Name _____ Date _____ Class _____

Classifying Rocks

This section explains how geologists classify rocks.

Use Target Reading Skills

As you preview the headings in this section, complete the graphic organizer with questions in the left column. Then as you read, fill in the answers in the second column.

Question	Answer
What does a rock's color tell about the rock?	

Introduction

1. Earth's crust is made of _____.
2. Circle the letter of each characteristic that geologists use to classify rocks.
   - **a.** texture
   - **b.** mineral composition
   - **c.** hardness
   - **d.** color

Mineral Composition and Color

3. What are rocks made of? _____

   _____

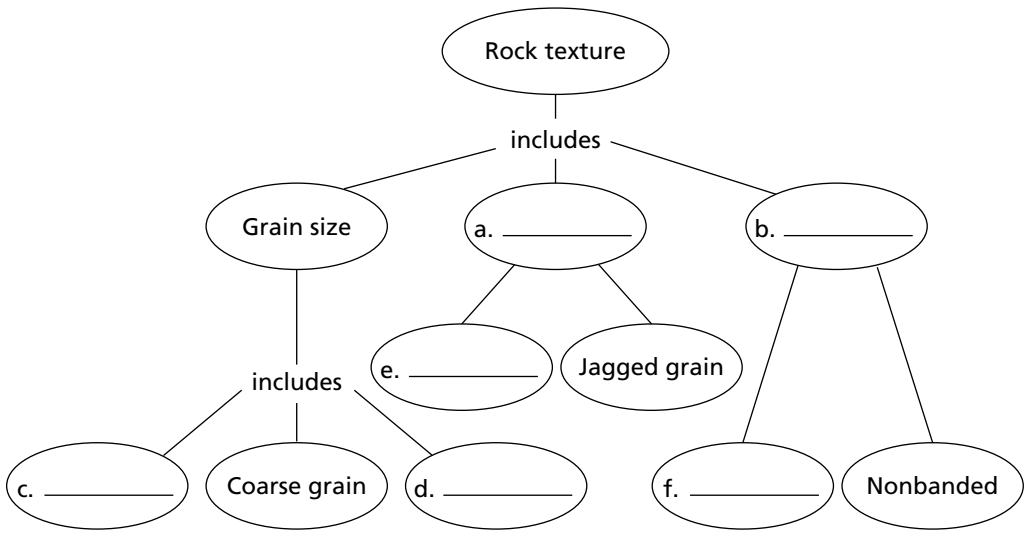
   _____

4. Circle the letter of each mineral that is found in granite.
   - **a.** quartz
   - **b.** feldspar
   - **c.** mica
   - **d.** hornblende

Classifying Rocks *(continued)*

Texture

5. Is the following sentence true or false? Most rocks can be identified by color alone. _____
6. The look and feel of a rock's surface is its _____.
7. Particles of minerals and other rocks that make up a rock are called _____.
8. Is the following sentence true or false? A rock's grains give the rock its texture. _____
9. Circle the letter of each sentence that is true about the grain size in rock.
   - **a.** An example of a coarse-grained rock is diorite.
   - **b.** An example of a fine-grained rock is slate.
   - **c.** Grains in fine-grained rock are easy to see.
   - **d.** Grains in coarse-grained rock are microscopic.
10. Complete the concept map showing the characteristics of rock texture.



g. Is the following sentence true or false? *Coarse grain* is a term that describes a rock's grain pattern. _____

11. Circle the letter of the choice that determines the grain shape of a rock such as granite.

a. Shape of the rock's crystals **b.** Size of the rock's crystals

c. Shape of fragments of other rock **d.** Coarseness of the rock's grains

12. Circle the letter of the choice that determines the grain shape of a rock such as conglomerate.

a. Fineness of the rock's grains **b.** Size of the rock's grains

c. Shape of the rock's crystals **d.** Shape of fragments of other rock

13. Circle the letter of the description of the grain pattern of gneiss.

a. It looks like different colors in bands.

b. It looks like a stack of pancakes.

c. It looks like waves.

d. It looks like rows of squares and rectangles.

