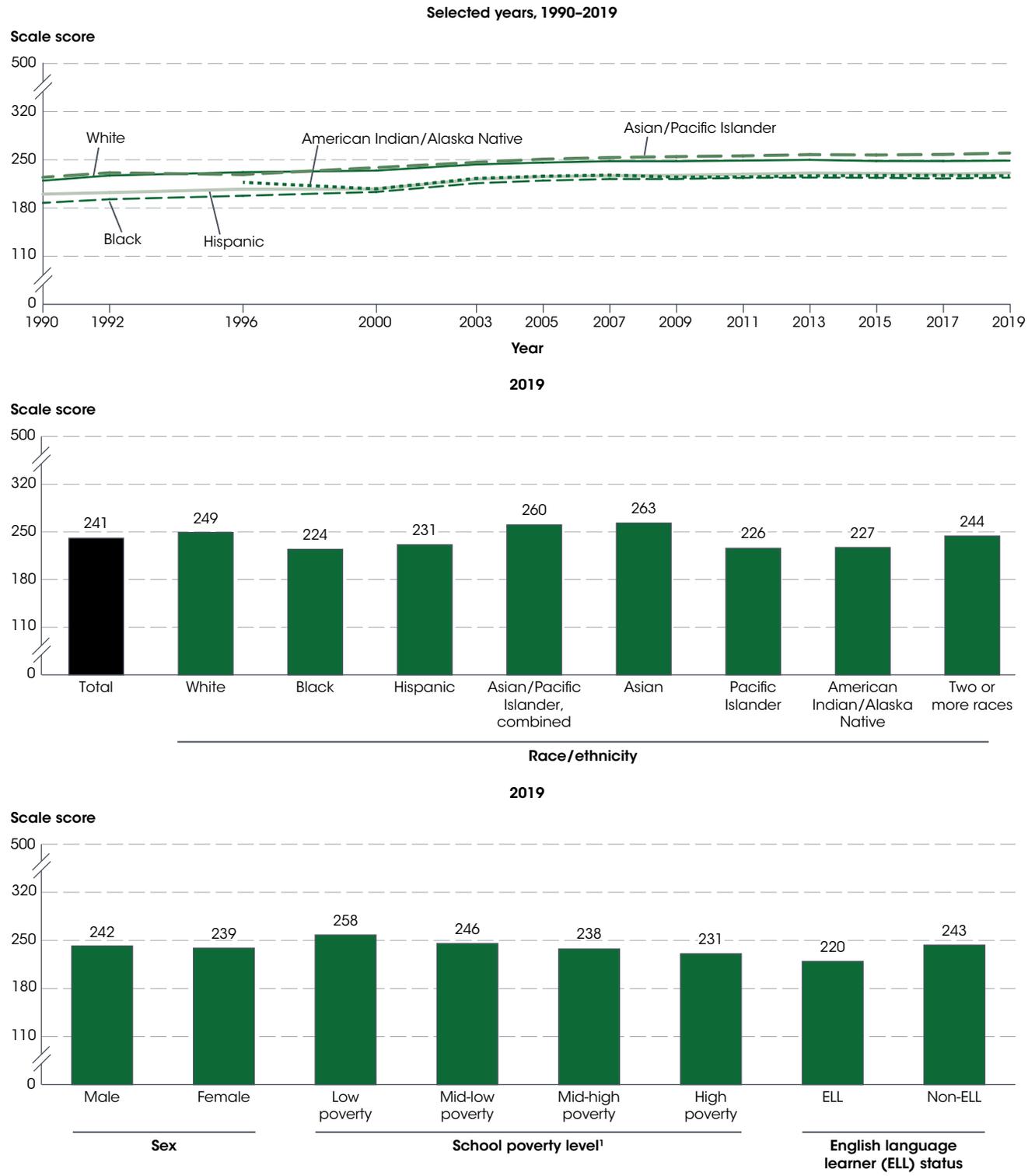
In 2019, some 81 percent of 4th-grade students performed at or above the *NAEP Basic* achievement level in mathematics, 41 percent performed at or above *NAEP Proficient*, and 9 percent performed at *NAEP Advanced*. The percentage of 4th-grade students who performed at or above *NAEP Basic* in 2019 was higher than the percentages in both 2017 (80 percent) and 1990 (50 percent). The percentage of 4th-grade students who performed at or above *NAEP Proficient* in 2019 was not measurably different from the percentage in 2017, but it was higher than the percentage in 1990 (13 percent). The percentage of 4th-grade students who performed at *NAEP Advanced* in 2019 was higher than the percentages in both 2017 (8 percent) and 1990 (1 percent).

