

NAME: _____ PERIOD: _____ DATE: _____

LAB PARTNERS: _____ LAB #33

ABSORPTION AND RE-RADIATION OF ENERGY BY LAND AND WATER

INTRODUCTION

The earth's surface is approximately 75% water and 25% land. Because land and water heat and cool off at different rates, variations occur in temperature which affects local and world-wide weather patterns.

OBJECTIVES

You will be able to measure the rates at which water and soil surfaces heat and cool.

APPROXIMATE TIME 2 periods

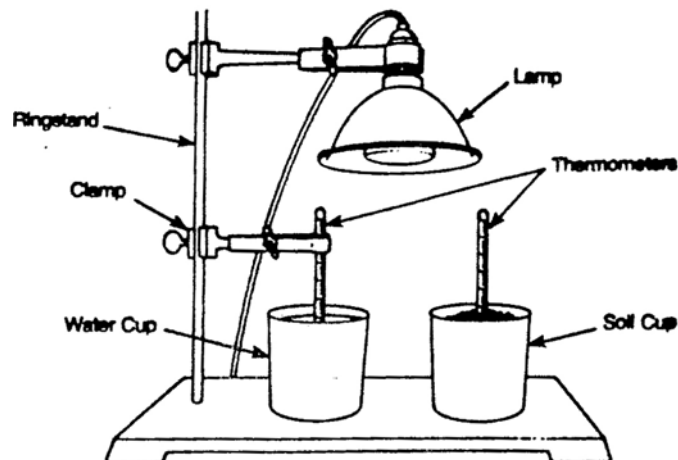
MATERIALS

2 cups	heat lamp	graph paper
2 thermometers	soil and water	ring stand 2 clamps

PROCEDURE

1. Fill one cup with water at room temperature and the other with soil at room temperature.
2. Place a thermometer in each cup making sure the bulb is just below the surface of the water and soil.
3. Allow the thermometers to reach room temperature and enter that reading under time 0 in the data table.
4. Turn on the lamp and take readings at one minute intervals for 10 minutes, recording these readings in the data table.
5. At the end of 10 minutes, **turn off the lamp and move it away**. Continue reading and recording the temperature of both cups each minute for the next 10 minutes.
6. Graph the temperature for the soil and water using two curves on the same set of axes. Label each line.
7. Answer questions 1-8.

HYPOTHESIS: Think about the set up of this lab. Write a short hypothesis about what you think may happen to the temperature of the soil and water in this lab.



DATA TABLE

LIGHT ON			LIGHT OFF		
TIME (Min)	SOIL TEMP °C	WATER TEMP °C	TIME (Min)	SOIL TEMP °C	WATER TEMP °C
0			11		
1			12		
2			13		
3			14		
4			15		
5			16		
6			17		
7			18		
8			19		
9			20		
10					

LABORATORY QUESTIONS

1. How did the heat energy **RECEIVED** by the cup of soil compare to the heat energy **RECEIVED** by the cup of water? _____
2. Which cup heated more rapidly? _____
3. Which cup cooled more rapidly? _____
4. Which was the better absorber of energy, soil or water? _____
5. Which material has the highest specific heat, soil or water? _____
6. By 4:00 PM on a clear summer day, would air be warmer over the land or over the nearby ocean?
 _____ Why? _____

7. Does this experiment support your hypothesis? Explain. _____

8. **CONCLUSION**: Using a short paragraph, write about what you learned in this lab.