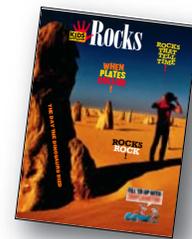




Teacher's Guide

Rocks



Dear Educator,

Meet some rock stars—Ayres Rock, Stonehenge, and fossils—and other rocks on the third rock from the sun (that's Earth!) with **KIDS DISCOVER Rocks!** Your young geologists will enjoy learning about the fascinating topics at right.

This Teacher's Guide is filled with activity ideas and blackline masters to help your students enjoy and learn more from *Rocks*. Select or adapt the activities that suit your students' needs best.

Thank you for making **KIDS DISCOVER** a part of your classroom.

Sincerely,

KIDS DISCOVER

P.S. We would love to hear from you!
E-mail your comments and ideas to teachers@kidsdiscover.com

Meeting the Standards

✓ Earth and Space Science
– *National Science Education Standards*

✓ Visit www.kidsdiscover.com/standards to find out more about how **KIDS DISCOVER** meets state and national standards.

PAGES

WHAT'S IN ROCKS

- 2–3 **Rolling Stones**
What is a rock? Plus, a diagram of the rock cycle
- 4–5 **Third Rock from the Sun**
The layers of the Earth and its major tectonic plates
- 6–7 **Tools and Tombs**
How rocks and minerals shape our lives
- 8–9 **Gemstones are Forever**
Precious stones, absolute hardness, and Mohs Scale
- 10–11 **Stonehenge**
A vibrant photograph of Stonehenge in Wilshire, England
- 12–13 **Bones of Stones**
How are fossils formed and where do you find them?
- 14–15 **Catch a Falling Star**
Moon rocks, meteors, and the debate over the cause of the dinosaurs' extinction
- 16–17 **Rock Stars**
Famous rocks and birthstone gems
- 18–19 **Student Activities**
Make a pet rock and design gemstone jewelry, plus an acrostic, resources, and more

• IN THIS TEACHER'S GUIDE •

2 **Prereading Activities**

3 **Get Set to Read (Anticipation Guide)** 

4 **Discussion and Writing Questions**

5–6 **It's in the Reading (Reading Comprehension)** 

7 **Everything Visual (Graphic Skills)** 

8 **Cross-Curricular Extensions**

9–12 **Answer Keys to Blackline Masters**

www.kidsdiscover.com

KIDS DISCOVER • 149 Fifth Avenue, 12th Floor • New York, NY 10010 • T: 212-677-4457 • F: 212-353-8030



PREREADING ACTIVITIES



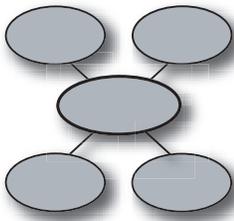
Before distributing **KIDS DISCOVER Rocks**, activate students' prior knowledge and set a purpose for reading with these activities.

Discussion

To get students thinking about how this topic relates to their interests and lives, ask:

- ✓ *Does anyone have a rock collection or ever looked at different types of rocks? Why do you think people collect rocks? What are some differences in the rocks?*
- ✓ *What are some questions you have about rocks?*

Concept map



Explain to students that they will be reading *Rocks*. Ask: *What are some words that are related to rocks?* List students' responses on the board. (See box below for some terms they may suggest.) After creating a list, ask

students to group the words into categories, such as **Types of Rocks** or **Famous Rocks**. Create a concept map by writing *Rocks* on the board and circling it. Write the categories around the circle and draw lines between the ideas to show connections. Then write the words from the list around the appropriate categories. Encourage students to add more words to the concept map as they read *Rocks*.

KEY TERMS

- | | |
|---------------|----------------------|
| ✓ sedimentary | ✓ fossil |
| ✓ igneous | ✓ meteor |
| ✓ metamorphic | ✓ tectonic plates |
| ✓ magma | ✓ Blarney Stone |
| ✓ birthstone | ✓ Ayres Rock (Uluru) |
| ✓ minerals | ✓ Friedrich Mohs |

Get Set to Read (Anticipation Guide)



Copy and distribute the **Get Set to Read** blackline master (page 3 of this Teacher's Guide). Explain to students that this **Anticipation Guide** will help them find out what they know and what misconceptions they have about the topic. **Get Set to Read** is a list of statements—some true, some false. Ask students to write whether they think each statement is true or false in the **Before Reading** column. Be sure to tell students that it is not a test and they will not be graded on their answers. The activity can be completed in a variety of ways for differentiated instruction:

- ◆ **Have students** work on their own or in small groups to complete the entire page.
- ◆ **Assign pairs** of students to focus on two statements and to become "experts" on these topics.
- ◆ **Ask students** to complete the **Before Reading** column on their own, and then tabulate the class's answers on the chalkboard, on an overhead transparency, or on your classroom computer.
- ◆ **Review the statements** orally with the entire class.

