Friday
August 12,2016

Note – Homework – Frayer model-Due 8/12
Quiz – classifying matter-Friday, the 12th

GPS -
SPS2
Students will explore the nature of matter, its classifications, and its system for naming types of matter.

Catalyst:
What is water displacement method.
When do we use it?

Topic: Classification of matter
Essential Question: What floats your boat?

By the end of the day, Scholars will be able to:

understand the nature of matter, its classifications, and its system for naming types of matter.

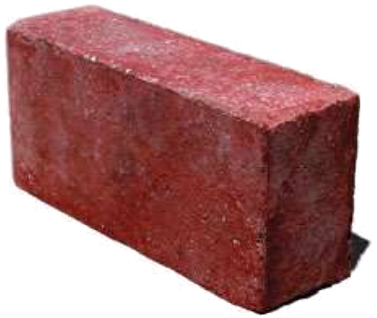
And answer a question like this:

What two quantities are required to find the density of objects?

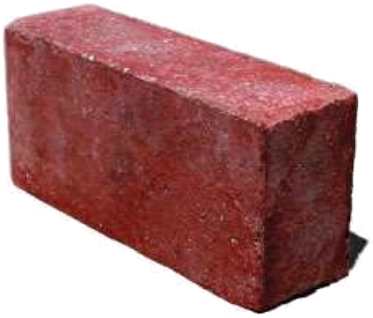
Agenda - Milestones Domain/Weight: Chemical Reactions and Properties of Matter 25%

Catalyst	10 min
Density - Gizmo	60 min
Matter – GO - complete	15 min
Classifying matter worksheet	25min

Draw a balance. Draw a 5 lb. brick on one side and a bag of feathers on the other that will make it balance.



Density



SPS2a. Calculate density when given a means to determine a substance’s mass and volume.

Mass

- The amount of matter (stuff) in an object.
- Measured on a triple beam balance.

Characteristics

- Units of measure equal grams (g) or kilograms (kg)

Volume

- How much space something takes up.
- Liquids are measured with graduated cylinders.
- Boxes are calculated by length times width times height.

Characteristics

- UoM = milliliters (mL) and Liters (L).

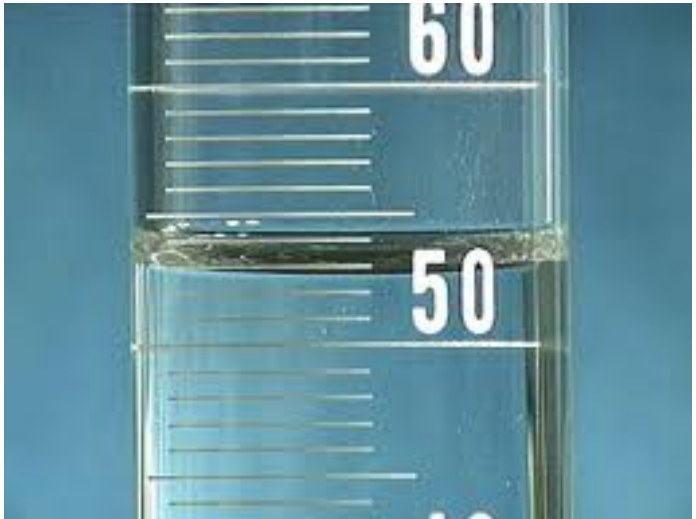
centimeters cubed (cm^3)

Meniscus

- Curve on the surface of the water in a cylinder.

Characteristics

- Curve
- Measure at the bottom of the curve



Density

- How close matter is packed together (Ratio of mass to volume).

  Characteristics
- Density is equal to mass divided by volume.
- D = m/V

Physical Science
Write the Questions

1. What piece(s) of lab equipment measure(s) mass?
2. What are the units for mass?
3. What piece(s) of lab equipment measure(s) volume?
4. What are the units for volume?
5. What is the equation for density?
6. What are the units for density?

Problem 7

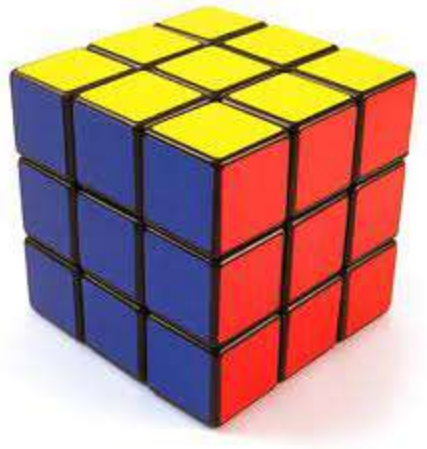
- An object has a mass of 55 g and a volume of 11 cm^3. What is the density of the object?

Problem 8

- A 100 g sample of sea water has a volume of 99 ml. What is the density of the sea water?

Problem 9

- What is the density of a 2cm cube that has a mass of 16 g?



Problem 10

- A rock is placed in a graduated cylinder that has a volume of 20 ml. The volume rises to 25 ml. If the rock has a mass of 25 g, what is the density of the rock?

