**Weathering Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## True or False

Write true if the statement is true or false if the statement is false.

\_\_\_\_\_ 1. Ice wedging is the transport of sediments by glaciers.

\_\_\_\_\_ 2. Agents of abrasion include wind and gravity.

\_\_\_\_\_ 3. Mechanical weathering increases the rate of chemical weathering.

\_\_\_\_\_ 4. Chemical weathering occurs because of chemical reactions.

\_\_\_\_\_ 5. Minerals that form deep under Earth’s surface are unstable on the surface.

\_\_\_\_\_ 6. Clay is an example of a mineral that is unstable on Earth’s surface.

\_\_\_\_\_ 7. Water can dissolve many minerals because water molecules are polar.

\_\_\_\_\_ 8. Acid rain accelerates the rate of chemical weathering.

\_\_\_\_\_ 9. Plants contribute to mechanical but not chemical weathering.

\_\_\_\_\_ 10. Cold, dry climates have the highest rates of weathering.

## Critical Reading

Read this passage based on the text and answer the questions that follow.

**Chemical Weathering**

Chemical weathering occurs when rocks undergo chemical reactions that change their mineral composition. Most minerals form under conditions of high pressure and temperature deep within the crust or even in the mantle. If the minerals reach Earth’s surface where pressure and temperature are much lower, they become unstable. As a result, the minerals change chemically to other minerals, such as clay, that are more stable under conditions on the surface.

Water is the most important agent of chemical weathering. Water is a polar molecule, meaning that one side of the molecule is slightly positive and the other side is slightly negative. The positive side of each water molecule attracts negative ions and the negative side attracts positive ions. In this way, water molecules separate ions from their compounds and surround them. Water can completely dissolve some minerals, such as salt.

Two other important agents of chemical weathering are carbon dioxide and oxygen, both of which are gases in Earth’s atmosphere.

* Carbon dioxide combines with water as raindrops fall through the atmosphere. This forms a weak acid, called carbonic acid, which can dissolve some types of rock.
* Oxygen is very reactive chemically. A common type of chemical reaction involving oxygen is oxidation. The most familiar example of oxidation is the reaction of iron with oxygen to create iron oxide, or rust. Minerals rich in iron break down as the iron rusts. This is why some soils are red in color.

**Questions**

1. What is chemical weathering? Why does it occur?
2. How does water cause chemical weathering?
3. Explain the roles of carbon dioxide and oxygen in chemical weathering.

## Multiple Choice

Circle the letter of the correct choice.

1. **Weathering does not occur on the moon because the moon has no**

A. Atmosphere. B. Weather. C. gravity. D. Two of these

1. **The general process that changes solid rock into sediments is called**

A. Erosion. B. Leaching. C. Hydrolysis. D. Weathering.

1. **Mechanical weathering results in pieces of rock that are the same as the parent rock in**

A. Mineral content. B. Shape. C. Size. D. Two of these

1. **Abrasion may be caused by**

A. Freezing and thawing. B. Weak acids. C. Oxidation. D. Gravity.

1. **Agents of mechanical weathering include**

A. Burrowing animals. B. Human beings. C. Plants. D. All of these

1. **The rate of chemical weathering is higher when**

A. Temperatures are lower. B. Precipitation is higher. C. Rocks are intrusive. D. All of these

1. **Which of the following can be an agent of both mechanical and chemical weathering?**

A.Carbon dioxideB.OxygenC. Gravity D. Water

## Matching

Match each definition with the correct term.

**Definitions**

\_\_\_\_\_ 1. Chemical reaction in which a mineral is changed by reacting with water

\_\_\_\_\_ 2. Major cause of mechanical weathering in climates with freeze-thaw cycles

\_\_\_\_\_ 3. Process of removing dissolved minerals as they are carried to lower layers of soil

\_\_\_\_\_ 4. Type of weathering in which rock breaks into smaller pieces

\_\_\_\_\_ 5. Chemical reaction in which oxygen reacts with another element to create a metal oxide

\_\_\_\_\_ 6. Form of mechanical weathering in which rocks scrape against each other

\_\_\_\_\_ 7. Type of weathering that changes the mineral composition of rock

**Terms**

A. mechanical weathering

B. leaching

C. chemical weathering

D. ice wedging

E. oxidation

F. abrasion

G. hydrolysis

## Fill in the Blank

Fill in the blank with the appropriate term.

1. Cobbles from a streambed are smooth and rounded because of the type of weathering called \_\_\_\_\_\_\_\_\_\_.
2. The most important agent of chemical weathering is \_\_\_\_\_\_\_\_\_\_.
3. Hydrolysis and leaching are more common in climates with high levels of \_\_\_\_\_\_\_\_\_\_.
4. Carbon dioxide in the air combines with water in raindrops to form \_\_\_\_\_\_\_\_\_\_.
5. Iron-rich minerals change to rust in the type of chemical reaction known as \_\_\_\_\_\_\_\_\_\_.
6. Chemical weathering occurs \_\_\_\_\_\_\_\_\_\_ quickly when temperatures are warmer.
7. The average temperature and precipitation in a region is its \_\_\_\_\_\_\_\_\_\_.

## Critical Writing

Thoroughly answer the question below. Use appropriate academic vocabulary and clear and complete sentences.

 **Identify and explain two ways that ice causes mechanical weathering.**