

Name \_\_\_\_\_

### Lab # 12 - Hot Metal

Description: In this lab you will learn to work metal while hot. These projects will be heated on a forge, but could be created using a oxy-acetylene torch with a rosebud tip. You will also learn how to temper steel. This is a useful skill when reconditioning tools. CAUTION: Steel will be very hot. Be cautious not to burn yourself or others.

#### Materials:

5 1/2" - 1/2" tool steel  
20" - 1/4" mild steel round stock

#### Tools:

Hammer  
Anvil  
Tongs  
Forge  
Sand bucket  
Bastard and mill files  
Grinder  
Oxy-acetylene torch with large tip  
Hacksaw

#### Cold Chisel Directions:

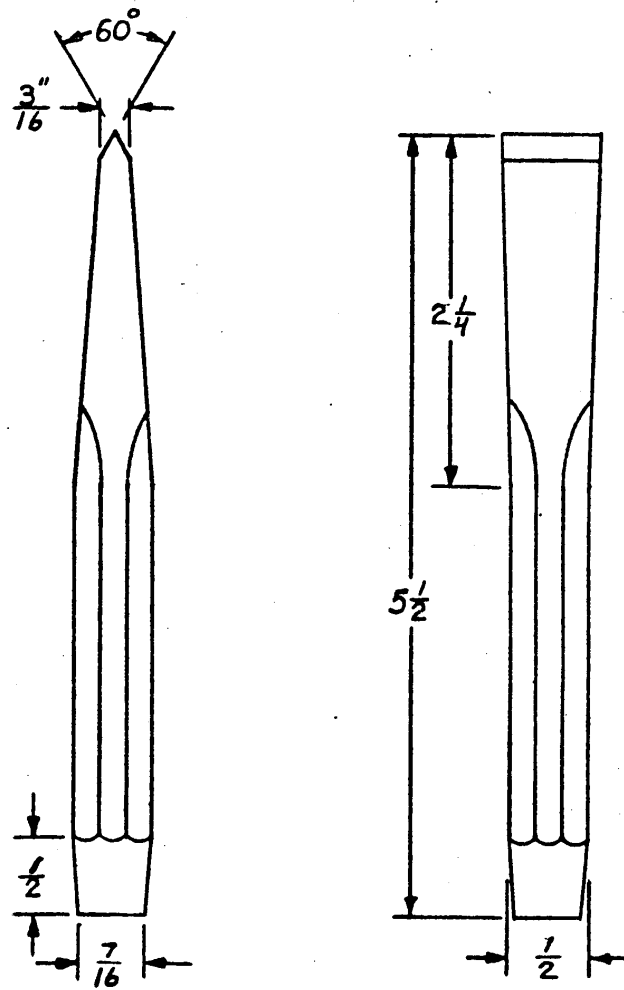
1. Cut a piece of tool steel to 5 1/2".
2. Heat one end of the tool steel until bright red.
3. Using a hammer and anvil taper the end as shown in the drawing.
4. Heat the chisel to cherry red and place in the sand bucket to cool. (Annealing process) NOTE: you can work on your chaining pin while the chisel is cooling.
5. When cool, use a file to finish the surfaces of the chisel. Grind the edge to the correct angle. Stamp your initials in the handle.
6. Temper the chisel using a oxy-acetylene torch
  - a) About 2 1/2" from the sharp end heat a 1" band on the chisel to cherry red
  - b) Watch the colors move down the chisel. When the edge changes dark blue, cool the ONLY the TIP of the chisel in water (use a figure 8 motion). When the redness has left the chisel, cool completely in water.

