

How

Nature Moves

Sediments and

Rocks By

Erosion

Erosion on Earth's surface is happening all around us all the time. Sometimes it happens so slowly or subtly that we don't know it is happening. Other times it can happen quickly right before our eyes. It is important for students to know what erosion is and how it is different from weathering. The definition of erosion is movement of sediments and rocks from one place to another. The forces of water, wind, and gravity cause erosion.

- Blowing wind will pick up sediments and carry them off to other places.
- Water run-off will carry with it a lot of sediments and even rocks off to other places
- Waves crashing against cliffs will disturb the soil and weather the rock on the cliffs. The loose soil and rock will fall into the ocean and be carried off by the undercurrents and taken to other places.
- As rocks break off high cliffs by ice in cracks they fall great distances. This falling is erosion since the rocks are moving from a high place to a low place by gravity.

Blowing Sand

If the wind blows strong enough it picks up the sediments and carries them off to some other place. Where the wind has blown the sand is called sand dunes.

Experiment #1 Blowing in the Wind

- 1 Level out the sand with your hand. With your hand acting as wind, gently push the sand with your hand. Describe what you saw happen.

A sand dune is forming.

- 2 Continue to gently push the sand with your hand. Describe what has happened on both sides of the dune.

The side that is being pushed up is a gradual slope. The backside of the slope is steep making it look like a sand dune.

- 3 How is weathering happening at the same time sand is blowing through the air?

When the wind is blowing the sand (erosion), it is hitting against hard rock surfaces breaking those rocks down (weathering).

Water Run-off

When it rains or snow is melting, the water will collect together while going downhill in the form of a stream. The stream will carry with it a lot of sediments and even rocks if the stream is moving fast enough. Where the streams drop the sediments are called deltas.

Experiment #2 A Race to the Bottom

- 1 You have a plastic tub of sand in front of you. Make a mountain range out of the sand. How do you think mountains are formed?

They are formed by pressures under the crust of the earth in the mantle pushing the crust up into mountains and mountain ranges.

- 2 Put some water in the can without the holes. Hold the can with the holes in the bottom over the mountain range. Have a team member pour some water in the can. Move the can over the mountain range so all parts of the mountain get “rained” on. Describe what happened.

The water carried the sand down the hillside forming canyons on the mountainsides.

- 3 Have a team member hold the can over the mountain range and do the same thing. Further describe what happened.

More sand is carried by the water down the mountainsides. The canyons are getting deeper. Water is starting to form as lakes.

- 4 What is forming at the bottom of the mountainsides?

The sand that is being carried down the mountainsides are forming a pile of sand at the bottom of the mountains. These piles of sand are called deltas.

- 5 What type of rocks could form at the bottom of the “lake”?

Sedimentary Rocks.

- 6 How is weathering happening at the same time the water is running down the mountainsides?

As the water is carrying the soil and rocks down the river (erosion), the sand is rubbing against the rocks like sandpaper and wearing them down (weathering). Also, as the rocks are tumbling in the water, they are hitting each other causing the rocks to break down (weathering).

Waves Against the Cliffs

On the coasts of oceans, waves crash up against the cliffs and break down the rocks and disturb the soil. The small sediments and small rocks that fall into the ocean are then carried off by the undercurrents and taken somewhere else. The place where these sediments are taken by the undercurrent are crating a new beach or adding to an old one.

Experiment #3 Crashing and Thrashing Water

- 1 Make a cliff out the sand on one side of the plastic tub. Put water on the other side of the tub making it look like an ocean. With your hands, lift up the end of the container in a jerking

manner making a wave and hitting the cliff.. Do this about five times. Describe what you see happening to the cliff.

The water of the waves is washing the cliff away.

- 2 Push the water against the cliff by lifting up and jerking the container a few more times. Describe what you seen forming at the bottom of the cliff.

The water of the waves is washing more of the cliff away. The sand is being carried down into the water. The waves then carry the sand up on the land making a beach.

- 3 What type of rocks could form at the bottom of the “ocean”?

Sedimentary Rocks.

- 4 How is weathering happening at the same time the water is crashing into the cliffs?

As the water is hitting against the cliff, the back current of the water is carrying the soil and rocks away (erosion). At the same time the sand is rubbing against the rocks like sandpaper and wearing them down (weathering). Also, as the rocks are tumbling in the water, they are hitting each other causing the rocks to break down (weathering).

Gravitational Pull

Experiment #4 Falling Rocks

As rocks break off high cliffs by ice in cracks or temperature change, they fall great distances. This falling is erosion because the rocks are moving from a high place to a low place by the force of gravity. The place where they fall is a pile of rocks.

- 1 Get some big, heavy rocks that are at least 6 inches in diameter. One after another, drop them at arms-length so they come crashing down onto the ground. Explain how erosion is happening when you are dropping the rocks.

The rocks are falling from one place to another—from high on top of the mountain to the bottom of the mountain.

- 2 How is weathering happening at the same time the rocks are falling off the cliffs?

As the rocks are falling down the side of the cliff (erosion), the rocks hit the rocks already on the ground and breaks not only the rocks on the ground apart but also the falling rocks break too (weathering).