

Bay Area Scientists in Schools Presentation Plan

Lesson Name Hear All About It! – Sound

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Grade Level 2 Standards Connection(s) Sound

Teaser:

Students will enjoy building their own Telephone, listening to a Stereo Hanger and the Whispering Bottles while learning about sound! This lesson will focus on vibrations, volume and pitch, and the different mediums that sound can travel through: gas, liquids, and solids. Students will work in pairs throughout these activities and will rotate from each of the three stations. We will provide questions to better engage students and keep the activity relatively focused.

Objective:

Students will engage in observation and interaction with sound. They will be allowed to make predictions and come up with an explanation for each activity given several vocabulary words to help formulate these answers. These activities are very hands-on which will give an opportunity for students to really enjoy learning about sound and be able to define related vocabulary in order to explain how sound “works.”

Vocabulary/Definitions:

Sound: Vibrations that travel through the air, a solid or liquid and can be heard when they reach a person’s ear.

Vibration: a shaky, back and forth motion of particles

Pitch: relates to frequency, or how many times a second the particles vibrate. High-pitched sounds have waves very close together; low- pitched sounds have a greater distance.

Volume: loudness or magnitude of sound

Medium: the substance through which sound travels- gas, liquid, or solid.

Frequency: how often particles vibrate.

Materials:

- Metal hangers
- Paper cups
- String (for Telephones and Stereo Hangers)
- Paper clips
- Glass bottles
- Metal spoons (for Stereo Hangers and Whispering Bottles)
- Beakers or plastic cups for measurement
- Scissors
- Markers to write students names on telephones
- Water- preferably a sink in the classroom
- Funnel
- Tubs to put the glass bottles in just in case of a spill (if possible)

What students should have ready:

Clipboard, if possible

Pencils

Classroom Set-up:

Student grouping by pairs and then placed into three different stations/areas

10 minutes to set up

Classroom Visit

1. Personal Introduction:

5 Minutes

Hi, my name is Jisella, I am a student from UC Berkeley and I am here today to share some fun activities with you all in order to learn a little more about sound. One of my favorite things to do is listen to music, and music is all about sounds, so let's break it down to see how sound is produced. We will bring nametags so we can communicate better with the students (we will wear name tags as well).

Topic Introduction:

10 Minutes

Can anyone tell me what sound is?

Define sound: Vibrations that travel through the air or another medium (such as a solid or liquid) and can be heard when they reach a person's ear.

Now I want you all to tilt your head back, place two fingers on your neck (next to throat) and make an "aahhh" sound with your mouth... can you feel the vibrations?

Introduce new vocabulary.



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2. Learning Experience(s):

10 Minutes at each (3) station

Station #1: Telephone!

Pair up students (groups of 2). Give each group 2 paper cups, 2 paper clips, and a piece of string (approx. 5ft). Each group will assemble their telephone following the instructions listed at the station.

1. Poke a hole in the center of the bottom of each paper cup, using the sharp tip of the pencil.
2. Thread one end of the string through the cup (from the outside in).
3. Knot the string inside the cup so that the knot prevents the string from slipping out if pulled.
4. Repeat with the second cup. Thread the other end of the string through the hole and knot it.
5. To secure the string further, place a paper clip after the knot, before the bottom of the cup.
6. You and your partner can use the phone by speaking into the cup while the other person listens by placing the open side of the cup to their ear. Take turns speaking and listening. Make sure the string is slightly tight when using the phone.

(help if necessary- especially to poke holes in paper cups)

Question: Can you hear your partner speak to you? If so, how do you think this telephone works? Which medium is sound traveling through?

Station #2: Stereo Hanger!

Each pair of students will receive one metal hanger and two pieces of string. Here we will learn a little more about vibrations!

1. Tie one piece of string on each end of a metal hanger (let the hanger hang upside down).
2. While only holding on to the string, wrap the ends of the string around the index fingers and place the index fingers close to your ears.
3. The partner will then tap the metal hanger with a metal spoon.
4. Switch off roles with your partner

Question: Can you hear and feel the vibrations? How do you think this is possible, do you think it would sound differently if you tapped the metal hanger with your finger? Try it!

Station #3: Whispering Bottles! (this station will use water)

This station will be working with glass bottles. First they will observe the noise that is produced from them blowing air through the top of the bottle opening while they tap the side of the glass bottle with a metal spoon. Then they will be able to pour water in the bottle until it is half full and repeat the procedure in order to notice the difference in sound.



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1. Grab an empty glass bottle
2. Put your mouth closely to the rim of the bottle and blow air (like if you were going to blow bubbles or blow up a balloon). Let your partner have a turn.
3. Now do the same but this time tap the side of the glass bottle with a metal spoon. Let your partner have a turn. Can you notice a difference?
4. Now ask a teacher to help you and your partner fill up the glass bottle half way.
5. Put your mouth closely to the rim of the bottle, blow air and tap the side of the bottle. Let your partner have a turn. Can you notice a difference?

Question: Why do you think having water in the bottle makes a different sound than if it was empty?

3. Wrap-up: Sharing Experiences **10 Minutes**

Once we have cleaned up the last station students have the opportunity to share to the rest of the class their observations, what he or she and his or her partner discovered, learned, found interesting, etc.

4. Connections & Close: **5 Minutes**

Ask if anyone has any questions or comments before leaving.

Total 60 Minutes

Follow-up:

The Science of Sound for Kids!

<http://www.sciencekids.co.nz/sound.html>

This website is perfect for students wanting to explore more about sound. This website has experiments, games, quizzes, interesting facts and videos easily understood and very enjoyable to all ages!