

Welding

Rule years 2024–2027 · Revision 1 · Published October 10, 2026

0. General Rules & Eligibility

Career Development Events are governed by the NAEA CDE Committee. All events follow [CDE General Rules and Eligibility](#).

Qualification for this event

District qualification	Top 5 teams per district
Students per team	4
Grades	9–12 (Roles: SMAW, MIG, OFW, GTAW)
National qualifying event?	No
Timeframe	FFA Convention
Host	SCC Welding Dept.
Event Superintendents	Mark Hawkins, Danny McCulloch

1. Overview

The Nebraska Welding Career Development Event is designed to promote and create an interest in welding by providing opportunities for recognition through evaluation of the contestants' manipulative skills and general knowledge. These skills and knowledge correlate to the students' preparation for employment in the broad field of welding, including agricultural and industrial welding.

AFNR courses that may align to Welding include: Power, Structure, & Technical Systems, Metals & Fabrication, Basic Welding, Advanced Welding, Agriculture Mechanics, and others.

Objectives

Contestants will demonstrate their ability to perform jobs and skills that are reflective of those required in the welding industry. The contest will consist of a hands-on component and a general knowledge component. Specific competency areas will include the following:

- Demonstrate an understanding of the need for shop safety and rules governing the use of equipment.
 - Understand the main hazards that are possible in the shop setting.
- Observe proper dress and use of personal protective equipment.
 - Understand and demonstrate proper handling and storage of materials.
 - Students should understand the gases used and how they are safely transported and stored.
- Demonstrate proper machine and tool safety and operation.
 - Assessment of safety and equipment operation on the written test. Students will not be scored but can be disqualified for demonstrating unsafe welding practices.
- The student will use common measurement systems and read blueprints using welding symbols.
 - Students will use a ruler/tape measure to follow the welding blueprint and create the weld.
 - Students will be assessed on correct measurements given on blueprints and performed on their welds.

- Students will be assessed on their ability to interpret the blueprint and apply it to the weld they turn in.
- Using the references below, students will use objectives from the resources.
 - Students will be tested on their knowledge of their assigned welding process (SMAW, MIG, OFW, or GTAW).

Each welder will be tested on each standard or benchmark in their specific area (SMAW, MIG, OFW, GTAW). These standards will also be assessed through their weld demonstration.

- Demonstrate their individual welding process. The four processes, which are the competency areas for contestants, are:
 - **SMAW** (Shielded Metal Arc Welding, also called stick or arc welding): an arc welding process that uses a consumable electrode coated in flux; the burning flux shields the weld.
 - **MIG** (Metal Inert Gas welding, also called Gas Metal Arc Welding or GMAW): an arc welding process that feeds a continuous wire electrode through a gun, with a shielding gas protecting the weld.
 - **OFW** (Oxy-Fuel Welding, also called oxy-acetylene or OA welding): a process that melts the base metal with an oxygen and acetylene flame, usually adding a filler rod by hand; no electric arc is used.
 - **GTAW** (Gas Tungsten Arc Welding, also called TIG welding): an arc welding process that uses a non-consumable tungsten electrode and an inert shielding gas (argon), with filler rod added separately by hand.
- Demonstrate welds on mild steel
- Be able to use a variety of filler metals
- Students should be able to weld the following positions and joints: Contestants will weld in the flat (1G and 1F), horizontal (2G and 2F), and vertical (3G and 3F) positions.
- Students should be able to perform the following possible joint configurations: square butt or prepared groove, lap and T fillet, and pipe-to-plate or pipe-to-pipe joints.
- Students should be able to use a variety of welding equipment/machines: Welding equipment may be obtained from various sources and may include a transformer, transformer/rectifier, and/or inverters.

2. Eligibility & Team

Open to students in Grades 9–12 (Roles: SMAW, MIG, OFW, GTAW). Teams are 4 students. Top 5 teams per district advance. This event is not national-qualifying.

Schools can qualify a team through their district contest, but welders who qualify for the district team do not need to be the same welders on the state team. If a school qualifies more than one team, their second team falls out of the top 5, and the 6th team moves up. Students previously on a state champion team may participate again by competing in a different welding area.

Students are pre-registered to compete in **one** of four welding processes: SMAW, MIG, OFW, or GTAW. Students compete individually and receive awards within that welding process area. The team score combines all four individual scores.

3. What to Bring

Attire

- **ZERO TOLERANCE POLICY:** Students who **do not** have all their own required welding and safety equipment **will not be allowed** to participate in any part of the welding event.
- Contestants who **do not** wear safety glasses **will not participate** in the lab part of the welding event.

