

Sound Sandwich

Musical instruments are great for investigating the physics of sound. To make different notes or pitches, musicians manipulate the vibration that instruments create. For stringed instruments like violins and guitars, the length of the string determines how fast it vibrates and therefore what pitch it produces. A “sound sandwich” is a simple musical instrument you can make with just craft sticks, straws and rubber bands. The rubber band vibrates to make a pitch just like a guitar string.



WHAT YOU NEED:

- 1 wide rubber band (#64)
- 2 jumbo craft sticks
- 2 smaller rubber bands (#32)
- 1 straw
- Scissors

WHAT TO DO:

1. Place a wide rubber band lengthwise over one craft stick.
2. Cut two small pieces of straw about 1 inch in length each.

3. Tuck two straw pieces underneath the rubber band and slide each straw to the opposite end of the craft stick, about 1 inch from the end.
4. Place another craft stick on top of the straws, like the top piece of bread on a sandwich.
5. Wrap a smaller rubber band around both of the craft sticks on one end of the sandwich. Use another rubber band to do the same on the other end. The rubber bands should pinch the two craft sticks together, making a small space between the two craft sticks created by the two pieces of straw.
6. Hold the sound sandwich up to your mouth and blow through the space between the sticks.

EXPERIMENT:

- What did you hear when you blew air between the sticks?
- What did you feel when you blew air between the sticks?
- What happens if you move the straws closer together? Farther apart?

WHAT'S THE SCIENCE?

When you blow through the sound sandwich, can you feel it vibrating (moving up and down quickly) against your lips? You just felt sound! Sound is produced when a vibration is transmitted through a solid, liquid or gas, like the air around us. When you blow air through the space between the craft sticks, that air causes the rubber band to vibrate. The vibration produces a sound.

Sound vibrations can be described as a wave. These waves can be big or small and have different wavelengths. The bigger the wave, the louder the sound. Longer wavelengths or slower vibrations make lower-pitched sounds. Shorter wavelengths or faster vibrations make higher-pitched sounds. When the straws are placed closer together, the part of the rubber band that vibrates is shortened and moves more quickly, resulting in a higher-pitched sound.



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