

- Share the book *Everybody Needs a Rock* by Byrd Baylor (Aladdin Paperbacks, 1987) with your students. Students can find a special rock and describe the characteristics that make their rock special. How can your special rock be used? Students should brainstorm a list of all the uses for their special rocks.
- Provided with a collection of rocks and minerals, students can sort them into groups based on properties that they observe. Encourage students to describe why they grouped the rocks and minerals the way they did. Compare grouping strategies with the rest of the class. Are there other ways to group these rocks and minerals?
- Invite a geologist to your classroom to share rock samples with your students. Students can compare the geologist's samples with those they've been studying in class.

### Suggested Internet Resources

Periodically, Internet Resources are updated on our web site at [www.LibraryVideo.com](http://www.LibraryVideo.com)

- [www.childrensmuseum.org/geomysteries/mysteries.html](http://www.childrensmuseum.org/geomysteries/mysteries.html)  
The Children's Museum of Indianapolis offers this "Geo Mysteries" Web site that provides animated illustrations of rock formation. This site also contains answers to frequently asked questions about rocks and tips for collecting rocks in the field.
- [www.fi.edu/fellows/fellow1/oct98/index2.html](http://www.fi.edu/fellows/fellow1/oct98/index2.html)  
The "Rockhounds With Rocky" Web site presents information about rock formation and a virtual rock collection for students to examine. Teaching connections, including lesson plans, activities and literature suggestions, are also provided.
- [www.mii.org](http://www.mii.org)  
The Mineral Information Institute is dedicated to educating students about minerals and other natural resources from the Earth. This Web site presents a great deal of information for teachers about minerals, including lesson plans and activities. A homework help section also provides photographs of many minerals, facts about common minerals and their uses, and details about the minerals found in specific states.

### Suggested Print Resources

- Christian, Peggy. *If You Find a Rock*. Harcourt Publishing, Orlando, FL; 2000.
- Gans, Roma. *Let's Go Rock Collecting*. HarperCollins Children's, New York, NY; 1997.
- Hiscock, Bruce. *The Big Rock*. Aladdin Paperbacks, New York, NY; 1999.

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- Hooper, Meredith. *The Pebble in My Pocket: A History of Our Earth*. Viking, New York, NY; 1999.
- Perrault, Chris. *The Best Book of Fossils, Rocks and Minerals*. Kingfisher Chambers, New York, NY; 2000.

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### TITLES

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## All About Rocks & Minerals

Grades K-4

This guide is a supplement, designed for educators to use when presenting this program in an instructional setting.

**Before Viewing:** Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create an "Everything We Know About..." list. Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as "science detectives" they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

**After Viewing:** After a brief discussion about the program, challenge your "science detectives" to prove or disprove the accuracy of the facts they put on their "Everything We Know About..." list. Discuss what else they learned and use the followup questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.



## Program Summary

The rocks that make up much of the Earth are made of different amounts and types of minerals, which are solid, pure substances with unique characteristics. All minerals are made of special crystal patterns, some of which are block-shaped, while others are pyramid-shaped. Minerals of the same kind break in the same way. These breaks usually follow the lines made by the mineral's crystals. Each mineral has different amounts of shine, also called luster. Minerals like diamonds have high luster, while others like talc do not shine at all. Some minerals are harder than others; no other mineral is hard enough to scratch the hardest mineral — diamond. Talc is the softest and can be scratched by all other minerals.

The series of steps or stages called the rock cycle is a continuous process of rock change and creation. Rocks are grouped into three main types: igneous, sedimentary and metamorphic. Igneous rocks are formed when very hot, liquid rock under the Earth's surface cools and hardens, either on or under the surface of the Earth. Wind, rain, ice, waves and other forces break down rocks over many years, creating smaller and smaller fragments. Sedimentary rock is formed as these particles, along with sand, dirt, pebbles, shells and twigs, sink to the bottom of oceans and lakes, and build up over millions of years. The weight of all of those layers pressing down squeezes them together, eventually turning into rock. Metamorphic rocks are formed when igneous and sedimentary rocks are changed by thousands of years of high heat and great pressure. If any rocks are forced down into the molten, liquid rock layer under the Earth's crust, they are then melted down and can later come back to the Earth's surface through volcanoes to form igneous rocks. The rock cycle can then continue.