### Chaining Pin Directions:

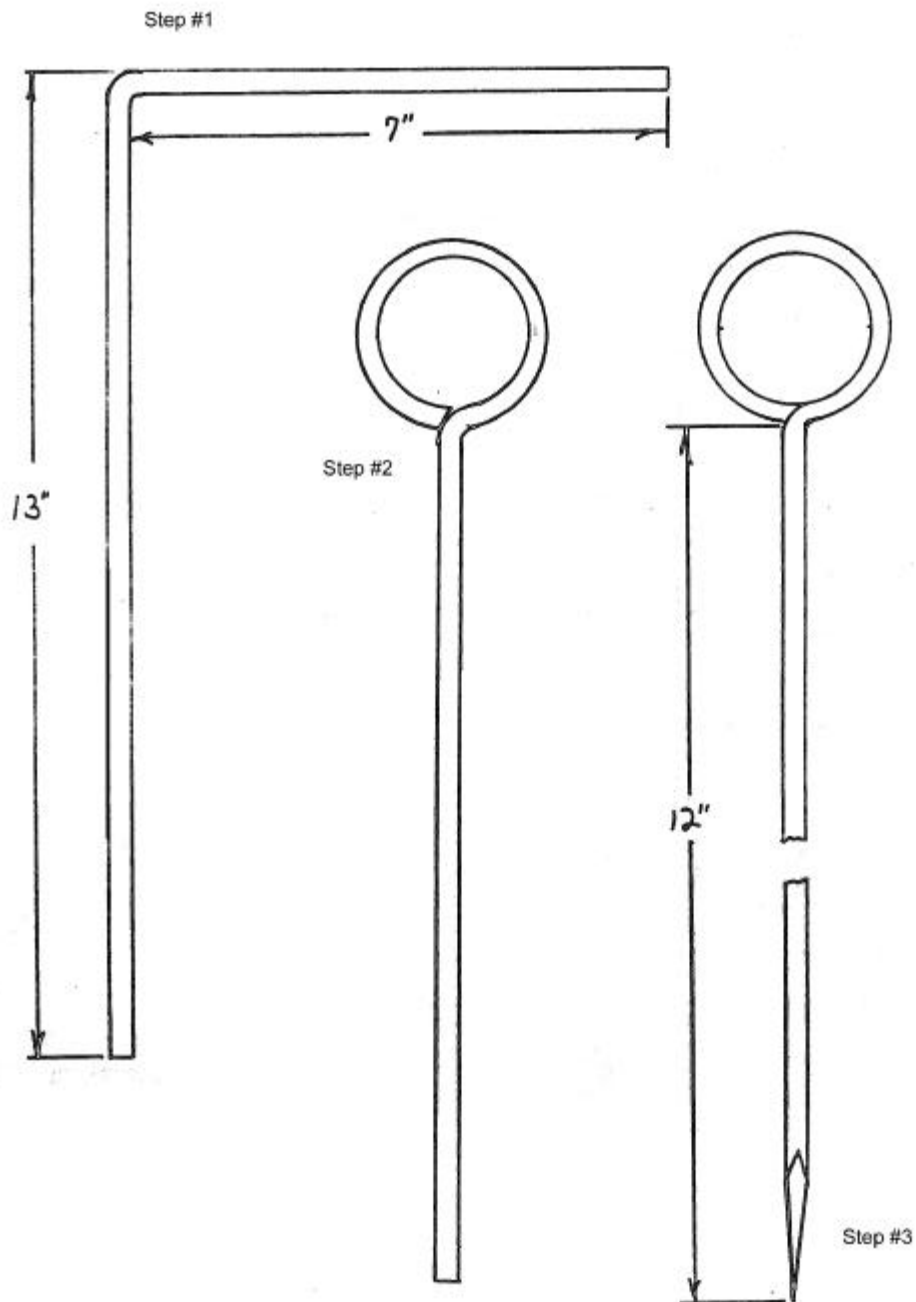
1. Always work the steel when red-hot.
2. Use a center punch to mark the bend of the eye (7"). Heat one end of the 1/4" round stock.
3. Form the eye by bending the stock at 90°
4. Then, reheat and bend the eye.
5. Trim to length and point.
6. Cool the project and mark with masking tape.

### Grading:

Criteria	Possible	Score
Chisel:		
Tempering (can cut steel)	4	
Sharpening	2	
Smooth Finish	2	
Shape and workmanship	2	
Chaining Pin:		
Eye correct size (+/- 1/8")	2	
Eye round	2	
Pin correct length (+/- 1/8")	2	
Point neat	2	
Overall workman ship	2	
TOTAL	20	



Cold Chisel



Chaining Pin