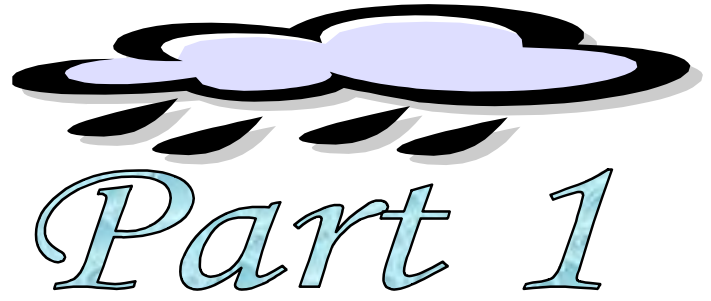


# Weathering Lab



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

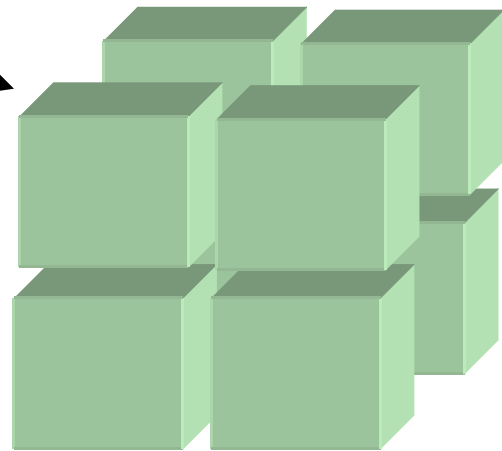
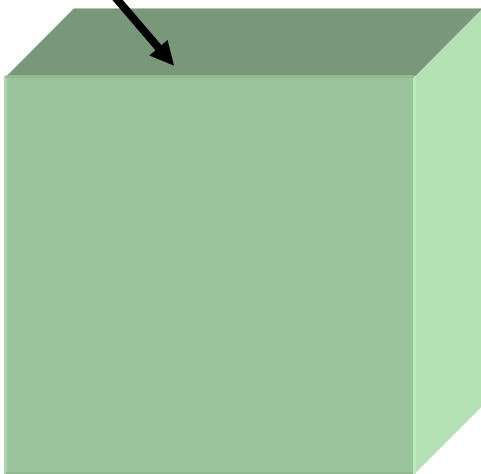
Class Period: \_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

**Introduction:** Running water is a primary agent of wearing down the surface of the Earth by both physical and chemical means.

- Rock fragments become rounded and smoothed as they are bounced along the stream channel and collide with other harder sediments.
- Water can also dissolve soluble minerals.
- The temperature of the environment can affect weathering.
  - High temperatures increase all chemical effects like dissolving and chemical reactions.
  - Low temperatures decrease all chemical effects
- The area of a rock surface exposed to chemical agents like water and physical agents like abrasion is called its SURFACE AREA.
  - More surface area exposed = more weathering
  - Less surface area exposed = less weathering

1 cube at 4 cm length/ width/ depth = **96 cm<sup>2</sup> of surface area**

8 cubes, each at 2 cm length/ width/ depth = **192 cm<sup>2</sup> of surface area**



**Same volume but 200% more surface area**

## Materials Needed:

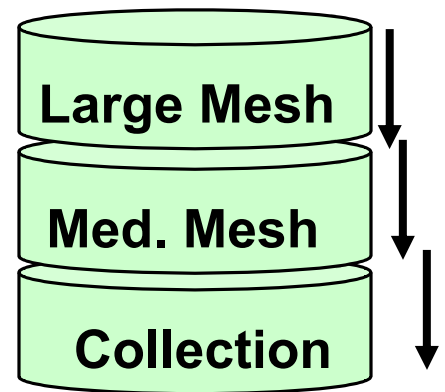
- Halite (rock salt form)
- Tap water (near room temperature)
- 400-500 ml beaker
- Sifting screens\* (large & medium mesh plus fine collection container)
- Window Screen section\*  
\* share with others
- Collection pan
- Balance
- Shaking jar with cap
- Stop watch or wall clock
- Waste bucket

