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Overview

Sounds differ. They may be loud or soft. Knowing what a loud or soft sound is, helps you become extra careful in hearing them.

This supplementary material helps learners to understand how a vibrating object can produce loud or soft sounds provided that they already have known the fact that sounds are produced when things vibrate. Simple and easy-to-do activities highlight the learning process and it is hoped that at the end of the activities, children can cite ways on how to conserve sound energy. Related readings are also provided for better understanding and appreciation of the topic.

I. Objectives

- Identify objects that produce soft or loud sounds.
- Show how a vibrating object produces loud or soft sounds.

II. Subject Matter

Topic: Loud and Soft Sounds

Science Concepts:

Sounds can be loud or soft. A loud sound is produced when a great force is applied and a soft sound is produced when a lesser force is applied.

References:

Science (Health and Environment Towards an Active and Responsible Living, Lilia R. Villanueva, pp. 263-66.
Flight to Discovery 3, Victoria A. Palomar, pp. 204-209.
Science Spectrum 3, Fallaria et. al., pp. 196-197.
Science and Health 3, (Textbook), Coronel, pp. 148-149.

Materials:radio, television set (optional)Duration:40 minutesValue:Conserving sound energy

III. Procedure

A. Motivation

When you are watching TV or listening to the radio, to what volume do you usually set your radio or TV? Why? Do you know how soft and loud sounds are made?

B. Activity (See separate sheets)

Presentation and critiquing of outputs by group.

C. Analysis

When you clapped your hands slowly and lightly, what kind of sound did you produce? (*soft*)

Why do you think so? (because we clapped our hands softly/lightly/slowly)

How about when you clapped your hands faster and stronger, what kind of sound were you able to produce? *(hard)*

What do you think is the reason? (because we clapped our hands faster/stronger)

When we set the radio to volume one, what can you say about the sound produced? *(soft)*

How about when we set the radio to the highest volume? (hard)

(Same questioning techniques for the third activity.)

When do you think is a loud sound made?

(A loud sound is made when an object vibrates fast, because a strong force is exerted on it. Strong vibrations make loud sounds. When you clapped your hands stronger and faster you were making strong vibrations. When you were also setting the radio/TV to the highest volume, the radio/TV was also making strong vibrations. When we turn up the volume on the radio/TV, it causes the sound waves to vibrate with more energy, and produces a louder sound.)

When do you think is a soft sound made?

(A soft sound is made when an object vibrates slowly, because a weak force is exerted on it. Gentle vibrations make quiet sounds. When you clapped your hands slowly and lightly you were making weak or gentle vibrations. When you were also setting the radio/TV to volume one, the radio/TV were making weak vibrations. When we turn down the volume on the radio/TV, it causes the sound waves to vibrate with less energy, and produces a softer sound.)

Is it ideal to hear loud sounds always? Why?

(No. Loud sounds or unpleasant sounds affect your health. You will feel uncomfortable. You cannot sleep well. Your mind cannot work well, too. Accept also other answers of children.)

When do you need to make soft or loud sounds?

(We make **soft** sounds when there are people sleeping./ When classes are going on./ When we are in the library. When hearing the holy mass. /Other related answers are accepted. We make **loud** sounds when we shout./ We make loud sounds during Christmas and New Year./We make loud sounds when we cheer our favorite basketball team. /Other related answers are accepted.)

Give other examples of objects/scenarios that produce soft sounds. *(lullaby/mother humming baby to sleep, sweet/classic music, whisper etc.)*

<u>Teacher Hint</u>: Tell the class that soft sounds are also called pleasant sounds.

Give other examples of objects/scenarios that produce loud sounds.

(siren of fire truck or ambulance, bomb explosion, shouting, etc.)

<u>Teacher Hint</u>: Tell the class that loud sounds are also called unpleasant sounds or noise.

Do you know that when you increase the volume of the radio or TV, you are also consuming much electricity?

(Tell the class that an increase in volume will also cause an increase in power consumption of the speakers of the appliance. Speakers have a separate power rating. See also other related reading attached in this supplementary material.)

D. Abstraction

When are soft sounds made?

(A soft sound is made when an object vibrates slowly, because a weak force is exerted on it.)

When are loud sounds made?

(A loud sound is made when an object vibrates fast, because a strong force is exerted on it.)

E. Application

- 1. LOUD AND SOFT SOUNDS AROUND
- **Instructions:** Cut out the picture squares, and think about the sounds that each of the object makes. Which ones make loud sounds? Which make soft sounds? Find the picture that makes the softest sound. Glue it on the handout where it says "soft." Glue the next loudest sound next to it, and keep gluing pictures of things that make louder and louder sounds until you glue the picture of the loudest-sounding object next to the word "loud."



- 2. Read each situation. Answer each question briefly.
 - You are watching your favorite television show while your baby brother is sleeping. What will you do so as not to waken up your sleeping baby brother?

(I will lower the volume of the television set./I will turn off the TV.)

