

Chapter 3 Rocks

Study Guide

1. Classifying Rocks

- a. How Geologists Classify Rocks
- b. **Texture**
 - i. **Grain Size**
 - ii. Grain Shape
 - iii. Grain Pattern
 - iv. No Visible Grain
 - v. *What terms describe a rock's texture?*
- c. Mineral Composition
- d. Origin
 - i. **Igneous Rock**
 - ii. **Sedimentary Rock**
 - iii. **Metamorphic Rock**

2. Igneous Rocks

- a. Characteristics of Igneous Rock
 - i. Origin
 1. **Extrusive rock**
 2. **Basalt**
 3. **Intrusive rock**
 4. **Granite**
 - ii. Texture
 1. **Porphyritic texture**
 - iii. Mineral Composition
 1. **Silica**
 2. *Describe three ways in which igneous rocks differ.*
 - iv. Uses of Igneous Rocks

3. Sedimentary Rocks

- a. From **Sediment** to Rock
 - i. **Erosion**
 - ii. **Deposition**

iii. **Compaction**

iv. **Cementation**

v. *What are the processes that change sediment to sedimentary rock?*

b. Types of Sedimentary Rock

c. **Clastic Rocks**

i. Shale

ii. Sandstone

iii. Conglomerate and Breccia

d. **Organic Rocks**

i. Coal

ii. Limestone

iii. *What are two important organic sedimentary rocks?*

e. **Chemical Rocks**

f. Uses of Sedimentary Rocks

4. Rocks From Reefs

a. Living Coal

i. **Coral reef**

b. How a Coral Reef Forms

i. **Atoll**

ii. *What are the three types of coral reefs?*

c. Limestone Deposits From Coral Reefs

5. Metamorphic Rocks

a. How Metamorphic Rocks Form

b. Classifying Metamorphic Rocks

i. **Foliated**

ii. *What is a foliated rock?*

c. Uses of Metamorphic Rock

6. **The Rock Cycle**

a. A Cycle of Many Pathways

i. *How can a rock change from one form to another?*

SECTION 3-1

REVIEW AND REINFORCE

Classifying Rocks

◆ Understanding Main Ideas

Fill in the blanks in the table below.

Grain Property	Description	Texture
Size	Large, easy to see	1.
Size	2.	Fine-grained
Shape	Mineral crystals	Crystalline
3.	Rock fragments	Rounded or jagged
4.	Layered or random grains	Banded or nonbanded
No visible grain	No crystal grains	5.

Answer the following questions on a separate sheet of paper.

6. What characteristics do geologists look for when observing a rock sample?
7. Name the three major groups of rocks and describe how each forms.
8. What tests do geologists use to identify minerals in rocks?

◆ Building Vocabulary

Fill in the blank to complete each statement.

9. The size, shape, and pattern of a rock's grains make up its _____.
10. The particles of minerals or other rocks that make up a rock are called _____.

SECTION 3-2**REVIEW AND REINFORCE****Igneous Rocks****◆ Understanding Main Ideas**

Fill in the blanks to complete the table below.

Origin of Igneous Rock	Resulting Texture
Slow cooling of magma far beneath Earth's surface	1.
Magma cooling in two stages, first slowly and then quickly	2.
Extremely rapid cooling of lava in which no crystals form	3.
Rapid cooling of lava in which tiny crystals form	4.

Answer the following questions on a separate sheet of paper.

5. Explain how the silica content of molten material affects the color of igneous rocks.
6. What qualities of igneous rocks have long made them useful for tools and building materials?
7. Describe one use each for the igneous rocks granite, basalt, and pumice.

◆ Building Vocabulary

Fill in the blank to complete each statement.

8. Igneous rock formed from lava on Earth's surface is called _____ rock.
9. A rock with large crystals scattered on a background of much smaller crystals has a(n) _____ texture.
10. Igneous rock formed from magma below Earth's surface is called _____ rock.

SECTION 3-3 REVIEW AND REINFORCE

Sedimentary Rocks

◆ Understanding Main Ideas

The flowchart below shows a sequence of processes that form sedimentary rock. Put the processes into the correct sequence by writing their letters in the correct order in the blank.

- a. Compaction → b. Erosion → c. Cementation → d. Deposition

1. _____

Classify each of the following sedimentary rocks by writing Clastic, Organic, or Chemical in the blank beside it.

- | | |
|--|--------------------|
| _____ 2. Sandstone | _____ 6. Coal |
| _____ 3. Limestone made from shells | _____ 7. Breccia |
| _____ 4. Conglomerate | _____ 8. Rock salt |
| _____ 5. Limestone made from dissolved calcite | _____ 9. Shale |

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term.