14. Circle the letter of the sentence that is true about rocks with no visible grain.

a. Some rocks without crystal grains cooled very quickly.

b. Some rocks have no visible grain even under a microscope.

c. Rocks without crystal grains look rough and coarse.

d. An example of a rock with a glassy texture is slate.

How Rocks Form

15. How do geologists classify a rock? _____

_____

_____

16. List the three major groups of rock.

a. _____

b. _____

c. _____

Classifying Rocks *(continued)*

17. Complete the compare/contrast table to show the similarities and differences among the types of rocks and how they form.

How Rocks Form	
Type of Rock	**How It Forms**
a.	Molten rock cools.
b.	Particles are pressed and cemented.
c.	Existing rock is changed.

d. What do the three major types of rocks have in common? _____

_____

e. How are they different? _____

_____

18. The type of rock that forms from magma or lava is _____ rock.

19. The type of rock that forms in layers is _____ rock.

20. Is the following sentence true or false? Most metamorphic rocks form close to the surface. _____

Name _____ Date _____ Class _____

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

Answer the following questions on a separate sheet of paper.

5. What characteristics do geologists look for when observing a rock sample?

6. Name the three major groups of rocks and describe how each forms.

7. Give two examples of how a rock's color provides clues to the rock's mineral composition.

Building Vocabulary

Fill in the blank to complete each statement.

8. The look and feel of a rock's surface is its _____.

9. The particles of minerals or other rocks that make up a rock are called _____.

10. The 20 minerals that make up most of the rocks of Earth's crust are known as _____.

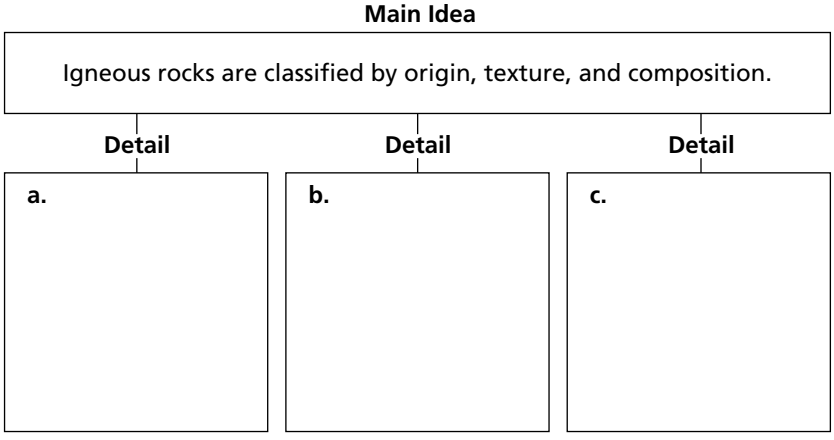
Name _____ Date _____ Class _____

Igneous Rocks

This section describes the characteristics and uses of igneous rocks.

Use Target Reading Skills

As you read about igneous rocks, fill in the detail boxes that explain the main idea in the graphic organizer below.



