## Grades 6–8

**3.5.6-8.W (ETS) Technology and Engineering**: Design Thinking in Technology & Engineering Education

**Students who demonstrate understanding can** *define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.*

**Clarifying Statement:** The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful.

**Assessment Boundary:** N/A

| Science and Engineering Practices (SEP) | Disciplinary Core Ideas (DCI) | Technology and Engineering Practices (TEP) |
|---|---|---|
| **Asking Questions and Defining Problems**<br>Asking questions and defining problems in 6–8 builds on K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.<br>• Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. | **ETS1.A: Defining and Delimiting Engineering Problems**<br>• The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. | **Critical Thinking**<br>Critiques technological products and systems to identify areas of improvement. |

**Pennsylvania Context:** N/A

**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) |
|---|---|
| **PA Core Standards: Reading and Writing in Science and Technical Areas** | CC.3.5.6-8.A: Cite specific textual evidence to support analysis of science and technical texts.<br>CC.3.6.6-8.G: Gather relevant information from multiple print and digital resources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. |
| **PA Core Standards and Practices: Math** | MP.2: Reason abstractly and quantitatively. |

| Standard Source | Possible Connections to Other Standard(s) or Practice(s) |
|---|---|
| **Integrated Standards for Science, Environment & Ecology, and Technology & Engineering Standards Grades K–12** | N/A |