

Journeyman Blacksmithing Skill Standards

These Blacksmithing Skill standards were developed by the Appalachian Blacksmiths Association, an ABANA chapter and registered with the Bureau of Apprenticeship and Training, United States Department of Labor. Before someone is accepted as a journeyman blacksmith, they need to be able to perform the following productively, quickly and accurately. It is a good self check list on the skills you need to develop in your craft.

Text in dark red, in parentheses and with letter designations are the additions of Jock Dempsey, anvilfire guru, for his students.

- a. Apprentice will keep sketchbook(s) and notes detailing their work, ideas, and progress toward becoming a Journeyman.
 - b. Show proficiency in shop math, mensuration and layout. Measure a sample block of metal and calculate its weight to within 1% or less. Create a layout with bluing using scribe, punch and dividers with exterior outline and an odd number bolt circle.
 - c. Learn to drive a straight shift. This may serve well in an emergency and also applies to operating trucks and heavy machinery.
1. Drawing Out: Draw a bar to a point or dress an edge or point a tool.
Produce short, medium and long tapers and points by hand.
 2. Upsetting: Upset to at least 1½ times the diameter or width of a bar on the end and in the middle.
 3. Bending: Make a ring out of bar stock or flat stock; forge a square corner right angle bend in square stock.
 4. Punching, slitting and decorative punch work: Show an example of decorative punch work; punch a hole in a bar the same size as the width of the bar.
 5. Drifting: Make a drift and use it to smooth, shape or enlarge a hole.
 6. Mortise and Tenon: Make an assembly from at least two separate pieces using this technique.
 7. Collaring: Make an assembly from at least two separate pieces using this technique.
 8. Scroll Work: Make two different types of scrolls.
 9. Splitting: Split a bar with a hot cut in the middle or at the end of the bar.
 10. Fullering, grooving, veining, set hammering: Show examples of each or if used as an intermediate technique, describe how and why the techniques are used.
 11. Riveting: Make two assemblies from at least two separate pieces for each assembly using hot riveting and cold riveting (pop riveting is not acceptable).

12. Forge Welding: Show at least three different techniques.
13. Arc Welding, brazing, soldering, oxyacetylene torch welding: Show an example of each.
13.b Explain MIG and TIG welding, produce sample TIG welds in steel, aluminium and stainless steel.
14. Hot Rasping, filing: Hot rasp the torch cut end of a bar to reasonable straightness and evenness, show a workpiece which has been filed to a smooth, flat surface, describe the types, care and use of files.
15. Sinking, raising, metal spinning: Make or show a hemispherical or hollow object made from flat sheet using any one technique.
16. Grinding: Know how to use a body grinder (portable angle grinder), pedestal grinder, belt grinder, sharpening stones and abrasive papers; know the types of abrasives and how they are graded and classified, show an edge tool that you have sharpened.
17. Drilling, tapping, die work and threads: Drill and tap a hole, thread the end of a bar with a die, know the common thread classifications, know the common drill size classifications, and the care and use of twist drills.
18. Heat treating, hardening, tempering, annealing, case hardening: Know how to properly anneal, harden and temper carbon tool steel, know how to use and case harden mild steel, know the colors for tempering, make or show a tool you have made that has been heat treated and will cut or forge mild steel without breaking or suffer deformation on the working end.
19. Heading: Head two bolts, one square headed, and one hex headed; head a nail, head a rivet.
20. Cutting and shearing: Know how to use the hot cut, cold cut, hack saw, tin snips, bench or floor shear, know how to use the oxyacetylene torch (AND Plasma torch) for cutting and demonstrate each technique.
21. Swaging: Swage a tenon or make the end of a square bar round using a swage.
22. Twisting: Show two (EIGHT) different twists in 1/2" (12-13mm) square bar. AND two twists in round bar.
23. Shop safety: Know first aid techniques for cuts, burns, abrasions and other shop related injuries; describe methods of hearing, sight and body protection and why they are necessary; know power tool and machinery safety including welding equipment safety.
24. Basic metallurgy: Know the properties and use of wrought iron, mild steel, carbon and tool steels and their classification, cast iron, brass, copper, aluminum; know sheet and plate gauging for ferrous and non-ferrous metals. Know all the elemental abbreviations for metals and elements used in metallurgy*.¹
25. Fire and Fuel: Know the constituents of good shop coal; know the different types of coal fires and fire maintenance. Build and demonstrate a least two types of forge (gas and solid fuel).
26. Jigs and dies: Make both a jig and a die for doing repetitive production work and show examples of work produced with them.
27. Explain the economics of a blacksmith shop, how to set shop rates and quote jobs.

JOURNEYMAN PROJECT:

Make a tool chest of wood and/or metal with wrought hinges, hasps and one internal chest lock with two or more catches and one padlock to fit hasp. Locks may be of simple (spring hasp) or complex (lever tumbler) types. Each will have two keys.

Apprentice made tools (minimum):

Tongs, four types, pickup, flat, bolt (several sizes), side offset.
Vise tool set including, ambidextrous chisel block, spacers up to 1",
Punch sets (3 piece), Slitting, punching and drift, in common sizes from 3/8" (10mm) to 1" (25mm).
Handmade ferruled file handles.
More. . .

RULE: Any tools made by the apprentice at the Master's expense will be duplicated in kind for the shop.

Apprentice Tips

Study the anvilfire daily tips (9 topics).

Forge as often as possible, at least one simple item or exercise each day. Forging exercises include round to square, square to round, points, tapers and free hand scrolls. Start small (1/4" (6mm) and work up. Accuracy is more important than power.

BOOKS:

Thoroughly study all the blacksmithing, metalworking and crafts books put before you. At a minimum:

Metalwork Technology and Practice., McGraw Hill or Bennett & McKnight (a text book)
The Art of Blacksmithing, Alex Bealer
New Edge of the Anvil, Jack Andrews
Werk und Werkzeug des Kunstschmieds, Otto Schmirler
Metal Techniques for Craftsmen, Oppi Untracht

See the anvilfire.com Sword Making Resources page for a good bibliography and links to reviews.

¹ YES, There will be a test, life is the test and THIS is it. Learning the periodic table is something you should have learned as a teenager in public school. Learning sufficient geometry and the minimum algebra is also something you SHOULD have learned at that time. However, unlike the famous line in the movie *Peggy Sue Got Married* where she says in geometry class, "I know for a fact that I will never need to know this stuff". . . when you chose this technical path you made all those things important in your life. If you have forgotten these things, dig out a math book (or Machinery's Handbook) and hang a copy pf the periodic table in your room and study.

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