Having a Meltdown
Density of Liquids and Solids

Name _____

Date _____ Period _____

Purpose

To compare the amount of water present in volumes of snow and rain by using their density values.

Materials

- 25 mL graduated cylinder
- scale
- wash bottle

Data Collection

Determine the mass of four different volumes of water. The volumes can be any amount between 1 mL and 25 mL. Record your measurements in the table.

Mass of the empty graduated cylinder: _____

Measured			Calculated
Mass of water plus graduated cylinder (g)	**Mass of water (g)**	**Volume of water (mL)**	**Density $= \frac{mass}{volume}$ (g/mL)**

Questions

1. What is the volume of 12 g of rain? How do you know?

2. The mass and volume data in these tables were collected for snow and ice. Use the data to figure out the density of snow and ice for these measurements.
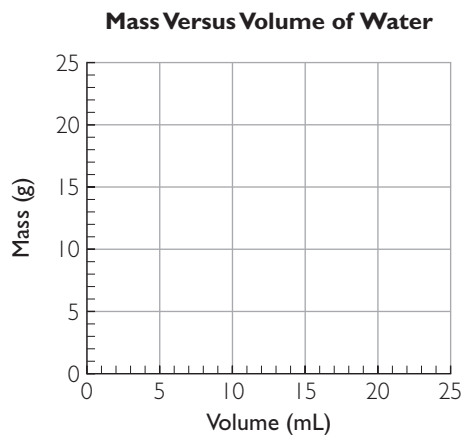
Snow

Mass	Volume	Density
1.7 g	3.4 mL	
3.7 g	7.4 mL	
7.9 g	15.8 mL	
10.2 g	20.4 mL	

Ice

Mass	Volume	Density
2.2 g	2.4 mL	
5.9 g	6.4 mL	
9.2 g	10.0 mL	
20.2 g	22.0 mL	

3. Plot the mass and volume data for rain, snow, and ice on the same graph. Draw the best straight line through each set of data points. Label them "rain," "snow," and "ice."

Mass Versus Volume of Water

[Graph with y-axis labeled "Mass (g)" ranging from 0 to 25 and x-axis labeled "Volume (mL)" ranging from 0 to 25]

4. What is the volume of 12 g of snow? How do you know? What is the volume of 12 g of ice? Show your work.

5. Compare. Place 12 g of rain, 12 g of snow, and 12 g of ice in order of increasing volume. Use density to explain the order.

6. Compare. Examine the lines on the graph for rain, snow, and ice. How is the steepness of each line related to the density of each substance?

7. Calculate. Imagine a 24 mL sample of snow from the mountains. When the snow melts, what is the volume of liquid water? Assume that the snow has density 0.5 g/mL.

8. Making Sense Explain how you can use the graph to compare the mass of water in equal volumes of snow and rain.

9. If You Finish Early If you have 10 cm of snow with volume 40 mL and density 0.5 g/mL, how many inches of rain is this?