



Wood Manufacturing I - Skills for the Beginning Woodworker

Course Information

Grade(s):	9-12
Discipline/Course:	Technology Education
Course Title:	Wood Manufacturing I: Skills For The Beginning Woodworker
Prerequisite(s):	None
Course Description: <i>Program of Studies</i>	This beginning level course offers a general introduction to wood manufacturing. Students will learn about the materials and processes used to change rough lumber into useful finished products. Students are immersed in a design and manufacturing environment that strengthens three-dimensional thought. Students work collaboratively and independently while utilizing tools safely and efficiently.
Course Essential Questions:	<ul style="list-style-type: none"> ● How do safety practices influence wood manufacturing and the work environment? ● What are the essential skills necessary to be successful in the wood manufacturing industry and construction trade? ● How can I use wood manufacturing to build community and connect with others? ● How do I design and plan a woodworking project? ● How do I troubleshoot problems that arise during a woodworking project? ● How do I evaluate the success of a woodworking project? ● How can wood manufacturing help me develop my problem-solving and critical thinking skills? ● How do the properties of wood and the different woodworking processes interact to create useful finished products?
Course Enduring Understandings:	<ul style="list-style-type: none"> ● Woodworking can be a safe and rewarding activity when proper safety procedures are followed. ● Woodworking layout tools can be used to draw project ideas on to paper. ● Woodworking is a creative and problem-solving activity that requires the use of critical thinking, problem-solving, student teaching, and teamwork skills. ● Wood is a natural material with a variety of properties that make it suitable for a wide range of uses. ● Woodworking tools and techniques can be used to transform raw wood into finished products with a

	variety of shapes, sizes, and functions. <ul style="list-style-type: none"> • Woodworking joints can be created to make different components and create strong and aesthetic looking projects. • Woodworking finishes can be used to bring out the best aesthetic qualities of wood. • Wood finishes have different characteristics that make them better suited to different applications.
Duration/Credits:	½ year; .5 credits
Course Materials:	Machinery and consumables.
FPS Course Academic Expectation(s):	EU Exploring and Understanding CC Creating and Constructing.
Year at a Glance (Units)	Unit 1 - Course Introduction (2 weeks) Unit 2 - Measurement and Layout (2 weeks) Unit 3 - Tools and Machines (4 weeks) Unit 4 – Joinery and Assembly (7 weeks) Unit 5 - Finishing (3 weeks)

Unit Number and Title:	Unit 1 – Course Introduction
Duration:	2 weeks
Resource(s):	Machinery and Consumables
Unit Overview:	Students will learn about careers in Wood Manufacturing. Students will be introduced to safety practices and policies. This will include the safety practices for specific machinery. This will also include the procedures related to workplace and job-site safety, personal protective equipment, machine safety, and material handling practices.
Learning Goals	
Standard(s):	<p>WM.01.01 Develop career goals and objectives as part of a plan for future career direction.</p> <p>WM.01.02 Develop strategies to reach career objectives.</p> <p>WM.02.01 Demonstrate safe material handling practices.</p> <p>WM.02.02 Demonstrate and explain knowledge of workplace safety procedures.</p> <p>WM.02.03 Demonstrate and explain knowledge of personal safety practices pertaining to eye wear, footwear, clothing, and personal protective equipment (PPE) used in wood technology.</p> <p>WM.02.04 Describe safety practices for specific machines.</p> <p>WM.03.16 Demonstrate good housekeeping at a workstation within the total laboratory.</p> <p>WM.03.18 Explain fire prevention and safety precautions and practices for extinguishing fires.</p> <p>WM.03.19 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.</p>
Essential Question(s):	<ul style="list-style-type: none"> ● How do safety practices influence wood manufacturing and the work environment? ● What are the essential skills necessary to be successful in the wood manufacturing industry and construction trade? ● How can I use wood manufacturing to build community and connect with others?
Enduring Understanding(s):	<ul style="list-style-type: none"> ● Wood manufacturing can be a safe and rewarding activity when proper safety procedures are followed.

	<ul style="list-style-type: none"> ● Woodworking is a creative and problem-solving activity that requires the use of critical thinking, problem-solving, student teaching, and teamwork skills.
<p>Learning Goal(s): <i>Students will be able to use their learning to:</i> (Content/ Skills)</p>	<p>Content: (Students will know...)</p> <ul style="list-style-type: none"> ● workshop safety procedures. ● personal safety practices pertaining to eye wear, footwear, clothing, and personal protective equipment (PPE) used in wood technology. ● safety procedures for specific machines. ● how and why a clean workshop contributes to workplace safety. ● the harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment. ● wood manufacturing character traits. <p>Skills: (Students will be able to...)</p> <ul style="list-style-type: none"> ● develop, demonstrate and practice safe working habits. ● practice lab safety policies. ● demonstrate safe material handling practices. ● describe workplace and jobsite safety procedures. ● describe safety practices for specific machines.

