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CTE Standards Unpacking
Advanced Cabinetry

Course: Advanced Cabinetry
Course Description: This course prepares individuals to apply technical knowledge and skills to set up and operate industrial woodworking machinery. Students will use industrial machinery to design and fabricate custom cabinets and architectural millwork. This course will cover safe use of hand and power tools and machinery used in the production of cabinets and millwork. A variety of cabinets will be designed and constructed. Students will apply proper finishing and explore proper installation techniques as part of this program.
Career Cluster: Architecture & Construction
Prerequisites: Cabinetry
Program of Study Application: Foundation Courses, Introduction to Architecture & Construction, Cabinetry, Advanced Cabinetry, Capstone Experience

INDICATOR #AC 1: Demonstrate proper rules and regulations to comply with personal and shop safety.		
SUB-INDICATOR 1.1 (Webb Level: 1 Apply): Apply hand/power/industrial tool and lab safety practices.		
SUB-INDICATOR 1.2 (Webb Level: 2 Determine): Determine and wear appropriate personal protective equipment (PPE)		
SUB-INDICATOR 1.3 (Webb Level: 1 Comply): Comply with government regulations regarding health and safety in the shop.		
Knowledge (Factual): Knowledge of general shop safety principals. Know what OSHA is and does for cabinetmaking. Knowledge of hand and power tools PPE (Personal Protective Equipment)	**Understand (Conceptual):** Practicing safety in cabinetmaking is essential.	**Skills (Application):** Identify improper shop safety practices and what precautions needs to be done to remedy those situations. Wear appropriate PPE while working in the shop.
Benchmarks Students will be assessed on their *ability* to: • Demonstrate the proper use of protective clothing and safety equipment. • Demonstrate basic first aid. • Explain basic safety using Occupation Safety Health Administration (OSHA) standards or equivalents.		

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard): RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range or formal and informal tasks	**Sample Performance Task Aligned to the Academic Standard(s):** Students will read and interpret in writing and speaking Safety Data Sheets to understand safety standards in shop and industry.

INDICATOR #AC 2: **Evaluate the career market that surrounds the cabinetry industry.**
SUB-INDICATOR 2.1 (Webb Level: 3 Acquire): Acquire career information and demonstrate knowledge of the career-planning process
SUB-INDICATOR 2.2 (Webb Level: 3 Identify): Identify individual career goals in the cabinetry industry.
SUB-INDICATOR 2.3 (Webb Level: 3 Develop): Enhance the development of employment readiness skills

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Knowledge (Factual):	**Understand (Conceptual):**	**Skills (Application):**
Various careers in cabinetry industry Employability skills Career planning Goal setting Ethics in the workplace	In the cabinetmaking industry it takes specific skills in order to be employed. Career planning process involves goal setting and obtaining knowledge of the industry.	Research various careers in the cabinetmaking industry Using SDMyLife evaluate traditional and non-traditional choices. Students will set individual career goals. Students will demonstrate their employment readiness skills and assess their effectiveness.

Benchmarks

Students will be assessed on their *ability* to:

- Use SDMyLife and ASCA National Standards to Career Development to set three career goals.
- Job shadow or interview someone in the cabinetmaking industry and prepare an oral or written report about this experience.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W9. Draw evidence from informational texts to support analysis, reflection, and research SL2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions	Students will orally or in writing explain what they learned from their job shadowing or interview.

and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range or formal and informal tasks	

INDICATOR #AC 3: **Utilize advanced math skills, formulas, and principles used in cabinetry.**		
SUB-INDICATOR 3.1 (Webb Level: 2 Apply): Apply geometric formulas to determine areas of various structures		
SUB-INDICATOR 3.2 (Webb Level: 2 Apply): Apply appropriate formulas to determine percentages/decimals		
SUB-INDICATOR 3.3 (Webb Level: 2 Apply): Apply appropriate formulas to determine ratios, fractions, and proportion measures		
SUB-INDICATOR 3.4 (Webb Level: 3 Apply): Apply appropriate formulas to determine measurement of dimensions, spaces, and structures		
SUB-INDICATOR 3.5 (Webb Level: 4 Develop, Conceptualize): Develop a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing		
SUB-INDICATOR 3.6 (Webb Level: 1 Define): Define the X,Y,Z coordinates involved in common Computer numeric control (CNC) applications		
Knowledge (Factual): Area formula Percentages and decimal conversions Board feet, linear feet, square feet 3D coordinates	**Understand (Conceptual):** Cabinetmaking requires the understanding and application of advanced math skills.	**Skills (Application):** Calculate area and volume of parts. Calculate board footage Design model to be cut with CNC.

