

Access: Go to PhET Website. Under physics, click on **Sound & Waves**. Launch the **Sound** Simulation.

- 1) In the Sound Waves simulation, go to the ‘**Listen to a Single Source**’ tab. Under the **Audio Control**, make sure that you have it set to **Listener and Audio Enabled**. You may have to *un-mute* the computer.
 - a. Move the person back and forth and describe what you hear.

 - b. Increase and decrease the frequency and describe what happens to a) the waves (color, wavelength, etc.) and b) the sound.

 - c. Increase and decrease the amplitude and describe what happens to a) the waves and b) the sound.

 - d. **Summary:** How does amplitude affect sound waves? How does frequency affect sound waves?

- 2) Go to ‘**Two Source Interference**’ tab. Make sure that you are set to **Audio Enabled and Listener**.
 - a. What do the light and dark bands represent?

 - b. What wave behavior occurs when two sources of sound waves are present?

 - c. What happens when you adjust the frequency and amplitude of the two sources?

 - d. Set the frequency back to 500 Hz. Move the head of the listener up and down so the ear is on a fuzzy band and then move the head again so the ear is not on a fuzzy band.
 - i. Identify the wave behaviors associated with the fuzzy bands and the areas in between.

 - ii. Is there a location in which you hear less sound? What is happening to the sound waves at this location?

- 3) Go to ‘**Listen with Varying Air Pressure**’ tab. Make sure that you are set to **Audio Enabled and Listener**.
 - a. What can you hear when the pressure is at 1 atm?

 - b. Now remove the air from the box and record what happens.

 - c. Add the air back into the box and record what happens.

 - d. What can you conclude about sound in a vacuum (no air present)? Why do you think this happens?

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