Now, try these on your own

- Al'Licia has a watch. It has a mass of 4g and a volume of $2cm^3$. What is the density of the watch?

- Mia has a wallet. It has a mass of 15g and a volume of $5cm^3$. What is the density of the wallet?

Activator

Mass	Weight
Volume	Density

What word does not belong?
Why does this word not belong? (2-3 sentences)
How are the other three words related?(2-3 sentences)

Activator

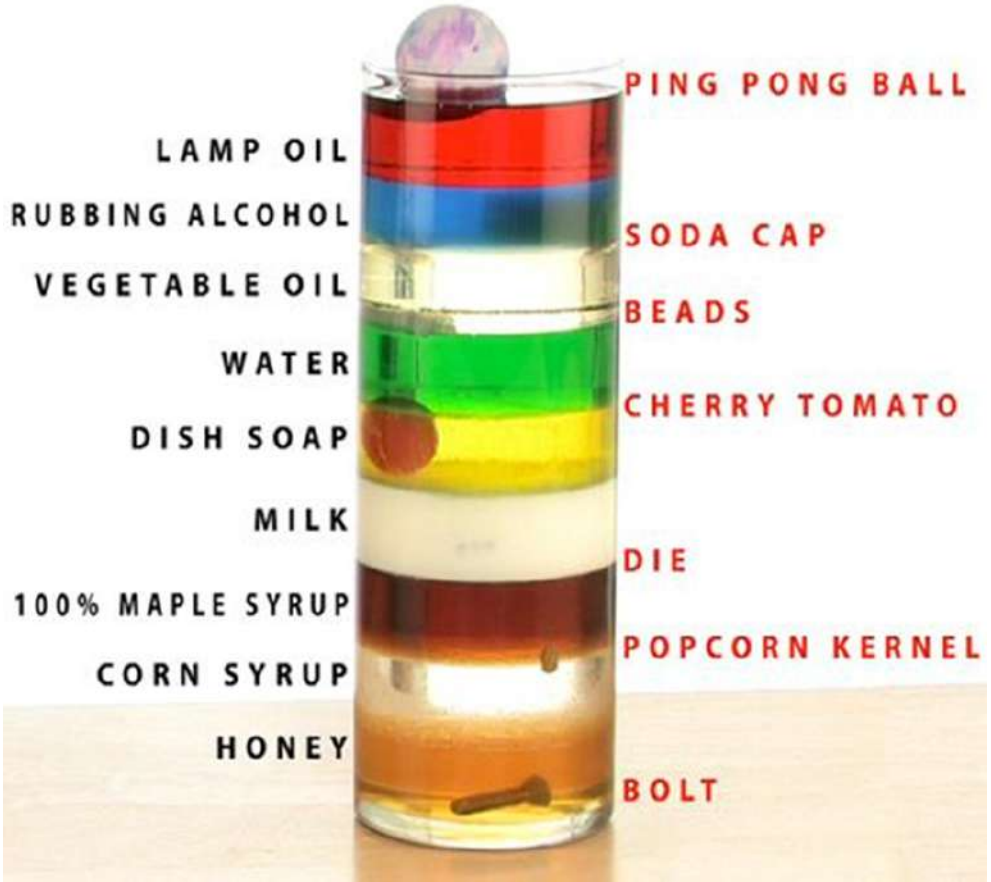
1. How do you measure the volume of your cell phone?
2. How do you measure the volume of a matchbox car?
3. How do you measure the mass of a 20 oz soda?

What is density?

- A measure of how close together matter is packed.

What makes an object float?

- An object that has a density lower than the surrounding matter will float in that matter.



What are some examples of objects that float?

- Wood in water
- A hot air balloon

Liquid Layers

- Which layer has the highest density?
- Which layer has the lowest density?

Problem 1

- Frank has a paper clip. It has a mass of 12g and a volume of 3cm^3. What is its density?

$$m = D = \frac{m}{V}$$

$$V =$$

Problem 2

- Frank also has an eraser. It has a mass of 3g, and a volume of 1cm^3. What is its density?

$$m = D = \frac{m}{V}$$

$$V =$$

Problem 3

- A block of aluminum is dropped into a graduated cylinder with an initial volume of water at 75 mL and the volume rises to 90 mL. If the block has a mass of 40.5 g. What is its density?
- $m = D = \frac{m}{V}$

$V =$

Problem 4

- Mercury metal is poured into a graduated cylinder and measures exactly 22.5 mL. The mercury used to fill the cylinder has a mass of 306.0 g. From this information, calculate the density of mercury.
- $D = \frac{m}{V}$

$V =$

Problem 5

- A rectangular block of copper metal has a mass of 1896 g. The dimensions of the block are 8.4 cm by 5.5 cm by 4.6 cm. From this data, what is the density of copper?

$$m = D = \frac{m}{V}$$

$$V =$$

Problem 6

- A flask that weighs 345.8 g is filled with 225 mL of carbon tetrachloride. The weight of the flask and carbon tetrachloride is found to be 703.55 g. From this information, calculate the density of carbon tetrachloride.

$$m = D = \frac{m}{V}$$

$$V =$$

Problem 7

- Calculate the density of sulfuric acid if 35.4 mL of the acid weighs 65.14 g.

$$m = D = \frac{m}{V}$$

V=

Problem 8

- You have a toy car and you use a triple beam balance to determine that the mass is 62 g. You then fill a graduated cylinder to 50 mL and drop the toy car in. The water rises to 67 mL. What is the density of the toy car?

$$m = D = \frac{m}{V}$$

$$V =$$

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Problem 9

- A box measures 10 cm by 8 cm by 14 cm and has a mass of 2240 grams. What is the density of the box?

$$m = D = \frac{m}{V}$$

$$V =$$

Summary

- Make up your own word problem.

