The Condition of Education 2019

Chapter: 1/Preprimary, Elementary, and Secondary Education
Section: Assessments

Technology and Engineering Literacy

Overall, 46 percent of 8th-grade students performed at or above the Proficient level on the National Assessment of Educational Progress Technology and Engineering Literacy assessment in 2018. Some 49 percent of female students scored at or above the Proficient level, which was higher than the percentage for male students (44 percent). The percentage of students scoring at or above Proficient was higher for Asian students (66 percent), White students (59 percent), and students of two or more races (53 percent) than for Hispanic students (31 percent), American Indian/Alaska Native students (29 percent), and Black students (23 percent).

The National Assessment of Educational Progress (NAEP) Technology and Engineering Literacy (TEL) assessment measures whether students are able to apply technology and engineering skills to real-life situations. In the assessment framework, technology is defined as “any modification of the natural world done to fulfill human needs or desires,” and engineering is defined as “a systematic and often iterative approach to designing objects, processes, and systems to meet human needs and wants.”

The TEL assessment is designed to measure three content areas. The first, Technology and Society, involves the effects that technology has on society and on the natural world and the ethical questions that arise from those effects. The second content area, Design and Systems, covers the nature of technology, the engineering design process by which technologies are developed, and basic principles of dealing with everyday technologies such as maintenance and troubleshooting. The final content area, Information and Communication Technology, includes computers and software learning tools; networking systems and protocols; handheld digital devices; and other technologies for accessing, creating, and communicating information and for facilitating creative expression.
In 2018, the average overall TEL score for 8th-grade students was 152 points on a scale ranging from 0 to 300. The average overall TEL score for 8th-grade students in 2018 was higher than in 2014 (150), when the TEL assessment was first administered. Student achievement on the 2018 TEL assessment varied by student and school characteristics. For example, female students scored higher on average than male students (155 vs. 150). The average TEL scores for Asian students (169), White students (163), and students of Two or more races (157) were higher than the average scores for students who were Hispanic (139), American Indian/Alaska Native (133), and Black (132). English language learners (ELL) had lower average scores (106) than non-ELL students (155).

In addition, students identified as having a disability (SD) had lower average scores (118) than students not identified as SD (157). The average TEL score was highest for students whose parents’ highest level of education was graduating from college (163). The average TEL score was lowest for students who did not have a parent who completed high school and for students whose parents’ highest level of education was graduating from college (163). The average TEL score was highest for students attending suburban schools (156) than for students attending city schools (147), but not measurably different from the scores for those attending town and rural schools.
Figure 2. Percentage distribution of 8th-graders attaining National Assessment of Educational Progress (NAEP) Technology and Engineering Literacy (TEL) achievement levels, by sex and race/ethnicity: 2018

1 Includes Pacific Islanders. Due to unmet reporting standards, TEL achievement levels for Pacific Islanders are not displayed separately.

NOTE: Includes public and private schools. Includes students tested with accommodations (11 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders). TEL achievement levels are for performance on the TEL assessment overall, rather than performance on any specific content area. NAEP achievement levels are provisional; thus, care should be used to ensure the proper interpretation of achievement levels. Achievement levels define what students should know and be able to do. Basic denotes partial mastery of the knowledge and skills that are fundamental for proficient work at a given grade. Proficient represents solid academic performance; students reaching this level have demonstrated competency over challenging subject matter. Advanced signifies superior performance. Race categories exclude persons of Hispanic ethnicity. Although rounded numbers are displayed, the figures are based on unrounded data. Detail may not sum to totals due to rounding.


TEL achievement levels define what students should know and be able to do: Basic indicates partial mastery of fundamental skills, and Proficient demonstrates solid academic performance and competency over challenging subject matter. Overall, 84 percent of 8th-grade students performed at or above the Basic achievement level on the TEL assessment in 2018. Some 46 percent of 8th-grade students performed at or above the Proficient level in 2018, a percentage that was higher than the corresponding percentage in 2014 (43 percent). In 2018, the percentage of students scoring at or above the Basic level was higher for female students than for male students (86 vs. 82 percent). The percentage of students scoring at or above Basic was higher for White and Asian students (92 percent each) than for students of Two or more races (87 percent), Hispanic students (76 percent), Black students (68 percent), and American Indian/Alaska Native students (67 percent). In 2018, some 49 percent of female students scored at or above the Proficient level, which was higher than the percentage for male students (44 percent). The percentage of students scoring at or above Proficient was higher for Asian students (66 percent), White students (59 percent), and students of Two or more races (53 percent) than for Hispanic students (31 percent), American Indian/Alaska Native students (29 percent), and Black students (23 percent).
Endnotes:

1 NAEP results are not comparable to results from assessments administered by state education agencies.
2 For details on the TEL assessment or its content areas, please refer to https://nces.ed.gov/nationsreportcard/tel/.
3 Due to unmet reporting standards, neither the average TEL score nor TEL achievement levels are reported separately for Pacific Islanders, although the data are included in the totals.
4 In addition to including students with an Individualized Education Program (IEP), SD status also includes students with a 504 plan.
5 NAEP achievement levels are provisional; thus, care should be used to ensure the proper interpretation of achievement levels.

Reference tables: Digest of Education Statistics 2018, table 224.70, Digest of Education Statistics 2017, table 224.70

Related indicators and resources: Children's Access to and Use of the Internet; Mathematics Performance; Reading Performance; Science Performance

Glossary: Achievement levels, NAEP; College; Disabilities, children with; Educational attainment; English language learner (ELL); High school completer; Locale codes; Racial/ethnic group