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Activities

Sound Lab

Name: _____ Date: _____

In this Planet Diary activity, you'll make waves in a virtual sound lab to explore the properties of sound.

Directions

- Go to the sound lab at PhET Sound. Click the green *Run Now* bar below the window. Select the *Listen to a Single Source* tab. Set the controls as follows:
  - Frequency: *500 Hz*
  - Amplitude: *Middle*
  - Audio Control: *Enabled, Listener*
- Make sure your computer's sound is on. Use headphones so you don't disturb your neighbor. You should hear a steady tone. Experiment with the frequency of the sound waves. Click *Play* and move the frequency slider to the right. How does the tone change? Move the slider to the left. Answer Workspace question 1.
- Move the amplitude slider all the way to the right. What happens to the volume (loudness) of the sound? Now move it the other way. Answer question 2.
- How are frequency and wavelength related? Select the *Measure* tab above the window. Reset the controls to their starting positions. Click *Pause* to freeze the wave, then drag the two vertical blue lines to surround a single wave (one compression (light area) + one rarefaction (dark area)). Use the onscreen ruler to measure the distance between the vertical lines. Record the wavelength in the table for question 3.
- Increase amplitude to 1000 Hz and click *Play*. Pause the wave and measure again. Record the wavelength. Decrease amplitude to 250 Hz, measure, and record again. Then answer question 4.
- What happens if you take the air out of the speaker box? Select the *Listen with Varying Air Pressure* tab. Click *Remove Air From the Box* and listen. Answer the last two questions.
- Have fun experimenting with the *Two Source Interference* tab. Can you move the listener to just the right spot to make the sound disappear?

Workspace

1. How does pitch (highness or lowness) of the tone change when frequency is increased or decreased?

2. What happens to the sound when you increase or decrease amplitude?

3.

Frequency	Wavelength
500 Hz	
1000 Hz	
250 Hz	

4. Describe the relationship between frequency and wavelength.

5. What happens when there's no air in the speaker box?

6. Give a hypothesis to explain your answer to question 5.

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