KIRKWOOD
SCHOOL DISTRICT

WOODWORKING AND CARPENTRY I 9TH-12TH

Approved by KSD Board of Education: May 19, 2025

Course Description:
Students will study trees and how the properties of the wood affect the design of a project. Students will design and construct several wood projects during the year, such as a candle holder, a pen, a toolbox, and more. A high emphasis is placed on safety around hand and power tools. Students will use a wide variety of hand tools, power tools, and machines to construct their projects. Students are expected to pay for the wood that they use to construct the projects that they will take home.

Grade Level: 9th-12th Grade (semester)

Unit Scope and Sequence

Unit 1: Safety, Measurement, Wood Species, and Characteristics
Unit 2: Tools of the Trade
Unit 3: Basic Woodworking Machinery
Unit 4: Capstone

Course Enduring Understandings:
- **Safety is Essential**: Proper use of tools, equipment, and safety procedures is critical to preventing accidents and maintaining a productive workshop
- **Tool & Machine Proficiency**: Mastery of hand tools, power tools, and woodworking machines is essential for shaping, joining, and finishing wood effectively.

Course Essential Questions:
- What safety procedures must be followed when using woodworking tools and machinery?
- How do we properly use and maintain hand tools and power tools in woodworking?

WOODWORKING AND CARPENTRY I 9TH-12TH
Unit 1: Safety, Measurement, Wood Specs, and Characteristics

In this unit, students will learn Standard American English measurement, general shop safety, and different types of wood species.

<table>
<tr><th colspan="2">Unit Essential Learning Targets</th></tr>
<tr><th>Enduring Understandings</th><th>Essential Questions</th></tr>
<tr><td>SAE measurement(Proper measurement is critical for ensuring parts fit together correctly and projects meet design specifications).
General shop safety and procedures(Understanding and following shop safety protocols is essential for maintaining a safe and productive work environment).
Characteristics of wood species(The right wood selection based on its properties ensures durability, functionality, and aesthetic quality in projects).</td><td>How do you prepare yourself to work in a woodshop?
How do proper measuring techniques impact the success and accuracy of a project?
How can being proactive about safety help prevent accidents and injuries in the shop?
Why is it important to choose the right type of wood for a given task?</td></tr>
<tr><th>Students must know:</th><th>Students must be able to:</th></tr>
<tr><td>How to read a ruler
How to add & subtract fractions
General shop safety
How to identify different species of wood</td><td>Measure objects
Read dimensioned(technical) drawing sheets
Prepare themselves to work in the shop with tools</td></tr>
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WOODWORKING AND CARPENTRY I 9TH-12TH
Unit 1: Safety, Measurement, Wood Specs, and Characteristics

MO Carpentry Technical Standards (CTS)
Priority Standard: Health, Safety, and Leadership (CTS.1.0) Supporting Standards: ● Maintain and use proper PPE (CTS.1.2). ● Report hazards to your supervisor/instructor and other workers (CTS.1.3). ● Recognize how to protect yourself and others from hazards associated with materials and material handling (CTS.1.4). ● Recognize how to protect yourself and others from hazards associated with hand and power tools (CTS.1.5). ● Demonstrate proper cleanup procedures while storing, cleaning, and maintaining tools, equipment, and supplies (CTS.1.9).
Priority Standard: Processing, Problem-Solving, & Layout (CTS.2.0) Supporting Standards: ● Apply the appropriate mathematical calculations including formulas that determine area, volume, lineal, and square feet (CTS.2.6).
Priority Standard: Material and Fasteners (CTS.3.0) Supporting Standards: ● Identify wood products and materials used in construction including OSB, plywood, and pressure-treated lumber (CTS.3.2) ● Identify common defects found in wood (CTS.3.3)

WOODWORKING AND CARPENTRY I 9TH-12TH
Unit 2: Tools of the Trade

In this unit, students will identify and use both hand and power tools.

