



SkillsUSA Championships Technical Standards

## PURPOSE

To evaluate each competitor's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of residential and commercial carpentry.

First, download and review the General Regulations at: <http://updates.skillsusa.org>.

## ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with carpentry as an occupational objective.

## CLOTHING REQUIREMENTS

### **Class C: Competition Specific — Manufacturing/Construction Khaki Attire**

- Official SkillsUSA khaki short-sleeve work shirt
- Khaki pants
- Black, brown, or tan work shoes

*Note:* Safety glasses must have side shields or goggles. (Prescription glasses may be used only if they are equipped with side shields. If not, they must be covered with goggles.)

These regulations refer to clothing items that are pictured and described at [www.skillsusastore.org](http://www.skillsusastore.org). If you have questions about clothing or other logo items, call 1-888-501-2183.

*Note:* Competitors must wear their official competition clothing to the competition orientation meeting.

## SAFETY REQUIREMENT

Both the instructor and the competitor certify that by registering for this competition that the competitor has received instructions and has satisfactorily passed an examination on the safe use of a portable power saw. They also certify that the competitor's saw has been thoroughly inspected and is in safe working condition. Further, both the instructor and the competitor agree that SkillsUSA Inc., the SkillsUSA Championships technical committee and national judges are released from all responsibility and liability relating to personal injuries resulting from its use. Competitors will be removed from competition if proper training has not been provided and/or they are using the equipment in an unsafe manner.

## EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
  - a. Prefabricated sawhorses
  - b. All lumber and materials, as specified on the job sheet
  - c. Job sheets and blueprints for each competitor and judge
  - d. All necessary information and furnishings for judges and technical committee
  - e. Hard hat
  - f. Safety glasses
2. Supplied by the competitor:
  - a. Cut-resistant Level 3 gloves
  - b. One 8 pt. crosscut saw (10 pt. or 12 pt. optional)
  - c. Claw hammer
  - d. One set chisels ( $\frac{1}{4}$ " to 1")
  - e. Framing square
  - f. 16' or longer steel tape measure
  - g. Utility knife with standard blades
  - h. Two pencils
  - i. One each — 1 and 2 pt. Phillips and 4" and 8" standard screwdrivers or one multi-tip with equivalent tip
  - j. Wrecking bar or gooseneck pinch bar
  - k. Coping saw and extra blade
  - l. Cat's paw (nail puller)
  - m. Chalk box and line
  - n. One nail set
  - o. Straight aviation snip or any metal-cutting snips
  - p. 24" or 30" spirit level
  - q. Combination wood rasp and file (8")
  - r. Carpenter's tool and nail pouch with belt and/or suspenders
  - s. Stair gauges
  - t. Combination square and/or speed square
  - u. 25' power cord (UL approved grounded)
  - v. Calculator
  - w. Power circular saw with new carbide-tipped blade
  - x. Drywall saw
  - y. Portable toolbox not to exceed 4.0 cubic feet of storage capacity.

3. All competitors must create a one-page resume. See “Resume Requirement” below for guidelines.

## **RESUME REQUIREMENT**

Competitors must create a one-page resume to submit online. SkillsUSA national competitors should submit their resume by the deadline published on the competition updates page of our website. The deadline and link for resume submission will be published on <http://updates.skillsusa.org>. Failure to submit a resume will result in a 10-point penalty.

**Your resume must be saved as a PDF file type using file name format of “Last Name\_First Name.”** For example, “Amanda Smith” would save her resume as **Smith\_Amanda**. If you need assistance with saving your file as a PDF, visit [the Adobe website](#) for more information.

**Note:** Check the Competition Guidelines and/or the updates page on the SkillsUSA website at <http://updates.skillsusa.org>.

## **PROHIBITED DEVICES**

Cellphones, electronic watches and/or other electronic devices not approved by a competition’s national technical committee are **NOT** allowed in the competition area. Please follow the guidelines in each technical standard for approved exceptions. Technical committee members may also approve exceptions onsite during the SkillsUSA Championships if deemed appropriate.

### **Penalties for Prohibited Devices**

If a competitor’s electronic device makes noise or if the competitor is seen using it at any time during the competition, an official report will be documented for review by the Director of the SkillsUSA Championships. If confirmed that the competitor used the device in a manner which compromised the integrity of the competition, the competitor’s scores may be removed.

## **SCOPE OF THE COMPETITION**

### **KNOWLEDGE PERFORMANCE**

The competition will include a written test that assesses knowledge of carpentry including, but not limited to, building materials, foundations and forms, rough framing, roof framing, exterior finish, interior finish, stairs, lumber, and tools.

