Worksheet for Exploration 18.4: Doppler Effect and the Velocity of the Source

Time: 25.4	The Doppler Effect

speed of source ◄ _____ _____ ► +0.454
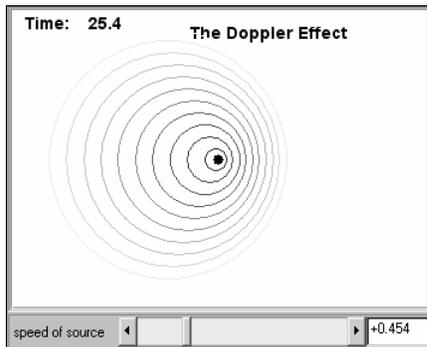
This example shows the Doppler effect. The black dot represents the source of the sound wave and travels with a speed set by the slider. That speed is given in terms of the speed of sound, hence v = 1 corresponds to the speed of sound.

Vary the speed of the source from zero to the speed of sound and then to the maximum value allowed by the slider. Watch the animation and answer the questions below.

a. How does the pattern of the wave fronts change according to v_{source}?
   i. You should specifically look at how far apart the wave crests are (those are the black circles) along the line of travel both ahead of the source and behind it.

Ahead:

Behind:

b. For $v_{source} > v_{sound}$ (slider values > 1) how does the V-shaped shock wave vary according to v_{source}?
   i. Note that you have observed this shock wave perhaps while on the water.