- When you speak loudly, do you easily tire? Why? (Of course, yes. That is because you use up much of your energy.)
- Why is it good to lower the volume of the radio and/or television set? (To conserve energy/ To save electricity/ To lower electric consumption/ To hear pleasant sound/ So as not to waken up someone who is sleeping.

Other answers are accepted. Stress also the importance of unplugging the radio/TV after using.)

• What are other ways of conserving sound energy? (Avoid shouting/ Avoid talking unnecessarily/ Lower the volume of radio/TV. Other answers are accepted.)

C.

IV. Assessment

Choose the letter of the best answer.

1. Which of the following pictures produces a loud sound?





http://www.cartooncliparts.com/pictures/river+flowing



http://www.animationlibrary.com/animation/27097/Big_firecracker_2/

D.

2. Which of these vibrates and produces a soft sound?





withfriendship.com/user/Athiv/live-band/php



C.

http://www.cartooncliparts.com/pictures/alarm+clock



http://www.featurepics.com/online/Take-Off-765091.aspx

- 3. Which of the following will make the loudest sound?
 - A. dropping a pin
 - B. dropping a ballpen
- C. dropping a paper clip
- D. dropping a big box on the floor
- 4. If you control the volume of every source of sound, you are _____.

 - A. reflecting energyC. producing energyB. conserving energyD. comparing energy
 - D. comparing energy

V. Agreement

B.

Write down three to five sentences on your paper how you can help noise pollution in your community.

VI. Resource Lists

fi.edu/pieces/dukerich/vibrations/soundvib2.html kidshealth.org/classroom/prekto2/body/functions/hearing_handout2.pdf http://www.philtulga.com/MSSActivities.html#03

- Activity Sheets
- **Related Readings** •
- Key Answer •

ACTIVITY SHEETS

Activity 1

Soft or Loud?

What to know: How can we make loud or soft sounds? What causes loud or soft sounds?

What to use: hands

What to do:

- 1. Clap your hands slowly and lightly three times. Listen to the sound.
- 2. Clap your hands faster and stronger three times. Listen to the sound.

Activity 2

Higher, Lower

What to use: radio

What to do:

- 1. Turn on the radio. Set it to volume one. Listen to the sound.
- 2. Set the radio to volume 5. Listen to the sound.
- 3. Compare the sounds.

Activity 3

Turn Up, Turn Down

What to use: television set

What to do:

- 1. Turn on the TV. Set it to volume one. Listen to the sound.
- 2. Set the TV to volume 5. Listen to the sound.
- 3. Compare the sounds.

Other related reading for the teacher (from http://www.philtulga.com/MSSActivities.html#03)

Sound Waves

Sounds also are different in how loud and how soft they are. The more energy the sound wave has the louder the sound seems. The intensity of a sound is the amount of energy it has. You hear intensity as loudness. Remember the amplitude, or height of a sound wave is a measure of the amount of energy in the wave. So the greater the intensity of a sound, the greater the amplitude.



Waves: Sound waves can be soft or loud.

Sounds can be soft or loud. This characteristic of sound is called amplitude or volume. Volume measures the amount of energy in sound waves. More energy will move more air molecules and will sound louder. Less energy will move fewer air molecules and will sound softer. The amount of energy in a sound wave is measured in decibels (dB). To see a decibel chart with some familiar sounds, please see below.

Jet Takeoff (25 M)	150 dB
Aircraft Carrier Deck	140 dB
Jet Takeoff (100 M)	130 dB
Li∨e Rock Music	120 dB
Power Saw	110 dB
Lawn Mower	100 dB
Food Blender	90 dB
Garbage Disposal	80 dB
Telephone dial tone	70 dB
Normal Conversation	60 dB
Quiet Conversation	50 dB
Library	40 dB
Quiet Li∨ing Room	30 dB
Whisper, rustling lea∨es	20 dB
Breathing	10 dB
Weakest sound heard	0 dB

Question: What was the loudest sound ever described by humans?

Hint: It was produced by the most famous volcano in recorded history.

Answer: In 1883, the Krakatoa volcano in Indonesia erupted and threw ash and stone 300 square miles. The explosive sound from this eruption was heard 3,000 miles away. That's the distance from San Francisco to New York City.

Question: What was the loudest animal sound ever measured?

Hint: It was made by the largest animal on the earth.

Answer: Blue whale communication has been measured up to 188 decibels, making it the loudest recorded sound from a living source. These underwater sounds have been detected 530 miles away.

KEY ANSWER

Assessment

Choose the letter of the best answer.

- 1. Which of the following produces a loud sound?
 - A. whisperB. hummingbirdC. flowing river waterD. exploding firecrackers
- 2. Which of these vibrates and produces a soft sound?
 - A. thunder
- C.) alarm clock
- B. live band
- D. an airplane during a take-off
- 3. Which of the following will make the loudest sound?
 - A. dropping a pin
 - B. dropping a ballpen
- C. dropping a paper clip
- D.) dropping a big box on the floor
- 4. If you control the volume of every source of sound, you are _____.
 - A. reflecting energy
- C. producing energy
- B.) conserving energy
- D. comparing energy