SCIENCE & MUSIC | Lesson 12: Make Your Own Phone! 2-6

Apply your understanding of how sound travels to make your own telephone!

Standards listed on next page

Supplies:

- 2 paper cups
- Ball point pen
- Science log

*Supplies Available, order here

- 30-50 ft of string
- Scissors

Objective

Students will experiment and observe how sound travels using a cup and string telephone.

Outline of Video

1. Consider the ways sound helps us in our daily life (0:30)
2. Before we experiment today, recall does sound travel fastest through a solid, liquid, or gas (1:40)?
    3. A: Sound travels fastest through solids because the particles are closer together (recall the dominos experiment).
4. Grab the supplies listed above for our experiment (2:34).
    5. Use the pen to poke a hole in the bottom of each up (3:00).
    6. Thread the string through the bottom of each cup and tie the inside end in a knot (3:40).
    7. Write the following question and your hypothesis: Do you think it will be possible to hear someone speaking into the cup from a distance of 30-50 feet? (4:44).
    8. With a partner, stand across from each other to stretch as far as the string will allow. One partner speaks into the cup while the other listens. Write the results of what happened in your log (5:39).
9. Consider why this string and cup telephone works (6:30).
    10. The soundwaves travel through the string to the air on the other side, and the cup serves as a resonator (6:38).

DIY: Perform this experiment with a friend both with and without the cup, and with whispering instead of speaking. Compare results of all variable changes!

Kentucky Standards:

K-PS2-1, K-PS2-2. Simple tests can be designed to gather evidence to support or refute student ideas about causes.
Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)
KPS2-1. Scientists use different ways to study the world.
KLS1-1. Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.
K-LS1-1. Patterns in the natural and human designed world can be observed and used as evidence.
K-ESS3-3. Events have causes that generate observable patterns.
K-PS3-1. Make observations (firsthand or from media) to collect data that can be used to make comparisons.
K-LS1-1. Scientists look for patterns and order when making observations about the world.
1-PS4-1 Science investigations begin with a question. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
2-PS1-4. Scientists search for cause and effect relationships to explain natural events.
3-LS1-1. Patterns of change can be used to make predictions.
3-LS2-1. Construct an argument with evidence, data, and/or a model.
3-LS3-2,3-LS4-2. Cause and effect relationships are routinely identified and used to explain change.
4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
4-PS3-4. Science affects everyday life.

Ohio Standards:

K.PS.2: Some objects and materials can be made to vibrate and produce sound
3.PS.3: Heat, electrical energy, light, sound and magnetic energy are forms of energy.
5.PS.2 Light and sound are forms of energy that behave in predictable ways.