

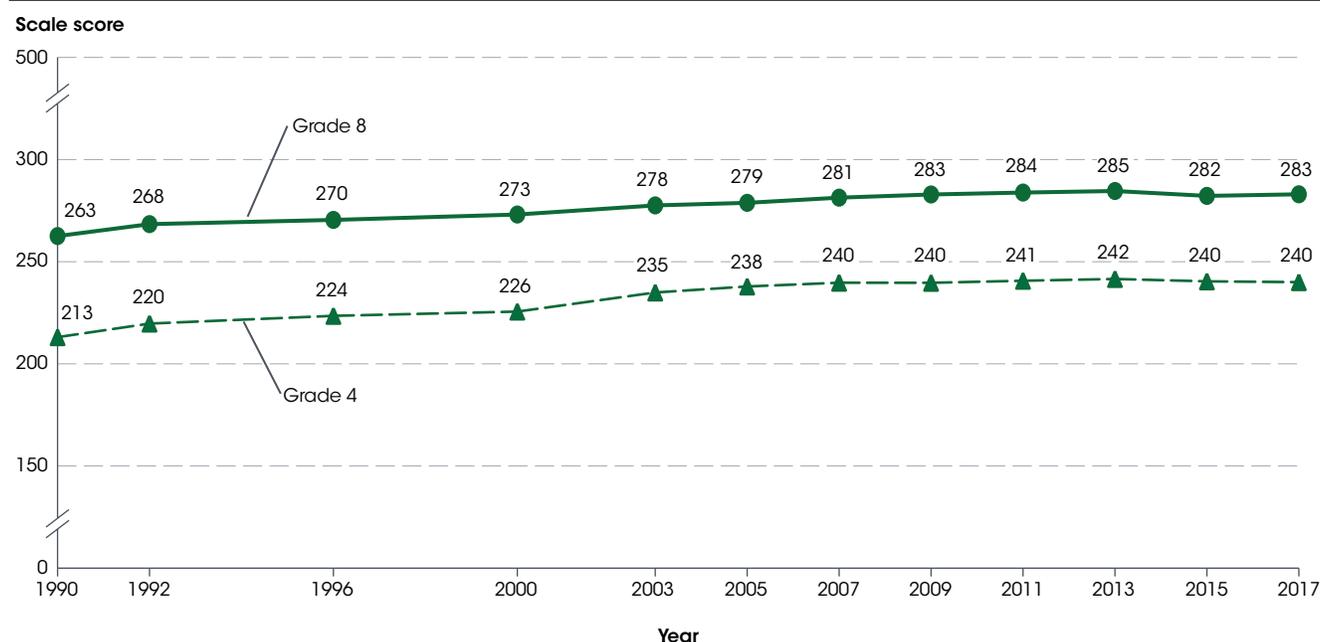
Mathematics Performance

The average 4th-grade mathematics score in 2017 (240) was higher than the average score in 1990 (213), but not measurably different from the average score in 2015, when the assessment was last administered. Similarly, the average 8th-grade mathematics score was higher in 2017 (283) than in 1990 (263), but not measurably different from the average score in 2015.

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. NAEP achievement levels define what students should know and be able to do: *Basic* indicates partial mastery of fundamental skills, *Proficient* indicates solid academic

performance and competency over challenging subject matter, and *Advanced* indicates superior performance beyond proficient. NAEP mathematics assessments have been administered periodically since 1990, more frequently in grades 4 and 8 than in grade 12.¹ The most recent mathematics assessments were conducted in 2017 for grades 4 and 8 and in 2015 for grade 12.²

Figure 1. Average National Assessment of Educational Progress (NAEP) mathematics scale scores of 4th- and 8th-grade students: Selected years, 1990-2017



NOTE: Includes public and private schools. At grades 4 and 8, the mathematics scale scores range from 0 to 500. Testing accommodations (e.g., extended time, small group testing) for children with disabilities and English language learners were not permitted in 1990 and 1992. Grade 12 mathematics scores are not shown because they are reported on a scale of 0 to 300.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), selected years, 1990-2017 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2017*, table 222.10.

