



SCIENCE OF THE SENSES: SOUND

IN THIS ACTIVITY YOU CAN LEARN MORE ABOUT THE SCIENCE BEHIND YOUR SENSES. LEARN ABOUT VIBRATIONS BY TRYING A FEW OF THESE PRACTICAL DEMONSTRATIONS USING ITEMS YOU CAN FIND AROUND YOUR HOME.

HOW DO WE HEAR THINGS?

- Your ear collects sound waves and reflects them down the ear canal onto your ear drum.
- This makes the ear drum vibrate and causes three tiny bones (the hammer, stirrup and anvil) to hit into each other to pass the message on.
- Next, the vibrations pass through the liquid in your **cochlea** (a snail-like structure) and tickle the tiny hairs found there.
- This then sends a signal to your brain via the **auditory nerve**.
- Finally, your **brain** decodes this signal and tells you what you are hearing!







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AT HOME ACTIVITIES



SCIENCE OF THE SENSES: SOUND ACTIVITY 1: SCI-FI SLINKY SOUND EFFECTS

YOU WILL NEED:

- Metal slinky
- Paper, plastic or styrofoam cup

laser gun sounds!





With an adult's help, push the end of a metal slinky through the bottom of a cup.



EXPLANATION

The vibrations pass along the metal slinky and are **amplified** by the cup. This means the cup acts like a speaker and makes the sound louder!

Hold the cup so the slinky dangles down to the floor. Then gently bounce the slinky up and down on the floor, or give it a wiggle from side to side to hear the

This is how they made the sound of laser guns in sci-fi films before fancy special effects on the computer!

Check out this YouTube video or search for 'slinky cup experiment' on YouTube if you need to watch a demo on what to do: www.youtube.com/watch?v=TMaNZMFPRfU



CHALLENGES

- What happens if you hold the metal slinky rather than the cup when you bounce the slinky? Is the noise quieter or louder? Why?
- What happens if you change the size of the cup?
- What do you think would happen if you changed the length of the slinky?
- Which type of cup gives the best sound? Plastic, paper or styrofoam? What about using a tin can or bucket?
- What other special effect sounds can you make with things around your house?



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AT HOME ACTIVITIES



SCIENCE OF THE SENSES: SOUND ACTIVITY 2: MUSICAL COAT HANGERS

YOU WILL NEED:

- Metal coat hanger
- String
- Scissors



Cut two pieces of string about 45cm in length each. Make sure they are even in length.



Tie the string to the coat hanger where these arrows are pointing. Then hold the string with the coat hanger hanging down.



Wrap the string several times around your index finger (pointer finger) on both hands. Put your index fingers in your ears and swing the coat hanger against a hard surface. This could be the side of the table, a wall or the back of a chair. Check with an adult where they are happy

for you to hit your hanger instrument before doing so!

Check out this YouTube video or search for 'hanger string experiment' on YouTube if you need to watch a demo on what to do: www.youtube.com/watch?v=-kYJzKudUmw

CHALLENGES

- Predict how the sound will change if you try a plastic or wooden hanger.
- Then test it out! Was your prediction correct?
- What about if you change the type of string? Does this affect the sound?
- Does the length of string affect the sound?
- Doctors and nurses use a piece of equipment called a stethoscope to pick up vibrations from your heart beat. This works in a similar way to the coat hanger, with the vibrations travelling up the tubing and into your ears.





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AT HOME ACTIVITIES



SCIENCE OF THE SENSES: SOUND ACTIVITY 3: STRING TELEPHONE

YOU WILL NEED:

- 2 paper, plastic or styrofoam cups
- String
- Scissors







Cut a piece of string about 2 metres in length.



With an adult's help, make a small hole in the bottom of each cup and thread the string into the hole. Tie a knot in the string to stop it sliding out the hole. You should end up with a cup at each end of the string.



Now you can speak to someone in your family by standing apart and making sure the string is taut (pulled tight). One person speaks into the cup

while the other person holds the other cup to their ear to listen. The vibrations will pass along the string and into your ear!



CHALLENGES

- What happens if you let the string go slack?
- What happens if you make the string longer or shorter?
- Does the type of string you use affect the sound? Try some wool or thick thread instead. Make a prediction then test it out!
- Hum a song into the cup and see if the other person can guess it.
- Can the other person still hear if you whisper a message?



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