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Introduction

Rocks cover the entire surface of the Earth, even beneath every body of water and the polar ice caps. This rock covering is referred to as the *crust* of Earth. Dirt or soil, which consists of crushed rock and pieces of once living (*organic*) material, covers some areas of the crust.

Earth's crust consists of three types of rock – *igneous*, *sedimentary*, and *metamorphic*. These rocks do not remain as one type but are continuously being recycled from one type to another.

Igneous

Melted rock beneath the crust, called *magma*, is under tremendous pressure and sometimes rises through cracks in the crust. Magma may cool underground within the crust or break through the crust and pour onto the surface in the form of liquid rock called *lava*. When the magma or lava solidifies, it is called *igneous* rock. The crust is cracked into large sections called *plates*. The edges of some crustal plates are forced beneath other plates, melting and recycling the leading edge of rock as it comes into contact with the hot magma.

Sedimentary

These rocks consist of crushed rocks which were once igneous, metamorphic, or sedimentary. This crushed rock material is deposited in layers by wind, water, or ice. As the layers build up, the pressure packs the material together until it compresses into solid rock layers. These sediments may consist of rock fragments ranging in size from large boulders to fine grains of sand and silt. Sedimentary rocks may also be deposits of minerals in the form of crystals or organic material such as shells.

Metamorphic

This type of rock changes or undergoes a *metamorphosis* due to tremendous pressure when it is buried deep in the earth's crust. It can also be changed due to the heat of magma when it comes close to the rock layer but not close enough to melt the rock. Metamorphic rock began as igneous, sedimentary, or metamorphic rock. The original rock changes in appearance and often in mineral composition. For example, the igneous rock *granite* changes to the metamorphic rock *gneiss*, and the sedimentary rock *limestone* changes to the metamorphic rock *marble*.

The activities in this book will enable students to develop an understanding of the rock cycle and the differences between rocks and minerals. They will also learn how to identify minerals.

An Ant's Eye View of Soil

Overview: *Students will examine a variety of soil samples.*

Materials (for each student)

- snack-size resealable bags
- magnifying lenses
- transparency and copies of What Is Soil? (pages 6 and 7)
- parent letter (page 5)
- plastic spoons

Lesson Preparation

- Make copies of the parent letter and attach a plastic bag to each note. Write students' names on the bags.
- A day or two before doing this activity, give each student a plastic bag and parent letter. Explain what they are to put in the bag and when they need to return the sample to school. Send home the letter and bag.

Activity: Day One

1. Ask the students what they call the 'stuff' which is found on the ground (*dirt*). Explain that this can also be called *soil* and that they are going to go on a walk around the school area to collect different samples of soil.
2. Take the students into the schoolyard to find different types of soil samples. Look for a variety of areas to dig up samples, such as a grass area, a field of native plants, or dry soil without any vegetation. Collect samples in bags and write where each was found. (**Caution:** Students need to wear vinyl gloves or wash their hands with soap each time they are finished working with soil samples.)
3. Return to the classroom and explain that these specimens will be used during the next science class. Explain that the students will need to bring in their soil samples from home so that the different specimens can be compared with those collected around the school area.

Activity: Day Two

1. Divide students into groups of four. Give each student a magnifier, plastic spoon and a copy of page 6 and 7 the two worksheets. Have the students put a plastic spoon into each bag with the soil specimen.
2. Discuss the difference between living or once-living things and things which were never alive. Give them examples of these two categories and write some of these on the board.
3. Use a transparency and copies of pages 6 and 7 to demonstrate how to use the spoon to place a small sample of one soil specimen in the circle. Show how to write the location where the sample was collected.
4. Monitor students as they complete the data for their first specimen.
5. Have students examine three other specimens and write their observations. Give them clear tape to place over their specimens to preserve their samples.

Closure

- Discuss what students found in their soil samples. Compare these with the materials found in the school soil samples. Save the worksheets for the students' rocks and minerals journals.

