Woodworking, Beginning

Exam Information

Exam number
520

Items
48

Points
54.5

Prerequisites
None

Recommended course length
One semester

National Career Cluster
Manufacturing

Architecture & Construction

Performance standards
Included (Optional)

Certificate available
Yes

Description

The Woodworking, Beginning industry certification exam assesses learners' ability to apply technical knowledge and skills to lay out, shape, assemble, and finish projects. The exam emphasizes craftsmanship, a production sense, and design principles. Learners demonstrate their proficiency in the safe use of a variety of hand tools, power tools, and machinery.

Exam Blueprint

Standard	Percentage of exam
1. Safety Practices	13%
2. Foundational Skills	32%
3. Wood Products	44%
4. CNC Equipment	7%
5. Career in Woodworking	4%

Standard 1

Students will develop safe woodworking habits.

Objective 1 Be aware of physical hazards present in a woodshop.

1. Sharp objects and cutting hazards.
2. Heavy objects and crushing hazards.
3. Kickback and potentially airborne objects.
4. Moving parts of machinery and applicable safety zones.
5. Excessive noise present in a woodshop.
6. Personal distractions (cell phones, headphones, etc.)

Objective 2 Be aware of chemical hazards present in a woodshop.

1. Common chemicals found in a woodshop (glue, finish, etc.).
2. Students will be aware of the dangers of sawdust.
3. Students will know what a Safety Data Sheet (SDS) is and where to find it.

Objective 3 Understand the importance of cleaning and organization in a woodshop and how that relates to safety.

Objective 4 Know what Personal Protective Equipment (PPE) is and when it should be used.

Objective 5 Be aware of clothing hazards present in a woodshop.

1. Loose or dangling items or pieces (including hair, draw strings, baggy clothing, etc.)
2. Open toed shoes
3. Jewelry

Performance Skill

1. Students will complete a basic safety test without errors (100%) before using any tools or equipment.
2. Consult with your school division's risk management department for specific policies or procedures.
3. Students will keep woodshops and classrooms clean and organized while working, after completing work, and when storing materials and projects.
4. Students will always wear safety glasses inside the woodshop.

Standard 2

Students will explore careers in woodworking and manufacturing.

Objective 1 Understand how this course fits into the USBE Manufacturing Pathway.

Objective 2 Learn about woodworking jobs and careers in their local area and across Utah, including how many jobs are available, how much they pay, and what education and training they require.

Objective 3 Learn about jobs and careers in different fields that use similar skills as the woodworking industry, such as job prospects, wages, and required education.

Objective 4 Learn about higher education opportunities in Utah for woodworking.

Standard 3

Students will gain an understanding of measuring and the basic math needed when building with wood.

Objective 1 Use a measuring tape or ruler to make accurate measurements within 1/16 of an inch.

Objective 2 Perform common, simple math calculations used in woodworking.

1. Students will be able to add, subtract, multiply, and divide whole numbers, mixed numbers, fractions, and decimals.
2. Students will be able to reduce fractions.
3. Students will be able to convert fractions to decimals.

Standard 4

Objective 1 Read, interpret, and understand scale drawings.

Objective 2 Read, interpret, and understand material lists and cut lists.

Objective 3 Read, interpret, understand, and follow a plan of procedure.

Performance Skill

1. Students can correctly identify the thickness, width, and length of a board from a cut list. (T”xW”xL”)
2. Students can determine the dimensions of a board based on a scale drawing.
3. Students can accurately follow a plan of procedure

Standard 5

Students will understand the basic properties of wood and how and why they must be considered when building with wood.

Objective 1 Understand wood grain.

1. Identify the face, edge, and end of a board.

2. Determine the thickness, width, and length of a board relative to the grain direction.

Objective 2 Identify common defects found in wood and how to use or mitigate them.

1. Knots
2. Cracks
3. Bark inclusions
4. Warping

Objective 3 Differentiate between solid wood and sheet goods.

Objective 4 Understand wood movement and how it affects the way things are built.

Standard 6

Students will learn how to process wood using industry relevant machinery

Objective 1 Identify and safely use equipment that is commonly used in the woodworking industry. (See Common Tools List)

1. Identify hand tools commonly used in the woodworking industry.
2. Identify clamps commonly used in the woodworking industry.
3. Identify handheld electric and pneumatic power tools commonly used in the woodworking industry.
4. Identify machinery commonly used in the woodworking industry.

