Coat Hanger Gong

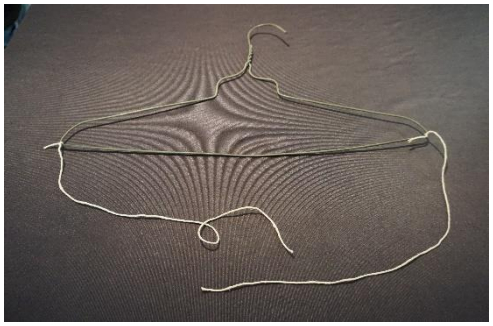
Can you make a coat hanger sound like a gong?

Materials

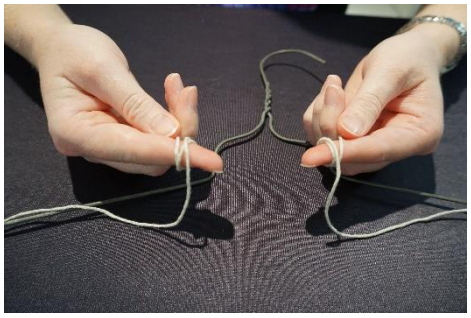
- Metal coat hanger
- 2 pieces of string about 40cm long

Instructions

1. Tie the pieces of string to the two bottom corners of the coat hanger.



2. Wrap the other ends of the strings around your pointer fingers and put your fingers in your ears.



3. Gently swing the coat hanger so that it hits something solid (for example, a table) and listen to the sound it makes. Does it sound the same if your fingers aren't in your ears?

Further investigation...

- Try swinging the coat hanger into different things. Does a table sound the same as a couch?
- Ask a friend to tap the coat hanger with objects made from different materials. Does it sound the same when a finger and a spoon taps the coat hanger? What else could you try?
- Repeat this experiment using something else instead of the coat hanger. Try a metal spoon. Does it work as well with a plastic coat hanger?
- What makes the loudest sound? Which sound do you like the best?

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What's happening?

When you tap the coat hanger onto a table normally (without fingers in your ears), the coat hanger vibrates and makes the particles in the air next to the coat hanger vibrate. The vibration is passed from one air particle to the next to the next to the next. This is a called a sound wave. If this sound wave moves into your ear and starts vibrating your ear drum, you can hear sound.

But the particles inside the coat hanger start to vibrate as well. And this vibration is passed from one coat hanger particle to the next to the next to the next. Then the vibration passes into the string and the string particles vibrate. The vibrations travel up the string and directly into your ear.

It sounds louder because sound can travel more easily through a solid than through the air. The particles in a solid are much closer together compared to the particles in the air.

This is why it will sound louder to someone that is directly connected by the solid string to the coat hanger, than someone who hears the sound through the air.

You can also experience this with a cup and string phone. Tie a string to the bottom of two paper or plastic cups. One person speaks into one cup while the other listens through the other cup.

Check your understanding

1. Describe the sounds the coat hanger made, both before and after you put your fingers in your ears. How were the sounds different?
2. How does sound reach our ears?
3. Why does putting your fingers in your ears in this experiment make the coat hanger sound louder?
4. What makes the loudest sound? Which sound do you like the best?
5. Explain your understanding of these scientific terms: vibration, sound wave.