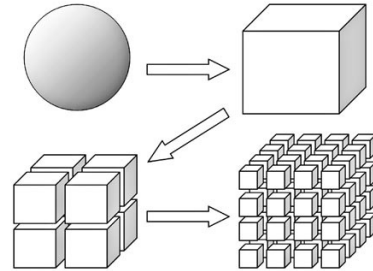


Name: \_\_\_\_\_  
Section: \_\_\_\_\_

# Rate of Weathering



**Introduction:** Weathering is the physical or chemical breakdown of rocks into smaller particles called sediments. These sediments may accumulate to form soil. Rocks weather because they are adjusting to a new environment which is different from the one in which they were formed. Weathering occurs when rocks are exposed to the air, water and living things at or near the earth's surface. Rocks may weather at different rates due to various factors concerning the rock or its environment.

**Purpose:** In this lab you will examine how particle size and exposed surface area affect the rates of weathering.

**Materials:** Ruler                  Stopwatch                  Candy

## Part 1: Measuring Average Particle Sizes

1. Each member in your team will receive an equal sized piece of candy. Leave the wrappers on the candy until you have read and completed all instructions for this part of the lab.
2. Record all data in the table and calculate the average particle size.
3. Using your Earth Science Reference Tables, classify the size of each candy (ex. – sand, clay, pebble). Write the name in the appropriate box marked "Particle Name".

	Largest	Larger	Smaller	Smallest
Particle Size	2.2 cm	0.93 cm	0.12 cm	.007 cm
Particle Name				

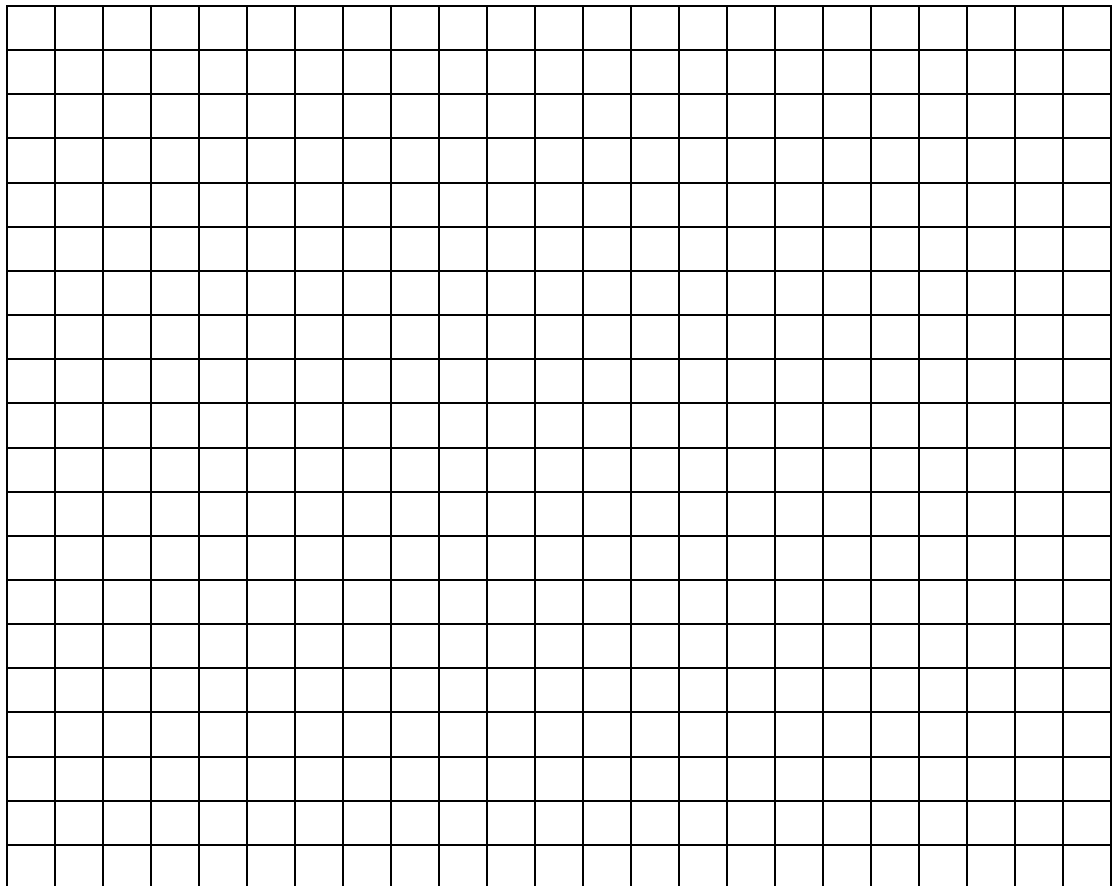
**Part 2: Measuring Weathering Rates**

1. Now all members of the group should place their respective candy particles in their mouths and start timing using the stopwatch. **Important:** *Try not to chew or swallow any of the particles in your mouth, let them dissolve.*
2. When the particle(s) in your mouth are completely dissolved, let your group timer record the time (in seconds) in the table.
3. Create a line graph comparing Particle Size vs. Weathering Time. Particle size should be plotted as the independent variable (X-axis) and weathering time as the dependent variable (Y-axis).