### **SKILL PERFORMANCE**

The competition will assess accuracy, workmanship, the ability to read and interpret blueprints, and the proper use of tools and equipment. Competitors may be required to frame walls using wood and/or steel studs; cut and install common, hip and jack rafters; and install drywall, siding, sheathing, baseboard moldings and window trim.

## **COMPETITION GUIDELINES**

1. Time limit: Competitors will be stopped when time limits, as specified on the competition job sheet, are up; however, competitors may stop whenever they have completed a particular phase of the competition.
2. The dismantling of the project will be considered the final sequence or task of this competition.

*Note:* If desired, a competitor may choose to use a standard hand saw without penalties.

## **STANDARDS AND COMPETENCIES**

### **C 1.0 — Read blueprints and specifications by interpreting dimensions and specifications, as well as door, window and finish schedules while understanding common blueprint abbreviations and symbols**

- 1.1. Interpret and determine dimensions from multiple view drawings and build the project from plans, elevations, sections and details
- 1.2. Interpret specifications and drawing notes by verbally demonstrating how specifications are used
- 1.3. Identify plot plan information such as reference points and benchmarks by locating the reference point; using Pythagorean theorem, a level and square, the participant can lay out building as drawn on the plot plan
- 1.4. Interpret oral and written changes, and incorporate modifications into existing plans
- 1.5. Understand common abbreviations and symbols, and verbally describe all common blueprint abbreviations and symbols on competition blueprints
- 1.6. Interpret door, window and finish schedules by describing location, quantity and type of materials

### **C 2.0 — Organize building site/materials in a safe and sequential manner while using builder's level and transit properly**

- 2.1. Use builder's level and transit properly for layout and elevation
- 2.2. Identify, receive and inspect materials and ensure all required materials are in place prior to start of competition by using material lists supplied
- 2.3. Store lumber and other materials properly by type and use in a safe and sequential manner

### **C 3.0 — Build foundations and forms including the construction and alignment of footing forms, wall and wall forms, and column and pier forms**

- 3.1. Construct and align various footing forms to include keyways, bulkheads, dowels and anchorages, as per plans
- 3.2. Construct and align foundation wall and wall forms to include pilasters and beam pockets
- 3.3. Construct and align column and pier forms
- 3.4. Maintain form materials properly

### **C 4.0 — Construct rough framing by identifying and selecting framing members, and installing frame components while meeting OSHA standards**

- 4.1. Identify framing members and select materials for project
- 4.2. Frame and install sill plate, girders, floor joists and bridging

- 4.3. Frame floor
- 4.4. Install subfloor
- 4.5. Build or erect safe scaffolding to meet OSHA standards
- 4.6. Frame and brace walls to include corners, openings, trimmers, cripples, partitions, plumbing partitions, fixture backing and sheathing
- 4.7. Frame stair stringer and other components

**C 5.0 — Construct roof framing by determining rafter lengths, making calculations, laying out a plan, framing and installing roof sheathing**

- 5.1. Identify types and components of roof construction and verbally describe all typical components of roof construction identified on the competition project blueprint
- 5.2. Determine rafter lengths from a rafter scale
- 5.3. Calculate and use the rise and run of a common roof
- 5.4. Lay out a common roof plan
- 5.5. Lay out, cut and install common rafters, ridge board, collar ties, gambrel rafters, valley rafters, valley jack rafters, tail rafters, hip rafters, hip jack rafters and cripple jack rafters
- 5.6. Frame roof openings, dormers and saddles
- 5.7. Lay out, cut and install roof trusses (purling)
- 5.8. Install roof sheathing

**C 6.0 — Construct exterior finish by installing frames, corner boards, moldings, cornices, siding and shingles as per industry standards**

- 6.1. Install window and doorframes as per competition project blueprint and manufacturer's standards
- 6.2. Measure, cut and install trim for window and door frames
- 6.3. Install corner boards, moldings or metal/vinyl corners within  $\frac{1}{8}$ "
- 6.4. Install wood, bevel, sheet and lap siding and aluminum or vinyl siding as per competition project blueprint and manufacturer's recommendations
- 6.5. Install wood shingles and miter corners as per industry standards
- 6.6. Install exterior finish rake, open cornice and box cornice as per competition project blueprint

**C 7.0 — Construct interior finish while measuring and cutting materials, fitting and hanging doors and trim, constructing closets and installing crown moldings**