Benchmarks

Students will be assessed on their *ability* to:

- Calculate the board footage with 100% accuracy.
- Calculate area, and volume with 90% accuracy.
- Use appropriate formula to figure area, and volume with 90% proficiency.
- Develop a model to be cut using a CNC machine.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
G-MG1 - Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder). G-MG2 - Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). G-MG3 - Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). Creating Equations A -CED2 - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	Create a model for CNC, and figure out amount of material will be needed to produce such model.

INDICATOR #AC 4: **Identify various materials and evaluate the proper**

<table>
<tr><td colspan="3">application in project planning.</td></tr>
<tr><td colspan="3">SUB-INDICATOR 4.1 (Webb Level: 3 Differentiate): Differentiate various cabinetry materials and their appropriate applications</td></tr>
<tr><td colspan="3">SUB-INDICATOR 4.2 (Webb Level: 2 Identify): Identify the common grades of lumber and sheet goods</td></tr>
<tr><td colspan="3">SUB-INDICATOR 4.3 (Webb Level: 2 Describe): Describe and identify natural defects in woods</td></tr>
<tr><td colspan="3">SUB-INDICATOR 4.4 (Webb Level: 1 Utilize): Utilize proper storage and handling techniques</td></tr>
<tr><td>Knowledge (Factual):
Materials used in cabinetmaking

Grades of lumber and sheet goods

Lumber defects

Storage of lumber</td><td>Understand (Conceptual):
Wood can come in many different shapes, sizes, and quality and they require specific handling techniques.</td><td>Skills (Application):
Compare and contrast various types of lumber

Identify wood defects

Use proper storage and handing techniques</td></tr>
<tr><td colspan="3">Benchmarks
Students will be assessed on their ability to:
Identify wood defects with 90% proficiency.
Know common grades for hardwoods, softwoods, and sheet good with 80%.
Know proper storage and handling techniques for wood, and sheet goods.</td></tr>
<tr><td colspan="3">Academic Connections</td></tr>
<tr><td colspan="2">ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):

RI4. - Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author
uses and refines the meaning of a key term or terms over the course of a text

SL4. - Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that</td><td>Sample Performance Task Aligned to the Academic Standard(s):

Students explain orally the various grades and defects of the cabinetmaking materials.</td></tr>
</table>

listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range or formal and informal tasks	

INDICATOR #AC 5: **Demonstrate advanced skills and techniques used in industry.**		
SUB-INDICATOR 5.1 (Webb Level: 2 Determine): Determine plumb, level, and square		
SUB-INDICATOR 5.2 (Webb Level: 2 Determine): Demonstrate proper techniques used in various sawing, shaping, carving, molding, and routing applications.		
SUB-INDICATOR 5.3 (Webb Level: 3 Apply, Fabricate): Apply fabricating techniques of various cabinet parts		
SUB-INDICATOR 5.4 (Webb Level: 3 Differentiate): Differentiate between different styles in cabinets, doors, and drawers		
SUB-INDICATOR 5.5 (Webb Level: 1 Identify): Identify and create the basic wood and mechanical joints used in cabinetry.		
Knowledge (Factual): Knowledge of various cabinets, drawers, and doors and the different styles. Knowledge of joinery used in cabinetmaking. Knowledge of plumb, level, and square. Knowledge of how to use cabinetmaking tools.	**Understand (Conceptual):** Many fabricating techniques go into making a cabinet.	**Skills (Application):** Fabricate doors, drawers, and cabinet parts for project. Maintain a style throughout the entire project. Construct the required joinery for the project.
Benchmarks Students will be assessed on their *ability* to: • Fabricate the various parts for their cabinet following the project plans. • Fabricate the required joinery according the project plans. • Provide written detail about the style chosen for their cabinet, door or drawer project		
Academic Connections		

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	Sample Performance Task Aligned to the Academic Standard(s):
G-MG3 - Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios	Students will fabricate the required doors, drawers, or cabinet parts following the plan of procedure in the project plans.

