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UNIFIED SUPPLEMENTARY LEARNING MATERIALS
(USLeM)

SCIENCE 6
Weeks 3 and 4

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UNIFIED SUPPLEMENTARY LEARNING MATERIALS
Grades 6 SCIENCE

LESSON 1: Sound as a Form of Energy

EXPECTATIONS

Energy is the ability to do work. Movement is one way to tell that there is energy. A person walking down the street, a tree swaying in the wind, and the hands of a clock spinning are all signs of energy. Another indication is if you see a light or hear a sound. As a result of energy, a radio turns on, a guitar produces sound, and a dog barks.

At the end of this lesson, you are going to describe sound energy, how sound is produced, and materials that produce sound.

PRETEST

Directions: Use the words related to sound energy to complete the sentences below.

LOW PITCH	MEDIUM / AIR	BACK- AND-FORTH
HIGH PITCH	VIBRATING OBJECTS	

1. Sound energy is produced by _____.
2. Vibrations happen when something moves_____ quickly.
3. Sound travels through the _____.
4. When the vibrations of an object producing sound are fast, the sound has _____.
5. When the vibrations of an object producing sound are slow, the sound has _____.

LOOKING BACK TO YOUR LESSON

Directions: Read the statements carefully. Draw a happy face ☺ if the statement shows a proper way of following road safety rules and a sad face ☹ if not.

_____1. Checking your brakes before using your bicycle.
_____2. Crossing in a pedestrian lane.
_____3. Never using a helmet when riding a motorcycle.
_____4. Knowing what the traffic light signals mean.
_____5. Driving fast on a rainy day when the road is slippery.

BRIEF INTRODUCTION

Sound is all around us. It is an energy that is produced by vibrating objects such as our vibrating vocal cords when we speak. Sound energy produced is carried through by a medium where it travels. As we speak, the vibrating vocal cords produce sound and this sound travels through the air, which is the medium that carries the sound to the ears of those in the surrounding.

As a form of energy, sound can be described based on its different characteristics like pitch, loudness, and speed. Some sounds are pleasant to the ear, while some sounds are not and may even be damaging if exposure is prolonged.

Singing, whistling, strumming a guitar, plucking a violin, striking a tuning fork, and blowing a flute produce vibrations that produce sound. But not all sounds can be detected by the human ear. Infrasonic sounds are sounds whose pitch is lower than humans can detect. Ultrasonic sounds are sounds whose pitch is beyond what humans can hear. There is a wide

range of applications for ultrasonic sounds such as sonar. Sonar is an echo-sounding device used to locate sunken ships, a school of flashes, and other solid objects underwater.

ACTIVITY 1 How Materials Produce Sound

Directions: The table below shows objects that can produce sound. Try to make a sound out of these objects and write your answer on the right column.

Objects that can produce sound	What I can do to make sound
1. empty can	
2. coins	
3. guitar/toy guitar/ ukulele	

Questions:

1. What did you do to produce sound?

2. Describe the object as they produce sound.

3. Suppose you want to produce a much louder sound using the objects listed in the table. What can you do to be able to produce a louder sound?

4. What does it tell you about loudness and the energy needed to produce a loud sound?

ACTIVITY 2 Sound of Music: Characteristics of Sound You Hear

Directions: Listen to two songs that have high and low pitch. Answer the questions below.

1.Which song has a distinctly a high pitch?

2. Which song has a distinctly a low pitch?

3. An important characteristic of sound is pitch, which is the highness or lowness of a sound. This is related to how fast the vibration is of the source of the sound. Study the representation of two sounds below. How are they different?

Low pitch sound

High pitch sound

4. Draw a representation of the sounds you heard below. You can refer to the representation above.

Song A with high pitch

Song B with low pitch

ACTIVITY 3 Medium

A. My Own Walkie-Talkie

What you need:

2 plastic cups or can
string or yarn
paperclips or match sticks

Take extra care. Ask an adult to supervise you.