Classifying Igneous Rocks

1. Circle the letter of the definition of igneous rock.

a. Rock that forms from minerals

b. Rock that contains iron

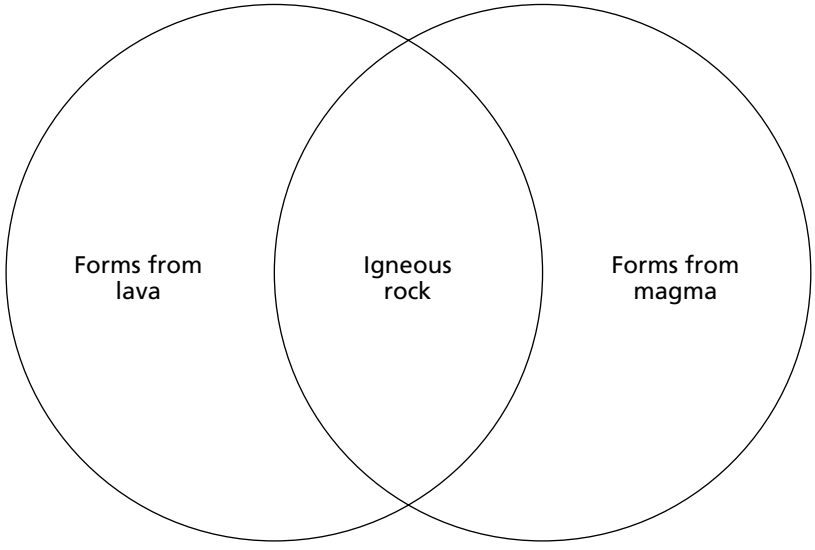
c. Rock that forms from magma or lava

d. Rock that contains crystals

Igneous Rocks *(continued)*

2. Complete the Venn diagram by labeling each circle with the type of rock it represents.

a. _____ **b.** _____



c. Use the Venn diagram to explain how the types of rocks shown are alike and different. _____

_____

3. Is the following sentence true or false? Extrusive rock forms beneath Earth's surface. _____

4. Circle the letter of each sentence that is true about basalt.

a. It forms oceanic crust.

b. It is the most common intrusive rock.

c. It forms from lava.

d. It forms beneath Earth's surface.

5. Circle the letter of each sentence that is true about granite.

a. It is the most abundant intrusive rock in continental crust.

b. It forms the core of many mountain ranges.

c. It forms from magma.

d. It forms on top of the crust.

6. The texture of an igneous rock depends on the size and shape of its _____.

7. Is the following sentence true or false? Igneous rocks with similar mineral compositions always have the same textures.

_____

Match the type of texture of igneous rocks with how rocks of that texture form.

Type of Texture	How Rocks of That Texture Form
____ **8.** fine-grained	**a.** Magma cools in two stages.
____ **9.** coarse-grained	**b.** Lava cools rapidly.
____ **10.** porphyry rock	**c.** Magma cools slowly.

11. Is the following sentence true or false? Intrusive rocks have smaller crystals than extrusive rocks. _____

12. A rock with large crystals surrounded by small crystals is called _____.

13. What type of texture do extrusive rocks such as basalt have?

_____

_____

14. What is obsidian? _____

_____

15. Describe the texture of obsidian. _____

_____

16. Circle the letter of each sentence that is true about the silica composition of igneous rocks.

a. Igneous rocks low in silica are usually dark-colored.

b. An example of an igneous rock low in silica is granite.

c. Igneous rocks high in silica are usually light-colored.

d. An example of an igneous rock high in silica is basalt.

17. Describe the different minerals that determine the color of granite.

_____

_____

18. How do geologists determine the mineral composition of granite?

_____

_____

Igneous Rocks *(continued)*

Uses of Igneous Rocks

19. Why have people throughout history used igneous rocks for tools and building materials? _____

_____

20. Describe three ways granite has been used throughout history.

a. _____

b. _____

c. _____

21. Complete the table that shows the ways igneous rocks are used.

How Some Igneous Rocks Are Used	
Type of Igneous Rock	**Way It Is Used**
Basalt	Gravel for construction
a.	Cleaning and polishing
b.	Soil mixes

c. Use the information in the table to draw a conclusion about the uses of igneous rocks. You may use more than one sentence.

_____

_____

_____

_____

Name _____ Date _____ Class _____

Igneous Rocks

Understanding Main Ideas

Fill in the blanks in the table below.

Origin of Igneous Rock	Resulting Texture
Slow cooling of magma far beneath Earth's surface	**1.** _____
Extremely rapid cooling of lava in which no crystals form	**2.** _____
Rapid cooling of lava in which tiny crystals form	**3.** _____

Answer the following questions on a separate sheet of paper.

4. What is the most common extrusive rock? Where is it found?

5. What is the most common intrusive rock? Where is it found?

6. Explain how the silica content of molten material affects the color of igneous rocks.

7. What qualities of igneous rocks have long made them useful for tools and building materials?

8. Describe one use each for the igneous rocks granite, basalt, and pumice.

Building Vocabulary

Fill in the blank to complete each statement.