INDICATOR #AC 6: **Demonstrate the use of cabinet fasteners and hardware.**		
SUB-INDICATOR 6.1 (Webb Level: 2 Determine): Determine proper application and use of mechanical fasteners and adhesives		
SUB-INDICATOR 6.2 (Webb Level: 2 Analyze): Analyze different hinge systems and their applications		
SUB-INDICATOR 6.3 (Webb Level: 2 Analyze): Analyze various drawer glides and their appropriate		
Knowledge (Factual): Various types of adhesives Hinge styles Various drawer slide styles Various fasteners	**Understand (Conceptual):** Various styles of adhesives, fasteners, hinges, and drawer slides are used in cabinetmaking.	**Skills (Application):** Install the correct type of hinge for the project Install the correct style of drawer slide for the project. Apply correct adhesive or fastener.
Benchmarks Students will be assessed on their *ability* to: • Choose and install correct hinges on their project according to plans. • Choose and install correct drawer slides on their project according to plans. • Use appropriate type of adhesive, or fastener depending on what the project plans call for.		
Academic Connections		

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ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
G-MG3. - Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios	Students will need to measure correct placement of hinges.

INDICATOR #AC 7: **Demonstrate proper assembly and finish preparation techniques.**		
SUB-INDICATOR 7.1 (Webb Level: 2 Develop): Develop logical assembly process/procedure		
SUB-INDICATOR 7.2 (Webb Level: 2 Demonstrate): Demonstrate various ways to remove excess adhesive		
SUB-INDICATOR 7.3 (Webb Level: 2 Apply): Apply surface preparation skills before finishing		
Knowledge (Factual): Assembly techniques Surface preparation Grits of sandpaper	**Understand (Conceptual):** Every project has a specific surface preparation, and assembly process.	**Skills (Application):** Prepare the surface of the project for finishing using appropriate grits of sandpaper. Remove excess adhesives. Assemble all project parts according to the plans.

Benchmarks

Students will be assessed on their *ability* to:

- Choose the appropriate grit of sandpaper for surface preparation 90% of the time.
- Follow assembly procedure according to the project plans.
- Prepare and finish a surface using proper techniques

Academic Connections

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ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	Students will read and follow directions for assembly according to their project plans.

INDICATOR #AC 8: **Demonstrate the use of finishing materials and processes.**		
SUB-INDICATOR 8.1 (Webb Level: 1 Explain): Explain the purpose and applications of various types of finishes and finishing processes		
SUB-INDICATOR 8.2 (Webb Level: 3 Develop): Develop and follow a finishing schedule		
SUB-INDICATOR 8.3 (Webb Level: 2 Apply): Utilize safe and approved methods for cleanup and disposal (OSHA, EPA, DENR)		
Knowledge (Factual): Types of stain Various types of finishes Finish schedule Safe and approved cleanup of stains and finishes.	**Understand (Conceptual):** There are specific steps that need to be followed to apply finishing products to a project and ensure adherence to OSHA guidelines.	**Skills (Application):** Develop a finish schedule to follow while finishing their project. Follow safety procedures to dispose of waste from finishing products.
Benchmarks Students will be assessed on their *ability* to: • Follow the safety protocol for cleanup and disposal of finishing techniques 100% of the time. • Follow the finish schedule they created.		
Academic Connections		

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ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
G-MG.1 – Use geometric shapes, their measures, and their properties to describe objects. G-MG.2 – Apply concepts of density based on area and volume in modeling situation G-MG3 – Apply geometric methods to solve design problems (e.g. designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios.) RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	Students will figure area of their project to determine how much finish is required to complete their project. Students will read the labels of the appropriate finish to determine correct application, and dry time for their project.

Additional Resources
Please list any resources (e.g., websites, teaching guides, etc.) that would help teachers as they plan to teach these new standards.