If you predict that students will need assistance finding the answers, complete the **Page Number** column before copying **Get Set to Read**.

Preview

Distribute *Rocks* and model how to preview it. Examine **titles, headings, words in boldface type, pictures, charts, and captions**. Then have students add new information to the **Concept Map**. If students will only be reading a few pages at one sitting, preview only the selected pages.

BE WORD WISE WITH POWER VOCABULARY!

You have exclusive access to additional resources including Power Vocabulary blackline masters for every available KIDS DISCOVER title! These activities introduce students to 15 specialized and general-use vocabulary words from each KIDS DISCOVER title. Working with both types of words helps students develop vocabulary, improve comprehension, and read fluently. Follow the links from your Teacher's Toolbox CD-ROM and find your title to access these valuable resources:

- ◆ Vocabulary cards
- ◆ Crossword puzzle
- ◆ Word find
- ◆ Matching
- ◆ Cloze sentences
- ◆ Dictionary list

◆◆◆◆◆ www.kidsdiscover.com ◆◆◆◆◆

KIDS DISCOVER • 149 Fifth Avenue, 12th Floor • New York, NY 10010 • T: 212-677-4457 • F: 212-353-8030



Name _____ Date _____

Get Set to Read

What do you know about rocks? In *Before Reading*, write *true* if you think the statement is true. Write *false* if you think the statement is not true. Then read *KIDS DISCOVER Rocks*. Check back to find out if you were correct. Write the correct answer and the page number where you found it.

CHALLENGE: Rewrite each false sentence in a way that makes it true.

Before Reading		After Reading	Page Number
_____	1. The three categories of rocks are organic, inorganic, and radioactive.	_____	_____
_____	2. Every mineral forms crystals with specific shapes.	_____	_____
_____	3. Metamorphic rocks form when heat and pressure cause rocks to go through a change.	_____	_____
_____	4. The Himalaya Mountains were formed when two tectonic plates collided violently.	_____	_____
_____	5. Limestone comes from fossilized zooplankton and phytoplankton that were transformed by pressure and heat over millions of years.	_____	_____
_____	6. Silver, which is naturally magnetic, was used to magnetize iron compass needles.	_____	_____
_____	7. Because they are so hard, diamonds can scratch every other mineral.	_____	_____
_____	8. Fossils are formed when minerals replace the tissues of dead animals and turn them to rock.	_____	_____
_____	9. The huge impact crater off the coast of Mexico was probably made by a nuclear explosion.	_____	_____
_____	10. Uluru, the world's largest rock, is two miles long and one mile wide.	_____	_____



Use the following questions as oral discussion starters or for journaling. For additional in-class discussion and writing questions, adapt the questions on the reading comprehension blackline masters on pages 5 and 6.

Pages 2–3

✓ What are some rocks that you see or use every day?

Pages 4–5

✓ Have you ever seen an active or dormant volcano? Where was it? What did it look like?

✓ Have you ever been in an earthquake? What was it like?

Pages 6–7

In the Stone Age, most tools and weapons were made of rocks. Then people began mixing together copper and tin and made weapons and tools out of bronze. Ask:

✓ How do you think using bronze weapons and tools rather than those made of stone changed the way of life for the people in this time?

Pages 6–7

Several uses of rocks are described and pictured on pages 6–7. Ask:

✓ Which use of rocks most surprised you? What are some other uses of rock?

Pages 8–9

Diamonds are expensive, in part because they are rare. Today, some people buy artificial gems instead of real ones. The two stones can look identical. Ask:

✓ Why do you think someone might want to buy a “real” diamond, for example, when an artificial one looks exactly like the real one?

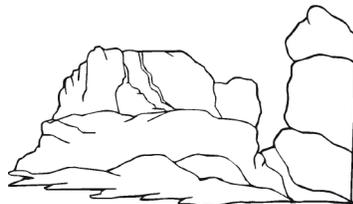
Pages 8–9

✓ Would you like to be a miner and mine for precious gems? Why or why not?

Pages 10–11

Stonehenge, in southern England, is featured on pages 10 and 11. Ask:

✓ Has anyone visited Stonehenge? What did it look like? How did you feel when you were there?



Pages 12–13

Geologists study the physical and chemical nature of Earth. Ask:

✓ Would you like to be a geologist?

✓ What kinds of things do you think a geologist does?

✓ What qualities do you think a good geologist needs to have?

Pages 12–13

Paleontologists are dinosaur scientists. Ask:

✓ Would you like to be a paleontologist? Why?

✓ Why do you think some people are fascinated by dinosaurs?

Pages 12–13

The Grand Canyon offers a unique look into the past. Ask:

✓ Has anyone been to the Grand Canyon? What did it look like? Did you notice the different rock layers?

Pages 14–15

✓ Have you seen a meteor shower? What did it look like?

