Lesson: Lava Lamp Experiment	Name:
Teacher:	Date:

Lava Lamp Experiment Lesson Plan – STEM Scholars Hub

Florida State Standards:

- SC.4.P.8.1: Observe and describe the properties of matter, including mass, volume, and density.
- SC.5.P.8.2: Identify the effects of forces on the motion of objects, including gravity, friction, and buoyancy.

Florida State Benchmarks:

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A. Teacher: [Insert Name]
B. Grade Level: 4–8 (Can be adapted for other grades)
C. Subject: STEM / Science
D. Date: [Insert Date]
E. Duration: 45–60 minutes
F. Lesson Focus: Exploring density and chemical reactions using a Lava Lamp experiment

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G. Materials (per group):

- Vegetable Oil (160 mL)
- Vinegar (80 mL)
- Food Coloring
- Baking Soda (15 g)
- Water (60 mL)
- Spoon
- Clear Cup or Glass
- Small Bowl or Cup

H. Lesson Objectives

By the end of the lesson, students should be able to:

1. Understand and explain density and its role in the layering of liquids.
2. Describe the chemical reaction between baking soda and vinegar.
3. Demonstrate the experiment and explain their observations.

I. Procedures

1. Introduction (10 minutes)

- Ask students if they have seen a lava lamp and discuss how it works.
- Show a video or image of a lava lamp to illustrate the concepts.
- Introduce the experiment and explain its relation to density and chemical reactions.
- Review key vocabulary: **density, chemical reaction, gas (carbon dioxide), acid (vinegar), base (baking soda).**

2. Experiment (25–30 minutes)

- Step 1: Fill a clear cup two-thirds full with vegetable oil.
- Step 2: Mix vinegar and water in a small bowl, then slowly pour it into the oil.
- Step 3: Add a few drops of food coloring and observe its behavior.
- Step 4: Add the baking soda paste to the mixture and carefully observe the reaction.

3. Observation (5–10 minutes)

- Students observe bubbles rising to the top and discuss why this happens.
- Explain that **carbon dioxide gas** is produced, causing the bubbles to rise.
- Discuss how **density** affects the layering of liquids.

4. Generalization

- Lead a discussion to help students generalize their findings about density, chemical reactions, and gas production.
- Connect concepts to real-life applications, such as lava lamps.

5. Assessment – Comprehension Questions

1. What are the two main liquids used in this experiment? Which is denser?

2. What gas is produced in the reaction?
3. How does the food coloring behave in the oil and water? Why?
4. What happens to the bubbles after they reach the top, and why?
5. How does this experiment demonstrate density and chemical reactions?

- Optional: Students can complete an **observation report** summarizing their experiment, findings, and conclusions.

Safety Notes:

- Always wear **safety goggles and aprons**.
- Handle vinegar and baking soda carefully, as they create a foamy reaction.
- Keep the work area clean and avoid spills.
- Supervise students closely, especially when using food coloring to avoid stains.

Accommodations for ELL / ESE Students:

- Provide visual aids such as pictures of materials and a video of a lava lamp.
- Pair ELL students with bilingual peers or provide simplified instructions in their native language.
- Allow ESE students extra time for the experiment and offer tactile materials for engagement.