

Matter

Virtual Lab: Metal Densities

DATA TABLE:

	Mass of Empty Graduated Cylinder (g)	Mass of Graduated Cylinder + Metal (g)	Mass of Metal (g)	Volume of Metal Sample (mL)	Density (g/mL)
Metal A					
Metal B					
Metal C					

Calculations:

$\text{Mass of Metal} = \text{Mass of Graduated Cylinder + Metal} - \text{Mass of Empty Graduated Cylinder}$

Metal A:

Metal B:

Metal C:

$\text{Density} = \text{Mass of Metal} / \text{Volume of Metal Sample}$

Metal A:

Metal B:

Metal C:

Questions:

1. Using the values given in the Problem Description, and comparing those values to the density you calculated in your data table, what is the identity of metal 1?
2. Using the values given in the Problem Description, and comparing those values to the density you calculated in your data table, what is the identity of metal 2?
3. Using the values given in the Problem Description, and comparing those values to the density you calculated in your data table, what is the identity of metal 3?
4. If the metals were not in powdered form (perhaps, pellets), what would be an alternate way of finding volume?

Instructions for opening and using the Java activity follow.

When the window opens, click on FILE and then **LOAD HOMEWORK**.

Open the **MOLARITY AND DENSITY FOLDER**.

Double click on the **METALS DENSITY PROBLEM**.

Double click on the **PROBLEM DESCRIPTION** in the next frame and read the material presented.

Click on **WORKBENCH 1**, a tab found on the bottom of the screen. If no tab is there, click on FILE and then **NEW WORKBENCH**.

Place the following items on the workbench:

1. Double click on **METAL 1** to place it on the workbench.
2. Click on TOOLS, the GLASSWARE, then GRADUATED CYLINDER, then **10 ML GRADUATED CYLINDER** to place it on the workbench.
3. Click on TOOLS, then INSTRUMENTS, then **SCALE** to place a balance on the workbench.

Procedure for finding metal masses and volumes:

4. Place the 10 mL graduated cylinder on the balance by clicking and dragging it ABOVE THE BALANCE and placing it down on top of the balance. Record the mass of the empty cylinder on the data sheet.
5. Remove the graduated cylinder from the balance by clicking and dragging.
6. Click and drag the Metal 1 bottle and place it so that the bottle and the graduated cylinder overlap. This gets the metal ready to be dispensed into the cylinder. Click and hold the POUR tab at the bottom of the screen. When you release the hold, the solid will be in the cylinder and you should read the volume from the graduated cylinder. Record to at least the tenths place on your data sheet.
7. Remove the bottle from the graduated cylinder.
8. Place the filled graduated cylinder on top of the balance and record the new mass.
9. Click on FILE and then REMOVE WORKBENCH 1 to load a new workbench.

Metals 2 and 3: Repeat the above procedure, Steps 4-9.

from:

http://cms.gavirtualschool.org/Shared/Science/Chemistry/matter_shared/matter_shared6.html