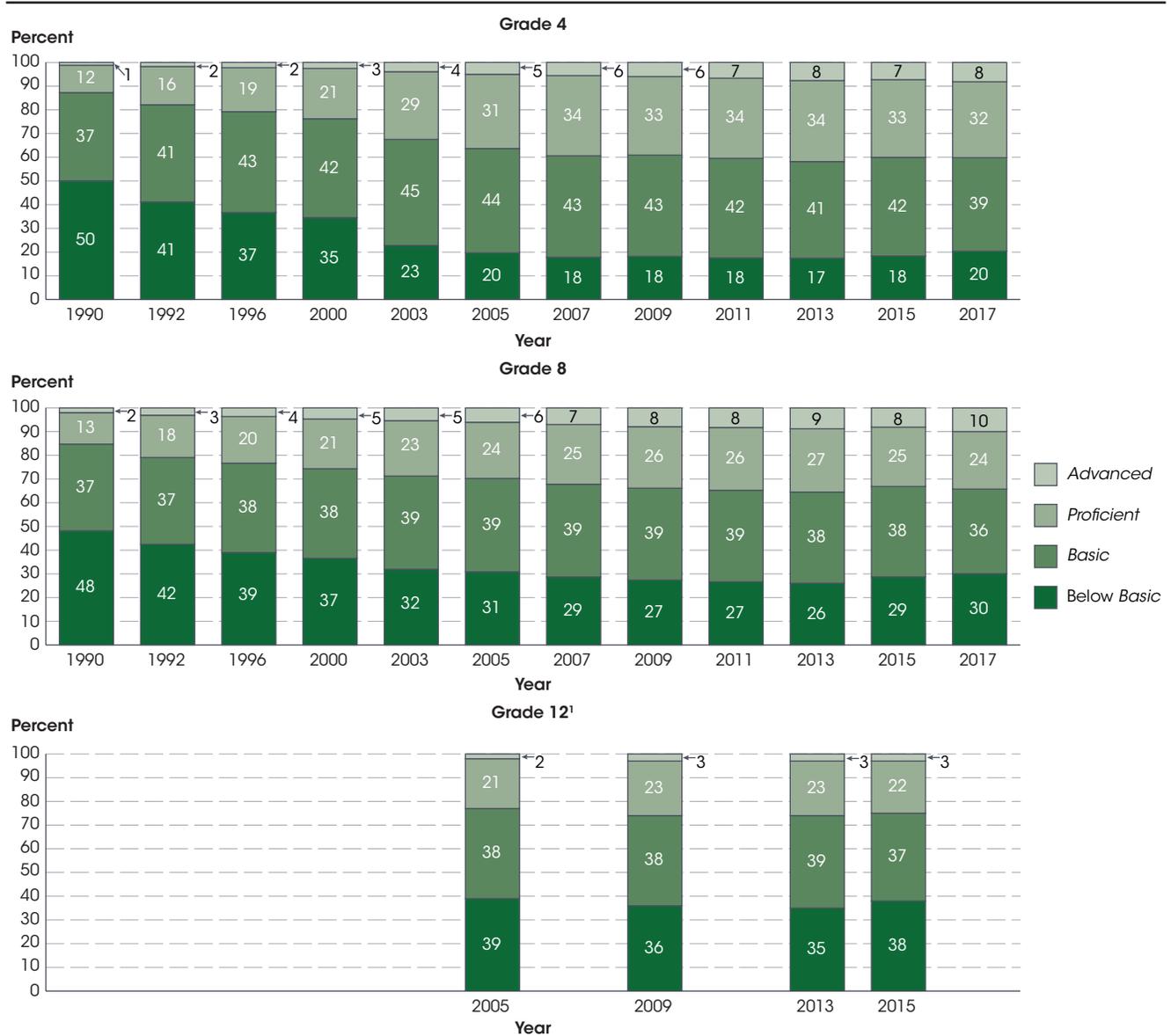
The average 4th-grade mathematics score in 2017 (240) was not measurably different than the score in 2015, although it was higher than the score in 1990 (213). Similarly, the average 8th-grade mathematics score in 2017 (283) was not measurably different than the score in 2015,

but it was higher than the score in 1990 (263). The average 12th-grade mathematics score in 2015 (152) was lower than the score in 2013 (153), but not measurably different from the score in 2005, the earliest year with comparable data.³

NAEP also reports scores at five selected percentiles to show the progress made by lower (10th and 25th percentiles), middle (50th percentile), and higher (75th and 90th percentiles) performing students.⁴ At grade 4, the mathematics scores for students at the 10th and 25th percentiles were lower in 2017 than in 2015. Also in 2017, 4th-grade mathematics scores were higher at all five selected percentiles than in 1990. At grade 8, mathematics scores for students at the 25th percentile were lower in

2017 than in 2015, and scores for students at the 75th and 90th percentiles were higher in 2017 than in 2015. In 2017, 8th-grade mathematics scores were higher at all five selected percentiles than in 1990. At grade 12, students at the 10th, 25th, and 50th percentiles scored lower in mathematics in 2015 than in 2013. In 2015, scores at all selected percentiles were not measurably different from the corresponding scores in 2005.

Figure 2. Percentage distribution of 4th-, 8th-, and 12th-grade students, by National Assessment of Educational Progress (NAEP) mathematics achievement levels: Selected years, 1990-2017



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.

