



## Curiosity Guide #302

### Sound Resonance

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

#### Singing Rod

Investigation #1

#### Description

Learn what makes a singing rod do its thing!

#### Materials

- Hollow singing rod of tempered steel or aluminum
- Powdered resin

#### Procedure

- 1) Dip your index finger, ring finger, and thumb in the bag of powdered resin to get the fingers lightly dusted.
- 2) Hold the rod lightly in the center of your other hand.
- 3) Grip the rod from the center of the rod with your fingers with the resin. Repeatedly stroke the rod out toward the end.
- 4) Is the singing rod making a sound?
- 5) Can you increase the rod's volume?

#### My Results

## Explanation

Every object has the potential to vibrate, from air molecules to the earth itself. 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. This is known as resonance.

In the case of the singing rod, sliding your fingers along the surface of the metal rod produces vibrations. At that moment, the tube's vibration, or natural wave pattern, starts to vibrate the air that is inside the tube. As the stroking continues, the additional rod vibrations match the air vibrations happening inside the rod. The waves get even bigger, creating resonance, and making a loud sound.

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