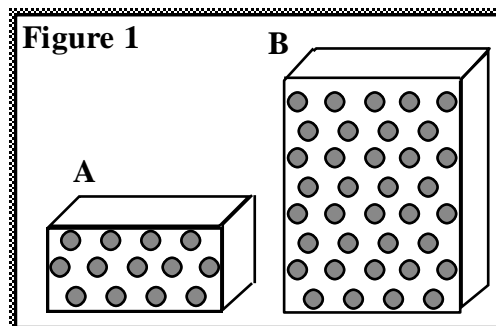


Classwork for Chemistry – Mass and Volume

1. Study the matter shown in Figure 1. Each dot represents a particle of matter. [Assume the particles are uniformly distributed throughout each object, and particles of the same size have the same mass.]

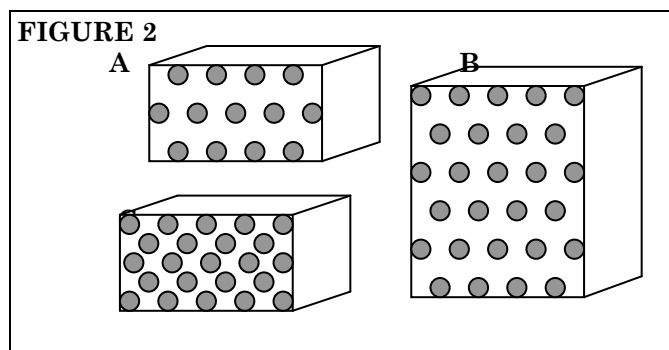
- In the table below, show how the masses, volumes, and densities of A and B compare by adding the symbol $<$, $>$, or $=$ to the statement in the second column.
- Explain your reasoning for each answer in the last column.



Property	Relationship	Reasoning
Mass	A ____ B	
Volume	A ____ B	
Density	A ____ B	

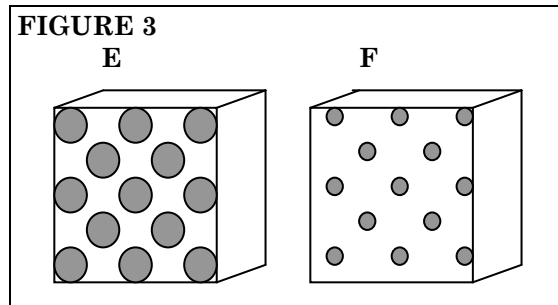
2. Study the matter in Figure 2. [Assume the particles are uniformly distributed throughout each object, and particles of the same size have the same mass.]

- In the table below show how the masses, volumes, and densities compare by adding the symbol $<$, $>$, or $=$ to the statement in the second column.
- Explain your reasoning for each

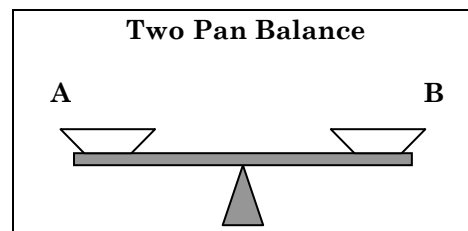
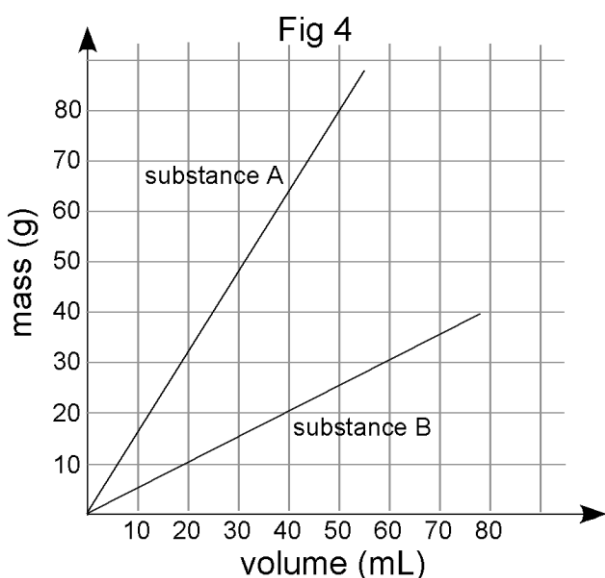


Property	Relationship	Reasoning
Mass	A ____ B	
	A ____ C	
Volume	A ____ B	
	A ____ C	
Density	A ____ B	
	A ____ C	

3. Is object E or object F more dense? [Assume the particles are uniformly distributed throughout each object, and particles with a larger size have a larger mass.] Explain your reasoning.