- | | |
|-------------------------|--|
| _____ 10. erosion | a. small, solid pieces of material from rocks or living things |
| _____ 11. clastic rock | b. the process that presses sediments together |
| _____ 12. sediment | c. sedimentary rock that forms from remains of plants and animals |
| _____ 13. cementation | d. the process in which water or wind loosen and carry away rock fragments |
| _____ 14. organic rock | e. the process in which dissolved minerals crystallize and glue sediments together |
| _____ 15. compaction | f. sedimentary rock that forms when rock fragments are squeezed together |
| _____ 16. chemical rock | g. the process by which sediment settles out of wind or water |
| _____ 17. deposition | h. sedimentary rock that forms when minerals dissolved in a solution crystallize |

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SECTION 3 - 4

REVIEW AND REINFORCE

Rocks From Reefs

◆ Understanding Main Ideas

Fill in the blanks in the flowchart below.

Coral animals absorb the element **1.** _____ from ocean water. ➔
Corals change the element into calcite to form protective **2.** _____
➔ When corals die, new **3.** _____ build on top of the dead corals' shells, creating a structure. ➔ Over thousands of years, **4.** _____ grow outward toward the ocean.

Answer the following questions in the spaces provided.

5. What conditions are present in the water just south of Florida that explain why coral reefs can be found there?

6. Explain why almost all growth in a coral reef occurs within 40 meters of the water's surface.

7. Describe each of the three types of coral reefs.

8. What explains how limestone that began as coral can be found on continents?

◆ Building Vocabulary

Fill in the blank to complete each statement.

9. A ring-shaped coral island found far from land is called a(n) _____.

10. A structure formed when the skeletons of coral animals grow together is a(n) _____.

SECTION 3-5

REVIEW AND REINFORCE

Metamorphic Rocks

◆ Understanding Main Ideas

Fill in the blanks to complete the flowchart below.

Forces inside Earth push rock down toward the heat of Earth's

1. _____ . → As the rock is buried deeper in the crust,
2. _____ increases on the rock. → The rock is squeezed so tightly that the
3. _____ of the rock change, creating metamorphic rock.

Answer the following questions in the spaces provided.

4. Describe a situation in which heat can change rock to metamorphic rock.

5. What characteristic do geologists use to classify metamorphic rocks?

6. Describe how quartzite forms.

7. Explain what characteristics make marble a useful metamorphic rock.

◆ Building Vocabulary

Classify each of the following metamorphic rocks by writing either Foliated or Nonfoliated in the blank beside it.

