Defining Density

As we know mass and volume are physical properties of matter. Mass and volume have a special relationship. Density is a physical property that describes how much matter is packed into a given space. In other words, density is how much mass is in a given unit of volume. The density of many substances is compared to the density of water. What happens to the substance when it is placed in water? Does it sink or does it float? Even gases such as air, oxygen and carbon dioxide can be compared to the density of water. Think about when you open a soda can. The gas bubbles come to the surface of the liquid and we call it fizz. When a substance has a high density it will sink in water. When a substance has a low density it will float in water.

Materials: Large beaker of water, 3 different blocks, Ocean in a Bottle, (for each lab table – beaker, water, graduated cylinder, baking soda, vinegar, spoon and 10 raisins)

Part 1

What To Do:

1. Your teacher will show you some blocks made of various materials.
2. Make predictions about whether or not each will float by completing the statements below.

My predictions:

I think that block number 1 will SINK /FLOAT (circle one)

because _____

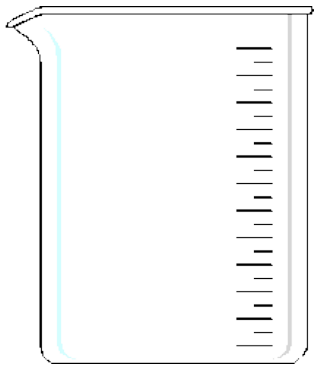
I think that block number 2 will SINK /FLOAT (circle one)

because _____

I think that block number 3 will SINK /FLOAT (circle one)

because _____

3. Your teacher will then place each block in a beaker of water.
4. Place a check mark by each prediction you got correct.
5. Draw the water level and where each block ended up.



Questions:

1. Which block had the highest density? _____

2. How do you know? _____

3. Which block had the lowest density? _____

4. How do you know? _____

Part 2

What To Do:

1. Your teacher will give your table a bottle that has two liquids in it.
2. Make a prediction about what will happen when the bottle is shaken by completing the statement below.

I think the two liquids will _____.

3. Shake the bottle for 1 minute. Observe for 1 minute.

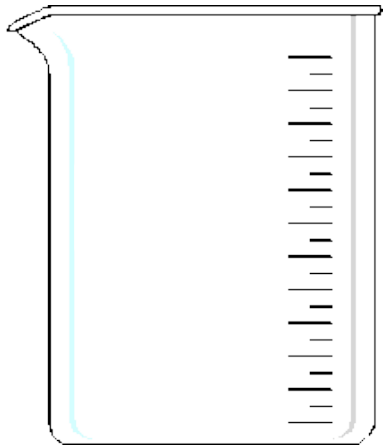
Questions:

1. Which color of liquid has the highest density? _____
2. How do you know? _____
3. Which color of liquid has the lowest density? _____
4. How do you know? _____

Part 3

What To Do:

1. Pour 30 ml of water into the beaker.
2. Place 1 spoonful of baking soda into the water and stir well.
3. Pour 10 ml of vinegar into the beaker.
4. Place 10 raisins in the beaker.
5. Draw what you observe in the space below.



Questions:

1. Why did the raisins sink in the liquid? _____
2. Why did the raisins float in the liquid? _____
3. What does this tell you about the density of the gas in the bubble?_____

Directions:

1. Watch the video "Float Egg" from www.missdoctorbailer.com.
2. Answer the following questions.

Questions:

1. What happened to the egg in the plain water?

_____

2. What happened to the egg in the salty water?

_____

3. Did the density of the egg change? _____

4. How did the density of the water change?

_____

5. From what you know about density explain why the egg sank in one glass and floated in another glass.

_____

_____

_____

Name _____ period _____

EXIT TICKET

Defining Density

From your experiences with this laboratory predict which of the following will float or sink in a beaker of water.

A penny	
A gas bubble	
A block of wood	
A piece of plastic	
Oil poured in the water	
A raisin	

Conclusion: (float, matter, salt, sink, property, dense)

Density is a physical _____ that measures how much _____ is packed into a volume of space. Objects with high density will _____ in water while objects with low density will _____ in water. Adding _____ to water causes the water to become more _____.

Name _____ period _____

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