Madison Public Schools

Materials Processing - Unit 1 - Woodworking

Unit Focus

Introductory Career & Technical Education courses like this one provides experiences far more important than those typically associated with shop based courses. Courses like this one, where students use their hands, build confidence, strength of character, and problem solving capabilities useful in all careers and in every educational experiences. In this unit, students will learn how to safely use a variety of hand and power tools in a shop-based environment. Students will take a short safety exam to ensure that they can work in a safe and respectful manner. The goal of each student is to learn how to reflect and persevere along each step of a procedure list when building a practical project. A PBA will have students safely use a variety of hand and power tools in constructing a cutting board.

Stage 1: Desired Results - Key Understandings

Standard(s)

Connecticut Goals and Standards
Building Construction: 12

- Demonstrate and explain knowledge of workplace safety procedures.*(A2) *BC.02.02*
- Demonstrate and explain knowledge of personal safety practices pertaining to eye wear, footwear, clothing, and personal protective equipment (PPE) used in wood technology.*(A3) *BC.02.03*
- Describe safety practices for the following machines: table saw, drill press, stationary sander, router table, and miter saw.*(A4) *BC.02.04*
- Identify, use, and maintain the following measuring, layout, and marking tools steel rule, tape measure, combination square, sliding "T" bevel, and compass.*(B8) *BC.03.01*
- Measure accurately to a sixteenth of an inch.*(C16) *BC.04.05*
- Identify and assemble the following types of joints: butt, miter, dado, rabbet, and lap.*(G27) *BC.04.13*
- Identify and describe the purpose of the following clamping devices: bar clamp, c clamp, parallel/hand screw clamp, and spring clamps.*(H30) *BC.04.16*
- Identify and apply various wood finishes for interior and exterior, with brush or wipe on, for the following: paint, stain, and clear coat.*(I31)

Transfer

T1 Explore and hone techniques, skills, methods, and processes to create and innovate
T2 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 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. **U2** Tools and machinery have specific functions and methods for usage. **U3** Reading and following a procedure list allows the builder to evaluate their progress along each step in determining their level of precision.	**Q1** How do my behaviors and actions affect the safety of myself and others? **Q2** How do I operate this tool to get the desired result? **Q3** What type of technique/s should be used for this project? **Q4** How do I utilize a procedure list to help me evaluate my progress?

Acquisition of Knowledge and Skill

Knowledge	Skill(s)
K1 United States customary units measuring system. **K2** Operation and purpose of various hand and power tools in the wood shop: Compound Miter Saw, Radial Arm Saw, Dovetail Saw, Biscuit Joiner, Doweling jig, Hand drill, Drill press, Surface Planer, Jointer, Table Saw,	**S1** Demonstrate safe operation of various tools in the wood shop **S2** Demonstrate how to create several different wood joints. **S3** Execute precise work using a procedure list to create a

Stage 1: Desired Results - Key Understandings

BC.04.17 • Describe the abrasive grit numbering grading system.*(F26) *BC.04.18* • Identify the difference between both nominal and actual dimensions.*(C17) *BC.04.06* • Identify and select the proper cutting process based on grain direction.*(E23) *BC.04.20* • Understanding kerf and its application to cutting and layout operations.*(E25) *BC.04.22* **Common Core** *Mathematics: 9-12* • Make sense of problems and persevere in solving them. *CCSS.MATH.MP.1* • Attend to precision. *CCSS.MATH.MP.6* **ITEEA - Standards for Technological Literacy** *Technological Literacy: K-12* • Students will develop the abilities to use and maintain technological products and systems. *12* **Student Growth and Development 21st Century Capacities Matrix** *Self-Direction* • Reflection: Students will be able to analyze their performance to evaluate progress toward learning goals in order to determine next step(s). *MM.4.1* • Perseverance: Students will be able to identify problem(s) and use appropriate strategies to continue toward a desired goal. *MM.4.2*	Belt Sander, Spindle Sander, Hand planes, chisels, hammer, squares, clamps (spring, bar, parallel hand screw), files, rasps & scrapers. **K3** Vocabulary: Procedure list, Joinery, safety protocol, fasteners, cross cutting, ripping, kickback, surface grain, end grain, edge grain, open & closed grained, finish, stain, polyurethane. **K4** Internal vs. external fasteners. **K5** The process of setting up an object to be engraved with a CNC Router.	product. **S4** Evaluate the quality of work before moving on to the next step. **S5** Demonstrate several woodworking techniques such as gluing, fastening and finishing.