



Physical and Chemical Weathering

BACKGROUND INFORMATION

There are different types of weathering, as discussed in the water erosion activities of Sedimentary Sleuths. The two main types of weathering are physical (also called mechanical) and chemical.

Physical weathering happens when rocks break down into smaller pieces. When water seeps into the cracks in rocks and freezes and expands, it causes cracks to grow and rocks to break apart. This is called freeze-thaw. Another example of physical weathering is when salt water gets into cracks in rocks. After the water evaporates, the salt crystals left behind will expand and cause the cracks to expand. Physical weathering does not change the composition of the rock.

Chemical weathering is different, because it does change the rock's composition. Some of the more common types of chemical weathering are dissolution, which is when acidic waters dissolve rocks, and oxidation, when the iron in rocks becomes oxidized or "rusts". In these experiments, you'll get to see examples of physical and chemical weathering in action.

1. Demonstrating the effects of physical weathering

MATERIALS

1 antacid tablet per student

1 small re-sealable plastic bag per student

1 durable object for crushing tablets per 4-5 students (rubber mallets, smooth palm-sized rocks, etc.)

Data sheet and pencil to record observations

PROCEDURE

1. Distribute 1 antacid tablet and 1 bag per student.
2. Have students record observations about antacid tablet before it undergoes any "weathering" processes. Observations should include size, texture, and any other things they notice.
3. Place tablets in bags and close tightly with as little air inside as possible.
4. Using the durable objects, have students take turns to carefully crush the antacid tablet inside the bags.
5. Once they feel satisfied with their weathering, have students record their new observations on the data sheet.

RESULTS – The antacid tablet should have broken into small pieces after it was physically weathered by crushing it into small pieces.

2. Demonstrating the effects of chemical weathering.

MATERIALS

1 antacid tablet per student

1 clear plastic cup per student

Water

Data sheet and pencil to record observations

PROCEDURE

1. Distribute 1 cup and 1 antacid tablet to each student.
2. Fill cups halfway with water.
3. Have students carefully place their antacid tablet into the water and watch what happens.
4. Once the reaction is complete (the tablet has dissolved and stopped fizzing), have students record their new observations on the data sheet and discuss what happened.

RESULTS – The antacid tablet should have reacted with the water to dissolve completely into the water, representing chemical weathering because the original “rock” (antacid tablet) no longer exists in the same state as before. The bubbles formed by this process are carbon dioxide gas.

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<p style="text-align: center;">BEFORE</p> <p>Size?</p> <p>Texture?</p> <p>Anything else?</p>	<p style="text-align: center;">AFTER EXPERIMENT 2</p> <p>Size?</p> <p>Texture?</p> <p>Anything else?</p>
<p style="text-align: center;">AFTER EXPERIMENT 1</p> <p>Size?</p> <p>Texture?</p> <p>Anything else?</p>	<p>Which of the two experiments represents physical weathering? How or why?</p> <p>Which of the two experiments represents chemical weathering? How or why?</p>