



# Stingless Bee Hummer

Bzzzzzz! Learn about the role that stingless bees played in Mayan culture. Discover the science behind sounds as you engineer a device that creates air vibrations to mimic a swarm of bees!

## TEKS:

SCI 1.6 A: The student is expected to identify and discuss how different forms of energy such as light, thermal, and sound are important to everyday life.

SCI 5.6 A: The student is expected to explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy.

SCI 7.12 A: The student is expected to investigate and explain how internal structures of organisms have adaptations that allow specific functions such as gills in fish, hollow bones in birds, or xylem in plants.

## Materials:

- 2 cap erasers
- Craft stick
- Index card or cardstock
- Rubber band (size #64 works best)
- Scissors
- Stapler
- Yarn or string (2 feet)

## How To:

1. Put a cap eraser on each end of the craft stick.
2. Trim an index card or piece of cardstock so it fits in the space between the two erasers on the stick.
3. Staple the card to the craft stick. It should stick out about two inches from one side of the stick (trim if needed).
4. Cut enough string (about two feet) to safely swing the Bee Hummer in a circle. Tie this string around the craft stick next to one of the erasers, making several knots so it's secure.
5. Once the string is tied to your Bee Hummer, stretch the rubber band around the craft stick from one eraser to the other and make sure it's snug in place.

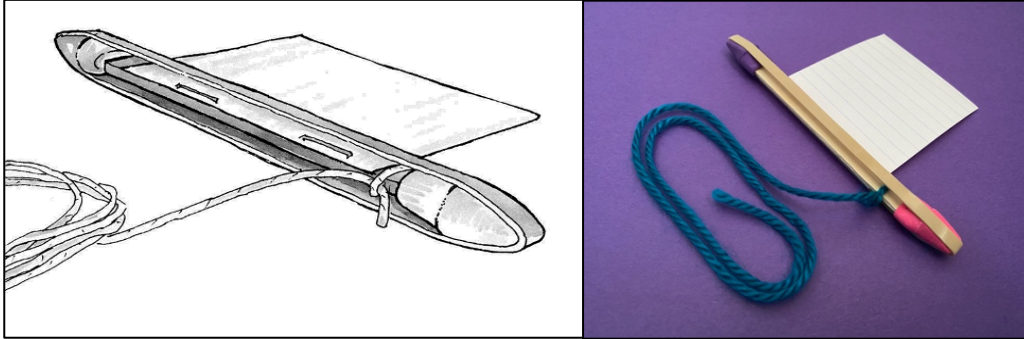
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6. Hold the end of the string and swing your Bee Hummer in a circle. You should hear a sound like bees buzzing. **Safety: make sure that you swing your Bee Hummer in an open area so that you don't hit any people or objects.**

Note: If your Bee Hummer doesn't seem to be working, check to be sure that the rubber band isn't twisted and that the string isn't touching the rubber band. Either of these things could stop the sound.



### STEM Explanation:

Stingless bees are native to Central America and very important to Mayan culture. Stingless bees got their name because, you guessed it, they can't sting! The Mayans cultivated hives of stingless bees, and gathered honey to cure diseases and make delicious food and drinks. These bees were so useful that they were often the subject of religious ceremonies, and many Mayans kept them as pets. In fact, lots of families had stingless bee hives inside of their homes. They were probably very used to the sound that you created with your Bee Hummer!

Sound is a type of energy made by vibrations. When any object vibrates, it makes the air particles near it move. These particles bump into the particles close to them, which makes them vibrate as well, causing them to bump into even more air particles! This movement, called sound waves, keeps going until the air particles run out of energy. If your ear is within range of the vibrations, you can hear the sound created by the waves.

When you spin your Bee Hummer, fast-moving air makes the rubber band vibrate. The air flowing over the rubber band makes it vibrate the same way that wind blowing over a flag makes it wave. The "swarm of bees" sound that you hear is simply a special noise produced by those rubber band vibrations, in the same way that vibrating strings on a guitar or violin produce sound. The index card amplifies the sound produced by these vibrations. What happens if you spin your Bee Hummer faster or slower? What about if you change the size of the rubber band or length of the string?

### Career Connection:

*Acoustical engineers* study the science of sounds and vibrations. They design, analyze, and control sound in different environments and are an important part of the music industry, auto manufacturing, architecture, environmental engineering, and urban design.

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## Resources:

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

[https://en.m.wikipedia.org/wiki/Stingless\\_bee](https://en.m.wikipedia.org/wiki/Stingless_bee)

<https://beekeepinglikeagirl.com/5-fascinating-facts-about-stingless-bees/>

<https://www.thoughtco.com/ancient-maya-beekeeping-169364>

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