



## **Wood Manufacturing II: Cabinet Construction Techniques**

**Course Information**

<b>Grade(s):</b>	9-12
<b>Discipline/Course:</b>	Technology education
<b>Course Title:</b>	Wood Manufacturing II: Cabinet Construction Techniques
<b>Prerequisite(s):</b>	Wood Manufacturing I: Skills for the Beginning Woodworker
<b>Course Description:</b> Program of Studies	This course is designed to provide students with skills and experience necessary for the manufacturing of wood products. Students design, build and finish a “case” style piece of furniture utilizing several types of wood joints and construction methods. Students work collaboratively and independently while utilizing tools safely and efficiently.
<b>Course Essential Questions:</b>	<ul style="list-style-type: none"> <li>● What are some of the challenges and rewards of working in the woodworking industry?</li> <li>● How can professional and respectful behavior in a manufacturing environment contribute to a positive and productive work environment?</li> <li>● How does a piece of furniture’s function affect its construction and design?</li> <li>● What is the relationship between creativity and problem-solving?</li> <li>● How can the selection of wood joinery techniques affect the appearance, durability, and cost of a woodworking project?</li> <li>● Why is it important to be able to choose the correct machine for a procedure?</li> <li>● How does awareness of the safety procedures involving each machine utilized in a project increase both efficiency and effectiveness?</li> <li>● Why is it important to analyze and resolve problems through practical experiences?</li> <li>● What impact does cabinetry have on the way people live?</li> <li>● How can the selection of fasteners affect the strength, durability, and appearance of a woodworking project?</li> <li>● How can the choice of finish affect the appearance, durability, and longevity of a woodworking project?</li> </ul>
<b>Course Enduring</b>	<ul style="list-style-type: none"> <li>● Safety is everyone's responsibility and students have a responsibility to themselves and to others to</li> </ul>

<b>Understandings:</b>	<p>work safely in the woodworking shop.</p> <ul style="list-style-type: none"> <li>● Woodworking is a sustainable practice that can be used to create beautiful and functional objects.</li> <li>● Woodworking projects require careful planning, execution, and troubleshooting with precision and accuracy.</li> <li>● Woodworking can help students develop the ability to persevere in the face of challenges and to learn from their mistakes.</li> <li>● Woodworking can be a lifelong hobby or career.</li> <li>● Woodworking is a material processing activity, and it is important to understand the math and science concepts that underpin it.</li> <li>● A woodworking plan or working drawing is a blueprint that provides instructions for how to construct a project.</li> <li>● Woodworking is a process of transforming raw materials into useful products.</li> <li>● Woodworking requires a variety of skills, including technical skills, problem-solving skills, and hand-eye coordination.</li> <li>● Cutting woodworking joints accurately and safely is necessary to them functioning properly.</li> <li>● It is important to select the appropriate woodworking equipment for a given task.</li> <li>● Selecting the appropriate wood finish for a given project is an important step and consideration should be given to the properties of the finish and the intended use of the finished product.</li> </ul>
<b>Duration and Credits:</b>	½ year; .5 credit(s)
<b>Course Materials/Resources:</b>	Machinery and consumables
<b>FPS Course Academic Expectation(s):</b>	EU Exploring and Understanding CC Creating and Constructing
<b>Year at a Glance (Units)</b>	Unit 1 - Course Introduction and General Safety (1 week) Unit 2 - Project Design (1-2 Weeks) Unit 3 - Machine Use (1-2 Weeks)

