Soldering 101
Soldering Tools

- Soldering torch
- Solder pick
- Third hand
- Soldering bricks

Not shown
- Flux bottle
- Tweezers
- Striker
- Copper tongs
- Pickle
- Screen mesh with tripod
Soldering Torch

• Tubing:
  • Red tube = gas
  • Green tube = oxygen
Flame Types

- **Oxidizing Flame**
  - Small blue cone
  - Emits a hissing sound
  - Used for delicate soldering jobs where the heat must be intense and localized
  - Results in oxidation

- **Neutral Flame**
  - Softly defined bright blue inner cone
  - Ideal for most soldering jobs
  - Hottest part is the flame tip cone

- **Reducing/Carburizing Flame**
  - Pale blue flame with a yellowish tip
  - Annealing and melting
  - More fuel than oxygen
Solder

- A low melting alloy, used for joining less fusible metals

Flux

- Prevents oxidation
  - What is oxidation?
    - Tarnishing of metal
  - Used to aid solder flow
1. Size your finger with the ring sizer
• Cut metal strip to desired size
• Saw and then file edges straight and flat
HOW TO...
Step 1

Criteria of soldering:
• 1. Has to be clean:
  • How? Sand and file
  • Why? Oils from your hands or any tarnish will not allow the solder to flow.
• 2. Has to be flat
  • How? Sand and file
  • Why? Solder won’t jump gaps

Techniques:
• When filing, hold the edge of metal perpendicular to file
• Use a support (bench pin) or edge to make sure you are filing flat and straight.
• Draw a line on the piece of metal and file to that line
• Sand metal until it is back to original color and has a brushed look
• Hold piece up to the light to see if any light comes through the seam. If there is a gap, your seam is not flat enough
• Bend metal into a D shape
• Overlap ends of ring to create tension and a tight join
• Hold metal up to the light to ensure the pieces are completely flat
Step 2

Solder placement:
- Solder has to be placed tightly to the join as possible
- Multiple pieces may be needed
- Use tweezers or soldering pick to place solder

Adding flux:
- Spray flux on entire piece before soldering (2-3 sprays)
- Solder melts at 900 degrees and turns white and fluffy
- If solder moves from boiling flux, place it back with the soldering pick
• Solder pieces together
• Place small amount of solder on join and spray with flux

• Flame needs to be about 2 inches and heat
  • When solder flows, remove heat
  • Pickle for 10 minutes and rinse with water
Step 3

Turning on torch:
- Always turn on the gas first (red tube)
- Use striker to ignite flame
- Slowly add oxygen for desired flame (green)

Heating
- Most of the time you will heat your project from the bottom
  - Why? Solder follows heat
- Placement
- Depending on the project:
  - Mesh screen
  - Charcoal bricks
  - Third hand
Flow
• Continue heating until the solder flows to a liquid
• Immediately stop when your piece gets cherry red
• You will notice a silver line that appears along the seam if done correctly
Step 5

Pickling

• Using only the copper tongs, place metal into the pickle acid to clean
• How long? 10 minutes
• Remove with copper tongs and wash with water

ONLY USE COPPER TONGS
Video

- https://www.youtube.com/watch?v=-M-v_cj8mNw
• Use ring mandrel and rawhide mallet to form ring
• Be sure to flip the ring when forming to ensure the ring does not dome on one side
• File any excess metal
• Solder pieces together
• File seam using a large flat file and/or needle files
• Polish, sandbland, or sand the ring
Then it’ll be time to buff!

- I’ll give instruction on that when we get there.
Your Challenge

• Your first ring will be a width of ½” and your choice of brass or copper
• You will create a design that implies positive and negative space or somehow cut a design on the edge of your ring
• Come up with at LEAST three different ideas and sketch them in your sketchbook
• Check it off with me and I’ll get you your materials!
Let’s get started!