1. Make a walkie-talkie using two plastic cups or soup cans and some string or yarn.
2. With the help of your home partner, punch a hole in the bottom of the cans or cups.
3. Pull a string or yarn through the holes and then wrap the ends around with match sticks or paperclips so they cannot slip out of the hole.
4. Tape along the edge of the open end of the can for safety.
5. Talk into one can while your friend listens to you using the other can.
6. Pull the string or yarn tightly.

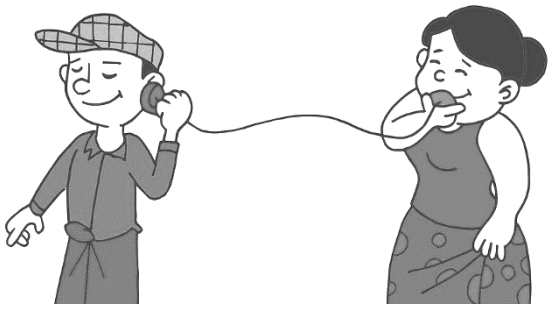
Questions:

1. Why can he or she hear you?

2. How does the sound travel?

B. Let's Find Out How Sound Travels

Below are two friends using a string walkie-talkie. Arrange the sentences below to correctly explain how sound travels from the girl to the boy. Write the numbers 1-5 in the boxes before each sentence.



https://pixabay.com/illustrations/talk-phone-yogurt-pot-string-1421412/

☐	The air vibrates in the girl's paper cup.
☐	The girl speaks and her vocal cords vibrate.
☐	The vibrations reach the boy's ear and are heard.
☐	The string vibrates.
☐	The air vibrates in the boy's paper cup.

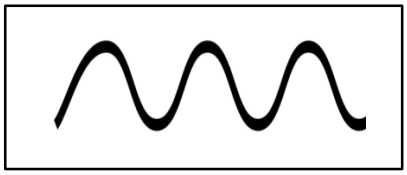
REMEMBER

Sound is energy produced by vibrating objects. As the object vibrates, the particles surrounding it vibrate as well and this produces sound waves that travel through different mediums which can be solid, liquid, or gas. Because the molecules of solids are close together, sound travels fastest in solids.

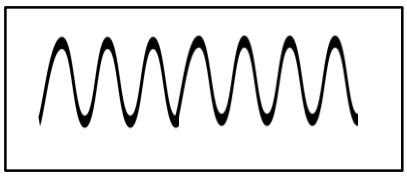
One characteristic of sound is **pitch. Pitch** refers to the highness or lowness of a sound and is related to how fast the vibration of the object producing the sound is. For example, a high note on a guitar is produced by a string vibrating fast while a low note is produced by a string vibrating slow. Similarly, a high-pitched human voice is produced by vocal cords that are vibrating faster than vocal cords that produce a low-pitched human voice.

CHECKING YOUR UNDERSTANDING

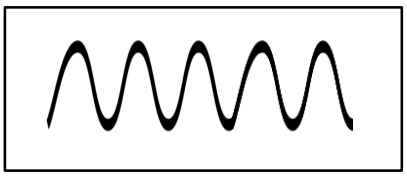
Three sounds, **Sound A**, **Sound B,** and **Sound C** are represented in the diagrams below. Rank these sounds, **from highest to lowest**, in terms of the pitch that they have. Write your answer in the space provided.



Sound A



Sound B



Sound C

POST TEST

Directions: Identify the term/material being described by the following statements by matching column A to column B.

Column A	Column B
____1. The energy produced by vibrating objects or bodies	A. sonar
____2. A material where sound travels slowest	B. solid
____3. A device that produces sound used to give a warning or signal	C. gas
____4. The state of matter in which sound travels fastest	D. sound energy
____5. An echo-sounding device that is used to detect objects underwater	E. whistle

UNIFIED SUPPLEMENTARY LEARNING MATERIALS
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LESSON 2: Forms of Energy (Heat, Electrical, and Light)

EXPECTATIONS

At the end of this lesson, you will be able to describe heat, light, and electrical energy, give examples of materials that produce heat and light and describe heat as a mode of energy transfer.

