NAME _____ *DATE* _____

INSTRUCTOR _____ *PERIOD* _____ *PARTNER* _____

UNIT 3: Surface Processes and Landscapes

LAB 3-1: STREAM ABRASION

INTRODUCTION: Running water wears down Earth's surface. Running water may break up sediments by both physical and chemical means. Rock fragments have their edges physically rounded as they are rolled and bounced along the stream channel. Running water may also dissolve soluble minerals in the rocks.

The model represented by this lab will demonstrate some factors that control the weathering of particles in running water.

OBJECTIVE: You will determine some factors that affect the rate at which rocks abrade in running water.

VOCABULARY:

abrasion:

weathering:

sediment:

erosion:

hardness:

soluble:

bedrock:

PROCEDURE A:

1. Weigh out 100 grams of presoaked limestone chips which have been drained. This does not have to be exactly 100 grams but do measure to the nearest .1 gram and record on Chart A on the Report Sheet.
2. Place the chips in the plastic container. Add 200 ml of water.
3. Tightly cap the container. Shake for 3 minutes at a steady tempo.
4. Placing a screen over the opening, pour out the water. Remove the chips and dry with a paper towel. Be sure to weigh ALL of the rock chips.
   Record this new mass remaining at Time = 3.
5. Return the chips to the container and repeat the process 3 more times (shaking for 3 minutes, drying, reweighing and recording data) until the chips have been shaken a total of 12 minutes.

6. Use the equation:

$$\% \text{ Remaining} = \frac{\text{New Mass}}{\text{Mass at Time 0}} \times 100$$

Calculate the percent of mass remaining after each 3 minute interval.

7. On Graph 1, plot the data for percent mass remaining versus time. Draw a line graph.

PROCEDURE B:

1. Repeat the steps of Procedure A using quartz chips in place of limestone. Record data on Chart B.

2. Graph these data on Graph 1 using the same axes but a different color than for Procedure A. Provide a key.

PROCEDURE C:

1. On Chart C, fill in the percent mass which remained for limestone and quartz at the end of the first 3 minutes.

2. Weigh approximately 100 grams of halite. Determine, by the above method, the percent mass remaining at the end of 3 minutes. Enter this on Chart C.

3. On Graph 2, plot the data from Chart C as a bar graph.

PROCEDURE D:

1. Compare the size and shape of abraded and unabraded particles of each rock type used in this lab.

2. Record your observations on Chart D of the report sheet.

REPORT SHEET

CHART A

Weathering time (min.)	Mass Remaining	% Mass Remaining
0		
3		
6		
9		
12		

GRAPH #1

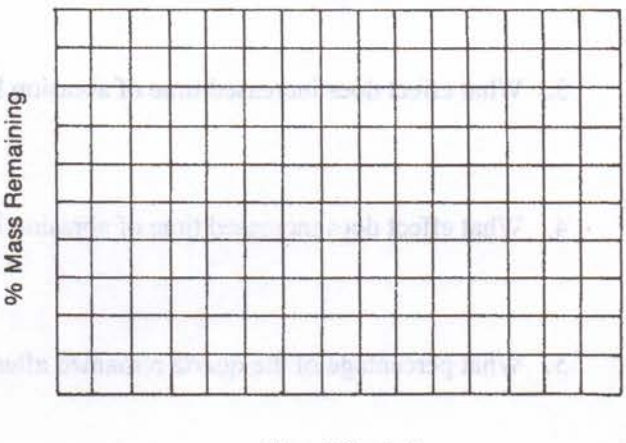

CHART B

Weathering time (min.)	Mass Remaining	% Mass Remaining
0		
3		
6		
9		
12		

CHART C

Type of Rock	% Mass Remaining After 3 min.

GRAPH #2

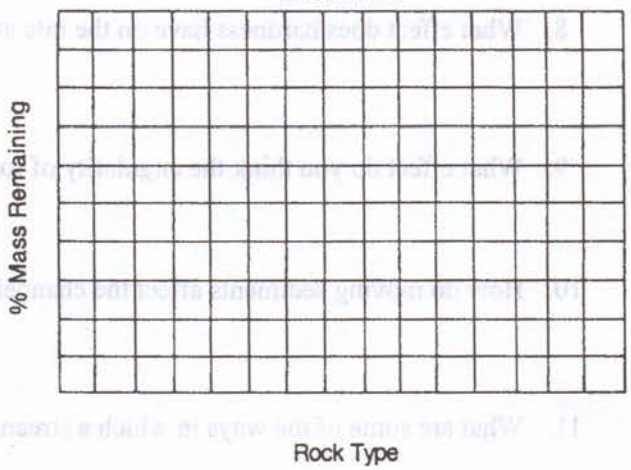

CHART D

ROCK TYPE	ROCK TYPE COMPARISON UNABRADED TO ABRADED

DISCUSSION QUESTIONS: *(Answer in Complete Sentences)*

1. How did the rate of loss of the limestone change from the beginning of the experiment to the end?

2. How do you explain the reason for the change in rate at which limestone was lost?

3. What effect does increased time of abrasion have on the size of rock fragments?

4. What effect does increased time of abrasion have on the shape of rock fragments?

5. What percentage of the quartz remained after three minutes?

6. What percentage of halite remained after three minutes?

7. What characteristic of halite is responsible for the results in Procedure C?

8. What effect does hardness have on the rate at which a rock abrades?

9. What effect do you think the angularity of rock chips has on the abrasion rate?

10. How do moving sediments affect the channel of a stream?

11. What are some of the ways in which a stream carries material?

CONCLUSION: What are some factors that affect the rate at which rocks abrade in running water?