

What Are Soil Horizons?

Older, undisturbed soils form into layers called horizons. Soil horizons can usually be seen at a road cut. They can also be seen where the soil is exposed several feet deep. There are four horizons on most older, undisturbed soils.

With the help of your teacher, fill in this chart about soil horizons.

Horizon	Name	Colors	Structure	Processes Occurring
O				
A				
B				
C				

Hunt for a good example of a soil profile. Look for an area where you can see the O, A, and B horizons. Road cuts are good areas. Carefully look at the profile, measure the depth of the layers from the surface.

Answer these questions while observing the soil horizon. Then on the back of this sheet draw a sketch of the soil profile about to scale. Label the horizons and indicate depths below the surface and any organisms that you see.

O Horizon

About how thick is the layer? _____

What color is it? _____ What types of material can you see in this O horizon? _____

Describe the structure. _____

Describe evidence of plants or animals. _____

A Horizon

How thick is this layer? The top is _____ inches below the surface and the bottom is _____ inches below the surface. What color is it? _____ Describe the structure. _____

Describe evidence of plants or animals. _____

B Horizon

How thick is it? The top is _____ inches below the surface and the bottom of the B horizon is _____ inches below the surface. What is the color? _____ Describe the structure. _____

Describe evidence of plants or animals. _____

Activity Master 4

What Are Soil Horizons?

Objectives

1. Students will inspect and diagram exposed soil profiles that are found near their homes.
2. Students will tell why soils form horizons.

Supplies Needed: soil samples, bean seeds, containers for growing beans

Project: Transparency 2, A Soil Profile, and explain to your students that this is a hypothetical example. Then use the transparency and the information outlined in the teacher's guide to help your students fill out the chart on the top of the activity sheet. For the second part of the activity, students should observe a soil profile and record their observations. List areas in your community (i.e., building sites, road cuts, etc.) where students can find a soil profile. Tell your students to be careful in these areas.

If your school property is large enough and you have permission, you might consider digging a soil pit. Soil pits are holes in the ground that are dug about 4 feet deep and 4 feet in diameter. The A and B horizons are usually evident within that depth.

After your students have observed the horizons, ask them to list how their example differed from the hypothetical one on the transparency. Then they could speculate why their example differed from the illustration. Possible answers include: Erosion or a bulldozer could have removed much of the topsoil. There could be very little surface organic matter because the land had been plowed and the organic matter was mixed into the A horizon. You could obtain samples of soils from the A and B horizons of a profile and have students answer the questions from the samples. You should provide them with the depth measurements that are asked for in the activity.

To conclude this lesson, plant two bean seeds (or similar fast-growing seeds) in pots containing soil from the A and B horizons. Always add the same amount of water and keep them under similar lighting conditions. Daily for the next 3 to 4 weeks, students should measure and record the heights on graph paper, using a different symbol for the plant in each soil. Students should compare the growth differences on the charts and discuss the possible reasons for them.

CONSERVING SOIL Activity Master 4

What Are Soil Horizons?

Older, undisturbed soils form into layers called horizons. Soil horizons can usually be seen at a road cut. They can also be seen where the soil is exposed several feet deep. There are four horizons on most older, undisturbed soils. With the help of your teacher, fill in this chart about soil horizons.

Horizon	Name	Colors	Structure	Processes Occurring
O	Organic	Black, dark brown	Loose, crumbly, well broken up	Decomposition
A	Topsoil	Dark brown to yellow	Generally loose, crumbly, well broken up	Zone of leaching
B	Subsoil	Brown, red, yellow, or gray	Generally larger chunks, may be dense or crumbly, can be cement-like	Zone of accumulation
C	Parent material (slightly weathered material)	Variable—depending on parent material	Loose to dense	Weathering, disintegration of parent material or rock

Hunt for a good example of a soil profile. Look for an area where you can see the O, A, and B horizons. Road cuts are good areas. Carefully look at the profile, measure the depth of the layers from the surface.

Answer these questions while observing the soil horizon. Then on the back of this sheet draw a sketch of the soil profile about 1 to 2 scale. Label the horizons and indicate depths below the surface and any organisms that you see.

O Horizon
About how thick is the layer? _____

What color is it? _____ What types of material can you see in this O horizon? _____

Describe the structure _____
Describe evidence of plants or animals _____

A Horizon
How thick is this layer? The top is _____ inches below the surface and the bottom is _____ inches below the surface. What color is it? _____ Describe the structure _____

Describe evidence of plants or animals _____

B Horizon
How thick is it? The top is _____ inches below the surface and the bottom of the B horizon is _____ inches below the surface. What is the color? _____ Describe the structure _____

Describe evidence of plants or animals _____

What Are Soil Horizons?

Soils develop into layers. These layers, called horizons, are usually seen along road cuts and other areas where the soil is exposed. In the hypothetical situation, there are four horizons in a soil profile. The thickness of each varies with location, and under disturbed conditions—heavy agriculture, building sites, or severe erosion, for example—not all horizons will be present.

The uppermost is called the organic horizon or O horizon. It consists of detritus, leaf litter, and other organic material lying on the surface of the soil. This layer is dark because of the decomposition that is occurring. This layer is not present in cultivated fields.

Below is the A horizon or topsoil. Usually it is darker than lower layers, loose, and crumbly with varying amounts of organic matter. In cultivated fields the plowed layer is topsoil. This is generally the most productive layer of soil.

As water moves down through the topsoil, many soluble minerals and nutrients dissolve. The dissolved materials leach from the topsoil. In fact, the A horizon is a zone of leaching.

Below is the B horizon or subsoil. Subsoils are usually light colored, dense, and low in organic matter. The subsoil is a zone of accumulation since most of the materials leached from the topsoil accumulate here.

Still deeper is the C horizon. It is a transition area between soil and parent material. Partially disintegrated parent material and mineral particles may be found in this horizon. The final horizon is bedrock.

In this activity, students learn about the four soil horizons and examine the soil in each horizon of a soil profile.