Can Sound Make Things Move?

Estimated Time:
Prep: 5 min.
Activity: 15 min.

Introduction

Overview

Experiment: Students use a tuning fork to show that **sound** can cause various objects to move.

Key Concepts: Students will deepen their understanding of sound as they observe that **sound waves** can transfer their **energy** through the air.

Lead-In

Remind students that sound is the result of **vibrations** that travel through the air in waves that move in all directions (like the ripples that occur when a stone is dropped into a pool of water). When sound waves reach our ears, the energy causes a tiny piece of tissue in our ear, called the **eardrum**, to **vibrate**. This allows us to hear sounds.

Stretch a piece of plastic wrap over a clear plastic container and secure it with a rubber band. Sprinkle some pepper on the plastic wrap and explain that you are going to demonstrate how sound is able to make things (like our eardrums) move without touching them. Hold a heavy pot and spoon near the bowl and bang the bottom of the pot hard. Watch the pepper jump around on the plastic wrap as the sound waves make it vibrate.

Introduce students to the tuning fork. In preparation for the upcoming experiment, model how to strike and hold it.

Teacher Preparation

Lead-In Materials:
- Plastic wrap
- Pepper
- Heavy pot and spoon
- Rubber band*
- Clear plastic container*

Teacher-Provided Experiment Materials:
- Water
- Book

Try This! Materials:
- Table or desk

Prepare:
- Make copies of the Experiment Sheet.

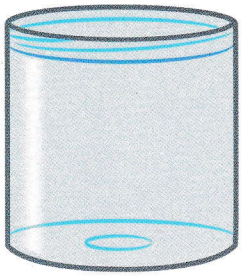
Note: The tuning fork can shatter glass. Be sure not to use it near windows or eyeglasses.

**included in kit*

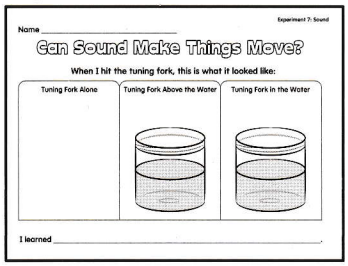
Vocabulary

- **eardrum** a thin, tightly stretched piece of tissue in the ear that vibrates when sound waves hit it
- **energy** power that can make things move
- **sound** anything that can be heard
- **sound waves** waves that form when a sound is made, moving through the air and carrying the sound to your ears
- **vibrate** to move with fast, short, back-and-forth motions
- **vibration** the movement produced from vibrating

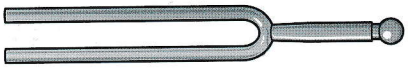
You Will Need



clear plastic container

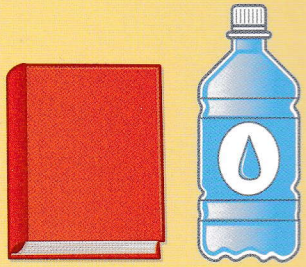


Experiment Sheet



tuning fork

Teacher-Provided Materials



book water

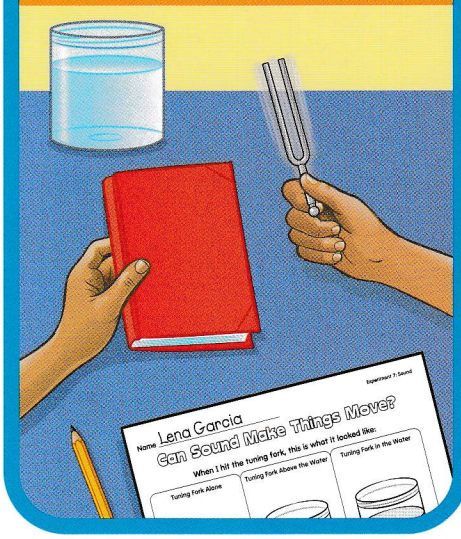
Procedure

1

Fill the container with water.

Hit the tuning fork against a book and look at it. What do you hear? What do you see?

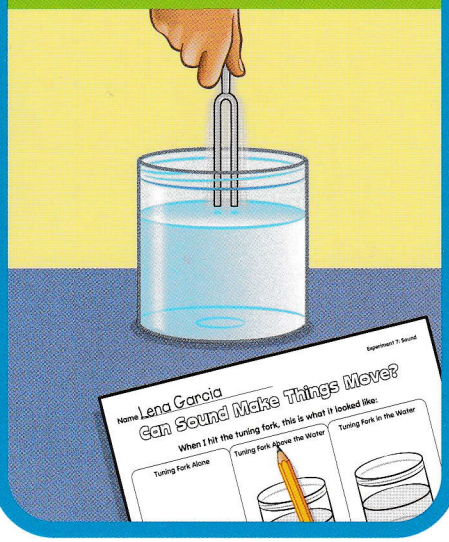
Record your results.



2

Hit the tuning fork on a book again. Then hold the tuning fork just above the water.

