



Grades 6–8

3.5.6-8.II Technology and Engineering: Nature and Characteristics of Technology and Engineering

Students who demonstrate understanding can *predict outcomes of a future product or system at the beginning of the design process.*

Clarifying Statement: Careful designers consider possible outcomes of a technological product before the product is completed. This is a habit of mind that students should continually expand through design, problem solving, ideation, and systems thinking.

Assessment Boundary: N/A

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Technology and Engineering Practices (TEP)
<p>Developing and Using Models</p> <p>Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.</p> <p>Develop and/or revise a model to show the relationships among variables, including those that are not observable but predict observable phenomena.</p>	<p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately an optimal solution. 	<p>Making and Doing</p> <ul style="list-style-type: none"> Exhibits safe, effective ways of producing technological products, systems, and processes. <p>Systems Thinking</p> <ul style="list-style-type: none"> Uses the systems model to show how parts of technological systems work together.

Pennsylvania Context: Examples of Pennsylvania context include but are not limited to the environmental impact of Pennsylvania’s sources of energy, such as wind, fossil, and hydroelectric power.

Pennsylvania Career Ready Skills: Make a decision based upon anticipated consequences.



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. 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>