

Station #1

Mac and Tosh stand 8 meters apart and demonstrate the motion of a transverse wave on a slinky. The wave can be described as having a vertical distance of 32 cm from a trough to a crest, a frequency of 2.4 Hz, and a horizontal distance of 48 cm from a crest to the nearest trough.

First Draw a diagram illustrating this wave and labeling the parts and distances listed. Next, Determine the amplitude, wavelength, and speed of such a wave.

Station #2

Ocean waves are observed to travel along the water surface during a developing storm. A Coast Guard weather station observes that there is a vertical distance from high point to low point of 4.6 meters and a horizontal distance of 8.6 meters between adjacent crests. The waves splash into the station once every 6.2 seconds. Determine the frequency and the speed of these waves.

Station #3

Fans in a sports stadium often do "the wave". To do so they stand up and sit down as the "wave" reaches them. This is an example of which of the two classes of waves, transverse or longitudinal? How would the fans need to move to create the other type of wave?

Station #4

A science fiction film depicts inhabitants of one spaceship (in outer space) hearing the sound of a nearby spaceship as it zooms past at high speeds. Critique the physics of this film.

Station #5

Name the common units for frequency, amplitude, and wave speed.

Station #6

Radio stations are broadcast at specific frequencies, which are given by their call number or station number. The radio frequencies of a given station are actually given in Mega hertz (MHz) which are 1,000,000 times larger than hertz. Dr. Day likes to listen to VPR which is found at 89.5FM. What is the wavelength of these radio waves?

*** HINT: Remember radio waves are on the EM spectrum so they will travel at the same speed as light in air or 2.99×10^8 m/s.

Station #7

Draw a ray diagram to show one beam of light hitting a plane mirror. Make sure to label normal and identify what the relationship between different angles is.