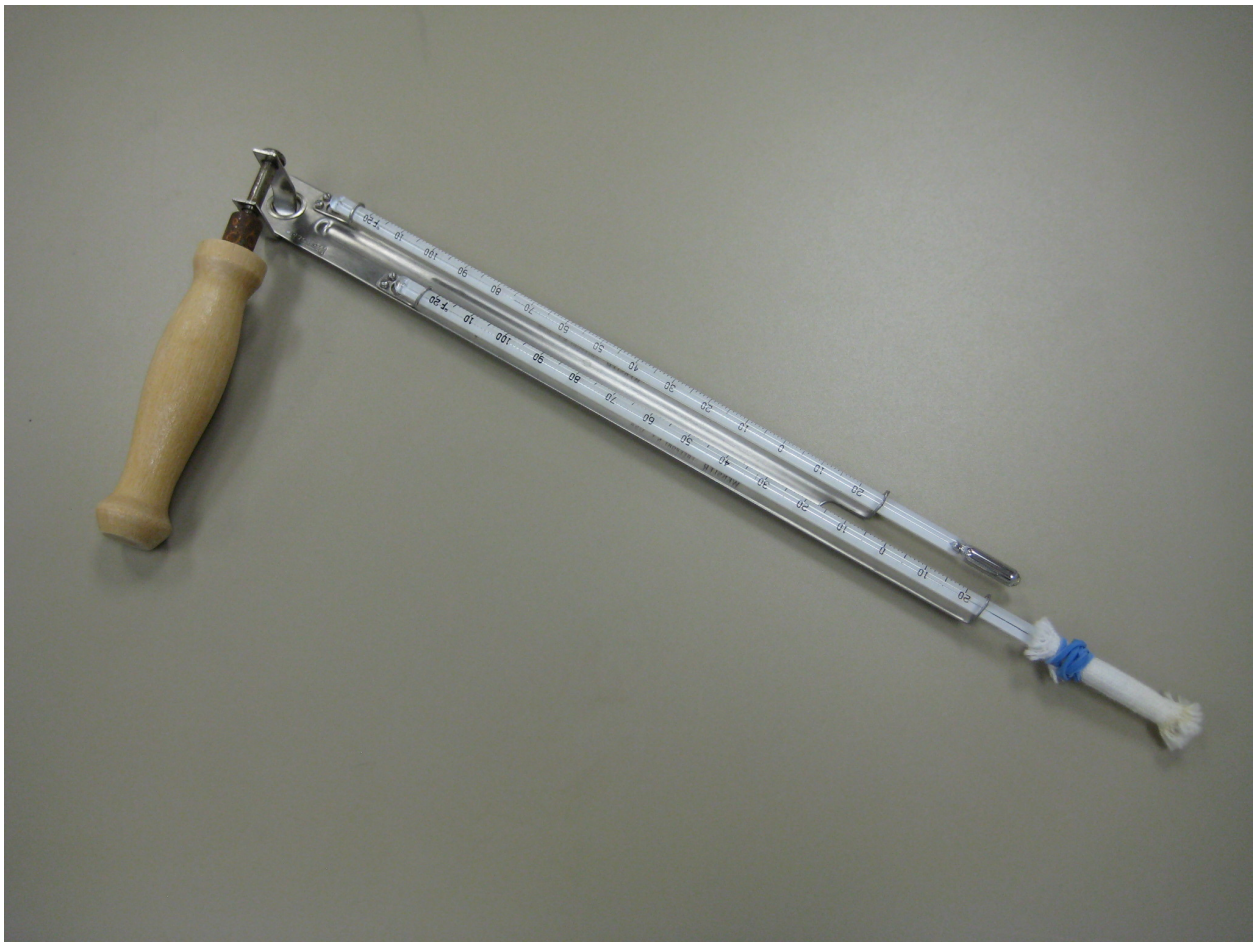
Sling psychrometers

1. Observe the initial temperatures on the thermometers.
2. Moisten the wick on the “wet” bulb thermometer.
3. Being careful not to hit someone, twirl the thermometers for about 30 seconds.
4. Pause and read each of the temperatures.
5. Continue twirling the thermometers, pausing from time to time to read the temperatures until you find that the values are no longer changing.
6. Explain what you observe.



Effect of Evaporation on Temperature (Sling psychrometers)

Summary – This activity investigates the effect of evaporation on the temperature of an object. A sling psychrometer is used. This consists of 2 thermometers mounted side by side on a device that allows one to twirl the thermometers through the air. The bulb end of one of the thermometers is covered by a wicking material that is moistened with water. This thermometer measures the wet bulb temperature.

Materials Needed

- A sling psychrometer
- Water that is at same temperature as the environment in which you will make the measurement

Scientific Questions
How does evaporation affect temperature?

Possible Hypothesis

- Evaporation has no effect on temperature
- Evaporation causes warming
- Evaporation causes cooling

Set up

- Be sure to moisten the wick before using the psychrometer

Notes

- Practice reading the temperatures on the thermometers.
- Though the temperatures on the 2 thermometers should be identical before moistening the wick and twirling, often they are not. This can lead to discussions about the importance of instrument calibration and accuracy.
- Evaporation requires the input of energy and results in the cooling of whatever provides the energy. In this case, heat flows out of the thermometer bulb under the wicking. Likewise, the input of energy is required to melt ice.