Mohawk Valley Library System

SCIENCE @ THE LIBRARY

SOUND WAVES

See how sound waves move through space.

MATERIALS:
1 Slinky
1 Spring

WHAT TO DO:

To make **Transverse Waves**, hold the slinky or spring coil between your hands. The slinky will be horizontal and sag. Move both of your hands up-and down together. As you move your hands, the slinky will also move up and down, in the opposite direction of your hands.

To make **Longitudinal Waves**, hold the slinky or spring coil between your hands and move just one hand toward the other and watch the "smooched up" part of the slinky slide along it to the other hand. This is the way sound moves.

With two kids holding the ends of the slinky or spring coil any displacement to the coil ALONG the line of the coil generates a **longitudinal wave**. Any displacement TRANSVERSE to the line of the coil generates a **transverse wave**.

Stretch the slinky or spring out on the floor or a table to about three to four meters with a partner firmly holding the other end. One of you represents the sound source and the other represents the sound receiver (the ear). The sound source person gives the slinky or spring a push. What happens? Put more force into the push. Does the wave change?

Do the coils of the slinky or spring travel away from one person toward the other?

What is moving from one end of the Slinky to the other?

WHAT IS HAPPENING?

A slinky or spring can model sound waves traveling through solids, liquids or gases. Each coil represents a molecule of the material. With a push, the coils compress against each other. The compression travels to the other end of the slinky or spring as a wave. Sound travels through solids, liquids and gases as a compression wave. Energy is transmitted through the coils and travels from source to receiver.

When an object begins to vibrate, the molecules next to it are compressed or pushed together. This compresses molecules further out. When the object moves back, a space in the air is created next to the object. The first molecules of air expand to fill this space, causing molecules further out to expand too. This compression and expansion of the air molecules is called a sound wave.

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