4. In Figure 4 below, a graph shows the relationship between mass and volume for two substances, A and B. Use the graph to answer questions about these two substances.



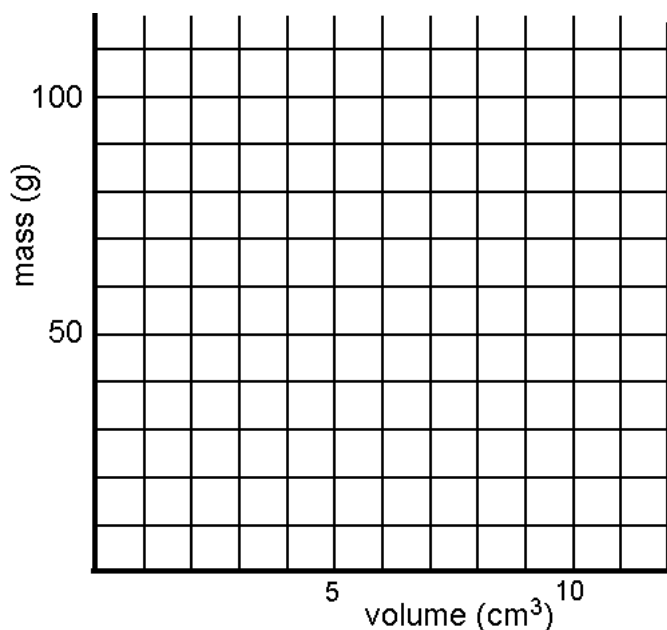
- a) You have built a simple two-pan balance shown above to compare the masses of substances **A** and **B**. What would happen to the balance if you put **equal masses** of **A** and **B** in the two pans? **Equal volumes** of **A** and **B** in the two pans? Explain your reasoning.
- b) Find the slope of the line for both A and B using correct units. State the physical meaning of the slope for each substance.
- c) If you put **10.0 mL of A** in one balance pan, what **mass of B** would you need in the other pan to make it balance? Explain your reasoning.
- d) If you put **35.0 mL of B** in one balance pan, what **volume of A** would you need in the other pan to make it balance? Explain your reasoning.
- e) Water has a density of 1.00 g/mL. Sketch the line representing water on the graph in Figure 4.

f) Determine whether substance A and B will sink or float when placed in a bucket of water.

A: sink float B: sink float (circle correct response)

Defend your answer using the m-V graph, and your outstanding understanding of density.

Refer to the table of densities at the right to answer the following questions.



Substance	Density (g/mL)
Aluminum	2.70
Titanium	4.54
Zinc	7.13
Tin	7.31
Iron	7.87
Nickel	8.90
Copper	8.96
Silver	10.50
Lead	11.35
Mercury	13.55
Gold	19.30

5. Sketch a graph of mass vs. volume for titanium,

6. You made some cubes out of each metal in the table that each measures 2.00 cm on every side. (all except mercury – why can't you make a cube of mercury?)

a. What is the volume of each cube in **cm³**? in **mL**? (Show your thinking)

