DENSITY LAB (1/24/2018)

This lab is in 3 parts. Please manage your time wisely to get all parts finished. You will be required to complete all tables and questions on this google document and TURN IT IN after completion in google classroom. (Do not share with me, you will need to turn it in.) You may work with your lab group and share information but each student MUST complete and turn in their own lab report.

LAB PART 1 - density of water

1. Read over "Useful Calculations" on page 20 in your AMSTI textbook.
2. Complete Inquiry 2.1 on page 21
      (*be sure to look at the picture on page 22 to see how to measure looking at the meniscus)
3. Answer questions and complete Table 1.

Question:	Answer:
What is the unit of measure for the graduated cylinder?	
What is the maximum volume it can measure?	
What is the minimum volume it can measure?	

<mark>Table 1 - Calculating density of water</mark>
D = M/V
- Hint: the density of water should be @1.00 g/mL (if your calculations are off, the digital scale might be malfunctioning.)

Volume of Water (mL)	Mass of graduated cylinder (g)	Mass of Graduated Cylinder and Water (g)	Mass of Water (g)	Density of water (g/mL)
25 mL				
50 mL				

Reflection:	Answer:
What is the density of water?	
Does the density change if you change the volume?	

LAB PART 2 - Density of different substances

1. Read over and complete Inquiry 2.2 on page 23 in your AMSTI textbook.
2. Read over "Useful Calculations" on page 20 in your AMSTI textbook.
3. Answer questions and complete Table 2.

Question:	Answer:
Do you think all of these blocks have the same density?	
What measurements will you need to make to find the volume of these blocks?	

Table 2 - Densities of different substance of blocks

D = M/V

- Use a ruler for this activity.

Substance Type	Length (l) (cm)	Width (w) (cm)	Height (h) (cm)	Volume (v) (cm³) [v=lxwxh]	Mass (m) (g)	Density (m/v)
Wax						
Transparent plastic						
White plastic						
Aluminum						

Question:	Answer:
Are the densities of the blocks the same or different?	
How could this information be used to identify the substance from which an object is made?	

LAB PART 3 - density of irregular objects

1. Read over information on page 25 in AMSTI textbook "Density as a characteristic of property."
2. Discuss with your group how you would find the densities of the irregular objects.
   Hint: You can't measure them with a ruler.
3. Complete the table

CAUTION: Try to remove the items without taking out the water to keep a consistent volume in the graduated cylinder.

Predict the order of density of the 3 items. (steel bolt, nylon spacer, copper cylinder)

1.	
2.	
3.	

What reasoning do you have for your predictions?

Table 3 - Densities of irregular objects

D = M/V

(mL and cm^3 are interchangeable)

Item	Mass of the item (g)	Volume of water (mL)	Volume of water after placing in the item (mL)	Volume of the item (cm^3)	Density of object (g/cm^3)
Steel bolt		90 mL			
Copper cylinder		90 mL			
Nylon spacer		90 mL			

Question:	Answer:
Are any of the blocks from Inquiry 2.2 made from the same substance?	
What evidence do you have for your answer?	

EXTENSION ACTIVITY

Inquiry 3.1 - Using Density of make predictions
- Fill in the densities of the blocks and other items from the previous lab activity.
- Predict whether the items will sink or float.
- Test your hypothesis.

Question:	Answer:
Reasoning behind your predictions?	

Substance	Density (g/cm³)	Prediction Float or Sink?	Actual Float or Sink?	Correct or incorrect?
Water (use as a comparison)				
Wax block				
White plastic block				
Transparent block				
Aluminum block				
Steel bolt				
Copper cylinder				
Nylon spacer				