CABINETMAKING (524)

DESCRIPTION

The third in a sequence of assessments, Cabinetmaking prepares students to apply technical knowledge and skills to set up and operate industrial woodworking machinery and to use such machinery to design and fabricate custom cabinets and architectural millwork. It stresses the safe use of trade hand and power tools and machinery used in the production of millwork items.

<table>
<thead>
<tr>
<th>Total Test Questions: 74</th>
<th>Levels: Grades 10-12</th>
<th>Units of Credit: .50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisites: Woodworking, Furniture Design, and Manufacturing</td>
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STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD 1 11% of Exam Blueprint

- **Understand the Cabinetmaking Industry.**
  - Objective 1: Identify career opportunities in cabinetmaking/millwork manufacturing.
  - Objective 2: Identify career opportunities in related millwork industries.
  - Objective 3: Describe the integration of cabinetmaking into construction schedules.

STANDARD 2 8% of Exam Blueprint

- **Understand the Design, Planning, and Estimation Process.**
  - Objective 1: Identify elements and principles of design as they apply to kitchen cabinets.
    1. U-shape
    2. Peninsula
    3. Corridor
    4. L-shape
    5. Work triangle
  - Objective 2: Draw the necessary views of a selected project.
  - Objective 3: Create a material list for the selected project and determine the project cost.
  - Objective 4: Create a procedure list for construction of a cabinet.
  - Objective 5: Extract pertinent cabinet information and specifications from house plans.
  - Objective 6: Identify cabinet standards relating to kitchen, vanity, and commercial type cabinets (quality standards, dimension standards, etc.).

STANDARD 3 5% of Exam Blueprint

- **Understand and Demonstrate Safe Practices.**
  - Objective 1: Demonstrate the ability to work safely in a cabinet shop following general safety rules.
  - Objective 2: Demonstrate the safe use of woodworking tools and machines.
Objective 3: Demonstrate how to handle and store materials according to MSDS sheets.
Objective 4: Pass a written safety test with a score of 100 percent.

STANDARD 4 9% of Exam Blueprint

UNDERSTAND AND DEMONSTRATE THE SAFE USE OF HAND TOOLS.

Objective 1: Describe the purpose and demonstrate the proper use of the following measuring and layout tools:
1. Measuring Tape
2. Scratch awl
3. Combination square
4. Try Square
5. Framing Square
6. Sliding T-bevel
7. Trammel points
8. Compass
9. Stud finder
10. Scribe

Objective 2: Describe the purpose and demonstrate the proper use of the following cutting and shaping tools:
1. Utility knife
2. Back saw
3. Block plane
4. Wood chisel
5. Wood file/rasp
6. Hand saw
7. Jack plane
8. Glue scraper
9. Putty knife

Objective 3: Describe the purpose and demonstrate the proper use of the following striking tools:
1. Claw hammer
2. Dead-blow hammer
3. Rubber mallet
4. Nail set

Objective 4: Describe the purpose and demonstrate the proper use of the following drill bits:
1. Twist
2. Forstner
3. Spade
4. Countersink
STANDARD 5 11% of Exam Blueprint

Understand and demonstrate the safe use of portable power tools.

Objective 1: Describe the purpose and demonstrate the proper use of routers.
Objective 2: Describe the purpose and demonstrate the proper use of reciprocal or circular saws.
Objective 3: Describe the purpose and demonstrate the proper use of a biscuit jointer.
Objective 4: Describe the purpose and demonstrate the proper use of a power plane.
Objective 5: Describe the purpose and demonstrate the proper use of power drills and drivers.
Objective 6: Describe the purpose and demonstrate the proper use of pneumatic tools.
Objective 7: Describe the purpose and demonstrate the proper use of the following portable power tools:
   1. Pneumatic nailer
   2. Power drills
   3. Router
   4. Finish sander
   5. Belt sander
   6. Orbital sander
   7. Biscuit jointer
   8. Hand jig saw
   9. Power plane
  10. Circular saw
  11. Reciprocal saw

STANDARD 6 7% of Exam Blueprint

Understand and demonstrate the safe use of power machines.

