

SCIENCE @ THE LIBRARY

SLINKIES

To show how sound waves, which are longitudinal, move through space.

MATERIALS:

1 Slinky

WHAT TO DO:

To make Transverse waves, hold the slinky 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 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.

Stretch the Slinky 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 a push. What happens? Put more force into the push. Does the wave change?

Do the coils of the Slinky 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 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 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.