



Lighthouse Community Public Schools

in collaboration with

Maker **Ed**

Maker **Promise**

INSTRUMENTS

A Guide from the Creativity Lab

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Special thanks to the Abundance
Foundation & Agency by Design
Oakland for their generous support.



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About This Project

In this project, students make discoveries about sound through building and using a variety of instruments.

When students make something from scratch, their relationship with the learning deepens. In this case, they learn how sound is made.

Students learn about sound through making three simple instruments: a harmonica, a cuica and a membranophone. These instruments make vibrations — and therefore sounds — in different ways.

Our Story

Students begin by exploring store-bought instruments and the sounds they make: drums, tambourines, ukuleles, etc. After that, students begin making their own sound machines to continue their exploration of sound. We chose these simple instruments because each makes a different sound in a different way, which gives students multiple opportunities to make the connection between vibration and sound.

Making instruments is part of our first grade inquiry-based unit on Light and Sound, which asks: How is sound made? Using their senses, students discover that sound involves vibration.

Materials & Tools

Harmonica

- 2 popsicle sticks
- 1 thick rubber band
- 2 thin rubber bands
- index card
- tape

Cuica

- plastic cup
- pushpin
- wood skewer
- cloth
- scissors

Membranophone

- plastic water bottle
- latex glove
- rubber band
- plastic straw
- paper
- tape

TIME: semester-long expedition

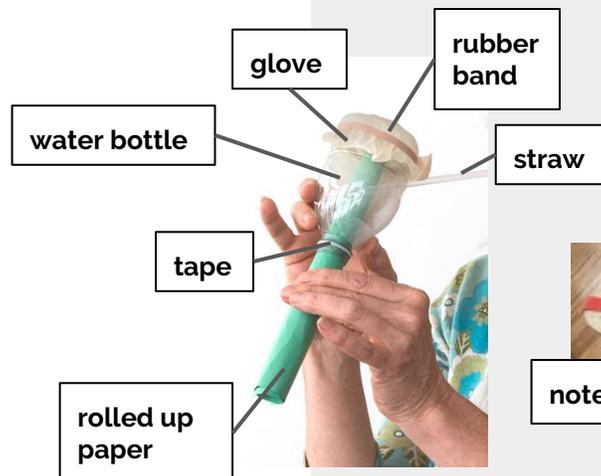
Learning Targets

- I can look closely and explore complexity.
- I can collaborate with others as an artist, maker, and designer.
- Detailed standards can be found in the [Light and Sound Expedition guide](#)

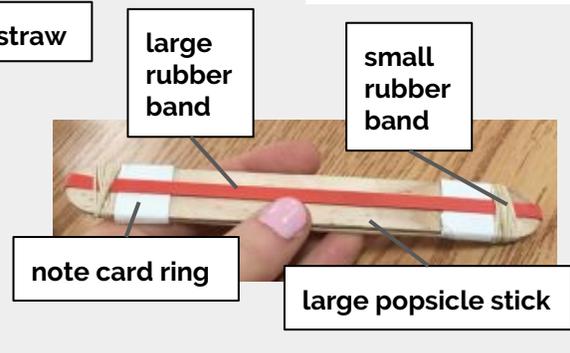
CUICA



MEMBRANOPHONE



HARMONICA



Context: Before we make...

Sounds are made when something vibrates. These vibrations travel in waves, and when those waves reach our ears, we hear sounds.

Before making instruments, students use [Parts](#), [Purposes](#), [Complexities](#) to explore drums, tambourines and ukuleles. They describe the characteristics of different sounds and compare and contrast the sounds of different instruments.



_____ is (loud/soft/fast/slow).
The _____ usually makes a _____ sound.
I made the _____(est) sound with the _____.

Students use a magnifying glass to look closely at ukulele strings as the instrument plays, allowing them to notice how the strings vibrate in waves.

This also is an opportunity for students to learn about the instrument that is their own voice, and explore different sounds (vibrations) that they can create with their vocal cords.

