

Sound and Wave Basics

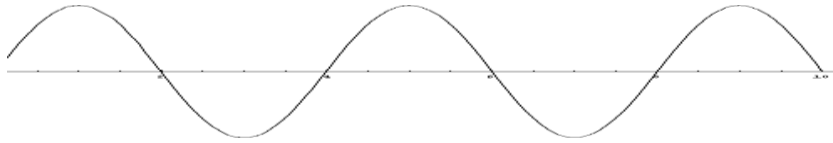
Name: _____

Use the PhET sim *Wave on a String* for questions 1-6. <http://PhET.colorado.edu>

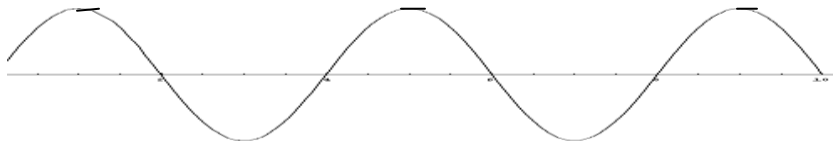
Play around and get familiar with the sim first. Be sure to try out all the buttons.

1. Are you familiar with longitudinal and transverse waves? Which type of wave is being shown by this sim?

2. Use arrows, or draw on the wave, to show what will happen when the **amplitude** is increased:



3. Use arrows, or draw on the wave, to show what will happen when the **frequency** is increased:



4. What direction does each individual part of the string move when a wave travels along it?
5. What direction does the actual wave move (hint, try pulse)?
6. The speed of the wave is how fast it travels from the oscillator/wrench to the clamp/window/loose end. Does the speed vary depending on Amplitude, Frequency, damping or tension? Make a table showing how/if it changes with each.

Use the *Sound* sim from PhET for questions 7 – 11.

Play around and get familiar first. Select **Audio Enabled** to hear the sound.

7. Which type of wave is being shown by this sim - longitudinal or transverse?

8. When you change the **frequency**, how does the sound change?

9. How does the visual model change (include a diagram)?

10. How does changing the **amplitude** affect the sound and its model?

11. Sound is produced when something vibrates; this movement causes disturbances in the surrounding air pressure. Investigate how the speaker cone moves to produce different sounds. Then, explain the relationships between the movement of the speaker cone and the sound that is made; include drawings to support your explanation.

Watch the video "Introduction to Waves" from the KahnAcademy.

<http://www.khanacademy.org/video/introduction-to-waves?playlist=Physics>

12. According to Kahn what is a periodic wave?

13. Draw a wave coming from a speaker as you saw modeled in the *Sound* sim. Then plot the density of the air over this diagram as Kahn demonstrates for sound traveling through air.