

Make the Sprinkles Dance

Description

Stretch plastic wrap across the top of a bowl or cup, secure it with a rubber band, then put dessert sprinkles on top, and you're all set. Make some noise close to the bowl and watch the vibrations from the sound you're producing make the sprinkles dance.

Instructions

1. Set out your supplies. Tell your child you're going to experiment with sound, but don't tell them what to expect just yet. Describing what they see, rather than looking for what they're supposed to see, is an important scientific principle.
2. Have your child help pull a piece of plastic wrap across the top of the bowl and use the rubber band to hold the plastic wrap in place. Stretch the plastic wrap as tight and flat as possible, without wrinkles.
3. Tell them to bring their lips close to the edge of the bowl without touching it.
4. Ask them to hum loudly and watch the plastic wrap closely. What happens? Can they see anything?
5. Add some sprinkles to the top of the plastic wrap. You may want to put the bowl onto a plate or tray to catch any sprinkles that fall off during the vibrations.
6. Try humming again. Watch the sprinkles closely. Can they see anything now?
 - If you successfully made the sprinkles dance, have your child speculate about whether the vibrations were still occurring before you added the sprinkles, but were just harder to see.
7. If nothing happens, try humming louder. If there are still no dancing sprinkles, try varying the pitch of your humming (higher or lower.) What happens now?
8. Add more sprinkles as needed if they fall off the bowl.
 - Now you can explain to your child that you have created a model of your eardrums with the experiment. You have a thin membrane, just like the layer of plastic wrap inside your ear that vibrates when sounds reach it.
9. What happens after they stop humming? Vibrations often continue for just a moment after a sound stops, as the sound waves finish traveling outward.

Materials Needed

- Cup or bowl
- A rubber band that fits around the top of the cup or bowl
- Plastic wrap
- Colored sprinkles, grains of rice, or salt
- (Optional) Large plate or tray

Why is this a great thing to do?

Your child will learn about physics and anatomy while they develop their understanding of cause and effect, and will learn how to experiment and work on their fine motor skills.

Introduces children to physics.

Studying sound waves and how they vibrate in this activity is a visual representation of the concept of physics. Sound waves are created by vibrating objects that bump into adjacent air molecules. These air molecules bump into other nearby air molecules and so on, transmitting the vibration through the air to our ears. Sometimes these vibrations are easy to see, like when you pluck a rubber band. However, most of the time, the waves are too small or too fast for us to see, like when you knock on a door, and it makes a sound even though you can't see the door vibrate.

Teaches anatomy.

The plastic wrap in this activity is a model of the eardrum, which is what lets us hear. Eardrums are tiny membranes inside your ears, and when vibrating air molecules hit those membranes, they cause it to vibrate as well. These vibrations are then converted into electrical signals that are sent to your brain.

Develops their understanding of cause and effect.

Manipulating something to obtain different results in a way that is almost immediately seen is an excellent study in cause and effect.

Practices doing experiments.

Even if your child isn't quite ready for all five steps of the scientific method, doing simple experiments can prepare them for the principles of making and testing hypotheses.

Enhances fine motor skills.

Carefully manipulating plastic wrap and rubber bands will build fine motor skills, which are essential for writing, eating, using scissors, and buttoning their clothes.

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Make STEM Connections

Help your child develop a more in-depth understanding of how things vibrate when they make sound, and how sound can also make things vibrate. These vibrations are what allow us to hear.

Look into adaptations for hearing-impaired people.

Explore how people who cannot hear often use visible or felt vibrations to help them understand sound. For example, deaf people often turn the music up very loud or have large speakers, so that they can experience music and rhythm through feeling the vibrations. You can get the attention of a person with a hearing impairment whose back is to you by stomping your foot on the floor to create a vibration they can feel. Do a Google search or talk to a friend who is deaf or hard of hearing to learn more.

Find out how old your ears are.

The way an object responds to sounds of different pitches is called its frequency response. Frequency is measured in hertz (Hz), which is the number of sound waves per second. Human hearing typically has a range from about 20 to 20,000 Hz, meaning frequencies in that range will cause your eardrum to vibrate. Some animals, such as dogs, can hear much higher frequencies, up to 45,000 Hz, which means their eardrums are sensitive to vibrations at a much higher amplitude. That is the reason dogs can hear "dog whistles" even when we can't! As human beings get older, we tend to lose hearing at either end of the spectrum (exceedingly high and incredibly low.) This [video](#) explains the concept and emits some tones to test you. Your child will probably love discovering they can hear some things that you aren't able to!

Next Generation Science Standards (NGSS) Correlation

1-PS4-1: Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

By constructing a simple model of an eardrum, placing clear plastic wrap tightly over the top of a bowl, and using sprinkles to watch the vibration of their voice humming alongside the rim of the container, your child is demonstrating that sound causes waves or vibrations that can be seen. This activity can be extended by using a free application called "Sound Wave" or "Garage Band" to show your child a visual sample of their voice; your child can alter the tone and volume of their voice and watch as the sound wave peaks and drops with their voice alterations.

Talking Tips

"What do you think will happen if we hum right beside the bowl?"

"Try humming high, like a mouse voice. Now try humming low, like a frog voice."

"What happens after you stop humming?"

Tips & Extensions

You can also cut the top off a milk carton to use as the bowl for this experiment.

Try this activity with different sizes of granular materials. What happens if you use tiny, spherical sprinkles instead of larger, oblong ones? What about salt? What about grains of rice?

Try the activity with plastic wrap stretched across the opening of containers of different sizes, shapes, and materials. What is the best material or shape to carry sound waves at different pitches?

Try putting the bowl directly in front of a speaker and playing music. What happens? Does it react more if the music you choose has a strong bass line?

Look for a "tone generator" app on your phone, then try playing a continuous tone near the bowl. Start with the volume low, since some sounds might hurt your ears.