

Good Vibrations

5th Grade

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References:

- <http://www.engineeringinteract.org/resources/oceanodyssey/oceanodysseylink.htm>
- <http://www.fatlion.com/science/sound.html>
- media.nasaexplores.com/lessons/04-043/5-8_1.pdf
- <http://www.iit.edu/~smile/ph9536.html>

Benchmarks & Objective:

- (ES-6) Describe and summarize observations of the transmission, reflection, and absorption of sound.
- (ES-7) Describe that changing the rate of vibration can vary the pitch of the sound

Materials:

Tuning fork

Water chimes:

- 8 glasses (or more)
- water
- salt or whatever solute the students would like to add to the water
- spoons to tap glasses

Kazoos:

- Toilet paper rolls
- Paper towel rolls
- Waxed paper
- Rubber bands

Target Concepts:

- All sound is produced from vibrations
- Sound frequency is the number of vibrations per second
- Sound travels in waves
- Pitch varies as the rate of vibration changes

Initial Introduction:

Students will be asked to describe what creates a sound. They will generate a list of hypotheses on the blackboard. Students will then be asked to hum and feel their throats above their voice boxes. They will revise their initial list. The student will be asked to describe what happens when a tuning fork is struck and placed in a glass of water (visible waves move from the fork).

Procedure:

Students will be given the supply list and told that they are going to create instruments to further examine properties of sound. (Groups of 4 work well). They will be asked to identify what the sound travels through? Does sound travel through solid, liquids and gases? If the students do not get rolling, start them by filling a glass with water and hitting it with a spoon, comparing it to an empty glass (they will notice the different pitches). Students may also be encouraged to fill the glasses with other mediums (milk, saltwater) etc. and compare the sounds.

Students will also make kazoos by putting waxed paper over one end of a toilet paper roll with a rubber band. Students should feel the ends of their kazoos vibrate when they hum into them. They should compare the volume of the long and short kazoos and see what happens when they poke holes in the side of the kazoo (the volume increases).

Target Observations:

- Sound travels in waves
- Vibrations cause sounds
- Pitch is related to the amount of sound vibrations
- We can see, hear, and feel sound waves
- Sound travels through solids, liquids, and gases

Summary & Discussion:

Students should discuss all of their observations about how sound was produced in their instruments.

Extensions (Optional):

- Students may make original instruments with a variety of materials
- Students may play a game on sound called ocean odyssey. The kids really enjoyed this if they have access to a computer lab.

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