

Light and Sound

Physical Science

Grade Level:

First

Title of Lesson:

Coke Bottle Music

Unit Title:

Physical Science

Performance Standards:

S1CS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities.

S1P1. Students will investigate light and sound.

c. Investigate how vibrations produce sound.

d. Differentiate between various sounds in terms of (pitch) high or low and (volume) loud or soft.

Essential Question:

How is sound made, and how can sound be altered?

Objective:

Students will understand how sound is made and why variations in pitch occur.

Key Words & Terms:

sound, vibration, volume, pitch

Learning Activity**Abstract:**

The students use coke bottles with varying water levels to study the role of vibrations in creating sound and to observe differences in pitch.

Materials Needed:

- several dozen glass coke bottles
- metal spoons
- water
- laptop to show the videos

Safety Concerns:

Be careful to make sure that students do not hit each other with the metal spoons. Also make sure they are careful not to drop/break the glass bottles.

Procedure:

This lesson is best when the students have already had an introduction to sound. In the class period prior to this lesson, introduce the students to the key terms sound, vibration, volume, and pitch, and make sure that they have a basic understanding of these concepts.

- 1 Show these videos of people making music using glass cups and bottles:
<https://www.youtube.com/watch?v=RW7xR9aLS98>
https://www.youtube.com/watch?v=Aj-PEhRfi_4
<https://www.youtube.com/watch?v=tmqCU43N8pY&app=desktop>
- 2 Pose a few questions to the class including: how is sound made, how are the

people in these videos making music, what is different about each of the glass bottles, and what does this difference cause, etc.

3 Demonstrate to the class what they will be doing with a set of 5 glass Coca Cola bottles, all filled with water to various pre-measured levels. Show them how hitting the bottles with different amounts of water produces sounds with different pitch. Also, show them that hitting the bottle harder produces a louder sound. If you are musically inclined, play a simple song, such as "Mary Had a Little Lamb", and ask them to guess what song you played.

4 Split the class into groups of 2 or 3.

5 Give each group 1 metal spoon and one set of pre filled Coke bottles.

6 Give the class 5 or 6 minutes to practice playing songs of their own.

7 Once each student has had a chance to experiment with playing music on the glass bottles, have each student place their hand on top of a bottle while they tap it. Ask them why they feel the vibrations. This will remind them that vibrations are responsible for creating sounds.

8 Finish up by asking them what was different about the sounds produced by each different bottle. Ask them which bottle created the highest pitch sound and which created the lowest pitch sound. The students should observe that the bottle with the least water in it creates the highest pitch sound, while the bottle with the most water in it creates the lowest pitch sound. Explain to them that the more water, the slower the vibrations of the sound waves, and therefore, the lower the pitch.

Notes & Tips:

Make sure your laptop is compatible with the smart board apparatus at your school, or make sure to email the video to your teacher to show it on their laptop. Also, while the groups were experimenting, walk around to each group to make sure they are staying on topic, and to ask them questions one-on-one to make sure that they are really getting the material.

Sources/ References:

<http://www.sciencekids.co.nz/experiments/makemusic.html>