

Lesson Plan: Lava Lamp

Content	Audience	Method	Output/Products	Outcomes/Impact
Give info on liquid density.	Ages Pre-K-4th grade	1. Give info on liquid density. 2. Facilitate brief discussion with students about liquid density, and ask questions. 3. Have the students hypothesize what they believe will happen. 4. Watch video https://youtu.be/CmjTVCU6nY4 5. Hands-on Activity	1. Brief discussion/info on liquid density.	1. Students will be able to work with instructor who will supervise this lesson. 2. Students will conduct a visual hands-on Experiment.

Supplies Needed

- Water bottles
- Funnel
- Food Coloring
- Alka-Seltzer
- Water Vegetable Oil

Subject

Science: Liquid Density

Prep

Optional: Have intern/instructor have all supplies ready and waiting for group.

Method

- Give a brief introduction of the experiment.
- Facilitate brief discussion with students about liquid density, and ask questions.
- Hypothesize

Liquid Density: Different liquids have different densities based on their weight. A cup of oil, for example, weighs less than a cup of honey. Liquids with the highest density will sink to the bottom of a cup, while liquids with a lower density will rise to the top. **Density** is how many particles are inside each liquid or simply how much space a substance takes up or uses. In an equation, density equals mass divided by volume. When the mass of an object/substance increases but the volume stays the same, the density of an object/substance increases.

Questions: What do you think is going to happen? What do you think you will see?

Hypothesis: Q&A: What do you think will happen if you add another alka seltzer tablet? It will cause a chemical reaction. Why are water and oil separate from each other? They cannot form chemical bonds.

Watch Video: <https://youtu.be/CmjTVCU6nY4>

Perform the Lava Lamp Experiment

1. Take a plastic bottle (16oz) and fill it about 2/3 full of vegetable oil using a funnel.
2. Use a 1/3 cup and fill with tap water. Then, add 5 to 10 drops of food coloring and stir together. (Step 1 and 2 can be reversed and vary in measurements.)
3. Pour the colored water into the plastic bottle using the funnel and let the mixture settle.
4. Take 1 alka-seltzer tablet and break it into 4 smaller pieces.
5. Drop one piece of the alka-seltzer tablet into the bottle.
6. The piece will sink to the bottom and as it dissolves, it will cause the colored bubbles to occur that will resemble "lava."

The Science behind the Lava Lamp Experiment

The oil and water will stay separated because they cannot form chemical bonds together. Once the components settle, you will see the colored water at the bottom of the bottle, and the oil on top. The alka-seltzer contains sodium bicarbonate and citric acid. When you mix these two ingredients with water, they combine to produce carbon dioxide. The carbon dioxide creates the water bubbles (lava) that float up through the oil. Then, as the chemical reaction slows down, the water bubbles fall back in place at the bottom of the water bottle.

Resources

<https://www.sciencefun.org/kidszone/experiments/lava-lamp/>

<https://www.steamsational.com/easy-science-experiments-for-kids-discover-liquid-density/>

Arkansas Education Standards

Kindergarten Science

K-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool
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1st grade Science

1-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
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2nd grade Science

2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
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NGSS Cross-Cutting Concepts

- Patterns
- Structure and Function

NGSS Science and Engineering Practices

- Asking Questions and Defining Problems
- Developing and Using Models
- Planning and Carrying Out Investigations



