# Current Temperature

### Purpose
To measure the current air temperature when an instrument shelter is not available.

### Overview
Current air temperature is measured using a thermometer held in the open air but in the shade for at least 3 minutes.

### Student Outcomes
*Science Concepts*

*Atmospheric Science*
- Weather can be described by quantitative measurements.
- Weather changes over different time and spatial scales.
- Weather changes over seasons.

*Physical Science*
- Properties can be measured by tools.

*Geography*
- Temperature variations affect the characteristics of Earth's physical geographic system.

*Scientific Inquiry Abilities*

Use a thermometer to measure temperature.

### Time
5 minutes

### Level
All

### Frequency
As needed in support of other GLOBE measurements

Calibration every three months

### Materials and Tools
- Alcohol-filled thermometer (calibration thermometer or sling psychrometer)
- A clock or watch
- Rubber band and a piece of string (if calibration thermometer is used)
- *Data sheets*

### Preparation
Find a shady spot for your air temperature measurement.

### Prerequisites
None

## Teacher Support
This method should be used only when an instrument shelter is not available and a current temperature measurement is required in support of another GLOBE measurement. Remember to define the appropriate site for your measurements (i.e., if other atmosphere measurements are taken this is would be an Atmosphere Study Site, if soil temperature measurements are taken, this is a Soil Temperature Study Site, etc.).

### Calibration and Quality Control
This measurement takes only a few minutes to complete. The main concern is to allow sufficient time for the thermometer to equilibrate to the temperature of the air, perhaps three to five minutes. In addition, the shady spot you use should not be adjacent to a building or other large structure, such as a tree. Try to maintain a distance at least 4 meters away from any such object, and take the measurement over a natural surface, such as vegetation, rather than concrete or paved walkways.

Your organic liquid-filled thermometer should be calibrated at least every three months as well as before its first use. Calibrate it following the instructions in the *Maximum, Minimum, and Current Temperatures Protocol*. The thermometers on your sling psychrometer should also be calibrated at least once every three months and before first use following the instructions in the *Relative Humidity Protocol*.

# Thermometer Calibration
## Lab Guide

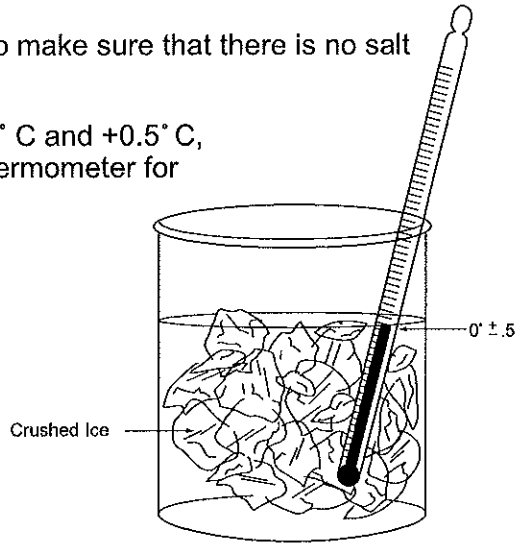
### *Task*
Check the calibration of the calibration thermometer.

### *What You Need*

- ❑ Calibration thermometer
- ❑ Clean container at least 250 mL in volume
- ❑ Crushed ice
- ❑ Water (distilled is ideal, but the key is that the water is not salty)

### *In the Lab*

1. Prepare a mixture of fresh water and crushed ice with more ice than water in your container.
2. Put the calibration thermometer into the ice-water bath. The bulb of the thermometer must be in the water.
3. Allow the ice-water bath and thermometer to sit for 10 to 15 minutes.
4. Gently move the thermometer around in the ice-water bath so that it will be thoroughly cooled.
5. Read the thermometer. If it reads between -0.5° C and +0.5° C, the thermometer is fine.
6. If the thermometer reads greater than +0.5° C, check to make sure that there is more ice than water in your ice-water bath.
7. If the thermometer reads less than -0.5° C, check to make sure that there is no salt in your ice-water bath.
8. If the thermometer still does not read between -0.5° C and +0.5° C, replace the thermometer. If you have used this thermometer for measurements report this to GLOBE.



# Current Air Temperature Protocol
## Field Guide

### *Task*
To measure current air temperature in support of other GLOBE measurements

### *What You Need*

- ❑ String and rubber band and calibration thermometer OR Sling psychrometer
- ❑ *Integrated 1-Day Data Sheet*
- ❑ Clock or watch
- ❑ Pen or pencil

### *In the Field*

1. Tie one end of a piece of string securely to the end of the calibration thermometer and the other end to a rubber band.
2. Slip the rubber band around the wrist so that the thermometer is not broken if it is accidentally dropped on the ground.

   OR

   Use the dry bulb thermometer on your sling psychrometer.
3. Hold the thermometer at chest height, in the shade, and away from your body for three minutes.
4. At the end of three minutes, record the temperature reading in your science log
5. Hold the thermometer the same way for another minute.
6. At the end of the minute, record the temperature once again. If the temperature is within 0.5˚ C of the previous reading, record the reading on your *Data Sheet.*
7. If the two temperature readings differ by more than 0.5˚ C, repeat steps 5 and 6 again.
8. If two consecutive temperature readings are not within 0.5˚ C of one another after 7 minutes, record the last measurement on the Data Sheet and report your other four measurements in the comments section along with a note that your reading wasn't stable after 7 minutes.