V = _____ cm³ V = _____ mL

b. Find the mass of these metal cubes: (Show your work below)

lead cube _____

nickel cube _____

zinc cube _____

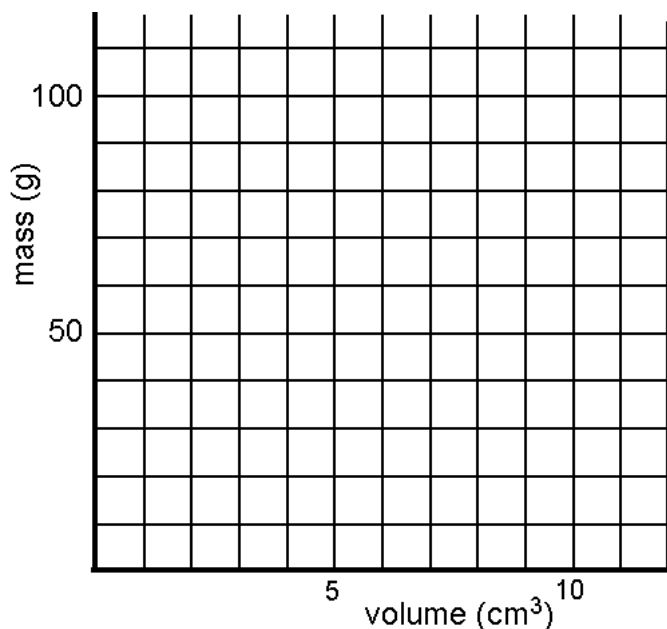


Name _____

Date _____

visit <http://genest.weebly.com>

Refer to the table of densities at the right to answer the following questions.



Substance	Density (g/mL)
Aluminum	2.70
Titanium	4.54
Zinc	7.13
Tin	7.31
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Copper	8.96
Silver	10.50
Lead	11.35
Mercury	13.55
Gold	19.30

1. Sketch a graph of mass vs. volume for zinc and silver.

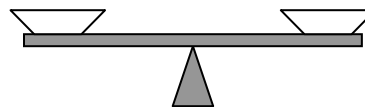
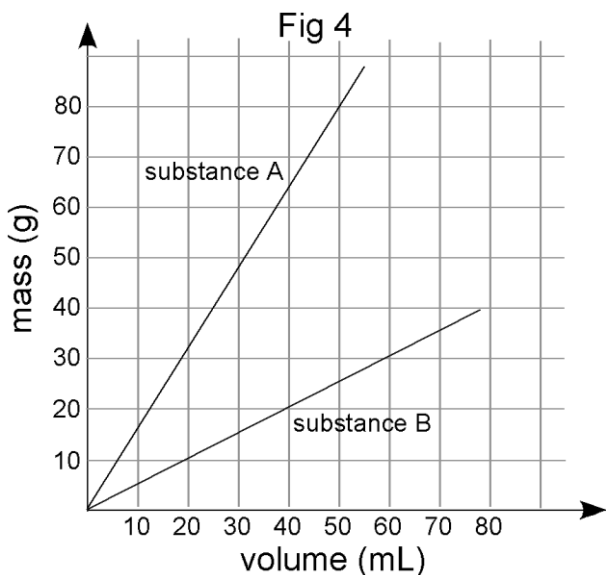
2. You made a cube out of each metal in the table that each measures 12.00 cm on every side.
 - a. What is the volume of each cube in **cm³**? in **mL**? Show your thinking.

V = _____ cm³

V = _____ mL

- b. Find the mass of the gold one: (Show your work below)
 gold cube _____

3. In Figure 4 below, a graph shows the relationship between mass and volume for two substances, A and B. Use the graph to answer questions about these two substances.



- b) You have built a simple two-pan balance shown above to compare the masses of substances **A** and **B**. What would happen to the balance if you put **equal masses** of **A** and **B** in the two pans? **Equal volumes** of **A** and **B** in the two pans? Explain your reasoning.
- b) Find the slope of the line for both A and B using correct units.
- c) Write a “For every...” sentence for each substance [See Wednesday’s notes or look online at Wednesday’s lecture]
- c) If you put **40.0 mL of A** in one balance pan, what **mass of B** would you need in the other pan to make it balance? Explain your reasoning.
- d) If you put **77.0 mL of B** in one balance pan, what **volume of A** would you need in the other pan to make it balance? Explain your reasoning.