	<p>Unit 4 - Project Construction (7 Weeks) Unit 5 – Joinery and Assembly (4 Weeks) Unit 6 - Finishing (2 Weeks) Unit 7 - Project Review and Evaluation (1 Week)</p>
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<b>Unit Number and Title:</b>	Unit 1 - Course Introduction and General Safety
<b>Duration:</b>	1 Week
<b>Resource(s):</b>	Equipment and Consumables
<b>Unit Overview:</b>	Students will learn about careers in Wood Manufacturing while being reintroduced to safety practices and policies; including the safety practices for specific machinery and procedures related to workplace and job-site safety, personal protective equipment, machine safety, and material handling practices.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p><b>CT State Dept of Education Standards 2014: Wood Technology</b></p> <p>WM.01 Identify and appraise the impacts wood manufacturing has on their future aspirations; both career based and/or as an educated consumer.</p> <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 Describe and demonstrate the procedures related to workplace and job site safety including personal protective equipment, machine safety, and material handling practices.</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 Identify and describe the safe and appropriate use of various types of hand and power tools and machinery used for building.</p> <p>WM.03.16 Demonstrate good housekeeping at a workstation within the total laboratory.</p> <p>WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products.</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.04.07 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> <p>WM.04.10 Interpret a design to facilitate replication.</p>
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● What are some of the challenges and rewards of working in the woodworking industry?</li> <li>● How can professional and respectful behavior in a manufacturing environment contribute to a positive and productive work environment?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>● Safety is not just a set of rules to follow, but a way of thinking about and approaching their work.</li> <li>● Woodworking safety is everyone's responsibility and students have a responsibility to themselves and to others to work safely in the woodworking shop.</li> </ul>
<b>Learning Goal(s):</b> <i>Students will be able to use their learning to:</i> <i>(Content/ Skills)</i>	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>● how to operate in a professional and respectful manner in a manufacturing environment.</li> <li>● the character traits that are needed to be successful in the field of wood manufacturing.</li> <li>● the policies and procedures for the wood manufacturing environment.</li> <li>● the classroom rules and contract expectations.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>● develop, demonstrate and practice safe working habits.</li> <li>● demonstrate safe material handling practices.</li> <li>● describe workplace and jobsite safety procedures.</li> <li>● describe safety practices for specific machines.</li> <li>● describe the wood joints and construction methods particular to “case” style furniture.</li> </ul>

<b>Unit Number and Title:</b>	Unit 2 - Project Design
<b>Duration:</b>	1-2 weeks
<b>Resource(s):</b>	Equipment and Consumables
<b>Unit Overview:</b>	Students will create a 1/4-scale drawing of their project including all the necessary joinery, from which they will create a stock-list to guide them as they mill and machine their project pieces.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p><b>Standards Wood Technology</b></p> <p>WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products.</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.04.07 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> <p>WM.04.10 Interpret a design to facilitate replication.</p>
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● How does a piece of furniture’s function affect its construction and design?</li> <li>● How can the selection of wood joinery techniques affect the appearance, durability, and cost of a woodworking project?</li> <li>● What is the relationship between creativity and problem-solving?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>● Woodworking is a sustainable practice that can be used to create beautiful and functional objects.</li> <li>● Woodworking projects require careful planning, execution, and troubleshooting.</li> </ul>

	<ul style="list-style-type: none"> <li>● Furniture’s construction reflects its function.</li> </ul>
<b>Learning Goal(s):</b> <i>Students will be able to use their learning to:</i> (Content/ Skills)	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>● the parts of an orthographic drawing.</li> <li>● the process for creating a 1/4-scale drawing.</li> <li>● the function of a stock list in creating a “case” piece.</li> <li>● the definitions of board feet and linear feet, as well as, the differences between them.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>● create an orthographic drawing.</li> <li>● create a 1/4-scale drawing.</li> <li>● create a stock list for their project.</li> <li>● calculate both board feet and linear feet.</li> </ul>



<b>Unit Number and Title:</b>	Unit 3 - Machine Use
<b>Duration:</b>	3 weeks
<b>Resource(s):</b>	Equipment and Consumables
<b>Unit Overview:</b>	Students will be able to identify the proper use and function of portable power tools, hand tools, stationary machinery and specialty machinery used in the construction of a piece of “case” style furniture.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p><b>Standards Wood Technology</b></p> <p>WM.02 Describe and demonstrate the procedures related to workplace and job site safety including personal protective equipment, machine safety, and material handling practices.</p> <p>WM.02.09 Describe safety practices for the following machines: table saw, drill press, stationary sander, router table, and miter saw.*(A4)</p> <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.03.01 Identify, use, and maintain the following measuring, layout, and marking tools: steel rule, tape measure, combination square, sliding “T” bevel, and compass.*(B8)</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.*(B9)</p> <p>WM.03.03 Identify proper use and function of the following fastening tools: hammer, Phillip head screwdriver, and slotted/flat head screwdriver.*(B10)</p> <p>WM.03.04 Demonstrate and explain knowledge of proper use and storage of portable power tools.*(A6)</p> <p>WM.03.05 Demonstrate and explain knowledge of proper use and storage of basic hand tools.*(A5)</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.*(B11)</p> <p>WM.03.07 Identify proper use and function of stationary saws.</p> <p>WM.03.08 Identify the proper use and function specialty machinery (e.g. drill presses. jointers. surface planers. table saws. power miter saws. band saws. scroll saws. and stationary sanders.*</p>

