

1.7: Water Waves

Tutorial 1.7: Water Waves

Many real, physical waves are combinations of three kinds of wave motion; transverse, longitudinal and torsional (which we have not yet discussed). The following is a more accurate simulation of water waves (but it still does not show breaking wave behavior which will come later). The dots are locations of water molecules or small objects floating in the water.

Water Waves

Questions:

Exercise 1.7.1

What two types of wave motion are represented in the simulation?

Exercise 1.7.2

Are the wavelengths and periods the same for both types of motion (Hint: Use 'pause' and hold the left mouse button down to make measurements)?

Exercise 1.7.3

Determine the wavelength, period and speed of the wave (use the 'pause' and 'step' buttons to measure the length of time it takes a peak to pass a given location in the simulation).

Exercise 1.7.4

How does the motion at the top of the water compare with the motion at the bottom?

Exercise 1.7.5

Describe the overall motion of one of the red dots; what path does the dot follow?

Exercise 1.7.6

Earthquakes can produce several different kinds of waves, each traveling at a different speed. Search for a reliable source and find a definition for P-waves, S-waves, Rayleigh waves and Love waves. Be sure to include comments on their speeds and which ones are more destructive.

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