Lesson 1

How do rocks form?

Rocks are everywhere. Some are as large as a mountain. Others are smaller than a grain of sand. Minerals make up rock. Rock forms in different ways.

Rocks

Earth consists of mostly different kinds of rocks. **Rock** is natural, solid, nonliving material made of one or more minerals. A **mineral** is a natural material that forms from nonliving matter.

You can tell rocks apart by looking at their physical properties. The physical properties of rocks include color, what minerals they are made of, and texture.

The rocks you see here range in color from gray to brown. Sometimes the minerals are so small that they aren't easy to see. Texture is the size of the bits of minerals, or grains, that make up the rock. Some rocks may have grains that are big enough to see. These different sizes of minerals make rocks feel smooth, rough, or bumpy.

1. **Checkpoint** What are some physical properties of rocks?

2. **Compare and Contrast** How are the rocks shown in the pictures alike? How are they different?

Rock Groups

Rocks can be placed into three main groups. Rocks in each group formed in a certain way. Each group contains many kinds of rocks.

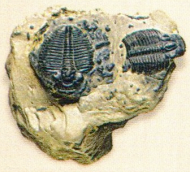
Igneous rock forms from a very hot mixture of melted minerals and gases. This mixture may cool slowly below ground until it hardens. Then the mineral grains may be large. If the rock cools quickly above ground or on the ocean floor, the grains may be too small to see.

Another group of rocks form from sediments, which are tiny bits of rock, sand, shells and other materials. Sediments settle to the bottom of rivers, lakes, and oceans. Over thousands of years, the sediments are pressed together and cemented into **sedimentary rock.** Sedimentary rock forms in layers—one layer at a time.

Fossils of extinct plants and animals can be found in sedimentary rocks. Their bodies were buried in sand and mud that hardened into rock. Fossils in sedimentary rock can show the history of life over time.

Fossils in Sedimentary Rock

Crinoids were ancient animals that looked like plants.



Trilobites were like modern crabs.

Ammonites looked similar to today's snails.

Igneous rock can come from volcanoes.

Metamorphic rock is rock that has been changed by heat and pressure. Shale is a sedimentary rock. Heat and pressure underground change the minerals in the shale. The shale becomes slate, a metamorphic rock. Granite is an igneous rock. It can be changed into gneiss, a metamorphic rock.

Igneous	Sedimentary
Granite Granite is igneous rock that has large grains. Granite is often used in building materials. 	**Shale** Shale is sedimentary rock. 

Changed into

Metamorphic	
Gneiss This gneiss was once granite. The grains in gneiss are arranged in layers. 	**Slate** This slate was once shale. 

Lesson Checkpoint

1. How is igneous rock that forms above ground different from igneous rock that forms below ground?
2. Describe clues, found in sedimentary rock, which show that living things have changed over time.
3. **Writing in Science** **Expository** List facts in your **science journal** about the three kinds of rocks. Then write a paragraph describing each of the three kinds.