In 2019, some 69 percent of 8th-grade students performed at or above the *NAEP Basic* achievement level in mathematics, 34 percent performed at or above *NAEP Proficient*, and 10 percent performed at *NAEP Advanced*. The percentage of 8th-grade students who performed at or above *NAEP Basic* in 2019 was lower than the percentage in 2017 (70 percent), but it was higher than the percentage in 1990 (52 percent). The percentage of 8th-grade students

who performed at or above *NAEP Proficient* in 2019 was not measurably different from the percentage in 2017, but it was higher than the percentage in 1990 (15 percent). Similarly, the percentage of 8th-grade students who performed at *NAEP Advanced* in 2019 was not measurably different from the percentage in 2017, but it was higher than the percentage in 1990 (2 percent).

In 2015, some 62 percent of 12th-grade students performed at or above the *NAEP Basic* achievement level in mathematics, 25 percent performed at or above *NAEP Proficient*, and 3 percent performed at *NAEP Advanced*. The percentage of 12th-grade students who performed at or above *NAEP Basic* in 2015 was lower than the percentage in 2013 (65 percent), but it was not measurably different from the percentage in 2005. The percentage of 12th-grade students who performed at or above *NAEP Proficient* was not measurably different from the percentages in 2013 and in 2005. Similarly, the percentage of 12th-grade students who performed at *NAEP Advanced* in 2015 was not measurably different from the percentages in 2013 and 2005.

Figure 3. Average National Assessment of Educational Progress (NAEP) mathematics scale scores of 4th-grade students, by selected characteristics: Selected years, 1990-2019



¹ High-poverty schools are defined as schools where 76 to 100 percent of the students are eligible for free or reduced-price lunch (FRPL); mid-high poverty schools are schools where 51 to 75 percent of the students are eligible for FRPL; mid-low poverty schools are schools where 26 to 50 percent of the students are eligible for FRPL, and low-poverty schools are schools where 25 percent or less of the students are eligible for FRPL. For more information on eligibility for FRPL and its relationship to poverty, see the NCES blog post "[Free or reduced price lunch: A proxy for poverty?](#)" The nonresponse rate for FRPL was greater than 15 percent but not greater than 50 percent.

NOTE: Includes public and private schools. The mathematics scale scores range from 0 to 500. Scale scores for American Indian/Alaska Native students were suppressed in 1990 and 1992 and for Asian/Pacific Islander students in 2000 because reporting standards were not met (too few cases for a reliable estimate). Testing accommodations (e.g., extended time, small-group testing) for children with disabilities and English language learners were not permitted in 1990 and 1992. Race categories exclude persons of Hispanic ethnicity. Although rounded numbers are displayed, the figures are based on unrounded data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), selected years, 1990-2019 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2019*, tables 222.10 and 222.12.

At grade 4, the average mathematics scores in 2019 for Asian/Pacific Islander (260), White (249), and Black (224) students were not measurably different from the corresponding scores in 2017, but the mathematics score for each group was higher in 2019 than in 1990 (225, 220, and 188, respectively). The 2019 mathematics score for 4th-grade Hispanic students (231) was higher than the scores in both 2017 (229) and 1990 (200). The 2019 mathematics score for 4th-grade American Indian/Alaska Native students (227) was not measurably different from the scores in 2017 and 1996 (1996 was the first year data were available for 4th-grade American Indian/Alaska Native students). In 2011, NAEP began reporting separate data for Asian students, Pacific Islander students, and students of Two or more races.⁶ At grade 4, the 2019 mathematics score for Asian students (263) was not measurably different from the score in 2017, but it was higher than the score in 2011 (257). The 2019 mathematics scores for Pacific Islander students (226) and students of Two or more races (244) were not measurably different from the corresponding scores in 2017 and 2011.

