Earth Science

Baseline Cornerstone Assessment

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2012 - 2013

This assessment consists of two parts.

DIRECTIONS to provide to read to students:

Today you will be taking the Earth Science Cornerstone Assessment to find out your skills in scientific investigation, data analysis and interpretation, and scientific reasoning. Read each question carefully and provide your *best* answer or response.

Record your answers directly on the spaces provided in the assessment. Be sure your work and responses are legible.

Earth Science Baseline Cornerstone Assessment: Part A. Scientific Investigation

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

Sam spent the summer as a lifeguard at the beach and observed that the sand was hotter than the water. He wondered how the absorption of heat was affected by different types of materials. He decided to perform an experiment for the science fair. Sam decides to test water, sand and potting soil.

1a. What is the **independent variable**? ______

1b. Why did you choose this answer?

2a. What is the **dependent variable**? ______

2b. Why did you choose this answer?

Design a science experiment to determine which material gets the hottest throughout a 30 minute time period. You may use some or all of the following:

- Sand
- Potting Soil
- Water
- Heat lamp
- Timer
- Q-tips
- Ruler

- stirring rod
- thermometers
- balance
- paper and pencil to record data
- Pyrex beakers
- Salt
- Balloons

3a. What is your hypothesis?

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3b. What is the logical reasoning behind your hypothesis?

4a. List three variables you need to hold **constant** in your experiment?

4b. Explain why they should be held constant.

5. Identify the materials you would use in your experiment.

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).

Earth Science Baseline Cornerstone Assessment: Part B. Data Analysis and Interpretation and Scientific Reasoning

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

Sam tried to answer the question: "Which material absorbs heat the fastest?" Here is the data that Sam collected.

	TEMPERATURE OVER TIME				
	0	10	20	30	
	minutes	minutes	minutes	minutes	
Sand	27	31	35	39	
Potting	27	28	30	32	
Soil					
Water	27	27	27	28	

1. Based on the data, predict the temperatures for each of the following substances at 40 minutes.

	40 minutes
Sand	
Potting Soil	
Water	

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

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3. Which material has the greatest rate of change?

4. Based on your graph, draw a conclusion about the absorption of heat and different types of materials.