PRETEST

Directions: Identify what forms of energy is present or produced in each item.

_____1. lightning
_____2. burning firewood
_____3. sun
_____4. cooking in a rice cooker
_____5. grilling barbeque
_____6. switching on a light bulb
_____7. using the electric heater
_____8. stars
_____9. washing machine
_____10. plucking a guitar

LOOKING BACK TO YOUR LESSON

Directions: Use what you have learned about sound energy to complete the sentences below.

WORD BANK

LOW PITCH ***BACK- AND-FORTH*** ***SOUND ENERGY*** ***HIGH PITCH*** ***MEDIUM/AIR***

1. Vibrating objects or bodies produce _____.
2. Vibrations happen when something moves_____ quickly.
3. Sound travels through the _____.
4. When the vibrations of an object producing sound are fast the sound has _____.
5. When the vibrations of an object producing sound are slow, the sound has _____.

BRIEF INTRODUCTION

Energy exists in different forms which we use in our daily lives, all of which measure the ability of an object or system to do work on another object or system. Persons, places, and things have energy. Observe your surroundings -- the swaying leaves, the flickering lights, the fast-moving cars -- everything uses energy.

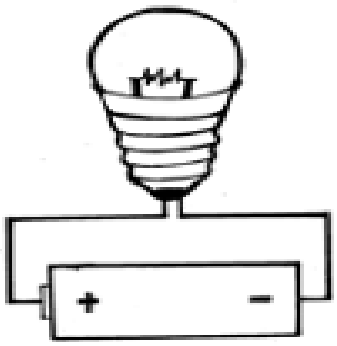
ACTIVITY 1

Directions: Classify the following materials/devices according to the energy they possess or produce.

firefly	*flashlight*	*stove*	*stars*	*refrigerator*
car headlights	*radio*	*oven*	*sun*	*blow dryer*
flat iron	*light bulb*	*lava*	*electric guitar*	*cell phone*

Heat Energy	Light Energy	Electrical Energy

ACTIVITY 2



ACTIVITY 2 A

Problem: Can a battery be used to produce light?
Materials: Flashlight bulb, battery, 5 inches wire
Procedure:
Make a simple electric circuit by using the flashlight bulb, battery, and wire.
Questions:
1. Did the bulb light up?

2. What caused the bulb to light up?

3. How is light energy produced?

ACTIVITY 2 B

Problem: Can a matchstick produce heat?
Material: matchstick
Procedure:
Light a matchstick and let it burn for a while.

Questions:
1. What energy is given off by the burning matchstick?

2. Is heat energy important? In what situations?

ACTIVITY 3

Directions: Identify the method of heat transfer that takes place in the following situations. Write **Convection, Conduction, or Radiation** on the space provided.

_____1. ironing a dress
_____2. grilling barbeque
_____3. hot coffee in a glass
_____4. drying hair using blower
_____5. sun rays warm a puddle
_____6. baking a cake inside the oven
_____7. using curling iron to curl your hair
_____8. heat from the stove burner to the pan
_____9. melting chocolate candy in your hand
_____10. heating a metal spoon in a boiling water inside a pot

REMEMBER

Heat is produced from molecules of matter that continuously vibrate. It is a form of energy that is transferred from a hotter object to a colder object. The methods of transferring heat are **Conduction, Convection, and Radiation**.

Electrical Energy is present in the movement of electrons in an electrical conductor. When electrons complete the path in a close circuit, electrical energy is distributed to the loads in the circuit that convert it to other forms of energy.

Light energy travels through space in all directions in the form of waves. Light is produced by the chemical reaction of substances in the sun, batteries, and from electricity.

CHECKING YOUR UNDERSTANDING

Directions: Unscramble the letters to form the correct words. Then describe each.

1. **IGTLH GREENY**

2. **CALLTIEER GREENY**

3. **TEHA GREENY**

POST TEST

Directions: Write **TRUE** if the statement is correct and **FALSE** if incorrect.

