Curiosity Guide #302
Sound Resonance

Accompanies Curious Crew, Season 3, Episode 2 (#302)

Stick Kazoo

Investigation #7

Description

Create a fun musical instrument that vibrates to produce sound, and learn how to change the sound. Happy music making!

Materials

- 2 large Popsicle or craft sticks
- 1 straw, the non-flexible kind
- Thick rubber band
- 2 small rubber bands
- Scissors
- Ruler

Procedure

1) Wrap the large rubber band lengthwise around one of the sticks.
2) Measure and cut 2 lengths of straw about 1 & 1/4 inches long.
3) Slide one of the straw pieces under the rubber band one-third of the way up the stick so the straw is perpendicular to the stick.
4) Balance the second straw piece on top of the rubber band, one-third of the way in from the other end of the stick. This straw piece should also run perpendicular to the stick.
5) Sandwich the second stick on top of the whole thing.
6) Gently twist and wrap the two ends with the small rubber bands to keep the whole thing together. Don't squish the straws! Keep the wrap about one-half inch in from the ends.

7) Hold the sticks up to your mouth and blow through the space between the sticks.
8) What happens if you blow hard? Or soft? Can you make different sounds?
9) What happens if you slide the straw parts closer together?

My Results

Explanation

Sound is produced when materials vibrate. In this case, the stretched rubber band vibrates as we blow, and that vibration produces sound. Moving the straw pieces closer together or farther apart changes the tension on the rubber band, which also changes the pitch. When the band is vibrating and we add to that vibration, the waves get larger and create resonance. Every object has the potential to vibrate, from air molecules to the earth itself, and those vibrations occur in different wave patterns, or natural frequencies. In the case of musical instruments, when a vibration occurs with its natural frequency, harmonic sound is produced. By adding an additional force with a matching frequency, the wave increases in amplitude and a louder sound is produced.

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