

## DESE Model Curriculum

GRADE LEVEL/UNIT TITLE: Agricultural Construction (Volume I), Unit I – Arc Welding

Course Code:

### Agricultural Construction Unit I — Arc Welding Instructor Guide

The instructor should explain the performance-based assessment activity format at the beginning of the unit. Students will work toward completing the competencies necessary to perform the activity as they progress through the unit material. The assessment activity will be due at the completion of the unit.

1. Explain the performance-based assessment activity format at the beginning of the unit: At the completion of the unit, students will perform a series of welds, identify welding-related equipment, and answer questions about welding equipment and procedures. Welds will be determined by the instructor and announced at the time of the performance-based assessment activity.
2. Use or adapt the activity sheets found in the unit to assess student competency at welding. Review or supplement these activities as needed, based on student mastery of the procedures and equipment the students will be using. **NOTE: Students should only complete this performance-based activity if they have mastered all the relevant competencies and have the instructor's permission to perform the activity.**
3. Assign the performance-based assessment activity. The student handout can be used as an outline for the activity or adapted as desired.
  - a. Information and directions for the student handout as it is currently written are listed at the end of this instructor guide.
  - b. Section II requires some advance setup by the instructor.
4. This activity will help prepare students for the arc welding portion of the Agricultural Mechanics Career Development Event.
  - a. Refer to the *Missouri CDE Handbook* for guidelines regarding Career Development Events. The *Missouri CDE Handbook* is available from the Missouri Department of Elementary and Secondary Education at [http://www.dese.mo.gov/divcareered/ag\\_cde\\_guidelines.htm](http://www.dese.mo.gov/divcareered/ag_cde_guidelines.htm).
  - b. Information about previous years' agricultural mechanics events can be found at <http://web.missouri.edu/~pavt0689/statecon.html>, accessed January 15, 2012.
5. Have students turn in their welds and completed handouts.
6. The final assessment score will be based on the ability to safely and correctly perform the assigned welding procedures and on the accuracy of responses to the identification and written assessment portions of the activity. All welds must pass destructive testing.
7. **ADDITIONAL ACTIVITIES:**
  - a. Create a display board using the students' best welds. Possible display board themes include the following: each student's best weld, the best example of each type of weld performed by the class, and the best weld of the week.
  - b. Create a display board that identifies different metals and their characteristics. Have students contribute samples.

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### **Section I: Welding**

1. Have students perform a series of welds that they have mastered as part of the instructional activities for this unit.

### **Section II: Identification**

1. Select ten parts of the shielded metal arc welder, gas metal arc welder, or items of related equipment that have been discussed in class.
2. Label the parts or items with tags A through J.
3. Have students identify the parts on their handouts.

### **Section III: Written Assessment**

1. Have students answer questions about arc welding procedures, equipment, or safety. Multiple-choice and short-answer questions are suggested.
2. The answers to the questions (and the questions) on the student handout are listed below.

#### **Answers to Written Assessment:**

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1. To weld a lap joint in flat position with a shielded metal arc welder, which choice reflects the correct work angle and travel angle?  
[b (45-degree work angle and a 25- to 30-degree travel angle)]
2. A bright silver metal that is slightly magnetic and relatively hard to chip is likely to be which of the following?  
[c (Stainless steel)]
3. For gas metal arc welding, the lens should **not** be lighter than number \_\_\_\_\_.  
[d (11)]

### Complete the following short-answer questions.

4. List four ways to avoid exposure to harmful light rays when arc welding. (Each answer is worth 1 point for a maximum value of 4 points.)

*[Students should list four of the following six answers:]*

- a. Always wear a helmet with the proper shade lens.
- b. Always check the helmet and lens for cracks before using.
- c. Wear long sleeves and gauntlet-style gloves.
- d. Do not leave any skin exposed to rays from the welder.
- e. Shout the word “Cover!” to all people standing nearby when ready to strike the arc.
- f. Never look at the arc with an unprotected eye.]

5. List three reasons why metals should be cleaned before being welded. (Each answer is worth 1 point for a maximum value of 3 points.)

*[Students should list three of the following four answers:]*

- a. Impurities cause poor fusion or bending of base metals, reducing their strength.
- b. Foreign material or impurities are poor conductors of electricity.
- c. Foreign material or impurities interfere with control and manipulation of the arc.
- d. Weld appearance is improved when impurities are removed.]