Objective 1: Describe the purpose and demonstrate the proper use of the following sawing machines:
   1. Table saw
   2. Power miter saw
   3. Radial arm saw
   4. Band saw

Objective 2: Describe the purpose and demonstrate the proper use of the following surfacing machines:
1. Surface planer
2. Jointer

Objective 3: Describe the purpose and demonstrate the proper use of the following sanding machines:
1. Disc sander
2. Surface sander
3. Spindle sander

Objective 4: Describe the purpose and demonstrate the proper use of the following shaping machines:
1. Router table
2. Shaper

Objective 5: Describe the purpose and demonstrate the proper use of the following drilling and turning machines:
1. Drill press
2. Line boring machine
3. Lathe

STANDARD 7  11% of Exam Blueprint

Understand Wood Products, Characteristics, and Procedures.

Objective 1: Describe the parts of a tree and the significance that it has in cabinet construction.
1. Bark
2. Sap wood
3. Pith
4. Annual (growth) rings

Objective 2: Describe and know natural defects.
1. Warp
2. Cracks
3. Bark inclusions
4. Knots

Objective 3: Demonstrate knowledge of the seasoning and drying of lumber.

Objective 4: Distinguish between softwoods and hardwoods.

Objective 5: Identify the differences between solid wood and manmade goods and describe the use of each.

Objective 6: Identify wood species and list the species most suited for cabinet construction.

Objective 7: Identify the common grades of lumber and sheet goods.
1. FAS
2. Select
3. #1COM
Objective 8: Properly store material.

STANDARD 8 9% of Exam Blueprint

- **Understand and demonstrate basic math and measuring concepts.**
  - Objective 1: Calculate the cost of a project.
  - Objective 2: Demonstrate the optimization of materials.
  - Objective 3: Demonstrate basic woodworking math proficiency.
  - Objective 4: Multiply two-digit numbers.
  - Objective 5: Calculate board feet and square feet.
  - Objective 6: Read and measure with a tape using sixteenths (1/16).

STANDARD 9 9% of Exam Blueprint

- **Understand and demonstrate the use of fasteners and adhesives.**
  - Objective 1: Identify the various woodworking fasteners and the application of each.
    1. Nails
    2. Screws
    3. Staples
    4. Confirmat screws
    5. Bolts
  - Objective 2: Identify the different adhesives and preferred use of each.
    1. Yellow glue
    2. Polyurethane glue
    3. Cyanoacrylate
    4. Contact cement
  - Objective 3: Identify the different types of clamps.
    1. Bar
    2. “C”
    3. Spring
    4. Band
    5. Hand screw

STANDARD 10 11% of Exam Blueprint

- **Understand and demonstrate the use of joinery.**
  - Objective 1: Identify the basic wood joints used in furniture making.
    1. Butt
    2. Miter
    3. Rabbet
    4. Dado
    5. Spline
    6. Mortise and tenon
Objective 2: Construct the basic wood joints used in cabinetmaking.

STANDARD 11 9% of Exam Blueprint

- Understand and demonstrate the use of cabinet components and hardware.

Objective 1: Identify the parts of traditional and European cabinets.
1. Stile
2. Rail
3. Mullion
4. Base
5. Toe kick
6. Side
7. Skin
8. Shelf
9. Web frame
10. Kicker
11. Drawer guide/glide
12. Nailer
13. Molding
14. Filler strip
15. Edge banding
16. Bottom
17. Back

Objective 2: Identify basic construction methods.

Objective 3: Identify the door options in cabinetmaking.

Objective 4: Identify the components of a drawer.

Objective 5: Identify and properly install common cabinet/furniture hardware such as:
1. Hinges - offset, overlay, European, butt, lip
2. Drawer guides
3. Pulls and knobs
4. Shelf supports

Objective 6: Assemble a cabinet with the proper adhesive and fasteners.

Objective 7: Layout and construct cabinet doors.