	WM.03.09 Identify proper use and function of the table and miter saws.*(B12) WM.03.10 Explain and demonstrate correct use of planers. WM.03.11 Explain and demonstrate use of molders
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● Why is it important to be able to choose the correct machine for a procedure?</li> <li>● How does awareness of the safety procedures involving each machine utilized in a project increase both efficiency and effectiveness?</li> <li>● Why is it important to analyze and resolve problems through practical experiences?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>● Woodworking is a process of transforming raw materials into useful products.</li> <li>● Woodworking requires a variety of skills, including technical skills, problem-solving skills, and hand-eye coordination.</li> <li>● Woodworking safety is everyone's responsibility and students have a responsibility to themselves and to others to work safely in the woodworking shop.</li> </ul>
<b>Learning Goal(s):</b> Students will be able to use their learning to: (Content/ Skills)	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>● the proper and safe operation of the wood manufacturing machines and tools.</li> <li>● the proper and safe operation of portable sanders.</li> <li>● difference between a palm sander and orbital sander.</li> <li>● the methods to laying out, cutting, and assembling joinery.</li> <li>● the difference between a shaper and a router table.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>● joint edges of a board on a jointer.</li> <li>● cut curves on a band saw.</li> <li>● surface plane a board to thickness with accuracy of 1/32".</li> <li>● drill holes according to a plan.</li> <li>● shape edges by hand and/or with a router table.</li> <li>● sand materials with a disc, belt or spindle sander.</li> <li>● cut angles with a miter saw.</li> <li>● demonstrate the proper procedures for setting up the table saw for a variety of different</li> </ul>

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|  | <p>operations.</p> <ul style="list-style-type: none"><li>● demonstrate radial arm saw cross cutting operations.</li><li>● demonstrate miter cutting operations on the saws.</li><li>● “square” a board.</li></ul> |
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<b>Unit Number and Title:</b>	Unit 4 - Project Construction
<b>Duration:</b>	7 Weeks
<b>Resource(s):</b>	Equipment and Consumables
<b>Unit Overview:</b>	Students will be able to read a project plan or drawing and construct their “case” piece from it. Students will be able to identify and demonstrate sanding and gluing techniques, as well as, set-up, adjust, and maintain a variety of wood manufacturing power equipment.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p><b>Standards Wood Technology</b></p> <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.03.01 Identify, use, and maintain the following measuring, layout, and marking tools: steel rule, tape measure, combination square, sliding “T” bevel, and compass.*(B8)</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.*(B9)</p> <p>WM.03.03 Identify proper use and function of the following fastening tools: hammer, Phillip head screw driver, and slotted/flat head screw driver.*(B10)</p> <p>WM.03.04 Demonstrate and explain knowledge of proper use and storage of portable power tools.*(A6)</p> <p>WM.03.05 Demonstrate and explain knowledge of proper use and storage of basic hand tools.*(A5)</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.*(B11)</p> <p>WM.03.07 Identify proper use and function of stationary saws. WM.03.08 Identify the proper use and function 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.*(B12)</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.03.14 Select appropriate tools, procedures, and/or equipment.</p>

	<p>WM.03.15 Follow laboratory safety rules and procedures.</p> <p>WM.03.16 Demonstrate good housekeeping at a workstation within the laboratory.</p> <p>WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products.</p> <p>WM.04.01 Describe and interpret technical drawings.</p> <p>WM.04.02 Describe and prepare rough drawings and sketches.*(C14)</p> <p>WM.04.03 Explain and prepare a cut list or bill of material from a basic plan and assembly drawing.(C15) WM.04.04 Interpret a design to facilitate replication WM.04.05 Describe and identify fractional measurements from a basic plan and assembly drawings.*(C13)</p> <p>WM.04.06 Identify the difference between both nominal and actual dimensions.*(C17) WM.04.07 Extrapolate information from a set of plans.</p> <p>WM.04.08 Measure accurately to a sixteenth of an inch.*(C16)</p> <p>WM.04.09 Estimate materials quantities in both board feet and linear feet.*(C18)</p>
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● Why is it important to be able to choose the correct machine for a procedure?</li> <li>● Why is it important to analyze and resolve problems through practical experiences?</li> <li>● What impact does cabinetry have on the way people live?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>● Cutting woodworking joints accurately and safely is necessary to them functioning properly.</li> <li>● It is important to select the appropriate woodworking equipment for a given task.</li> </ul>
<b>Learning Goal(s):</b> Students will be able to use their learning to: (Content/ Skills)	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>● the procedure for assembling a case joinery.</li> <li>● the process of translating a project plan from paper to the real world.</li> <li>● the purpose of a web frame.</li> <li>● the purpose of a floating runner works.</li> <li>● the correct method of countersinking a screw.</li> <li>● difference between lip, overlay, and flush fit drawers.</li> <li>● the proper procedure for mounting drawer hardware.</li> <li>● the anatomy of a drawer.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p>

