

Investigation Eight – Sound Vibrations

Standard 06: Students will understand properties and behavior of heat, light, and sound.
Objective 3: Describe the production of sound in terms of vibration of objects that create vibrations in other materials.
<u>Intended Learning Outcomes</u> 1 – Use science process and thinking skills 3 – Understand science concepts and principles 4 – Communicate effectively using science language and reasoning

**Standard
VI**

**Objective
3**

Background Information

Whenever something vibrates it is creating sound. The sound travels in the form of a wave through a medium. The medium is anything that has molecules touching each other. If there is no medium, there is no sound. In the following demonstration students will be able to see the sound waves as they cause the salt to dance on the plastic wrap. They will also hear the tapping as the sound wave reaches their eardrums. Sound waves travel through air and cause plastic wrap to wiggle.

Pre-Assessment/Invitation to Learn

You have all heard a siren, a blast from a firework, a dog bark and the song of a bird. But have you ever wondered how the sound got to you? Or how about an echo? How do you hear the same word more than one time? The following activity should help you answer these questions.

Instructional Procedures

1. Blow up a large balloon to stretch it out. Deflate it and cut off the hole.
2. Stretch the balloon over the top of one #10 can. Pull it tightly so it is smooth like a drum. Use clean book tape to hold it in place.
3. Sprinkle salt on the plastic wrap.
4. With opened end down of can #2, hold can #2 about 3' above can #1. (The closed end is now up.)
5. While you are holding can #2, tap the closed end with a spoon, like you would a drum.
6. Have students describe in their journals what happened.

Materials

- Two #10 cans from the cafeteria (label them can #1 and can #2)
- A large balloon
- One can
- Clear book tape
- Salt
- Spoon
- Journal

Curriculum Extensions

Science –

- Move the can you tapped to different angles to the salt and record what happens. (ILO 1)
- Use other objects that do not focus the sound as the can does to see if the salt moves: (hitting sticks, clapping, playing a recorder, etc.) What do you observe? (ILO 1)
- Have students design an experiment that creates an echo (Sound waves bouncing back to the same point). (ILO 1)

Assessment Suggestion

The following rubric could be used or adapted for grading this activity.

Description						Total
Student set up demonstration correctly.	5	4	3	2	1	
Student's journal showed understanding in writing	5	4	3	2	1	
Student's journal showed understanding with pictures/drawings	5	4	3	2	1	
Student's journal showed evidence of self-learning	5	4	3	2	1	
Oral report activity	5	4	3	2	1	

Reference to Assessment Section:

Unit Test	Multiple Choice	Constructive Response	Performance Test
1	13,14,15,16	3	Musical pop bottles
2	12,13,14	2,3	Musical pop bottles

Resources

See Resources in Investigation Seven.