



Metalwork/Blacksmith



Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet.

This Workbook can help you organize your thoughts as you prepare to meet with your merit badge counselor.

You still must satisfy your counselor that you can demonstrate each skill and have learned the information.

You should use the work space provided for each requirement to keep track of which requirements have been completed, and to make notes for discussing the item with your counselor, not for providing full and complete answers.

If a requirement says that you must take an action using words such as "discuss", "show", "tell", "explain", "demonstrate", "identify", etc, that is what you must do.

Merit Badge Counselors may not require the use of this or any similar workbooks.

No one may add or subtract from the official requirements found in Boy Scout Requirements (Pub. 33216 – SKU 637685).

The requirements were last issued or revised in 2008 • This workbook was updated in November 2017.

Scout's Name: _____ Unit: _____

Counselor's Name: _____ Counselor's Phone No.: _____

<http://www.USScouts.Org> • <http://www.MeritBadge.Org>

Please submit errors, omissions, comments or suggestions about this **workbook** to: Workbooks@USScouts.Org

Comments or suggestions for changes to the **requirements** for the **merit badge** should be sent to: Merit.Badge@Scouting.Org

1. **Read the safety rules for metalwork. Discuss how to be safe while working with metal.**

Discuss with your counselor the additional safety rules that apply to the metalwork option you choose for requirement 5.

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2. Define the terms native metal, malleable, metallurgy, alloy, nonferrous, and ferrous.

Native Metal

Malleable,

Metallurgy,

Alloy,

Nonferrous,

Ferrous.

Then do the following:

- a. Name two nonferrous alloys used by pre-Iron Age metalworkers. Name the metals that are combined to form these alloys.

Alloy			Combination of:
		an d	
		an d	

- b. Name three ferrous alloys used by modern metalworkers.

1.	
2.	
3.	

- c. Describe how to work-harden a metal.

- d. Describe how to anneal a non-ferrous and a ferrous metal.

- 3. **Make a temper color index from a flat piece of steel. Using hand tools, make and temper a center punch of medium-carbon or high-carbon steel.**
- 4. **Find out about three career opportunities in metalworking.**

1.	
2.	
3.	

Pick one and find out the education, training, and experience required for this profession.

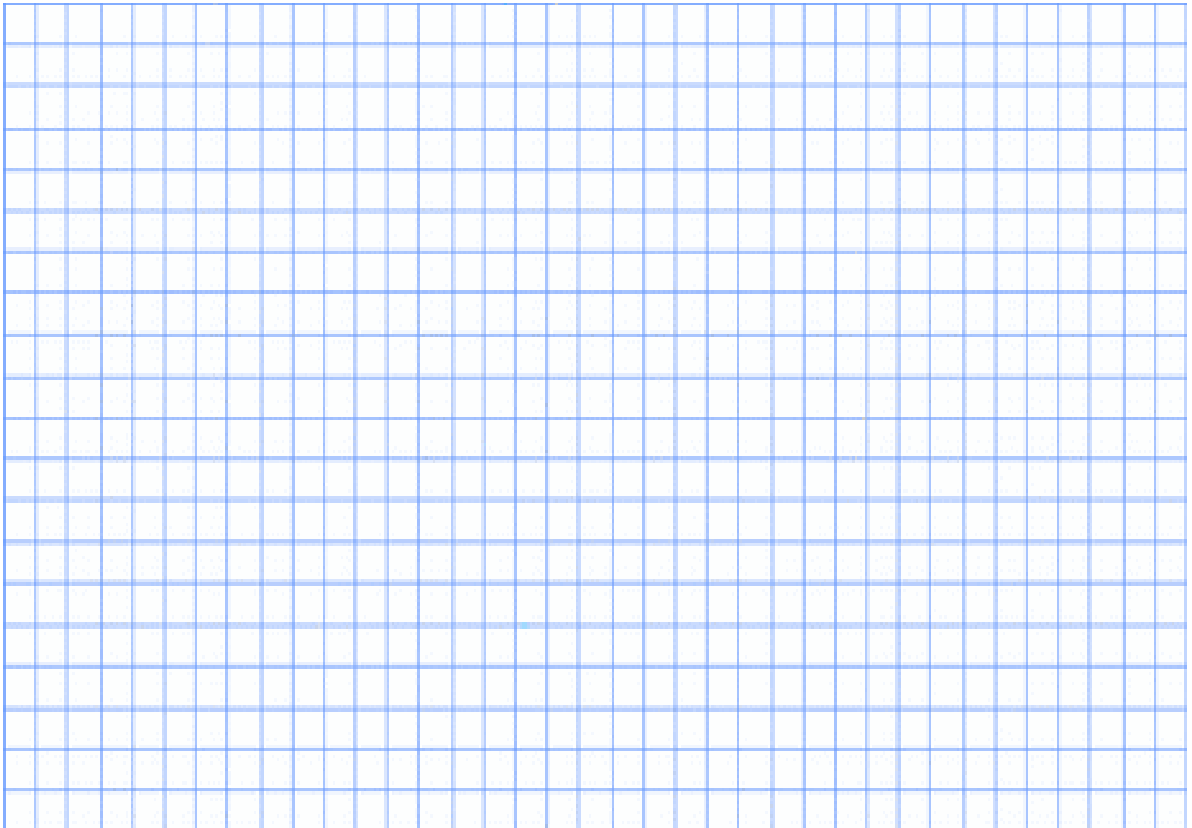
Career:	
Education:	
Training:	
Experience:	

Discuss this with your counselor, and explain why this profession might interest you.

d. **Option 4 - Blacksmith**

1. Name and describe the use of a blacksmith's basic tools.

2. Make a sketch of two objects to hot-forge. Include each component's dimensions on your sketch, which need not be to scale.



3. Using low-carbon steel at least $\frac{1}{4}$ inch thick, perform the following exercises:
 - a. Draw out by forging a taper.
 - b. Use the horn of the anvil by forging a U-shaped bend.
 - c. Form a decorative twist in a piece of square steel.
 - d. Use the edge of the anvil to bend metal by forging an L-shaped bend.
4. Using low-carbon steel at least $\frac{1}{4}$ inch thick, make the two objects you sketched that require hot-forging. Be sure you have your counselor's approval before you begin.
 - a. Include a decorative twist on one object.
 - b. Include a hammer-riveted joint in one object.
 - c. Preserve your work from oxidation.

When working on merit badges, Scouts and Scouters should be aware of some vital information in the current edition of the *Guide to Advancement* (BSA publication 33088). Important excerpts from that publication can be downloaded from <http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf>. You can download a complete copy of the *Guide to Advancement* from <http://www.scouting.org/filestore/pdf/33088.pdf>.