- construct parts of a cabinet.
- construct a project from a plan or drawing.
- utilize lumber, supplies and tools to construct and produce various parts of a “case” piece of furniture
- design and cut a scroll design.
- combine basic joining techniques and procedures in the manufacture of a furniture piece.
- identify the proper wood joint for a specific part of a project.
- identify several different styles of drawer fronts.
- utilize the table saw to rip, crosscut, cut dados and cut angles using the fence, miter gauge, push stick and other fixtures.
- plane a board down to the needed thickness through adjustment and use of the planer.
- laminate boards by gluing and clamping.
- build an overlay, lip or flush drawer.

<b>Unit Number and Title:</b>	Unit 5 – Joinery and Assembly
<b>Duration:</b>	4 Weeks
<b>Resource(s):</b>	Machinery and Consumables
<b>Unit Overview:</b>	Students will be able to explain the uses of different types of fasteners, glue and hardware. They will also be able to discuss and execute any special procedures for joining and assembling their “case” piece, including the proper application of hardware.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p><b>Standards Wood Technology</b></p> <p>WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products.</p> <p>WM.04.11 Consider the natural characteristics of grain, knots, and checks when laying out a board.*(C19)</p> <p>WM.04.12 Identify and assemble the following types of joints: butt, miter, dado, rabbet, and lap.*(G27)</p> <p>WM.04.13 Identify and select the proper cutting process based on grain direction.*(E23)</p> <p>WM.04.14 Identify how grain direction affects a material’s strength.*(E24)</p> <p>WM.04.15 Understanding kerf and its application to cutting and layout operations.*(E25)</p> <p>WM.04.16 Identify characteristics and applications of the following coniferous softwoods: pine, cedar, and fir.*(D20)</p> <p>WM.04.17 Identify characteristics and applications of the following deciduous hardwoods: oak, maple, and poplar.*(D21)</p> <p>WM.04.18 Identify characteristics and applications of the following engineered lumber: plywood and medium density fiberboard.(D22)</p> <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.*(H29)</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.*(H30)</p>

<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>• How can the use of different wood joinery techniques affect the strength, durability, and appearance of a woodworking project?</li> <li>• How can the selection of fasteners affect the strength, durability, and appearance of a woodworking project?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>• Woodworking is a material processing activity, and it is important to understand the math and science concepts that underpin it.</li> <li>• A woodworking plan or working drawing is a blueprint that provides instructions for how to construct a project.</li> </ul>
<b>Learning Goal(s):</b> Students will be able to use their learning to: (Content/ Skills)	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>• the use for clamping cauls.</li> <li>• the difference between glue curing and workable times.</li> <li>• the benefits of a 90 degree clamping block.</li> <li>• the difference between I beam, bar, pipe, and quick clamps.</li> <li>• the purpose of an awl.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>• use clamping cauls.</li> <li>• explain the uses of different types of fasteners.</li> <li>• discuss special procedures used to glue edge joints, frames, finished assemblies, and miter joints.</li> <li>• explain the steps in preparing wood for gluing molding to the base, top and back of a cabinet.</li> <li>• describe the application of hardware on a product.</li> <li>• utilize hand screws while gluing a frame and panel door.</li> </ul>



