

If You Find a Rock

Description

Learners observe, describe, and sort a variety of rocks, discovering that rocks have certain physical properties by which they can be classified.

Suggested Grade Levels: 2–4

Lesson Objectives *Connecting to the Standards*

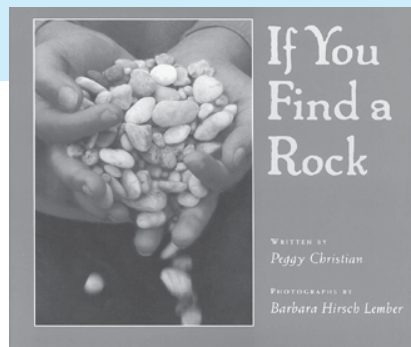
Content Standard A: Scientific Inquiry

- Ask a question about objects, organisms, and events in the environment.
- Employ simple equipment and tools to gather data and extend the senses.
- Communicate investigations and explanations.

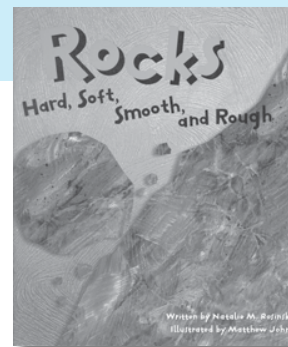
Content Standard D: Earth and Space Science

- Understand that Earth materials include solid rocks and soils and that they have different physical and chemical properties which make them useful in different ways.

Featured Picture Books



Title	<i>If You Find a Rock</i>
Author	Peggy Christian
Illustrator	Barbara Hirsch Lember
Publisher	Harcourt
Year	2000
Genre	Story
Summary	Soft, hand-tinted photographs and simple, poetic text celebrate the variety of rocks that can be found, including skipping rocks, chalk rocks, and splashing rocks.



<i>Rocks: Hard, Soft, Smooth, and Rough</i>
Natalie M. Rosinky
Matthew John
Picture Window Books
2003
Non-narrative Information
Simple text and cartoonish illustrations provide information on igneous, sedimentary, and metamorphic rocks.

Time Needed

This lesson will take several class periods. Suggested scheduling is as follows:

Day 1: **Engage** with *If You Find a Rock* read aloud and then have students bring in a special rock the next day.

Day 2: **Explore/Explain** with I Found a Rock and Rock Sorting.

Day 3: **Elaborate** with *Rocks: Hard, Soft, Smooth, and Rough* read aloud and rock identification.

Day 4: **Evaluate** with Pet Rock Posters.

Materials

Per student:

- Hand lens
- Centimeter ruler
- A rock (brought in by student)
- Colored pencils, crayons, or markers
- Poster board

Per group of 5 students:

- One of each of the following rock samples: obsidian, granite, sandstone, limestone, and marble

Per class:

- 1 interesting rock to engage students
- Optional: Photo of the original Pet Rock packaging

Rock specimens in packs of 10 are available from www.carolina.com

Rock	Order Number
Obsidian, Black	GEO1112B
Granite, Gray	GEO1080B
Sandstone, Red	GEO2012B
Limestone, Fossil	GEO1198B
Marble, White	GEO2054B

Student Pages

I Found a Rock

Pet Rock Advertising Poster Rubric

Background

Children are naturally curious about the world around them, including the rocks beneath their feet. Learning about the properties and uses of earth materials such as rocks helps young children build a foundation for later understandings about the interactions of the Earth's *geosphere* (crust, mantle, and core), *hydrosphere* (water), *atmosphere* (air), and *biosphere* (living things). The National Science Education Standards state that students in grades K–4 should understand that earth materials include solid rocks and soils, water, and the gases of the atmosphere. These materials have different physical and chemical properties that make them useful in different ways. The Standards also suggest that young children be encouraged to closely observe the objects and materials in their environment, note their properties, and distinguish them from one another. Following these suggestions, this lesson focuses primarily on recognizing properties of rocks (shape, size, color, texture, and luster, but not hardness,

which is a property used to identify minerals only), as well as understanding how properties of rocks can be used to sort them and exploring how a rock's properties and its uses are related.