NOTE: Includes public and private schools. Achievement levels define what students should know and be able to do: *Basic* indicates partial mastery of fundamental skills, *Proficient* indicates solid academic performance and competency over challenging subject matter, and *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 estimates. 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, 1990-2017 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2017*, table 222.12.

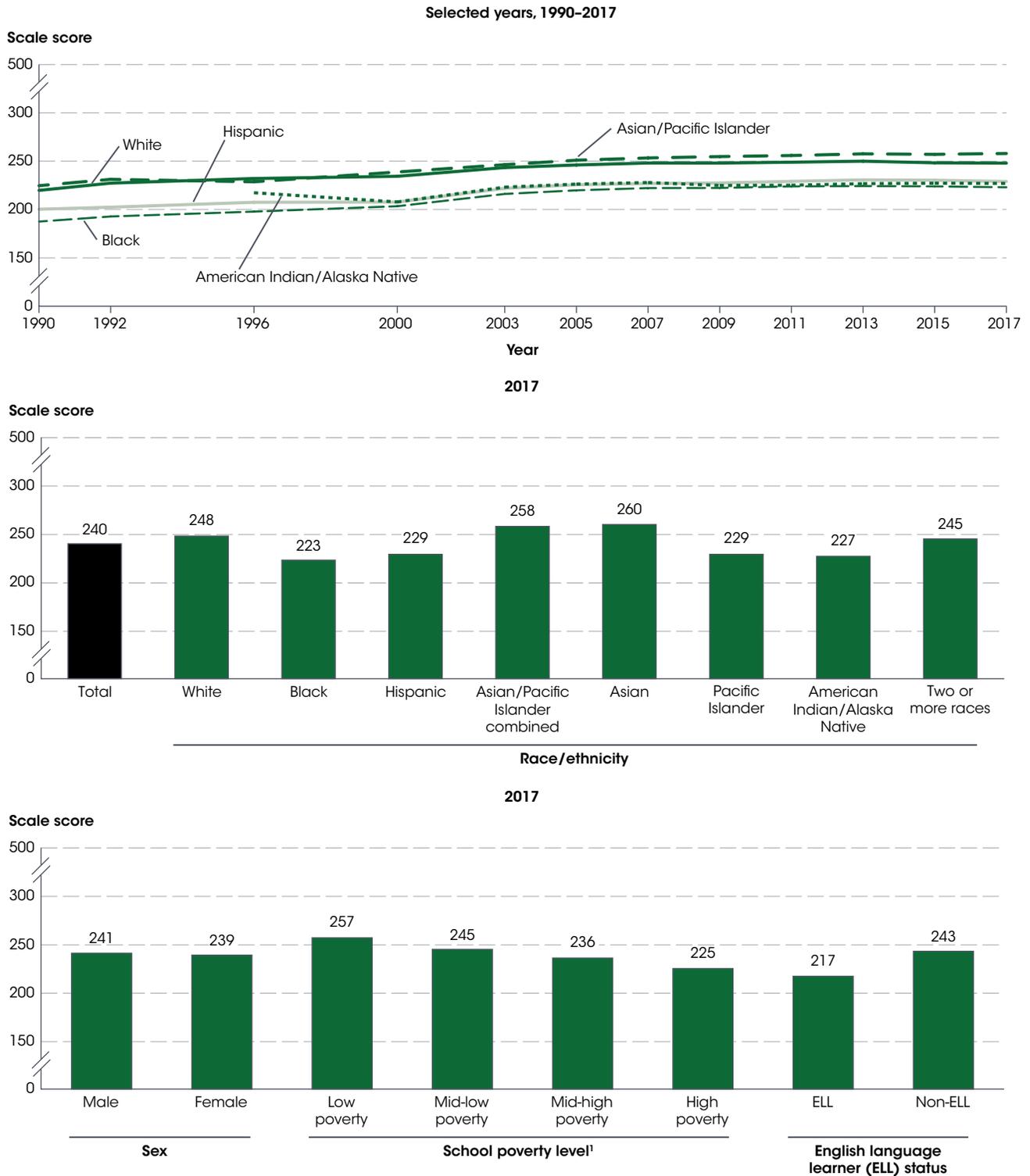
In 2017, some 80 percent of 4th-grade students performed at or above the *Basic* achievement level in mathematics, 40 percent performed at or above the *Proficient* level, and 8 percent performed at the *Advanced* level. While the percentage of 4th-grade students who performed at or above *Basic* in 2017 was lower than in 2015 (82 percent), it was higher than the percentage in 1990 (50 percent). The percentage of 4th-grade students who performed at or above *Proficient* in 2017 (40 percent) was not measurably different than in 2015, but it was higher than in 1990 (13 percent). Similarly, the percentage of 4th-grade students who performed at the *Advanced* level in 2017 (8 percent) was not measurably different than the percentage in 2015, but it was higher than the percentage in 1990 (1 percent).