Objective 2 Outline the necessary steps to get a rough board to its final dimensions.

Performance Skills

1. Students can safely use hand tools commonly used in the woodworking industry.
2. Students can properly use clamps commonly used in the woodworking industry.
3. Students can safely use handheld electric and pneumatic power tools commonly used in the woodworking industry.
4. Students can safely use machinery commonly used in the woodworking industry.
5. Students can mill a piece of lumber to final thickness, width, and length while making every surface 90 degrees to its adjacent surfaces.
6. Students can perform the following actions on a CNC:
    a. Position and secure the workpiece to the CNC work surface.
    b. Load a program into the controller.
    c. Confirm settings and proper tooling.
    d. Successfully run a program

Standard 7

Students will learn basic ways to join wooden boards together

Objective 1 Identify the following joints:

1. Butt Joint (including reinforced)
2. Dado Joint
3. Rabbet Joint

Objective 2 Understand the elements necessary for a strong glue joint.

1. Flat, smooth surfaces
2. Appropriate pressure
3. Appropriate type and amount of glue
4. Proper set and cure time

Objective 3 Understand the difference between working time, setting, and curing.

Objective 4 Identify common adhesives used in woodworking and their applications:

1. PVA Glue (wood glue)
2. Cyanoacrylate (CA glue)
3. Epoxy

Objective 5 Identify common fasteners used to join wood together and their applications.

1. Nails
2. Screws

Performance Skills

1. Students can join two or more boards together using each of the joints listed:
   a. Butt (including reinforced)
   b. Dado
2. Rabbet
3. Students can join two or more boards together using the correct type of glue for the application. The glue line should be as invisible as possible.
4. Students can use fasteners listed:
   a. Nails
   b. Screws

Standard 8

Students will learn how to prepare for and apply a wood finish.

Objective 1 Understand what sandpaper grit numbering means: higher number = finer finish

Objective 2 Understand the difference between a film finish and a penetrating finish.

Objective 3 Understand the difference between drying and curing.

Performance Skills

1. Students can properly prepare a surface for a finish.
2. Students can properly apply a film finish or penetrating finish.

Common Tools List

Measuring & Marking Tools	Clamps	Bits and Drivers	Hand Tools	Power Tools	Machines
Tape Measure Calipers Combination Square Framing Square Tri-Square Scratch Awl Center Punch	Bar Clamp Handscrew Clamp C Clamp Spring Clamp Countersink	Phillips Driver Flathead Driver Square Driver Star Driver (Torx) Forstner Bit Twist Bit Mallet Hole Saw	Hand Saw Claw Hammer Dead Blow Rubber Mallet Chisel Glue Scraper Nail Set Screwdriver Spoke Shave Wood File Wood Rasp Hand Plane Cabinet Scraper Pocket Hole Jig	Router Drill Driver Random Orbit Sander Finish Sander Brad Nail Gun Pin Nail Gun Staple Gun Jig Saw Oscillating Tool Belt Sander Biscuit Joiner Finish Sprayer	Upcut Saw Jointer Surface Planer Wide Belt Sander Table Saw Miter Saw Band Saw Panel Saw Horizontal Belt Sander Spindle Sander Drill Press CNC Router Shaper Disc Sander Lathe Mortiser Router Table CNC Laser Edge Bander

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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 standards and 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.

Student's Name: _____

Class: _____

Performance standards rating scale

0	Limited skills	2	→	4	Moderate skills	6	→	8	High skills	10

- Complete a woodworking project that demonstrates the use of woodworking tools, machinery, basic joinery, adhesive, and finishing techniques.
- Use a CNC machine to apply a simple design to a wood surface.
- Demonstrate practice of the Technology & Engineering Professional Workplace Skills.
- Participate in a significant activity that provides each student with an opportunity to render service to others, employ leadership skills, or demonstrate skills they have learned through this course, preferably through participation in a Career & Technical Student Organization (CTSO) such as SkillsUSA.

Performance standard average score:

Evaluator Name: _____

Evaluator Title: _____

Evaluator Signature: _____

Date: _____