

Create a tool to help visually observe the effects of sound waves on a surface. Experiment using different pitches. Record your results.

*Standards listed on next page*

**Supplies:**

- Empty cardboard cylinder
- Small tube (toilet paper roll)
- Marker\*
- Salt

**\*Supplies Available, order [here](#)**

- Scissors or exacto knife
- Balloon\*
- Electrical tape\*
- Science log

**Objective**

Explore how sound can travel through matter using a experimental sound device.

**Outline of Video**

1. Craft the experiment (you may need an adult's help for the cutting aspects)
  2. Place the small tube about an inch or two down from the top of the cylinder (1:40).
  3. Use a marker to trace around the small tube. (2:13)
  4. Use an exacto knife or scissors to cut around the traced circle (2:30)
  5. Put the small tube into the newly cut hole (3:02)
    6. If your canister has a lid, remove it
  7. Snip off the end of the balloon and stretch it over the lid of the canister (3:34)
  8. Wrap electrical tape around the edge of the balloon to secure (4:28)
    9. Tap the center of the balloon to see if it springs back like a drum
  10. Sprinkle a little bit of salt on top of the balloon head (5:12)
11. Write a hypothesis in your science log: What will happen to the salt when you hum into the tube? (5:45)
  12. Hum into the tube and watch the salt move
13. Write another hypothesis: What will happen to the salt when you hum a higher pitch into the tube? Will the salt move again, or stay where it is? (6:16)
  14. Hum a higher pitch and observe
15. Continue experimenting by humming into the tube. Hum different notes, different volumes and observe the changes. Look for any patterns the salt forms. (7:08)

16. Consider and discuss what you think causes the salt to move? (7:42)
17. Remember from earlier lessons, sound can travel through all three forms of matter. The sound moves through the tube and vibrates the balloon and salt.
  18. Different notes produce different soundwaves and create different salt patterns.
  19. Louder sounds produce bigger soundwaves causing the salt to move more.
20. DIY: Experiment humming different notes into the tube until the salt forms a pattern you like. Sketch the pattern on a piece of paper or take a photo (9:02).

### **Kentucky Standards:**

- K-PS2-1, K-PS2-2. Simple tests can be designed to gather evidence to support or refute student ideas about causes.
- KPS2-1. Scientists use different ways to study the world.
- LSI-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-LSI-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-LSI-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.