Sound Station

Estimated Time:
Prep: 5 min.
Activity: 15–20 min.

Introduction

Overview

Experiment: Students pluck different-size rubber bands to create different **sounds**.

Key Concepts: Students will understand that sound travels in **sound waves** caused by **vibrations**. They will experiment with creating high- and low-**frequency** sounds.

Lead-In

Introduce the topic of sound by having students clap their hands. Then have them hum while touching two fingers lightly to their throats. Explain that sound is caused by vibrations. Anytime two objects collide—like when we clap our hands or push air through our voice box—the air around those objects **vibrates**, or moves. The sound energy moves in waves through the air to our ears where we hear it as sound.

Demonstrate by dropping a small stone or marble in a wide bowl of water. Point out the ripples that spread out from the place where the stone hit the water. Sound waves work the same way, moving outward through the air.

Explain that long, slow waves (have students move their hands in long, slow waves) make lower sounds, while short, fast waves (have students move their hands in short, fast waves) make higher sounds.

Teacher Preparation

Lead-In Materials:
- Wide bowl
- Small stone or marble*
- Water

Try This! Materials:
- Various instruments and noisemaking tools (maracas, harmonica, whistle, gong, pots/pans and wooden spoons, etc.)
- Various open containers (tissue box, shoe box, plastic container lid, etc.)

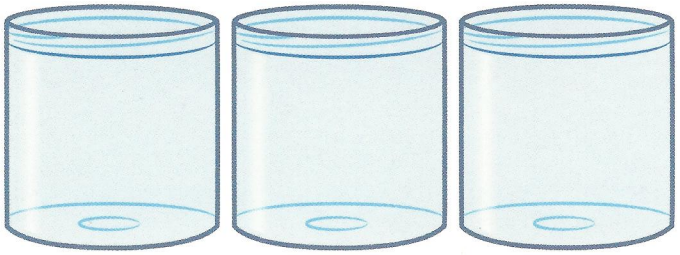
Prepare:
- Make copies of the Experiment Sheet.

**included in kit*

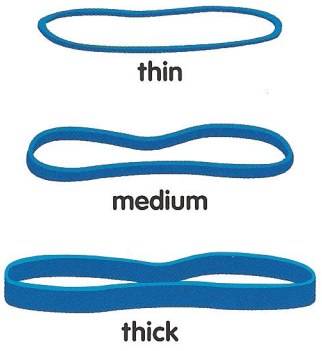
Vocabulary

- **frequency** the number of times that something (such as a sound wave or a radio wave) is repeated in a period of time (such as a second)
- **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

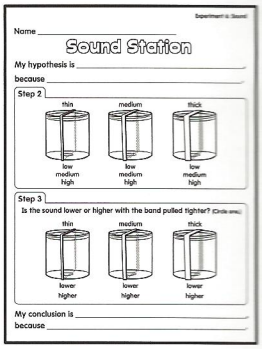
You Will Need



3 clear plastic containers



3 rubber bands



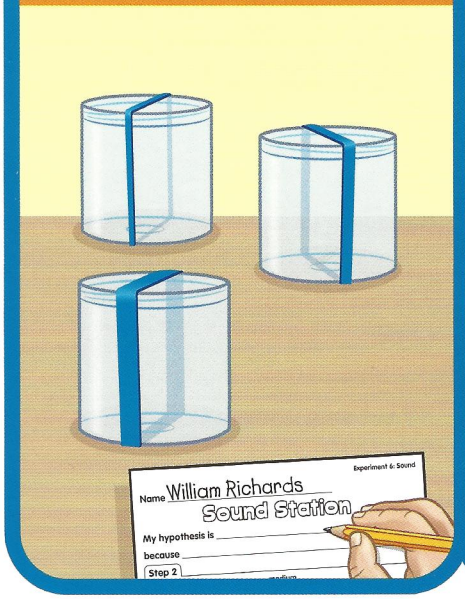
Experiment Sheet

Procedure

1

Place one rubber band around each container.

Record what you think you will hear when you pluck the rubber bands.

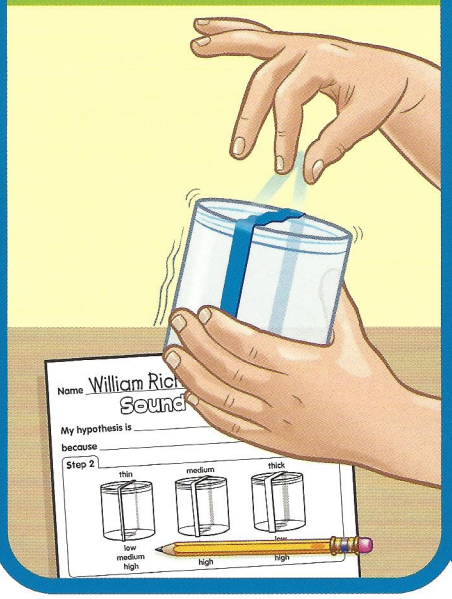


2

Pluck each rubber band and listen to the sound it makes.

Is it low, medium, or high?

