Grades 6–8

3.5.6-8.AA Technology and Engineering: Integration of Knowledge, Technologies, and Practices

Students who demonstrate understanding can *adapt and apply an existing product, system, or process to solve a problem in a different setting.*

Clarifying Statement: Technology transfer is a creative way for people to address needs and wants. For instance, an automated pump based on biology laboratory designs was created for the Mars Viking space probe. The pump was modified for use as an insulin delivery mechanism, providing patients with a way to automatically regulate blood sugar. In classrooms, this concept is often already implicitly achieved as students apply existing technologies in novel ways. An example that may be highlighted is the use of a microcontroller to solve a design problem.

Assessment Boundary: N/A

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Technology and Engineering Practices (TEP)
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6–8 builds on K– 5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. • Apply scientific ideas or principles to design, construct, and test a design of an object, tool, process or system.	**Optimizing the Design Solution** • Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process - that is, some of these characteristics may be incorporated into the new design.	**Making and Doing** • Exhibits safe, effective ways of producing technological products, systems, and processes. **Creativity** • Exhibits innovative and original ideas in the context of design-based activities.

Pennsylvania Context: Examples of Pennsylvania context include but are not limited to Pennsylvania's academic and research institutions, programs, inventions, and maker spaces.

Pennsylvania Career Ready Skills: Identify and evaluate distractors that impact reaching ones' goals.

Connections to Other Standards Content and Practices

Standard Source	Possible Connections to Other Standard(s) or Practice(s)
PA Core Standards: Reading and Writing in Science and Technical Areas	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.
PA Core Standards and Practices: Math	N/A
Integrated Standards for Science, Environment & Ecology, and Technology & Engineering Standards Grades K–12	3.3.6-8.M: Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.