

Lava Lamp in a Bottle



Grade: 5th Grade | **Topic:** Lava Lamp in a Bottle | **Measurement:** US Customary (cups, ounces, inches, etc.)

Purpose

This experiment shows how oil and water behave when mixed and how adding a fizzy tablet creates moving bubbles. It helps students understand the concepts of density and chemical reactions in a fun way.

Hypothesis

If I put an effervescent tablet into a bottle filled with oil and colored water, then bubbles will form and move up and down inside the bottle like a lava lamp because gas is created and moves through the liquids.

Materials

- 1 clear plastic bottle or glass jar (about 16 ounces)
- 1 cup water
- 3 tablespoons vegetable oil (or any cooking oil)
- Food coloring (any color)
- 1 effervescent vitamin tablet or Alka-Seltzer tablet
- Measuring spoons
- Funnel (optional, to pour liquids)
- Paper towel or cloth for spills

Procedure

1. Fill the bottle about one-quarter full with water.
2. Add 5-6 drops of food coloring to the water and mix gently. The water will be colored.
3. Using a funnel, pour the vegetable oil into the bottle until it is nearly full, leaving some space at the top.
4. Wait a few minutes for the oil and colored water to separate into two layers (oil on top, water on bottom).
5. Break the effervescent tablet into 2 or 3 pieces.
6. Drop one piece of the tablet into the bottle and watch carefully what happens.
7. Observe the bubbles forming and moving up and down inside the bottle.
8. When the bubbling slows, you can add more pieces of tablet to keep the lava lamp effect going.
9. Clean up any spills with the paper towel.

Results

You will see colored bubbles rising and falling inside the bottle, creating a lava lamp effect. The bubbles are gas formed by the tablet reacting with the water, and because oil and water do not mix, the bubbles move through the oil seemingly floating up and down.

Conclusion

The oil and water separate because oil is less dense and does not mix with water. When the effervescent tablet touches water, it produces gas bubbles that rise through the oil, creating a moving lava lamp effect. This shows how different liquids and gases interact in a fun and visual way.

Learning Objectives

- Understand that oil and water do not mix because of differences in density.
- Observe a chemical reaction between an effervescent tablet and water producing gas bubbles.
- Learn how gas bubbles move through liquids, creating a lava lamp effect.
- Practice making a hypothesis and observing results.

Teacher Notes:

Key Concept: This experiment demonstrates the properties of liquids like density and immiscibility (oil and water do not mix), as well as a simple chemical reaction that produces gas bubbles. It also introduces students to observing and describing physical changes.

Answer/Explanation: The oil floats on top of the water because it is less dense. The effervescent tablet reacts with water to produce carbon dioxide gas. The gas bubbles carry droplets of colored water up through the oil, creating the lava lamp motion. When the bubbles reach the top, the gas escapes and colored water droplets fall back down.

Teaching Tips:

- Encourage students to predict before adding the tablet. 2. Make sure to supervise when handling the tablet. 3. Use clear bottles for best visibility. 4. Remind students to wait and watch carefully for bubble formation. 5. Discuss real lava lamps to connect the experiment to everyday life.

Relevant Standards: NGSS 5-PS1-4: Conduct an investigation to determine whether the mixing of two or more substances results in new substances., NGSS 5-PS1-3: Make observations and measurements to identify materials based on their properties.



Name: _____

Date: _____

Experiment Title:

Purpose: *(I wonder...)*

Hypothesis: *(I think...)*

Materials:

Procedure:

Results: *(What happened?)*

Conclusion: *(I learned...)*