

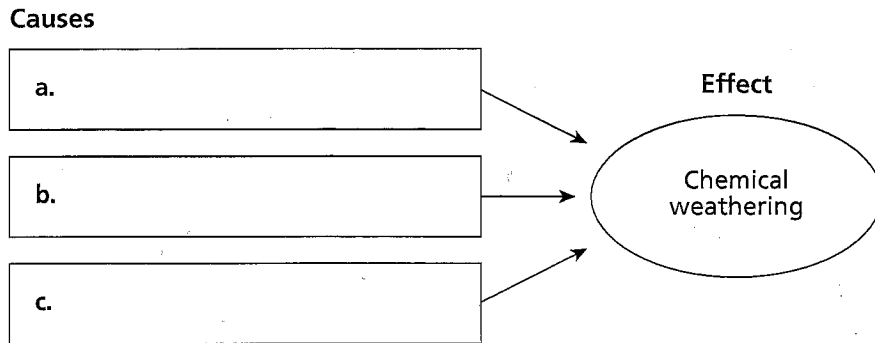
**Weathering and Soil Formation** ▪ *Guided Reading and Study*

# Rocks and Weathering

*This section describes how rocks are broken down by forces of weathering. The section also describes factors that determine how quickly weathering occurs.*

## Use Target Reading Skills

*As you read, identify the causes of chemical weathering. Write them in the graphic organizer below.*



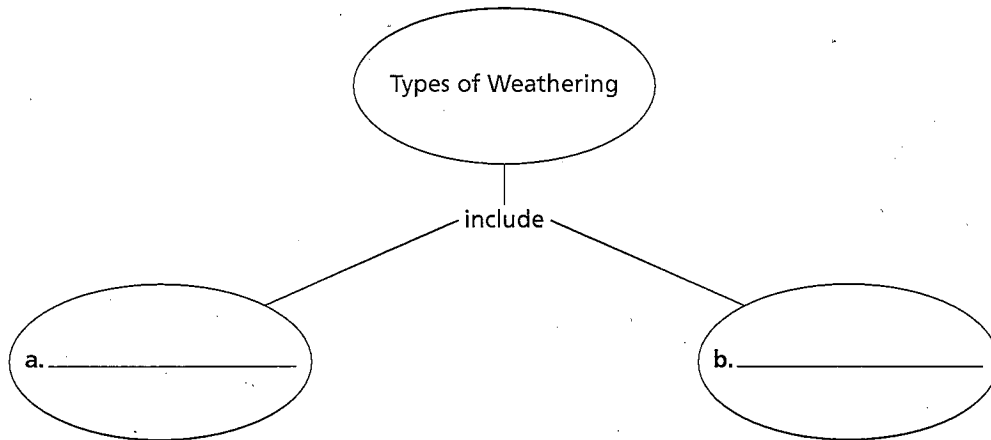
## Weathering and Erosion

Match the process with its description.

- Process**
- \_\_\_ 1. weathering
- \_\_\_ 2. erosion

- Description**
- a. Movement of rock particles by wind, water, ice, or gravity
- b. Breaking down of rock and other substances at Earth's surface

3. Complete the concept map.



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**Rocks and Weathering** *(continued)*

**Mechanical Weathering**

4. The type of weathering in which rock is physically broken into smaller pieces is called \_\_\_\_\_ weathering.

5. List the forces of mechanical weathering.

a. \_\_\_\_\_ b. \_\_\_\_\_

c. \_\_\_\_\_ d. \_\_\_\_\_

e. \_\_\_\_\_

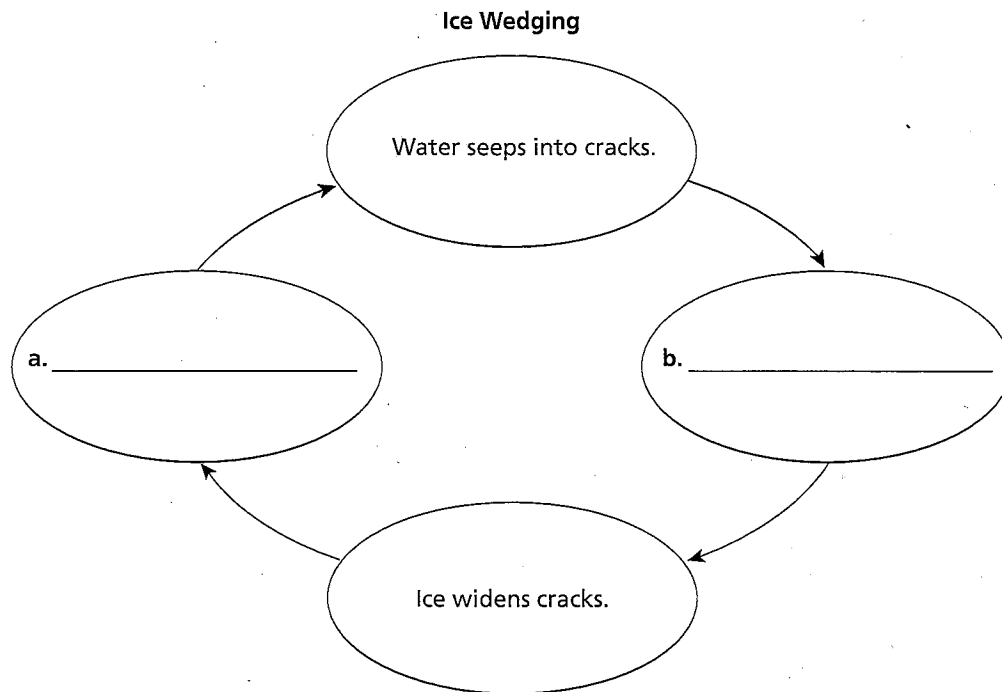
6. What is abrasion?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. Complete the cycle diagram.



