

STEMs Lesson Plan from Hayden

Peak 6th Grade Teachers:

Tara Moore

Alev Arli

Pam Broadhead

Becky Pratt

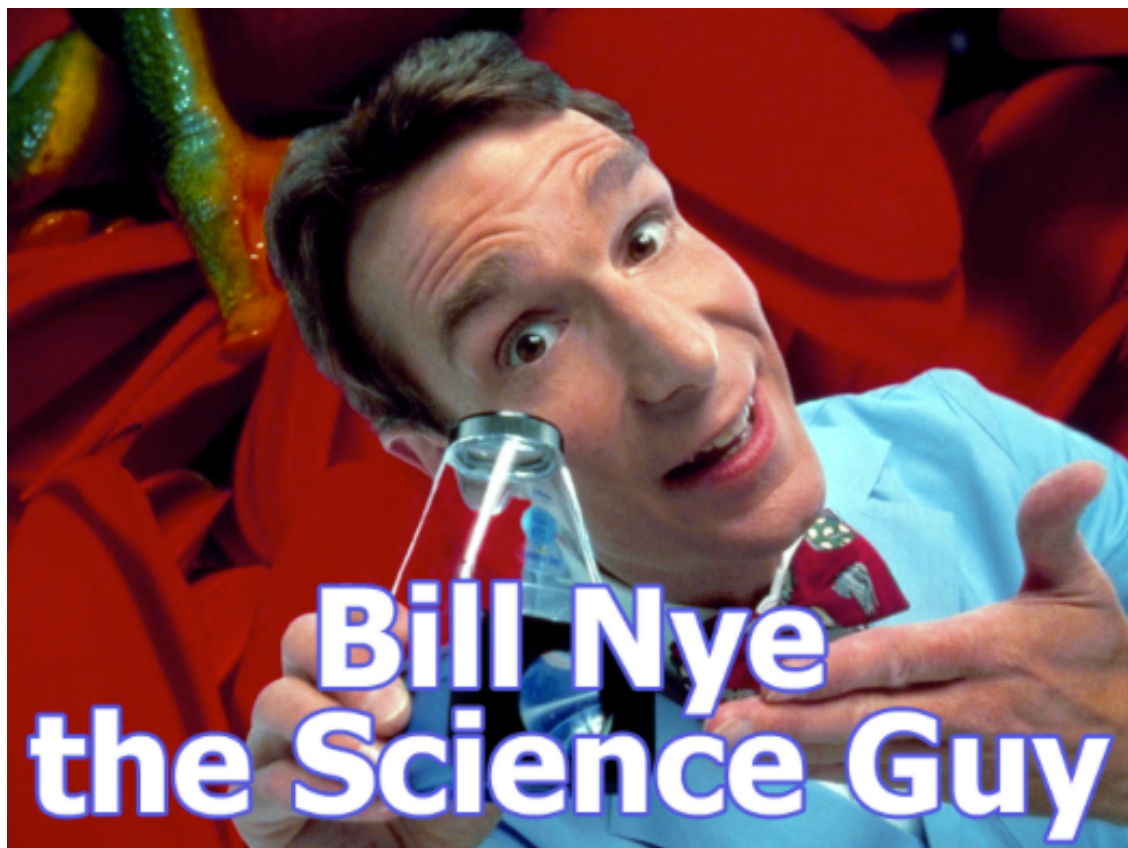
Nicole Hileman

Todd Burdick

Step 1 (HOOK)

Show the Bill Nye youtube movie to introduce sound:

<http://www.youtube.com/watch?v=ACeUO4ufx2I>



Standard VI - Heat, Light, Sound

Standard: Students will understand properties and behavior of heat, light, and sound.

Objective 1: Investigate the movement of heat between objects by conduction, convection, and radiation.

Objective 2: Describe how light can be produced, reflected, refracted, and separated into visible light of various colors.

Objective 3: Describe the production of sound in terms of vibration of objects that create vibrations in other materials.

Step 2 (ANTICIPATORY SET)

Film Canister Game

Each student gets a film canister and finds their partner by matching the sound that is similar to theirs. To create the game fill two film canisters with the same things. Examples are two buttons that are the same, five popcorn seeds, beads that are the same, screws that are the same etc.. You will need to make enough matches so that each child has a canister. Randomly pass out the canisters. The students are instructed to find a partner who has the same sound as the sound in their canister. When they think they have found their matching partner they will sit down next to their partner. When all students are sitting allow them to open up the canisters to see if they were correct.



