

Title:

Sound Sandwich

Workshop Overview

Description: Participants will make a device called a sound sandwich that vibrates to produce sound. They will learn about high and low pitched sounds with their sound sandwich.

Topic Area(s): Science

Grade Level: P-4

Duration: 30 minutes

Learning Outcomes:

- Learn how sound is generated from vibrations
- Learn what determines a high or low pitch sound

Hook

Make your own 'noise-maker', just like a harmonica!

Background Information

Long, massive objects vibrate slowly and produce a low-pitched sound. Shorter, less massive objects vibrate quickly and produce a high-pitched sound.

Vocal cords vibrate when someone speaks or sings. The more tension they're under, the faster they vibrate and the higher the sound they make. In this activity, the rubber band will be vibrating to create the sound!

Materials per each camper

Per child

- 2 jumbo craft sticks
- 2, 1.5-2 inch long straw pieces
- Scissors
- 1 wide rubber band (#64 size)
- 2 small, thin rubber bands

Safety Considerations

Rubber bands may snap onto skin if pulled too tightly.

Procedure

1. Place a wide rubber band lengthwise over one of the craft sticks.
2. Put one of the small straw pieces underneath the wide rubber band, about $\frac{1}{3}$ of the way down from the end of the stick.
3. Take the other craft stick and place it on top of the first one, 'sandwiching' the straw piece.
4. Wrap one of the small rubber bands around the end of the sticks a few times, about $\frac{1}{2}$ inch from the tip, on the same side where you placed the piece of straw. Make sure the rubber band pinches the two craft sticks tightly together.
5. Insert the second small piece of straw in between the two craft sticks, on the opposite end, approximately a $\frac{1}{3}$ of the way down from the top of the stick. This time, don't put the straw underneath the wide rubber band; place it *on top* of the rubber band, in between the two sticks.
6. Wrap a small rubber band around this end of the craft stick, about $\frac{1}{2}$ inch from the end. When you're done, the two ends should be pinched and there should be a small space between the two craft sticks created by the two pieces of straw.
7. To make the noise, put your mouth in the centre of the sound sandwich and blow through the sticks, not through the straws.
8. Experiment with sliding the straws closer together and further apart – what difference does this adjustment make on the sound produced?



Wrap-Up/Debrief

What made the sound? When blowing into the Sound Sandwich, the large rubber band vibrates, which produces the sound.

What happened to the sound when the straws were slid closer together? The section of rubber band available to vibrate was shortened, so the pitch became higher than the pitch of the original sound.

Review what features create low pitch and high pitch sounds.

Additional Resources

- <https://www.exploratorium.edu/snacks/sound-sandwich>