

Food Chains and Webs: SOIL

Soil is a thin layer of material on the Earth's surface in which plants have their roots. It is made up of many things, such as weathered rock and decayed plant and animal matter. Soil is formed over a long period of time.

Soil Formation takes place when many things interact, such as air, water, plant life, animal life, rocks, and chemicals.

Soil Formation

The formation of soil happens over a very long period of time. It can take 1000 years or more. Soil is formed from the weathering of rocks and minerals. The surface rocks break down into smaller pieces through a process of weathering and is then mixed with moss and organic matter. Over time this creates a thin layer of soil. Plants help the development of the soil. How? The plants attract animals, and when the animals die, their bodies decay. Decaying matter makes the soil thick and rich. This continues until the soil is fully formed. The soil then supports many different plants.

Weathering:

Weathering is the process of the breaking down rocks. There are two different types of weathering.

Physical weathering and chemical weathering.

In physical weathering it breaks down the rocks, but what it's made of stays the same. In chemical weathering it still breaks down the rocks, but it may change what it's made of. For instance, a hard material may change to a soft material after chemical weathering.

Soils are a mixture of different things; rocks, minerals, and dead, decaying plants and animals. Soil can be very different from one location to another, but generally consists of organic and inorganic materials, water and air. The inorganic materials are the rocks that have been broken down into smaller pieces. The size of the pieces varies. It may appear as pebbles, gravel, or as small as particles of sand or clay. The organic material is decaying living matter. This could be plants or animals that have died and decay until they become part of the soil. The amount of water in the soil is closely linked with the climate and other characteristics of the region. The amount of water in the soil is one thing that can affect the amount of air. Very wet soil like you would find in a wetland probably has very little air. The composition of the soil affects the plants and therefore the animals that can live there.

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Soil Profile

Soil Profile refers to the layers of soil; horizon A, B, and C. If you're wondering what horizon A is, here's your answer: horizon A refers to the upper layer of soil, nearest the surface. It is commonly known as topsoil. In the woods or other areas that have not been plowed or tilled, this layer would probably include organic litter, such as fallen leaves and twigs. The litter helps prevent erosion, holds moisture, and decays to form a very rich soil known as humus. Horizon A provides plants with nutrients they need for a great life.

The layer below horizon A, of course, has to be horizon B. Litter is not present in horizon B and therefore there is much less humus. Horizon B does contain some elements from horizon A because of the process of leaching. Leaching resembles what happens in a coffee pot as the water drips through the coffee grounds.

Leaching may also bring some minerals from horizon B down to horizon C.

If horizon B is below horizon A, then horizon C must be below horizon B. Horizon C consists mostly of weatherized big rocks. This solid rock, as you discovered in the Soil Formation section, gave rise to the horizons above it.

Soil profiles look different in different areas of the world. They are affected by climate and other things.

Soil Types

Sand, silt, and clay are the basic types of soil. Most soils are made up of a combination of the three. The texture of the soil, how it looks and feels, depends upon the amount of each one in that particular soil. The type of soil varies from place to place on our planet and can even vary from one place to another in your own backyard.

Soil erosion, caused by wind and rain, can change land by wearing down mountains, creating valleys, making rivers appear and disappear. It is a slow and gradual process that takes thousands, even millions of years. But erosion may be speeded up greatly by human activities such as farming and mining. Soil develops very slowly over a long period of time but can be lost too quickly. The clearing of land for farming, residential, and commercial use can quickly destroy soil. It speeds up the process of erosion by leaving soil exposed and also prevents development of new soil by removing the plants and animals that help build humus.

Today's farmers try to farm in a way that reduces the amount of erosion and soil loss. They may plant cover crops or use a no-till method of farming. Soil is an important resource that we all must protect. Without soil there is no life.

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Worm Your Way through Soil Questions.

<http://www.nrcs.usda.gov/feature/education/squirm/skQstns.html>

The Dirt on Soil

<http://school.discovery.com/schooladventures/soil/>

The Microbe Zoo

<http://commtechlab.msu.edu/sites/dlc-me/zoo/zdmain.html>