

Example Assessment

Shielded Metal Arc Welding

This is an example classroom assessment created by Illinois educators as part of the Illinois State Board of Education (ISBE) Local Assessment Support (LAS) Project. ISBE encourages educators to modify example assessments to meet the needs of their individual educational context. Please note that the authors have provided suggestions for grade level use, applicable standards, data use, as well as possible accommodations, modifications, or alternative assessments. These suggestions are not inclusive of all possible uses and applications of this assessment.

This assessment serves as a possible example of a classroom assessment and its use is not required.

More information concerning the LAS project may be found here:

www.isbe.net/assessment/htmls/balanced-asmt.htm

Content: Agriculture

Grade Level: Grades 9-12

Purpose

The purpose of this assessment is to provide evidence of student learning that will inform teaching practices and provide meaningful feedback to students. Students will demonstrate their ability to strike and maintain a shielded metal arc weld for three four inch beads.

Standards

- PST.04.04.07.b. Distinguish welding processes, positions, and materials preparation.
- PST.04.04.07.c. Construct and/or repair metal structures and equipment using welding fabrication procedures, including those associated with SMAW, GMAW, GTAW, fuel-oxygen and plasma arc torch methods.

Data Use

This assessment may be used to monitor students progressing ability to complete three four inch shielded metal arc welding beads.

Accommodations, Modifications, and Alternate Assessments

Students may be provided with appropriate timing and scheduling accommodations.

Materials

1. Shielded Metal Arc Welding Activity Sheet
2. Shielded Metal Arc Welding Rubric
3. Guide to Evaluating Welds

Equipment

- Single Process - Constant Current Power Source
- Arc Welder
- Mild Steel Plate 1/8" Thick, Measuring 5 x 7" for Each Student
- 3 E6013 Electrodes for Each Student
- Pliers
- Welding Helmet- Shade #10
- Safety Glasses
- Leather Gloves
- Chipping Hammer
- Wire Brush
- Soapstone and Holder
- Camera, iPad, or Other Electronic Device Capable of Capturing Photographs
- Sample Projects with Varying Levels of Proficiency

Directions

1. Students will strike and maintain an arc to run short beads as identified in the Shielded Metal Arc Welding Activity Sheet.
2. Students will use the Shielded Metal Arc Welding Rubric to engage in self- and peer-evaluation.
3. The teacher will evaluate each student's performance using the Shielded Metal Arc Welding Rubric and provide specific feedback to students concerning how they may improve their performance.

Additional Materials

Shielded Metal Arc Welding Activity Sheet

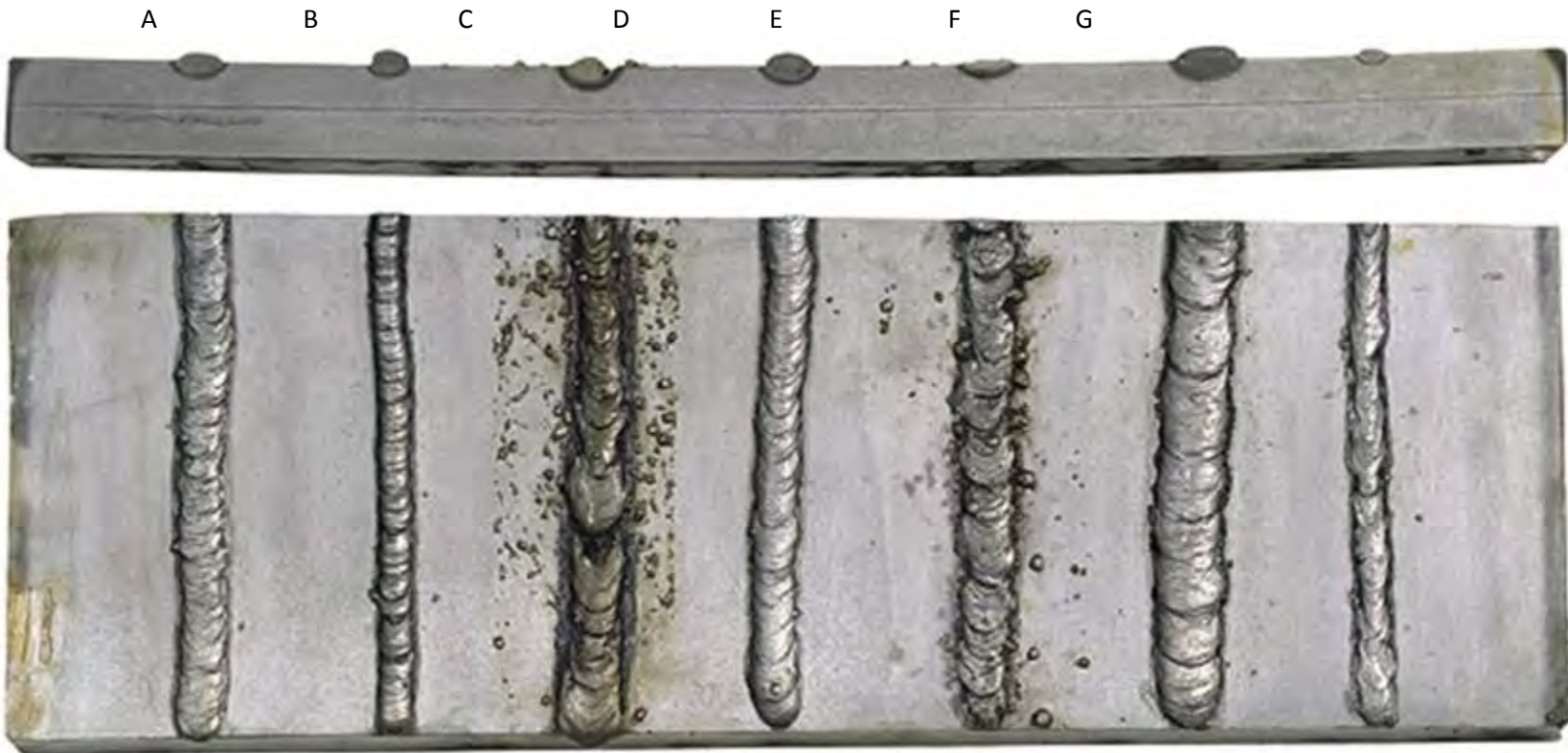
Exercise: Strike and maintain an arc to run quality 3-4" beads.