In the Elaborate activity, students learn that rocks can melt inside the Earth, and that they are made of *minerals*. They are also introduced to the idea that rocks can be classified as igneous, sedimentary, or metamorphic depending upon how they are formed. *Igneous* rock was once melted within the Earth. After it forms, melted rock (*magma*) can push its way upward through cracks in the Earth's crust and cool while still within the Earth to form *plutonic* igneous rock or reach the surface where it is called *lava*. The lava then cools and hardens to become *volcanic* igneous rock. *Granite* is an example of plutonic igneous rock and *obsidian* is an example of volcanic igneous rock. Rocks can also form when *sediments* such as sand, mud, pebbles, bones, shells, and plants settle into layers on the bottoms of lakes, oceans, or rivers. Over millions of years, the top layers press down on the bottom layers and the bottom layers become *sedimentary* rock. *Sandstone* and *limestone* are examples of sedimentary rock. Limestone often contains the fossilized remains of animals that lived millions of years ago. The third kind of rock is *metamorphic* rock—rock that was formed when another kind of rock was exposed to tremendous heat and pressure over a long period of time. For example, *marble* is a metamorphic rock formed when limestone is “squeezed and cooked” inside the earth. The minerals within metamorphic rock are often arranged in stripes or swirls caused by heat and uneven pressure. Students learn that rocks can be identified by their color, texture, mineral arrangement, and luster, but not by their size or shape.

Engage

If You Find a Rock Read Aloud

With an interesting rock hidden in your hand, announce to the class that you have found something that is older than them, older than the school building, even older than you ... something that could even be millions of years old! Have students guess what it is. Reveal the rock, and then tell students that a rock is probably one of the oldest things that they will ever touch. Ask students to share observations of the rock as it is passed around. Then tell students that you have a book to read to get them thinking about special rocks.

Making Connections: Text to Self

Introduce the author and illustrator of the book, *If You Find a Rock*. The author, Peggy Christian, is a rock hound who was born in the Rocky Mountains

of Colorado and loves skiing, camping, and reading. Build connections to the author by asking

- ? What is a *rock hound*? (a person who likes to collect rocks)
- ? Is anyone here a rock hound?
- ? What do you call a scientist who studies rocks to learn about the Earth? (a geologist)
- ? Would you like to be a geologist?

Explain that there are many people, both men and women, who choose geology as a career and devote their entire lives to studying it. Tell students that Peggy Christian's father was a geologist and maybe that is why she loves rocks so much.

Determining Importance

Explain that, while you are reading the book aloud, you would like students to think about what some of the rocks in the book are used for and what properties, or characteristics, make them suited for those uses.

Read aloud *If You Find a Rock*. (For fun, stop after reading the page about the wishing rock

If You Find a Rock *read aloud*

and invite students to close their eyes and make a wish.)

After reading, ask

- ? What are some of the uses for the special rocks in the book? (Answers might include: wishing rock, skipping rock, chalk rock, resting rock, splashing rock, and worry rock.)
- ? Have you ever owned a special rock?
- ? What made it special to you?

Tell students that they are going to be rock hounds on the hunt for their own special rock. They can go outside and, with adult supervision, search for a rock or select a rock from their own collection. They should bring their special rock to school the next day. Send a letter home to inform parents of the assignment. Include these rules for students to follow: *Your rock must be smaller than a tennis ball. You are not allowed to throw your rock.* You may want to have extra rocks available for students who don't bring one in.

explore/explain

I Found a Rock

The next day, have students place their rocks on their tables or desks. Ask them to observe their own rock and then look around at some of the rocks near them. Discuss the following questions:

- ? How are the rocks alike?
- ? How are the rocks different?

Encourage students to notice that rocks come in a wide variety of colors, shapes, sizes, and other characteristics. Then explain that a scientific tool called a hand lens can help them get an even closer look at their rocks. Demonstrate the proper way to use a hand lens (holding the lens close to one eye while bringing the rock toward the hand lens until it comes into focus), and caution them that touching the rock to the surface of the hand lens can scratch the lens. Pass out hand lenses to all students, and have them use the lenses to observe their rock more closely.

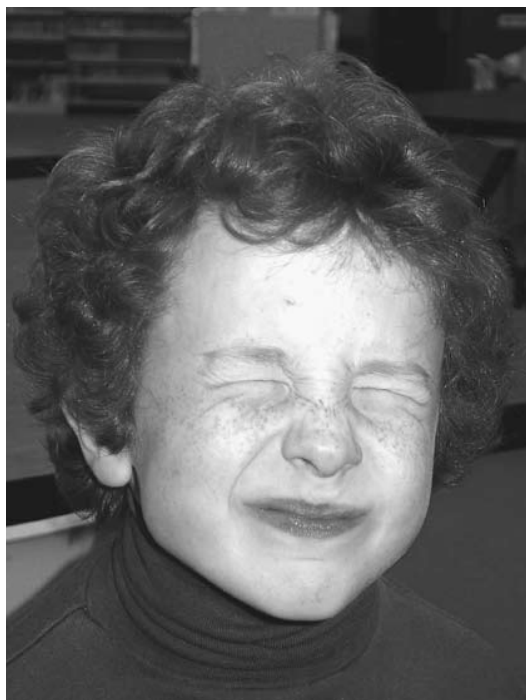
Next, revisit the book, *If You Find a Rock*. Ask students to recall the rocks described in the book. List some of the rocks on the board, such as

- skipping rock
- chalk rock
- resting rock
- wishing rock
- worry rock
- climbing rock

Then ask

- ? What makes each rock in the book suited for its special use? (Answers might include: its shape, its color or size, and how it feels.)

