

5E Lesson Plan Directions
“Waves”

Cal Teach Student Name(s): Kelsey Johnsen

Grade Level and Subject: Grade 2, Physical Science

Lesson Source(s):

<http://mypages.iit.edu/~smile/ph9616.html>

Focus/Essential Question:

Gives a basic understanding of the different kinds of waves and what they do.

Student Learning Objectives:

Students discover the difference between transverse and longitudinal waves as well as learning that sound is also a wave. Students discover different ways to create sound through instruments that vibrate (create waves).

California State Standards:

Physical science standard 7:
Sound is vibration, describe with pitch and volume

Student Prior Knowledge:

Students should have a rudimentary understanding of what a wave is (i.e. there are waves in the ocean; I can make waves by throwing rocks into water, etc.).

Lesson Outline for Your Students:

Students should know what matter is?
Draw three types of waves (water, longitudinal, transverse) on the board.
Write the vocabulary words on the board for later elaboration.

Lesson Rationale:

Looking at the different ways that sound

**Materials and
Technology
List:**

For 20-25 students:

One stone

One tuning fork

One tub of water

One ruler per group of students (perhaps a group of 2-3 students)

Four slinkies

Four pieces of string

One balloon per group of students (perhaps a group of 3-4 students, balloons already blown up)

Preparation Tasks:

Have materials, write on boards

Safety Concerns:

Students need to be aware of their fellow classmates, need to be careful with the slinkies and rope, and need to listen to the instructor.

Write the lesson plan as you would give it, providing yourself with a tool that summarizes flow and transitions, records age-appropriate wording for all instructions and prompts, and contains ideas for observation and adjustment.

Evaluate: Observe and adjust your lesson as you teach.

<p>Engage: Activities that engage students' interest and build connections to their lives and prior knowledge.</p>	<p>Baseline Learning and Preparation</p>
<p>Introduce self, introduce method of getting their attention (tuning fork) On board: drawing of three different kinds of waves, vocabulary words What are these three drawings on the board? Give definition of waves, write definition on board. What kinds of waves can you think of? When they come up with water waves, drop a stone in the bowl of water. Ask for observations. Have students stand in a line (if there are a lot of them, have them stand in two lines) and link arms. Move the student at the end of the line back and forth toward the other students. Explain that this is called a longitudinal wave, and have students break into four groups to explore with slinkies for 2 minutes. Label longitudinal wave on board. Have students stand in a line (if there are a lot of them, have them stand in two lines) and link arms. Move the student at the end of the line from side to side. Explain that this is called a transverse wave, and have students break into four groups to explore with the string for 2 minutes. Label transverse wave on board. If there are enough students, use half of class for longitudinal wave demonstration and half of class for transverse wave demonstration. Give a definition of vibration, and write definition on board. Do any of you know what sound is? Time: 15-20 minutes</p>	<ol style="list-style-type: none"> Vocabulary words: Vibration, volume, pitch, waves, longitudinal wave, transverse wave Students seated in a circle on floor near whiteboard (or wall, if there is no whiteboard) Wave: (as students tell me) Longitudinal wave: (picture) Transverse wave: (picture) Vibration: really fast back and forth movement
<p>Explore: Hands-on task designed to explore ideas and to develop skills together.</p>	<p>Focus, Involvement, Results, Recording</p>
<p>Demonstration of sound waves: hit tuning fork on something, touch it to the surface of the water in the bowl, and observe the waves made in the water. Demonstration of ruler activity. Hold ruler with part of it off of table or desk; press down and release the end of the ruler that is off the desk. Varying the length of the ruler that is off the desk with vary the sound it makes. Have students go to desk and work in groups to see what they can discover. After 5 minutes, they come back to the floor. What did you see/hear? Give definition of pitch. Write definition on board. Demonstration of balloon activity. Blow up balloon, tie it off, and hold it to throat. Hum and see what the balloon does. Let students go to desks in groups to discover. After 10 minutes, they come back to the floor. What</p>	<ol style="list-style-type: none"> Pitch: related to vibration, different notes Volume: loudness

<p>happened?</p> <p>Time: <u>20-25 minutes</u></p>	
<p>Explain: <i>Students explain the phenomena they explored and discuss their different ideas and perspectives.</i></p>	<p><i>Participation, Reporting and Debating, Evidence-Based Reasoning</i></p>
<p>Much of the explanation will be done in between activities to make a more solid connection between reality and weird vocabulary or concepts.</p> <p>Let students summarize what they learned in class. Ask what they saw and heard, ask for the vocabulary words they learned, ask about each activity and how it relates to the lesson.</p> <p>Time: <u>5-10 minutes</u></p>	<p>1. The students should be able to answer these questions without too much prompting. If necessary, allow them to discuss with a neighbor.</p>
<p>Elaborate: <i>Teacher-stimulated consideration and clarification of concepts, skills, attitudes, processes or terminology.</i></p>	<p><i>Demonstrated Understanding, Use of Skills, Applications</i></p>
<p>The further application of this: musical instruments. Can you think of any instruments that use vibrations to make sound? (Hopefully, they should understand that all of them do)</p> <p>Further application (not enough time during this lesson, but if the teacher wants to continue with it later, they can): create your own musical instrument (draw or make out of straws, rubber bands, etc.) that demonstrates what we saw about sound.</p> <p>Possible further activity: sound sandwich (http://www.exploratorium.edu/afterschool/activities/index.php?activity=137.)</p> <p>Time: <u>5 minutes</u></p>	<p>1. If students can name instruments and explain that they use vibrations to create sound, they have a good understanding.</p> <p>2. If students realize that playing the instruments changes the pitch, they have a good understanding.</p>

5 minutes for clean-up

Initial questions for teacher:

1. Have students done anything with sound or waves?
2. Do students have an understanding of musical instruments (what they are, some examples)?
3. How many students are there?
4. Do they work in groups?
5. Is there a whiteboard?
6. Do the students/does the classroom have plastic rulers?
7. Is there an area for the students to sit?