



WHY DO LAVA LAMP BLOBS FLOAT & SINK?

Density Lab ($\rho = m \div V$) • NGSS 5-PS1-3 • CurioTreeShow.com • @CurioTreeShow

Student Name: _____ Date: _____ Grade: _____ XP / Score: _____

PART 1: KEY SCIENCE IDEAS FROM EPISODE 2

1. DENSITY

Nova • Math & Measuring

$$\rho = m \div V$$

0.92 < 1.00

Density is how much mass is packed into a space. Fill two same-size cups: the heavier one holds the denser liquid. Denser liquids sink; less dense liquids float on top.

2. OIL & WATER DON'T MIX

Tess • 1,000x Micro-Zoom

$$0.92 < 1.00 \text{ g/mL}$$



Water molecules stick to each other like tiny magnets. Oil molecules don't join in, so the two liquids separate into layers, with lighter oil (0.92 g/mL) floating on water (1.00 g/mL).

3. THE CO₂ BUBBLE ELEVATOR

Zara • Gas & Buoyancy

Bubbles ↑ Pop ↓



A fizzy tablet makes carbon dioxide gas. Bubbles stick to colored water blobs, making them less dense, so they rise. At the top, bubbles pop and the gas escapes, so the blobs sink again.

PART 2: EPISODE 2 REVIEW QUESTIONS (CIRCLE OR WRITE YOUR ANSWER)

1. When Milo poured vegetable oil into the bottle of water, why did the oil float on top?

- ☐ A) Oil is hotter than water ☐ B) Oil is less dense than water
☐ C) Oil has no mass ☐ D) The bottle was upside down

2. What made the colored water blobs rise up through the oil?

- ☐ A) Magnets in the food coloring ☐ B) Carbon dioxide bubbles stuck to the blobs
☐ C) The oil got heavier ☐ D) Build-O-Bot shook the bottle

3. MATH CHALLENGE ($\rho = m \div V$): A cup holds 100 mL of water with a mass of 100 g. The same cup filled with oil has a mass of 92 g. Find each density:

Water: $\rho = \underline{\quad} \text{ g} \div \underline{\quad} \text{ mL} = \underline{\quad} \text{ g/mL}$ Oil: $\rho = \underline{\quad} \text{ g} \div \underline{\quad} \text{ mL} = \underline{\quad} \text{ g/mL}$

4. THINK LIKE A SCIENTIST: Why do the blobs sink again after they reach the top of the bottle?

PART 3: HANDS-ON KITCHEN MINI-LAB — THE 3-LAYER DENSITY TOWER & LAVA LAMP (ADULT HELP!)

SUPPLIES: 1 Clear plastic bottle or tall glass • Water • Vegetable oil • Food coloring • 1 Fizzy (effervescent) tablet broken into 4 pieces • Timer. **Do not drink!**

INSTRUCTIONS: Fill the bottle 1/4 with water and add 5 drops of coloring. Slowly pour oil until the bottle is 3/4 full and wait for layers. Drop in 1 tablet piece and count the blobs that rise in 30 seconds. Repeat with 2 pieces.

Step	Prediction	What Is on Top?	Blobs Rising in 30 s	Notes / Drawing
1. Water + food coloring	[] Float [] Sink [] Mix	_____	_____	_____
2. Add vegetable oil	[] Float [] Sink [] Mix	_____	_____	_____
3. Add 1-2 tablet pieces	[] Float [] Sink [] Mix	_____	_____	_____

TEACHER / PARENT ANSWER KEY: Q1: B (oil is less dense) • Q2: B (CO₂ bubbles) • Q3: Water $100 \text{ g} \div 100 \text{ mL} = 1.00 \text{ g/mL}$; Oil $92 \text{ g} \div 100 \text{ mL} = 0.92 \text{ g/mL}$ • Q4: Bubbles pop, gas escapes, blob is denser again and sinks.

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