Earth's crust is made of rock. Rocks are mixtures of minerals and other materials, although some rocks may contain only a single mineral. Geologists collect and study samples of rock in order to classify them. **When studying a rock sample, geologists observe the rock's color and texture and determine its mineral composition.** Using these characteristics, geologists can classify a rock according to its origin, or where and how it formed.

As with minerals, color alone does not provide enough information to identify a rock. Texture, however, is very useful. Most rocks are made up of grains of minerals or other rocks. **Texture** is the look that results from the size, shape, and pattern of a rock's grains. Some rocks are smooth and glassy, while others are rough or chalky.

Often, the grains in a rock are large and easy to see. Such rocks are said to be coarse-grained. In other rocks, the grains are so small that they can be seen only with a microscope. These rocks are said to be fine-grained. Rock grains vary widely in shape. Some grains look like tiny particles of fine sand. Others look like small seeds or exploding stars. In some rocks, the grain shapes result from the shapes of the crystals that form the rock. In other rocks, the grain shapes result from fragments of other rock.

The grains in a rock often form patterns. Some grains lie in flat layers. Other grains form wavy, swirling patterns. Some rocks have grains that look like rows of beads, while other rocks have grains that occur randomly throughout the rock. Some rocks have no grain, either because they cooled quickly when they formed or because they are composed of tiny silica particles that have settled out of water.

Often, geologists must look closely at a rock to determine its mineral composition. By looking at a small sliver of a rock under a microscope, a geologist can observe the shape and size of crystals in the rock and identify the minerals it contains. In identifying rocks, geologists also use some of the tests used to identify minerals, such as the scratch test to determine hardness.

**There are three major groups of rocks: igneous rock, sedimentary rock, and metamorphic rock.** These terms refer to how the rocks in each group formed. **Igneous rock** forms from the cooling of molten rock. **Sedimentary rock** forms when particles of other rocks or the remains of plants and animals are pressed and cemented together. **Metamorphic rock** forms when an existing rock is changed by heat, pressure, or chemical reactions.
A Crust Full of Rocks

The three major groups of rocks make up Earth's crust. But these groups of rocks are not found in equal amounts. The circle graph in the center below shows each group's percentage of the crust. The three circle graphs that surround the central one show the percentage of rocks that make up each group. You'll learn about many of these rocks as you read the rest of the chapter. Study the circle graphs below, and then answer the questions that follow.

Answer the following questions on a separate sheet of paper.

1. Which rock group makes up most of Earth's crust, and what is its percentage?
2. How do rocks in that rock group form?
3. What kind of rocks make up most of the igneous rocks?
4. Which rock group makes up the least part of Earth's crust, and what is its percentage?
5. How do rocks in that rock group form?
6. What kind of rock makes up the greatest part of metamorphic rocks, and what is its percentage?
7. How do metamorphic rocks form?