Space Sound Maker (Pew Pew Blaster SFX)

Objective:
Be Han Solo with a homemade blaster sound effect.

Difficulty Level:
Easy (ages 8-14)/Medium (ages 6-8)

Materials:

- Large paper or plastic Slinky
- Scissors
- String

Procedure:

1. Cut two lengths of string about 2 feet long, and tie them to either side of one end of the Slinky (one on each side of the same end).

2. Hold the Slinky by the strings and let it dangle, then stick the foam cup between two of the coils.

3. Lightly pull the Slinky back and let it go. The cup will amplify the sound and you can make great sound effects!

What happens if you use a different size of cup?

What happens if you put the cup at different places on the Slinky?

What's the Science?
When an object **vibrates**, it causes tiny **air molecules** to move. These tiny invisible particles bump into each other, traveling until they reach our ears. The outside part of our ear, called the **pinna**, is shaped so it funnels the air molecules down into the ear, where they bounce off the stretchy membrane we call the eardrum.

When the membrane bounces, it also vibrates, making the tiny bones in your inner ear vibrate as well. This helps send the vibrations into a curvy organ sort of shaped like a seashell, called the **cochlea**, where they are turned into electrical impulses that go to your brain, and we process them as sounds.

Not all sounds move at the same speed! When the end of the Slinky hit the floor, vibrations traveled back up it and were **amplified**, or made more powerful, by the cup. The cup is hollow and full of air, so when it is vibrated, there is a lot of space for the air molecules to move around in. We perceive this as the sound being louder.

Some of the vibrations moved slower than others. The slower vibrations make sounds that we perceive as being lower in **pitch**. Faster-moving sound waves make sounds that we perceive as higher in **pitch**. The faster sound waves get to our ears first, and then the slower sound waves follow. We hear the higher-pitched blaster noise first, then the lower one.

Explore More:

Now, take the cup off your Slinky. Wrap the strings around your fingers and gently touch them to your ears. Let the Slinky fall to the ground again. What do you hear?

Star Wars Trivia:

Did you ever wonder who decided what a light saber sounds like?

Someone had to imagine it first, then think how to design that sound! Many of the sound effects in the Star Wars films were designed by Ben Burtt.

Some of the sounds Ben created as part of the Star Wars universe include R2D2's beeps, whistles, and chirps; light saber humming, blaster guns firing, Darth Vadar's mechanized breathing, and Ewokese, the language spoken by the fierce Endor natives.

Before the first Star Wars film (Star Wars Episode IV: A New Hope) was released in 1977, most science fiction movies used electronic sounds for spaceships and futuristic technology. Ben decided that for Star Wars, he wanted to use "found sounds" to create effects.

He used the sound of a film projector motor blended with feedback from an old television to create the low hum that we hear when lightsabers are powered up. He hit a tense metal wire on a radio tower with a wrench to create the 'pew-pew!' sound of a blaster firing -- that's the sound we are imitating here with the Slinky and cup.

Ben likes to put a sound effect he created, called "The Wilhelm scream," into his film projects. (If you have ever heard Goofy fall from something high in a Disney short, that yodeling yell is 'the Wilhelm scream'). Next time you are watching *A New Hope*, listen carefully and see if you can hear it!

Take a picture and share it with us, so we can see what you made! For more engineering projects and science activities, subscribe to our newsletter! Have an adult send it to online@scienceworksmuseum.org or share it using the hashtag #ScienceWorksOnline