# Fizz Frenzy – The Explosive Mentos and Coke Experiment

**Florida State Standard:** SC.5.P.8.1 – Observe and describe that most substances exist in one of three states: solid, liquid, or gas.

**Florida State Benchmark:** SC.5.P.8.2 – Identify that gases can be released from liquids, and describe how the release of gas results in bubbles or foam.

**A. TEACHER:**
**B. GRADE LEVEL:** 5th Grade
**C. SUBJECT:** STEM/Science
**D. DATE:** [Insert Date]
**E. DURATION:** 45 minutes
**F. LESSON FOCUS:** Understanding physical reactions by observing how gas is released from carbonated beverages and how surface area affects this process using the Mentos and Coke experiment.
**G. MATERIALS:**

- 1 bottle of Diet Coke (2-liter)
- 1 roll of Mentos (mint flavor)
- Mentos dropper or paper tube
- Outdoor space
- Safety goggles (optional)

**H. LESSON OBJECTIVES:**
By the end of the lesson, students will:

1. Demonstrate the physical reaction between Mentos and Diet Coke.
2. Understand how surface area affects gas release in carbonated liquids.
3. Make observations about the reaction and explain it using scientific reasoning.
4. Answer comprehension questions related to gas release and reactions.

**I. PROCEDURES:**

1. **INTRODUCTION (5 minutes):**

- Ask students if they've ever seen a soda fizz or bubble after shaking. Introduce carbonation and the release of carbon dioxide gas ($CO_2$).
- Have students predict what will happen when the Mentos are dropped into the Diet Coke.
- Explain that today, they will observe a dramatic release of gas in the Mentos and Diet Coke experiment and learn the science behind it.

2. **EXPERIMENT (15 minutes):**

- **Setup:** Lead the class outside to a safe, open area.
- **Demonstration:** Show the materials (Diet Coke and Mentos) and explain what will happen when they are combined.
- **Step-by-step guide:**
  ▪ Open the Diet Coke bottle and place it on the ground.
  ▪ Use a Mentos dropper to quickly release 5-7 Mentos into the bottle.
  ▪ Step back and watch as the Coke erupts into a fountain of foam.

3. **OBSERVATION (10 minutes):**

- Have students record their observations (height of the geyser, speed of reaction).
- Discuss their observations and thoughts on why the reaction occurred.

4. **GENERALIZATION (10 minutes):**

- Explain that the rough surface of the Mentos creates many bubbles by providing nucleation sites for $CO_2$ to escape. This results in the rapid release of gas and the impressive foam fountain.
- Discuss practical applications of understanding gas release and surface area in real-world situations.

5. **ASSESSMENT (5 minutes):**

- Ask the following comprehension questions:
     1. What type of gas is released from the Diet Coke when the Mentos are dropped in?
     2. Why do you think Mentos causes a stronger reaction than other candies?
     3. How does the surface area of the Mentos affect the reaction?
     4. What would happen if we used warm soda instead of cold?
     5. How is this a physical reaction instead of a chemical reaction?
- Provide criteria for evaluating students' responses.

**Note 1 (Safety):**
Please ensure you conduct this experiment outdoors in a wide-open area, as the reaction can cause the soda to foam and shoot up rapidly. Wear safety goggles if necessary to protect eyes from splashes. After dropping the Mentos, step back to avoid being in the path of the eruption. Keep a safe distance from the bottle and ensure students are aware of the surrounding area to avoid any accidents. Always have adult supervision during the experiment.

**Note 2 (Accommodation of ELL, ESE, etc.):**
For ELL students, provide visual aids and demonstrations to ensure they understand the scientific terms related to gas release and surface area. Simplify the language used in the comprehension questions and encourage peer discussion. For students with special needs (ESE), allow extra time to observe and record the experiment and offer one-on-one assistance if needed. Consider providing a peer buddy system for support during the experiment.