



Grades 9–12

3.5.9-12.H Technology and Engineering: Applying, Maintaining, Assessing, and Evaluating Technological Products and Systems

Students who demonstrate understanding can evaluate ways that technology and engineering can impact individuals, society, and the environment.

Clarifying Statement: A variety of approaches and resources can be used by students when asked to evaluate given technologies. These include technology assessment, cost-benefit analysis, risk assessment, environmental impact analysis, and case studies, among others. By applying evaluative techniques, students can analyze the relationships between resources and technology to improve sustainability efforts. This process should be accompanied by an understanding of the importance of evaluating technologies in a holistic manner.

Assessment Boundary: N/A

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Technology and Engineering Practices (TEP)
<p>Engaging in Argument From Evidence</p> <p>Engaging in argument from evidence in 9–12 builds on K–8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science.</p> <ul style="list-style-type: none"> Compare and evaluate competing arguments or design solutions in light of currently accepted explanations, new evidence, limitations (e.g., trade-offs), constraints, and ethical issues. 	<p>HS-LS2-7</p> <ul style="list-style-type: none"> Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. <p>NAEP T.12.4</p> <ul style="list-style-type: none"> Analyze cultural, social, economic, or political changes (separately or together) that may be triggered by the transfer of a specific technology from one society to another. Include both anticipated and unanticipated effects. 	<p>Attention to Ethics</p> <ul style="list-style-type: none"> Assesses technological products, systems, and processes through critical analysis of their impacts and outcomes.

Pennsylvania Context: Examples of Pennsylvania context include but are not limited to Pennsylvania’s wind farms.

Pennsylvania Career Ready Skills: Evaluate consequences from a personal, and civic perspective to inform decision making.

Connections to Other Standards Content and Practices



Standard Source	Possible Connections to Other Standard(s) or Practice(s)
<p>PA Core Standards: Reading and Writing in Science and Technical Areas</p>	<p>CC.1.2.3.G: Use information gained from text features to demonstrate understanding of a text. CC.1.2.4.G: Interpret various presentations of information within a text or digital source and explain how the information contributes to an understanding of text in which it appears. CC.1.2.5.G: Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. CC.1.4.3.V: Conduct short research projects that build knowledge about a topic. CC.1.4.4.V: Conduct short research projects that build knowledge through investigation of different aspects of a topic. CC.1.4.5.V: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. CC.1.4.3.W: Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. CC.1.4.4.W: Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.</p>
<p>PA Core Standards: Reading and Writing in Science and Technical Areas (continued)</p>	<p>CC.1.4.5.W: Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.</p>
<p>PA Core Standards and Practices: Math</p>	<p>MP.3: Construct viable arguments and critique the reasoning of others. MP.7: Look for and make use of structure.</p>
<p>Integrated Standards for Science, Environment & Ecology, and Technology & Engineering Standards Grades K–12</p>	<p>N/A</p>