

## Public Q&A for the 2018 NAEP Technology and Engineering Literacy (TEL) Assessment at Grade 8

### What is The Nation's Report Card™?

The National Assessment of Educational Progress (NAEP), also known as the Nation's Report Card, is the largest continuing and nationally representative assessment of what our nation's students know and can do in subjects such as mathematics, reading, science, and writing. Teachers, principals, parents, policymakers, and researchers all use NAEP results to assess progress and develop ways to improve education in the United States. Standard assessment administration practices are implemented to provide a common measure of student achievement.

The National Center for Education Statistics (NCES), within the U.S. Department of Education's Institute of Education Sciences (IES), is charged by Congress with administering the NAEP program. The National Assessment Governing Board (NAGB) sets policy for the NAEP program.

### What is the Technology Engineering and Literacy (TEL) assessment?

The Technology and Engineering Literacy Assessment, also known as "TEL," provides critical insights into how students use their understanding of technology and engineering to interact, interpret, and influence the world in which they live. TEL is a digitally based assessment designed to assess grade 8 students' knowledge and skill in understanding technological principles, solving technology and engineering-related problems, and using technology to communicate and collaborate. TEL was developed to measure the level of technological and engineering skills and knowledge needed by all students, not just those pursuing careers in the in the fields of science, technology, engineering, and mathematics (STEM). TEL was administered for the first time in 2014.

TEL is administered on laptops and allows students to demonstrate their range of knowledge and skills detailed in the three interconnected content areas—technology and society, design and systems, and information and communication technology—and three cross-cutting practices—understanding technological principles, developing solutions and achieving goals, and communicating and collaborating. They are asked to answer questions and perform a variety of problem-solving tasks based on interactive, multimedia scenarios requiring realistic solutions.

### What is "technology and engineering literacy"?

For the purposes of the TEL assessment, the definitions of technology, engineering, and technology and engineering literacy are as follows:

- **Technology** is any modification of the natural or designed world done to fulfill human needs or desires.

- **Engineering** is a systematic and often iterative approach to designing objects, processes, and systems to meet human needs and wants.
- **Technology and engineering literacy** is the capacity to use, understand, and evaluate technology as well as to understand technological principles and strategies needed to develop solutions and achieve goals.

### **What is the relationship between technology and engineering and science?**

While technology, engineering, and science are closely linked, they are distinct from one another. The framework, which guides the development of the assessment and the content to be assessed, defines science as the *investigation* of the natural world.

### **What content was assessed in the NAEP TEL assessment in 2018?**

The TEL framework organizes the assessment objectives into the following three major content areas:

- **Technology and Society** deals with the effects that technology has on society and the environment as well as the ethical questions raised by those effects.
- **Design and Systems** focuses on the processes used for designing and developing new technologies and the need for maintenance and troubleshooting.
- **Information and Communication Technology** covers the software and systems used for accessing, evaluating, managing, creating, and communicating information and how digital technologies can facilitate collaboration and expression.

When asked to solve problems within the content areas, students were expected to apply certain types of thinking and reasoning, categorized by the TEL framework into the following three practices:

- **Understanding Technological Principles** focuses on how well students are able to make use of their knowledge about technology.
- **Developing Solutions and Achieving Goals** refers to students' systematic use of technological knowledge, tools, and skills to solve problems and achieve goals presented in realistic contexts.
- **Communicating and Collaborating** refers to how well students are able to use contemporary technologies to communicate for a variety of purposes and in a variety of ways, such as working individually or in teams or with peers or experts.

### **What makes the TEL assessment unique?**

TEL is an interdisciplinary assessment designed to measure the technology and engineering knowledge and skills that are important for all students to participate

intelligently and thoughtfully in the world around them, not just for those pursuing STEM-related careers.

The TEL assessment emphasizes innovative, scenario-based tasks. In scenario-based tasks, students interact with computer simulations of technology and engineering problem-solving tasks set in a variety of realistic scenarios. These scenarios challenge students to use a diverse set of tools to solve problems and communicate their findings. Because the digitally based scenarios simulate situations the students may encounter in their lives, they provide an increased level of authenticity. While other NAEP assessments make use of interactive or hands-on tasks, TEL incorporates scenario-based tasks as a main component of creating reliable scales to measure student performance nationally.