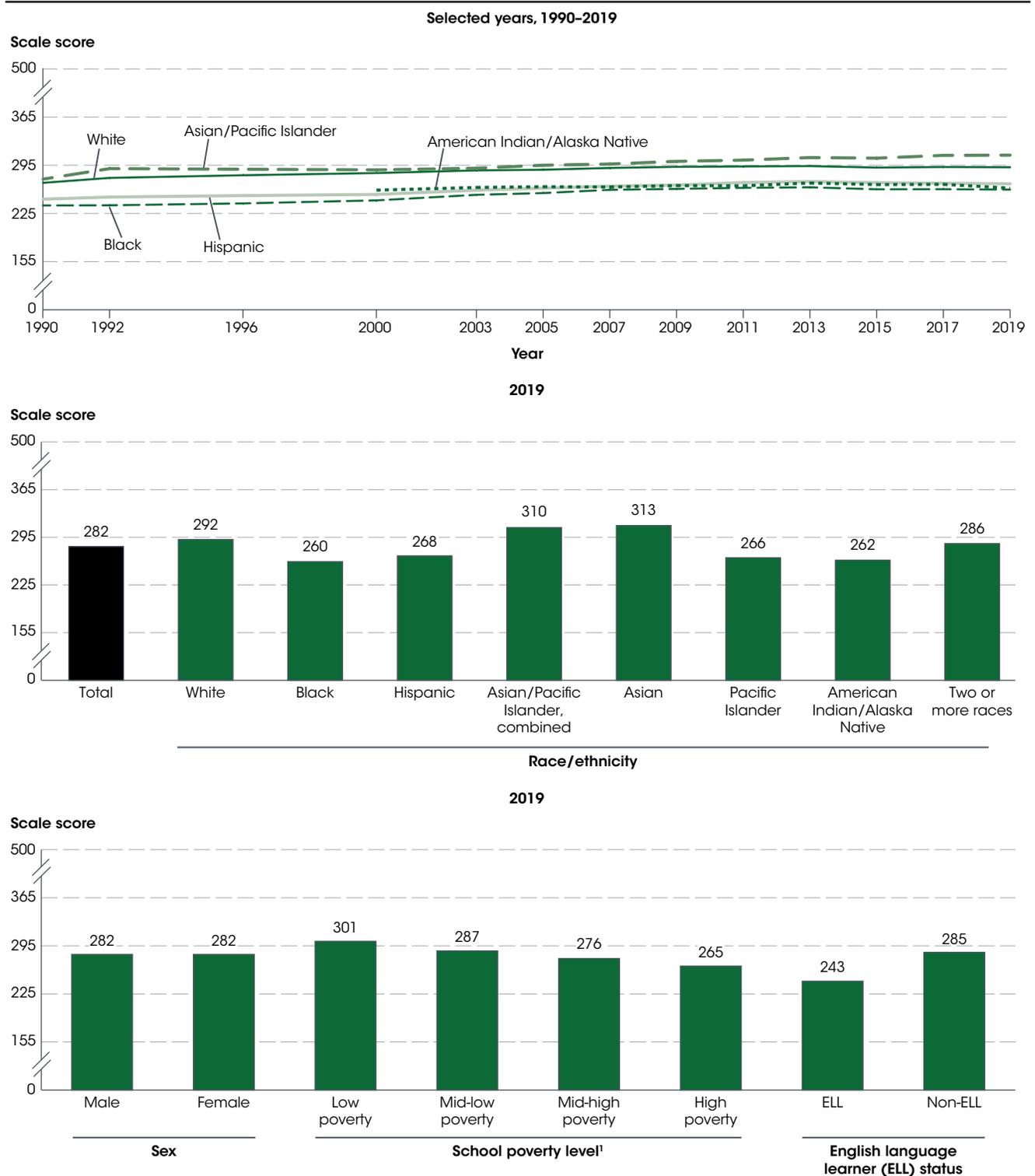
In 2019 and in all assessment years since 1990, the average mathematics scores for White students in grade 4 have been higher than those of their Black and Hispanic peers. Although the White-Black and White-Hispanic achievement gaps at grade 4 did not change measurably

from 2017 to 2019, the White-Black achievement gap narrowed from 32 points in 1990 to 25 points in 2019. The 4th-grade White-Hispanic achievement gap in 2019 (18 points) was not measurably different from the gap in 1990.

At grade 4, the average mathematics score for male students in 2019 (242) was higher than the scores in both 2017 (241) and 1990 (214). The mathematics score for female students in 2019 (239) was not measurably different from the score in 2017, but it was higher than the score in 1990 (213). In 2019, the mathematics score for 4th-grade male students was 3 points higher than the score for 4th-grade female students; this 3-point gap was not measurably different from the corresponding gaps between male and female students in 2017 and 1990.

