

Name \_\_\_\_\_  
 Period \_\_\_\_\_

## Lab: Homeostasis in Humans

### Learning Targets:

Explain why something is considered living or non-living using the characteristics of life.

### Background:

Mammals maintain their internal body temperatures within very narrow limits. A temperature rise of less than 10°C in human beings can be fatal because many of the essential chemical reactions in the body's cells are disrupted. To prevent this rise in temperature, the body uses a variety of mechanisms including the flow of hot blood towards the surface of the skin (blushing) and the production of sweat. Sweat is a solution of salt and urea in water and, as it evaporates, it cools the skin's surface. Mammals can have a problem losing heat in very warm environments. As well as absorbing heat from the outside, they produce large amounts of heat from the reactions going on inside their bodies, which can lead to a dangerous rise in body temperature. In this experiment, you will look at how effective sweating is as a mechanism for increasing heat loss from a hot body.

### Materials:

Metal can

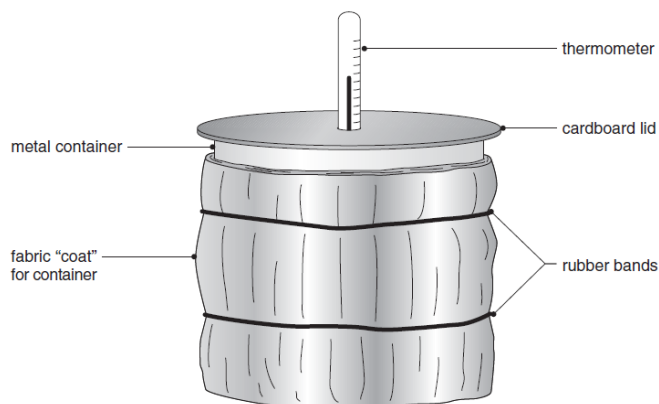
Fabric

Rubber bands

Thermometer fixed in a cardboard,

Clock or stopwatch

Boiling water



### Safety



Be careful when pouring the boiling water and handling the can with boiling water in it.



Be careful handling the metal can as the edges of the rim may be very sharp.

**Hypothesis:** \_\_\_\_\_

### Procedure:

1. Wrap pieces of dry fabric around the metal can and secure it with two rubber bands as shown in the diagram on the first page. Pour boiling water into the can until it is nearly full. Then place the lid with the thermometer over the can.
2. Start the stopwatch and take the temperature of the water. Record the value in the data table every 30 seconds for 15 minutes.
3. Carefully empty the water from the can and then repeat the same process using a wet towel wrapped round the outside of the can.

Data:

TIME (minutes)	Temperature (°C)	
	DRY	WET
0:00		
0:30		
1:00		
1:30		
2:00		
2:30		
3:00		
3:30		
4:00		
4:30		
5:00		
5:30		
6:00		
6:30		
7:00		
7:30		
8:00		
8:30		
9:00		
9:30		
10:00		
10:30		
11:00		
11:30		
12:00		
12:30		
13:00		
13:30		
14:00		
14:30		
15:00		

Questions:

- Graph your results as a line graph. You should have two lines—dry fabric and wet fabric—and a different color for each line.
- What was the total change in temperature for each can?

Wet Fabric: \_\_\_\_\_

Dry Fabric: \_\_\_\_\_



