

Sound Waves

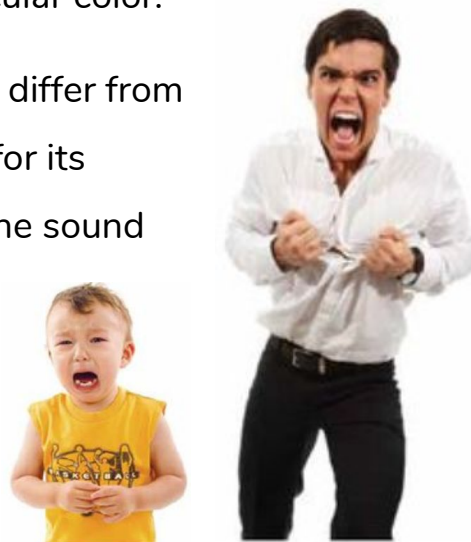
(This text is adapted from an original work of the Core Knowledge Foundation.)

Light and sound can both travel through mediums. A medium is a substance that light or sound can travel through, like a solid, a liquid, or a gas. However, there is a difference. Sound must have a medium to travel through—a solid, liquid, or gas. Light, on the other hand, does not need a medium. Light can travel through the emptiness, or vacuum, of outer space. Sound cannot.

The speed at which light and sound travel is also different. Light travels much faster than sound. There are important ways that light and sound are similar. They are both forms of energy that travel in waves. There are also other similarities.

Light waves can be different lengths. Some are long and some are short. It is the length of a light wave that makes it appear to be a particular color.

Perhaps you are wondering whether sound waves differ from one another. Imagine these two sounds—a baby crying for its mother and an adult yelling. Both of these are sounds. The sound waves of each travel through the same medium, air, so they are alike in that way. But a baby crying surely sounds different than an adult yelling! The baby makes a high-pitched, “screeching” sound. When an adult yells, it is a low-pitched, deep tone. Could this difference in pitch, or how high or how low a sound is, come from different kinds of sound waves?

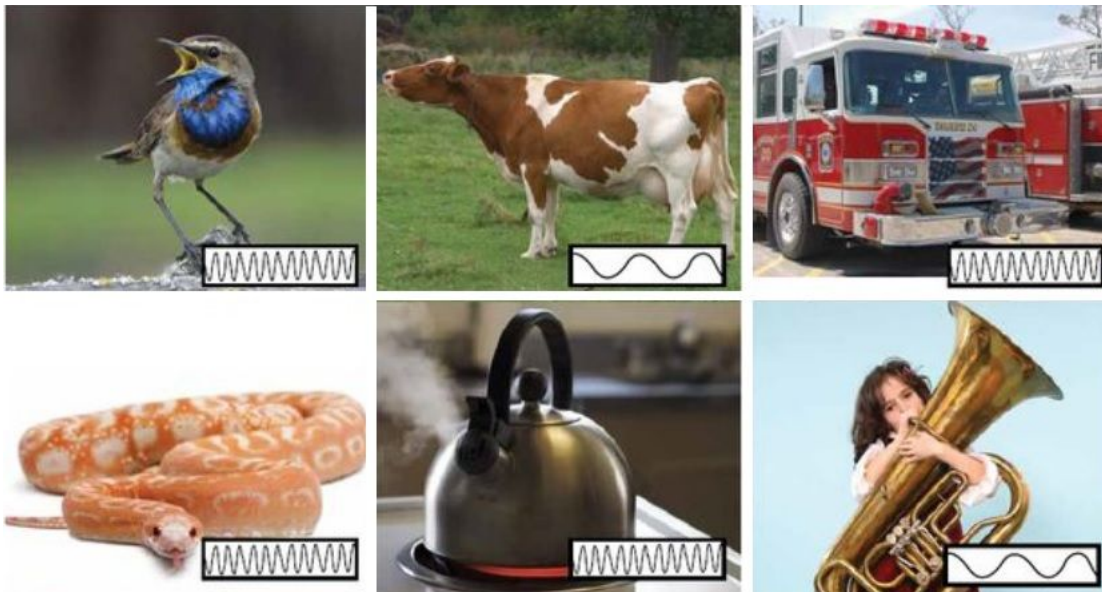


The answer is yes and it has to do with the length of the sound waves! It helps if we first understand how vibrations affect sound waves. Faster vibrations produce shorter sound waves, which make sounds with a higher pitch. The baby’s screeching

sound vibrates very rapidly, making shorter, but more, sound waves. Can you think of some other sounds that have a high pitch? Slower vibrations produce longer waves, which make sounds with a lower pitch. A yelling voice makes longer, fewer waves so you hear a lower pitch. Pitch describes the highness or lowness of a sound. Can you think of some sounds that have a low pitch? Try changing your voice pitch. Can you speak in a high, squeaky voice? Can you speak in a low, rumbling voice?

Answer the questions below on your lab sheet!

6. Which sounds are high-pitched? Which are low-pitched?



7. Justify your answer to number 6.

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