Explain that these things—shape, color, size, texture (how it feels)—are called *properties* of rocks. Discuss how the properties of each rock in the book make it suited for a different purpose. For example, a skipping rock is used for skipping across water. The properties that make it suited



Making a wish

for that purpose are its flat and rounded *shape* and its small *size*. Shape and size are properties of rocks. A chalk rock is used to make pictures on the pavement. The properties that make it suited for that purpose are its white *color* and its soft, dusty *texture*. Texture describes how a rock feels. Color and texture are also properties of rocks. Another property students may notice as they observe their rocks is *luster*, or how the tiny specks in rocks reflect light. Words that describe luster include shiny, dull, and sparkly.

Explain that shape, size, color, texture, and luster are different properties of rocks that make each one unique. Geologists who study rocks use *some* of these properties to identify different types of rocks. Tell students that they are going to observe and record the properties of their own special rock. Pass out the I Found a Rock student page and centimeter rulers. Make sure students understand how to record the properties listed on the data table by discussing questions such as

- ? What are some words that might describe a rock's *color*? (Answers might include: black, white, and reddish-brown.)
- ? What are some words that might describe a rock's *texture*? (Answers might include: bumpy, smooth, and rough.)
- ? What are some words that might describe a rock's *luster*? (Answers might include: shiny, dull, and glassy.)
- ? What is one way to measure a rock's *size*? (Use a ruler to measure the longest side in centimeters.)

Discuss how observations of size such as big or small are not scientific observations because they are not exact. Using measurements to describe the size of a rock is more scientific. Then have students make careful observations of their rocks and complete their data tables.

Next, have students think about the unique properties of their rocks and fill in the cloze sentence, "I found a rock that would be good for _____ because it is _____."

Rock Sorting

This activity is a fun way to show that rocks can be identified by their unique properties. The object is to end with one student standing, holding his or her rock. Collect all of the I Found a Rock student pages. Randomly select one from the stack, but don't let students see it. Have all the students stand, holding their rocks. Then read the first observation on the page, for example, "I found a rock, and it is gray. If your rock is gray, stay standing." Students whose rocks are not gray should sit. Then read the second observation on the page, for example, "I found a rock, and it is smooth. If your rock is smooth, stay standing." Students whose rocks are not smooth should sit. Continue reading the observations, including the cloze sentence at the bottom, until only one student is standing. Repeat the process with several more student pages.



Measuring a rock

elaborate

Rocks: Hard, Soft, Smooth, and Rough Read Aloud and Rock Identification

Form groups of about five students. Give each student in a group a hand lens and one of the following rocks: obsidian, granite, sandstone, limestone, or marble. Have each student observe his or her rock and compare it to the other rocks in their group. Ask

- ? Are the five rocks all the same kind of rock? (no)
- ? How are they different? (They have different properties: shape, size, color, texture, and luster.)
- ? Is it possible to look at a rock and tell what kind of rock it is? (Answers will vary; the following activity will help students understand how geologists identify rocks by their properties.)

Next, tell students that the picture book *Rocks: Hard, Soft, Smooth, and Rough* can give them clues

about their rock's identity. Each one of the rocks they have been observing is described in the book. As you read the book aloud, stop after reading each rock description and ask students to hold up their rock if they think it is the one being described. After reading, use the rocks chart on page 21 to help students identify their rocks correctly. Explain that many different kinds of scientists use these kinds of charts, also called keys, to identify unknown objects.

