

Let's Make a Shoreline

Below is an overview of the activity Let's Make a Shoreline (Spike's Science Projects) to incorporate information learned from Dr. Herrington's presentation and subsequent discussion.

Lesson Overview

Students learn how the direction and size of waves influences the shoreline, both by creating and destroying the shoreline.

Lesson Rationale

How does a beach form? A question that few students can answer, but most have been to the shore in the summer. This lesson uses two demonstrations to reinforce that beaches are created and destroyed by the influence of waves and sand along the shoreline. Sand moves on and offshore as well as along the coastline to form beaches. The patterns in the movements of the sand on shorelines is related to the direction of on coming waves, the size of waves, and the lengths of time that waves interact with the shoreline. These concepts become real as students manipulate the variables of waves and see the effects on the shoreline.

Key Concept

Students make a model of different shorelines to determine how waves shape our shorelines and move sediments.

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LET'S MAKE A SHORELINE AND STUDY A REAL ONE

Obtain a 10 by 15 inch baking pan about 5 inches deep. Mix some soil with water to make mud. Beginning at one end, fill about one-third of the pan with mud to a height of 4 inches. When the mud dries, place a 2-inch layer of sand in the rest of the pan, and add enough water to submerge the sand. Place a wooden board in the pan at the sandy end, and move it back and forth to make waves. The model represents the ocean battering a shoreline.

Observe the waves as they splash against the land mass. Note how a beach gradually forms, how the particles are tumbled about by the waves, how the land mass is eroded, and how the eroded portions of land are distributed. Put a little Monopoly-type house on the cliff. Watch it fall into the ocean after enough erosion has taken place.

Make a model beach of sand or dirt at the far end of a large rectangular pan or tray. Be sure the edge of the beach is parallel to the end of the pan. Fill the pan about half full of water. Produce a wave by lifting the near end of the pan about 1 inch above the table top and returning it quickly to its original position. Repeat this every five seconds for two minutes. Observe and discuss what gradually happens to the model beach. Repeat the activity after rebuilding the beach so that its edge is at an angle of 30 degrees to the end of the pan. Discuss the differences in the results.

For more fun:

If possible, take several field trips to a coastal region, and record observations of waves at different seasons of the year. Determine the relationship between waves and the appearance of the shore by observing how the waves approach the beach. Determine the approximate heights of waves and breakers by reference to the heights of people on the beach and to the heights of fixed objects, such as pilings. Study the shoreline in an area where there is a cliff and you can see how the ocean has eaten away at the higher shoreline. Check the bottom edge of the cliff for signs of ocean life, such as shells. Walk along the water line during low tide, and pick up some of the rocks you will see lying in the sand. Try to figure out from where the water brought the rocks; from deeper in the ocean, from a mile down the shoreline, or from the shoreline adjacent to the spot where you found them.

While you're at the seashore, study the plant and animal life washed up on the shore. Keep a record of where and when particular organisms were found. Reference books can help you identify and classify organisms.

Wash your hands. Use soap.

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