LEARNING GUIDE: Beginning Woods **Main Resources:Textbook / Lab Work** **Copyright: Dobry (2014-2015)**

Overview: This is a beginning level course that introduces the students to basic knowledge and skills that are foundational to manufacturing. Safety, measuring, planning, and production processes will be covered. (Target Grades 9-11)
Standards:
Standard 1. Students will demonstrate a complete understanding of need for shop safety and rules governing the use of equipment.
Standard 2. Students will develop the ability to analyze precision measurement devices by applying mathematical skills while working with fractions and decimals. Distinguish symbols and identify line usage used in blueprints and plan reading.
Standard 3. Students will demonstrate the planning and layout processes used in manufacturing.
Standard 4. Students will understand and demonstrate how products can be manufactured.

Unit: (days)	Benchmarks:	Indicators:	Learning Objectives:	Vocabulary:	Resources:	Projects, Problem Solving, Labs:	Assessments: Formative, Summative, Rubric
General Safety, Materials, and tools (50 Days)	**1.1** The students will understand the main hazards that are possible in the shop setting. **1.2** The students will observe proper dress and use of personal protective equipment **1.3** The students will demonstrate proper handling and storing of materials **1.4** The students will demonstrate proper machine and tool safety operation.	**1.1.a** Identify the types of risks of injury/illness in the lab. **1.1.b** Identify and describe common hazards in the lab. **1.1.c** Explain the role of government agencies in providing a safe workplace. **1.1.d** Interpret safety signs and symbols. **1.2.a** Wear proper clothing for each working area **1.2.b** Inspect and use personal protective equipment (PPE) **1.2.c** Verify that safety and personal protective equipment is available and performs correctly **1.3.a** Demonstrate principals of safe physical movement to avoid slips, trips, and spills. **1.3.b** Learn the correct way to lift and move materials. **1.3.c** Make sure work area is clean and free of obstructions.	Students will be able to: -Demonstrate safe practices to be followed when using tools, equipment, and machines. -Think Safety before beginning any hand or power tool operation. -Identify basic parts of a tree and how these parts function together to form usable wood. -Identify basic classifications of wood and be able to identify common defects. -Identify basic hand tools used in the woodshop and proper techniques for using each tool. -Identify basic power tools used in the wood shop and proper techniques for using each tool.	-OSHA - Personal Protective Equipment. -Hygroscopic -Cambium Layer -Sapwood -Heartwood -Pith -Softwood -Hardwood -Open-Grained -Closed-Grained -Defect -Grading -Veneer -Plywood -Hardboard -Particleboard -Crosscut Saw -Ripsaw -Miter Saw -Coping Saw -Keyhole Saw -Circular Saw -Scroll Saw -Bandsaw -Table Saw -Crosscutting -Mitering	-Teacher Lecture. -Text Book. -Video Presentation. -Direct Examples -Demonstrations	Lab: -Using equipment in the shop to practice safety techniques. -Using equipment in the shop to get a “feel” for each piece students will be using.	-Worksheet, Questions at the end of the chapter. - Discussion about proper clothing and what to do with hair. - Presentation, both physical and PowerPoint.

		1.3.d Identify procedures necessary for maintaining a safe work area. **1.3.e** Follow good housekeeping procedures **1.4.a** Understand the proper use of hand and power tools. **1.4.b** Understand proper operating procedures of machines for wood. **1.4.c** Give operators a complete orientation of equipment. **1.4.d** Demonstrate proper operation. **1.4.e** Make sure all important information regarding equipment safety is communicated clearly and effectively.		-Ripping -Radial Arm Saw -Power Miter Saw -Auger Bit -Forstner Bit -Spade Bit -Hole Saw -Twist Drill -Countersink Bit -Hand Drill -Power Drill -Drill Press -File -Rasp -Plane -Jointer -Surfacer			
Measuring and Hardware (20 Days)	**2.1** The students will use common measurement systems **2.2** The students will understand mathematical equations and computations. **2.3** The students will properly use and handle precision measuring tools. **2.4** The students will identify fundamentals of blueprint reading.	**2.1.a** Incorporate both Metric and Customary systems of measurement. **2.1.b** Review fractions, decimals, and their conversions. **2.2.a** Figure board footage. **2.2.b** Figure square footage. **2.2.c** Implement geometry calculations. **2.2.d** Implement trigonometry. **2.3.a** Understand proper use and reading of Rules and Tape Measures **2.3.b** Understand proper use and reading of Protractor **2.3.c** Understand proper use and reading of Compass.	Student will be able to: -Correctly use a tape measure to find the dimensions of a standard board. -Use both standard and metric forms of measurement. -Compute both board footage and square footage. -Properly use a protractor and compass. -Identify, select, and install various types of hardware.	-Tape Measure -Rule -Scale -Board Foot -Caliper -Square Foot -Compass -Protractor -Hardware -Hinge -Pull/Knob -Catch/Latch -Lock -Sliding Track	-Teacher Lecture. -Text Book. -Video Presentation. -Direct Examples -Demonstrations	Lab: -Practice using tape measures, rules, and calipers. -Practice figuring out board footage and square footage. -Testing out different types of hardware.	-Worksheet, Questions at the end of the chapter. - Presentation, both physical and PowerPoint. -Board Footage and Square Footage worksheet

