Agents of Weathering

Rocks are constantly being broken down into smaller and smaller pieces. This process is called weathering. Mechanical weathering is the process that breaks down rocks though physical changes. There are four agents of mechanical weathering abrasion, ice wedging, root pry and actions of animals.

Abrasion happens when rocks knock against each other because of falling down a mountain or tumbling in a river, small pieces of rock break off making the original rock rounder. Ice wedging happens when rainwater gets in to cracks in a rock and then the temperature drops below freezing, the ice pushes open the rock and causes it to break into smaller pieces. The growth of plants through rocks, called root pry, and wind using sand to abrade other rocks are also agents of mechanical weathering.

Chemical weathering is the process that breaks down rocks using chemical changes. The main agents of chemical weathering are water, oxygen and weak acids.

Water weathers rock by dissolving parts of the rock but it takes a long time - hundreds to thousands of years. Acids also weather rock. A weak acid is formed when carbon dioxide from the atmosphere is dissolved in rainwater. This is called acid rain. Acid rain causes very rapid chemical weathering of marble and limestone by dissolving them.

Mechanical Weathering by Abrasion

Materials: sugar cube, gravel in portion cup, plastic bottle, paper towel

What To Do:

1. Observe the sugar cube.
2. Draw it in the box.
3. Place the gravel in the bottle and then the sugar cube and screw the top on the bottle.
4. Have one member of your team shake the bottle 6 times.
5. Observe the sugar cube and draw it in the box below.
6. Have another member shake the bottle 6 times and draw the sugar cube in the box below.
7. Continue until the bottle has been shaken 4 times.

Observations:

After 1 shake	After 2 shakes	After 3 shakes	After 4 shakes

Questions:

1. How did the sugar cube change after shaking?

_____

2. What caused the sugar cube to change?

_____

3. What did the sugar cube represent in this model? _____
4. What agent of mechanical weathering did this illustrate?

_____

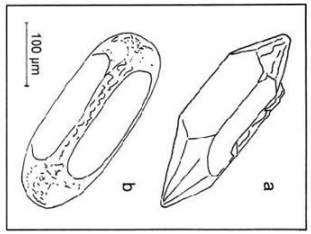
Watch the Weathering video from www.missdoctorbailer.com and write down three facts you learned.

_____

_____

_____

Directions: Describe what is happening in each picture below. Name the agent of mechanical weathering.

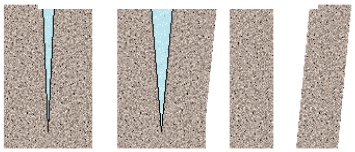


1. Rock a and rock b are the same rock. How did rock a change into rock b?

_____

2. What agent of mechanical weathering caused rock a to change into rock b?

_____



3. Put these steps in order.
_____Water freezes to ice
_____ Water fills a crack
_____ Rock breaks apart

4. What agent of mechanical weathering caused the rock to break? _____

5. What do you see in the first picture? _____
6. What changes occurred from the first picture to the second picture?

_____

_____

7. What agent of mechanical weathering caused the rocks to break apart? _____


Sandstone formations

8. These rocks were once all the same mountain. What process caused them to break into different shapes?_____

_____

10. What agent of mechanical weathering caused the mountain to be carved into these shapes?

_____

Part 2 Chemical weathering by acid

Materials: large marble chips, beaker, vinegar

What To Do:

1. Pour enough vinegar (acid) to just cover the marble pieces in the beaker.
2. Observe what happens in the beaker from the top and side.
3. Draw what you observe in the beaker.

Questions:

1. What did you observe when you placed the vinegar over the marble? _____
2. What is happening to the marble pieces? (circle one)

Breaking apart. *Dissolving.* *Sitting there.*

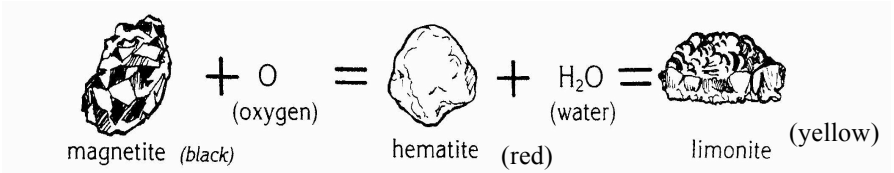
Part 3 Chemical weathering by oxygen and water

Materials: magnet, magnetite, hematite, limonite

What To Do:

1. Observe the three rocks in your basket. They were once all black magnetite.
2. Write down the physical properties in the chart below.

Property	Magnetite	Hematite	Limonite
Magnetic			
Color			



1. What agent of weathering caused the magnetite to change?

_____

2. What changes do you observe in the hematite? _____
3. What agent of weathering caused the hematite to change?_____
4. What changes do you observe in the limonite? _____

Name _____ period _____

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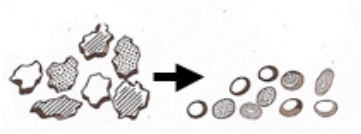
Agents of Weathering

1. What caused the rocks below to change?

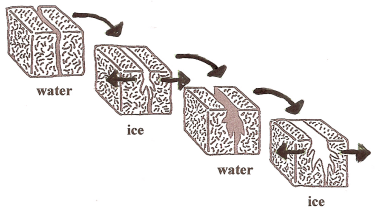


A. Succession
B. Weathering
C. A hurricane

2. Which of the following is an agent of mechanical weathering?

A. Oxidation
B. Acid rain
C. Abrasion

3. Which of the following is an agent of chemical weathering?



A. Oxidation
B. Root pry
C. Freezing water

4. The picture to the right shows what type of weathering?

A. Root pry
B. Ice wedging
C. Ice pry

5. Why does ice have this effect on rocks?

A. Water expands when frozen
B. Water contracts when frozen
C. Water stays the same when frozen

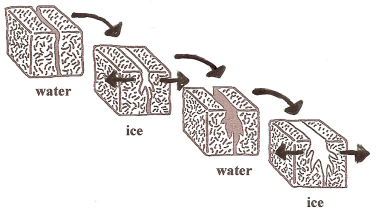
Name _____ period _____

EXIT TICKET

Agents of Weathering

1. Which of the following is an agent of chemical weathering?

A. Oxidation
B. Root pry
C. Freezing water



2. The picture to the right shows what type of weathering?

A. Root pry
B. Ice wedging
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3. Why does ice have this effect on rocks?

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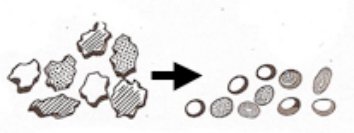
4. What caused the rocks to change?

A. Succession
B. Weathering
C. A hurricane



5. Which of the following is an agent of mechanical weathering?

A. Oxidation
B. Acid rain
C. Abrasion