9. Igneous rock formed from lava that erupted onto Earth's surface is called _____ rock.

10. Igneous rock formed from magma below Earth's surface is called _____ rock.

Name _____ Date _____ Class _____

Sedimentary Rocks

This section describes how sedimentary rocks form and how they are classified and used.

Use Target Reading Skills

As you read about sedimentary rocks, use the headings to complete the outline below.

Sedimentary Rocks
I. From Sediment to Rocks A. Erosion B. _____ C. _____ D. Cementation II. Types of Sedimentary Rock A. _____ B. Organic Rocks C. _____ D. _____ III. _____

From Sediment to Rock

1. What remains of living things may sediment include? _____

_____

_____

2. Small, solid pieces of material that come from rocks or living things are called _____.
3. Is the following sentence true or false? Sedimentary rocks form from particles deposited by water and wind. _____

Sedimentary Rocks *(continued)*

4. List three forces that can carry sediment.

a. _____

b. _____

c. _____

Match the process with its description.

Process	Description
____ **5.** erosion	**a.** Dissolved minerals glue sediments together.
____ **6.** deposition	**b.** Sediments are pressed together in layers.
____ **7.** compaction	**c.** Water or wind loosen and carry away fragments of rock.
____ **8.** cementation	d. Sediments settle out of water or wind.

9. What happens to rock fragments and other materials carried by water?

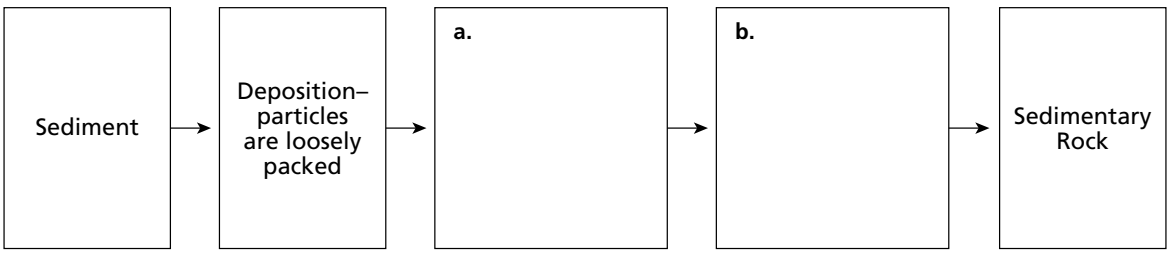
_____

_____

10. The process in which thick layers of sediment press down on the layers beneath them is called _____.

11. Complete the flowchart to show how sediment is turned into sedimentary rock and what happens to it at each step.

Sedimentary Rock Formation



c. Describe what happens to sediment as it is changed to sedimentary rock. _____

_____

12. Is the following sentence true or false? It takes millions of years for sedimentary rock to form. _____

Types of Sedimentary Rock

13. How do geologists classify sedimentary rock? _____

_____

14. List the three major groups of sedimentary rock.

a. _____

b. _____

c. _____

15. Is the following sentence true or false? The same process forms all types of sedimentary rock. _____

16. Is the following sentence true or false? Clastic rocks form when rock fragments are squeezed together. _____

17. How are clastic rocks classified? _____

_____

_____

18. Complete the table to show the different materials from which clastic rock forms.

How Clastic Rock Forms	
Type of Clastic Rock	**Material From Which It Forms**
a.	Tiny particles of clay
b.	Small particles of sand
c.	Different-sized rock fragments

d. How are the types of clastic rocks shown in the table similar and different? _____

_____

19. The type of rocks that form where the remains of plants and animals are deposited in thick layers is called _____ rock.

