

Name \_\_\_\_\_

### Lab # 11 -- Cold Metal

Description: The skills in these exercises are layout, threading, and working metal. These skills are used in repair work and construction of small parts. Projects will be done with hand tools.

#### Materials:

18" -- 1/2" round mild steel  
2 1/2" -- 1"x5/16" (or 1"x3/8") mild  
steel flat stock  
Cutting Oil

#### Tools:

Hacksaw  
Bastard and Smooth Flat files  
Ball Peen hammer  
1/2" NC Tap and 1/2" NC Die  
Drill Press, drills  
Bender

#### Directions:

##### Eye Bolt:

1. Cut the round stock to 9 1/2" with a hacksaw. Dress one end with the file.
2. Bend the eye on the dressed end using the bender.
3. Trim to length. Dress the cut end.
4. Thread the round stock 1 1/4" with a die on the un-bent end. USE OIL.

##### "L" bolt:

5. Cut the round stock to 8 1/2" with a hacksaw. Dress one end with the file.
6. Bend the "L" on the dressed end using the bender.
7. Trim to length. Dress the cut end.
8. Thread the round stock 1 1/4" with a die on the un-bent end. USE OIL.

##### Nuts:

9. From the 1" flat stock cut two pieces 1" long with a hack saw. Dress the cut ends with a file (do not round the corners). These are the nuts for the bolts.
10. Locate the center of the nut and drill a hole the proper size for a 1/2" NC tap.
11. Tap the hole in each nut. Be sure that the tap is perpendicular to the steel when cutting threads. USE OIL.

##### Finish:

12. Wipe free of oil.
13. Remove sharp edges from the project with a mill file. Use a wire wheel to buff as needed (don't buff threads).

Grading:

Name:

<b>Criteria (tolerance +/- 1/16")</b>	<b>Possible</b>	<b>Score</b>
Length of eye bolt	2	
Eye bolt thread quality	2	
Eye bolt thread length	2	
Length of "L" bolt	2	
"L" bolt thread quality	2	
"L" bolt thread length	2	
Nut square cut	4	
Nut size	4	
Nut threads square	4	
Nut hole is centered	4	
General workmanship (edges, finish, etc.)	2	
<b>TOTAL</b>	<b>30</b>	