<table>
<tr><th colspan="2">Unit Essential Learning Targets</th></tr>
<tr><th>Enduring Understandings</th><th>Essential Questions</th></tr>
<tr><td>Safely and effectively using hand and power tools is crucial for building woodworking projects that are both functional and visually appealing.
Selecting the appropriate hand or power tool is crucial for achieving precision and efficiency in woodworking.
Understanding the safety procedures for using both hand and power tools is vital for a safe working environment.
Proper tool handling and technique improve speed and precision, making the woodworking process more efficient.</td><td>How do you prepare yourself to work in the woodshop?
What is the proper setup and technique to use different hand tools and power tools?
How do you determine the right tool to use for a specific woodworking task?
How does the proper use of hand and power tools improve the efficiency of your woodworking projects?</td></tr>
<tr><th>Students must know:</th><th>Students must be able to:</th></tr>
<tr><td>Hand saws
Hand planes
Speed square
Combination square
Twist bit
Forester bit
Standard Drill
Impact Drill
Chisel
Rip Cut
Cross Cut
Dado</td><td>Determine which tools are necessary to build formative and summative projects:
Cutting board
Sanding block
Bookshelf
Tool tour</td></tr>
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WOODWORKING AND CARPENTRY I 9TH-12TH
Unit 2: Tools of the Trade

MO Carpentry Technical Standards (CTS)

Priority Standard: Processing, Problem-Solving, & Layout (CTS.2.0)
Supporting Standards:

- Construct projects specific to requirements and expectations (CTS.2.1)
- Read for information to understand the sequencing and phases of construction projects (CTS.2.2).
- Create and adjust layouts so that projects are plumb, square, and level (CTS.2.3)
- Use methods and tools to check the accuracy of a project including the diagonal method, the Pythagorean Theorem, and the use of leveling devices to check for elevation, level, and plumb (CTS.2.4).
- Interpret and apply information to calculate materials, estimate costs, and develop procedures to complete projects (CTS.2.5).
- Demonstrate the use of a jig/template (CTS.2.7).
- Demonstrate the sequence of cutting, assembly, and finishing projects (CTS.2.8)
- Identify different types of technical drawings including plan, elevation, section, and detail views (CTS.2.9).
- Identify and use drawing dimensions (CTS.2.10).

Priority Standard: Material and Fasteners (CTS.3.0)
Supporting Standards:

- Select the proper grit sizes and sequences for shaping and smoothing operations (CTS.3.7)

Priority Standard: Hand and Power Tools (CTS.4.0)
Supporting Standards:

- Demonstrate the basic care, proper maintenance, and use of hand, portable, and stationary tools related to Carpentry (CTS.4.1).
- Demonstrate proper selection and use of tools (CTS.4.2).
- Demonstrate the accurate use of common measuring and layout tools (CTS.4.3).
- Select the most appropriate blade or bit for a given operation (CTS.4.4).

WOODWORKING AND CARPENTRY I 9TH-12TH
Unit 3: Basic Woodworking Machinery

In this unit, students will learn how to use basic woodworking machinery to offset the need for hand tools.

<table>
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<tr><td>Safely set up and operate basic woodworking machinery.
Properly use machinery in the shop to create projects.
The use of machines allows for uniformity in cuts, shapes, and dimensions, improving the overall quality of the work.
Understanding how to properly set up and calibrate woodworking machinery is crucial for achieving accurate and safe results.</td><td>How can woodworking machinery simplify and improve processes in the shop?
In what ways does machinery contribute to consistency in woodworking projects?
Why is it important to properly set up and calibrate woodworking machinery before use?
What safety precautions should be followed when operating woodworking machinery?</td></tr>
<tr><th>Students must know:</th><th>Students must be able to:</th></tr>
<tr><td>Band Saw
Drill Press
Mortise Machine
Lathe
Drum Sander
Belt & Disc Sander
Spindle Sander</td><td>Safely and properly set up and use the band saw to fabricate the following projects:
Push stick
Candleholder
Safely and properly set up and use the drill press or mortise machine to fabricate the drill block.
Safely and properly set up and use the lathe to fabricate the following projects:
Practice piece
Pen
Identify, safely, and properly use the correct sander with each of the projects.</td></tr>
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WOODWORKING AND CARPENTRY I 9TH-12TH
Unit 4: Capstone

In this unit, students will use the design process to brainstorm, sketch, determine the cost of, and build a project of their choice.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• The design process encourages creative thinking and innovative solutions, which are essential for developing functional and unique projects. • Using a structured design process, including brainstorming, sketching, and prototyping, leads to well-thought-out projects that meet both needs and expectations. • Thorough planning and careful decision-making, such as selecting materials and calculating costs, ensure that projects are feasible and successful.	• How can I create my own projects using my skills in the woodshop? • In what ways can creative thinking and innovation solve problems during the design and building process? • Why is it important to calculate and manage costs when designing and building a project?
Students must know:	***Students must be able to:***
• Sketching • Dimensioning • Basic math skills • Proper technique for safely using the machinery and tools	• Apply their knowledge of hand tools and machinery to create their own design and build. • Design and sketch a project. • Create a cost analysis for a project. • Take proposed plans and build their project.

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