



Name: _____

Date: _____

Pd: _____

Heating Earth's Surface: How We Get Local Winds

I. Purpose/Hypothesis

The purpose of this lab is to determine how land breezes and sea breezes occur by comparing the heating and cooling rates of water (ocean) and sand (land).

If the same _____

then _____ will gain heat faster and lose heat faster than _____.

II. Materials

- 2 thermometers
- 2 beakers, 400 mL each
- 300 mL water
- 1 Metric Ruler
- 300 mL sand
- 1 Lamp with 150-W Bulb
- 1 Clock or Stopwatch

III. Procedure:

1. Gather your tray of materials from your teacher
2. Place 1 thermometer in each beaker about 5 cm into the beaker (about the length of your thumb)
3. Turn on the lamp. **MAKE SURE IT IS FACING THE WATER AND THE SAND**
4. Position the lamp so it is about 20 cm or so away from each beaker
5. Once your lab is set up, record the temperature of the sand and water in your data table below every minute for 10 minutes
6. Turn off the light and read the temperature of the sand and water for every minute for another 10 minutes. Record in your data table.
7. Clean up your lab materials and type a formal lab report.

IV. Data:

A. Diagram – Attach on a separate paper, or color directly on typed lab.

B. Observations – n/a

C. Data Table

Temperature with Light On		
Minute #	Sand	Water
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Temperature with Light Off		
Minute #	Sand	Water
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

D. Graph – Create two separate graphs, one for heating, and one for cooling

E. Analysis Questions: *(rewrite the questions, then answer them)*

1. Calculate the total change in temperature for both the sand and water. *(Hottest Temperature – Coldest Temperature = Net Change in Temperature)* Which had the greater change?
2. What can you conclude about which material absorbed heat faster?
3. Based on your results, which do you think will heat up more quickly on a sunny day: the water in a lake or the sand surrounding it? Which will cool off more quickly after dark?
4. Using the data from your lab, explain how Land Breezes and Sea Breezes occur

V. Conclusion

Write your **3rd person** conclusion, including all prompts from your pink sheet.