PROJECT – Welded Log

Foundation Skills

The Purpose...

In this activity you will fabricate a Stick-Welded Log, and Blacksmithed Axe. This introduces you to Stick Welding, Blackmisthing, and Brazing.



The Preparation...

For this activity you will need the following:

- About a Hand-Width of 2" SCH40 pipe
- 1/4 x 2-1/2 x 2-1/2" HRMS Flat Bar
- Enough 1/8 x 1 Flat bar to hang on to
- About 3" of 3/16" CRMS Round
- Hacksaw
- Demonstrated safe use of Horizontal Bandsaw
- Demonstrated safe use of Machine Lathe
- Demonstrated safe use of Stick Welder
- Demonstrated safe use of Blacksmithing Forge
- Demonstrated safe use of Oxy-Acetylene Torch

LOG – CUTTING

- Use the Horizontal Bandsaw to cut about a hand-width's length of 2" SCHED40 pipe
- Use the Horizontal bandsaw to cut a square (2-1/2 x 2-1/2) piece of the 1/4" Flat



LOG – FACING

Make Both Ends Flat

- Place in LATHE CHUCK, sticking out no more than a finger width
- Lathe speeds are based on where the cutting is happening. What is the diameter of this pipe?
 USE THE LATHE SPEED CHART!
- Set cutter to be <u>90° to direction</u> of travel
- Rocker tool holder UP or DOWN to hit the center
- Face BOTH ENDS smooth



Facing Demo









WELDING

Stick The Lid To The Pipe

- ARC WELDING SAFETY consists of:
 - o Welding Helmet
 - $\circ \quad \text{Leather Gloves} \\$
 - Leather Jacket
 - Wear Them!
- I will likely give you a one-on-one demo on stick welding. You will play with it a bit to figure it out, then when you're feeling cocky, I want you to TACK weld the LID to the PIPE from the INSIDE
- Strike up on the underside of the lid
- Run a slow bead up the side and back down again in THREE different places
- Don't be tempted to run a bead all they way around the circumference – we JUST need to hold it together, that's IT.
- Drop it on the floor. If it breaks, you suck do it again! (you will eventually stop sucking ^(c))

HACKSAWING

Make It More Round

• Use a VISE and a HACKSAW t o cut off the corners of the lid, at least into an Octagon (8 sides)



SPARK UP ON THE

SIT ON TABLE LULE THIS

Botrom

GRINDING



BARK

Make It Really Look Like A Tree

- Back to the Arc Welder
- Lay the pipe HORIZONTALLY on the welding table, and run a wack of beads, CHIPPING the slag off after each bead
 - You CANNOT weld over slag it MUST be chipped off
- COVER the ENTIRE outside of the "Stump"
 - There should be NO CRACK
 - There should be NO PIPE
 - NO CRACK PIPE!

BLACKSMITHING

Making An Axe

- With a piece of 1/8" x 1" flat bar long enough to hold with TONGS (not gloves), heat one end red hot in the forge
- Beat it with a Cross Pein Hammer on the Anvil until it looks like an Axe
 DO NOT MAKE IT TOO THIN!
- You can always shape it better later if Blacksmithing goes wrong for you
- Use the HAND SHEAR to cut off a decent looking blade
- Cut about a 3" piece of 3/16" round rod and shape it to look like whatever you want for a handle



RODS

There are many different rods you can weld with. For beginners, I use a 4011 rod.

They do not make a super awesome weld, but they are easy to use, make nice beads, and require no fancy storage.

Unfortunately, they DO NOT weld vertically!



ASSEMBLY

Attaching The Axe to The Handle

- Ask for a one-on-one demo on using the Oxy-Acetylene Torch for brazing
- Brazing is easy, and can be UN-brazed
- Get only to the temperature to melt the braze, NO HOTTER
- Braze CANNOT touch the grinder you can file or sand it, but NOT grind it

Attaching The Axe to The Stump

- HACKSAW a groove in the corner of the stump to hold the axe
 the handle can point up or down (your choice)
- BRAZE the Axe into the slot you cut in the stump
- You'll want a #2 tip, because there is a lot of metal in the stump FOCUS the heat on the stump, the thin blade will heat up almost too quickly on its own
- Get only hot enough to melt the braze, NO HOTTER (your bowels will thank you)

OPTIONS

The "cool kids" will grab the hacksaw that has three blades on it, and cut a groove wide enough to break through, so they can stick-weld the axe in from underneath!

 If you decided to be a cool kid, you will want to run a SLOW bead in the underside to definitely melt the blade into the bead and secure it with weld



WIRE WHEEL

Making It Pretty

- Use the WIRE WHEEL to clean up as much of the debris as you can reach with the wire wheel
- Be mindful that the Wire Wheel doesn't GRAB you project and throw it on the floor if it DOES, let the machine have it nothing in high school is worth getting injured over
- Smooth up the BOTTOM of the Welded log so it cannot scratch your mom's 10,000 year-old Honduran Mahogany Ming Dynasty coffee table.

OPTIONS

- I do not require projects to be painted (providing paint gets expensive), HOWEVER, if you provide your own paint and paint it, I will give you BONUS!
- Read the instructions on the PAINT CAN!
- Multiple THIN coats are MUCH BETTER than one THICK coat.
- Paint DOES NOT GO DOWN THE SINK!!

HAND IT IN FOR MARKING!