

Welcome to Family Science Night!

Does sound travel better through a solid or a gas?

Do you like to talk on the telephone?

Have you ever been under water at the pool and heard someone talking to you above the water?

Have you ever put your ear to the ground and heard sounds?

Sound travels differently through solids, liquids, and gases. Does sound travel better through a solid or a gas?

Materials:

Two Paper Cups

Push Pin

String (2 meters long)

Scissors

Two Paper Clips

Two 30 cm pieces of thread

One metal clothes hanger

Investigate 1:

1. Poke a small hole in the bottom of each cup with the pushpin.
2. Thread a 2 meter piece of string through the holes.
3. Tie a paperclip to each end of the string to ensure that it is secured inside the cup.
4. Give one cup to a friend. Stretch the cups apart so that the string is tight. Talk and listen to each other through the string telephone.

5. Take turns whispering into the cup. Can you hear the other person whispering when the cup is over your ear?

Can you hear the other person whispering when the cup is not over your ear?

6. Does the sound travel better through a solid (string) or through a gas (air)?

Extend:

More questions to ponder:

1. What happens if the string hangs loose between the two cups?
2. What happens if you hold the string with your hand?
3. Why isn't your family telephone made out of string and cups?
4. What happens if you connect three or four string telephones together?

Investigate 2:

1. Tie one piece of thread (30 cm) to each end of the hanger.
2. Hold the hanger upside down by the ends of the pieces of string.
3. Bang the hanger against a table.
4. Listen to how loud the sound is!
5. Now repeat steps one and two but this time put your fingers in your ears while holding the strings.
6. Bang the hanger against a table.
7. Listen to how loud the sound is!

Questions:

- A. When you bang the coat hanger on the table, what happens if the string and coat hanger dangle away from your ears?

- B. When you bang the coat hanger on the table, what happens if you hold the strings up to your ears with your hand?

Besides traveling through air, sound can also travel through solid objects. When you talk into the cup, you cause it to vibrate. This in turn causes the string to vibrate. The cup on the other end of the string also begins to vibrate. Whoever is listening hears the vibrations caused by your voice. Voice vibrations travel from one cup, through the string, to the opposite cup.

When your fingers are in your ears with the string connected to the coat hanger, the sound is much louder. Sound travels better through a solid (string and fingers) than through a gas (air).