Step 3 (LITERACY)

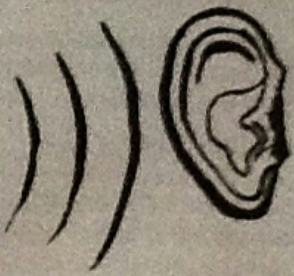
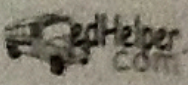
Shared Read : The Language of Sound and discuss questions as a whole group. Reading Strategy will be **Monitor and Clarify Reading**

Standard: Reading Informational Text

RI.6.6: Determine an author's point of view or purpose in a text and explain how it is conveyed in the text.

RI.6.7: Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

The Language of Sound
By Cindy Grigg



1. Sound is a form of energy. An object makes sound when it vibrates matter. Matter could be a solid (earth), a liquid (water), or a gas (air). Most of the time, we hear sound that travels through air. Sound energy is transported through waves. A wave travels from one place to another with a certain velocity. Velocity is the speed and direction of the movement.

2. Sound waves must travel through matter. You cannot hear anything in space where there is little or no air. Waves that travel through matter are called mechanical waves. When something vibrates in the atmosphere, it moves the air particles around it. Those air particles move other air particles in front of them. This carries the wave of energy through the air and away from its source. An echo happens when the sound wave hits a solid surface and bounces back toward the source.

3. The **amplitude** of a sound is the greatest distance the particles in a wave rise or fall from their rest position. A sound wave with large amplitude will carry a loud sound.

4. The **intensity** (loudness) of a sound depends on the amplitude of the sound waves. The bigger the amplitude, the more intense the sound will be. The loudness of a sound can differ for different people. Loudness describes the way a person responds to a sound's intensity. A sound that seems loud to one person may not be loud enough for someone else.

5. A **decibel (dB)** is the unit used to measure loudness or intensity of a sound. Normal talking has a loudness of about sixty dB. The quietest sound that can be heard is zero dB. Any sound above eighty-five dB can cause hearing loss. The loss is related to both the intensity of the sound as well as the length of exposure. You know that you are listening to an eighty-five dB sound if you have to raise your voice to be heard by somebody else. Eight hours of listening to ninety dB sound can cause damage to your ears. Any exposure to one hundred forty dB sound will cause immediate damage and causes actual pain to the human ear. On the decibel scale, the smallest sound you can hear is zero dB. A sound ten times more powerful than that is ten dB. A sound one hundred times the smallest sound is twenty decibels. A sound one thousand times more powerful than the smallest audible sound is thirty dB.

6. The **frequency** of a sound is the number of waves that pass a certain point in one second. Frequency is measured in hertz (Hz). Humans can hear sounds ranging from twenty

er than those
tases. The
ty thousand

ated to its
w pitches

Velocity
ter through
per second
utting their
eling
locity of
arm air than

ne pitch and
quality of a
tha.

also be
ounds are

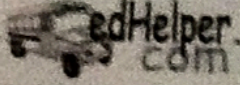
rent
When you
white light
combine

them, you would get white noise. Because white noise contains all frequencies of sound, it is used to mask other sounds. People use white noise to help them get a better night's sleep.

Copyright © 2014 edHelper

Step 3 (LITERACY)

Shared Read : Careers that use Sound

Name Madelyn  Date _____

The Language of Sound

What careers are related to sound?

Sonographer - takes ultrasound images to help diagnose illness

Audiologist - studies learning

Audio Technician - workers place speakers, microphones, cables, ~~etc~~ and repair equipment

3. What happens to the wavelength of a sound when the frequency increases?
 A It stays the same.
 B It increases.
 C It decreases.

4. What level of sound will cause immediate damage to the human ear?
 A 140 dB
 B 85 dB
 C 200 dB

5. Waves that have high frequency also have high _____

6. Sound travels faster through a gas.
 A False
 B True

7. What two things does velocity tell us?
 A Speed and direction
 B Pitch and tone quality
 C Amplitude and pitch

8. How is sound made?
 A By the sun
 B By an amplifier
 C By a vibration of matter

9. The decibel _____ scale
 A is a logarithmic
 B is a linear

10. _____ to measure sound?

Name _____

Why do you think _____

Math Standard and Mathematical Practice related to this activity.

As the length, volume or circumference of the instrument changes the pitch changes.

Grade 6 Overview

Ratios and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems.

Mathematical Practices

- ★ 1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
- ★ 7. Look for and make use of structure.
- ★ 8. Look for and express regularity in repeated reasoning.

Dear Parents,

As part of our sound unit we are having your child build a simple musical instrument from supplies that you have on hand at home. This can be built out of anything from various sizes of rubber bands, to glass pop bottles, to PVC pipe, or anything else. Please have your child create an instrument that has at least 3-5 various pitches. Please be creative and have fun with this project. They will be due Friday, March 7.

This will be part of your child's Science grade so participation is required. Thanks for your assistance.