Sedimentary Rocks *(continued)*

20. List two important organic rocks.

a. _____

b. _____

21. Organic rock that forms from the remains of swamp plants buried in water is _____ .

22. How does organic limestone form? _____

_____

_____

_____

_____

_____

23. Circle the letter of each sentence that describes a way that chemical rocks can form.

a. Minerals that are dissolved in a solution crystallize.

b. Sediments of plants and animals form oil and other chemicals in rock.

c. Mineral deposits form when seas or lakes evaporate.

d. Tiny particles of clay are cemented together with chemicals.

24. Is the following sentence true or false? Some limestone is considered to be a chemical rock. _____

25. Rock salt crystallizes from the mineral _____.

Uses of Sedimentary Rocks

26. Why have sandstone and limestone been used as building materials for thousands of years? _____

_____

_____

27. Is the following sentence true or false? The White House in Washington, D.C., is built of limestone. _____

28. What are some ways that builders today use sandstone and limestone?

_____

_____

_____

29. Is the following sentence true or false? Limestone is used for making cement. _____

Name _____ Date _____ Class _____

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

_____ **3.** Limestone made from shells

_____ **4.** Conglomerate

_____ **5.** Limestone made from precipitated calcite

_____ **6.** Coal

_____ **7.** Breccia

_____ **8.** Rock salt

_____ **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

____ **11.** clastic rock

____ **12.** sediment

____ **13.** cementation

____ **14.** organic rock

____ **15.** compaction

____ **16.** chemical rock

____ **17.** deposition

a. small, solid pieces of material from rocks or living things

b. the process that presses sediments together

c. sedimentary rock that forms from remains of plants and animals

d. the process in which running water, wind, or ice loosen and carry away rock fragments

e. the process in which dissolved minerals crystallize and glue sediments together

f. sedimentary rock that forms when rock fragments are squeezed together

g. the process by which sediment settles out of wind or water

h. sedimentary rock that forms when minerals dissolved in a solution crystallize

Name _____ Date _____ Class _____

Metamorphic Rocks

This section explains how metamorphic rocks form, how they are classified, and how they are used.

Use Target Reading Skills

Look at Figure 17 and write two questions you have about the visuals in the graphic organizer below. As you read about metamorphic rocks, write the answers to your questions.

Q. Why do the crystals in gneiss line up in bands?
A.
Q.
A.

Introduction

1. List the two forces that can change rocks into metamorphic rocks.

a. _____

b. _____

Metamorphic Rocks *(continued)*

2. Is the following sentence true or false? Metamorphic rocks form deep beneath Earth's surface. _____
3. How do rocks change when they become metamorphic rocks?

   _____

   _____
4. What kinds of rocks can be changed into metamorphic rocks?

   _____

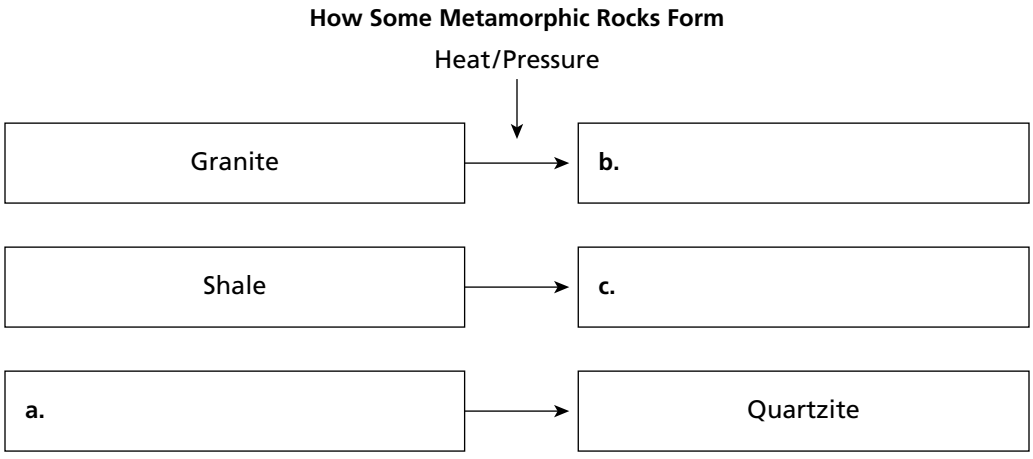
   _____
5. Is the following sentence true or false? The deeper a rock is buried in the crust, the less pressure there is on that rock. _____

Types of Metamorphic Rocks

6. Is the following sentence true or false? Geologists classify metamorphic rocks by the arrangement of grains making up the rocks.

