

Soil—A Limited Resource

1. Soil: Loose rock material covering part of Earth's surface
 - a. Soil is a natural resource
 - i. Natural Resource: any useful material from Earth (water, oil, minerals)

Using Soil Wisely

1. Running water causes the most soil erosion
2. Gully: miniature river valley formed in the soil
3. Conservation: the wise use of natural resources
 - a. The most important way to conserve soil is to leave plants growing whenever possible because the roots help hold the soil down

Soil Profile

1. Topsoil: top layer; a mixture of weathered rock and humus
 - a. Humus: decayed plant and animal matter; provides nutrients to plants
2. Subsoil: Below the topsoil; yellow or red layer made mostly of clay and minerals
3. Weathered Rock: Partly weathered rock below subsoil

Rocks to Riches

1. Earth is made up of layers
 - a. The outermost layer is the crust and it is made mostly of rocks
 - i. Thickest part of the crust: continents
 - ii. Thinnest part of the crust: sea floor
 - b. The other layers are the mantle, outer core, and inner core
2. Rock: solid material made up of one or more minerals
3. Minerals: natural solids that have a definite chemical makeup.
4. The way rocks are used depends on their properties
 - a. Granite: very hard rock; doesn't weather easily, used as building material
 - b. Marble: used for its beauty; used in sculptures
 - c. Graphite: the lead in your pencil
 - d. Chalk: made from a mineral called Calcite
 - e. Halite: table salt; sodium chloride (NaCl)
5. Ore: rock mined for the minerals it contains
 - a. Most minerals come from ores
 - b. What are the most valuable substances that come from ores? metals
 - i. Iron, copper, gold, tin, aluminum
 - c. Metals are nonrenewable resources, which means they can't be replaced.

Rocks and Minerals (Green Book)

Minerals: What properties can be used to identify minerals?

1. Rocks are made up of one or more minerals
2. Minerals are natural solids with a definite chemical makeup
3. Properties are used to describe and name things like rocks and minerals.
 - a. Some minerals are magnetic, which means they are attracted to some metals.
 - i. Example: magnetite

- b. Some minerals can be named by the shape of their **crystals**
 - i. Example: **quartz, salt**
 - c. Other properties of minerals are **color, shine/luster, and hardness**
 - i. To test the hardness of a mineral, geologists use the **Mohs Scale**
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Igneous Rock: Melted Rock: What are three ways rocks can form from melted rock?

1. Melted rock inside the earth is called **magma**
 2. When magma cools, it changes into **solid rock**
 - a. Rocks formed from magma are called **igneous** rocks.
 3. Magma that cools **slowly** makes rocks with large **crystals**, like **Granite**
 4. Magma that cools **quickly** (like lava) makes rocks with small **crystals**, like **Obsidian**
 5. Some magma cools so quickly that **gases** don't have time to escape. This leaves holes in the rock, like **Pumice**
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Sedimentary Rock: Rocks from Sediment: How are sedimentary rocks formed?

1. Sediment builds up at the bottom of **lakes** and **oceans**
 - a. Over time, this sediment builds up in **layers**
 - b. The heavy **top layers** press down on the bottom layers
 - c. After many years, the sediment hardens into **sedimentary rock**
 2. When you look at sedimentary rocks, you can often see layers of **sediment**
 - a. Different sediments form different sedimentary rocks:
 - i. Sandstone: formed from sediments of **sand**
 - ii. Limestone: formed from materials in **water**
 1. You can sometimes see **shells** and the remains of **plants** and **animals**
 2. **Calcite** (Chalk) is a type of limestone
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Metamorphic Rock: Rocks that Change into Other Rocks: How are metamorphic rocks formed?

1. High **temperature** and **pressure** can change igneous and sedimentary rocks that are buried deep in the Earth into other rocks.
 - a. These rocks are called **metamorphic** rocks
 2. Examples:
 - a. Heat and pressure change Soft Coal into **Hard Coal**, which is much harder and a better fuel.
 - i. Hard coal changes into the mineral **Graphite**
 - b. Heat and pressure change Sandstone into **Quartzite**
 - c. Heat and pressure change Limestone into **Marble**
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What properties can be used to identify minerals? _____

What are three ways rocks can form from melted rock? _____

How are sedimentary rocks formed? _____

How are metamorphic rocks formed? _____
