Weathering Lab

**Purpose:** To investigate the processes of physical and chemical weathering.

**Materials:**

- Sugar Cubes (5)
- Shaker Bottle
- Hot Water
- Cold Water
- Alka-seltzer
- Triple Balance
- Blank paper
- 2 Thermometers
- 2 250 ml Beakers
- 2 Stop watches

**Part 1 Physical Weathering**

1.) Take the mass of 5 sugar cubes together using your triple beam balance. Record this mass in grams in the data table (attached to this sheet).
2.) Sketch a drawing of what the average sugar cube looks like in the data table.
3.) Place the sugar cubes in the jar.
4.) Shake the jar 20 times.
5.) Pour the contents of your jar out on your blank sheet of paper. Separate the sugar cubes and the crumbs.
6.) Take the mass of all your sugar cubes together and sketch the general appearance of one of the sugar cubes in your data table.
7.) Repeat this four more times.

**Analysis Questions**

1.) Describe in detail how the sugar cubes have changed throughout the experiment.

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

## Physical Weathering Data Table

<table>
<thead>
<tr>
<th>Shaking Trial</th>
<th>Drawing of Sugar Cube</th>
<th>Mass of Sugar Cubes (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Shakes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After 20 Shakes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After 40 Shakes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After 60 Shakes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After 80 Shakes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After 100 Shakes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 2 Chemical Weathering

Purpose: Temperature has an effect on the rate of weathering rocks. In a hot, moist climate chemical weathering occurs rapidly while in a cool, moist climate physical weathering occurs faster.

1.) You will be given 2 beakers, one with hot water and the other with cold water.
2.) For a minute, take the temperature for both the hot water and cold water. Record this in the data table.
3.) Drop an alka-seltzer tab in each of the containers. And time how long it takes each to dissolve.
4.) Record your information in the data table (on the back of this sheet).
5.) Repeat this two more times and record all information in the data table.

Analysis

1.) How does temperature affect the rate of chemical weathering?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
<table>
<thead>
<tr>
<th>Trial</th>
<th>Hot water temperature (Celsius)</th>
<th>Hot water time (seconds)</th>
<th>Cold water temperature (Celsius)</th>
<th>Cold water time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Graphing Physical and Chemical Weathering

Part 1 Physical Weathering

1.) Create a line graph that demonstrates the relationship between the amount of shakes and the masses of the sugar cubes.
2.) Label your x axis (horizontal axis) with the number of shakes (0 shakes to 100 shakes)
3.) Label your y axis (vertical axis) with possible masses of your sugar cubes (start low and increase, provide steady increments).
4.) Draw a line graph that illustrates the change in mass of the cubes after each shake. Draw this below:

Part 2: Chemical Weathering

1.) Create a double bar graph for the amount of time taken to dissolve the alka-seltzer in both hot and cold water.
2.) Label the x axis with your three trials.
3.) Label the Y axis with the time (start low and increase, provide steady increments).
4.) Draw your double bar graph on the back. See the board for examples.
Post Lab Questions

Directions: Answer these questions to the best of your ability. These are for a grade, do your best. You can use your book, your notes, or your lab results for the answers. Work together with your group to come up with the best answers.

1.) In what type of climate/biome would chemical weathering have the greatest affect on rocks and why? (2 points)

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

2.) Describe in detail how weathering and erosion work together as destructive forces to create geologic landforms. Explain what weathering and erosion are and how they work together. Finally give a specific example of a landform they created. (4 points).

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

3.) Explain how ice wedging (frost wedging) and plant roots as a form of physical weathering can damage a driveway (2 points).

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________