Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Alka Seltzer Reactions: An Inquiry-Based Investigation

In your lab groups, you will design, execute and interpret an experiment to test the effect of particle size on the reaction between Alka Selter tablets and water. You should be able to quantify your results in *at least* 1 way. Stronger experiments will include more than 1 type of quantitative data. *(\*Remember: “Quantitative” means you will be taking a measurement of something)*

BACKGROUND:

Alka Seltzer is a combination of an acid (C6H8O7) and baking soda (NaHCO3). When the two react in water, they generate, among other things, Carbon Dioxide gas (CO2).

C6H8O7 + 3NaHCO3 → 3H2O + 3CO2 + Na3C6H5O7

This means that as the reaction proceeds, you will observe several changes, including bubbles that indicate the release and loss of the carbon dioxide gas. You must use these changes in order to quantify the rate and extent of the reaction.

PROBLEM: How will the size of Alka Seltzer particles affect the rate and extent of its reaction with water?

PREDICTION: What result do you expect to see in this experiment and why?

MATERIALS AVAILABLE:

* Alka Seltzer
* Water
* Graduated Cyllinders
* Stop Watch or Timer
* Balance
* Straws
* Balloons
* Beakers/cups
* Plastic soda bottles
* Foil
* Syran wrap
* Rubber bands

DIRECTIONS:

1. Discuss with your group the goal of this lab.
2. Examine the available materials and write a procedure for your experiment.
3. Before starting experimentation, check in with your teacher and have your procedures approved.
4. Conduct your experiment and make adjustments as needed- you may need to conduct more than one trial or try several methods in order to produce quality data.
5. Be sure to include all procedures with your lab report.

LAB WRITE-UP: *(To be done in your lab book)*

Your write-up should include-

1. Your initial prediction
2. Materials list (only those that your group used)
3. All Procedures, even those that did not work as planned.
4. A sketch of your final set-up.
5. Organized data tables to display your results.
6. At least 1 graphical representation of your data with properly labeled axes.
7. The answers to the analysis questions below.

ANALYSIS:

1. Describe your groups experiment design process- how did you come up with your procedures? What were some challenges you faced and how did your group overcome them?
2. Explain 1 specific problem you had with your experiment design. How did this problem affect your data and how did you address the problem in future designs?
3. Explain 1 of your methods for obtaining quantitative data- what did you measure and what does that measurement mean in terms of reaction rate and vigor?
4. Write 1 paragraph in which you make a **claim**, support it with **evidence** from the experiment and explain your **reasoning** about the question: How does the size of particles affect the rate and extent of a reaction?