

Name:

Date:

Activity 1.2

Differential Heating and Cooling

Objectives:

To observe that soil both heats up and cools faster than water.

To observe that different colors absorb different amounts of the Sun's radiation.

To research, compare and contrast temperature patterns around the country/world.

Materials:

- Reflector lamp with 100 watt bulb
- 2 x 250 ml beakers
- 150 ml of soil
- 150 ml of water
- 2 thermometers
- Stopwatch
- Temperature map (download current ones from the Internet and/or from links at the LFSTORM site)

Procedure:

1. Place 150 ml of soil in one beaker and 150 ml of water in the other beaker. Place a thermometer in each beaker and record the starting temperature.
2. Place the lamp 10 cm from the beakers. Make sure that both beakers are equally distant from the lamp and that both receive an equal amount of light.
3. Turn on the lamp and record the temperature every minute for 10 minutes.

Heating

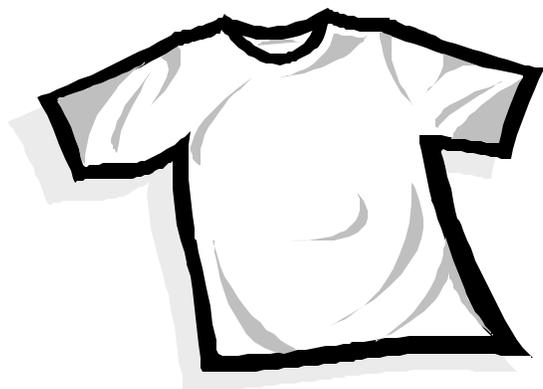
Minute 1	
Minute 2	
Minute 3	
Minute 4	
Minute 5	
Minute 6	
Minute 7	
Minute 8	
Minute 9	
Minute 10	

4. Turn off the lamp and record the temperature every minute for 10 minutes.

Cooling

Minute 1	
Minute 2	
Minute 3	
Minute 4	
Minute 5	
Minute 6	
Minute 7	
Minute 8	
Minute 9	
Minute 10	

5. Graph your results.
6. Write up your results in your WEATHERlogs and explain what you observed.



CHALLENGE ACTIVITY THE “COOL” SPORTS SHIRT DESIGN CONTEST

Your challenge is to design a sports shirt for your soccer club (which plays in the chilly fall or winter—yep, Northern hemisphere chauvinism at work again: if you’re reading this in the South, just flip things around!), or baseball/softball team, which plays in the summer heat. Choose your sport and season, and come up with a color scheme that will make you and your team-mates happiest—keeping as cool as possible in summer, and as warm as possible in winter!

Materials:

- 4 thermometers
- Construction paper (white, black, yellow and red or green)
- Light source (this can be the Sun)

Form a hypothesis which ranks the four colors of construction paper, beginning with the one that will absorb the most light (and therefore heat up most) and then in decreasing order ending with the one which will reflect the most light, i.e. absorb the least light.

Procedure:

1. Cut pieces of construction paper 2 centimeters wide by 8 centimeters long. Fold each piece in half to form a pocket 2 centimeters wide by 4 centimeters long. Tape the sides to close the pocket. Note: If you are using wider thermometers you will need to make the pockets to fit your thermometers.
2. Place a thermometer inside each paper pocket. Place the four pockets with the thermometers equally distant from the heat source so they all receive the same amount of light. Wait five minutes and record each temperature. Was your hypothesis correct? Explain your results.
3. Use what you learned from this experiment to explain why you would wear light clothing in the summer and dark clothing in the winter. Record your findings and explanation in your WEATHERlogs.