### Grades 9–12

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

Students who demonstrate understanding can develop a solution to a technological problem that has the least negative environmental and social impact.

**Clarifying Statement:** Students can be challenged to engage in problem identification, analysis, investigation, and design to find technological solutions that improve people’s living conditions or that improve the well-being of individuals or members of a group.

**Assessment Boundary:** N/A

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asking Questions and Defining Problems</strong>&lt;br&gt;Asking questions and defining problems in 9–12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.&lt;br&gt;&lt;br&gt;• Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.</td>
<td><strong>ETS1.B: Developing Possible Solutions</strong>&lt;br&gt;• When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts.</td>
<td><strong>Attention to Ethics</strong>&lt;br&gt;• Assesses technological products, systems, and processes through critical analysis of their impacts and outcomes.</td>
</tr>
</tbody>
</table>

**Pennsylvania Context:** Examples of Pennsylvania context include but are not limited to Pennsylvania’s hydroelectric power plants.

**Pennsylvania Career Ready Skills:** Evaluate a situation to identify skills and strategies to prevent and resolve conflicts.
## Connections to Other Standards Content and Practices

<table>
<thead>
<tr>
<th>Standard Source</th>
<th>Possible Connections to Other Standard(s) or Practice(s)</th>
</tr>
</thead>
</table>
| **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** | MP.1: Make sense of problems and persevere in solving them. |
| **Integrated Standards for Science, Environment & Ecology, and Technology & Engineering Standards Grades K–12** | N/A |