1. Clean base metal and position flat on the table.
2. Check work connection to table or work piece.
3. Set the polarity and amperage on the welder: AC at 100-135A for 1/8" E6013 electrode.
4. Hold the electrode upright to the base metal, inclined at a 65 to 70 degree angle in the direction of travel.
5. Strike and establish the arc. Maintain a normal arc length, 1/16" to 1/8", and move the electrode across the plate at a uniform rate. A right-handed welder works from left to right.
6. Observe the back of the molten puddle, or crater, as the arc builds up the bead. Allow the arc force to penetrate the base metal and deposit filler metal. Correct speed will be indicated by the proper shape and size of the bead (see Guide to Evaluating Welds).
7. Re-strike the arc and run another bead. Move over the plate, increasing the length of the beads until you are able to develop four beads that are 3-4" in length.
8. Clean the slag off each bead by chipping with the chipping hammer and brush clean with the wire brush. Remember to always chip slag away from you.
9. Visually inspect the bead for shape, penetration, and uniformity.
10. Using soapstone write your name on the front of your metal so it is visible on the side with your beads.
11. Document your Shielded Metal Arc Welding Beads by taking a photo of the beads that can be printed and placed in your student portfolio.

Evaluation:

1. Evaluate Yourself: After you have completed your four beads for evaluation, please use the Shielded Metal Arc Rubric to evaluate your own welds using the Guide to Evaluating Welds, and prior knowledge from our classroom discussions.
2. Evaluate a Peer: Find a peer to evaluate your weld using the Shielded Metal Arc Rubric and Guide to Evaluating Welds.
3. Instructor Evaluation: Once both you and your peer have reviewed your weld, please bring your weld to the course instructor for their evaluation rating along with this packet.

Guide to Evaluating Welds



A: Proper Current, Travel Speed, and Arc Length
B: Current Too Low
C: Current Too High
D: Arc Length Too Short

E: Arc Length Too Long
F: Travel Speed Too Slow
G: Travel Speed Too Fast

Shielded Metal Arc Welding Rubric

Name:

Date:

Quality Indicator	Beginning	Developing	Accomplished
Consistent Travel Speed	Weld is not consistent. There are three or more areas that are uneven.	Weld is mostly consistent with one or two uneven areas.	Weld is consistent throughout the entire length of the bead.
Appropriate Travel Speed	Weld has more than one area of inconsistent speed that is too fast or too slow.	Weld has one area of inconsistent speed that is too fast or too slow.	Weld demonstrates a consistent and accurate speed throughout the entire length of the bead.
Appropriate Arc Length (Spatter)	Spatter is present on 51-100% of the weld.	Spatter is present on 25-50% of the weld.	Spatter is present on less than 25% of the weld.
Appropriate Current (Penetration)	There are no obvious penetration markings on the underside of the base-metal.	There are penetration markings on the underside of the base-metal, but they are not well defined and inconsistent.	There are well-defined and consistent penetration markings on the underside of the base-metal.
Comments:			