In 2017, some 70 percent of 8th-grade students performed at or above *Basic* in mathematics, 34 percent performed at or above *Proficient*, and 10 percent performed at the *Advanced* level. The percentage of 8th-grade students who performed at or above *Basic* was lower in 2017 than in 2015 (71 percent), but was higher than the percentage in

1990 (52 percent). The percentage of 8th-grade students who performed at or above *Proficient* in 2017 (34 percent) was not measurably different than the percentage in 2015, but was higher than the percentage in 1990 (15 percent). The percentage of 8th-grade students who performed at the *Advanced* level in 2017 (10 percent) was higher than the percentages in 2015 and 1990 (8 and 2 percent, respectively).

In 2015, some 62 percent of 12th-grade students performed at or above *Basic* in mathematics, 25 percent performed at or above *Proficient*, and 3 percent performed at the *Advanced* level. The percentage of 12th-grade students who performed at or above *Basic* in 2015 was lower than the percentage in 2013 (65 percent), but not measurably different from the percentage in 2005. The percentage who performed at or above *Proficient* (25 percent) was not measurably different from the percentages in 2013 and in 2005. Similarly, the percentage of 12th-grade students who performed at the *Advanced* level in 2015 (3 percent) 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, 1990-2017



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 those schools where 51 to 75 percent of the students are eligible for FRPL, and mid-low poverty schools are those schools where 26 to 50 percent of the students are eligible for FRPL. Low-poverty schools are defined as 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 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 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. SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), selected years, 1990-2017 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2017*, tables 222.10 and 222.12.

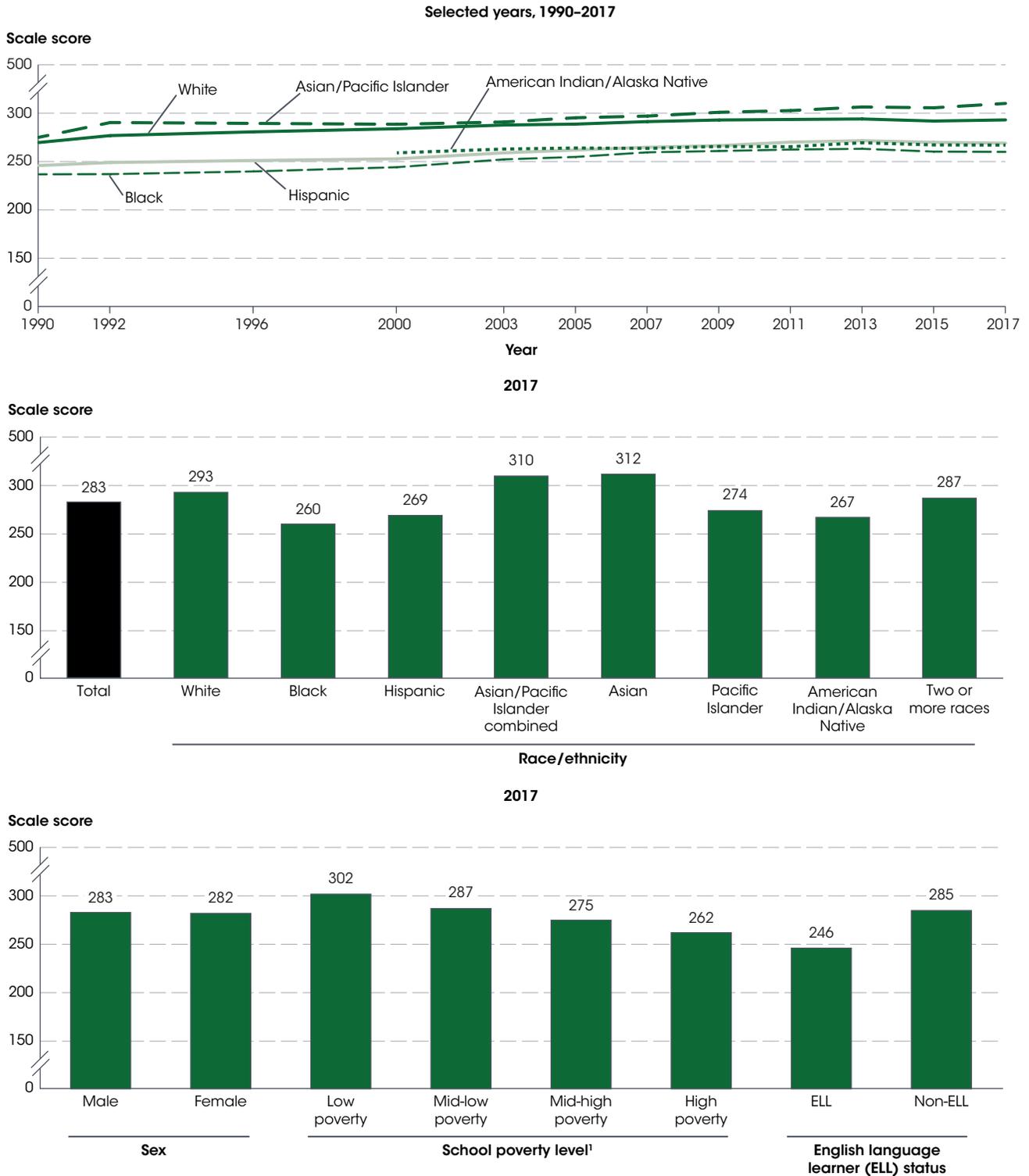
At grade 4, the average mathematics scores in 2017 for White (248), Black (223), Hispanic (229), and Asian/Pacific Islander (258) students were not measurably different from the 2015 scores, but the average score for each group was higher in 2017 than in 1990 (220, 188, 200, and 225, respectively). The 2017 average score for 4th-grade American Indian/Alaska Native students (227) was not measurably different from the scores in 2015 and in 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.⁵ At grade 4, the 2017 average mathematics scores for Asian students (260), Pacific Islander students (229), and students of Two or more races (245) were not measurably different from the scores in 2015 and 2011.