NAEP scores can also be disaggregated by students' English language learner (ELL) status and by the poverty level of the school they attended.⁷ In 2019, the average mathematics score for 4th-grade ELL students (220) was 24 points lower than the score for their non-ELL peers (243). In 2019, the mathematics score for 4th-grade students in high-poverty schools (231) was lower than the scores for 4th-grade students in mid-high poverty schools (238), mid-low poverty schools (246), and low-poverty schools (258).⁸

Figure 4. Average National Assessment of Educational Progress (NAEP) mathematics scale scores of 8th-grade students, by selected characteristics: Selected years, 1990-2019



¹ High-poverty schools are defined as schools where 76 to 100 percent of the students are eligible for free or reduced-price lunch (FRPL); mid-high poverty schools are schools where 51 to 75 percent of the students are eligible for FRPL; mid-low poverty schools are schools where 26 to 50 percent of the students are eligible for FRPL; and low-poverty schools are schools where 25 percent or less of the students are eligible for FRPL. For more information on eligibility for FRPL and its relationship to poverty, see the NCES blog post "Free or reduced price lunch: A proxy for poverty?" The nonresponse rate for FRPL was greater than 15 percent but not greater than 50 percent.
NOTE: Includes public and private schools. The mathematics scale scores range from 0 to 500. Scale scores for Asian/Pacific Islander students in 1996 and for American Indian/Alaska Native students in 1990, 1992, and 1996 were suppressed because reporting standards were not met (too few cases for a reliable estimate). Testing accommodations (e.g., extended time, small-group testing) for children with disabilities and English language learners were not permitted in 1990 and 1992. Race categories exclude persons of Hispanic ethnicity. Although rounded numbers are displayed, the figures are based on unrounded data.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), selected years, 1990-2019 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2019*, tables 222.10 and 222.12.

At grade 8, the average mathematics scores for Asian/Pacific Islander (310), White (292), Hispanic (268), and Black (260) students in 2019 were not measurably different from the corresponding scores in 2017, but the score for each group was higher in 2019 than in 1990 (275, 270, 246, and 237, respectively). In 2019, the mathematics score for 8th-grade American Indian/Alaska Native students (262) was lower than the score in 2017 (267), but it was not measurably different from the score in 2000 (2000 was the first year data were available for 8th-grade American Indian/Alaska Native students). In 2011, NAEP began reporting separate data for Asian students, Pacific Islander students, and students of Two or more races. At grade 8, the 2019 mathematics score for Asian students (313) was not measurably different from the score in 2017, but it was higher than the score in 2011 (305). The mathematics score for Pacific Islander students (266) in 2019 was lower than the score in 2017 (274), but it was not measurably different from the score in 2011. The 2019 grade 8 mathematics score for students of Two or more races (286) was not measurably different from the scores in 2017 and 2011.

