Light and Sound

Grades 4-6

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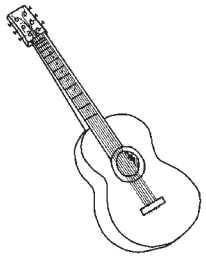
What is Sound?

Teacher Notes

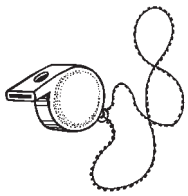
Sound is usually produced by compressing or "squishing" air. This can happen in three basic ways:

1. **Vibration:** When an object vibrates, it intermittently compresses the air around it and produces a sound. For example, a drumstick hitting a drum makes the drum vibrate, or strumming a guitar makes its strings vibrate.



2. **Explosions:** Explosions rapidly compress the air around them and produce a sound like a "bang" or a "pop." A balloon that pops and fireworks are examples of explosions that produce sound.

3. **Flow of air:** When air flows against surfaces (for example, when we blow in a whistle or the wind blows against window sills), a whistling sound is produced.



Where Does Sound Come from? (page 9)
Students learn about the different ways sound is produced. The experiment can be done as a group demonstration, with the students completing the worksheets individually.

I Know How Sound is Produced! (page 10) This activity reinforces the concepts learned.

Where Does Sound Come From?

Name: _____

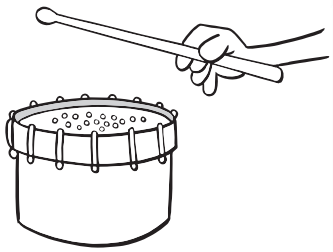
Sound Activity I

you'll need:

- a drum and drumstick
- salt
- a balloon
- a whistle

what to do

Part I: Let´s hit the drums!

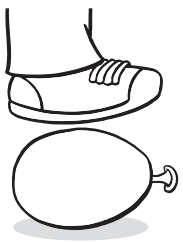


1. Sprinkle the salt on the drum.
2. Hit the drum with the drumstick.
3. What happens to the salt?_____
4. Unscramble the word to explain one way that sound can be produced.
   Mystery Word: **TI VIB ONS RA**
   The sound was produced by _____.

Part 2: Whistle blower

1. Blow in the whistle
2. What happens? _____
3. Unscramble the word to explain another way that sound can be produced.
   Mystery Word: **WI BLO NG**
   Another way sound can be produced is by _____ air.

Part 3: Balloon popper



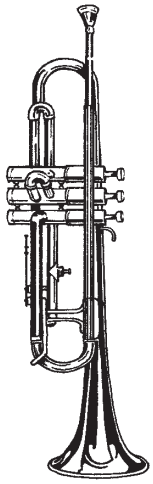
1. Blow up the balloon, and tie it.
2. Pop the balloon by stepping on it.
3. What happens? _____
4. Unscramble the word to explain another way that sound can be produced.
   Mystery Word: **PLO EX SI ONS**
   Another way sound can be produced is by _____..

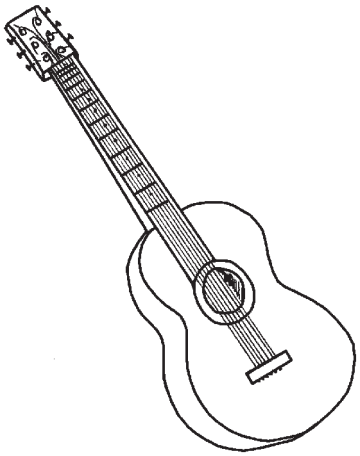
I Know How Sound is Produced!

Name: _____

Sound Activity 2

Sound can be produced in three different ways: explosions, blowing air, and vibrations. Connect each sound below to the word that explains how it is produced. Fill in the empty bubbles with sound sources of your choice!

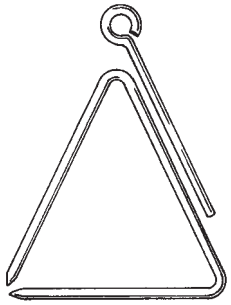




EXPLOSION

BLOWING AIR

VIBRATIONS



Pitch and Intensity:

Teacher Notes

Sounds can be characterized by two different attributes: pitch and intensity.

Pitch:

High-pitched sounds are "high notes" and include squeaky noises and sounds made by a bell or a triangle. Low-pitched sounds are "low notes" and include sounds made by a bass drum or a rumble of thunder.

You could use a musical instrument to introduce the concept of high-pitched or low-pitched sounds (high notes and low notes, respectively) to your students. Once they understand the concept, you can reinforce it by playing two notes and asking which one is the highest or the lowest.

Make a Xylophone (page 13)
Students will build their own musical instrument (a xylophone with baby food jars filled with various amounts of water) and the concepts of pitch can be reinforced. The jars containing less water will give higher notes, and the ones with more water will give lower notes.

Intensity:

Intensity refers to the loudness of sounds.

What's a Decibel Meter? (page 15) and **A Scientific Investigation** (page 16)
Students will learn to use a decibel meter to measure how loud a sound is. (If you cannot obtain a decibel meter, you could conduct these experiments by relying on the students' perception.) The students will discover that the louder they turn the volume of the radio, the larger the reading on the decibel meter – therefore, the decibel meter measures how loud a sound is. They will then use the decibel meter again and find out that sound becomes softer as they move away from a sound's source. The subject of standing too close to loud-speakers or noisy tools could be brought up at this point.

Sound Patrol (page 19)
A sound patrol will be formed and the students will search for potentially dangerous sources of loud noise around their school. The experiment follows the scientific method (see introduction) by asking the students to predict which sources will be the loudest, then carrying out the measurements to confirm or disprove their prediction.