

Name _____

Date _____

Lab # _____

Title: Rates of Weathering

Problem: How does temperature and surface area affect the rate of chemical weathering?

Introduction: The climate in an area has an affect on the rate of weathering of rocks. In a hot, moist climate chemical weathering occurs rapidly while in a cool, moist climate physical or mechanical weathering is the predominate form of weathering. In this laboratory you will be observing how temperature and surface area will affect the rate of weathering on a tablet of alka-seltzer.

General Directions: Essentially you will be doing two separate experiments.

In the first experiment you will be comparing how fast the alka-seltzer tablets dissolve in two different temperatures of water. Carefully measure the temperature in the different containers of water leaving the thermometer in the water for about one minute to get more accurate readings. You will complete this part of the experiment by making a graph of your data with the temperature on the x-axis and time taken to dissolve on the y-axis. By connecting the points on your graph you will see the general relationship between changes in temperature and rate of chemical weathering.

What do you think will happen to the speed that the alka-seltzer dissolves in the different temperature water?

In the second part of the experiment you will be comparing the rate or speed that the tablets dissolve in water when the tablets are broken into smaller pieces. You will be working in your groups and have two tablets to work with. One tablet should not be broken while the other should be broken into many pieces or crushed. It is very important that the water be the same temperature in both cups you are using. Drop the tablets in the cups recording the time taken to dissolve.

Note: Always start the stopwatch as soon as the tablet enters the water and stop it when the entire tablet disappears.

Note: if the tablet is crushed you should stir both tablets so the powder does not clump.

What do you think will happen to the speed that the alka-seltzer dissolves as it is crushed?

Directions:

1. On a clean sheet of paper place your full heading, title, and problem for your lab.
2. Design a hypothesis that states your opinion for each problem.
3. Make a materials list of all the things that you need to solve the problem.
4. Make a list of **Procedures** that you will follow to do your investigation.
Note: write in complete sentences and in numbered sequence.
5. Make a data table for the data you will collect.
6. Have your Hypothesis – Procedure checked by your teacher.
7. Do your experiment and collect your data.
8. Make two graphs for your data. You may use a line graph
Note: Be sure to make your scale to use as much of the graph paper as possible.
9. Write a paragraph **conclusion**. Did your conclusion support your hypothesis? Why or why not? What is the relationship between the variables? Why do you believe this relationship exists?
10. Answer analysis and conclusion questions.

Analysis and Conclusions

1. **How** does temperature affect the rate of chemical weathering?
2. **How** does breaking the object in many pieces affect the rate of chemical weathering?
3. **Why** does breaking the object in many pieces affect the rate of chemical weathering? (Think molecular)
4. **Why** does temperature affect the rate of chemical weathering? (Think molecular)
5. In what type of climate would chemical weathering have the greatest affect on the land?
6. In what type of climate would mechanical weathering have the greatest affect on the land?
7. Finish this sentence: As the temperature of the water increases the time it takes for the tablet to dissolve _____.
8. Finish this sentence: As the tablet is broken into more pieces the time it takes for the tablet to dissolve _____.
9. Write a **conclusion** for each of your experiments.