2022-23 EDITION

SkillsUSA CHAMPIONSHIPS

MOBILE ELECTRONICS INSTALLATION

SkillsUSA Championships Technical Standards

PURPOSE

To evaluate each contestant's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of mobile electronics installation.

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

ELIGIBILITY

Open to active SkillsUSA members enrolled in technology programs that include mobile electronics installations as an occupational objective.

CLOTHING REQUIREMENTS

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

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. If you have questions about clothing or other logo items, call 1-888-501-2183.

Note: Contestants must wear their official contest clothing to the contest orientation meeting.

EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
   a. Necessary materials, schematics and equipment required for the contest
2. Supplied by the contestant:
   a. Safety glasses
   b. Laptop computer for written test
   c. Cell phone with hot spot
   d. 6' multiple outlet surge protector
   e. All competitors must create a one-page resume. See "Resume Requirement" below for guidelines. Contestants will also submit a hard copy resume at orientation as part of the competition.

RESUME REQUIREMENT

Competitors must create a one-page resume to submit online. SkillsUSA national competitors should submit their resume by June 1. The link for resume submission will be published on http://updates.skillsusa.org on May 1. 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

Cell phones 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 SkillsUSA Championships director. If confirmed that the competitor used the device in a manner which compromised the integrity of the competition, the competitor's scores may be canceled.

SCOPE OF THE CONTEST

The scope of the contest will be consistent with the industry standards outlined in the competencies for the Mobile Electronics Certified Professional Basic Installation Technician.

KNOWLEDGE PERFORMANCE

The written test is based on the Mobile Electronics Certified Professional Basic Installation Technician exam produced by the Consumer Electronics Association (CEA). See www.mecp.com. Contestants are also required to take the SkillsUSA professional development test.

SKILL PERFORMANCE

The event includes a professional interview and seven hands-on applications that include taking electrical measurements, installing consumer electronic equipment in a mobile environment, soldering, working with relay circuits and troubleshooting electronic circuitry.
Contestants will demonstrate their ability to perform jobs or skills selected from the competencies listed below as determined by the SkillsUSA Championships Mobile Electronics Installation Technical Committee. Skills performance areas include:

1. **Charging and Electrical System Measurements**
   Comprised of one task associated with using standard test instruments to establish a State of Health report for a given vehicle.

2. **Removing and Replacing Head Units**
   Comprised of one task related to removing an existing head unit and replacing it with an OEM upgrade head unit.

3. **Installing Audio Amplifiers**
   Comprised of one task related to physically adding an audio amplifier to an existing mobile audio installation and configuring it for safe usage by the customer.

4. **Using Relays**
   Comprised of one task requiring the contestant to design and configure a relay-based circuit to perform the requested mobile installation related to upgrading consumer electronic systems in a vehicle.

5. **Locating and Diagnosing Open and Short Circuits**
   Comprised of one task related to locating and repairing an open circuit and/or a short circuit condition. Judged on ability to locate, identify and repair all malfunctions; and adherence to safety and ESD procedures.

6. **Electronics Installer Theory Exam**
   Contestants will take an examination covering their knowledge of basic and advanced electrical theory, installation knowledge and techniques, and mobile consumer electronics systems. Questions cover basic 12-volt circuits and devices, mobile consumer electronics systems and subsystems (sound, security, wireless and navigation), and basic mobile

electronics diagnostic and troubleshooting questions. The exam consists of multiple-choice questions and lasts up to three hours

7. Customer Service

Contestants will respond to questions related to providing professional customer service techniques.

8. Personal Interview

A business/industry preliminary interview will be conducted with an industry professional, focusing on the customer service culture.

STANDARDS AND COMPETENCIES

The current MECP Mobile Electronics Installer competency standards are available on the web at: www.mecp.com.

MEI 1.0 — Installing, Diagnosing and Servicing

1.1. Wiring basic automotive alarm system
- 2.1.1. Use test equipment to make specified measurements
- 2.1.2. Follow recommended manufacturer's sequence of installation procedures and troubleshooting practices
- 2.1.3. Identify the scope of the task or problem
- 2.1.4. Identify any defective component

MEI 2.0 — Practical Skills

2.2. Soldering techniques
2.3. Workmanship and assembly techniques
2.4. Final operation of installations tasks
2.5. Ability to locate, identify and/or repair malfunctions
2.6. Safety and ESD procedures

MEI 3.0 — Basic and Advanced Electrical

3.1. Electrical laws and formulas for the mobile electronics environment
3.2. Electrical components
3.3. Basic electrical troubleshooting
3.4. Filters
3.5. Relays, batteries and cable
3.6. Semiconductors
3.7. Automotive, electrical and charging systems
3.8. Troubleshooting

MEI 4.0 — Mobile Electronics Installation Knowledge and Techniques

4.1. Basic installation practices
4.2. Noise troubleshooting
4.3. Battery troubleshooting
4.4. Meters and test equipment

4.5. General installation and equipment
4.6. Shop safety
4.7. Troubleshooting guide

MEI 5.0 — Introduction to Autosound, Security, Wireless and Navigation

5.1. Introduction to audio — autosound basics
5.2. Introduction to security
5.3. Wireless communications: The basics of installation
5.4. Navigation basics
5.5. Satellite radio

MEI 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 above, as you may be scored on specific elements applied to your project. For more, visit: www.skillsusa.org/about/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.
- Simplify numerical expressions.
- Use scientific notation.
- Solve practical problems involving percentages.
- Solve single variable algebraic expressions.
- Make predictions using knowledge of probability.
- Make comparisons, predictions and inferences using graphs and charts.
- Solve problems using proportions, formulas and functions.

Science Skills

- Use knowledge of mechanical, chemical and electrical energy.
- Use knowledge of heat, light and sound energy.
- Use knowledge of sound and technological applications of sound waves.
- Use knowledge of work, force, mechanical advantage, efficiency and power.
- Use knowledge of principles of electricity and magnetism.
- Use knowledge of static electricity, current electricity and circuits.
- Use knowledge of magnetic fields and electromagnets.

Language Arts Skills

- Provide information in conversations and group discussions.
- Demonstrate use of verbal communication skills: word choice, pitch, feeling, tone and voice.
- Demonstrate use of nonverbal communication skills: eye contact, posture and gestures using interviewing techniques to gain information.
- Demonstrate comprehension of a variety of informational texts.
- Identify words and phrases that signal an author's organizational pattern to aid comprehension.
- Demonstrate knowledge of appropriate reference materials.
- Use print, electronic databases and online resources to access information in books and articles.
- Demonstrate informational writing.

CONNECTIONS TO NATIONAL STANDARDS

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

Math Standards

- Numbers and operations
- Algebra
- Geometry
- Measurement
- Problem solving
- Reasoning and proof
- Communication
- Connections
- Representation

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

Science Standards

- Understands the structure and properties of matter.
- 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/browse.asp.*

Language Arts Standards

- Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.
- Students apply a wide range of strategies to comprehend, interpret, evaluate and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics).
- 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 apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language and genre to create, critique and discuss print and nonprint texts.
- 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.
- 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.*