<b>Unit Number and Title:</b>	Unit 6 – Finishing
<b>Duration:</b>	2 Weeks
<b>Resource(s):</b>	Equipment and Consumables
<b>Unit Overview:</b>	Students will learn about the grit numbering system for sandpaper and its proper use to prepare wood surfaces for finishing. Students will learn about the application and characteristics of various types of finishes and polishes and use this new knowledge to finish their case piece to a desired appearance.
<b>Learning Goals</b>	
<b>Standard(s):</b>	Standards Wood Technology WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products.. 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.*(I31) WM.04.23 Describe the abrasive grit numbering grading system.*(F26) WM.04.24 Differentiate among various abrasive materials
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>How can the choice of finish affect the appearance, durability, and longevity of a woodworking project?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>Selecting the appropriate wood finish for a given project is an important step and consideration should be given to the properties of the finish and the intended use of the finished product.</li> </ul>
<b>Learning Goal(s):</b> Students will be able to use their learning to: (Content/ Skills)	<b>Content:</b> (Students will know...) <ul style="list-style-type: none"> <li>finishing terminology.</li> <li>the uses of various finishes.</li> <li>the proper application of wax and other protective coatings.</li> <li>difference between a top coat and a stain.</li> <li>the process for cleaning brushes properly</li> <li>proper use of various solvents.</li> </ul>

- the proper disposal of oil soaked rags.

**Skills:** (Students will be able to...)

- to finish a case piece.
- utilized stain and color changing finishes.
- prepare surfaces for staining and finishing.
- apply stain to wood.
- apply a protective transparent finish to wood.
- to clean brushes properly
- utilize the correct solvent when cleaning brushes.

<b>Unit Number and Title:</b>	Unit 7 - Project Review and Evaluation
<b>Duration:</b>	1 week
<b>Resource(s):</b>	Consumables
<b>Unit Overview:</b>	Students will reflect on the process of designing, building and finishing their “case” piece, evaluating the entire process in addition to the end product.
<b>Learning Goals</b>	
<b>Standard(s):</b>	<p>Standards Wood Technology</p> <p>WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products.</p> <p>WM.04.01 Describe and interpret technical drawings.</p> <p>WM.04.02 Describe and prepare rough drawings and sketches. *(C14)</p> <p>WM.04.03 Explain and prepare a cut list or bill of material from a basic plan and assembly drawing.(C15)</p> <p>WM.05 Describe and demonstrate the attributes of wood design.</p> <p>WM.05.01 Utilize the design process; including defining a problem, brainstorming, researching and generating ideas, identifying criteria and specifying constraints, exploring possibilities, selecting an approach, developing a design proposal, making a model or prototype, testing and evaluating the design using specifications, refining the design, creating or making it, and communicating processes and results.</p> <p>WM.05.02 Check and critique a design continually, and improve and revise the idea of the design as needed.</p> <p>WM.05.03 Design and create cabinet and wood products</p> <p>WM.05.04 Develop a production plan, including the layout, bill of materials, and cost analysis, for the production of cabinets or wood products.</p>
<b>Essential Question(s):</b>	<ul style="list-style-type: none"> <li>● How does a piece of furniture’s function affect its construction and design?</li> <li>● What is the relationship between creativity and problem-solving?</li> </ul>

	<ul style="list-style-type: none"> <li>● How can woodworkers develop their ability to troubleshoot and adapt when faced with unexpected challenges in a project?</li> </ul>
<b>Enduring Understanding(s):</b>	<ul style="list-style-type: none"> <li>● Woodworking can help students develop the ability to persevere in the face of challenges and to learn from their mistakes.</li> <li>● The woodworking process provides opportunities to learn how to think critically, creatively, and reflectively.</li> <li>● Woodworking can foster a sense of accomplishment and pride in students.</li> <li>● The woodworking process requires flexibility and adaptability, as problems can arise unexpectedly.</li> <li>● Woodworking can be a lifelong hobby or career.</li> </ul>
<b>Learning Goal(s):</b> <i>Students will be able to use their learning to:</i> (Content/ Skills)	<p><b>Content:</b> (Students will know...)</p> <ul style="list-style-type: none"> <li>● the elements that make a project successful.</li> <li>● the elements that make a project aesthetically pleasing.</li> <li>● the process for assessing errors and mistakes on a finished project.</li> </ul> <p><b>Skills:</b> (Students will be able to...)</p> <ul style="list-style-type: none"> <li>● self-evaluate work.</li> <li>● to spot blemishes and dents and other defects in a case project</li> <li>● identify quality aspects of completed work.</li> <li>● identify changes which could improve the process.</li> </ul>