



Welding

Scouts BSA · Trades

Name

Started

Completed

Welding is the skill of joining metal, and it's used to build everything from bridges to bikes. You will learn the safety rules, how welding works, and try some practice welds yourself. It's hands-on work with real tools, always done with a qualified instructor.

Requirements

Every official requirement, in plain language. Check the official wording when you sign off (scouting.org/merit-badges/welding/). Tips and examples are ideas, not extra requirements.

1 Hazards and first aid

Tips for this section: Learn the hazards, like burns, sparks, and bright light, and how you'd treat a burn.

Example for this section: Explain the main hazards and their first aid: burns from hot metal or sparks (cool the burn with water and get help), eye injury from arc light (cover the eyes and see a doctor), and fumes (get to fresh air).

- ☐ **1a** Explain to your counselor the hazards you're most likely to face while welding and how to anticipate, help prevent, and reduce them

- ☐ **1b** Show you know first aid for and prevention of welding injuries and illnesses, including burns, eye injuries, electrical shock, dizziness, fume inhalation, skin irritation, and exposure to hazardous chemicals such as welding gases and filler metals

2 Safety gear and equipment care

Tips for this section: Try on the protective gear with an instructor and learn how gas and equipment are stored safely.

Example for this section: Put on the full gear with your instructor and explain each piece: the helmet's dark lens, flame-resistant clothing with no frayed edges, leather gloves, and boots. Then describe how gas cylinders are chained upright and stored away from heat.

- ☐ **2a** With your counselor, discuss general welding safety precautions and safety data sheets (SDS), and explain why SDS matter

- ☐ **2b** Describe the safety gear and clothing required for welding, then show up properly dressed in protective equipment, clothing, and footwear

- ☐ **2c** Explain and show how to properly look after and store welding tools, equipment, and protective clothing and footwear

- ☐ **3** Explain what welding, electrode, slag, and oxidation mean. Then describe how welding works: how heat is produced, what filler metal (if any) is added, and what shields the molten metal from the air

Tip: Make flash cards of welding terms and ask your instructor to explain how the process works.

- ☐ **4** Name the mechanical and thermal methods of cutting metal. Describe how to use one of them, plus one advantage and one limitation

Tip: Ask an instructor to show you a few ways to cut metal and explain one in detail.

5 Welding processes and setup

Tips for this section: Watch two welding processes, then set one up yourself with your instructor guiding, and have your counselor check your work area.

Example for this section: Compare two processes, like shielded metal arc (stick) welding and gas metal arc (MIG) welding: the equipment each needs, one advantage, and one limitation. Then set one up yourself, step by step, and have your counselor inspect your welding area.

- ☐ **5a** Pick two welding processes, list the equipment components each needs, and discuss one advantage and one limitation of each

- ☐ **5b** Choose one process and set it up, including the work clamps, gas regulators, filler materials, cables, and machine settings, then have your counselor inspect and approve your welding area

6 Practice welds (after finishing 1-5, using your 5b setup)

Tips for this section: Practice welds only with a qualified instructor and full protective gear. Take your time.

Example for this section: Under your instructor's supervision, sketch your initial on a plate and weld a bead along it, cover a small plate with side-by-side beads, then tack and weld a butt joint, a T joint, and a lap joint. Look at each weld afterward and talk about what to improve.

- ☐ **6a** Use a metal scribe or soapstone to sketch your initial on a metal plate, then weld a bead following it

- ☐ **6b** Cover a small plate (about 3 x 3 x 1/4 inches) with weld beads laid side by side

- ☐ **6c** Tack-weld two plates into a square-groove butt joint

- ☐ **6d** Weld both sides of the joint from 6c

- ☐ **6e** Tack two plates into a T joint and get your counselor's inspection, then fillet weld the T joint on both sides

- ☐ **6f** Tack two plates into a lap joint and get your counselor's inspection, then fillet weld the lap joint on both sides

7 Careers and the profession

Tips for this section: Look up welding careers and the American Welding Society to see what jobs and training are out there.

- ☐ **7a** Learn about three welding careers. Pick one, find out the education, training, and experience it needs, and discuss with your counselor why it might interest you

- ☐ **7b** Discuss what the American Welding Society does for the welding profession