Humans have found many uses for rocks and minerals. Many buildings are made using solid rock; minerals are crushed to make pigments for paints and cosmetics; metals such as iron are turned into tools and supports for buildings; still other minerals, such as gold and silver, are made into coins and jewelry. Minerals are also necessary ingredients for good health. We obtain these valuable minerals when we eat plants that absorb the minerals in the soil through their roots. Rocks and minerals are extremely important resources for humans and other living things throughout the world!

## Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the show.

**rocks** — The solid materials that form the Earth's surface, made of minerals and other substances. There are three different types of rocks: igneous, sedimentary and metamorphic. *(Continued)*

**minerals** — Solid, pure substances found in the Earth that combine to form rocks. Each mineral is formed in crystals, has a specific color, luster and hardness, and breaks in a specific way. Minerals are made by processes deep within the Earth.

**crystals** — Special patterns of shapes that make up each mineral. These patterns help us tell minerals apart. Crystals are formed when mineral-rich liquids are frozen or evaporated.

**cleavage** — The way a mineral breaks. Minerals can break along smooth or jagged surfaces. Minerals usually make their own shapes and patterns when they break.

**luster** — The shine of a mineral.

**hardness** — The ability of a mineral to resist being scratched.

**crust** — The outer layer of the Earth that is made of rock.

**igneous rocks** — Rocks that are formed when melted rock cools and hardens, either under or above the surface.

**sedimentary rocks** — Rocks formed over time by the hardening of layers of sediment like mud, shell particles, pieces of bone and rock fragments.

**metamorphic rocks** — Rocks formed when heat and pressure change one kind of rock into another.

**gemstones** — Valuable minerals like diamonds, opals and rubies that are often used in jewelry.

**lapidary** — A person who cuts and polishes minerals for use in making jewelry.

**rock cycle** — The natural process by which rocks are created and changed to form new rocks.

## Pre-viewing Discussion

Before students generate their list of "Everything We Know About..." this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

- What is a rock? Where can rocks be found?
- What are minerals? How can they be used?

After the class has completed their "Everything We Know About..." list, and before watching the show, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

## Focus Questions

You may wish to ask your class the following questions to assess their comprehension of key points presented in the program. *(Continued)*

1. What are rocks?
2. What are minerals?
3. All minerals are made of crystals. What does this mean?
4. How are crystals formed in nature?
5. What does cleavage mean? Is cleavage the same for all minerals?
6. What is luster?
7. What is hardness? How can it be tested?
8. What is the hardest mineral on Earth? What are its uses?
9. What are igneous rocks and how are they formed?
10. How do small particles form sedimentary rocks?
11. What are metamorphic rocks? How are they formed?
12. What is the rock cycle? How are all three types of rocks involved in this cycle?
13. What happens in a lapidary shop?

## Follow-up Discussion

The most important part of this segment is to examine both the facts and beliefs generated by the class in their "Everything We Know About..." list. Research indicates that students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. Because of this, it is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. After reviewing the list, encourage students to share the answers they got to the questions raised, before viewing the program.

Raising a thought-provoking question is a good way to assess the overall depth of student understanding. A couple of suggestions are listed below:

- What are some ways that people use rocks and minerals?
- What are some properties of minerals that make them different from other minerals?

## Follow-up Activities

- Have students bring in rocks from their neighborhoods to create a classroom mineral collection. Students should then make observations that focus on the color, shape, weight, hardness, luster and texture of the rocks. Magnifying glasses, rulers and scales should be made available to students throughout their investigations. Students can then write a short description and make a detailed picture of their rock for inclusion in a class rock book. *(Continued)*