



Bee Hummer

Bzzzzzz! Discover the science behind sounds as you engineer a device that creates air vibrations to sound like a swarm of bees.

TEKS:

SCI 3/4.8 Force, motion, and energy. The student knows that energy is everywhere and can be observed in cycles, patterns, and systems.

SCI 3.8.A: The student is expected to identify everyday examples of energy, including light, sound, thermal, and mechanical.

SCI 4.8.A: The student is expected to investigate and identify the transfer of energy by objects in motion, waves in water, and sound.

Materials:

- 2 cap erasers
- Craft stick
- Index card
- Rubber band (size #64)
- Scissors
- Stapler
- String

How To:

1. Place one cap eraser on each end of the craft stick. Make sure the erasers are fit onto the craft stick as tight as possible.
2. Slide the index card between the two cap erasers. If the index card is too wide, trim the edges to fit between the erasers.
3. Place the index card over the craft stick and align the edge of the index card with the edge of the craft stick.
4. Staple the craft stick and index card together. Let the remainder of the index card hang from the stick.

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5. Cut 2 feet of string and tie it to the craft stick. Make multiple knots and secure the string below the cap eraser at one end so that the string does not come off.
6. Stretch a #64 rubber band around the ends of each cap eraser so it is parallel to the craft stick.
7. Find a clear area and hold the bee hummer by the loose end of the string.
8. Swing the bee hummer in a circle and listen to the sound it creates!

STEM Explanation:

Soundwaves are produced by vibrating objects. As objects vibrate they send waves through the air that travel and are heard as sound. Think about how a guitar makes noise. A guitar has strings that extend across the instrument. When a musician strikes a guitar string, it causes the string to vibrate in an up-and-down wave motion. These vibrational waves push the air around the string to move in waves as well, creating sound as the waves reach your ears. The bee hummer works similarly! As you spin the bee hummer in the air, the moving air causes the rubber band to vibrate against the craft stick. The index card is used to make bigger waves with the moving air to amplify the sound as the bee hummer is spun. All these components work together to sound like a swarm of bees!

Explore further: How do changes in your design affect the sound? Redesign your activity to learn more about sound waves, frequencies, volume, and pitch. Try changing the size of the rubber band, the length of the string, or the size of the index card, and test to see how these factors affect the sound.

Career:

Acousticians are physicists who study sound waves. Some types of acousticians include engineers, physicists, speech and hearing scientists, architects, biologists, psychologists, linguists, mathematicians, oceanographers, computer scientists, and musicians.

Resources:

<https://www.exploratorium.edu/snacks/bee-hummer>

<http://www.physicsclassroom.com/mmedia/waves/gsl.cfm>

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