- All PPE (Personal Protective Equipment):
 - Safety glasses (approved ANSI Z87 with side shields). Safety glasses must be worn at all times in the welding lab (including under the welding helmet).
 - Welding helmet/face shield/goggles with appropriate #5 - #7 filter lenses for the OFW processes
 - Welding helmet with appropriate #10 - #12 filter lenses for the SMAW, MIG, and GTAW processes
 - Leather gloves
 - Appropriate leather or fire-retardant cloth welding jacket with full-length sleeves. **No Exceptions.** Only fire-resistant rated jackets (no coveralls) are permitted.
 - High-top leather shoes or boots. (No tennis shoes or sport shoes)
 - Full-length cotton jeans with no holes or frays.

Supplies

ZERO TOLERANCE POLICY: Students without their own required supplies **will not be able to participate** in the event.

- In addition to PPE, each student must bring the following tools:
 - Tape measure
 - Magnetic Square
 - Soap Stone
 - Combination Square
 - Chipping hammer (SMAW)
 - Wire Brush (SMAW)
 - Metal Pliers

No unauthorized notes, printed material, or tools are permitted - violators may be disqualified.

4. Event Format

Timing

- A. Welding participants will meet in rooms at the Welding Technology Center for registration. The building is located on the north side of the SCC-Lincoln campus.
- B. Each division will involve a 30 minute written test and a 30 minute skill test. A 10-minute orientation for each division will also be included, for a total of 70 minutes per event division. Safety will be a big part of the event and will be emphasized at all times.

Format

Overview - Contestants will receive plan sets at the contest site that outline the hands-on portion of the contest. These plan sets will be basic, three-view shop drawings that incorporate welding symbols and procedures. Contestants must interpret the drawings and weld symbols to configure their projects according to the described welding symbols, procedures, and measurements. Projects will be submitted at the end of the prescribed time period for evaluation by the judges.

- A. **Orientation:** (10 minutes)
- B. **Written Examination:** (30-minute time limit)
 - I. An exam will be distributed for SMAW, MIG, OFW, and GTAW.
 1. Questions: 25 questions worth 2 points each

2. Types of questions: True & False and/or Multiple Choice Questions

3. Question areas:

- a. Safety, Equipment
- b. Set Up, and Electrodes/Flames/Wire
- c. Welding Power Sources
- d. Procedures
- e. Terms and Definitions (see resource list by specific area)

C. **Welding Practicum:** (30-minute time limit) Students will participate in one of four welding areas: SMAW, MIG, OFW, or GTAW

I. Shielded Metal Arc Welding (SMAW)

- 1. Weld joints: Butt, Lap, T joint, Inside Corner Joint
- 2. Weld types: Square Groove and Fillet Welds
- 3. Weld positions: Flat, Horizontal, Vertical Down, Vertical Up, around pipe
- 4. Material thickness: 3/16"- 1/4"
- 5. Base metal type: Mild Steel
- 6. Electrodes: Diameters = 3/32" or 1/8", E6010, E6011, E6013, E7014, or E7018
- 7. Power Source: Combination AC- DC

II. Gas Metal Arc Welding (MIG)

- 1. Weld Positions: Flat, Horizontal, and Vertical (down),vertical up,
- 2. Weld joints: Butt, Lap, Inside Corner, and T Joints around pipe or tubing
- 3. Weld types: Groove & Fillet Welds
- 4. Material thickness: 1/8" to 1/4"
- 5. Base Metal Type: Mild Steel
- 6. Shielding gas type: C25

III. Oxy-Fuel Welding (OFW), also known as Oxygen Acetylene Welding

- 1. Weld joints: Butt, Lap, T Joints, Inside Corner Joints, around tubing or pipe
- 2. Weld types: Square Groove and Fillet Welds
- 3. Weld positions: Flat, Horizontal, Vertical Up
- 4. Material thickness: 3/32"- 1/8"
- 5. Base Metal Type: Mild Steel
- 6. Filler Metal:
 - a. Mild Steel Rod (RG-45), 3/32" Diameter
 - b. Coated Braze Welding Rod - 3/32" Diameter

IV. Gas Tungsten Arc Welding (GTAW)

- 1. Weld Positions: Flat, Horizontal, and Vertical (down), vertical up
- 2. Weld joints: Butt, Lap, Inside Corner, and T Joints around pipe or tubing
- 3. Weld types: Groove & Fillet Welds
- 4. Material thickness: 16 gauge or 3/32" or 1/8" or 1/4"
- 5. Base Metal Type: Mild Steel
- 6. Shielding gas type: Argon