Unit Number and Title:	Unit 2 – Measurement and Layout
Duration:	2 weeks
Resource(s):	Machines and Consumables
Unit Overview:	Students will learn to accurately create scale drawings/sketches for projects. This will also include the proper use of measuring tools and layout skills during project production.
Learning Goals	
Standard(s):	<p>WM.03.01 Identify, use, and maintain the following measuring, layout, and marking tools: steel rule, tape measure, combination square, sliding “T” bevel, and compass.</p> <p>WM.04.01 Describe and interpret technical drawings.</p> <p>WM.04.02 Describe and prepare rough drawings and sketches.</p> <p>WM.04.03 Explain and prepare a cut list or bill of material from a basic plan and assembly drawing.</p> <p>WM.04.04 Interpret a design to facilitate replication.</p> <p>WM.04.05 Describe and identify fractional measurements from a basic plan and assembly drawings.</p> <p>WM.04.06 Identify the difference between both nominal and actual dimensions.</p> <p>WM.04.07 Extrapolate information from a set of plans.</p> <p>WM.04.08 Measure accurately to a sixteenth of an inch.</p> <p>WM.04.09 Estimate materials quantities in both board feet and linear feet.</p>
Essential Question(s):	<ul style="list-style-type: none"> ● How do I design and plan a woodworking project? ● How do I troubleshoot problems that arise during a woodworking project? ● How do I evaluate the success of a woodworking project?
Enduring	<ul style="list-style-type: none"> ● Woodworking layout tools can be used to draw project ideas on to paper.

Understanding(s):	<ul style="list-style-type: none"> • Woodworking is a creative and problem-solving activity that requires the use of critical thinking, problem-solving, and teamwork skills. • Wood is a natural material with a variety of properties that make it suitable for a wide range of uses.
Learning Goal(s): <i>Students will be able to use their learning to:</i> (Content/ Skills)	<p>Content: (Students will know...)</p> <ul style="list-style-type: none"> • the identity and use of the following measuring, layout, and marking tools: steel rule, tape measure, combination square, sliding “T” bevel, and compass. • the difference between technical drawings and rough drawings or sketches. • how to describe and identify fractional measurements from a basic plan and assembly drawings. • the difference between both nominal and actual dimensions. • how to draw and visually communicate simple geometric shapes and parts. • the difference between board feet and linear feet. <p>Skills: (Students will be able to...)</p> <ul style="list-style-type: none"> • demonstrate an understanding of rough drawings and sketches. • explain and use fractional dimensions. • identify, use and maintain measuring, layout, and marking tools. • measure accurately to a sixteenth of an inch.

Unit Number and Title:	Unit 3 - Tools and Machines
Duration:	4 weeks
Resource(s):	Machines and Consumables
Unit Overview:	Students will be able to identify the proper use and function of portable power tools, hand tools, stationary machinery and specialty machinery.
Learning Goals	
Standard(s):	<p>WM.03 Identify and describe the safe and appropriate use of various types of hand and power tools and machinery used for building.</p> <p>WM.03.02 Identify proper use and function of the following portable power tools: circular saw, drill, jig/saber saw, finishing sanders, and routers.</p> <p>WM.03.03 Identify proper use and function of the following fastening tools: hammer, Phillip head screwdriver, and slotted/flat head screwdriver.</p> <p>WM.03.04 Demonstrate and explain knowledge of proper use and storage of portable power tools.</p> <p>WM.03.05 Demonstrate and explain knowledge of proper use and storage of basic hand tools.</p> <p>WM.03.06 Identify proper use and function of the following hand tools: cross cut saw, rip saw, level, coping saw, nail set, hand plane, chisel, and file.</p> <p>WM.03.07 Identify proper use and function of stationary saws.</p> <p>WM.03.08 Identify the proper use and function of specialty machinery (e.g. drill presses, jointers, surface planers, table saws, power miter saws, band saws, scroll saws, and stationary sanders.)</p> <p>WM.03.09 Identify proper use and function of the table and miter saws.</p> <p>WM.03.10 Explain and demonstrate correct use of planers.</p> <p>WM.03.11 Explain and demonstrate use of molders.</p> <p>WM.03.12 Identify functions and demonstrate use of wood lathes.</p> <p>WM.03.13 Identify and demonstrate use and function of sanders.</p> <p>WM.03.14 Select appropriate tools, procedures, and/or equipment.</p>
Essential Question(s):	<ul style="list-style-type: none"> • What essential skills are necessary to be successful in the wood manufacturing industry and

	<p>construction trade?</p> <ul style="list-style-type: none"> ● How do safety practices influence wood manufacturing and the work environment? ● How can wood manufacturing help me develop my problem-solving and critical thinking skills? ● Woodworking joints can be created to make different components and create strong and aesthetic looking projects.
Enduring Understanding(s):	<ul style="list-style-type: none"> ● Woodworking tools and techniques can be used to transform raw wood into finished products with a variety of shapes, sizes, and functions. ● Woodworking can be a safe and rewarding activity when proper safety procedures are followed.
Learning Goal(s): <i>Students will be able to use their learning to:</i> (Content/ Skills)	<p>Content: (Students will know...)</p> <ul style="list-style-type: none"> ● various types of hand, power tools, and machinery used for wood manufacturing. ● the identity and basic uses of machinery ● how to select appropriate tools, procedures, and/or equipment. ● the steps and procedures of the “milling process”. <p>Skills: (Students will be able to...)</p> <ul style="list-style-type: none"> ● make exact cuts and shapes. ● learn the correct way to set up and adjust tools. ● use the “milling process” to mill boards to the correct length, width and thickness for their projects. ● choose the most suitable tool or machinery. ● properly and safely use tools and machinery. ● rip cut and crosscut on the table saw. ● understand which saws are used for straight cutting and cutting curves.

