

# KEY

## Earth Science Midyear Cornerstone Assessment: Part A. Scientific Investigation

*Directions:* Read the paragraph below and then respond to the questions.

The Class of 2016 has decided to buy the school a statue of your mascot as a commemorative gift. Your sponsor has reminded the officers to choose a statue material that is resistant to chemical weathering by acid rain. She has asked you to design an experiment to test the resistance of different types of rocks to the effects of acid rain. She would like you to investigate the following types of rock: Limestone, Marble, Granite.

1a. What is the **independent variable in your investigation**? Type of rock

1b. Why did you choose this answer?

b/c that is the variable being tested (what we are changing)

2a. What is the **dependent variable in your investigation**? Mass of rock after weathering/rate of weathering

2b. Why did you choose this answer?

That is what we are measuring and it depends on the IV

3a. What is your **hypothesis**?

If all the rock types are exposed to acid, then the granite's mass will change the least/then the limestone's mass will change the most.

3b. Why did you choose this answer?

Answers will vary

Available Materials:

Sample of limestone	jars with lids	metric ruler	heat lamp
Sample of granite	weak acid solution	graduated cylinder	clock/stopwatch
Sample of marble	thermometer	balance	food coloring

4. Identify the **materials** you would use in your experiment.

Sample of limestone, sample of granite, sample of marble, jars with lids, acid, graduated cylinder, stopwatch

## KEY

- 5a. List the variables you need to hold **constant** in your experiment? Amount of acid, same person shaking, amount of material started with
- 5b. Explain why they should be held **constant**. To make sure you are testing only one variable
6. Describe the **steps** you would take to conduct your experiment.
7. Set up a data table for this experiment. Include labels for each row and column (you do not need to include data).

1 get samples of granite, limestone, marble

2 record the mass of each sample rock

3. place rock sample in each jar

4 add a given amount of acid to each jar

5 put lid on

6 shake for 10 min.

7 empty acid/ dry rock/ measure/record mass of rock left

Repeat steps 4-7 two more times

# KEY

## Earth Science Mid-term Cornerstone Assessment: Part B. Data Analysis and Interpretation and Scientific Reasoning

*Directions:* Read the paragraph below and review the data table. Then, answer the questions that follow.

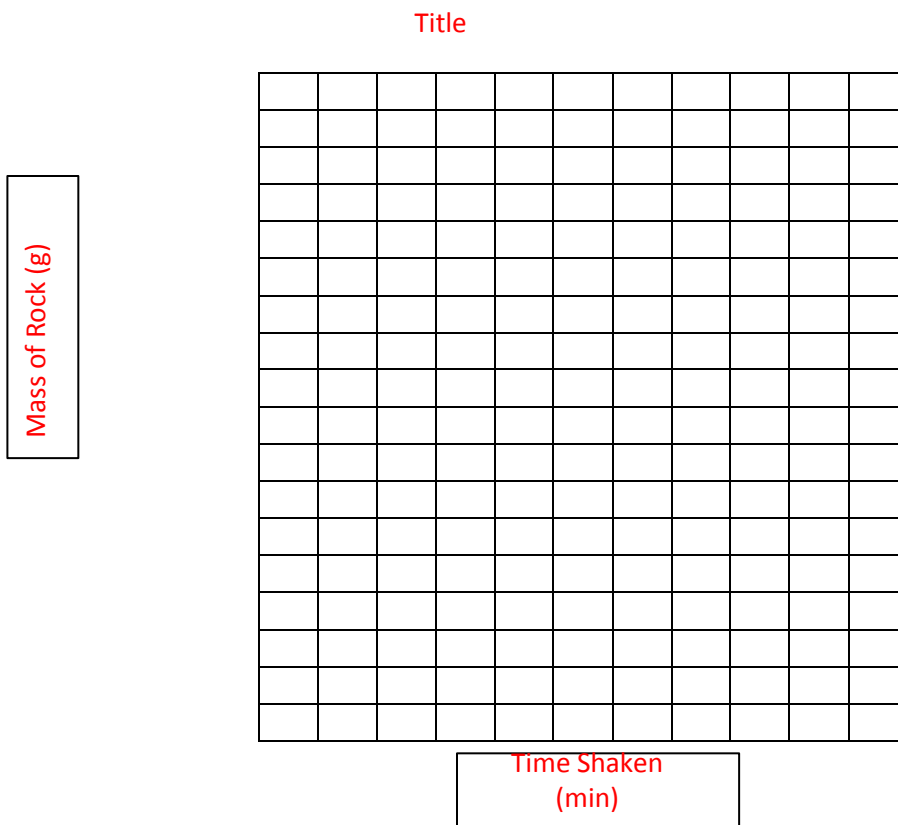
The officers of the Class of 2016 were investigating the resistance of different rock types to the effects of chemical weathering by acid rain. Here is the data they collected.

	Mass of Rock Sample (grams)			
	Initial Mass	10 minutes of shaking	20 minutes of shaking	30 minutes of shaking
Granite	50	50	50	50
Marble	50	49	48	47
Limestone	50	45	40	35

- Based on the data, predict the mass of each sample after 40 minutes of shaking.

	40 minutes of shaking
Granite	50
Marble	46
Limestone	30

- Create a graph to display the data provided for this experiment.



## KEY

3. Which material has the greatest rate of change? Limestone
4. Based on your graph, draw a conclusion about the resistance of different types of rock to the effect of chemical weathering by acid rain?

According to the graph, limestone is the least resistant to chemical weathering and granite is the most resistant to chemical weathering by acid