SCIENCE & MUSIC | Lesson 3: How Does a Flute Work? K-6

Make your own simple flute using a water bottle, and learn how flutes produce sound and change pitch.

Standards listed on next page

Supplies: *Order Eligible, Limited Quantity

- Full Water Bottle*

Objective

Students will gain an understanding of how a flute produces sound through a hands on experiment where they will create their own water bottle flute.

Outline of Video

1. Ensure all students have one water bottle that is full with water.
2. Before starting the experiment, have the students drink a few sips - just enough for the water to not splash as they blow into the opening.
3. The opening of the bottle should be placed under the student's bottom lip. They should blow down and across the hole, in an attempt to make a sound. If they can't get it right away, that's okay! Encourage them to try different lip positions until a whistling sound can be heard.
4. After a sound is achieved, take a few more sips and try again. Did the pitch change? Pause and discuss with the class.
5. Repeat steps 2 and 3 as many times as you wish. Consider the following questions for class discussion:
6. Did the pitch get higher or lower as the bottle got more empty?
7. As you drink the water, is there more or less air in the bottle?
8. Based on these two questions, what can you conclude about the relationship between the pitch of the sound and the air content in the bottle? (Hint: the more air, the lower the note)
9. How does this apply to music? Let's look at these two instruments: the piccolo and the flute. Pause the video and ask the students which one they think will have a higher pitched sound.
10. Repeat step 5, this time considering the contrabass flute.

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.
1-LS1-1. The shape and stability of structures of natural and designed objects are related to their function(s).
4-PS3-4. Science affects everyday life.

Ohio Standards:

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
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.