Pages 14–15

Astronauts have brought back moon rocks, which have given us information about how and when the moon was formed. Ask:

✓ Do you think it’s important to know how and when the moon was formed? Why or why not?

Pages 16–17

Have students look at the bottom of page 17 and find their birthstones. Ask:

✓ Do you like your birthstone? Which stone is your favorite? Why?

All pages

After students read the issue, ask:

✓ What are some things you found out about rocks that you didn’t know before?



Add KOIDS DISCOVER issues and a class set of blackline masters to your substitute teacher folder for when you are absent.



Name _____ Date _____

It's in the Reading

After reading **KIDS DISCOVER Rocks**, choose the best answer for each question.
Fill in the circle.



Find your answers on the pages shown in the book icon next to each question.

1. All of the following are formed from minerals except ____.

- A. fingernails
- B. gypsum
- C. marble
- D. quartz



2. Igneous rock forms when ____.

- A. heat and pressure change rocks from one form to another
- B. a chemical reaction dissolves limestone deposits
- C. tiny bits of rock are pressed together
- D. magma or lava cools and hardens



3. Earthquakes usually occur along fault lines because ____.

- A. these are where tectonic plates are moving
- B. glaciers move along fault lines, creating friction
- C. there are no volcanoes in these areas to relieve the buildup of pressure underground
- D. Earth's core is hotter directly under fault lines



4. Rocks have been used for art in all of the following ways except ____.

- A. to make paint
- B. to drill for oil
- C. as material for carving
- D. to coat photographic film



5. One opinion about gemstones is ____.

- A. The Cullinan was the largest diamond ever found
- B. Artificial diamonds are used to make saws and drill bits
- C. Rubies are more beautiful than diamonds
- D. Topaz is softer than diamond



It's in the Reading (continued)

6. Archaeologists think Stonehenge may have been used _____.

- A. as a local marketplace
- B. as a burial mound
- C. as a park
- D. as an astronomical calendar



7. In a canyon like the Grand Canyon, the oldest rock layers are usually _____.

- A. very difficult to identify
- B. the lightest color
- C. those that contain the most fossils
- D. those deepest in the canyon



8. The following event that happened first is _____.

- A. Luis and Walter Alvarez developed a theory about the mass extinction of dinosaurs
- B. A space rock the size of Mount Everest slammed into what is now Mexico's east coast, causing the dinosaurs to die
- C. A 15,000-ton meteorite crashed into Canyon Diablo in Arizona
- D. A rocky object exploded in western Siberia with enough force to level trees in an area the size of New York City



9. Sculptor Gutzon Borglum probably chose to carve the four presidents that he did because _____.

- A. he was only able to find portraits of these four presidents
- B. they were all outspoken advocates for the arts
- C. they made important contributions to the nation during their terms in office
- D. no monuments have ever been made for any of them



10. What is the most important use of rocks today? Why?



Name _____ Date _____

Everything Visual

Diagrams, photographs, maps, and charts all tell a part of the story, but often in different ways. Study the Rock Around the Rock Cycle diagram on page 3. Consider how this visual helps you understand rocks better. Then answer the questions.

1. What kinds of rocks can become sediment? What natural processes cause these rocks to become sediment?

2. What causes igneous rock or sedimentary rock to become metamorphic rock?

3. Look at where igneous rock comes in the cycle. Why is fire-formed a good description for igneous rock?

4. What is the difference between sediment and sedimentary rock?

5. Is it possible for magma to become sedimentary rock directly? Indirectly? Why or why not?

6. Why are the processes shown in the diagram described as a cycle?



Name **ANSWER KEY** _____ Date _____

Get Set to Read

What do you know about rocks? In *Before Reading*, write *true* if you think the statement is true. Write *false* if you think the statement is not true. Then read *KIDS DISCOVER Rocks*. Check back to find out if you were correct. Write the correct answer and the page number where you found it.

CHALLENGE: Rewrite each false sentence in a way that makes it true.

Before Reading	After Reading	Page Number
_____ 1. The three categories of rocks are organic, inorganic, and radioactive igneous, sedimentary, and metamorphic .	_____ <i>False</i>	_____ <i>p. 2</i>
_____ 2. Every mineral forms crystals with specific shapes.	_____ <i>True</i>	_____ <i>p. 2</i>
_____ 3. Metamorphic rocks form when heat and pressure cause rocks to go through a change.	_____ <i>True</i>	_____ <i>p. 3</i>
_____ 4. The Himalaya Mountains were formed when two tectonic plates collided violently.	_____ <i>True</i>	_____ <i>p. 4</i>
_____ 5. Limestone Petroleum comes from fossilized zooplankton and phytoplankton that were transformed by pressure and heat over millions of years.	_____ <i>False</i>	_____ <i>p. 6</i>
_____ 6. Silver Lodestone , which is naturally magnetic, was used to magnetize iron compass needles.	_____ <i>False</i>	_____ <i>p. 7</i>
_____ 7. Because they are so hard, diamonds can scratch every other mineral.	_____ <i>True</i>	_____ <i>p. 8</i>
_____ 8. Fossils are formed when minerals replace the tissues of dead animals and turn them to rock.	_____ <i>True</i>	_____ <i>p. 12</i>
_____ 9. The huge impact crater off the coast of Mexico was probably made by a nuclear explosion comet or asteroid .	_____ <i>False</i>	_____ <i>pp. 14–15</i>
_____ 10. Uluru, the world's largest rock, is two miles long and one mile wide.	_____ <i>True</i>	_____ <i>p. 17</i>