### **How can you measure something that is not taught in a specific course or not always taught within schools?**

What makes NAEP a unique and valuable measure of what students know and can do is that it is not an assessment that can be “taught” to in the classroom. Rather, it serves as a benchmark for what students know and can do. The results serve to inform discussion of how we might improve education and student knowledge and skills in the United States.

TEL was designed to measure “literacy” as the level of knowledge and competencies needed by all students and citizens. People who are literate about technology and engineering are not expected to “do” engineering or produce technology in the professional sense. Therefore, the assessment is not intended to address technical knowledge of specific technologies or types of engineering expertise taught in specialized courses. It is designed to address how well students have mastered the processes and tools they need to participate intelligently and thoughtfully in the world around them.

### **How many schools and students participated?**

The 2018 Grade 8 TEL assessment results are based on nationally representative samples of eighth-graders. Approximately 15,400 eighth-graders from about 600 private and public schools participated in the assessment.

### **How are TEL results reported?**

Overall scores are reported on a 0–300 scale. Scales for the three major content areas and the three practices for grade 8 are also reported. Achievement levels are reported as the percentages of students performing at or above three achievement levels (*NAEP Basic*, *NAEP Proficient*, and *NAEP Advanced*). The Governing Board defines *NAEP Proficient* performance as “competency over challenging subject matter.”

### **Are results for private schools included in the report?**

No. Although private school students did participate in the 2018 TEL assessment, results for private schools are not available because participation rates did not meet the required standard for reporting reliable results.

### **Why are results not reportable for Native Hawaiian/Other Pacific Islander students in 2018?**

Although Native Hawaiian/Other Pacific Islander students did participate in the 2018 TEL assessment, results for this student group are not available because participation rates did not meet the required standard for reporting reliable results.

### **How was the TEL assessment developed?**

The [TEL framework](#) is the blueprint that guides the development of the assessment and the content to be assessed. Each NAEP assessment is based on an organizing framework, which is informed by a collaboration of content experts, business leaders, educational policymakers, teachers, parents, and the general public.

### **What testing accommodations are offered?**

Accommodations are adaptations to standard testing procedures that remove barriers to participation without changing what is being tested. NAEP allows students with disabilities and English language learners to use most testing accommodations that they receive on state or district tests. Examples of such accommodations are extended time and small-group or one-on-one administration.

Because TEL is a digitally based assessment, some accommodations are provided within the testing platform (e.g., extended time) while others are available outside of the testing platform (e.g., breaks during the test). NAEP digitally based assessments also include a set of accessibility features, referred to as universal design elements, that are available to all students taking the assessment. These features include the ability to adjust font size, directions read aloud via text to speech, and a highlighter tool. To see more on NAEP accommodations and universal design features, please visit [https://nces.ed.gov/nationsreportcard/about/accom\\_table.aspx](https://nces.ed.gov/nationsreportcard/about/accom_table.aspx).

### **When comparing results, how could there be two numeric differences (e.g., score differences between two groups) of the same size, only one of which is statistically significant?**

NAEP uses widely accepted procedures to measure when estimated score differences are statistically significant. Comparisons between groups are based on statistical tests that consider both the size of the differences and the standard errors of the two statistics being compared.

Standard errors are margins of error, and estimates based on smaller groups are likely to have larger margins of error. The size of the standard errors may also be influenced by other factors such as how representative the assessed students are of the entire population. When an estimate has a large standard error, a numerical difference that seems large may not be statistically significant. Differences of the same magnitude may or may not be statistically significant depending upon the size of the standard errors of the estimates. To say that a difference is not statistically significant means that there is too much random fluctuation in the sample to say for certain that the difference exists.

**For more information about The Nation’s Report Card, visit <http://nationsreportcard.gov>.**

Direct links to other resources:

NCES	<a href="http://nces.ed.gov">http://nces.ed.gov</a>
NAEP Data Explorer	<a href="http://nces.ed.gov/nationsreportcard/naepdata">http://nces.ed.gov/nationsreportcard/naepdata</a>
NAEP Questions Tool	<a href="http://nces.ed.gov/nationsreportcard/itmrlsx/">http://nces.ed.gov/nationsreportcard/itmrlsx/</a>
NAEP Frameworks	<a href="https://www.nagb.gov/naep-frameworks/frameworks-overview.html">https://www.nagb.gov/naep-frameworks/frameworks-overview.html</a>
NAEP Achievement Levels	<a href="https://www.nagb.gov/focus-areas/NAEP-achievement-levels.html">https://www.nagb.gov/focus-areas/NAEP-achievement-levels.html</a>