**Sound Applications**

Teacher Lesson Plan



**Background Information**

Sound is energy vibrating through substances. The energy can be transferred from one material to another. Sound must have a medium in which to travel. Our ears are amazing organs that change sound waves into electrical signals and then send them to our brains. Sound waves enter the ear canal and travel back to the eardrum. The eardrum is a thin layer of skin that is stretched tightly over the end of the ear canal, much like the skin of a drum, or the plastic over the metal can. The sound waves transfer energy to the eardrum, which begins to vibrate.

Sound gives organisms information about their environment. Sound is constantly occurring all around us. Sometimes, we don’t even recognize that it is occurring until someone points it out.

Animals use sounds to survive in their habitats. Some animal ears are designed to collect very soft sounds such as the ears of an owl and the long ears of a rabbit. Prey and predator animals use it to flee dangerous situations and to locate food.

**Content Standards**

* Physical Science
* Light and sound are forms of energy that behave in predictable ways.
* Life Science
* Organisms perform a variety of roles in an ecosystem.

**Student Activities**

**LESSON 1: Sound Shakers**

**Lesson Materials:**

* Eight mystery plastic containers with materials inside. Note: Be sure the containers are taped shut to prevent spilling.
* Materials inside the shakers
  1. Rocks
  2. Salt
  3. Pennies
  4. Rice
  5. Toothpicks
  6. Beans
  7. Paper Clips
  8. Beads
* Sound Shakers Lab Sheet

**Procedure:**

* Discuss how the human ear hears and interprets sound.
* Shake each container and listen to the sound.
* Record your hypothesis on student lab sheet in Chart 1.
* Give students a list of the materials in the containers.
* Shake each container again. Using the list, predict what is in the container.

**Student Discussion Question:**

* Why do you think that different materials make different sounds? *Each material will vibrate at its own frequency depending on its mass, density and shape.*

**LESSON 2: Sound Bingo**

**Lesson Materials:**

* Sound Bingo Card
* Outside area

**Procedure:**

* Students will recognize sounds in their environment using a Bingo Card to become more aware of sound/noise in their surroundings.
* Take students to an outdoor area around the school.
* Sit students in a large circle, (facing out). This activity can also be done on a “silent hike”.
* Students must not talk during this activity.
* Students should try and fill all the spots on the Bingo Card.
* Choose a time limit.
* Students can close their eyes to listen. They may notice more if not distracted by sight.
* Repeat in a different area. Try near a road, for example, to demonstrate how traffic noise can mask other sounds.

**Student Discussion Questions:**

* Did you notice any sounds that you normally don’t hear? *Answers will vary.*
* Did you hear any sounds that you couldn’t identify the source? *Answers will vary.*
* What was the loudest sound? What was the softest sound? *Answers will vary.*

**LESSON 3: Sound Sit Spots**

**Lesson Materials:**

* Sit Spot Sheet

**Procedure:**

* Walk to an area around your school.
* Find a location and sit for 5 minutes and recording all sounds that you hear.
* List whether the sounds are natural sounds (birds, etc.) or artificial (man-made – cars).
* Repeat in another location.

**Student Discussion Questions:**

* Compare the sounds produced by nature verses man made sounds? *Answers will vary.*
* Noise pollution is a problem in many cities. Would you consider it a problem where you did your sit spot? *Answers will vary*
* Can you describe a place or time where you consider it a problem? *It could be a problem where there is traffic, large cities, construction, large machinery, etc.*

**LESSON 4: Soundscape Activity: Communicating in the Wild**

Animals rely on sound for communication and survival. The purpose of this activity is to help students understand what wildlife may experience under unnatural noise conditions.

**Lesson Materials:**

* Computer with Speakers
* Audio clip of traffic

**Procedure:**

* Refer to the Soundscape Activity from the National Park Service found in your packet.