

Soil Unit

Introduction

Rich topsoil from one of Iowa's best soils.

Photo by Lynn Betts, courtesy of USDA NRCS

If you ask the question “What is soil?” you will get many different answers, depending on whom you ask. If you ask an engineer planning a road project, you’ll find that soil is the material that can be moved about without blasting. A geologist thinks of soil as the loosely packed material that lies above its underlying layer of bedrock. Ask an agronomist, and you’ll hear about soil as Earth’s natural medium for growing plants. Ask your young elementary students, and you’ll probably hear about that which should not be tracked all over the clean floor!

What are Children Likely to Know?

For many young children, and even adults, the words soil and dirt are interchangeable. You can “soil” your clothing and grow plants in “dirt.” Young children do not necessarily draw a distinction between materials that lie on or in the ground. While they may think of soil as being composed of fairly small particles, they are likely to include non-organic materials such as fine gravel, grit or sand into the category of soil. Their own experiences of soil may relate more to getting “dirty” than to ideas about the mixture of materials that is soil. Clearly some children who have experience of growing plants in flower or vegetable gardens, or even in farmland, will know more. Some children may have dug holes in the ground and come across surprises, like worms and other creatures, plant roots, rock chips and pebbles. Even so, they may not think of soil as being in part organic and understand how important soil is supporting life. The fact that it takes a very long time for soil to form may also be outside young children’s understanding. They can’t easily see the process happening before their eyes. Yet soil is all around them and they can probably take you to a spot and point it out.

Finding Out What Your Students Already Know about Soil

Knowing what ideas children already have about a science topic is critical to providing appropriate learning situations. Time spent revealing the ideas they have is a good investment. Quite apart from alerting you, the teacher, to their current understanding of soil, it also gets them going--focusing them on what they will be doing. It gives students a stake in the learning enterprise; "This is the bit I have to offer." Finally, it fixes a benchmark for each student against which he or she can make later comparisons, which allows him or her to see how understanding has progressed.

Here are some questions about weather that can be used to get your students thinking. You can have them write or draw answers, share and discuss them with a partner, and then repeat the process with another pair, forming a group of four:

- What is soil?
- Where can you find soil?
- What’s in soil?
- Why is soil important for living things?
- What would happen if there was no soil?

When groups have discussed these questions, have them report their ideas to everyone. You can write up these ideas on the marker-board, overhead, or flipchart for later reference.

Investigation Questions

Each of the investigations that follows is led by an investigative question. It is important that students come to realize that scientists try to find out about the world by asking questions, predicting likely answers and conducting tests to see if their ideas are correct or not.

Soil Unit Sections

Introduction

Comparing Soils

Soil as a Mixture

Water and Soil

Chemicals in Soil

What Lives in Soil?