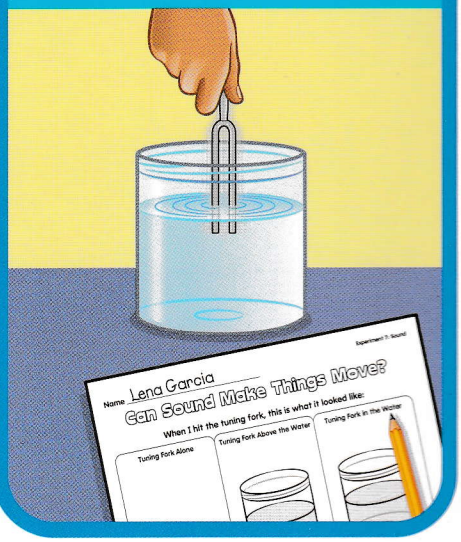
Record your results.



3

Hit the tuning fork on a book again. Then dip the tuning fork in the water.

Record your results.



Name _____

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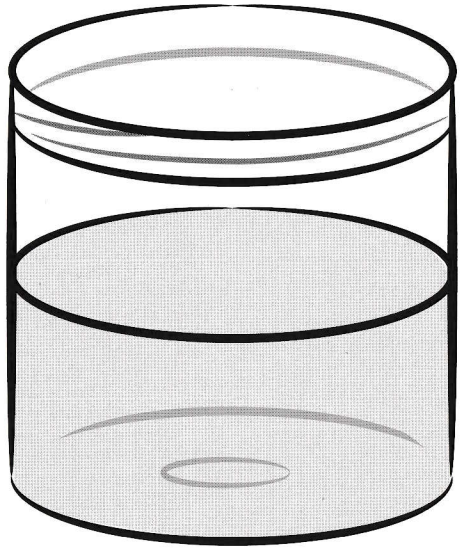
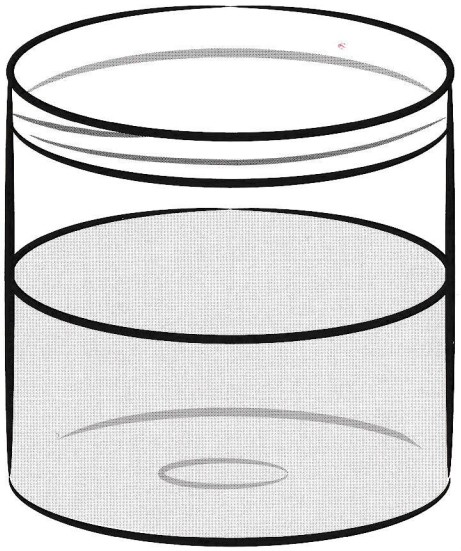
When I hit the tuning fork, this is what it looked like:

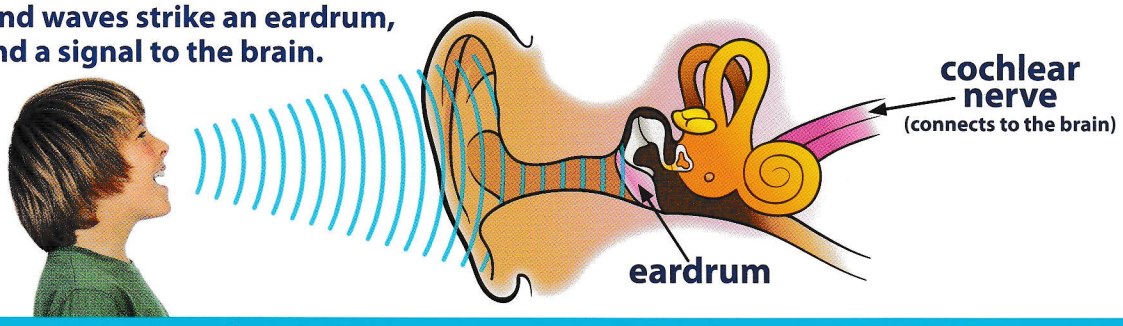
Tuning Fork Alone	Tuning Fork Above the Water	Tuning Fork in the Water
		

I learned _____.

Why?

Sound happens when motion causes surrounding air molecules to vibrate. The molecules bump into other air molecules in a wavelike pattern. These waves travel through the air (or other medium) in all directions, but they are not considered to be sound until they are picked up by an ear or other sound receiver. Inside the ear, the sound waves cause the eardrum to vibrate, which then sends a signal along nerves to the brain. The brain interprets the signal as sound.

When sound waves strike an eardrum, nerves send a signal to the brain.



Discussion Prompts & Questions

- What does a wave look like? Where have you seen waves?
- What kind of sound does a tuning fork make?
- What do you feel when you hit the tuning fork?
- Why do you think loud sounds can hurt our ears?

Sentence Frames

- The water moves even when the tuning fork is not touching it because _____.
- When I held the tuning fork above the water, it _____.
- When I touched the water with the tuning fork, it _____.

Try This!

For an extension activity, explain that sound can travel not only through air and water, but also through solids. Have students work in pairs, with students at opposite ends of a table or desk. One student will tap lightly on the table, and the other student will describe what she hears. Try again, but this time have the other student lay his ear on the table while his partner taps lightly. What did the students hear? Was it louder or softer listening through the table? Is this what they expected? Have the students switch places and try again. Try tapping harder and softer. Discuss the results.