



# Marine Science and Technology - Unit 3 Tech - Product Creation

## Unit Focus

In this unit, students will safely use a variety of hand and power tools in a shop-based environment to complete their fishing rod, landing net project and the engineering component of their Interdisciplinary project. Students will also be responsible for maintaining the class boat used for school experiments. The PBA will have students construct the engineered solution from the independent project proposal from trimester 1.

## Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
<p><b>Connecticut Goals and Standards</b></p> <p>Manufacturing: 12</p> <ul style="list-style-type: none"> <li>Apply a variety of manufacturing techniques and processes to create a usable product (MAN.03.03)</li> </ul> <p>Pre-Engineering Technology: 12</p> <ul style="list-style-type: none"> <li>Brainstorm possible solutions. (ENG.02.05)</li> <li>Analyze and research between alternate solutions. (ENG.02.06)</li> <li>Build a prototype from plans. (ENG.02.08)</li> <li>Test a prototype. (ENG.02.09)</li> <li>Communicate processes and results. (ENG. 02.11)</li> <li>Make an oral presentation. (ENG.05.03)</li> <li>Describe the function of a safety device. (ENG. 06.01)</li> <li>Demonstrate safe personal behavior in the classroom. (ENG.06.02)</li> <li>Use all tools and equipment safely (ENG.06.03)</li> <li>Explain and use pre-engineering laboratory equipment and materials. (ENG.06.04)</li> <li>Describe and demonstrate the components of personal and group laboratory safety. (ENG. 06.05)</li> <li>Describe and use safety laboratory equipment. (ENG.06.06)</li> </ul> <p><b>Madison Public Schools Profile of a Graduate</b></p> <ul style="list-style-type: none"> <li>Idea Generation: Studying a problem, need or model (mentor text, political piece, documents, art work, etc.) to consider limitations and imagine new solutions/transformations. (POG. 2.1)</li> <li>Product Creation: Effectively use a medium to communicate important information. (POG.3.2)</li> </ul>	<p><i>Students will be able to independently use their learning to...</i></p> <p><b>T1</b> Communicate effectively based on purpose, task, and audience using appropriate vocabulary.</p> <p><b>T2</b> Leverage connection(s) in other subject areas (including STEM) to make sense of a given problem, product, or solution.</p> <p><b>T3</b> Explore and hone techniques, skills, methods, and processes to create and innovate</p> <p><b>T4</b> Develop a product/solution that adheres to key parameters (e.g., cost, timeline, restrictions, available resources and audience).</p>	
	Meaning	
	Understanding(s)	Essential Question(s)
	<p><i>Students will understand that...</i></p> <p><b>U1</b> Tools and machinery have specific functions and methods for usage.</p> <p><b>U2</b> Both the tools I am using and the way I am using them impact the quality of the result, the safety of the shop environment, and the longevity of the equipment.</p> <p><b>U3</b> Execution of a plan requires understanding of basic tool usage, attention detail, and time management.</p> <p><b>U4</b> 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.</p>	<p><i>Students will keep considering...</i></p> <p><b>Q1</b> Which tools do I need in the shop to produce my engineered solution?</p> <p><b>Q2</b> How do I make what I designed? When does the design need to be changed?</p> <p><b>Q3</b> How do I create a design that will perform as intended and falls within the necessary constraints?</p>

## Stage 1: Desired Results - Key Understandings

- Self-Awareness: Examining current performance critically to identify steps/strategies to persist. (POG.4.1)

### Acquisition of Knowledge and Skill

#### Knowledge

*Students will know...*  
**K1** School safety protocol.  
**K2** All hand and power tools have a specific purpose in either manipulating or changing the shape in wood, metal or other materials.

#### Skill(s)

*Students will be skilled at...*  
**S1** Demonstrate proper safety etiquette according to school safety expectations and procedures.  
**S2** Demonstrate safe operation of various tools in the wood shop.  
**S3** Evaluate the quality of work before moving on to the next step.