- 7.1. Measure, cut and install gypsum board to meet blueprint specs and industry standards
- 7.2. Cut and install paneling while trimming to fit in prescribed locations
- 7.3. Fit and hang doors and trim to include swinging, sliding, folding and pocket doors to industry and manufacturers' standards
- 7.4. Construct closets and built-in units and install accessories as per competition blueprint specs and manufacturers' recommendations
- 7.5. Cut and install crown molding or other moldings within  $\frac{1}{16}$ "

**C 8.0 — Build stairs by laying out stringer and stringer sets, calculating rise, run and tread cutting and installing stair treads and stair skirts**

- 8.1. Lay out a straight run stringer and a two-flight stringer set with landing using a carpenter square
- 8.2. Calculate rise, run and tread width within  $\frac{1}{16}$ "

8.3. Cut and install stair treads and stair skirt within a  $\frac{1}{8}$ " variable

**C 9.0 — Identify lumber by writing a requisition for ordering lumber**

- 9.1. Match letters designating uses in plywood or composition board to their current application
- 9.2. Match at least two examples each of common hardwoods and softwoods to their uses
- 9.3. Identify types of trim and moldings, and describe use
- 9.4. Identify common defects in lumber
- 9.5. Write a requisition for ordering lumber based on a given material list
- 9.6. Calculate board feet using the standard formula (no. of pieces x thickness in inches x width in inches x length in feet  $\div$  12 = board feet)

**C 10.0 — Using and maintaining tools safely per manufacturers' recommendations**

- 10.1. Inspect and properly use hand tools as per manufacturers' recommendations. Hand tools from the following list: sliding T-bevel, tape measure, combination square/speed square coping saw, keyhole saw, folding rule, hammer, punch, hand saw, nail set, wood chisel, carpenter's level and framing square
- 10.2. Inspect and properly operate power tools as per manufacturers' recommendations. Power tools from the following list: reciprocating (jig saw), miter saw, hand drill, belt sander, circular saw, sabre saw, table saw, finish sander and hand router

**C 11.0 — SkillsUSA Framework**

The SkillsUSA Framework is used to pinpoint the Essential Elements found in Personal Skills, Workplace Skills and Technical Skills Grounded in Academics. Students will be expected to display or explain how they used some of these Essential Elements. Please reference the graphic, as you may be scored on specific elements applied to your project. For more, visit: [www.skillsusa.org/who-we-are/skillsusa-framework/](http://www.skillsusa.org/who-we-are/skillsusa-framework/).



**COMMITTEE IDENTIFIED ACADEMIC SKILLS**

The technical committee has identified that the following academic skills are embedded in this competition.

**Math Skills**

- Use fractions to solve practical problems
- Use proportions and ratios to solve practical problems
- Measure angles
- Find surface area and perimeter of two-dimensional objects
- Apply transformations (rotate or turn, reflect or flip, translate or slide, and dilate or scale) to geometric figures
- Construct three-dimensional models
- Apply Pythagorean Theorem
- Make comparisons, predictions and inferences using graphs and charts
- Find slope of a line

- Solve practical problems involving complementary, supplementary and congruent angles
- Solve problems involving symmetry and transformation

### **Science Skills**

- Use knowledge of work, force, mechanical advantage, efficiency and power
- Use knowledge of simple machines, compound machines, powered vehicles, rockets and restraining devices

### **Language Arts Skills**

- Provide information in conversations and in group discussions
- Provide information in oral presentations
- Demonstrate use of such nonverbal communication skills as eye contact, posture and gestures using interviewing techniques to gain information
- Demonstrate comprehension of a variety of informational texts
- Use text structures to aid comprehension
- Identify words and phrases that signal an author's organizational pattern to aid comprehension
- Understand source, viewpoint, and purpose of texts

## **CONNECTIONS TO NATIONAL STANDARDS**

State-level academic curriculum specialists identified the following connections to national academic standards.

### **Math Standards**

- Numbers and operations
- Geometry
- Measurement
- Data analysis and probability
- Problem solving
- Communication
- Connections
- Representation

*Source: NCTM Principles and Standards for School Mathematics. For more information, visit: [www.nctm.org](http://www.nctm.org).*

### **Science Standards**

- Understands the structure and function of cells and organisms
- Understands relationships among organisms and their physical environment
- Understands the sources and properties of energy
- Understands forces and motion
- Understands the nature of scientific inquiry

*Source: McREL compendium of national science standards. To view and search the compendium, visit: <http://www2.mcrel.org/compendium/>.*

## **Language Arts Standards**

- Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.
- Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

*Source: IRA/NCTE Standards for the English Language Arts. To view the standards, visit: [www.ncte.org/standards](http://www.ncte.org/standards).*