

## Making Waves

### Overview

Ocean waves are the rising and falling movement, known as undulation, of the sea surface and can travel thousands of miles before making landfall. Waves on the ocean are usually caused by winds, and a general rule is that stronger winds result in bigger waves, but they can also be generated by activity above or below the surface of the sea. Your classroom can be an easy venue to better understand ocean waves and how they are made. Use this water wave activity to illustrate wave formation or variations in waves.

### Episode Connection: Waves

### Objectives

The students will

- understand waves both in lecture form and through a mental image
- build a wave tank
- be able to describe wave formation and variation
- identify the characteristics of a wave
- learn about ocean waves and how they act as they approach shore

Time Required: 1 class period

### Material

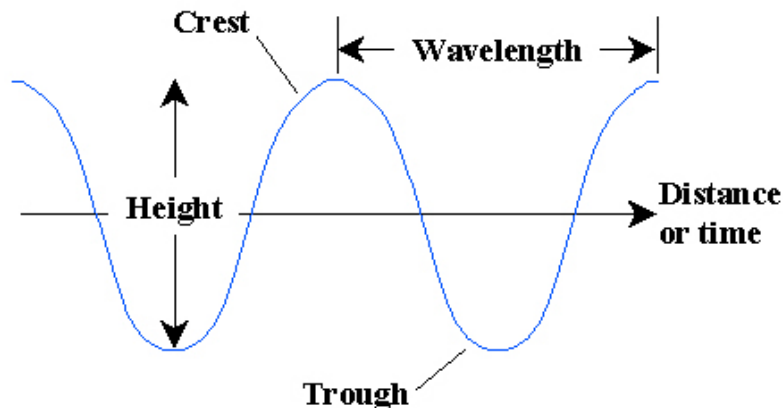
- Tank (i.e. empty aquarium or deep pan)
  - Note: Depending on resources, you can use 1 large tank for the entire class or smaller tanks for various groups to work together
- Water to fill your tank
- Sand (Optional, to simulate “beaches”)
- To make waves:
  - Sturdy piece of wood or plastic
  - Electric or handheld fan

### Procedure

1. Making a wave machine in your classroom is the next best thing to studying the real thing, and you can control how big to build your wave machine and how your waves will break. To begin, your students will need a pan to make the tank- the longer the better, as you will be able to observe the formation and breaking of a wave longer in a bigger tank.
2. Add about 2 inches of water to your tank, or more if you like, and sand that breaches the water line at one end of your tank.
  - a. To make a “beach”, put sand on one side. Allow some sand on the side to lift out of the water, simulating the shoreline.

3. Have students generate waves in the tank.
  - a. Using a piece of wood or plastic, move it up and down in a tank; show them that they can cause variations in the wave size and shape by varying speed and motions. Speed up movement of the stick and pay attention to what happens to the waves on the beach. Add more sand for a steeper slope and have students pay attention to any changes.
  - b. Using a fan, place the fan about one foot from the pan or use a hand held fan if you prefer. Turn on the fan or start fanning by hand. Start on the slowest setting and have students note what happens. Repeat on a higher setting or fan harder to show how the wind creates waves.
4. Discuss the identifying characteristics of waves with the students as a group. Feature *Science Minutes, Episode: Waves* to further understanding.

By conducting an in-depth study of the characteristics of ocean waves, which can vary greatly in terms of size and shape, you can master your students' understanding of them. All waves have a form, which can be described by height, length and frequency and are made by wind, gravitation and submarine activity. Waves are generated in the "fetch area," as friction causes the water's surface to ripple as wind passes over it, and the size of the ripples is affected by the wind's strength, the distance it blows and the length of each gust. Ocean waves can be identified by their separate parts: the crest, trough, wavelengths, wave heights and wave periods. The "crest" is the highest part of an ocean wave while the "trough" is the lowest point between two waves. "Wavelengths" are the horizontal distance between the crests or troughs of consecutive waves, "wave height" is the vertical distance between a wave's crest and the next wave's trough and the "wave period" is the measurement of a wave's size over time. The "collapse" of an ocean wave is considered its end, as its movement and energy is dispersed as it breaks onshore.



Go Further...

Make an Episode Connection with Weather:

Beaufort Wind Force Scale

- Understanding the different classifications of the Beaufort Wind Force Scale is another activity that will help your class better understand oceanic waves and their characteristics. In 1805, Admiral Sir Francis Beaufort of Britain developed one of the first wind force scales to help estimate wind speeds using visual observations of the ocean's surface. Still employed to estimate wind strengths to this day, the scale ranges from 0 to 12 and describes seas with everything from a calm, glassy surface to hurricane conditions. Have your class match up the characteristics of ocean waves with the appropriate wind force level to master the Beaufort Wind Force Scale.

Resource: [Ocean Wave Classroom Activities | eHow.com http://www.ehow.com/list\\_7637255\\_ocean-wave-classroom-activities.html#ixzz1Hd5nM8Ma](http://www.ehow.com/list_7637255_ocean-wave-classroom-activities.html#ixzz1Hd5nM8Ma)

Standards

Coming soon....