



## Curiosity Guide #302

### Sound Resonance

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

#### Bee Buzzer

Investigation #8

#### Description

Fly like a butterfly; buzz like a bee!

#### Materials

- Narrow Popsicle stick
- Notecard
- Stapler
- Scissors
- Ruler
- Chisel pencil erasers
- String
- Large rubber band, number 64

#### Procedure

- 1) Slide the erasers on either end of the Popsicle stick.
- 2) Measure and cut the notecard so that the card can fit against the stick, but inside the erasers.
- 3) Carefully staple the notecard in place so that it lines up with one long edge of the stick and overhangs the other edge by 2 inches.
- 4) Cut a 2-foot length of string.
- 5) Tie one end of the string securely around the stick, just under the head of one of the erasers.

- 6) Stretch the large rubber band lengthwise around the stick so that the rubber band contacts the erasers and lies flat on both sides.
- 7) Find an open space where you will have enough room to swing the Buzzer in a circle. Outside may be best!
- 8) Hold the loose end of the string and spin around.
- 9) What do you notice? Can you change the sound that the Buzzer produces?

## My Results

### Explanation

As the Bee Buzzer spins around, the flowing air causes the rubber band to wiggle and vibrate. As the Buzzer continues to experience more pressure from the air, some of the collisions with the air molecules match the frequency with the rubber-band vibration. The wave is amplified, produces resonance, and makes a louder sound.

If the device stops working, check to be sure the rubber band is still flat and that the string is not hitting the rubber band.

**Something else to try:** When sound vibrations resonate, the sound can get much louder. Have you ever heard someone talk about a resonant voice? Well, in our necks we have our vocal folds that vibrate and make it possible for us to make sound and speak. But some people are especially good at using their chests, heads, or even their faces to amplify the sound.

It's easy to feel the vibration. Say "Mmmmmmm" while touching the front of your face. Can you feel your face buzzing as well? Then try adding the word "one" right after the Mmmm sound, and you can hear your voice resonate a bit more. Try it!

**Still fascinated?** You may want to use the internet for further investigation. Try typing "vocal fold vibration" in your browser and then select Images. You'll find lots of interesting information!

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