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8. Would the process in the cycle diagram in #7 work in areas near Earth's equator? Explain.

\_\_\_\_\_  
\_\_\_\_\_

**Chemical Weathering**

9. The process that breaks down rock through chemical changes is \_\_\_\_\_ weathering.
10. List the agents of chemical weathering.
- a. \_\_\_\_\_ b. \_\_\_\_\_  
c. \_\_\_\_\_ d. \_\_\_\_\_  
e. \_\_\_\_\_
11. Is the following sentence true or false? Chemical weathering produces rock particles with the same mineral makeup as the rock they came from. \_\_\_\_\_

*Match the cause of chemical weathering with the statement that is true about it.*

Cause	Statement
___ 12. water	a. It causes iron to rust.
___ 13. oxygen	b. It is caused by pollution.
___ 14. carbon dioxide	c. It is the most important cause.
___ 15. living organisms	d. It forms carbonic acid.
___ 16. acid rain	e. Lichens are one example.

17. Is the following sentence true or false? Water weathers rock by gradually dissolving it. \_\_\_\_\_
18. Oxygen weathers rock through a process called \_\_\_\_\_.
19. List two kinds of rock that are easily weathered by carbonic acid.
- a. \_\_\_\_\_ b. \_\_\_\_\_

Weathering and  
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**Rocks and Weathering** *(continued)*

20. How do plants dissolve rock?

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**Rate of Weathering**

21. The most important factors that determine the rate of weathering are type of rock and \_\_\_\_\_.

22. Is the following sentence true or false? The minerals that make up a rock determine how fast it weathers. \_\_\_\_\_

23. A rock that is full of tiny, connected air spaces is said to be \_\_\_\_\_.

24. Why does a permeable rock weather chemically at a fast rate?

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25. Why does chemical weathering occur more quickly in a hot climate?

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**Weathering and Soil Formation** ▪ *Review and Reinforce*

# Rocks and Weathering

## Understanding Main Ideas

Fill in the blanks in the table below.

Cause	Type	Description
1. _____	Mechanical	Rock particles wear away rock.
2. _____	Chemical	Forms from coal, oil, and gas burning
Freezing and thawing	3. _____	Breaks rock by ice wedging
Carbon dioxide	4. _____	Forms carbonic acid in water
5. _____	Chemical	Weathers marble and limestone
6. _____	Mechanical	Burrowing in the ground breaks rock.
Plant growth	7. _____	Roots pry apart cracks in rock.
Living organisms	8. _____	Produce weak acid that weathers rock
Oxygen	9. _____	Causes rust on some rock

Weathering and Soil Formation

Answer the following questions on a separate sheet of paper.

- How does erosion differ from weathering?
- What factors determine the rate of weathering?

## Building Vocabulary

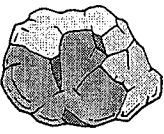
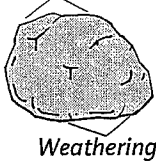
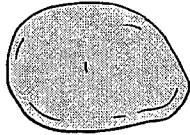
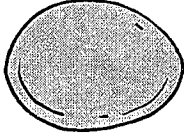
Fill in the blank to complete each statement.

- \_\_\_\_\_ is the movement of rock particles by wind, water, ice, or gravity.
- \_\_\_\_\_ means that a material has spaces that allow water to seep through it.
- The process that breaks down rock and other materials at Earth's surface is called \_\_\_\_\_.
- The grinding away of rock by other rock particles is called \_\_\_\_\_.
- The process by which ice widens and deepens cracks in rocks is called \_\_\_\_\_.

**Weathering and Soil Formation • Enrich**

## Why Are Many Rocks Round?

Maybe you have noticed that many of the rocks you see are rounded. This is true for the small stones near a riverbank and for the large boulders in a field or forest. Sometimes you do see rocks with jagged edges, such as in a rockfall at the bottom of a cliff. These rocks' jagged edges are a sign that they have broken off from a larger block of rock fairly recently. The reason for this difference in shape is that over time, weathering tends to make rocks round. Study the figures below to find out why.

	<p style="text-align: center;"><i>Weathering</i></p>  <p style="text-align: center;"><i>Weathering</i></p>		
<p><b>A</b> Ice wedging has broken off a piece from a larger block of rock. When weathering breaks rocks apart, the pieces have jagged edges and sharp corners.</p>	<p><b>B</b> Weathering continues to act on the rock, affecting every part of the rock's surface. The most rapid weathering, though, occurs at the sharp edges and corners. This is because these places have a greater amount of surface area than the more rounded places have.</p>	<p><b>C</b> The shape of a rock that has the least amount of surface area for its volume is a rounded shape. Therefore, weathering eventually rounds off the jagged edges and sharp corners of the rock.</p>	<p><b>D</b> Weathering continues to affect the rock. Now, instead of changing shape, the rock gets smaller because weathering is affecting its entire surface fairly equally.</p>

*Answer the following questions on a separate sheet of paper.*

1. How would you describe the shape of a rock that has just broken off of a larger block of rock?
2. What is the process that changes the shape of rocks?
3. What part of a rock does weathering attack most rapidly?
4. Why does a rock tend to become rounded?
5. After a rock is rounded, how does weathering affect it?