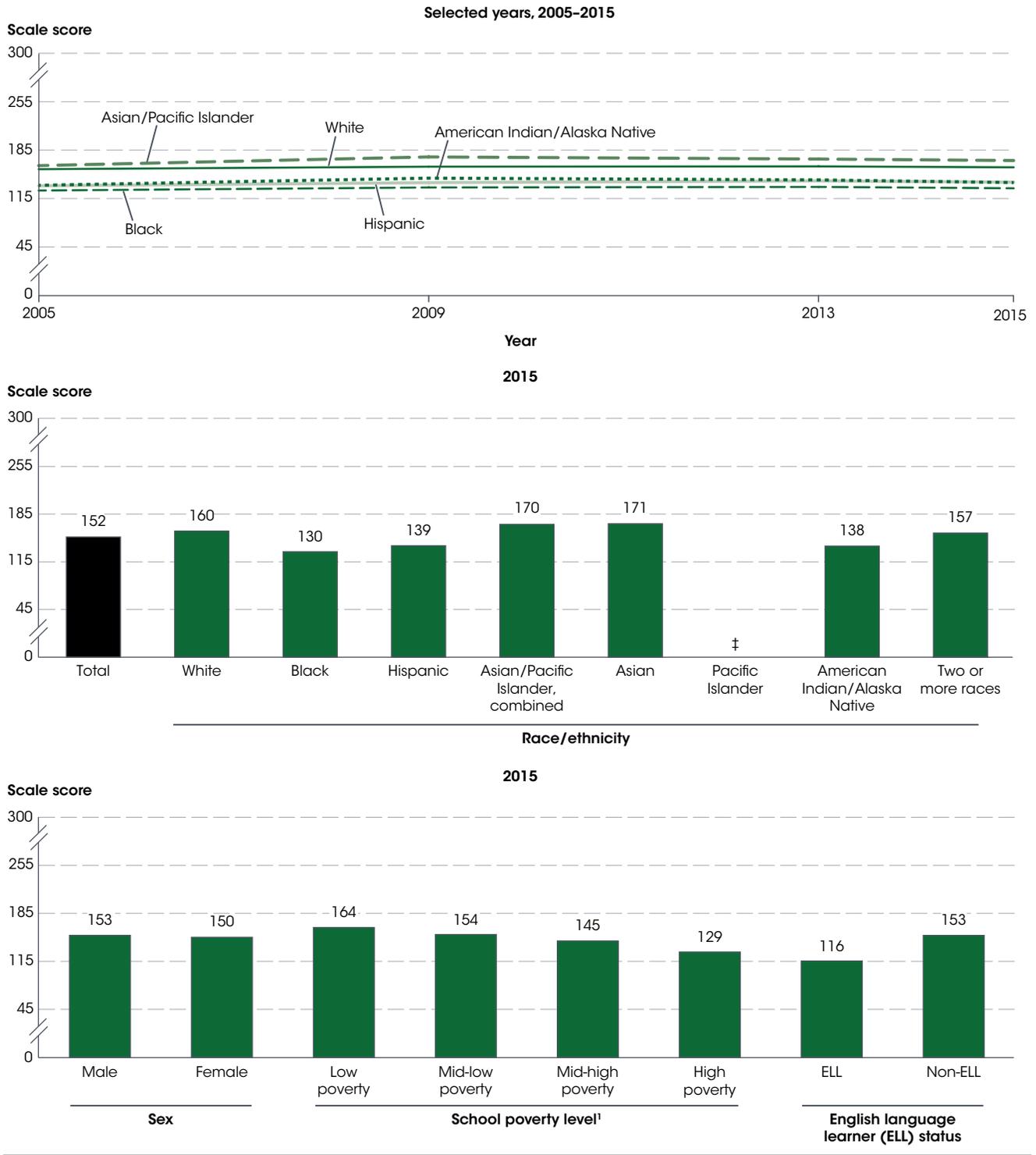
In 2019 and in all assessment years since 1990, the average mathematics scores for White students in grade 8 have

been higher than the scores for their Black and Hispanic peers. At grade 8, the White-Black (32 points) and White-Hispanic (24 points) achievement gaps in 2019 were not measurably different from the corresponding gaps in 2017 and 1990.

At grade 8, the average mathematics score for male students in 2019 (282) was lower than the score in 2017 (283) and higher than the score in 1990 (263). The mathematics score for female students in 2019 (282) was not measurably different from the score in 2017, but it was higher than the score in 1990 (262). In 2019 and 1990, the mathematics scores for male and female students were not measurably different from each other; however, male students scored 1 point higher than female students in 2017.

In 2019, the average mathematics score for 8th-grade ELL students (243) was 42 points lower than the score for their non-ELL peers (285). The 2019 mathematics score for 8th-grade students in high-poverty schools (265) was lower than the scores for 8th-grade students in mid-high poverty schools (276), mid-low poverty schools (287), and low-poverty schools (301).⁹

Figure 5. Average National Assessment of Educational Progress (NAEP) mathematics scale scores of 12th-grade students, by selected characteristics: Selected years, 2005–2015



‡ Reporting standards not met. There were too few cases for a reliable estimate.

¹ High-poverty schools are defined as schools where 76 to 100 percent of the students are eligible for free or reduced-price lunch (FRPL); mid-high poverty schools are schools where 51 to 75 percent of the students are eligible for FRPL; mid-low poverty schools are schools where 26 to 50 percent of the students are eligible for FRPL; and low-poverty schools are schools where 25 percent or less of the students are eligible for FRPL. For more information on eligibility for FRPL and its relationship to poverty, see the NCES blog post [“Free or reduced price lunch: A proxy for poverty?”](#)

NOTE: Includes public and private schools. The mathematics scale scores range from 0 to 300. Assessment was not conducted for grade 12 in 2007, 2011, and 2017. The most recent mathematics assessment for grade 12 was conducted in 2019; however, data for grade 12 in 2019 were not available in time for publication. In this figure, data for grade 12 come from the 2015 assessment, the most recent NAEP assessment year with available data. Because of major changes to the framework and content of the grade 12 assessment, scores from 2005 and later assessment years cannot be compared with scores from earlier assessment years. Race categories exclude persons of Hispanic ethnicity. Although rounded numbers are displayed, the figures are based on unrounded data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), selected years, 2005–2015 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2019*, tables 222.10 and 222.12.

