Madison Public Schools

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)

Connecticut Goals and Standards
Manufacturing: 12

- Apply a variety of manufacturing techniques and processes to create a usable product *MAN.03.03*

Pre-Engineering Technology: 12

- Brainstorm possible solutions. *ENG.02.05*
- Analyze and research between alternate solutions. *ENG.02.06*
- Build a prototype from plans. *ENG.02.08*
- Test a prototype. *ENG.02.09*
- Communicate processes and results. *ENG.02.11*
- Make an oral presentation. *ENG.05.03*
- Describe the function of a safety device. *ENG.06.01*
- Demonstrate safe personal behavior in the classroom. *ENG.06.02*
- Use all tools and equipment safely *ENG.06.03*
- Explain and use pre-engineering laboratory equipment and materials. *ENG.06.04*
- Describe and demonstrate the components of personal and group laboratory safety. *ENG.06.05*
- Describe and use safety laboratory equipment. *ENG.06.06*

Student Growth and Development 21st Century

Transfer

T1 Communicate effectively based on purpose, task, and audience using appropriate vocabulary.
T2 Leverage connection(s) in other subject areas (including STEM) to make sense of a given problem, product, or solution.
T3 Explore and hone techniques, skills, methods, and processes to create and innovate
T4 Develop a product/solution that adheres to key parameters (e.g., cost, timeline, restrictions, available resources and audience).

Meaning

Understanding(s)	Essential Question(s)
U1 Tools and machinery have specific functions and methods for usage. **U2** 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. **U3** Execution of a plan requires understanding of basic tool usage, attention detail, and time management. **U4** 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.	**Q1** Which tools do I need in the shop to produce my engineered solution? **Q2** How do I make what I designed? When does the design need to be changed? **Q3** How do I create a design that will perform as intended and falls within the necessary constraints?

Acquisition of Knowledge and Skill

Knowledge	Skill(s)
K1 School safety protocol. **K2** All hand and power tools have a specific purpose in	**S1** Demonstrate proper safety etiquette according to school safety expectations and procedures.

Stage 1: Desired Results - Key Understandings		
Capacities Matrix *Creative Thinking* • Imagining: Students will be able to conceive of a novel approach to create a text, performance, solution, application, or inquiry. *MM.2.2* *Collaboration/Communication* • Product Creation: Students will be able to effectively use a medium to communicate important information (findings, ideas, feelings, issues, etc.) for a given purpose. *MM.3.2* *Self-Direction* • Perseverance: Students will be able to identify problem(s) and use appropriate strategies to continue toward a desired goal. *MM.4.2*	either manipulating or changing the shape in wood, metal or other materials.	**S2** Demonstrate safe operation of various tools in the wood shop. **S3** Evaluate the quality of work before moving on to the next step.