

## **Metalwork**

## 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 June 2017.
Sco	ut's Name: Unit:
	nselor's Name: Counselor's Phone No.:
	http://www.USScouts.Org • <a href="http://www.MeritBadge.Org">http://www.MeritBadge.Org</a> Please submit errors, omissions, comments or suggestions about this <a href="workbook">workbook</a> to: <a href="workbooks@USScouts.Org">Workbooks@USScouts.Org</a> Comments or suggestions for changes to the <a href="mequirements">requirements</a> for the <a href="merit badge">merit badge</a> should be sent to: <a href="merit badge@Scouting.Org">Merit.Badge@Scouting.Org</a>
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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Metalwork Scout's Name: \_\_ 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.

	Combination of:
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lame three ferrous allovs use	ed by modern metalworkers.
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. Do the	following:
☐ a.	Work-harden a piece of 26- or 28-gauge sheet brass or sheet copper. Put a 45-degree bend in the metal, then heavily peen the area along the bend line to work-harden it.
	Note the amount of effort that is required to overcome the yield point in this unworked piece of metal.
b.	Soften the work hardened piece from requirement 3a by annealing it and then try to remove the 45–degree bend. Note the amount of effort that is required to overcome the yield point.
c.	Make a temper color index from a flat piece of steel. Using hand tools, make and temper a center punch of medium
Find or	carbon or high-carbon steel. t about three career opportunities in metalworking.
1.	about three career opportunities in metalworking.
2.	
3.	
	e and find out the education, training, and experience required for this profession.
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Traini	.g:
Exper	ence:

Atter completing the first four requirements, complete at least ONE of the options listed below.    a. Option 1 - Sheet Metal Mechanic / Tinsmith   1. Name and describe the use of the basic sheet metalworking tools.    2. Create a sketch of two objects to make from sheet metal. Include each component's dimensions on your sketch, which need not be to scale.	iscuss this																												
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3.	Using low-carbon steel at least ¼ 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 ¼ 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.

Scout's Name: \_\_\_

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 <a href="http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf">http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf</a>.

c. Preserve your work from oxidation.

You can download a complete copy of the Guide to Advancement from http://www.scouting.org/filestore/pdf/33088.pdf.

Metalwork