
SYNOPSIS:

Throughout history, minerals have played an important role in the story of human progress. Scientific research continues to find new ways to use minerals, promising great changes in our future.

Exploring the many ways minerals touch our lives everyday, this program surveys the sources and uses of some of the minerals which have become most important to us, and looks at efforts to conserve and find suitable substitutes for these indispensable, non-renewable, natural resources.

CURRICULUM UNITS:

Conservation
Earth Science
General Science
Geology
Mineralogy
Technology

CAREER OPPORTUNITIES:

Builder
Chemist
Civil Engineer
Communications Engineer
Electronics Engineer
Gemologist
Geologist
Manufacturer
Materials Chemist/Engineer
Miner/Mining Engineer

PROGRAM OVERVIEW:

A mineral is a naturally occurring chemical element or combination of elements (chemical compound) formed through inorganic processes. Coal, oil, and natural gas, although commonly referred to as mineral resources, cannot be considered true

minerals because they are made up of plant and animal remains.

Nearly 3,500 minerals are known to exist. Some are plentiful such as quartz. Others are much more rare such as, gold, diamond, and emerald. Scientists identify minerals by examining their properties, or characteristics, such as structure, shape, color, and harness.

Minerals are formed when the hot, liquid rock deep within the earth finds its way to the earth's crust, cools, and hardens. Rock is made up of pure deposits or veins of minerals, or combinations of them.

This program shows where and how we get minerals as well as documents their vital uses. Minerals are in nearly everything we build and manufacture. This program ends with the message that with the help of scientists and engineers, conservation, and recycling, the earth should continue to provide the minerals we need, even with what surely will be increased world demand.

ISSUES AND CRITICAL THINKING:

1. After showing the program, ask your students the following:

- What is a mineral?
- What are some of the things you use everyday that are made from minerals?
- Where do minerals come from?
- What are some ways minerals are used significantly?
- Why are minerals so precious?

2. Explain how minerals give rocks their color and hardness. Using a piece of quartz, a piece of rock salt, and a steel nail, have students perform a scratch test to determine which of the two minerals is harder.

3. Lead a discussion about how rocks and minerals change due to weathering.

4. Many minerals are found in beautiful crystalline shapes. Try "growing" some crystals from supersaturated solutions such as Epsom salts and alum, which are available at drug stores.

5. Visit a local museum to explore special collections of minerals.

6. Have students list as many items in their classroom as they can made from minerals.

7. Have students compile lists of the minerals that are mined in various countries.

8. Arrange for a geologist (possibly from a local college or university) to show students how minerals are identified.

9. Let students use a magnifying glass to observe whether anything sticks to a strong magnet passed over some high mineral content breakfast cereal you have smashed.

10. Have students research minerals required for good health.

11. Make a list of materials and have students determine whether each is considered a mineral. (Ex. Plastic, wood, glass, cloth, steel, oil.)

GLOSSARY:

CATALYTIC CONVERTER- A device that neutralizes the pollutants in automobile exhaust before they are ejected into the air.

CONDUCTOR- A material that transmits energy.

COPPER- A golden-red metal with excellent conductive properties, used especially in electrical wires.

CRUST- the outer layer of the earth.

FIBER-OPTIC CABLES- Bundled strands of glass that transmit light and can be used to carry telecommunications signals.

GALVANIZER- A material which is applied as a coating over another material to protect it from corrosion, such as zinc galvanize on steel.

GEOLOGY- The scientific study of the earth and its surface.

GOLD- A soft, rare, heavy, yellow metal, which has very good conductive properties and does not corrode.

IRON- A gray-white metal used in making steel.

MINERAL- A naturally occurring chemical element or chemical compound formed through inorganic process.

ORE- A mineral from which a metal can be extracted.

PLATINUM- A rare, soft, heavy metal that looks like silver.

RUST- A type of corrosion, the reddish brown or orange coating that occurs when iron is exposed to moisture in the air.

SILICON- a very abundant element common in rocks and sand.

SILVER- A rare, shiny white metal that is soft and easily shaped.

SUPERCONDUCTING- Allows electric current to pass through without resistance.

The Wonders of Earth Science



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MINERALOGY: CONSERVING OUR PRECIOUS MINERALS



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