Activator

- Explain the difference between element, compound, homogeneous and heterogeneous.

- How do you determine the volume of an irregular object?

- How do you determine the volume of a cube?

What is the density of a piece of wood that has a mass of 25.0 grams and a volume of 29.4 cm^3?

m=

$$D = \frac{m}{V}$$

V=

A piece of wood that measures 3.0 cm by 6.0 cm by 4.0 cm has a mass of 80.0 grams. What is the density of the wood?

m=

$$D = \frac{m}{V}$$

V=

A cup of gold colored metal beads was measured to have a mass 425 grams. By water displacement, the volume of the beads was calculated to be 48.0 cm^3. Given the following densities, identify the metal.

Gold: 19.3 g/mL

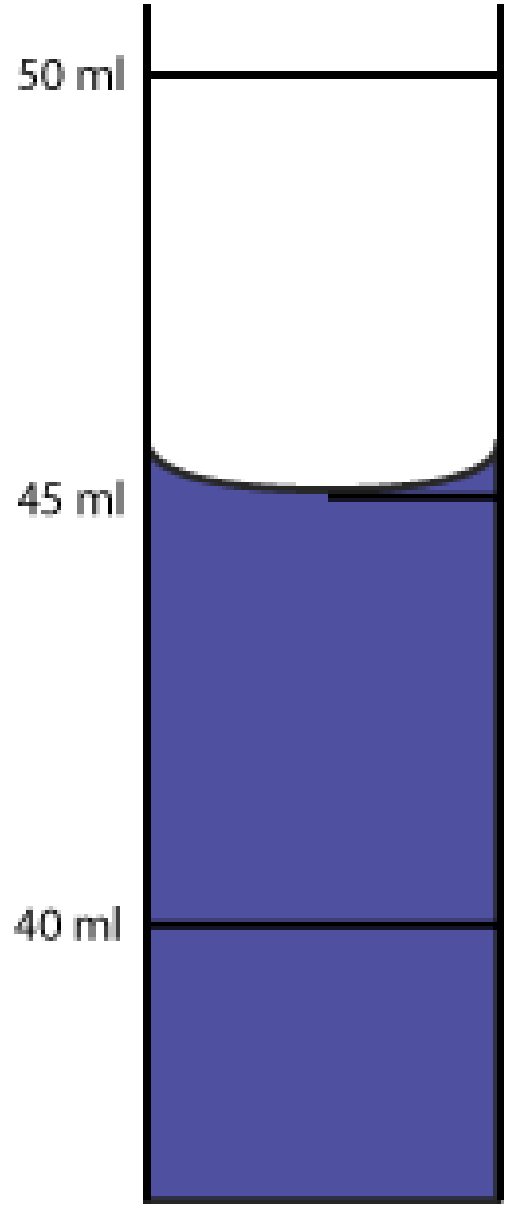
Copper: 8.86 g/mL

Bronze: 9.87 g/mL

m=

$$D = \frac{m}{V}$$

V=



The volume of a solution was measured in a graduated cylinder (shown to the left). If the mass of solution is measured to be 60.75 grams, what is the density of the solution?

m=

$$D = \frac{m}{V}$$

V=

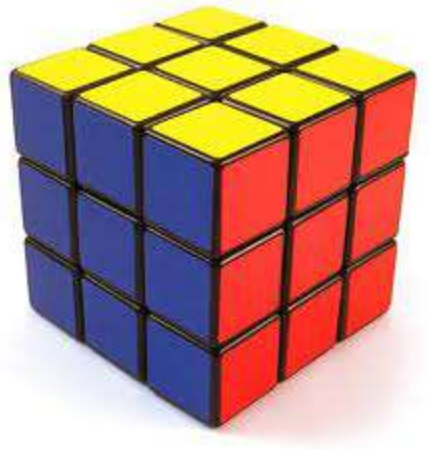
Activator

1. What equipment do we use to measure mass and volume?

2. What are the units of measure for mass, volume, and density?

Problem 1

What is the density of a 3 cm cube that has a mass of 27 g?



Problem 2

What is the density of a 55 g rock that displaces 10 ml of water?

Problem 3

What is the density of piece of wood that has a mass of 50 g and a volume of 10 cm^3.

Summary

1. How did you do on the assessment?
2. Which learning activities from this week helped you the most?
3. How could the instruction this week been better?
4. What concerns do you have about Physical Science?