5. Scoring & Tiebreakers

Individual Scoring

Component	Detail	Points
Exam (SMAW, MIG, OFW, or GTAW – one process per contestant)	25 Questions × 2 Points	50
Welding Practicum (SMAW, MIG, OFW, or GTAW – one process per contestant)	Scored by rubric (Appendix A: Sample Welding Rubric)	150
Grand total		200

- After a warning, the sponsoring school reserves the right to remove any contestant that violates accepted safety practices that endanger him/her or others in the contest.
- Any observed communications other than with the judges may result in disqualification of the individual or team.

Individual Tiebreakers

Individual tiebreakers are resolved in this order:

- A. Written Test for individual

Team Scoring

Component	Detail	Points
Sum of Individual Scores	4 Students × 200 Points	800
Grand total		800

Team Tiebreakers

Team tiebreakers are resolved in the order listed below.

- A. Highest Practicum scores for team

6. Study Resources

Approved study resources

- [UNL CDE Study Materials Folder \(OneDrive\)](#) — Practice materials and examples for this CDE.
- It's recommended that students use the following materials in preparation for the event:
- [Mig Setup 1](#) — YouTube video by Dan Zabel (Southeast Community College) on MIG welder setup, part 1.
- [Mig Setup 2](#) — YouTube video by Dan Zabel (Southeast Community College) on MIG welder setup, part 2.
- [SMAW Setup](#) — YouTube video by Dan Zabel (Southeast Community College) on SMAW (stick) welding setup.
- [O/A Setup](#) — YouTube video by Dan Zabel (Southeast Community College) on oxy-acetylene (O/A) equipment setup.

- **Primary Resource for Exam: Modern Welding by Althouse, Turnquist, Bowditch, and Bowditch - The Goodheart- Willcox Company, Inc.- Tinley Park, Illinois.** — Shielded Metal Arc Welding (SMAW) (Chapter 5 and 6); Oxy Fuel Welding (OFW) (Chapter 4, 11-16); Gas Metal Arc Welding (GMAW) (Chapter 7-9); Gas Tungsten Arc Welding (GTAW) (Chapter 8); Safety (Chapter 1); Blueprint Reading (Chapter 2 and 3); Project Layout (Chapter 2 and 3)
- [Welding page on the Nebraska CDEs website](#) — Secondary resources for the event, in the CDE resource file.
- See Appendix A: Sample Rubric.

Past Exams

- Past exams are not available for this event.

7. After the Event

Teachers and students can tour the Southeast Community College welding facilities during State Convention by contacting the superintendents. Following the competition, welds may be picked up from 3:00 - 5:00 p.m. the day of the event. Pictures can be taken of welds and welders at this time. Students will be able to pick up welds if the scoring of the welds has been completed. Teachers and students will be able to get copies of the welding plans. No pictures or copies of the test can be taken.

List of Appendices

- [Appendix A: Sample Welding Rubric](#)

Appendix A: Sample Welding Rubric

This rubric is provided as a courtesy to help instructors coach students. Rubrics will not be completed at the state CDE.

DEFECTS	POINTS
Incorrect Start of Bead	-1
Arc Strikes Out of Weld Zone	-2
Incorrect Bead Height or Throat Zone	-4
Continuity of Bead Height	-2
Excessive Penetration	-3
Insufficient Penetration	-3
Flux Inclusion	-10
Porosity (Surface or Internal)	-5
Undercut	-4
General Appearance	-1 to -5
Whiskers or Filler Wire Stubs (MIG, OFW, GTAW)	-5
Incorrect Weld Bead Profile	-10
Cracks	-25
Weldment Dimensions Incorrect	-25
Improper Finish or Bead	-1

Subcommittee

Standing subcommittee for this event

Name	School / Organization	Role
Ashton Bohling	Johnson-Brock	Chair
Mark Hawkins	Southeast Community College	Superintendent
Danny McCulloch	Southeast Community College	Superintendent
Chad Schimmels	Eustis-Farnam	Exec liaison
Juliana Kroeger	Deshler	Member
Colin Kubik	Norris	Member
Keith Nielson	Lexington High School	Member
Alex Stocker	Central City	Member

What changed — 2024–2027 rev 1 EDITORIAL

October 10, 2026

- First version published on CDE Rules Hub.