6th Grade Teachers

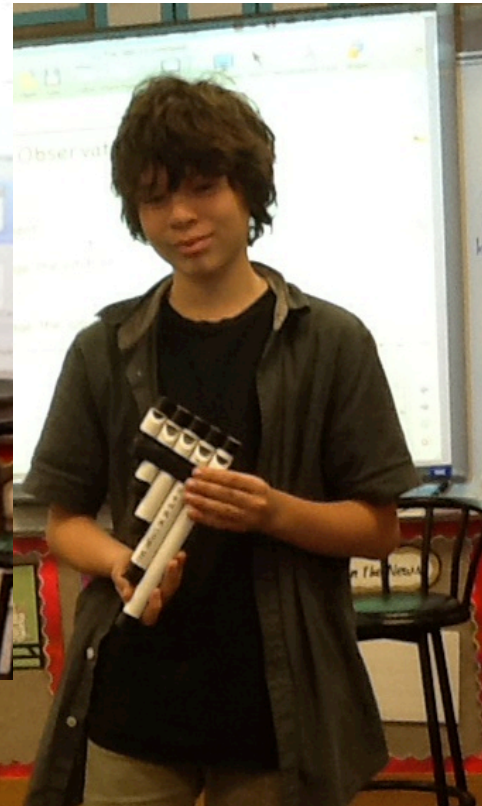
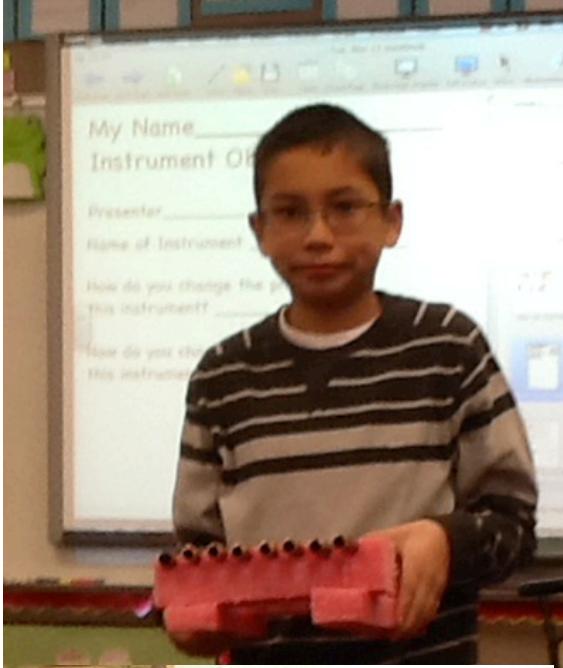
IMG_0185.MOV

STEM
Lesson Plan

Step 4 (ENGINEERING AND MATH)

Instructions were sent home with students to build a musical instrument that produces various pitches and volumes. Students will have to use various measurements of volume, circumference, and length to vary the pitch.

Various Lengths



STEM
Lesson Plan

Step 4 (ENGINEERING AND MATH)
Instructions were sent home with students to build a musical instrument that produces various pitches and volumes. Students will have to use various measurements of volume, circumference, and length to vary the pitch.

Various Circumferences



STEM
Lesson Plan

Step 4 (ENGINEERING AND MATH)
Instructions were sent home with students to build a musical instrument that produces various pitches and volumes. Students will have to use various measurements of volume, circumference, and length to vary the pitch.



Various Lengths

STEM
Lesson Plan

Step 4 (ENGINEERING AND MATH)

Instructions were sent home with students to build a musical instrument that produces various pitches and volumes. Students will have to use various measurements of volume, circumference, and length to vary the pitch.



Various Volumes of Liquid

Step 5 (ASSESSMENT)

Instrument Observation Sheet

My Name _____

Take notes on each instrument and answer the following questions.

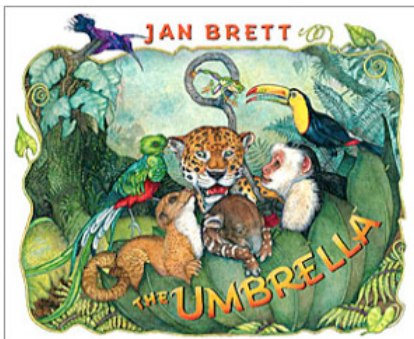
Presenter Name _____

Name of Instrument

How do you change the pitch of this instrument?

How do you change the volume of this instrument?

Conclusion/Extention to Learning youtube Video
www.youtube.com/watch?v=uENITui5_jU



The Umbrella
Written and illustrated by
Jan Brett

G. P. Putnam's Sons
ISBN: 0-399-24215-5

[Read my All About letter](#)

Share story and discuss how the instrument they made would be used to represent one of the sound.
They play their sound each time the word associated with their instrument is read.
Share story and instruments with buddies too.