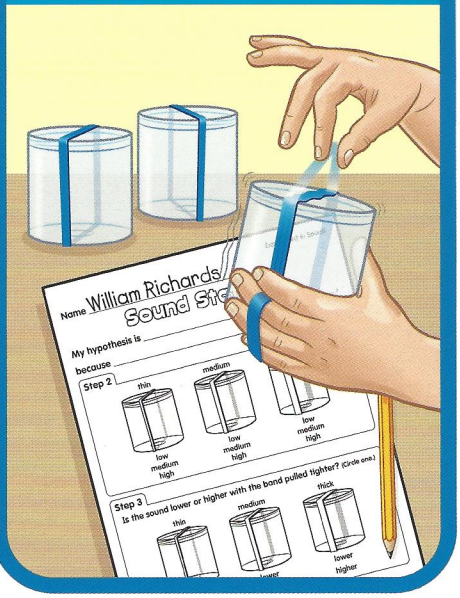
Record your results.



3

Pull each rubber band tighter and pluck it again. Was the sound lower or higher than before?

Record your results.



Name _____

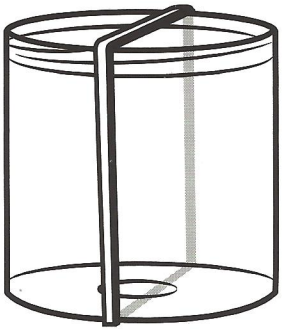
Sound Station

My hypothesis is _____,

because _____.

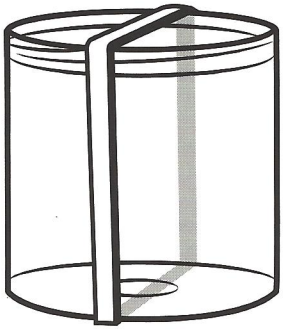
Step 2

thin



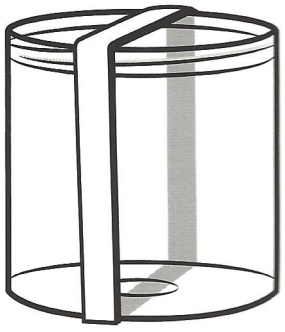
low
medium
high

medium



low
medium
high

thick

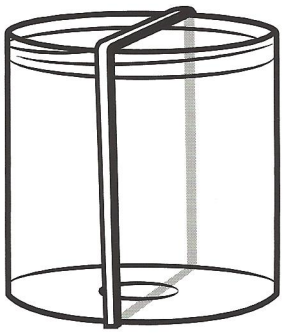


low
medium
high

Step 3

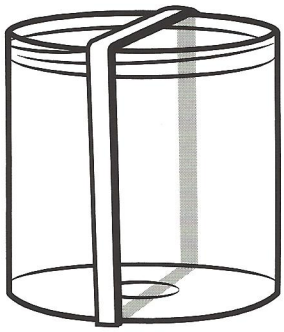
Is the sound lower or higher with the band pulled tighter? (Circle one.)

thin



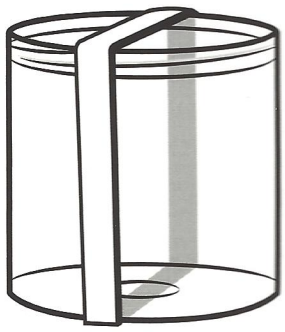
lower
higher

medium



lower
higher

thick



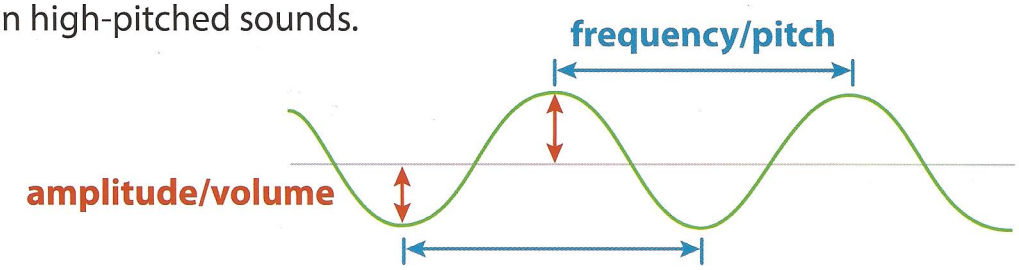
lower
higher

My conclusion is _____,

because _____.

Why?

Sound happens when a vibration, such as that of a plucked guitar string, creates sound waves in the air. These waves travel through the air in all directions, but they are not considered to be sound until they are picked up by an ear or other sound receiver. Vibrations with more energy create bigger waves (higher amplitude), which make louder sounds (higher volume). Faster vibrations make waves that are closer together (higher frequency), which results in high-pitched sounds.



Discussion Prompts & Questions

- Compare the rubber bands. How are they different from each other?
- Can you explain how a rubber band makes sound?
- What happens to a rubber band when you pluck it?
- What are some loud sounds you have heard? What do you do when you hear a loud sound? Why?

Sentence Frames

- The _____ *(thin, medium, or thick)* rubber band made the lowest sound.
- The _____ *(thin, medium, or thick)* rubber band made the highest sound.
- The rubber bands made _____ *(lower or higher)* sounds when I pulled them tighter.
- If I wanted a rubber band to make a lower sound, I could _____.

Try This!

- Try putting the rubber bands around other open containers, such as a tissue box, a shoe box, or a plastic container lid. Which type of container makes the lowest-pitched sound?
- Set out various musical instruments and noisemaking tools, such as maracas, a harmonica, a whistle, a gong, pots/pans and wooden spoons, a bell, etc. Allow students to explore the items. Ask which ones make higher sounds and which ones make lower sounds. Ask if students can explain how each object makes a sound.