What is soil?

Soil is a mixture of minerals, weathered rocks, and other things. It has bits of decayed plants and animals called humus (HYEW•muh•s). Humus looks dark. It adds nutrients to soil. Plants then use these nutrients. Humus works like a sponge to soak up rainwater and keep the soil moist. Water, air, and living things are also found in soil.

Living Things in Soil

If you dig away a chunk of soil, you might see roots. A plant’s roots take in water and minerals from the soil. They also hold the soil in place and help slow erosion.

You might also see animals living in soil. Animals such as ants, earthworms, and moles break up soil. Their burrows help air and water get into the soil.

Ants and earthworms are just a few of the organisms that live in soil.

How Soil Forms

The making of soil starts with weathering. Weathering causes rocks to break down into smaller and smaller pieces. The tiny bits of weathered rock build up into layers. Living things die and decay in the weathered material and become humus. Over time, layers of soil form. The top layer is called topsoil. Topsoil is dark and has the most humus and minerals. Below the topsoil is subsoil. This layer is lighter in color and has less humus. Below the subsoil is bedrock, or solid rock.

Soil takes a long time to form—up to 1,000 years for just 1 centimeter! That is why people try to prevent soil erosion. They add minerals and humus to soil to keep it healthy.

Quick Check

Problem and Solution  What do people do to try to solve the problem of keeping soil healthy?

Critical Thinking  How is soil a habitat?
How are soils different?

Different soils are found in different places. They are made up of different rocks and minerals. They have different amounts of humus in them, too. Some soils have thick layers of topsoil. These soils are rich in humus. They are good for growing plants. Some soils have thin layers of topsoil. These soils have little humus. They are not as good for growing plants.

Soil Color

Like rocks, soils differ in color and texture. A soil's color depends on what is in it. Soil rich in humus looks dark brown or black. Soil with a lot of calcite (KAL-sit) in it looks white. Soil with hematite (HEM-aht-tite) in it looks red. That is because hematite contains iron.

Soil Texture

Soil texture describes how big the pieces, or grains, of soil are. Sandy soil has a lot of small grains called sand. Silty soil has grains smaller than sand called silt. Clay soil has the smallest grains called clay. Loam is soil made up of a mixture of sand, silt, and clay.

Soil texture affects how much water soil can hold. Clay soil holds a lot of water. Sandy soil holds very little water. Many plants grow best in loam. It is neither too wet nor too dry.

Quick Lab

Classify Soils

1. **Observe** Look at the two soils in plastic bags. How are they alike? How are they different?
2. **Observe** Use a hand lens to look closely at each soil. Which soil has larger grains?
3. **Classify** Which soil is sandy soil? Which is clay soil? How do you know?

Quick Check

Problem and Solution What if plants could not grow well in your neighborhood? What might be the problem? How might you solve it?

Critical Thinking A cactus plant grows best in dry soil. Which soil would be best for a cactus?
Why is soil important?

Soil is a natural resource (NACH-uhr-uhl REE-sawrs). A natural resource is a material on Earth that is necessary or useful to people. Without soil, most plants could not grow. People and animals would not have food to eat. There would be no cotton to make clothes. There would be no wood to build houses or burn for heat. There would be fewer medicines.

It is important to keep soil healthy. It is also important to prevent soil erosion. We can farm in ways to help keep soil from eroding. We can keep soil healthy by keeping it clean. We can put nutrients into the soil for plants to use.

Quick Check

Problem and Solution How can people keep soil healthy and prevent soil erosion?

Critical Thinking Are rocks and minerals natural resources? Why or why not?

Visual Summary

Soil is mostly made up of weathered rocks, minerals, and once-living things.

Soils have different colors and textures. They also hold different amounts of water.

Soil is a natural resource that is important to many living things.

Think, Talk, and Write

1. Main Idea List some things that make up soil.

2. Vocabulary What is humus?

3. Problem and Solution What problems might occur if we do not protect soil?


5. Test Prep Which helps soil hold water?
   A. humus
   B. air
   C. bedrock
   D. animals

Contour farming helps prevent soil erosion.

Math Link

Solve a Problem
Suppose it takes 1,000 years for 1 centimeter of soil to form. How long would it take 5 centimeters of soil to form?

Health Link

Medicines from Plants
Research a medicine that people get from plants. If possible, find out what kind of soil the plant grows best in. Share your findings with the class.

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