

PRELIMINARY ACTIVITY FOR Soil Temperature

Soil temperature affects climate, plant growth, the timing of budburst or leaf fall, the decomposition rate of organic material, and other biological, chemical, and physical processes that take place in the soil.

How do flowers and other plants know when to start growing in the spring? How do farmers know when it is safe to plant their crops? Soil temperature plays an important role in both of these decisions. Each spring, soil is heated from above by warmer air and by solar radiation. Once the soil reaches a certain temperature, it is time to plant and grow.

Figure 1 shows the average soil temperatures across the United States at a depth of 4 inches (approximately 10 cm). This is the depth used by the U.S. Department of Agriculture (USDA) and the National Oceanographic and Atmospheric Administration (NOAA) in their *Weekly Weather and Crop Bulletin*. This particular figure shows data from April 2002. If you look carefully, you can see the isotherms indicating the regions where various crops such as wheat and corn can develop.

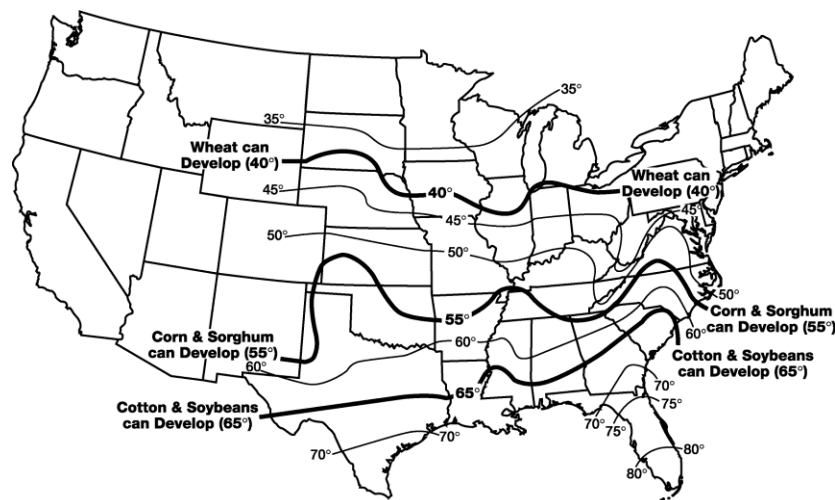


Figure 1 Soil temperatures at a depth of four inches

In the Preliminary Activity, you will gain experience using a Temperature Probe and learn soil temperature measuring technique as you determine the temperature of a soil sample.

After completing the Preliminary Activity, you will first use reference sources to find out more about soil temperature and factors that affect it before you choose and investigate a researchable question dealing with soil temperature. Some topics to consider in your reference search are:

- soil
- soil temperature
- soil temperature protocol
- soil composition
- soil texture
- soil moisture
- compost
- mulch

Experiment 8

PROCEDURE

1. Connect a Temperature Probe and the data-collection interface.
2. Obtain a soil sample. Use a long nail, or similar tool, to make a vertical hole in the soil that is 10 cm deep and which will firmly accommodate a Temperature Probe.
3. Insert the Temperature Probe into the soil to a depth of 10 cm.
4. When the temperature reading stabilizes record the displayed value (to the nearest 0.1°C) as the soil temperature 10 cm below the sample surface.

QUESTIONS

1. What was the temperature 10 cm below the surface of the soil sample you tested?
2. How is soil temperature important to plants?
3. List three factors that influence soil temperature.
4. List at least one researchable question for this experiment.