In 2017, and in all previous assessment years since 1990, the average mathematics score for White students in grade 4 has been higher than the scores of their Black and Hispanic peers. Although the White-Black and White-Hispanic achievement gaps did not change measurably from 2015 to 2017, the White-Black achievement gap narrowed from 32 points in 1990 to 25 points in 2017. The 4th-grade White-Hispanic achievement gap in 2017 (19 points) was not measurably different from the White-Hispanic gap in 1990.

At grade 4, the average mathematics scores for male (241) and female (239) students in 2017 were not measurably different from those in 2015 but were higher than those in 1990 (214 and 213, respectively). In 2017, the average mathematics score for male 4th-graders was 2 points higher than the average score for female students, which was not measurably different from the corresponding gaps between male and female students in 2015 and 1990.

NAEP also disaggregates scores by students' English language learner (ELL) status and by the poverty level of the school they attended.⁶ In 2017, the average mathematics score for 4th-grade ELL students (217) was 26 points lower than the average score for their non-ELL peers (243). In 2017, the average mathematics score for 4th-grade students in high-poverty schools (225) was lower than the average scores for 4th-grade students in mid-high poverty schools (236), mid-low poverty schools (245), and low-poverty schools (257). At grade 4, the 2017 achievement gap between students at high-poverty and low-poverty schools (32 points) was not measurably different from the corresponding achievement gaps in 2005 and 2015.

Figure 4. Average National Assessment of Educational Progress (NAEP) mathematics scale scores of 8th-grade students, by selected characteristics: Selected years, 1990-2017



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 those schools where 51 to 75 percent of the students are eligible for FRPL, and mid-low poverty schools are those schools where 26 to 50 percent of the students are eligible for FRPL. Low-poverty schools are defined as 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 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 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. SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), selected years, 1990-2017 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2017*, tables 222.10 and 222.12.

At grade 8, the average mathematics scores for White (293), Black (260), Hispanic (269), and Asian/Pacific Islander (310) students in 2017 were not measurably different from the corresponding scores in 2015, but the average score for each group was higher in 2017 than in 1990 (270, 237, 246, and 275, respectively). In 2017, the average score for 8th-grade American Indian/Alaska Native students (267) was not measurably different from the scores in 2015 and 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 2017 average mathematics scores for Pacific Islander students (274) and students of Two or more races (287) were not measurably different from the scores in 2015 and 2011. The average mathematics score for Asian students (312) in 2017 was higher than in 2011 (305), but not measurably different from the score in 2015.