At grade 12, the average mathematics scores for Asian/Pacific Islander (170), White (160), Hispanic (139), and Black (130) students in 2015 were not measurably different from the scores in 2013, but the score for each group was higher in 2015 than in 2005 (163, 157, 133, and 127, respectively). The mathematics score for American Indian/Alaska Native students in 2015 (138) was not measurably different from the scores in 2013 and 2005. In 2013, NAEP began reporting separate data at the 12th-grade level for Asian students, Pacific Islander students, and students of Two or more races. The 2015 mathematics scores for Asian students (171) and students of Two or more races (157) were not measurably different from the scores in 2013. The mathematics score for Pacific Islander students was 151 in 2013, but it was suppressed in 2015 because reporting standards were not met. In 2015, the mathematics score for White 12th-grade students was 30 points higher than the score for their Black peers and 22 points higher than the score for their Hispanic peers. The White-Black and White-Hispanic gaps in 2015 were not measurably different from the corresponding gaps in 2005 and 2013.

At grade 12, the average mathematics scores for male (153) and female (150) students in 2015 were lower than the scores in 2013 (155 and 152, respectively), but they were not measurably different from the scores in 2005. In 2015, male students scored 3 points higher than female students. This gap was not measurably different from the gaps in 2005 and 2013.

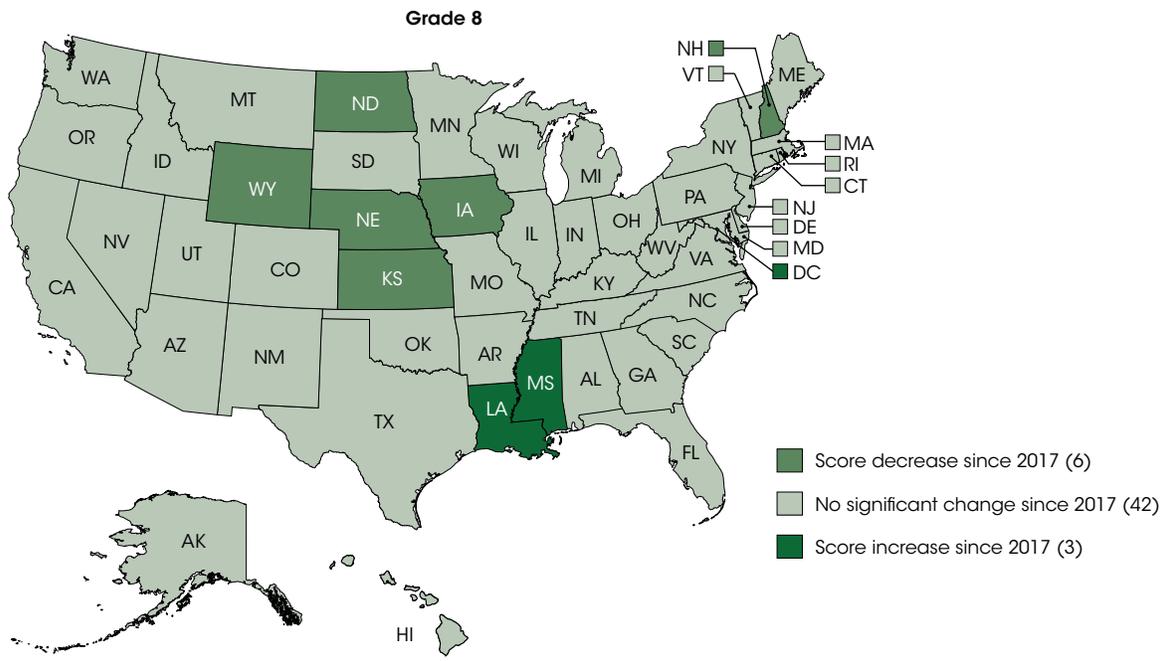
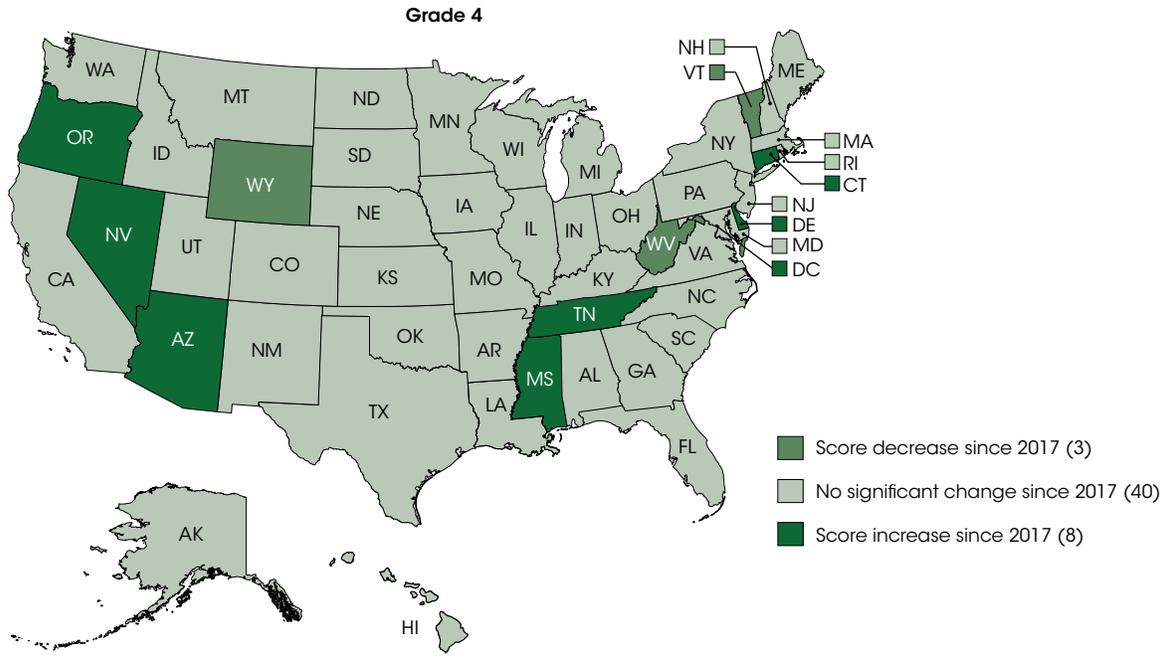
In 2015, the average mathematics score for 12th-grade ELL students (115) was 37 points lower than the

