

BACKGROUND

Seismic is a technology that bounces sound waves off rock formations deep below the surface of the earth to provide explorers with a picture of the subsurface, often revealing locations where oil and gas may be trapped.

Seismic relies on a process in which sound generated at the surface travels into the earth, hits a rock formation and then bounces back to devices that record the echo. The time it takes the sound to bounce back to the receiver is related to the depth of that rock formation. When thousands of these echoes are recorded over time, they create a picture of the rocks beneath our feet.

This activity explores the behavior of sound waves. After the activity, discuss with students how to test how sound travels through different types of rock.

QUESTION

How do sound waves travel?

MATERIALS

- Metal slinky spring Large foam cup Small foam cup

INSTRUCTIONS

1. Place the slinky on the floor so the coils are all together facing up. Place the large foam cup inside of the slinky coils and press in gently.
2. Lift the cup straight up. The end coils should come up around the center of the cup.
3. Place your hand around a few coils in the cup's middle to hold the slinky in place.
4. Bounce your hand up and down to create longitudinal waves and observe the sound vibrations echoing from the cup.
5. Repeat your hand motions at different heights—low and high—to hear the different sound vibrations and see the longitudinal waves produced.
6. Remove the large cup and repeat the investigation with the small cup.

CONCLUSIONS

1. Was there a difference in longitudinal waves produced from the trials at different heights? Describe. _____

2. What was the difference in the two sounds you heard from the two different cups? _____

3. Explain how seismic technology uses sound to locate specific geologic formations underground. _____