_____ 8. marble

_____ 9. slate

_____ 10. gneiss

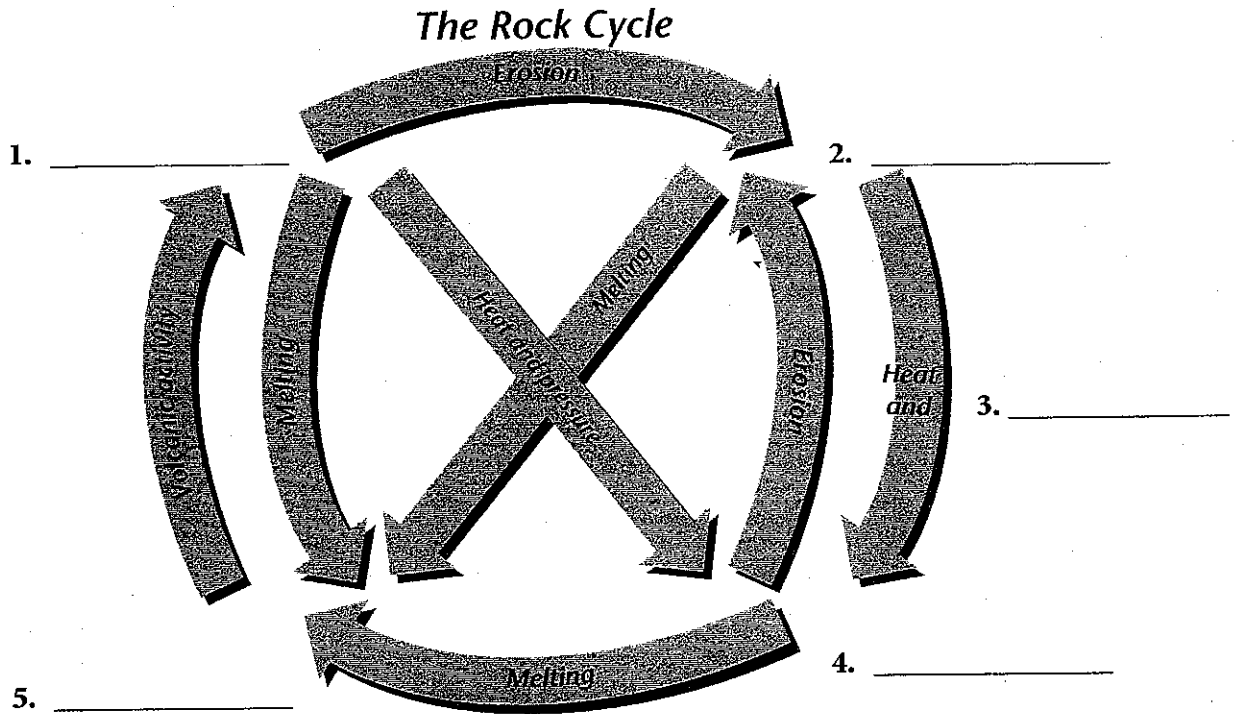
SECTION 3-6

REVIEW AND REINFORCE

The Rock Cycle

◆ Understanding Main Ideas

Use these terms to fill in the blanks in the figure below: metamorphic rock, sedimentary rock, magma, igneous rock, pressure.



Answer the following questions on a separate sheet of paper.

6. How do constructive and destructive forces inside Earth contribute to the rock cycle?
7. Describe an alternate pathway within the rock cycle.
8. Describe how the granite of a mountain could change first into sandstone and then into quartzite.

◆ Building Vocabulary

Using your own words, write a definition of the rock cycle on the lines below.

9. _____

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Name: _____

Class: Earth Science
Ch. 3 Review

Choose the letter of the correct answer.

- For igneous rock to form in the rock cycle, rock must be
[A] compacted and cemented. [B] melted and then cooled.
[C] slightly heated. [D] changed chemically.
- The sedimentary rock formed when water deposits tiny particles of clay in very thin, flat layers is called
[A] shale. [B] calcite. [C] limestone. [D] gypsum.
- What step in the rock cycle would be required to change granite into sandstone?
[A] Pieces of the granite melt when they return to the mantle by subduction.
[B] The granite must be buried under a layer of sand.
[C] Lava flows melt the granite sediment.
[D] Dissolved calcite in ocean water cements granite sediment together.
- Igneous rock that formed from lava that erupted onto Earth's surface is called
[A] clastic rock. [B] intrusive rock. [C] extrusive rock. [D] sedimentary rock.
- A series of processes on Earth's surface and interior that slowly changes rocks from one kind to another is called
[A] crystallization. [B] erosion. [C] the rock cycle. [D] evaporation.
- Where does most metamorphic rock form?
[A] at the surface [B] deep underground [C] just below the surface [D] in sea waters
- Heat and pressure deep beneath Earth's surface can change any rock into
[A] metamorphic rock. [B] sedimentary rock. [C] chemical rock. [D] gemstones.
- A sedimentary rock made up of rounded fragments of other rocks is called
[A] breccia. [B] conglomerate. [C] sandstone. [D] shale.
- Which of the following is NOT one of the possible stages in the rock cycle?
[A] smelting [B] melting [C] erosion [D] volcanic activity

Choose the letter of the correct answer.

10. The most abundant intrusive rock is
[A] flint. [B] slate. [C] quartzite. [D] granite.
11. Chalk formed from sediments made of skeletons of microscopic living things in the ocean must be a(n)
[A] igneous rock. [B] clastic rock. [C] organic rock. [D] chemical rock.
12. When all the grains in a rock are large and easy to see, the rock is described as
[A] nonbanded. [B] coarse grained. [C] porphyritic. [D] fine grained.
13. The process by which sediment settles out of the water or wind carrying it is
[A] compaction. [B] deposition. [C] cementation. [D] erosion.
14. During the rock cycle, forces inside Earth can push rock down toward the heat of the mantle, producing
[A] metamorphic rock. [B] coarse-grained rock.
[C] sedimentary rock. [D] igneous rock.
15. The heat that changes a rock into metamorphic rock comes from
[A] the sun. [B] friction of plate movement.
[C] chemical rocks in the crust. [D] the heat of the mantle.

Fill in the word or phrase that best completes the statement(s).

