

Project FOCUS
Best Lessons
FOURTH GRADE

Title of Lesson: Sound Sandwich

Theme: Physical Science

Unit Number: 4 **Unit Title:** Sound & Light

Performance Standard(s) Covered (enter code):

S4P2

Enduring Standards (objectives of activity):

Habits of Mind

- X Asks questions
- Uses numbers to quantify
- X Works in a group
- X Uses tools to measure and view
- X Looks at how parts of things are needed
- X Describes and compares using physical attributes
- X Observes using senses
- X Draws and describes observations

Content (key terms and topics covered):

Sound waves, frequency, vibration, pitch, volume

Learning Activity (description in steps)

Abstract (limit 100 characters): Students will learn what is needed to produce sound

Details:

To Begin, I asked the students what they knew about sound and how instruments had the ability to not only make sound but produce sound in different pitches, frequencies, and volumes. The main objective was for students to learn that Sound waves were produced through vibration. Sound needs three things to occur: A source, a medium, and something to receive the sound (Your ear!). With this being said, the students will learn to make their own instruments.

MAKING THE SOUND SANDWICH:

Step 1: Choose Volunteers to help pass out the materials to each student

Step 2: Once every student has their materials, the large rubber band is placed length-wise across the craft stick

Step 3: Take one of the pieces of straw and place it underneath the rubber band, about one-third of the way down the stick.

Step 4: Take the other craft stick and place it on top of the first one.

Step 5: Wrap one of the small rubber bands around the end of the stick a few times, about 1/2 inch from the top, on the same side where you placed the piece of straw. Make sure the rubber band pinches the two craft sticks tightly together.

Step 6: Put a second small piece of straw in between the two craft sticks, on the opposite end, approximately a third of the way down from the top of the stick. This time, don't put the straw underneath the wide rubber band; place it on top of the rubber band, in the middle of the two sticks.

Step 7: Wrap a small rubber band around this end of the craft stick, about 1/2 inch from the end. When you're done, the two ends should be pinched and there should be a small space between the two craft sticks.

Instruct the students to blow into their sound sandwich then write down what they observe and discuss it with others. Then instruct them to push the two straws closer together and again write and discuss what they observe.

When the students blow into the sound sandwich make the large rubber band vibrate. The vibration causes sound. When they move the straws closer together they shorten that part of the rubber band that can vibrate. This makes it vibrate faster, causing a higher pitch.

- Longer or bigger vibrating objects vibrate slowly making low-pitched sounds
- Shorter or smaller vibrating objects vibrate faster making higher pitched sounds.

Questions Asked:

- What is our source?
- What is our medium?
- Would we hear our sound sandwiches in space?
- What is receiving the sound?
- Why do you think ears are shaped they way they are?
- Do you think animals with bigger ears hear better than us?
- What is the difference between volume and pitch?

Materials Needed (type and quantity)

For Each Student:

- 2 Craft Sticks
- 2 one-inch pieces of straw
- 1 wide rubber band
- 2 Skinny rubber bands

Notes and Tips (general changes, alternative methods, cautions): The students liked this activity a lot. They seemed to like anything that was hands-on and that they could take home to show their parents. It was simple to make and I highly recommend getting your supplies from the Dollar Tree. Some tips I would suggest is insuring you have visuals for each step in making the sound sandwich. When making your own at home take a picture of each step and then upload them onto a PowerPoint. This helps out the students a lot in understanding what to do for each step, while also minimizing the amount of time it takes to walk around and help each student individually. Also, at the end when the students have completed their sound sandwiches, give them a specific amount of times to blow on their instruments. For example, "Blow three times and then record your observations." It can get pretty loud when they are all playing at the same time. Make sure at the end of the lesson the sound sandwiches are placed in book bags.

Sources/References:

- 1) <http://www.exploratorium.edu/afterschool/activities/docs/soundsandwich.pdf>
- 2) <http://www.engineeringinteract.org/resources.htm>