Soil Temperature Protocol

Field Guide

Task

Measure soil and air temperature.

What You Need

- ❑ *Soil Temperature Data Sheet*
- ❑ Dial or Digital Soil Thermometer (calibrated using a calibrated thermometer)
- ❑ Thermometer spacers (prepared prior to going in the field)
- ❑ 12 cm or longer nail marked at 5 cm, 7 cm, 10 cm and 12 cm from its point (if soil is firm or extra firm)
- ❑ Watch or timer
- ❑ Science Notebook
- ❑ Pen or pencil
- ❑ Hammer (if soil is extra firm)

In the Field

1. Fill in the top portion of the *Soil Temperature Data Sheet*.
2. Locate your sampling point (If soil is soft, skip step 3).
3. Use the nail to make a 5 cm deep pilot hole for the thermometer. If the soil is extra firm and you have to use a hammer, make the hole 7 cm deep. Pull the nail out carefully, disturbing the soil as little as possible. Twisting as you pull may help. If the soil cracks or bulges up, move 25 cm and try again.
4. Insert the thermometer through the longer spacer so that 7 cm of the probe extends below the bottom of the guide. The dial should be against the top of the spacer.
5. Gently push the thermometer into the soil.
6. Wait 2 minutes. Record the temperature and time in your Science Notebook.
7. Wait 1 minute. Record the temperature and time in your Science Notebook.
8. If the 2 readings are within 1.0˚ C of each other, record this value and the time on the *Soil Temperature Data Sheet* as Sample 1, 5 cm reading. If the 2 temperatures are not within 1.0˚ C, continue taking temperature readings at 1-minute intervals until 2 consecutive readings are within 1.0˚ C.
9. Remove the thermometer from the hole. (If the soil is soft, skip step 10.)
10. Use the nail to deepen the hole to 10 cm. If you have to use a hammer, deepen the hole to 12 cm.

11. Replace the long spacer with the shorter one so that 12 cm of the thermometer extends below the bottom of the spacer. Insert the thermometer in the same hole. Gently push down until the thermometer tip is 12 cm below the surface.

12. Wait 2 minutes. Record the temperature and time in your Science Notebook.

13. Wait 1 minute. Record the temperature and time in your Science Notebook.

14. If the 2 readings are within 1.0˚ C of each other, record this value and time on the *Soil Temperature Data Sheet* as Sample 1, 10 cm reading. If the 2 temperatures are not within 1.0˚ C, continue taking temperature readings at 1-minute intervals until 2 consecutive readings are within 1.0˚ C.

15. Repeat steps 2 – 14 for 2 other holes 25 cm away from the first hole. Record these data on the *Soil Temperature Data Sheet* as Sample 2, 5 and 10 cm and Sample 3, 5 and 10 cm.
    Note: These three sets of measurements must all be made within 20 minutes.

16. If possible, read and record the current air temperature from the thermometer in the instrument shelter or by following the *Current Temperature Protocol* in the *Atmosphere Investigation*.

17. Wipe clean all the equipment.