average score for their non-ELL peers (153). In 2015, the mathematics score for 12th-grade students in high-poverty schools (129) was lower than the scores for 12th-grade students in mid-high poverty schools (145), mid-low poverty schools (154), and low-poverty schools (164).

NAEP results also permit state-level comparisons of the mathematics achievement of 4th- and 8th-grade students in public schools.¹⁰ At grade 4, the national average score for public school students in 2019 was 240, and scores across states ranged from 230 to 248. In 14 states, mathematics scores for 4th-grade students in public schools were higher than the national average score for 4th-grade students in public schools. In 20 states, the mathematics scores for 4th-grade public school students were not measurably different from the national average score for public school students. Mathematics scores in the District of Columbia and the remaining 16 states were lower than the national average score for 4th-grade public school students.

At grade 8, the national average mathematics score for public school students in 2019 was 281, and scores across states ranged from 269 to 294. In 21 states, mathematics scores for 8th-grade students in public schools were higher than the national average score for 8th-grade students in public schools. In 14 states the mathematics scores for 8th-grade students in public schools were not measurably different from the national average score. Mathematics scores in the District of Columbia and the remaining 15 states were lower than the national average score for 8th-grade public school students.

Figure 6. Change in average National Assessment of Educational Progress (NAEP) mathematics scale scores of 4th- and 8th-grade public school students, by state: 2017 to 2019



NOTE: At grades 4 and 8, the National Assessment of Educational Progress (NAEP) mathematics scale ranges from 0 to 500.
 SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2017 and 2019 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2019*, tables 222.50 and 222.60.

