



# Principles of Engineering State Contest Information

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Updated 4/11/24 by Renee Reed [renee.reed@careertech.ok.gov](mailto:renee.reed@careertech.ok.gov)

***NOTE: New Location***

Students must report to the Chairman at the Contest area in Cox Convention Center Ballroom A at 9:00 a.m. on **Monday, April 22**.

## **RULES and REGULATIONS**

The SkillsUSA (PDP) test will be taken on-line **March 13-April 9th**. All testing must be completed through schools testing center as a proctored test. No provisions are being made for make-up testing on-site.

Please refer to the SkillsUSA Championships Technical Standards for guidelines.

**Contestant Resume** All contestants will be required to submit a one page, typed resume. If any contestant does not submit a resume to the contest chair, penalty points will be assessed.

**Clothing Requirements** Each member of the team will be evaluated at the beginning of the contest for official SkillsUSA dress. According to the SkillsUSA Championships Technical Standards - clothing requirements for the Principles of Engineering contest are:

**For men:** Official blazer, jacket or sweater; black dress slacks; white dress shirt; plain black tie with no pattern or SkillsUSA black tie; black socks and black shoes.

**For women:** Official blazer, jacket or sweater; black dress slacks or knee-length skirt with businesslike white, collarless blouse or white blouse with small, plain collar that may not extend onto the lapels of the blazer, and black dress shoes.

**Awards Ceremony** Contest winners will be recognized at the General Session on **Tuesday, April 23**, at 9:00 a.m. in the Tulsa Convention Center Grand Hall. Official SkillsUSA clothing requirements are as follows: "*For men:* SkillsUSA official attire: Official red blazer or jacket, black dress slacks, white dress shirt, plain black tie with no pattern or SkillsUSA tie, black socks and black shoes. *For women:* Official red blazer or jacket, black dress slacks or skirt (knee length), with businesslike white, collarless blouse or white blouse with small, plain collar that may not extend onto the lapels of the blazer, black sheer or skin-tone hose and black shoes."

Should additional information be needed, please call Renee Reed at 405-743-5400 or email at [renee.reed@careertech.ok.gov](mailto:renee.reed@careertech.ok.gov)

### **Equipment and Materials**

1. Supplied by the technical committee:
  - a. Timekeeper
  - b. 8'x12' space, one table, and access to power
2. Supplied by the competitor:
  - a. Competitors are required to bring five (5) copies of the discussion paper to the orientation meeting.
  - b. All materials and equipment required for the demonstration
  - c. If electricity is required, competitor must have a 20-foot heavy-duty extension cord.
  - d. All competitors must create a one-page resume. See "Resume Requirement" below for guidelines.

### **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.

### **KNOWLEDGE PERFORMANCE**

There is no written knowledge test for this competition. Instead, a paper will be prepared and presented. Competitors are required to take the SkillsUSA Professional Development Test.

### **SKILL PERFORMANCE**

The competition includes a technical demonstration where the knowledge, underlying theories, and applications of the chosen concept or principle in action and application will be demonstrated.

### **COMPETITION GUIDELINES**

1. Present a technical demonstration of a chosen principle of engineering or technology. Demonstrate the principle in theory and/or application and leave the judges with a clear comprehension of the subject unit or sub-unit from principles of engineering or technology.
2. Answer questions and discuss the application of the chosen principle with the judges.
3. Any technical concept may be demonstrated, provided it is related to physics, can be referenced to the course curriculum, and incorporates basic principles of applied physics. If any hazardous or caustic materials are used, competitors must bring the associated Material Safety Data Sheet(s) (MSDS) to the competitor meeting and present three (3) copies along with the three (3) copies of the discussion paper for committee review.

4. The recitation of curriculum experiments is not, in and unto itself, sufficient to meet the requirements of the competition. Thorough research and in-depth treatment of the subject matter will be required to comply with the requirements of the competition. Imagination and innovation will be expected by the judges.

5. Any visual aids (signs, charts, transparencies, slides, diagrams) are to be prepared by the competitors. Professionally prepared visual materials are not permitted. No sound device of any kind may be used to transmit or amplify audible words unless they are integral to the technical demonstration itself. No compressed air, gas, or flammable liquid may be used.

