

Name: _____ Date: _____

The Effect of Salt on Density
Rainbow Salt--An Investigation in Density

Purpose:

To make various saline solutions and layer them according to their respective densities.

Background:

Density is...

The density of pure water is...

Materials:

Triple-beam Balance	water dropper
1 – 50 mL Graduated Cylinder	salt
1 – 100 mL Beakers	food coloring
Sheet of background paper, White	water

Procedure:

- 1.) Prepare each of the following solutions in a 100mL beaker by adding salt, water, and food coloring in the following amounts :

Solution Number	Salt (g)	Water (mL)	Food Coloring (drops)
1	16.0	60	1 – Blue
2	11.7	60	1 – Yellow & 1 Blue
3	7.2	60	1 – Yellow
4	3.4	60	1 – Yellow & 1 – Red
5	0.0	60	1 – Red

NOTE: Stir until ALL salt is dissolved

- 2.) Using your water dropper, slowly draw up the solution from the first beaker. Place 10mL of the solution in the graduated cylinder.
- 3.) Rinse beaker and water dropper and create the next solution.
- 4.) For the second, third, fourth, and fifth solutions, place the water dropper along the inside of the graduated cylinder near the previous layer of solution, but not touching it. Drop the next solution drop-by-drop, gently allowing it to roll down the side.

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Picture: (Draw and label a picture of your results.)

Data and Observations:

Calculate the density of each salt solution using the example below. Make a data table under your drawing. Include Solution Number, Mass of Solution, Volume of Solution, and Density of Solution. Use correct units, carrying calculations to the hundredths place (2 decimal places).

Example: **Solution #1** *mass* = 16.0 g of salt + 60.0 g of water = 76.0 g of salt solution
volume = 60 mL of water (ignoring the 2 drops of food coloring)

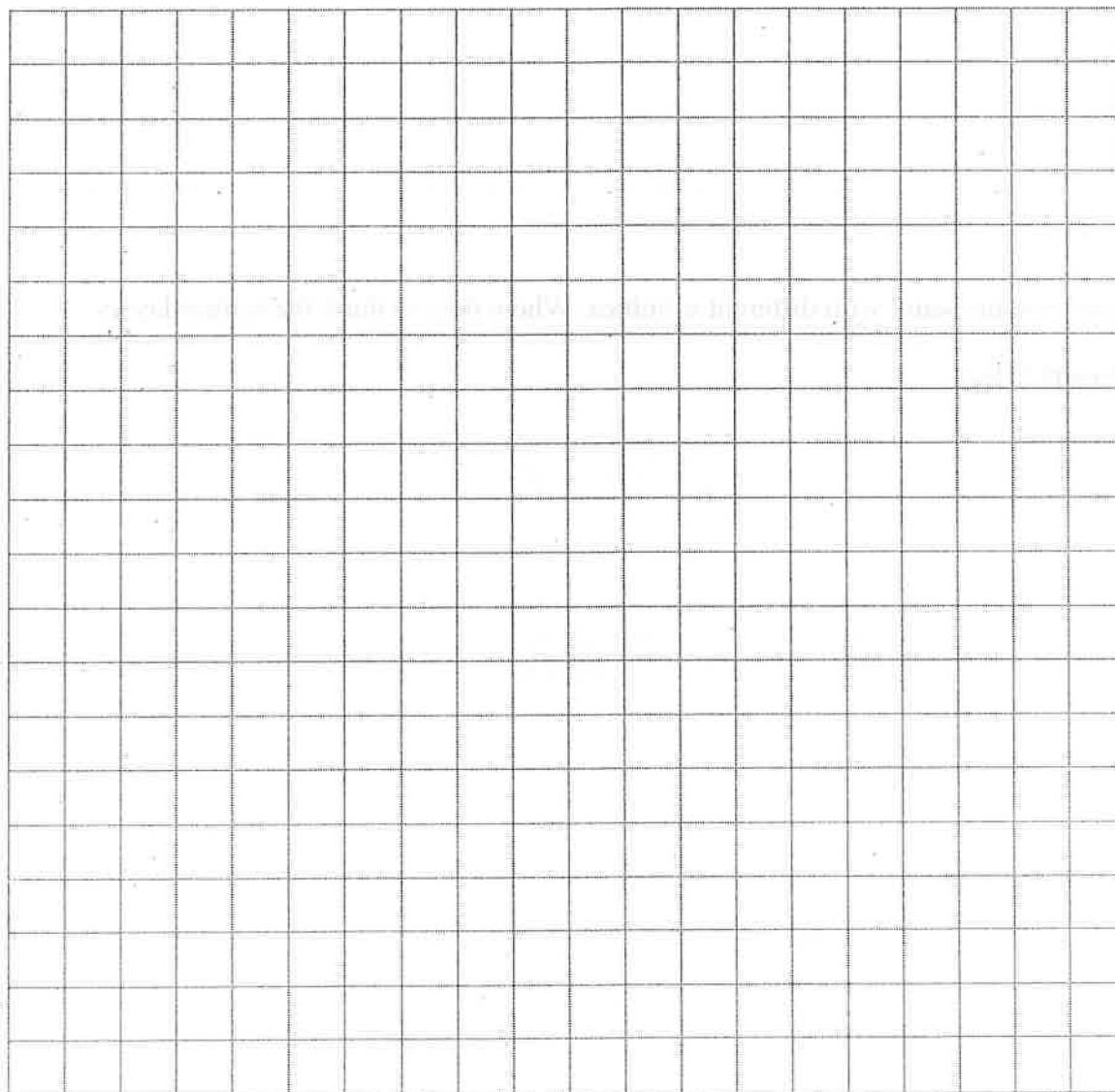
$$\text{density} = \frac{\text{mass}}{\text{volume}} = \frac{76.0\text{g}}{60\text{mL}} = 1.27 \frac{\text{g}}{\text{mL}}$$

Solution Number	Mass of salt	Mass water	Mass of Salt Solution	Volume of Solution	Density of Solution
1	16.0 g	60.0g	76.0 g	60.0 mL	1.27 g/mL
2					
3					
4					
5					

Analysis: (Describe WHAT happened)

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Analysis (cont.): Make a graph with “Mass of Solution” along the X-axis (scaled 0 to 100 g in increments of 5g or so) and “Volume” along the Y-axis (scaled 0 to 100 mL in increments of 5 mL or so).

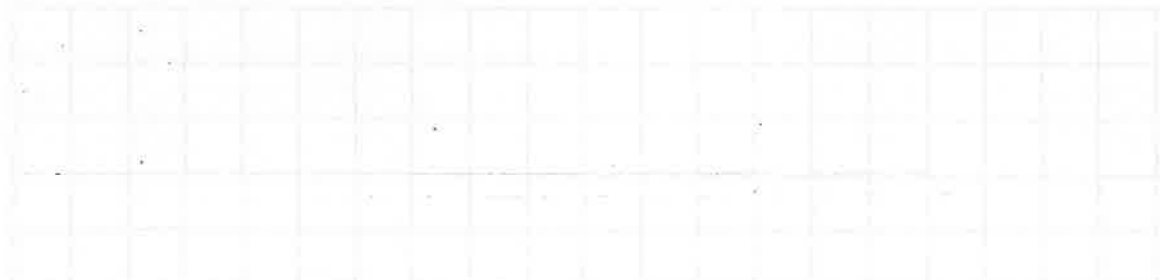


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Conclusion:

Answer the following questions in complete sentences:

1.) If all of the solutions were made with just salt and water, why did they form different layers?



2) The ocean contains water with different salinities. Where do you think the saltiest layers would be found? Why?

