

Forces that Change Rock

What is Weathering?

Imagine you're at a park and you reach down to pick up a handful of rocks, pebbles, or sand. Geologists use the term **sediment** to define these pieces of the Earth. Where did this sediment come from? Has it always looked like this?



Sediment comes in many sizes, colors, and shapes.

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Like landscapes, rocks and sediment are constantly changing size and shape. **Weathering** is the process responsible for breaking rocks and sediment into smaller pieces.



Weathering can cause rocks like these to crack.

An important type of weathering is known as **abrasion**. Abrasion is the grinding together of rocks and sediment against another. It occurs when some force, such as flowing water, causes rocks and sediment to move. As the rocks and sediment move, they grind against other rocks and sediment, and break down into smaller pieces.



Abrasion by rocks and sand can create patterns like the ones in this rock.

What is Erosion?

Have you ever sprayed a hose onto the ground and watched what happens to the sediment? As the running water hits the ground, it can loosen sediment and cause it to move with the flowing water. This process in which rocks and sediment are worn away and moved elsewhere is known as **erosion**.



A girl plays in a small stream that erodes a sandy beach.

Sediment may be moved by water, transported by glacial ice, or blown by the wind. For sediment eroded by water and wind, the amount of sediment that erodes depends on the speed of the water or wind. Fast flowing rivers and areas with high wind cause more erosion than slow rivers and areas with little or no wind.

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Erosion causes many changes to the landscape. For example, moving water is capable of eroding tons of sediment from the sides of a river. Similarly, wind can easily erode sediment from a beach or a sand dune.



Erosion by water can cause ruts in this hillside.

What is Deposition?

Deposition is related to erosion. After sediment is eroded by moving water, wind, or ice, it ends up somewhere else. The gradual build-up of this eroded sediment is known as **deposition**.



These sand bars were deposited by water.

As eroded sediment moves along, some change can cause it to be deposited. For example, moving water or wind may slow down. When this occurs, **gravity** can cause the sediment being carried by the water or wind to settle on the ground. Or, if the sediment is eroded by ice, the ice may melt and deposit sediment that was frozen within the ice.

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Like erosion, deposition is usually a very slow process. It plays a major role in shaping the surface of the Earth. For example, sediment eroded by a river flows downstream. Eventually, this sediment may be deposited at the shore of an ocean, sea, or lake. If enough sediment is deposited in one area, then a beach may be created.



This sediment will be deposited downstream.

Types of Erosion and Deposition

Some of the ways that moving water, wind, and ice can cause erosion and deposition include the following:

Water

- Rain water flows down a hill. Loose sediment erodes and is deposited at the base of the hill.
- Rivers and streams flow down a mountain. They erode sediment from their banks and deposit it downstream.
- Ocean waves and currents erode sand and rocks from beaches and cliffs and deposit sediment along the shore.



Erosion by water can create these small gullies.

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Wind

- Wind blows over beaches and sand dunes. Sand erodes from one area and is deposited in another.
- Wind blows over a baseball field. Dirt erodes and is deposited somewhere else.



Wind erodes the sand and deposits it somewhere else.

Ice

- Glaciers creep slowly down mountainsides. As they move, the ice erodes and transports rocks and sediment and deposits them lower down the mountain.

Glossary

abrasion

The grinding together of rocks and sediment against another.

deposition

The process in which water, wind, or ice build up the Earth's surface by dropping rocks and sediment in new locations.

erosion

The process in which rocks and sediment are worn away and moved elsewhere by gravity, water, ice, and wind.

gravity

The force that attracts all objects toward the center of the Earth.

sediment

Materials, such as sand, silt, soil, and rocks, that have been carried along and deposited by water, wind, or ice.

weathering

The breaking down of rocks into smaller pieces.

Credits

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