

## Density of Metals Lab

- Go to <http://chemcollective.org/activities/autograded/108>

### **Materials:**

- In the Stockroom, go to Solutions and add “H2O Distilled Water 3.0 L”, “Metal 1”, “Metal 2”, and “Metal 3”.
- In the Stockroom, go to Glassware and add three “Weighboats” under “Other”.
- In the Stockroom, go to Glassware and add three “50 mL Graduated Cylinders”
- In the Stockroom, go to Tools and add a Balance.

### **Background:**

To find the Density of a Metal, you must find the mass of a substance and that substance’s volume.

Density = Mass (grams) / Volume (mL)

#### Density of Metals

Silver (Ag) = 10.49 g/mL

Platinum (Pt) = 21.45 g/mL

Rhodium (Rh) = 12.4 g/mL

### **Workbench 1:**

- Place the Weighboat on the Balance and Record the Mass of the Weighboat in the table below.
- Place Metal 1 on the Weighboat and Click the “Hold to Pour” button until over 100 grams of the metal is placed on the Weighboat. Record the Mass of the Weighboat and Metal 1 in the table below.
- Calculate the mass of the Metal 1.
- Place the H2O Distilled Water 3.0 L on the Graduated Cylinder. Click the “Hold to Pour” button until about 20 mL of the Distilled Water is placed in the Graduated Cylinder. Record the exact volume of the distilled water in the graduated cylinder in the table below.
- Take the Weighboat with Metal 1 and place it on the Graduated Cylinder. Click the “Hold to Pour” button until all of Metal 1 is in the Graduated Cylinder. Record the exact volume of the distilled water and Metal 1 in the graduated cylinder in the table below.
- Calculate the volume of Metal 1.
- Calculate the Density of Metal 1.
- Repeat the steps above for Metal 2 and Metal 3.

	Mass of Weighboat	Mass of Weighboat and Metal	Mass of Metal	Volume of Graduated Cylinder and Distilled Water	Volume of Graduated Cylinder, Distilled Water, and Metal	Volume of Metal	Density of Metal (grams / mL)
<b>Metal 1</b>							
<b>Metal 2</b>							
<b>Metal 3</b>							

**Post-Lab Questions:**

- 1) Identify Metal 1, Metal 2, and Metal 3.
- 2) A piece of iron was placed on a scale and weighed 17.16 grams. The metal was also found to have a volume of 2.2 mL. Using your knowledge of the metal's mass and volume, calculate the density of the metal.
- 3) A strip lead metal was found to have a volume of 3.4 mL. If lead has a density of 11.3 grams/mL, calculate the mass in grams of the lead.
- 4) In a laboratory, a student found a weighboat had a mass of 3.7 grams. The student then measured the mass of the weighboat and an unknown metal to have a total mass of 49.98 grams. A graduated cylinder had some distilled water placed inside it by the student. The student measured the volume to be 32.7 mL. When the student placed the metal inside the graduated cylinder, the volume was measured to be 37.9 mL.
  - a. Calculate the mass of the metal in grams.
  - b. Calculate the volume of the metal in mL.
  - c. Calculate the density of the unknown metal.