_____1. Electrical energy is present while charging your mobile phone.
_____2. We can produce light by using a battery and bulb only.
_____3. Lighting a matchstick gives electrical energy.
_____4. Using a hair blower is an example of heat transfer through conduction.
_____5. Electricity is produced by the movement or flow of electrons in an electric conductor like a wire.

REFERENCES

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Man and Woman on a String Phone. Accessed February. https://pixabay.com/illustrations/talk-phone-yogurt-pot-string-1421412/

Road Safety video || Traffic Rules And Signs For Kids || Kids Educational Video. Accessed February. https://www.youtube.com/watch?v=_NeEF1fwT4k.

ANSWER KEY

PRETEST

1. Light Energy
2. Heat Energy
3. Light/heat energy
4. Heat Energy
5. Electrical/ heat Energy
6. Electrical/light Energy
7. Electrical/light Energy
8. Light/heat Energy
9. Electrical Energy
10. Electrical energy

LOOKING BACK TO YOUR LESSON

1. vibrating objects
2. back and forth
3. waves/air
4. high pitch
5. low pitch

ACTIVITY 1

Heat Energy	Light Energy	Electrical energy
flat iron	firefly	radio
stove	car headlights	electric guitar
oven	flashlight	refrigerator
lava	bulb	
stars	stars	
blow drier	cellphone	

ACTIVITY 2A

1. Yes.
2. Electrical energy from the battery is used to light up the bulb.
3. Light energy is produced when the bulb converts electrical energy to light energy (and heat).

ACTIVITY 2B

1. HEAT ENERGY
2. Heat energy is important like in cooking our food, in ironing clothes and in keeping our body warm.

ACTIVITY 3

1. Conduction
2. Radiation
3. Convection
4. Convection
5. Radiation
6. Radiation
7. Conduction
8. Conduction
9. Conduction
10. Convection

POSTTEST

1. TRUE
2. FALSE
3. FALSE
4. TRUE
5. TRUE

CHECKING YOUR UNDERSTANDING

1. LIGHT ENERGY - Light energy travels through space in all directions in the form of waves. Light is produced by chemical reaction of substances in the sun, batteries and from electricity.
2. ELECTRICAL ENERGY - Electrical Energy is present in the movement of electrons in an electrical conductor
3. HEAT ENERGY - Heat is produced from molecules of matter that continuously vibrate. It is a form of energy that is transferred from a hotter object to a colder object.

LESSON 2

LESSON 1

PRETEST	LOOKING BACK TOU YOUR LESSON
1. vibrating objects 2. back and forth 3. medium/air 4. high pitch 5. low pitch	1. ☺ 2. ☺ 3. ☹ 4. ☹ 5. ☹

ACTIVITY1

Objects that can produce sound	What I can do to produce sound
1. Empty can	hitting the can
2. coins	shaking coins in a box
3. guitar/toy guitar/ ukulele	plucking

1. I hit the can, shake the coins in a box, and pluck my toy guitar to produce sound.
2. As the object vibrates, the particles surrounding it vibrate as well and this produces sound waves that travel through different mediums which can be solid, liquid, or gas.
3. I will make the objects vibrate even more by shaking them/ banging them/ strumming more strongly to produce a louder sound.
4. The loudness of a sound depends on how much the sounding body vibrates. A sound is loude/ as the vibration is stronger. More energy is needed to produce a louder sound.

ACTIVITY 2

1. It depends on the song the learner heard.
2. It depends on the song the learner heard.
3. The one with lower pitch has fewer farther peaks and lows while the one with higher pitch has peaks and lows closer together. It appears there are more vibrations for the sound with higher pitch than the sound with the lower pitch.
4.

ACTIVITY 3A

1. Because the vibrations have traveled through the string to me
2. Sound travels through a medium, which in this case was a string. The medium through which sound travels can be solid, liquid, or gas.

ACTIVITY 3B	CHECKING YOUR UNDERSTANDING	POSTTEST
2 1 5 3 4	Sound B, Sound C, Sound A	1. D 2. C 3. E 4. B 5. A