

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:

Criteria (tolerance +/- 1/16")	Possible	Score
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	
TOTAL	30	

