

Name: _____

Date: _____

Density Lab

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

Goal:

- 1) To determine the density of tap water
- 2) To determine the density of given objects
- 3) To correctly predict if an object will sink or float
- 4) To apply this concept to solve a real life problem

Part 1: Density of Water

- 1) Design and conduct a procedure to find the **MASS** of a given amount of water (50 mL and 25mL). RECORD your data in the table below.
- 2) Calculate the **density** of the water- SHOW your work.

Data Table:

Volume of Water (mL)	Mass of Graduated Cylinder (g)	Mass of H ₂ O and Graduated Cylinder (g)	Mass of H ₂ O (Subtract out mass of graduated cylinder)	Density of water (g/mL)
25 mL				
50 mL				

- 1) What is the density of water in grams per milliliter?

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- 2) Does the density of water depend on how much water you have? WHY or WHY NOT?

Part 2: Density of Objects

- 1) Find the **MASS** of each object on the table. Record in the table below.
- 2) Find the **VOLUME** of each object on the table. Record in the table below.
- 3) Determine the **DENSITY** of the three objects on the table. Record the density in the table below.
- 4) Include **UNITS** and **SHOW** work.

Object	Mass	Volume	Density
Object A			
Object B			
Object C			

HINT:

There are two main ways to find the **VOLUME** of a solid object:

- 1) Use geometry formulas (see attached cheat sheet)
- 2) Use the “water displacement” method:
 - a) Fill a beaker with water, and record how much water you start with
 - b) Put the object in the water
 - c) Record how much water was displaced (how much the level changed)→
this is the volume of the object!

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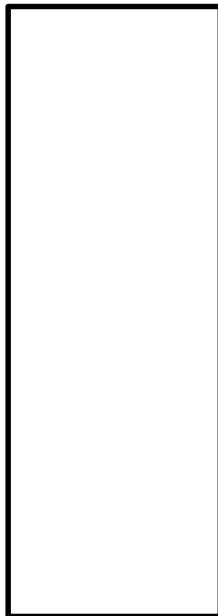
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Part 3: Predictions

- 1) You are given 3 liquids with the following masses and volumes.
 - a) Calculate the density of each liquid
 - b) Complete the density column using all 3 liquids and LABEL your drawing

Liquid	Mass (g)	Volume (mL)
1	23	25
2	70	60
3	54	35



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Part 4: Applications

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- This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



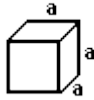
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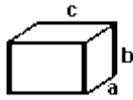
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Formulas for Volumes of Common Shapes:

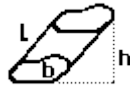
cube = a^3



rectangular prism = $a \times b \times c$

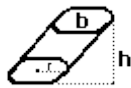


irregular prism = $b \times h$

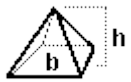


(b = area of base)

cylinder = $\pi \times r^2 \times h$

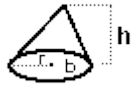


pyramid = $(1/3) b h$



(b = area of base = length * width)

cone = $1/3 \pi \times r^2 \times h$



sphere = $(4/3) \pi \times r^3$



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