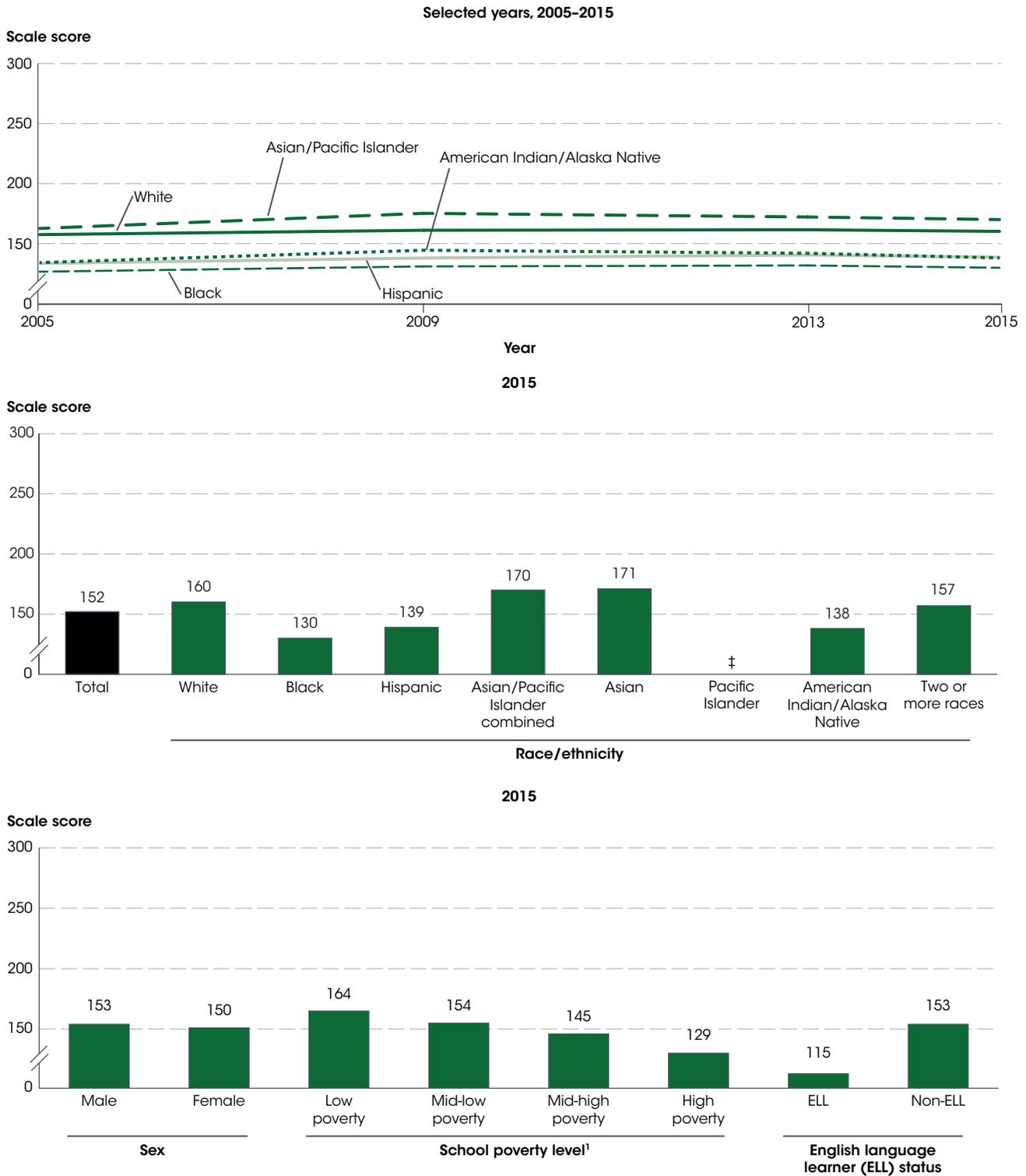
In 2017, and in all previous assessment years since 1990, the average mathematics scores for White students in grade 8 have been higher than the scores of their Black and Hispanic peers. In 2017, the 8th-grade achievement

gaps between White and Black students' average scores (32 points) and between White and Hispanic students' scores (24 points) were not measurably different from the corresponding gaps in 2015 or 1990.

At grade 8, the average mathematics scores for male (283) and female (282) students in 2017 were not measurably different from those in 2015 but were higher than those in 1990 (263 and 262, respectively). At grade 8, male students scored 1 point higher than female students in 2017. This gap was not measurably different from the gaps observed in 2015 and 1990.

In 2017, the average mathematics score for 8th-grade ELL students (246) was 40 points lower than the average score for their non-ELL peers (285). The average 2017 mathematics score for 8th-grade students in high-poverty schools (262) was lower than the average scores for students in mid-high poverty schools (275), mid-low poverty schools (287), and low-poverty schools (302). At grade 8, the 2017 achievement gap between students at high-poverty and low-poverty schools (39 points) was not measurably different from the corresponding achievement gaps in 2005 and 2015.

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 those schools where 51 to 75 percent of the students are eligible for FRPL and mid-low poverty schools are those schools where 26 to 50 percent of the students are eligible for FRPL. Low-poverty schools are defined as 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 NCEES 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. 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.

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 2017*, tables 222.10 and 222.12.