There are many artistic extensions related to sound that classes can explore together - from visualizing sound waves with color to creating a community musical bench to using ordinary objects to create music.



[Fabian Oefner's Dancing Colors](#)



[Exploratorium's Musical Bench](#)



[STOMP](#)

Material Management

- This project was a great opportunity to have students teach each other. Split students into three groups, and have each group become the experts in making one instrument.
- Print instructions (ideally in color) with photos to show each group of students how to make a different instrument. Using the photos, most students were able to follow the instructions and work independently.
- Students can then rotate through stations and teach each other how to make their instrument, so all students eventually make all the instruments.
- Kids may need help stretching the latex tight enough on the membranophone.
- This is also a good opportunity to incorporate science learning targets on observation and description. Throughout the expedition, you can have students put sentence strips on the wall or keep notes of their discoveries in notebooks.

Step-By-Step Guide

CUICA

Based on the Exploratorium's [Coffee Can Cuica](#)

1. Poke a hole with the pushpin in the bottom of the cup.
2. Poke the skewer through the hole.
3. Cut out a small square of cloth.
4. Wet the cloth in the sink.
5. Play the cuica by rubbing the cloth along the skewer.



1.



2.



3.



4.

Step-By-Step Guide

MEMBRANOPHONE

Based on the Exploratorium's [Water Bottle Membranophone](#)

1. Cut off the bottom of the water bottle and poke a hole in the side. Cut the glove open and put it over the bottom.
2. Stretch the rubber band around the glove.
3. Roll the paper into a tube lengthwise.
4. Insert the paper tube into the neck of the water bottle so it goes all the way to the glove. Tape it to the neck of the bottle so it stays in place.
5. Insert the straw into the hole in the side of the water bottle.
6. Play the membranophone by blowing into the straw.



1.



2.



3.



4.



5.

Step-By-Step Guide

HARMONICA

Based on the Exploratorium's [Sound Sandwich](#)

1. Make index card loops. Put loops on the ends of one popsicle stick.
2. Wrap the thick rubber band around the length of the popsicle stick.
3. Put the other popsicle stick on top and wrap the thin rubber bands around the ends of both sticks keeping them together.
4. Play the harmonica by blowing into the space between the popsicle sticks.



1.



2.



3.

Light & Sound Expedition Description

In each of the projects involved in this expedition, students investigate science concepts through making. Each project has its own set of inquiries to launch discovery:

Instruments

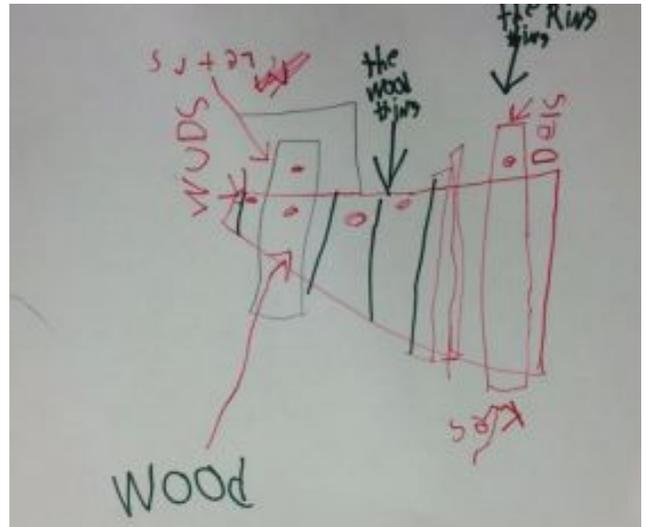
- How is sound made?
- Through their senses of touch and hearing, students discover that sound involves vibration.

Light Play

- What is light? How does it work?
- By playing with light and watching it interact with different materials, students explore light.

Shadow Puppets

- How are light and sound used for communication?
- Students design and perform a shadow puppet play using light boxes and instruments.



Other Projects in This Expedition



[Light and Sound Expedition](#)



[Light Play](#)