



# Children's Museum of Houston

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## Pre/Post Classroom Activities

### Seeing Sound

#### Rationale

*How Does It Work?* brings physical science to life through exploration of everyday phenomena by investigating sound waves. Questions can be posed and answered through investigations in this exhibit. Children learn that methods, models, and conclusions built from these investigations can change as new observations are made.

#### TEKS Objectives (Science)

1.1A: Demonstrate safe practices during field and laboratory investigations.

1.2: The student develops abilities necessary to do scientific inquiry in the field and the classroom.

1.7A: Observe, measure, and record changes in...sound and movement.

#### Background

Certain sounds are described as high, such as those produced by a violin, or low, such as those produced by a tuba. A description of a sound as high or low is known as the pitch. The pitch of a sound depends on the number of waves produced in a given time. In this lesson plan, children begin to understand that sound travels in waves, is created by vibrations, and can create different pitches. Children will also investigate and explore how sound travels in waves. Later, they will further explore concepts of sound waves in their visit to the *How Does It Work?* exhibit.

#### Vocabulary

Sound waves

Pitch

High pitch

Low pitch

Instruments

#### Materials (per group of students)

- Tuning forks
- Clear plastic cups
- Water
- Pitchers
- Food coloring
- Paper towels

#### Procedure

**Set Up:** After an introduction in how sound travels in waves discuss high and low pitch and how this relates to waves. This activity is best if completed in small groups of 2-4 students.

1. Prepare pitchers with water by adding food coloring and stirring so that the color is spread out evenly.
2. Set up various stations with the materials listed above.
3. Ask children to fill the cups to the brim with water.
4. Children will strike the tuning fork sharply against their desk so that it produces a note.
5. Then, they will touch the surface of the water with the prongs of the tuning fork. (The water will immediately splash around, driven by the vibrations of the fork).
6. Discuss the various results and how the pitch of the tuning fork affects the water.

### Questions to ask:

- What did you hear when you hit your tuning fork against your desk?
- What happened when you put your tuning forks in the water?

### Extensions

Provide students with different surfaces, each with a different hardness. Allow children to explore the various degrees of waves in the water of the different surfaces.

### Resources

- Sound by Peter D. Riley. Gives an introduction to different kinds of sounds and how they are produced.
- Sound and Light: Science Facts and Experiments by David Glover
- Sound Science by Etta Kaner
- Stop Faking It: Sound by William C. Robertson, PH. D.
- Make It Work: Sound by Alexandra Parsons

### Websites

- BrainPop: <http://www.brainpop.com/science/energy/sound/>. Provides educational movies that help make learning fun. In this movie, Tim and Moby introduce you to the world of sound.
- PhET: <http://phet.colorado.edu/simulations/sims.php?sim=Sound>. This interactive simulation allows students to analyze the properties of **sound** waves.
- School for Champions: <http://www.school-for-champions.com/science/sound.htm>. This website explains how obstacles affect sound waves.
- Think Quest: Sound is Energy <http://library.thinkquest.org/5116/sound.htm>. Find out about **sound** waves and how their graph varies with change of pitch and volume.