

## Student Worksheet

### Activity 3.1.4, Making Weather Instruments

### Psychrometer (Wet bulb/Dry bulb thermometer)

#### OBJECTIVES

To design and build instruments

To observe how weather instruments work

To compare the accuracy of "their" instruments with actual weather instruments

#### MATERIALS

- 2 thermometers
- small piece of cheesecloth
- 2 pieces of cardboard (2 cm wider than the thermometer and 1 cm longer)
- clear packaging tape
- string
- relative humidity chart (provided)
- access to current relative humidity
- WEATHERLog

#### PROCEDURE

1. Tape each thermometer to a piece of cardboard with the bulb end of the thermometer extending over the edge approximately 3 cm.
2. The thermometers must be firmly secured to the cardboard or they may fly off while doing this experiment! If you are using metal backed thermometers and can securely attach a string to the top of each of them you do not need to attach them to the cardboard.
3. Line up the pieces of cardboard holding the thermometers so that they are back to back. (Thermometers should be facing out.)
4. Punch a hole in the top of the cardboard and tie the string securely to the top.
5. Wrap the bulb of one thermometer in cheesecloth and dampen the cheesecloth. If possible use distilled water. This will be your "wet bulb" reading.
6. Take your psychrometer outside and look at the temperatures. Swing the thermometers and every minute or two check to see if the thermometers are staying at a constant temperature. (To avoid the chance of a thermometer flying off the cardboard you can also fan the thermometers, but your readings may not be as accurate.)
7. Once the temperatures have stabilized (i.e. are no longer changing) read each thermometer. Be careful to accurately record which temperature is the *wet* bulb and which is the *dry* bulb.
8. Use the relative humidity chart (provided) to determine your relative humidity.
9. In your WEATHERLog draw a picture of your instrument. Look up the current humidity. Record the date, the relative humidity you measured, the relative humidity using your source, and describe today's weather in your WEATHERLog.
10. Continue to take readings using your psychrometer and compare them to the current readings over the next couple of days.

## OBSERVATIONS

Make a drawing of your psychrometer in your WEATHERLog.

Record your daily measurements. Include the current relative humidity reading and a description of today's weather.

## CONCLUSIONS

At the end of the week or the period of time in which you will be taking your measurements write a summary paragraph (or two) explaining how the accuracy of your psychrometer compared to the accuracy current data.

Draw conclusions about the effects of weather and the changes of weather on relative humidity.

<http://sln.fi.edu/weather/todo/hygrometer.html>

The Franklin Institute: Franklin's Forecast

<http://www.allstar.fiu.edu/aero/Experiment15.htm>

Aeronautics

<http://www.minnetonka.k12.mn.us/support/science/lessons45/cricket.html>

Minnetonka Public Schools Elementary Science Center