After reading, use the following questions to help students understand how size and shape might not be good properties to use to identify rocks. Ask

- ? What properties did you use to identify your rock? (Answers might include: color, texture, luster, swirls, stripes, or specks.)
- ? Were you able to identify your rock based on its size or shape alone? (no)
- ? Why might size not be a good property to use to identify a rock? (Rocks are all different sizes depending on how they formed or broke apart from larger rocks—for example, a piece of granite can be any size.)
- ? Why might shape not be a good property to use to identify rocks? (For the same reason as in the previous question—for example, a piece of granite can be any shape.)
- ? What are the basic building blocks of rocks called? (minerals)

Next, have students use hand lenses to see if they can find any specks, crystals, swirls, or stripes in their rock samples. These are the minerals that make up their rocks. Some rocks are made of a single mineral, but most are made of several minerals. (A student who is observing a very fine-grained rock may not be able to see any minerals. Geologists often use special microscopes to look at very thin slices of rocks so that they can determine mineral content and thus rock type.)

Then ask

- ? What are the three main types of rocks you learned about in the book? (igneous, sedimentary, and metamorphic)
- ? How are rocks classified into these three

groups? (Rocks are classified based upon how they are formed.)

- ? How do scientists identify unknown rocks? (They can observe their properties and use a key.)

Evaluate

Pet Rock Posters

Ask students if they have ever heard of a Pet Rock. Explain that way back in 1975, a businessman in California came up with the idea of selling rocks as pets. He considered dogs, cats, and birds too messy and expensive to keep, and instead advertised his Pet Rock as the ideal pet. The Pet Rock was packaged in a box that looked like a pet carrying case, and it even came with a “Pet Rock Training Manual.” Topics included “How to Make Your Pet Rock Roll Over and Play Dead” and “How to House-Train Your Pet Rock.” Believe it or not, the Pet Rock became a huge hit and the salesman became rich. (Optional: Show students a photo of the original Pet Rock and its packaging.)

Ask

- ? Would you have bought your own Pet Rock if you lived in the 1970s?
- ? Why do you think this businessman was able to sell so many Pet Rocks? (Answers might include: He had an original idea, and he used creative packaging and advertising.)
- ? What are some ways that advertisements help sell products? (Answers might include: They describe them, they make them sound useful, and they make them seem fun.)

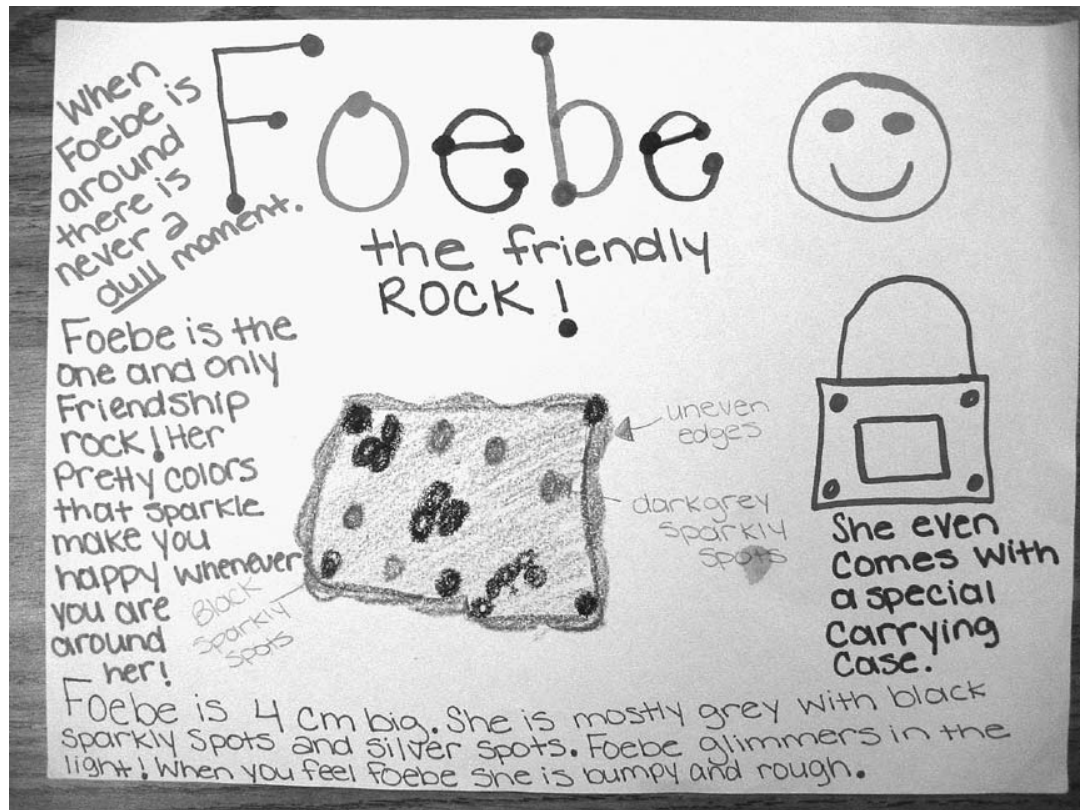
Pass out the Pet Rock Poster Rubric and challenge students to create an advertisement for a Pet Rock. You may want to have them use either their own special rock or the rock they identified using the book *Rocks: Hard, Soft, Smooth, and Rough*. Have them give their rock a clever name (“Dusty,” “Rocky,” and “Cliff” come to mind!) and then design an ad to sell the rock. The advertisement should show what they have learned about properties of rocks, including