Objective 8: Cut out and construct drawers.

Objective 9: Install door and drawer.
Objective 10: Identify basic construction methods.
   1. Frame and panel
   2. Casework construction

STANDARD 12

◊ Understand and demonstrate finishing, installation, and transportation techniques.
Objective 1: Understand and properly apply the basic rules of sanding.
Objective 2: Select and correctly use each specified grit size.
Objective 3: Properly prepare a surface for finishing.
Objective 4: Properly apply stain, penetrating oil, and/or a clear finish.
Objective 5: Properly spray a clear coat.
Objective 6: Understand basic cabinet installation techniques such as scribing, leveling, and shimming.
PERFORMANCE STANDARD EVALUATION CHECKLIST

Student Name ____________________________________________________________

Instructor’s Name _______________________________________________________

School _____________________________ District _____________________________

Performance Rating Scale:

1 2 3 4 5 6 7 8 9 10

Limited Skills ......................... Moderate Skills ......................... High Skills

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated written exam. To pass the performance standard the student must attain a performance standard average of 8 or higher on the rating scale. Students may be encouraged to repeat the objectives until they average 8 or higher for the following elements:

PERFORMANCE SKILLS STANDARDS

STANDARD 1 - Understand the cabinetmaking industry. Score:

STANDARD 2 - Understand the design, planning and estimation process. Score:

☐ Identify elements and principles of design as they apply to kitchen cabinets
  • U-shape
  • L-Shape
  • Peninsula
  • Work triangle
  • Corridor

☐ Identify cabinet standards (quality, dimension, etc.) relating to the following:
  • U-shape
  • Peninsula
  • Corridor

☐ Draw the necessary views of a selected project

☐ Create a material list for the selected project and determine the project cost

☐ Create a procedure list for construction of a cabinet

☐ Extract pertinent cabinet information and specifications from house plans
### PERFORMANCE SKILLS STANDARDS

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<td>□ Demonstrate safe use of woodworking tools and machines</td>
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<td>□ Demonstrate how to handle and store materials according to the Material Safety Data Sheets (MSDS)</td>
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<td>□ Pass a written safety test with a score of 100 percent</td>
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<td>• Tammel points</td>
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<td>• Nail set</td>
<td>• Rubber mallet</td>
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<td>□ Describe the purpose and demonstrate the proper use of the following drill bits:</td>
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<td>• Twist</td>
<td>• Forstner</td>
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<tr>
<td>• Countersink</td>
<td>• Hole Saw</td>
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<tr>
<td>• Hogging tool</td>
<td>• Spade</td>
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<td>• Pneumatic nailer</td>
<td>• Power drills</td>
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<td>• Finish sander</td>
<td>• Belt sander</td>
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<tr>
<td>• Biscuit jointer</td>
<td>• Hand jig saw</td>
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<th>STANDARD 6 - Understand and demonstrate the safe use of power machines.</th>
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<td>□ Describe the purpose and demonstrate the proper use of the following sawing machines:</td>
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<td>• Table saw</td>
<td>• Power Miter saw</td>
</tr>
<tr>
<td>• Brand saw</td>
<td>• Radial arm saw</td>
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### PERFORMANCE SKILLS STANDARDS

#### STANDARD 6 – continued

- Describe the purpose and demonstrate the proper use of the following surfacing machines:
  - Surface planer
  - Jointer
- Describe the purpose and demonstrate the proper use of the following shaping machines:
  - Router table
  - Shaper
- Describe the purpose and demonstrate the proper use of the following sanding machines:
  - Disc sander
  - Surface sander
  - Spindle sander
- Describe the purpose and demonstrate proper use of the following drilling and turning machines:
  - Drill press
  - Line boring machine
  - Lathe