   _____
7. Metamorphic rocks with grains arranged in parallel layers or bands are said to be _____.
8. Circle the letter of each type of metamorphic rock that is foliated.
   - **a.** slate
   - **b.** quartzite
   - **c.** gneiss
   - **d.** marble
9. Metamorphic rocks with grains arranged randomly are said to be _____.
10. List two examples of nonfoliated metamorphic rocks.
    - **a.** _____
    - **b.** _____

11. Complete the flowchart to show the metamorphic rocks that are formed.



d. What does the flow chart show is happening to the rocks to the left?

_____

_____

Uses of Metamorphic Rock

12. Why is marble useful for buildings and statues? _____

_____

_____

13. What are some of the ways that slate is used? _____

_____

_____

Metamorphic Rocks

Understanding Main Ideas

Fill in the blanks in the flowchart below.

Collisions between Earth's plates push rock down toward the heat of Earth's **1.** _____. ➡ As the rock is buried deeper in the crust, **2.** _____ also 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

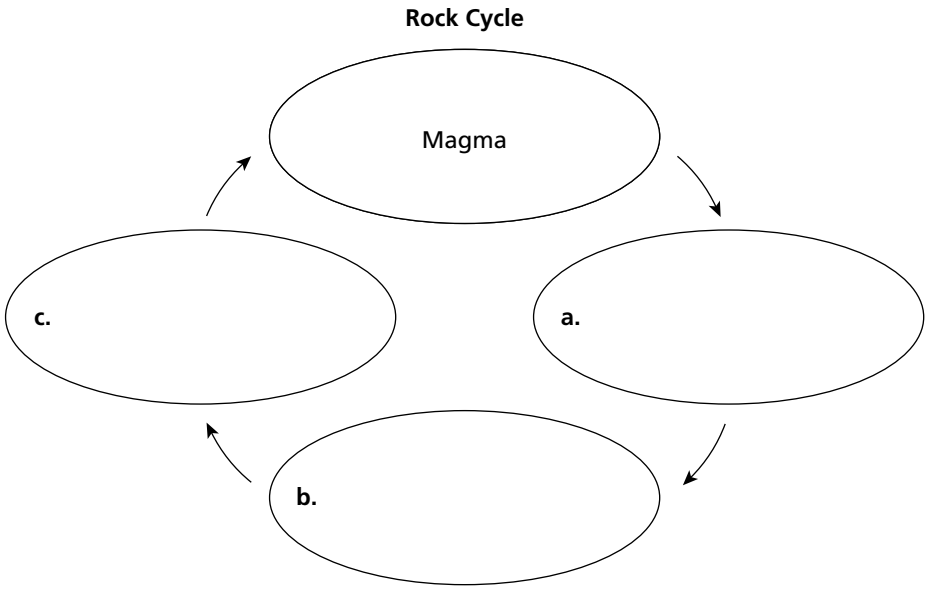
_____ **10.** gneiss

The Rock Cycle

This section describes the cycle that builds, destroys, and changes rocks in Earth's crust. The section also explains how this cycle is related to movements in Earth's crust.

Use Target Reading Skills

As you read about the rock cycle, fill in the cycle diagram below. Write each stage of the rock cycle in a separate circle.