## Hypotheses:

Small particles have more surface area by mass than large particles and therefore will weather faster (lose mass) than larger particles

### Preparation – Each Team:

1. Gather materials
2. Sort out three particle sizes using the sifting screen
  - a. Yields 3 different particle or grain sizes
3. Weigh (mass) 50 grams of large size halite
4. Weigh (mass) 50 grams of small size halite
5. Place the medium size halite into the 'medium' collection jar.
6. The teacher will save small samples of each size for comparison later



### Procedure – Hypothesis 1, Surface Area:

1. Place **50 grams of SMALLEST grains** into one shaking jar
2. Get a 300 ml beaker of tap water
3. Get stop watch – you will time for 40 seconds
4. Pour 300 ml of warm tap water into SMALL grain shaking jar
5. Close the lid and shake jar for 40 seconds
6. Pour small particle jar out through the window screen and collect any material on the screen – dump it out onto paper towels – dry it off a bit with paper towels
7. Observe the remaining sample for changes in size and shape
8. Weigh the remaining sample separately and RECORD data on data table
9. Place **50 grams of LARGEST grains** into another shaking jar
10. Then pour large particle jar out through the window screen and collect any material on the screen – dump it out onto paper towels – dry it off a bit with paper towels

**READ THIS STUFF**

## Data Table

### Surface Area: Data - Hypothesis 1

	<i>Halite Grain Size</i>	
Weight (grams)	Small	Large
<b>Beginning Weight</b>		
<b>Ending Weight</b>		
<b>Loss or Gain (g)</b> (Beginning – Ending Weight)		

### *Surface Area: Experimental Observations*

OBSERVATIONS	RECORD OBSERVATIONS IN THIS COLUMN
<b>SMALL GRAINS</b> - Are there any of the small grains left?	Yes or No
Is the halite grain size the same grain size you started with?	Yes or No
Is the halite the same shape you started with?	Yes or No
What happened to the small size material in the experiment?	
<b>LARGE GRAINS</b> - Are there any of the large grains left?	Yes or No
Is the halite grain size the same grain size you started with?	Yes or No
Is the halite the same <i>shape</i> you started with?	Yes or No
What happened to the large size material in the experiment?	

### **Conclusions for Hypothesis 1 - Surface Area**

**(how did the experiment prove or disprove the hypothesis) – Be Specific! Use examples from your experiment to explain the results of your experiment.**

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**Regents Review Questions: (circle the correct answer)**

<p>1. What is the largest particle that can generally be transported by a stream that is moving at 200 cm per second?</p> <p>a. sand                                  c. cobble b. pebble                                 d. boulder</p>	<p>5. When small particles settle through water faster than large particles, the small particles are probably</p> <p>a. lighter                                  c. better sorted b. flatter                                  d. more dense</p>
<p>2. Which geologic feature is caused primarily by chemical weathering?</p> <p>a. large caves in limestone bedrock b. a pattern of parallel cracks in a granite mountain c. blocks of basalt at the base of a steep slope d. the smooth polished surface of a rock in a dry sandy area</p>	<p>6. Which type of climate has the greatest amount of rock weathering caused by frost action?</p> <p>a. a wet climate in which temperatures remain below freezing b. a wet climate in which temperatures alternate from below freezing to above freezing c. a dry climate in which temperatures remain below freezing d. a dry climate in which temperatures alternate from below freezing to above freezing</p>
<p>3. Chemical weathering will occur most rapidly when rocks are exposed to the</p> <p>a. hydrosphere and lithosphere b. mesosphere and thermosphere c. hydrosphere and atmosphere d. lithosphere and atmosphere</p>	<p>7. Which factor has the most influence on the development of soil?</p> <p>a. climate b. longitude c. amount of rounded sediment d. age of the bedrock</p>
<p>4. Which material would most easily be carried in suspension by a slow moving stream?</p> <p>a. clay                                      c. sand b. silt                                        d. gravel</p>	<p>8. Define physical weathering</p>

