

Classroom Noise Meter

Student quiz — *Answer key*

Word Bank

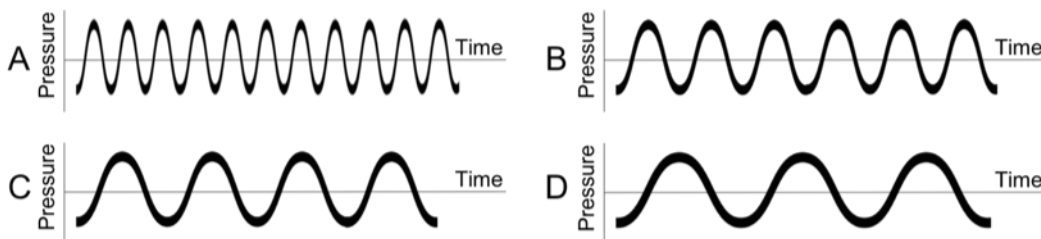
(when appropriate, use these words in your short answers)

- | | | |
|-------------|-------------------|---------------|
| • Amplitude | • Sound intensity | • Vibrations |
| • Frequency | • Sound volume | • Vocal cords |
| • Pitch | • Sound wave | |

1. Explain in your own words how we can generate sounds with our voice. Where relevant, use the terms from the Word Bank above.

In our throat, we have a voice box that contains vocal cords, also called vocal folds. When we talk, hum, or sing, these vocal cords start vibrating. These vibrations create a sound wave (pressure wave) that travels through the air.

2. The figure below shows a representation of four different sound waves. Which of these sound waves generates the sound with the highest pitch (frequency)?



- a. Sound wave A
- b. Sound wave B
- c. Sound wave C
- d. Sound wave D

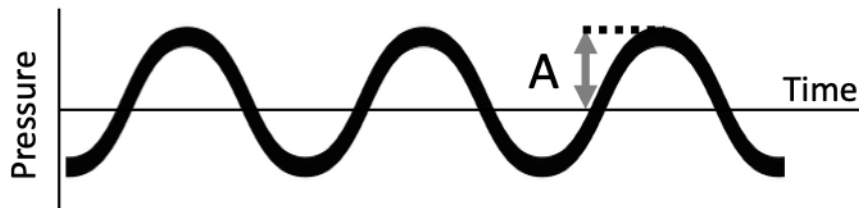
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Answer Key

Student quiz

Directions: Complete the questions below, as described.

3. Waves have different properties. Which wave characteristic is represented by “A” in the diagram shown below?



- a. Wavelength
 - b. Wave frequency
 - c. Wave amplitude
 - d. Wave speed
4. How does the amplitude of a sound wave correlate to the sound we hear?
- a. the higher the amplitude, the louder the sound we hear
 - b. the lower the amplitude, the louder the sound we hear
 - c. the higher the amplitude, the higher the pitch of the sound we hear
 - d. the lower the amplitude, the higher the pitch of the sound we hear

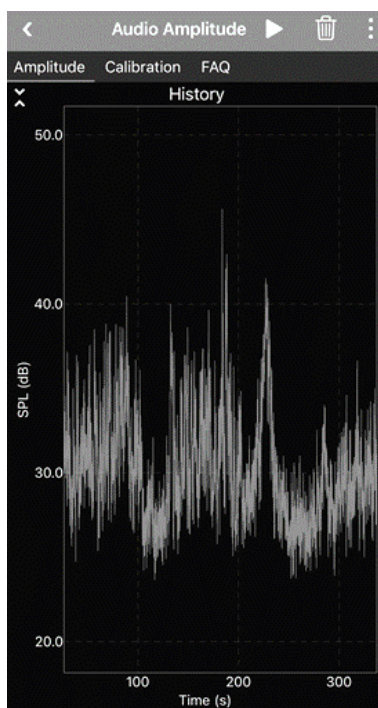
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Answer Key

Student quiz

Directions: Complete the questions below, as described.

5. The graph below shows data recorded with the phyphox app during one of the five classroom scenarios (background noise, one speaker, independent work, discussion in pairs, group discussion). Based on your results from your investigations, which of the following scenarios do you think was recorded in the graph below? Explain your reasoning below.



- a. Group discussion
- b. One speaker
- c. Background noise

One indication that this is a background noise graph is the low decibel levels of the recording. The second indication is that there are no significant variations in the decibel levels. They stay pretty much the same for the whole time. If people were talking, you would expect much more variation in the decibel readings and higher sound intensities in general.

[Based on their data, students should have seen that normal speech between two people typically has a range of 50-60 decibels (dB). With background noise, this is around 5 decibels higher. When more people are talking, the noise level increases. However, students' measurements will depend on how close the microphone (sound sensor) was located to the sound source.]