Introduction

1. What forces move rocks through the rock cycle?

_____

_____

The Rock Cycle *(continued)*

A Cycle of Many Pathways

2. The series of processes that slowly change rocks from one kind to another is referred to as the _____.
3. Is the following sentence true or false? All rocks follow the same pathway through the rock cycle. _____
4. How could granite be changed into sandstone? _____

_____

_____

_____

The Rock Cycle and Plate Tectonics

5. How do plate movements drive the rock cycle? _____

_____

_____

_____

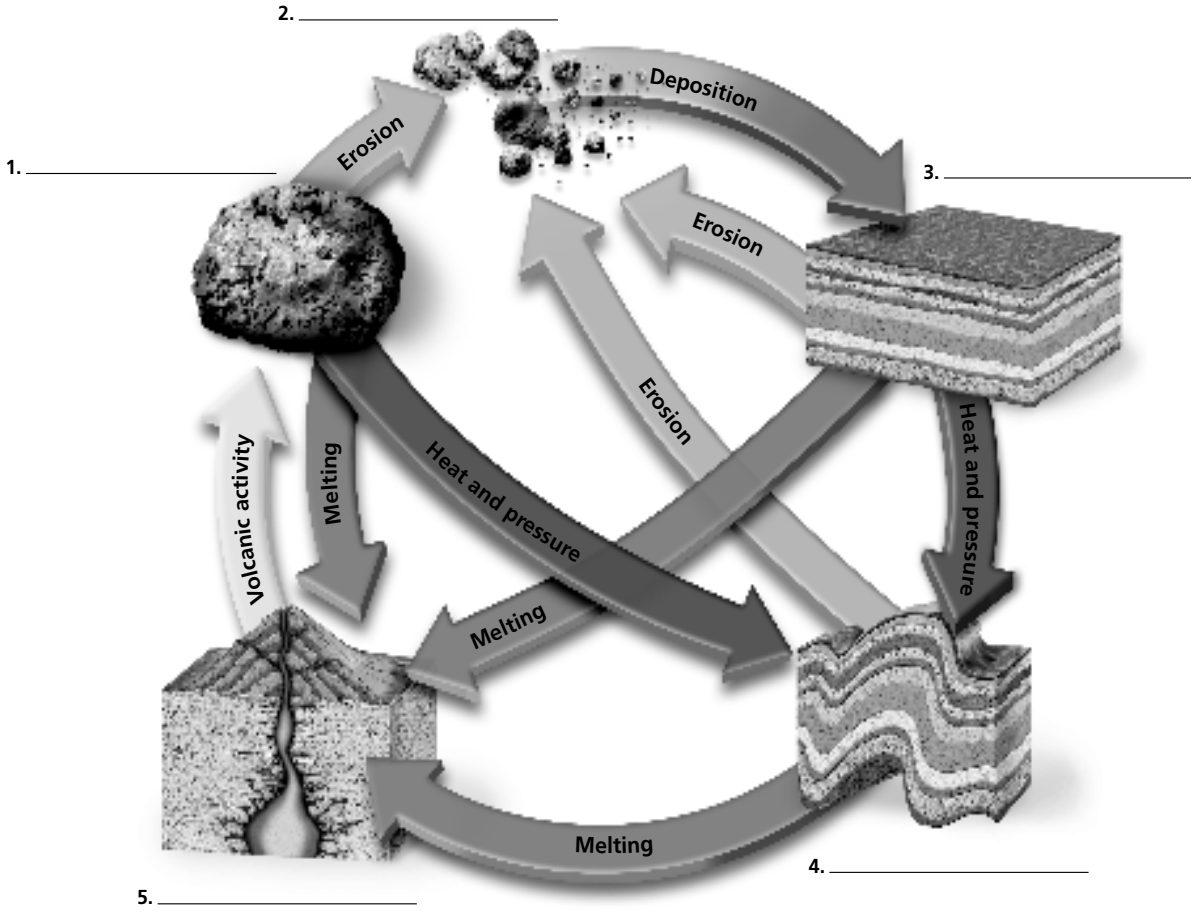
_____

Name _____ Date _____ Class _____

The Rock Cycle

Understanding Main Ideas

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



Answer the following questions on a separate sheet of paper.

6. Describe how the granite of a mountain could change first into sandstone and then into quartzite.

7. Describe how a collision between continental plates can result in the formation of metamorphic rock.

Building Vocabulary

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

_____

_____

_____