6. The competitor will use his or her competitor number only and will not mention his or her school, city, or state.

7. The Principles of Engineering-Technology competition is an individual performance event. However, others can assist in the set up and/or tear down of the demonstration. Only students can be used as models or props in the demonstration.

8. Discussion paper — The competitor will prepare and present to the competition chair three (3) copies of a discussion paper in accordance with the following requirements.

a. The discussion paper shall include subjects (such as background, history, development, explanation of the theory, applications, examples, methods of demonstration or benefits) to be addressed to the extent appropriate to present a clear explanation and demonstrate the competitor's understanding of the subject.

b. The discussion paper must be typed, one-and-a-half- or double-spaced in 10- or 12- point type, must have 1-inch margins on all sides, and must be four to eight pages long. Each page (except the cover) is to have a one-up page number at the bottom of the page. The cover page will not be counted in the page count; however, all tables, graphs, Principles of Engineering-Technology, 2023-24 • 4 pictures, and illustrations will be counted and must not take up most of the page(s). There should not be more graphics than discussion of the concept/principle.

c. A cover page is required and must include the following: "(current year) Principles of Engineering-Technology Competition," and title of the technical demonstration. The competitor must create in the header blanks for the date, time, and competitor number in the upper right-hand corner. The competitor number shall be placed in the header in the upper right-hand corner of each page before handing in the paper.

d. The discussion paper shall conform to the following format:

1). Title — short, descriptive title for the technical demonstration (concept/principle), centered near the top of the page.

2). Introduction — a descriptive introduction to the technical demonstration principle involved, objectives of the demonstration and reason(s) for the choice.

3). Discussion — as a minimum, include a detailed discussion of the following subject areas:

a) The history and background of the principle(s) involved

b) A description of the principle(s) involved, and an explanation of the scientific theories embodied in the principle(s)

c) The technical demonstration to be given: how it will be conducted, what will be shown and how it relates to the subject matter

d) Practical applications of the principle (or principles) involved, including past, present and/or future

e) Provide examples of demonstrations of the principle(s) that are possible or in existence but are not practical for the competition.

f) Cite the particular unit and/or sub-unit in Principles of Engineering or Technology curriculum that is the basis for this technical demonstration.

4). Summary — present a concluding discussion of the principle to be demonstrated, what the demonstration will have achieved, relevance to the practical world and any concluding remarks or conclusions.

e. A bibliography shall be included with the discussion paper to properly credit reference sources. All bibliography and footnote information shall be included at the end of the paper. Use APA or MLA formatting. Page numbers such as “B1” will be used for the bibliography and footnote section but will not be included in the page count.

9. Technical demonstration — The competitor shall prepare and present a technical demonstration to a panel of judges in accordance with the following requirements. The purpose of the technical demonstration is for the competitors to demonstrate thorough knowledge and awareness of the history, underlying theories, descriptive knowledge and applications of the chosen principle in action and application. The competitors shall be prepared to present their demonstrations three (3) times. Exhibition of the competitors’ demonstrations to the general public will be required, but not scored.

a. Competitors will be allowed five (5) minutes to set up the demonstration and five (5) minutes to clear the demonstration area. Penalty: Five points will be deducted for each 30 seconds or fraction thereof over the five-minute setup or clearing times.

b. Each presentation of the technical demonstration to the judges shall be at least 10 minutes in length and shall not exceed 15 minutes in length. Penalty: Five points will be deducted for each 30 seconds or fraction thereof under 10 minutes or over 15 minutes in length. The timekeeper will indicate elapsed time of the demonstration at the 10-, 13- and 15-minute points.

c. Setup time will begin when the competitor indicates readiness to set up by handing to the lead judge a 3"x5" card containing the title of the technical demonstration and the competitor number. The demonstration time will begin when the competitor indicates readiness and will stop when the competitor indicates that the technical demonstration has ended. The tear-down time will be timed from the end of the question-and-answer period until the competitor indicates completion to the lead judge.

d. A question-and-answer period will be allowed at the conclusion of each demonstration to permit the competition judges to query the competitors and further evaluate the competitors’ understanding of the demonstrated principle. Questions by the judges may cover any aspect of a competitor’s chosen principle(s) as presented in the discussion paper or technical demonstration. **This question-and-answer period is not to exceed 10 minutes in length.**