



Grades 9–12

3.5.9-12.OO Technology and Engineering: Nature and Characteristics of Technology and Engineering

Students who demonstrate understanding can use project management tools, strategies, and processes in planning, organizing, and controlling work.

Clarifying Statement: Management is sometimes defined as getting work done through other people. Teamwork, responsibility, and interpersonal dynamics play a significant role in the development and production of technological products. Management processes are used to oversee and guide these functions.

Assessment Boundary: N/A

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Technology and Engineering Practices (TEP)
Planning and Carrying Out Investigations Planning and carrying out investigations in 9–12 builds on K–8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical, and empirical models. <ul style="list-style-type: none"> Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts. 	Defining and Delimiting Engineering Problems <ul style="list-style-type: none"> Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. 	Attention to Ethics <ul style="list-style-type: none"> Assesses technological products, systems, and processes through critical analysis of their impacts and outcomes. Communication <ul style="list-style-type: none"> Clearly conveys ideas in constructive ways, including through written and oral communication and via mathematical and physical models.

Pennsylvania Context: Examples of Pennsylvania context include but are not limited to Pennsylvania's food supply companies in the Commonwealth.

Pennsylvania Career Ready Skills: Evaluate behaviors in relation to the impact on self and others.

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	<p>CC.1.2.3.G: Use information gained from text features to demonstrate understanding of a text.</p> <p>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.</p> <p>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.</p> <p>CC.1.4.3.V: Conduct short research projects that build knowledge about a topic.</p> <p>CC.1.4.4.V: Conduct short research projects that build knowledge through investigation of different aspects of a topic.</p> <p>CC.1.4.5.V: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.</p> <p>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.</p> <p>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>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>
PA Core Standards and Practices: Math	<p>MP.5: Use appropriate tools strategically.</p>
Integrated Standards for Science, Environment & Ecology, and Technology & Engineering Standards Grades K–12	<p>N/A</p>