		2.4.a Identify line types, lettering, and symbols. **2.4.b** Understand scale **2.4.c** Identify and explain detail drawings **2.4.d** Identify and explain dimensioning **2.4.e** Identify and explain notes and bill of materials					
Planning and Preparation (25 Days)	**3.1** The students will read and/or produce prints **3.2** The students will understand the scheduling process **3.3** The students will be able to identify and understand materials used in the manufacturing process **3.4** The students will understand estimating materials and cost of materials and products	**3.1.a** Develop sketches of a product **3.1.b** Develop basic drawings **3.1.c** Develop working drawings **3.2.a** Identify the steps required to create the product **3.2.b** Identify the equipment used to create the product. **3.2.c** Make sure the production schedules are met effectively **3.2.d** Be aware of schedule requirements in a timely way **3.3.a** Study and select raw materials that best fits the needs of the production process. **3.3.b** Acquire knowledge of materials, their properties and methods to use them. **3.3.c** Identify and explain the selection of materials. **3.4.a** Develop parts list and bill of materials. **3.4.b** Identify and explain notes and bill of materials. **3.4.c** Figure product cost. **3.4.d** Estimate materials needed for products.	Student will be able to: -Identify basic product design considerations. -Prepare a sketch, a bill of materials, and a plan of procedure. -Clearly define the design problem.	-Size -Proportion -Durability -Balance -Harmony -Sketch -Working Drawing -Bill of Materials -Board Foot -Plan of Procedure	-Teacher Lecture. -Text Book. -Video Presentation. -Direct Examples -Demonstrations	Project: -Prepare their plan by sketching. -Estimate cost and bill of materials.	-Worksheet, Questions at the end of the chapter. - Presentation, both physical and PowerPoint. -Drawing a plan -Estimation Worksheet

Production and Manufacturing (80 Days)	**4.1** The students will demonstrate various types of assembling processes used in manufacturing **4.2** The students will demonstrate how materials can be processed using tools and machines **4.3** The students will properly finish the selected product. **4.4** The students will explain the process of inspection and quality control used in manufacturing.	**4.1.a** Apply appropriate fastening or joining procedures to the design and production of a manufactured part of product. **4.1.b** use tools and processes of cutting, shaping, combining, forming, etc. of materials to manufacture a part or product. **4.1.c** Set up equipment for the production process. **4.1.d** Perform and monitor the process to make the product. **4.2.a** Make adjustments to equipment prior to putting into service. **4.2.b** Verify that set-up meets process specifications. **4.2.c** Verify that production operations comply with safety procedures. **4.3.a** Select a finishing process for a product appropriate to the job it must perform, environment in which it functions, and its aesthetic appeal. **4.4.a** Perform continuous inspections to ensure that parts or products meet design specifications. **4.4.b** Select correct inspection tools and procedures and use them correctly	Student will be able to: -Identify different types of wood joints and their applications. -Be able to construct wood joints using the proper techniques and tools. -Identify the most common finishes used in the shop. -Prepare a piece for finishing and finish it to the desired appearance. -Trace the history of automated manufacturing. -Identify several careers involved in the woodworking industry.	-Butt joint -Miter joint -Lap joint -Rabbet joint -Dado joint -Mortise and Tenon joint -Biscuit joint -Box joint -Dovetail joint -Filler -Tack Rag -Stain -Sealer -Washcoat -Varnish -Lacquer -Polyurethane -Shellac -Turpentine -Numerical Control -Computed-Aided Drafting -Forestry -Building Construction -Industrial Woodworker	-Teacher Lecture. -Text Book. -Video Presentation. -Direct Examples -Demonstrations	Lab: -Students will begin creating their projects.	-Worksheet, Questions at the end of the chapter. - Presentation, both physical and PowerPoint. -Drawing a plan -Finished product report -Career research paper

		4.4.c Inspect materials against correct specifications. **4.4.d** Make necessary adjustment in the manufacturing process in a timely manner. **4.4.e** Take corrective action on out-of-specification material.					