

Power Core Standards Within Standards for Technological and Engineering Literacy: How STEL Can Guide Educators to Build Curricula PreK-16

The power core standards in *Standards for Technological and Engineering Literacy* are well defined and supported with information to guide the development of curriculum writing and related processes for educators at every level. Chapters 1 (The Need for Standards for Technological and Engineering Literacy) and 2 (Overview of *Standards for Technological and Engineering Literacy*) create the foundation for guiding the use of the core standards with the Practices and through the Contexts. Chapter 3 (Core Disciplinary Standards) provides an in-depth set of details for every standard at each grade band (PreK-2, 3-5, 6-8, and 9-12). The content within Chapters 1, 2, and 3 provides a clear pathway to connect the Standards with the prescribed Practices (Chapter 4) and Contexts (Chapter 5).

The *STEL* Preface provides an excellent foundation from which to start, “*Standards for Technological and Engineering Literacy* has departed from the original 2000 *Standards for Technological Literacy* document in several notable ways. The number of core content standards has been reduced from 20 to 8 and associated benchmarks from 288 to 142. This reflects input from the technology and engineering profession and from other members of the STEM community, and a desire to focus on what might be termed ‘power’ standards—that is, standards and benchmarks that define the enduring ideas and abilities that will withstand technological changes over time. The former ‘designed world’ standards have been reconceived here as technological and engineering contexts in which the core standards are applied. This reflects a desire to move beyond an approach that attempts to cover an overly broad scope of technological and engineering activity to one that more realistically allows for local emphases and variations while still helping students assimilate and apply the core content and practices. For each context area, examples of curricular approaches are suggested. In addition, the document outlines technological and engineering practices that identify key attributes and personal qualities that all technology and engineering students should exhibit. Thus, *Standards for Technological and Engineering Literacy* is a foundation upon which educators can build curricular approaches and assessments, design learning environments, connect with the larger educational community, and prepare students for their future.”

The framework of the National Assessment of Educational Progress Technology and Engineering Literacy (NAEP TEL) assessment is based heavily on *STL* (ITEEA, 2007) and *STEL* provides a vital update to this foundation (<https://nces.ed.gov/nation-sreportcard/tel/>). The Preface and Chapter One of the NAEP TEL Assessment Framework have deliberate parallels to *STL* Chapter 1. ITEEA has been very involved with the NAEP TEL since its inception.

The National Academies (particularly the National Academy of Engineering and National Research Council) also have strong connections to *STL* and the underlying technology and engineering education research. For example, a direct connection to the *STEL* standards can be seen in the repeated discussion of the three dimensions of technology: knowing, thinking, and doing. This has been a tenet of our field since 1929 and has been validated through work such as ITEEA’s Focal Points (2016), *STEL* (2020), and numerous National Academies reports. Below are key National Academies’ reports with strong connections to ITEEA standards:

- Honey, M., Pearson, G., & Schweingruber, H. (Eds.). (2014). *STEM integration in K-12 education: Status, prospects, and an agenda for research*.
- Katehi, L., Pearson, G., & Feder, M. (Eds.). (2009). *Engineering in K-12 Education: Understanding the Status and Improving the Prospects*.
- National Academy of Engineering. (2010). *Standards for K-12 Engineering Education?*
- National Research Council. (2002). *Technically Speaking: Why all Americans Need to Know More about Technology*.
- National Research Council. (2006). *Tech Tally: Approaches to Assessing Technological Literacy*. Washington, DC: National Academies Press. NGSS Lead States. (2013). *Next Generation Science Standards: For States, By States*.
- Weiss, I. R., Knapp, K. S., Hollweg, K. S., & Burrill, G. (Editors). (2002). *Investigating the influence of standards: A framework for research in Mathematics, Science, and Technology education*.

There is no question that the National Assessment Governing Board (through NAEP TEL) and the National Academies’ reports mentioned above are a strong validation of technology and engineering education, especially ITEEA’s standards. These resources can be valuable aids in work to develop curriculum that provides a rich learning experience for all students.

The full *STEL* Document is available for download at www.iteea.org/stel.aspx. Print, printable PDF, and EPub versions are also available. Please contact iteea@iteea.org with any questions.