

What's the difference between soil and dirt?

Dirt is what you find under your fingernails. Soil is what you find under your feet. Think of soil as a thin living skin that covers the land. It goes down into the ground just a short way. Even the most fertile topsoil is only a foot or so deep. Soil is more than rock particles. It includes all the living things and the materials they make or change.

Let's take an elevator ride from the surface to the bedrock below. We'll pass several distinct layers, or horizons, as we go. These layers form the soil profile. Going down!

SOIL LAYERS

Organic Layer:

Plants grow and animals live here. Decomposers turn dead plants and animals into humus, a nutrient rich soil. This is sometimes called the organic layer.

Topsoil:

Made mostly of minerals from parent material along with other organic matter. Topsoil is a good material for plants and other organisms to live in.

Subsoil:

This is a mix of mineral particles and some humus near the top. Subsoil is very low in organic matter compared to the topsoil. This is the layer where most of the soil's nutrients and water are found.

Parent Material:

This horizon can be very deep. There is no organic matter here at all. It's all rock particles, full of minerals. The entire soil profile used to look like this all the way to the surface before it was weathered down into the small pieces that make up the soil today.

Bedrock:

We finally found solid rock! The bedrock formed before the soil above it. It will wait here until erosion or an earthquake exposes it to the surface. Then some of it will be weathered to become the next batch of parent material. The soil-making process will start all over again.

SOIL ON OTHER PLANETS????

There is no soil on Mars or Venus. How come? Those planets have plenty of rocks! Mars has windstorms that erode rocks into dust. Venus has an acid atmosphere that cooks rocks into new chemicals. But there's still something missing... without life, there is no soil. Living things haven't just made a home in the soil on our planet. Life actually made the soil as we know it.

RECIPE FOR SOIL

First, select a large quantity of bedrock. When weathered, or broken down, it will become the parent material that will make the next batch of soil.

Physical Weathering:

Next, break some of the parent material into pieces. Use a glacier to break off big boulders. Wind or running water weather rocks into small mineral particles. Be patient, this can take several thousand years.

Chemical weathering:

Now, we must change some of the parent material and the mineral particles into other kinds of minerals. Run water over rock to dissolve the rock and make the water more acidic. This can also take a while. But you can go onto the next step while this cooks.

Biological actions:

Finally, throw in some microscopic decomposers like bacteria and fungi. Together, they make humus out of dead organic matter. Pretty soon, you'll have enough humus for plants to begin growing. Your soil will now start to clump together so that water can stay longer instead of draining away.

Sprinkle in plenty of tiny insects like mites and springtails. They'll pass the organic matter from the plants on to the smaller decomposers.

Simmer slowly in the sunshine for at least a few hundred years. Add rain regularly as needed. Now you've got living, breathing soil. Yummy!