#### STANDARD 7 - Understand wood components and characteristics.

- Describe the parts of a tree and the significance that it has in cabinet construction
  - Bark
  - Sap Wood
  - Pith
  - Annual (growth) rings
- Describe and know natural defects
  - Warp
  - Cracks
  - Knots
  - Bark inclusions
- Identify wood species and list the species most suited for furniture construction
  - Alder
  - Cherry
  - Oak
  - Walnut
  - Maple
  - Poplar
  - Pine
  - Mahogany
  - Cedar
- Identify the common grades of lumber and sheet goods
  - FAS
  - Select
  - #1COM
- Demonstrate a knowledge of the seasoning and drying of lumber
- Distinguish between softwoods and hardwoods
- Identify the difference between solid wood and manmade goods and describe the use of each
- Properly store material

#### STANDARD 8 - Understand and demonstrate basic math and measuring concepts.

- Add two- and three-digit numbers
- Subtract two-, three-, and four-digit numbers
- Solve two-digit divisor numbers
- Multiply a two-digit factor
- Add, subtract, multiply, and divide fractions and mixed numbers
- Reduce fractions
- Add, subtract, multiply, and divide decimal numbers
- Calculate percentages and basic ratios
- Demonstrate the optimization of materials
- Add and subtract linear measurement in feet and inches
### PERFORMANCE SKILLS STANDARDS

#### STANDARD 8 – continued
- Convert fractions to decimals
- Calculate board feet and square feet
- Use a ruler or measuring tape to measure within a sixteenth (1/16) of an inch

#### STANDARD 9 - Understand and demonstrate the use of fasteners, adhesives, and abrasives.
- Identify the various woodworking fasteners and the application of each
  - Nails
  - Screws
  - Bolts
  - Staples
- Identify the different adhesives and preferred use of each
  - Yellow glue
  - Polyurethane glue
  - Epoxy
  - Cyanoacrylate
- Identify the different types of clamps
  - Bar
  - “C”
  - Spring
  - Handscrew

#### STANDARD 10 - Understand and demonstrate the use of joinery.
- Identify the basic wood joints used in furniture making
  - Butt
  - Lap
  - Dovetail
  - Pocket
  - Miter
  - Spline
  - Groove (plough)
  - Rabbet
  - Mortise and tenon
  - Dado/blind dado
  - Biscuit
- Construct the basic wood joints used in cabinetmaking/millwork

#### STANDARD 11 - Understand and demonstrate the use of cabinet components and hardware.
- Identify basic construction methods
  - Frame and panel
  - Casework construction
  - Post and rail
- Identify the cabinet components of a face frame and cabinet box
  - Stile
  - Skin
  - Mullion
  - Side
  - Web frame
  - Base
  - Shelf
  - Toe kick
  - Kicker
  - Rail
  - Drawer runner/glide
  - Back
- Identify the door options in cabinetmaking
  - Flush
  - Overlay
  - Mullion
  - Tambour
  - Lip
  - Base
- Identify and properly install common cabinet/furniture hardware such as:
  - Shelf supports
  - Pulls and knobs
  - Hinges – offset, overlay, European, butt, lip
  - Drawer guides
PERFORMANCE SKILLS STANDARDS

**STANDARD 10 – continued**

- Assemble a project with the proper adhesive and fasteners
- Describe the concept of a European (frameless) cabinet system and the advantages/disadvantages
- Construct a drawer
- Identify the components of a drawer
- Use frame and panel construction
- Install lid or door and drawer

**STANDARD 12 - Understand and demonstrate finishing, installation, and transportation techniques.**  
**Score:**

- Understand and properly apply the basic rules of sanding
- Select and correctly use each specified grit size
- Properly apply stain, penetrating oil, and/or a clear finish
- Properly prepare a surface for finishing
- Properly spray a clear coat

**STANDARD 13 - Understand the need for professional development.**  
**Score:**

**STANDARD 14 - Understand the need for leadership skills.**  
**Score:**

**STANDARD 15 - Understand the need for career planning.**  
**Score:**

**STANDARD 16 - Understand the importance of employability and work habits.**  
**Score:**

- Develop a list of work standards to follow at school and on the job
- Evaluate your personal ethics

**PERFORMANCE STANDARD AVERAGE**  
**Average:**