

Name _____
Date _____

How Much Heat Can Water Hold?

Probing Questions:

Have you ever been to the beach or to a sandy lake in the morning? Is the sand warm or cool? What was the temperature of the sand like at lunch time? What about at night? Have you ever wondered why the temperature of the sand is different at different times of the day? What about the water temperature? Does it vary as much as the sand? Can you explain your observations?

In this lab, you will investigate the scientific principles behind your observations.

Materials:

sand
water
hot plate or heat source
beakers
thermometers

Procedure:

1. Heat 200 mL of sand and water for 15 minutes on a low heat setting.
2. Record the temperature **change** of the sand and water every minute for the 15 minutes.
3. Cool the sand and water for 15 minutes.
4. Record the temperature **change** every minute for the 15 minutes.

Data:

Heating Data

Time (minutes)	Water	Sand
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Cooling Data

Time (minutes)	Water	Sand
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Analysis:

1. Did the sand or water heat faster? How can you explain this?
2. Which substance lost heat the fastest? How can you explain this?
3. Were your observations/hypotheses from the probing questions supported by the data from the experiment? How might you modify your explanations to the probing questions based on the data?
4. What is specific heat?
5. How does specific heat explain your results?