

Buoyant Butter

Section: Properties of Matter; Topic: Density

Name: _____

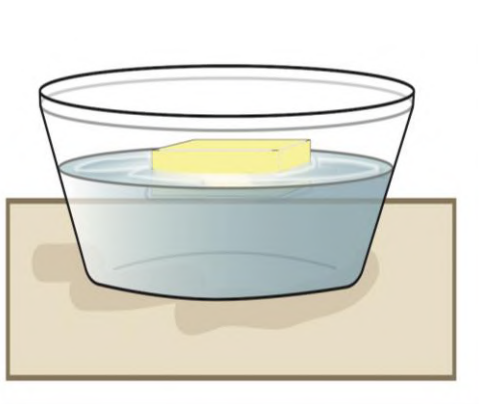
Date: _____

Inquiry Question

Write down what you'll be learning today! What do you want to understand?

Procedure

1. Determine and record the mass of the butter in grams (g). This can be measured on a scale or found on the wrapper label or box.
2. Using a ruler, measure and record the length, width, and height of the stick of butter in centimeters (cm).
3. Calculate the volume of the stick of butter by multiplying the length times the width times the height ($V = l \times w \times h$).
 - The answer will be in centimeters cubed (cm^3), which is equal to milliliters (mL). Record the volume in milliliters.
4. Calculate the density of the butter.
 - Density is the mass divided by the volume ($D = m/V$), so divide your answer from step 1 by your answer from step 3.
5. Determine the density of water. Make a prediction about whether the butter will float, hover in the middle, or sink in the water. Draw a model, and explain your thinking.
6. Fill the large bowl or container with water and place the butter in the bowl to determine whether your prediction was correct. Record your observations.



Observations, Data Collection & Analysis

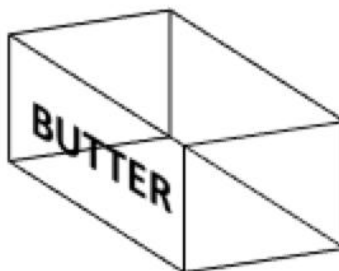
Write down your observations below.

1. Record your measurements and calculations in the following table.

Mass of Butter (g)	
Length (cm)	
Width (cm)	
Height (cm)	
Volume (cm ³)	
Density of Butter (g/cm ³)	
Density of Water (g/cm ³)	

2. Label this diagram (representative of the stick of butter) with your measurements and show the density calculation:

$$V = l \times w \times h$$



3. What is the formula for density? What is the unit of measurement for density?

4. Based on your calculation, is the density of the butter greater or less than the density of water?

5. What is the density of water? (This can be looked up online or in a textbook, or calculated by measuring the volume and mass.)

6. We know that the density of water is 1 g/mL. Is the density of the butter less than, equal to, or greater than the density of water? Does this mean that the butter will float, hover in the middle, or sink if we put it in the bowl of water?

7. Draw a model of where the butter will go when added to the water. Was your prediction correct?

8. If you place the stick of butter in salt water, do you think it will sink or float? Why?
