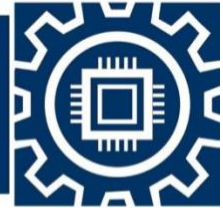




## TEAM ENGINEERING CHALLENGE



SkillsUSA Championships Technical Standards

### PURPOSE

This competition is designed to evaluate and recognize outstanding students for excellence and professionalism in the areas of creative and critical thinking skills and the decision-making process used to solve a problem. The competition is intended to foster creativity, innovation, teamwork, and problem-solving skills.

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

### ELIGIBILITY (TEAM OF THREE)

This competition is open to active SkillsUSA members enrolled in a middle school chapter (grades 6-8). A team consists of three students from the same local chapter. Teams must qualify from their local state conference.

### CLOTHING REQUIREMENT

To assist in keeping costs manageable, two competition attire options shall be offered.

#### OPTION 1

##### **Class E: Competition Specific — Business Casual**

- Official SkillsUSA white polo shirt
- Black dress slacks or black dress skirt (knee-length minimum)
- Black closed-toe dress shoes

#### OPTION 2

##### **Class A: SkillsUSA Official Attire**

- Official SkillsUSA red blazer or official SkillsUSA red jacket
- Button-up, collared, white dress shirt (accompanied by a plain, solid black tie or SkillsUSA black tie), white shirt (collarless or small-collared) or white turtleneck, with any collar not to extend into the lapel area of the blazer, sweater, windbreaker or jacket

- Black dress slacks or black dress skirt (knee-length at minimum)
- Black closed-toe dress shoes

**Note:** The official SkillsUSA windbreaker, sweater and black Carhartt jacket are no longer available for purchase in the SkillsUSA Store. However, these clothing items are grandfathered in as previous official SkillsUSA clothing and can be worn in SkillsUSA competitions as directed in this document.

**Note:** Wearing socks or hose is no longer required. If worn, socks must be black dress socks and hose must be either black or skin-tone and seamless/nonpattern.

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 Note:** Closed-toe shoes must be worn for safety purposes during the competition.

## EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
  - a. All tools, materials, and supplies necessary to solve the competition problem (except those items listed under number two below). Such items may include hack saw, glue guns, and electric drill.
  - b. All necessary information and furnishings for judges and technical committee
2. Supplied by the competitors:
  - a. Drawing equipment (team's choice, e.g., ruler, straightedge, T-square, triangle, scale, pencils, pens, compass, etc.)
  - b. Safety glasses
  - c. Calculator
  - d. Scissors
  - e. Exacto knife or equivalent (1.5" max blade exposed)
  - f. Coloring/writing utensils (markers, crayons, colored pencils, etc.)
  - g. Tape, glue, paper, staples, paper clips, etc.
  - h. Students are not allowed materials that will "add" to their prototype.
  - i. Paint is not allowed.
  - j. Teams are not allowed to bring their own saws, glue guns or drills; these will be provided by the competition committee.
  - k. Other tools as listed on the competition update page of the national website

## **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.

## **COMPETITION PROCEDURES**

1. Competitors will be identified by number only.
2. The technical committee will provide each team with the problem and the competition supplies at the time of the competition orientation.
3. Each team's "solution" will be constructed on site.
  - a. Construction is only allowed in the competition area and during the competition times as presented in the pre-competition briefing.
4. Competition judges will interview each team as a part of the competition.
  - a. Team interview timeslots will be available during the pre-competition briefing.

## **SCOPE OF THE COMPETITION**

### **SKILL PERFORMANCE**

The demonstration is a presentation of an occupational skill accompanied by a clear explanation of the topic using examples, experiments, displays and practical testing operations.

### **COMPETITION GUIDELINES**

The Team Engineering Challenge competition will allow SkillsUSA members to demonstrate their ability to work together to solve a problem.

1. The challenge will be selected from an area such as, but not limited to:
  - a. Transportation
  - b. Communications
  - c. Construction
  - d. Manufacturing
  - e. Biotechnology
  - f. Engineering
2. The competitor's advisor/instructor must attend the mandatory orientation meeting with the competitors.
3. Competitors will not take the skills-related written or SkillsUSA Professional Development Test as outlined in the general regulations.

4. Tie Breaker — Tie will be broken by reviewing the highest score from the team rubrics. If tie is not broken from option a., then option b. and c. will be looked at in order.
  - a. “Solution: Performance”
  - b. “Interview: Presentation”

## **STANDARDS AND COMPETENCIES**

### **TEC 1.0 — Perform effectively as team members**

- 1.1. Demonstrate group problem-solving techniques
- 1.2. Demonstrate team proficiency in construction of a building project
- 1.3. Perform additional teamwork competencies as determined by the technical committee

### **TEC 2.0 — Wear appropriate clothing for the national competition**

- 2.1. Display clothing that meets national standards for competition
- 2.2. Demonstrate good grooming in dress and personal hygiene

### **TEC 3.0 – Integrate knowledge of basic engineering principles into technical writing and presentations following the guidelines the competition technical committee has established**

- 3.1. Apply engineering knowledge in the areas of force, work, rate, resistance, energy, power, force transformers, momentum, waves and vibrations, energy converters, transducers, radiation, optical systems

### **TEC 4.0 — Transform existing systems into conceptual models**

- 4.1. Transform conceptual models into determinable models
- 4.2. Use determinable models to obtain system specifications
- 4.3. Select optimum specifications and create physical models
- 4.4. Apply the results from physical models to create real target systems
- 4.5. Critically review real target systems and personal performance
- 4.6. Design effective and usable IT-based solutions and integrate them into the user environment
- 4.7. Assist in the creation of an effective project plan
- 4.8. Identify and evaluate current and emerging technologies and assess their applicability to address the users’ needs

### **TEC 5.0 — Showcase knowledge of project planning**

- 5.1. Apply brainstorming techniques
- 5.2. Implement benchmarking
- 5.3. Discuss continuous improvement
- 5.4. Explain cause and effect relationships
- 5.5. Apply knowledge of customer satisfaction
- 5.6. Demonstrate how to collect data
- 5.7. Apply decision-making skills
- 5.8. Define and describe a process
- 5.9. Empower team members
- 5.10. Recognize methods of idea generation
- 5.11. Prioritize tasks
- 5.12. Reach consensus amongst the team

- 5.13. Display teamwork during the competition
  - 5.13.1. Have equal team participation
  - 5.13.2. Show positive group dynamics
  - 5.13.3. Define team roles

### **TEC 6.0 — 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**

None identified

#### **Science Skills**

None identified

#### **Language Arts Skills**

- Provide information in oral presentations
- Demonstrate use of verbal communication skills: choice, pitch, feeling, tone and voice
- Demonstrate use of nonverbal communication skills: eye contact, posture and gestures using interviewing techniques to gain information
- Identify words and phrases that signal an author’s organizational pattern to aid comprehension
- Organize and synthesize information for use in written and oral presentations
- Demonstrate knowledge of appropriate reference materials
- Demonstrate understanding of skill

### **CONNECTIONS TO NATIONAL STANDARDS**

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

#### **Math Standards**

None identified

#### **Science Standards**

None identified

### **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 employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes
- Students use spoken, written and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion and the exchange of information)

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