**Shake & Fizz! (Mechanical-“Physical” & chemical weathering)**

**\***Follow all safety guidelines for this lab**.**

**Introduction:**

Mechanical weathering is also known as \_\_\_\_\_\_\_\_\_\_\_\_\_weathering. Mechanical weathering takes place when rocks are broken down without any change in the chemical nature of the rocks. The rocks are essentially torn apart by physical force, rather than by chemical breakdown. The examples of **mechanical weathering** include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Chemical weathering** causes reactions in rocks where the bonds that hold the rocks together are broken. A new compound has been formed. The most common types of chemical weathering are oxidation, hydrolysis and carbonation. These occur often in the locations where there is a lot of water. When chemical reaction occurs, you can often feel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, hear \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or see\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Procedure:**

In this lab, you will simulate both mechanical and chemical weathering for three different types of rocks by placing them in different types of liquid in part A and shaking the rocks inside a bottle for 5 minutes in part B. ***Please make your predictions and your initial measurements first proceeding with the lab.***

**Part A:**

1. Make observation of cup A, B, and C before the lab. (What do you see?)

2. Place 1 piece of chalk in cup marked A. This is vinegar (please be careful!) Make observation when you drop it in (do you see anything? Hear anything?)

3. Place 2-3 limestone pieces in cup marked B. This is carbonated soda. Make observation when you drop it in (do you see anything? Hear anything?)

4. Place 3-4 limestone pieces in cup marked C. This is pure water. Make observation when you drop it in (do you see anything? Hear anything?)

5. **Move on to part B,** come back for step 6-7 & conclusion.

6. (After part B). Tilt each cup slightly to see any changes that you see. Is it cloudy? No change? Fizzing? Do you see any sediment? Record data.

7. Please remove all rock samples from the cup. Pour down water & carbonated drink in the sink. Bring cup A (vinegar) to disposing area. Dry all rock samples on napkin. Clean up your area (make sure the lab area is exactly as you found it)

**DATA:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Observation of each liquid before lab** | **Rock in each cup (sedimentary)** | **Observation immediately following rock addition** | **Observation after 10-15 minutes** |
| A (vinegar) | Chalk |  |  |
| B (carbonated drink) | Limestone |  |  |
| C (water) | Limestone |  |  |

**Part B:**

**1.** Make your observation of the 3 different types of rocks before starting. Write your observation. Write down the type of rock on table on the next page.

2. Measure the mass of each rock before starting. Record this data in the table on the next page.

3. Make your prediction on which rock will lose the most mass. Fill in your prediction on the next page.

**STOP, wait for the rest of the class to catch up.**

4. Put all 3 rocks in the bottle, and shake when the timer starts (you may have to wait patiently until other groups are ready). You will rotate shaking the bottle every 30 seconds (I will tell you when). Make sure everyone gets to shake at least twice. DO NOT STOP SHAKING THE BOTTLE before time is up. Your group will shake the bottle for 5 minutes.

5. Carefully pour out the water and dry the rocks on a napkin. Measure each rock’s mass and find the difference.

**Data:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of Rock**  [igneous]  [metamorphic]  [sedimentary] | **Proper Name** | **Mass Before** | **Mass After** | **Mass Lost (subtract mass after-mass before)** |
|  | Sandstone |  |  |  |
|  | Gabbro |  |  |  |
|  | Quartz |  |  |  |

**Hypothesis:** If the sandstone, gabbro and quartz is shaken up in a bottle for 5 minutes, then \_\_\_\_\_\_\_\_\_\_\_\_rock will lose the most mass.

**Part A Analysis: (Answer in complete sentences, using evidence from your lab).**

1. What were you simulating in this lab? (chemical or mechanical weathering?) How do you know?

2. Which rock was most affected by the liquid they were dropped in? Which one was affected the least? Explain why you think you this occurred.

**Part B Analysis: (Answer in complete sentences, using evidence from your lab).**

1. What were you simulating in this lab? (chemical or mechanical weathering?)How do you know?

2. How did your hypothesis compare to your actual result (cite evidence)?

The hypothesis was that if the three rocks are shaken up in a bottle for 5 minutes, then \_\_\_\_\_\_\_\_\_\_\_\_rock will lose the most mass. In the lab \_\_\_\_\_\_\_\_\_\_\_\_\_lost the most amount of mass, the mass of \_\_\_\_\_\_\_\_\_\_g, therefore, the hypothesis \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (is true. or must be rejected?)

3. Which rock lost the most mass? Which lost the least? Why do you think this is?