Unit Number and Title:	Unit 4 - Joinery and Assembly
Duration:	7 weeks
Resource(s):	Machines and Consumables
Unit Overview:	Students will be able to identify various types of basic joints, explain the steps in preparing wood for gluing, and explain the uses of different types of fasteners.
Learning Goals	
Standard(s):	<p>WM.04.19 Identify and describe the purpose and use of the following woodworking fasteners: common nails, round head screws, flat head screws, and oval head screws.</p> <p>WM.04.20 Identify, describe purpose of and use woodworking adhesives.</p> <p>WM.04.21 Identify and describe the purpose of the following clamping devices: bar clamp, c-clamp, parallel/hand screw clamp, and spring clamps.</p>
Essential Question(s):	<ul style="list-style-type: none"> ● How do the properties of wood and the different woodworking processes interact to create useful finished products? ● How do I troubleshoot problems that arise during a woodworking project? ● How do I evaluate the success of a woodworking project?
Enduring Understanding(s):	<ul style="list-style-type: none"> ● Woodworking tools and techniques can be used to transform raw wood into finished products with a variety of shapes, sizes, and functions.
Learning Goal(s): <i>Students will be able to use their learning to:</i> (Content/ Skills)	<p>Content: (Students will know...)</p> <ul style="list-style-type: none"> ● the identity and use of woodworking fasteners. ● when to use certain woodworking adhesives. ● the identity and use of various clamping devices. <p>Skills: (Students will be able to...)</p> <ul style="list-style-type: none"> ● layout and construct a project using proper joinery for strength and durability.

- choose and use the correct chemical or mechanical fastener for the wood joints in their project.
- demonstrate how the order of assembly affects the construction of a project.

Unit Number and Title:	Unit 5 - Finishing
Duration:	3 weeks
Resource(s):	Machines and Consumables
Unit Overview:	Students will learn how to prepare a project for finish through proper sanding and gluing techniques. They will gain a clear understanding of the abrasive grit numbering system and their correct use. They will learn to identify common finishes used in the wood manufacturing industry, their properties and how one type of finish might be more suitable in certain situations.
Learning Goals	
Standard(s):	<p>WM.02.05 Demonstrate knowledge of proper use, storage, and disposal of hazardous materials following OSHA’s proper safety practices for a woodworking facility.</p> <p>WM.02.06 Obtain, read and follow SDS (Safety Data Sheets) information.</p> <p>WM.02.07 Follow safe practices relating to environmental hazards.</p> <p>WM.02.08 Explain safe proper use, disposal, and storage of chemicals following OSHA standards.</p> <p>WM.04.22 Identify and apply various wood finishes for interior and exterior, with brush or wipe on, for the following: paint, stain, and clear coat.</p> <p>WM.04.23 Describe the abrasive grit numbering grading system.</p> <p>WM.04.24 Differentiate among various abrasive materials.</p>
Essential Question(s):	<ul style="list-style-type: none"> ● How do safety practices influence wood manufacturing and the work environment? ● How do I troubleshoot problems that arise during a woodworking project? ● How do the properties of wood and the different woodworking processes interact to create useful finished products? ● How do I evaluate the success of a woodworking project?
Enduring Understanding(s):	<ul style="list-style-type: none"> ● Woodworking finishes can be used to bring out the best aesthetic qualities of wood. ● Wood finishes have different characteristics that make them better suited to different applications.

<p>Learning Goal(s): <i>Students will be able to use their learning to:</i> (Content/ Skills)</p>	<p>Content: (Students will know...)</p> <ul style="list-style-type: none"> ● the proper use, storage, and disposal of hazardous materials following OSHA’s proper safety practices for a woodworking facility. ● where to obtain, read and follow SDS (Safety Data Sheets) information. ● the safe practices relating to environmental hazards. ● the safe proper use, disposal, and storage of chemicals following OSHA standards. ● the identity and application of various wood finishes for interior and exterior, with brush or wipe on, for the following: paint, stain, and clear coat. ● the abrasive grit numbering/grading system. <p>Skills: (Students will be able to...)</p> <ul style="list-style-type: none"> ● demonstrate the proper use of abrasive paper on wood grain surfaces. ● prepare wood surfaces for finishing and finish to a desired appearance. ● demonstrate the correct methods of finishing applications.
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