Name **ANSWER KEY** _____ Date _____

It's in the Reading

After reading KIDS DISCOVER *Rocks*, choose the best answer for each question.
Fill in the circle.



Find your answers on the pages shown in the book icon next to each question.

1. All of the following are formed from minerals except _____.

- A. fingernails (*draw conclusions*)
- B. gypsum
- C. marble
- D. quartz



2. Igneous rock forms when _____.

- A. heat and pressure change rocks from one form to another
- B. a chemical reaction dissolves limestone deposits
- C. tiny bits of rock are pressed together
- D. magma or lava cools and hardens (*content vocabulary*)



3. Earthquakes usually occur along fault lines because _____.

- A. these are where tectonic plates are moving
(*cause and effect*)
- B. glaciers move along fault lines, creating friction
- C. there are no volcanoes in these areas to relieve the buildup of pressure underground
- D. Earth's core is hotter directly under fault lines



4. Rocks have been used for art in all of the following ways except _____.

- A. to make paint
- B. to drill for oil (*main idea*)
- C. as material for carving
- D. to coat photographic film



5. One opinion about gemstones is _____.

- A. The Cullinan was the largest diamond ever found
- B. Artificial diamonds are used to make saws and drill bits
- C. Rubies are more beautiful than diamonds (*fact and opinion*)
- D. Topaz is softer than diamond



It's in the Reading (continued)

6. Archaeologists think Stonehenge may have been used _____.

- A. as a local marketplace
- B. as a burial mound
- C. as a park
- D. as an astronomical calendar (*details*)



7. In a canyon like the Grand Canyon, the oldest rock layers are usually _____.

- A. very difficult to identify
- B. the lightest color
- C. those that contain the most fossils
- D. those deepest in the canyon (*summarize*)



8. The following event that happened first is _____.

- A. Luis and Walter Alvarez developed a theory about the mass extinction of dinosaurs
- B. A space rock the size of Mount Everest slammed into what is now Mexico's east coast, causing the dinosaurs to die (*sequence*)
- C. A 15,000-ton meteorite crashed into Canyon Diablo in Arizona
- D. A rocky object exploded in western Siberia with enough force to level trees in an area the size of New York City



9. Sculptor Gutzon Borglum probably chose to carve the four presidents that he did because _____.

- A. he was only able to find portraits of these four presidents
- B. they were all outspoken advocates for the arts
- C. they made important contributions to the nation during their terms in office (*draw conclusions*)
- D. no monuments have ever been made for any of them



10. What is the most important use of rocks today? Why?

Answers will vary, but students should provide reasons for their opinion.



Name **ANSWER KEY** _____ Date _____

Everything Visual

Diagrams, photographs, maps, and charts all tell a part of the story, but often in different ways. Study the Rock Around the Rock Cycle diagram on page 3. Consider how this visual helps you understand rocks better. Then answer the questions.

1. What kinds of rocks can become sediment? What natural processes cause these rocks to become sediment?

Through weathering and movement, metamorphic, igneous, and sedimentary rocks all can be broken down into sediment.

2. What causes igneous rock or sedimentary rock to become metamorphic rock?

The diagram shows that heat and pressure combine to change sedimentary and igneous rocks into metamorphic rocks.

3. Look at where igneous rock comes in the cycle. Why is fire-formed a good description for igneous rock?

Igneous rock results from the cooling and crystallization of molten rock, or magma. It takes great heat to melt rock into magma, so fire-formed is appropriate.

4. What is the difference between sediment and sedimentary rock?

Sediment is tiny pieces of broken rock and minerals. Sedimentary rock is formed when sediment gets settled and pressed tightly together.

5. Is it possible for magma to become sedimentary rock directly? Indirectly? Why or why not?

Magma, or molten rock, does not become sedimentary rock directly, but in the rock cycle the minerals of magma may eventually be found in sedimentary rock. Sedimentary rock is formed from smaller pieces of already formed rock.

6. Why are the processes shown in the diagram described as a cycle?

A cycle describes a circular process. The process of rock formation is circular, meaning minerals can pass through every stage or phase repeatedly.