The average mathematics score for 4th-grade public school students nationally was higher in 2019 than in 2017 (239). Similarly, the mathematics score was higher in 2019 than in 2017 in seven states and the District of Columbia. Grade 4 mathematics scores for public school students were lower in 2019 than in 2017 in three states—Vermont, West Virginia, and Wyoming. For the remaining 40 states, mathematics scores in 2019 were not measurably different from the scores in 2017. At grade 8,

the national average mathematics score for public school students in 2019 was lower than the score in 2017 (282). In two states (Louisiana and Mississippi) and the District of Columbia, the mathematics scores for 8th-grade public school students were higher in 2019 than in 2017. In six states, the mathematics scores for 8th-grade public school students were lower in 2019 than in 2017. Mathematics scores in the remaining 42 states showed no measurable change between 2017 and 2019.

Endnotes:

¹ Average scores are reported on a 0–500 scale at grades 4 and 8; however, the scale scores were derived separately and therefore scores cannot be compared across grades.

² NAEP achievement-level setting is based on the judgments of a broadly representative panel of teachers, education specialists, and members of the general public. The authorizing legislation for NAEP requires that the achievement levels be used on a trial basis until the Commissioner of the National Center for Education Statistics (NCES) determines that the achievement levels are reasonable, valid, and informative to the public (20 USC § 9622(e)(2)(C)). The NCES Commissioner’s determination is to be based on a congressionally mandated, rigorous, and independent evaluation. The latest evaluation of the achievement levels was conducted by a committee convened by the National Academies of Sciences, Engineering, and Medicine in 2016. The evaluation concluded that further evidence should be gathered to determine whether the achievement levels are reasonable, valid, and informative. Accordingly, the NCES Commissioner determined that the trial status of the achievement levels should be maintained at this time. Read more about the [NAEP mathematics achievement levels by grade](#).

³ This indicator presents data from the Main NAEP mathematics assessment, which is not comparable to the Long-Term Trend NAEP mathematics assessment. The Main NAEP mathematics assessment was first administered in 1990 and assesses student performance at grades 4, 8, and 12, while the Long-Term Trend NAEP mathematics assessment was first administered in 1973 and assesses student performance at ages 9, 13, and 17. In addition, the two assessments differ in the content assessed, how often the assessment is administered, and how the results are reported.

⁴ NAEP mathematics scores for 4th-grade students in 2019 had a mean of 241 and a standard deviation (SD) of 32. NAEP mathematics scores for 8th-grade students in 2019 had a mean of 282 and an SD of 40. NAEP mathematics scores for 12th-grade students in 2015 had a mean of 152 and an SD of 34 (retrieved December 20, 2019, from the [Main NAEP Data Explorer](#)).

⁵ The 2005 mathematics framework for grade 12 introduced changes from the previous framework in order to reflect adjustments in curricular emphases and to ensure an appropriate balance of content. Consequently, the 12th-grade mathematics results in 2005 and subsequent years could not be compared to previous assessments, and a new trend line was established beginning in 2005.

⁶ While NAEP reported some data on students of Two or more races for earlier years, the reporting standards changed in 2011.

⁷ High-poverty schools are defined as schools where 76 to 100 percent of the students are eligible for free or reduced-price lunch (FRPL); mid-high poverty schools are schools where 51 to 75 percent of the students are eligible for FRPL; mid-low poverty schools are schools where 26 to 50 percent of the students are eligible for FRPL; and low-poverty schools are schools where 25 percent or less of the students are eligible for FRPL.

⁸ Nonresponse rate for this variable was greater than 15 percent but not greater than 50 percent.

⁹ Nonresponse rate for this variable was greater than 15 percent but not greater than 50 percent.

¹⁰ NAEP results serve as a common metric for all states and selected urban districts and are not comparable to results from assessments administered by state education agencies.

Reference tables: *Digest of Education Statistics 2019*, tables 222.10, 222.12, 222.50, 222.60, and 222.77

Related indicators and resources: [Absenteeism and Achievement \[Status and Trends in the Education of Racial and Ethnic Groups\]](#); [International Comparisons: Reading, Mathematics, and Science Literacy of 15-Year-Old Students](#); [International Comparisons: U.S. 4th-, 8th-, and 12th-Graders’ Mathematics and Science Achievement](#); [Mathematics Achievement \[Status and Trends in the Education of Racial and Ethnic Groups\]](#); [Reading and Mathematics Score Trends \[web-only\]](#); [Reading Performance](#); [Science Performance](#); [Technology and Engineering Literacy \[web-only\]](#)

Glossary: Achievement gap; Achievement levels, NAEP; English language learner (ELL); Public school or institution; Racial/ethnic group