

IDENTIFYING TYPES OF COAL

OBJECT OR PURPOSE:

Students review the differences between rocks and minerals and categorize the ranks of coal. They also complete a map activity identifying countries and states where large deposits of coal are found.

1. Review the characteristics of rocks and minerals
2. Examine samples of coal and hypothesize whether the samples are rocks or minerals
3. Identify the locations of the largest coal reserves in the United States and around the world
4. Understand the role that coal plays in the U. S. economy.

MATERIALS REQUIRED:

- Specimens of four types of coal (free through the American Coal Foundation)
- Photocopies of outline maps of the world and the United States
- Colored pencils or crayons

TIME REQUIRED

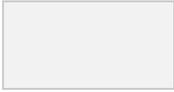
- one class period

PROCEDURE OR INSTRUCTIONS:

1. Begin by explaining or reviewing the differences between rocks and minerals. You may want to write this information on the blackboard or display it on the overhead projector and have students copy it into their notebook. Explain that minerals are inorganic (nonliving) substances found in nature that are made of single elements or compounds. There are many types of minerals. Students may even recognize a few, such as copper, gold, silver, diamond, topaz, and quartz. A rock, on the other hand, is a combination of two or more types of minerals fused together. Rocks may sometimes include organic materials such as microscopic remains of plants or animals. Both rocks and minerals are essential components of our planet.

Rocks are classified according to the way they form. There are three types of rock; igneous, sedimentary, and metamorphic. Igneous rock forms when magma, molten rock material within the earth, forces its way to the surface and cools. Sedimentary rock forms from mineral fragments deposited by wind, water,





or glaciers. Metamorphic rock is rock whose minerals and texture have been changed by high temperatures, water, and pressure.

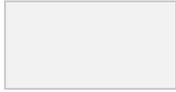
No rock's life is set in stone. One type of rock can change into another when erosion, heat, or pressure (or a combination of all three) break down the rock and transform it. This transformation is called the rock cycle.

Through the forces of nature, the earth's landscape is constantly changing.

2. Pass an unidentified sample of anthracite coal around the classroom and ask students to guess whether the object is a rock or a mineral. Explain that the object is a rock, but see if students can guess what kind of rocks it is. When students have finished guessing, explain that anthracite is a type of coal that is formed by metamorphism. Most other types of coal are classified as sedimentary rock. .Reproduce the following chart on the blackboard or overhead projector. Pass around the other samples of coal as you review the four types of coal.

Type of Coal	Appearance	Texture	Rock or	Carbon content
			Mineral	
Classification				
Peat	Dark brown to black	Soft; breaks unevenly when dry	Sedimentary rock	Low
	with much visible Plant material			
Lignite	Brown, with some visible plant material	Crumbly	Sedimentary rock	Medium
Bituminous	Black; dirty to handle	Hard and brittle	Sedimentary rock	High
Anthracite	Glassy black	Uneven	Metamorphic	Extremely high C





	surface	rock		

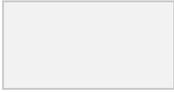
3. Explain to students that the carbon content in coal makes it burn and produce heat used to generate energy in power plants. Coal is important because of its abundance and its use in producing energy. Ask students if they know where coal can be found.
4. Distribute two blank outline maps: one of the world and another of the United States. Have students create a color-coded legend for the world map, identifying, in order, eight countries with the largest coal reserves. Using their own legend, have the students color in the following countries according to their rank in recoverable coal reserves. Provide the information in descending order so that students are surprised to find that the United States has the largest recoverable coal reserve in the world.
 8. Ukraine
 7. South Africa
 6. Germany
 5. Australia
 4. India
 3. China
 2. Russia
 1. United States

Ask students if they are surprised to find that the United States has more coal than any other country in the world. Ask them if they know where in the United States coal is found.

5. Name the 37 states that have coal deposits. As you do, have students identify them on the map, then color or shade them in. Begin with the more obvious coal mining states and continue through all 37 coal-producing states. (The following are states without coal deposits: Connecticut, Maine, New Hampshire, Vermont, Hawaii, New Jersey, Rhode Island, Delaware, South Carolina, Florida, Wisconsin, Minnesota, and Massachusetts.)
6. Ask students whether they are surprised to find out how many states have coal deposits. Tell them that one-eighth of the land area of the United States lies atop coal beds. As a class, discuss the role that coal plays in the economy of the United States. Review with students that coal is a plentiful, inexpensive, and reliable source of energy. How do these attributes affect the economy of the United States and the lives of Americans?

OTHER OPTIONS:





Have students write a newspaper article or a television news report about coal. Make sure they include information about where coal can be found, what types of coal there are, what characteristics coal has, and how it is used.

OTHER OPTIONS: How to take it down for lower grades or up for higher grades, other things that could be used and things like that