**Particle Size vs Weathering Time**

<b>Average Diameter</b>	<b>Largest 2.2 cm</b>	<b>Larger 0.93 cm</b>	<b>Smaller 0.12 cm</b>	<b>Smallest 0.007 cm</b>
<b>Weathering Time (Seconds)</b>				

**Graph – Particle Size vs. Weathering Time**



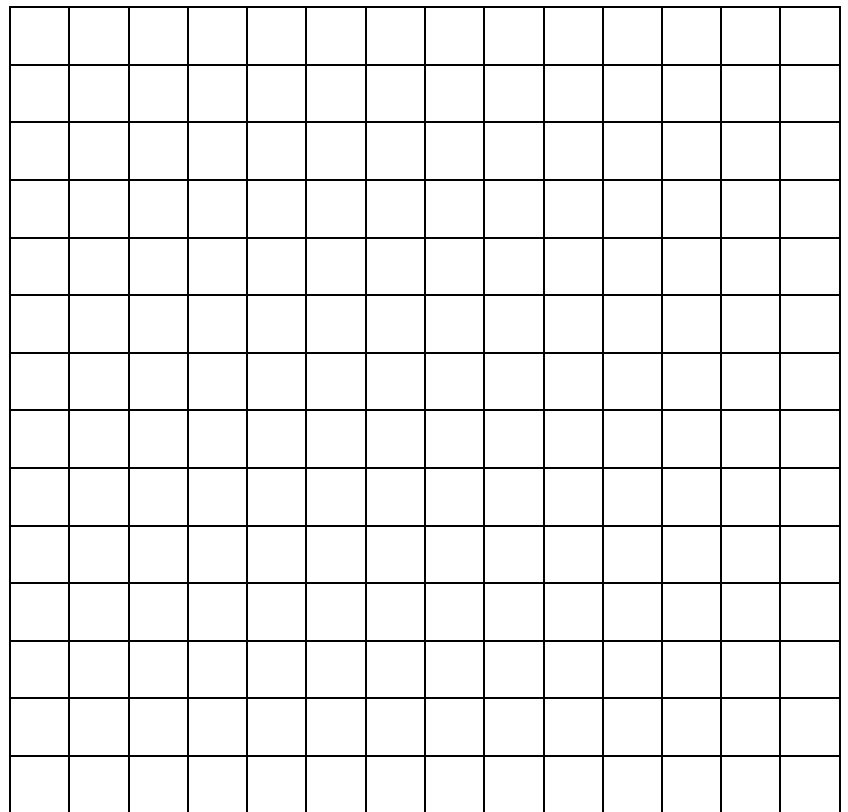
### Analysis and Conclusions:

1. Describe the relationship between particle size and weathering time.
2. What happens to surface area as the candy was broken into smaller pieces?
3. In this lab, what type of weathering took place first? Explain why
4. What type of weathering took place second (in your mouth)? Explain why.
5. Describe two (2) other factors, other than particle size, that affect weathering rates.
6. Which size particles have the greatest surface area?
7. What type of weathering is dominant in dry climates?
8. What type of weathering is dominant in warm, moist climates?
9. What type of mechanical weathering occurs in New York during winter on our roadways?
10. Name two (2) rocks that will dissolve in weak carbonic acid?

11. A group of students investigated the weathering rates of four different rocks. They placed 120 grams of each rock type into the same size container with the same amount of water. The students then shook the containers. Every three (3) minutes the students measured the amount of rock that had not weathered away. The table below shows the results of this investigation. Plot this information on the graph provided, and then answer the questions that follow.

Amount of rock not weathered (grams)

Amount of rock not weathered (grams)				
Time (minutes)	A	B	C	D
0	120	120	120	120
3	120	117	116	115
6	119	101	83	60
9	118	80	60	30
12	117	60	40	10
15	115	55	35	0
18	110	53	33	0
21	105	51	30	0
24	103	48	27	0



Time (minutes)

12. Which rock is hardest to weather? \_\_\_\_\_
13. At the end of 12 minutes, which of the rocks had weathered away half of its original mass? \_\_\_\_\_  
\_\_\_\_\_
14. For all four rocks, very little weathering took place during which time interval: 0 -3 minutes, 3 – 6 minutes, 6 – 9 minutes, or 9 – 12 minutes? \_\_\_\_\_ Why? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
15. What caused the rates for rocks B and C to level off between 15 and 24 minutes? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
16. Which of the four (4) rocks completely weathered away? \_\_\_\_\_
17. How much of rock B had weathered away in 24 minutes? \_\_\_\_\_
18. After seven (7) minutes, how much of rock D had weathered away? \_\_\_\_\_