At grade 12, the average mathematics scores for White (160), Black (130), Hispanic (139), and Asian/Pacific Islander (170) students in 2015 were not measurably different from the scores in 2013, but the average score for each group was higher in 2015 than in 2005 (157, 127, 133, and 163, respectively). The average score for American Indian/Alaska Native students in 2015 (138) was not measurably different from the 2013 and 2005 scores. 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 average scores for Asian students (171) and students of Two or more races (157) were not measurably different from the scores in 2013. The average score for Pacific Islander students was 151 in 2013, but was suppressed in 2015 because reporting standards were not met. In 2015, the average 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 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 observed in 2005 and 2013.

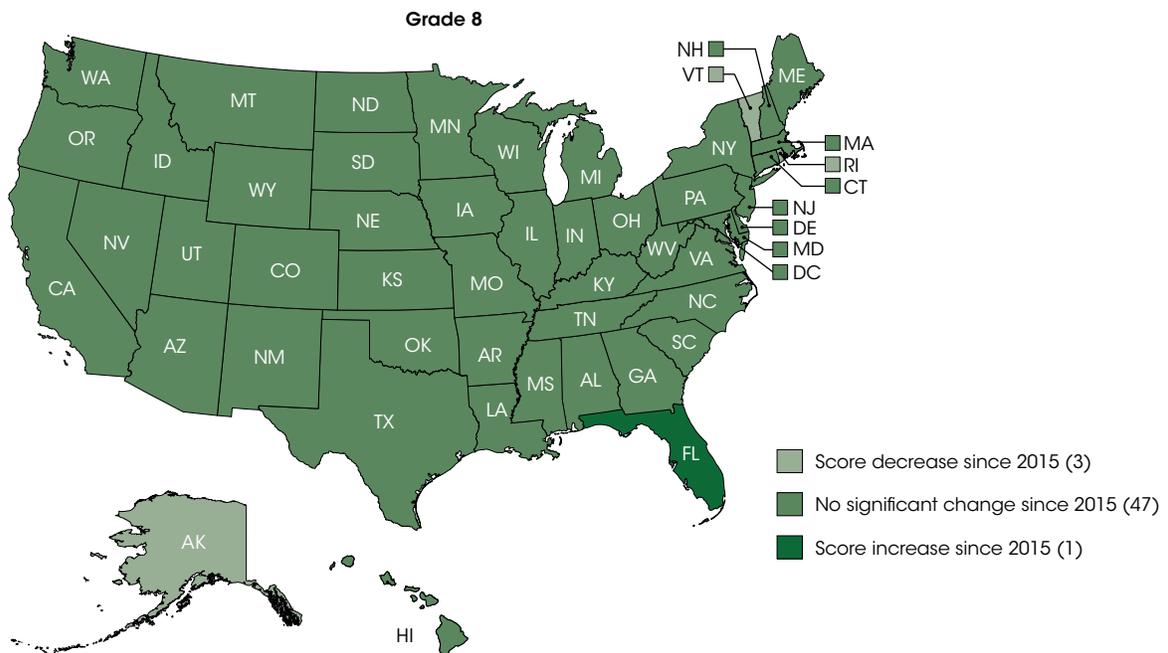
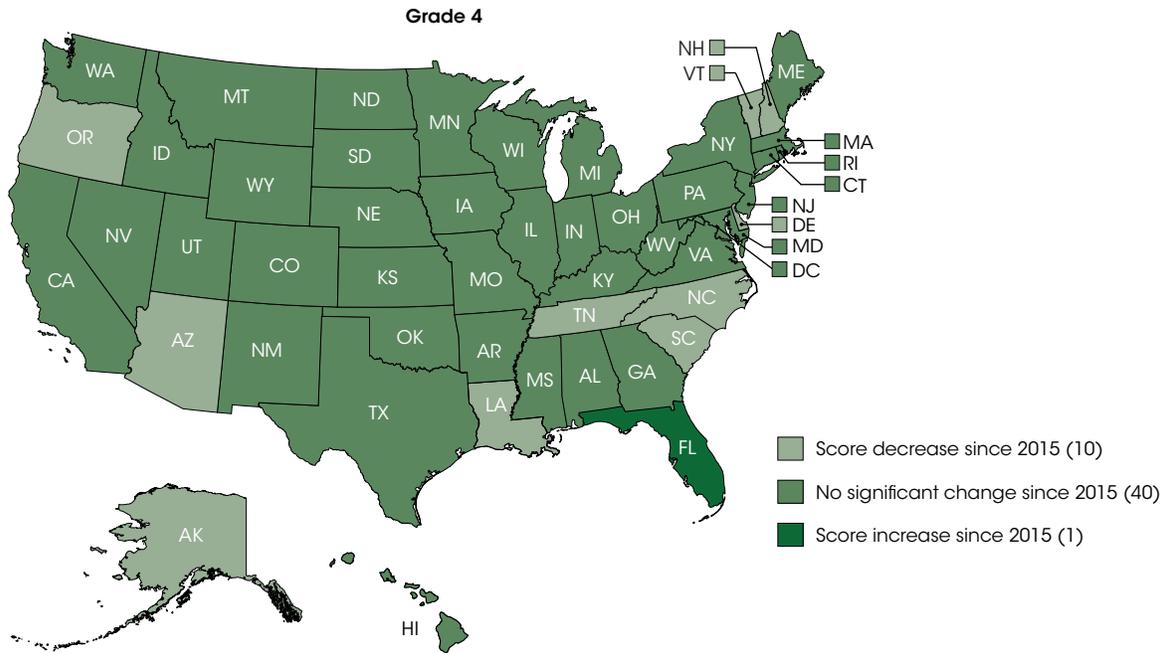
In 2015, the average mathematics score for 12th-grade ELL students (115) was 37 points lower than the average score for their non-ELL peers (153). In 2015, the average

