



## Organic Components



*Essential Question: How is organic material related to the nitrogen in soils?*

### Overview

You have learned that soil is made of minerals (in the form of sand, silt, and clay), organic material, and empty space (which can be filled with water or air). In this activity, you will investigate the organic material in soil.

The organic component of soil consists of raw plant residues, “active” organic material, and stable organic matter. Raw plant residues are plant materials that have not yet begun to decompose. They typically are found on the soil surface. Raw plant residues form a layer that protects soil from erosion by reducing the impact of raindrops, and by reducing the exposure of the soil to wind or water that can carry the soil away. The “active” organic material in soil is made up of decaying plant and animal matter, as well as live bacteria, fungi, mold, ants, earthworms, spiders, and other creatures. The life processes of these organisms make the soil more productive for growing plants. Active organic material releases nutrients into soil for use by growing plants, help keep soil porous, and hold solid soil particles together. They bind small soil particles into larger particles known as aggregates. This process, called aggregation, is important for good soil structure. The stable organic matter, also known as humus, is made of plant matter that has decomposed over time to create a material rich in carbon. Stable organic matter helps retain water, provides nutrients, and contributes to the soil’s color. Farmers and gardeners value humus because it aids plant growth and increases soil water absorption.

In this activity, you will determine what organic materials are contained by several different soil samples. You will also test each soil sample to see how much nitrogen it contains. By comparing these two measurements, you will be able to answer the essential question: *How is organic material related to the nitrogen in soils?*

### Materials

- 6 sets of soil samples
- Graduated cylinder, plastic, 100 mL
- Funnel, set of 3
- Plastic spoon
- Magnifying glass
- 2 16-oz glass jars with lids
- 2 smaller glass jars with lids
- 3 eyedroppers with rubber tops
- Filter paper
- Nitrate test paper strips
- Distilled water