SCIENCE & MUSIC | Lesson 2: Sound Travels through Solids, Liquids, and Gases K-6

Learn about three states of matter (solids, liquids, gases) and how sound moves differently through each one. Use dominoes to model how sound moves through particles in different states of matter. Test how sound moves through air, water, and flour and record any observations.

Standards listed on next page

Supplies:

*Supplies Available, order here

- 3 Plastic Bags*
- Water
- Flour or Sand*
- Small speaker or cellphone
- Dominos (Teacher Only)*
- Notebook/Record Log (template on pg. 3)

Objective

Students will explore and hypothesize how sound can move differently through three types of matter. They'll view experiments and record observations.

Outline of Video

1. Students learn about "matter" and create a list of things that have mass and take up space, therefore things that are matter and could be measured.
2. Explore types of matter through the demonstrations:
    3. Air in a balloon = gas matter
    4. Water in glass = liquid matter
    5. Book = solid matter
6. Students consider how sound moves through air (matter). They answer and discuss which of the three types of matter they think air belongs to.
7. Students learn that sound can travel through water. When animals in the ocean communicate through sound in water, it is called "**echolocation**".
8. Students scratch a book or hard surface to test how sound travels through solid matter.
9. Students hypothesize whether sound will travel differently through the three types of matter in the upcoming experiment. Notebook questions are at (5:53).
    10. Students try each phase of the experiment or they can watch the experiment demonstrated in the video. If access to a music device/speaker is difficult, try snapping on the other side of the bag to produce sound.
    11. Phase 1: Bag of air
    12. Phase 2: Bag of water

13. Phase 3: Bag of flour or sand

14. Students answer questions from (5:53) after completing the 3 phases. Option to discuss answers as a class.

15. Students watch domino demonstration to illustrate how particles are spaced differently in the three types of matter, and how that changes the travel of sound.

16. DIY: With a partner, experiment how sound changes from a room with the door open or closed.

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.
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.
5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen. [Clarification Statement: Examples of evidence could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.]

Ohio Standards:

OH State Standards Introduced:
K.PS.1: Objects and materials can be sorted and described by their properties.
K.PS.2: Some objects and materials can be made to vibrate and produce sound
2.PS.1: Forces change the motion of an object.
3.PS.1: All objects and substances in the natural world are composed of matter.
3.PS.2: Matter exists in different states, each of which has different properties.
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.

SCIENCE & MUSIC | My Science Log

Name & Teacher

Will the music or sound be different when listened to through the three bags of matter?

HYPOTHESIS (Y/N):

Which will be loudest/clearest?

Which will be softest/most muffled?

DIY at home: Have a partner in another room speak with the door open. Then close the door to that room and have the partner speak again. How did the sound of their speaking change and why might that be?