Fizzing Science: Exploring the Chemistry of Alka-Seltzer Reactions!

Florida State Standard:
SC.4.P.8.1 - Recognize that the properties of matter can change in various ways, including physical changes and chemical reactions.

Florida State Benchmark:
SC.4.P.8.2 - Identify that the amount of substance remains the same before and after a chemical reaction, even though physical changes may occur.

A. TEACHER: [Your Name]
B. GRADE LEVEL: 4-8 (Adaptable for other grades)
C. SUBJECT: STEM/Science (Chemistry)
D. DATE: [To be filled by the teacher]
E. DURATION: 45-60 minutes
F. LESSON FOCUS: Exploring Acid-Base Reactions and Gas Production
G. MATERIALS:

- Alka-Seltzer tablets
- Water (room temperature)
- A clear plastic cup or small beaker
- A stopwatch or timer
- A stirring rod (optional)

H. LESSON OBJECTIVES:
By the end of the lesson, students will be able to:

- Conduct the Alka-Seltzer experiment to observe and analyze the chemical reaction.
- Document changes in gas production, reaction time, and physical observations.
- Formulate hypotheses on how varying conditions (like water volume and tablet quantity) affect the reaction.

I. PROCEDURES:

1. INTRODUCTION (10 minutes):

- Introduce the concept of chemical reactions, focusing on acid-base interactions and gas production.
- Ask students if they have seen or used Alka-Seltzer before and discuss what they think happens when it is added to water.

- Present the objectives of the experiment and review key vocabulary: acid, base, chemical reaction, gas production.

2. EXPERIMENT (25-30 minutes):

- **Step 1:** Prepare the Equipment: Place the clear plastic cup or beaker on a stable surface.
- **Step 2:** Add Water: Pour a measured amount of water into the cup or beaker (e.g., 100 mL).
- **Step 3:** Drop the Tablet: Quickly drop one Alka-Seltzer tablet into the water.
- **Step 4:** Observe the Reaction: Start the stopwatch or timer as soon as you add the tablet. Observe the reaction between the Alka-Seltzer and water.
- **Step 5:** Record Observations: Note the time it takes for the reaction to start, how long it lasts, and any observable changes, such as bubbling or fizzing.
- **Step 6:** Measure Gas Production (Optional): If you want to measure the gas produced, you can use a sealed container with a balloon to capture the gas and measure its volume.

3. OBSERVATION (5-10 minutes):

- Have students share their observations and discuss the signs of a chemical reaction.
- Encourage students to compare their results and discuss the factors affecting the reaction, such as temperature and water volume.

4. GENERALIZATION (5-10 minutes):

- Summarize the key concepts: acid-base reactions, gas production, and factors that influence reaction rates.
- Discuss the importance of variables in experiments and how changing one factor can lead to different results.

5. ASSESSMENT:

- **Comprehension Questions:**
  - What happens to the Alka-Seltzer tablet when it is placed in water?
  - How long does the reaction last from start to finish?
  - What observable changes occur during the reaction?
  - What gas is produced during the reaction?
  - How does changing the amount of water affect the reaction?
  - What would happen if you used more than one tablet?

Note 1: Safety Precautions
During this experiment, ensure that students understand the importance of safety. Have them wear safety goggles to protect their eyes from any potential splashes. Handle the Alka-Seltzer tablets carefully, as they are for external use only and should not be ingested. Make sure that the experiment is conducted on a stable surface to prevent spills. Remind students not to inhale the gas directly and supervise closely when using the reaction containers. All students should clean

up their workspace thoroughly after the activity to avoid any lingering residue from the experiment.

Note 2: Accommodation for ELL and ESE Students
For ELL (English Language Learners) and ESE (Exceptional Student Education) students, provide visual aids such as diagrams or photos to support understanding of the experiment. Use simple and clear language in the instructions, and pair students with a peer for guidance when necessary. For ELL students, provide key vocabulary words in both English and their native language if possible. Allow additional time for these students to complete the experiment and share observations. For ESE students, provide physical demonstrations of each step of the experiment and ensure they understand the process before starting the activity.