mathematics score for 12th-grade students in high-poverty schools (129) was lower than the average scores for 12th-grade students in mid-high poverty schools (145), mid-low poverty schools (154), and low-poverty schools (164). The achievement gap between the students at high-poverty schools and low-poverty schools was 36 points in 2015, which was not measurably different from the gap in previous assessment years.

NAEP results also permit state-level comparisons of the mathematics achievement of 4th- and 8th-grade students in public schools.⁷ At grade 4, the national average score for public school students in 2017 was 239, and scores across states ranged from 229 to 249. In 15 states, average scores for 4th-grade students in public schools were higher than the national average for 4th-grade students in public schools. In 18 states, the average mathematics score for 4th-grade public school students was not measurably different from the national average for public school students. Average scores in the District of Columbia and the remaining 17 states were lower than the national average for public school students.

At grade 8, the national average mathematics score for public school students in 2017 was 282, and average scores varied across states from 266 to 297. In 22 states, average scores for 8th-grade students in public schools were higher than the national average for 8th-grade students in public schools, and in 11 states the average scores for 8th-grade students in public schools were not measurably different from the national average. Average scores in the District of Columbia and the remaining 17 states were lower than the national average for 8th-grade students in public schools.

Figure 6. Change in average National Assessment of Educational Progress (NAEP) mathematics scale scores of 4th- and 8th-grade public school students, by state: 2015 to 2017



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), 2015 and 2017 Mathematics Assessments, NAEP Data Explorer. See *Digest of Education Statistics 2017*, tables 222.50 and 222.60.

While there was no measurable change from 2015 to 2017 in the mathematics score for 4th-grade public school students nationally, the average score was higher in 2017 than in 2015 in one state (Florida). Average 4th-grade mathematics scores for public school students were lower in 2017 than in 2015 in 10 states. For the remaining 39 states and the District of Columbia, average scores in 2017 were not measurably different from the scores in 2015. At the 8th-grade level, the national average

mathematics score for public school students in 2017 was not measurably different from the score in 2015. In one state (Florida), the average score for 8th-grade public school students was higher in 2017 than in 2015. In three states—Alaska, Rhode Island, and Vermont—the average score for 8th-grade students in public schools was lower in 2017 than in 2015. Average scores in the remaining 46 states and the District of Columbia showed no measurable change between 2015 and 2017.

Endnotes:

¹ This indicator presents data from the Main NAEP mathematics assessment, which is not directly 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.

² NAEP mathematics scores for 4th-grade students in 2017 had a mean of 240 and a standard deviation (SD) of 31. NAEP mathematics scores for 8th-grade students in 2017 had a mean of 283 and an SD of 39. NAEP mathematics scores for 12th-grade students in 2015 had a mean of 152 and an SD of 34 (retrieved March 13, 2018, from the Main NAEP Data Explorer, <http://nces.ed.gov/nationsreportcard/naepdata/>).

³ 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.

⁴ For more information on NAEP scores by percentile, see the [Nation's Report Card](#) website.

⁵ While NAEP reported some data on students of Two or more races for earlier years, the reporting standards changed in 2011.

⁶ 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 those schools where 51 to 75 percent of the students are eligible for FRPL, and mid-low poverty schools are those schools where 26 to 50 percent of the students are eligible for FRPL. Low-poverty schools are defined as schools where 25 percent or less of the students are eligible for FRPL. Data disaggregated by school poverty level are presented for 2005 and later years because prior year data are not comparable.

⁷ NAEP results serve as a common metric for all states and selected urban district and are not comparable to results from assessments administered by state education agencies.

Reference tables: *Digest of Education Statistics 2017*, tables 222.10, 222.12, 222.50, and 222.60

Related indicators and resources: [Absenteeism and Achievement](#) [*Status and Trends in the Education of Racial and Ethnic Groups*]; [International Comparisons: Science, Reading, and Mathematics 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 learners (ELL); Public school or institution; Racial/ethnic group

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