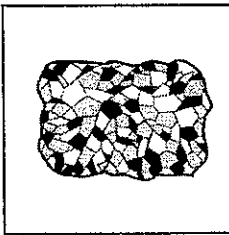
16. A series of processes known as the _____ continuously changes rocks from one kind to another kind.
17. *Foliated* and *nonfoliated* are terms used to describe the texture of _____ rocks.
18. The carrying away of rock fragments by water, wind, or ice is called _____, an important process in the formation of sedimentary rocks.
19. Metamorphic rocks such as marble and quartzite are said to be _____ because their mineral grains are not arranged in parallel layers or bands.
20. Some of the sedimentary rock called _____ is made from ancient coral reefs buried by sediments.

If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

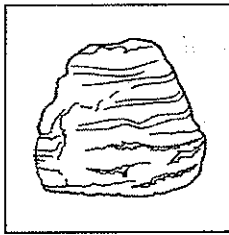
21. Sandstone changing to quartzite is an example of the process that forms sedimentary rock.
22. Igneous rocks that formed beneath Earth's surface are extrusive rocks.
23. The small particles of rock or the remains of living things that make up sedimentary rocks are called cement.
24. Examples of clastic rocks, which are made of particles of other rocks, include sandstone, shale, and breccia.

Use the diagram to answer the question(s).

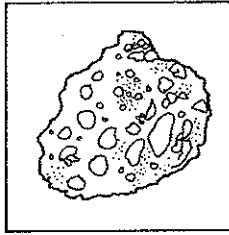
Rocks and How They Form



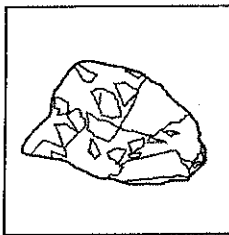
Rock A: Coarse-grained crystals of different shapes and sizes



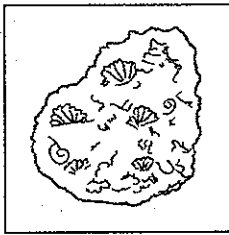
Rock B: Coarse-grained crystals arranged in parallel bands



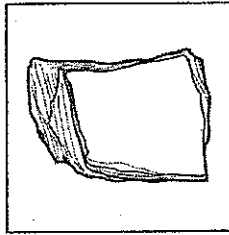
Rock C: Rounded pebbles and sand cemented together



Rock D: Jagged rock fragments cemented together



Rock E: Shells and shell fragments cemented together with calcite

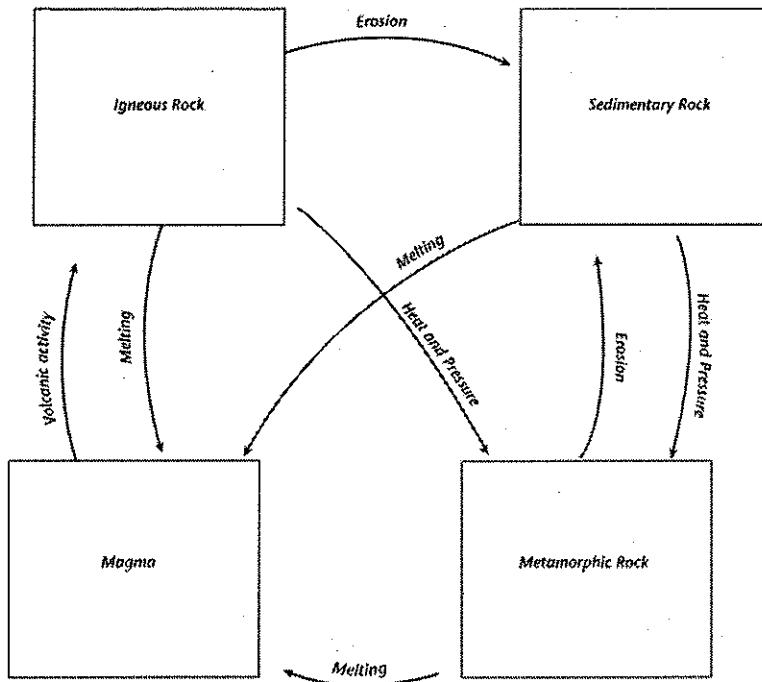


Rock F: Fine-grained crystals in thin foliated layers

25. Match Rock F with the correct rock from the following list: slate, breccia, granite, limestone, conglomerate, gneiss. Classify Rock F into one of the three major rock groups and explain how it formed

Use the diagram to answer the question(s).

The Rock Cycle



26. What step in the rock cycle helps sedimentary rock to form?

Write an answer to the following question(s).

27. Explain how a grain of sand that washes up on a beach could end up some day as lava pouring from a volcano.
28. Explain why limestone that began as coral can be found on land.
29. Which group of rocks is most likely to contain fossils? Why?
30. Describe what geologists do to determine the mineral composition of a rock.

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