Using the Rock Identification Chart

- 4 Points: A detailed description of the Pet Rock's properties (including size, color, texture, and luster)
- 3 Points: A labeled, detailed, full-color drawing of the Pet Rock showing its unique features
- 2 Points: Two suggested uses for the Pet Rock based on its properties
- 1 Point: A creative statement to make people want to buy the Pet Rock
- Extra Credit: A poem, song, rap, jingle, drawing of the rock's packaging, or training tips for the Pet Rock

Have students share their advertisements with the rest of the class or have a gallery walk.



Pet rock advertisement

Inquiry Place

Have students brainstorm testable or researchable questions about rocks, such as

- ? How many ways can these rocks be sorted?
- ? How can you measure the volume of a rock?
- ? Which rock is the most common in our state?
- ? What can _____ be used for?
- ? Where is _____ found?

Then have students select a question to investigate or research as a class, or have groups of students vote on the question they want to investigate or research as a team. After they make predictions, have them design an experiment to test their predictions. Students can present their findings at a poster session or gallery walk.

More Books to Read

Baylor, B. 1985. *Everybody needs a rock*. New York: Aladdin.

Summary: Everybody needs a rock—at least that's the way this particular rock hound feels about it in presenting her own highly individualistic rules for finding just the right rock for you.

Gans, R. 1984. *Let's go rock collecting*. New York: Harper Collins Publishers.

Summary: This entry in the *Let's-Read-and-Find-Out Science* series describes the formation and characteristics of igneous, sedimentary, and metamorphic rocks and how to recognize and collect them.

Hooper, M. 1996. *The pebble in my pocket*. New York: Viking Juvenile.

Summary: A girl finds a pebble on the ground and wonders where it came from. The answer unfolds

through scientifically accurate text, colorful illustrations, and a helpful timeline that follows its long journey from the inside of a volcano to the day the girl picks it up off the ground.

Hurst, C.O. *Rocks in his head*. New York: Greenwillow Books.

Summary: Based upon true events in the life of the author's father, this book tells the story of how a young man's lifelong love of rocks eventually lead him to work at a science museum.

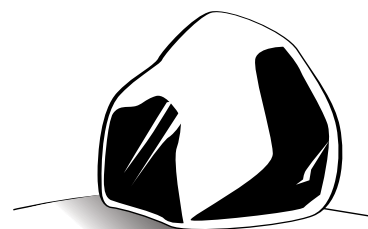
Website

Rock Hounds: Learn how to collect rocks safely, find out how rocks are formed, take a quiz, and more.

<http://sln.fi.edu/fellows/payton/rocks/index2.html>

Rock Hound's Name: _____

I Found a Rock



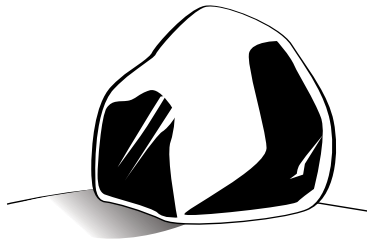
Color What colors or patterns does it have?	Texture How does it feel?	Luster How shiny or dull is it?	Size What is the longest length in cm?

Labeled Drawing of My Rock

A large, empty rectangular box with a thin black border, intended for a student to draw their rock. It is located below the 'Labeled Drawing of My Rock' caption.

I found a rock that would be good for _____

because it is _____.



Pet Rock

Advertising Poster Rubric

Your Name: _____ Pet Rock's Name: _____

Your poster includes:

4	Points: A detailed description of the Pet Rock's properties (including size, color, texture, and luster)	4	3	2	1	0
3	Points: A labeled, detailed, full-color drawing of the Pet Rock showing its unique features	3	2	1	0	
2	Points: Two suggested uses for the Pet Rock based on its properties		2	1	0	
1	Point: A creative statement to make people want to buy the Pet Rock			1	0	

Extra Credit: Your poster includes a poem, song, rap, jingle, drawing of the rock's packaging, or "training tips" for the Pet Rock

1 0

Total Points _____/10

Comments: _____