

MERIT BADGE SERIES



WELDING



BOY SCOUTS OF AMERICA®

STEM-Based

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WELDING



"Enhancing our youths' competitive edge through merit badges"



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Requirements

1. Do the following:
 - a. Explain to your counselor the hazards you are most likely to encounter while welding, and what you should do to anticipate, help prevent, mitigate, or lessen these hazards.
 - b. Show that you know first aid for, and the prevention of, injuries or illnesses that could occur while welding, including electrical shock, eye injuries, burns, fume inhalation, dizziness, skin irritation, and exposure to hazardous chemicals, including filler metals and welding gases.
2. Do the following:
 - a. With your counselor, discuss general safety precautions and Safety Data Sheets related to welding. Explain the importance of the SDS.
 - b. Describe the appropriate safety gear and clothing that must be worn when welding. Then, present yourself properly dressed for welding—in protective equipment, clothing, and footwear.
 - c. Explain and demonstrate the proper care and storage of welding equipment, tools, and protective clothing and footwear.
3. Explain the terms *welding*, *electrode*, *slag*, and *oxidation*. Describe the welding process, how heat is generated, what kind of filler metal is added (if any), and what protects the molten metal from the atmosphere.
4. Name the different mechanical and thermal cutting methods. Choose one method and describe how to use the process. Discuss one advantage and one limitation of this process.
5. Do the following:
 - a. Select two welding processes, and make a list of the different components of the equipment required for each process. Discuss one advantage and one limitation for each process.

- b. Choose one welding process. Set up the process you have chosen, including gas regulators, work clamps, cables, filler materials, and equipment settings. Have your counselor inspect and approve the area for the welding process you have chosen.
6. After successfully completing requirements 1 through 5, use the equipment you prepared for the welding process in 5b to do the following:
 - a. Using a metal scribe or soapstone, sketch your initial onto a metal plate, and weld a bead on the plate following the pattern of your initial.
 - b. Cover a small plate (approximately 3" x 3" x ¼") with weld beads side by side.
 - c. Tack two plates together in a square groove butt joint.
 - d. Weld the two plates together from 6c on both sides.
 - e. Tack two plates together in a T joint, have your counselor inspect it, then weld a T joint with fillet weld on both sides.
 - f. Tack two plates together in a lap joint, have your counselor inspect it, then weld a lap joint with fillet weld on both sides.
7. Do the following:
 - a. Find out about three career opportunities in the welding industry. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why the profession might interest you.
 - b. Discuss the role of the American Welding Society in the welding profession.



Welding Resources

The resources listed below represent only a fraction of available welding information. Check your local library, bookstores, and the Internet for additional titles, including older or out-of-print books. Most welding techniques are timeless.

Scouting Resources

Drafting, Electronics, Engineering, First Aid, Inventing, Metalwork, Robotics, and Safety merit badge pamphlets

With your parent's permission, visit the Boy Scouts of America's official retail website at www.scoutstuff.org for a complete list of all merit badge pamphlets and other Scouting materials and supplies.

Books

- American National Standards Institute (ANSI) Accredited Standards Committee Z49. *Safety in Welding, Cutting, and Allied Processes*. ANSI Z49.1:2012. American Welding Society, 2012.
- American Welding Society. *Welding Handbook, Vol. 1*, 9th ed. American Welding Society, 2001.
- . *Welding Handbook, Vol. 2*, 9th ed. American Welding Society, 2004.
- . *Welding Handbook, Vol. 3*, 9th ed. American Welding Society, 2007.

Geary, Don, and Rex Miller. *Welding*, 2nd ed. McGraw-Hill, 2011.

Minnick, William H. *Gas Tungsten Arc Welding Handbook*, 5th ed. Goodheart-Willcox Company, 2005.

O'Brien, Robert L. *Jefferson's Welding Encyclopedia*, 18th ed. American Welding Society, 1997.

Organizations and Websites

American Welding Society

Website: www.aws.org

ESAB Education Resources

Website: www.esabna.com/us/en/education/index.cfm

Hobart Institute of Welding Technology

Website: www.welding.org

James F. Lincoln Arc Welding Foundation

Website: www.jflf.org

Lincoln Electric Company

Website: www.lincolnelectric.com

Miller Electric Manufacturing Company

Website: www.millerwelds.com/resources