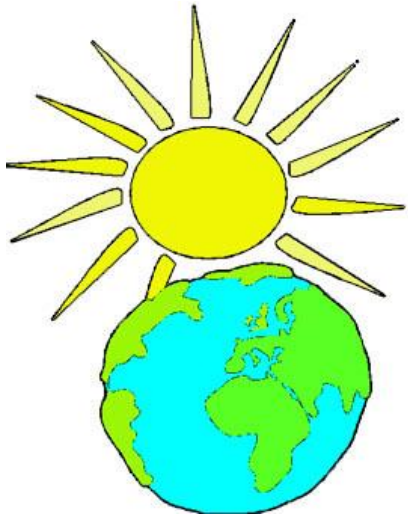


Light and Sound Unit Plan



Designed for 3rd grade students

By: Lisa Barr, ID # 113648

February 24, 2010

Student Teaching 1st Placement

Dr. Walker



Saint Columba Catholic School
40 E. Third St.
Bloomsburg, PA 17815
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Miss Lisa Barr, 3rd grade student teacher

Dear Parents/Guardians,

February 24, 2010

Our class is going to be learning about light and sound over the next few weeks. This unit is appropriate for your third grade child because it teaches them valuable information on weather.

This unit will help your child understand where light and sound come from. Everyone uses light in some shape or form to see. This unit will also help them be more responsible with the lights around the house. The students will learn about sound which will allow them to understand how sound waves work. This will be helpful for students as they become more responsible and have to use alarm clocks and the different technology that uses sounds such as video games, television, and cell phones.

The light and sound unit will start on February 24, 2010 and will proceed for about three weeks. I strongly encourage your participation with your child at home with the different assignments that he/she will be bringing home. During the course of the three weeks you child will be using their imagination to create hypothesis and questions about science. If you would like to join us for this experience, more information will be sent home at a later date.

I am looking forward to the next several weeks of class designed for your child's learning and achievement on light and sight

If you have any questions or concerns, please feel free to contact me.

Sincerely,

Lisa Barr

Rationale

The unit on light and sound is appropriate for third grade students because it teaches them valuable information on light and sound and how it works. Students will be using light and sound through-out their whole lives. This unit meets the standards because it covers lightening, talking, reading, writing, viewing, and visual representation.

It is important for the teacher to do research and learn about light and sound just as it is for the students. A teacher needs to do a lot of research and make sure they understand what they are talking about and the concepts that they are dealing with. This is a topic that can be covered by the basics or it can go into a deep depth of information. The teacher needs to pull specific information for the students. This is a very important topic to cover with the students because it deals with something that they are around every day. This is also important for the teacher because they are also around light and sound every day.

It is important for students to learn about light and sound because it will help them become more familiar with how light is formed and how it travels, and how sound travels. Students may wonder where light comes from and how it gets to every house, building, and street as fast as it does. Students may also wonder how our ears work and also how sound travels from one thing to another. When the students flip on a light they are going to be able to understand where it comes from and how it was first originated. When students hear a sound such as the lunch bell or an alarm clock, they are going to be able to understand how it travels from the object and then through our ears to our brain for understanding.

Students will learn how to give a presentation and learn how to speak clearly and professionally in front of others. The students will be practicing their listening skills by listening to the teacher talk, and by listening to other student's presentations. The students will be talking in small and large group discussion. The students will be reading different passages through-out the unit which will help them on fluent reading and comprehension of passages. The students will also be writing in their packets and their presentation. The information that is in their packets to be completed is what will be handed in as a portfolio of their light and sound unit experience.

Students will want to learn about light and sound because they are surrounded by it every day.

The standards this unit covers are as follows:

SCIENCE

3.1 Unifying Themes

3.1.4.E Recognize change in natural and physical systems

- Describe the change to objects caused by heat, cold, light, or chemicals.

3.2 Inquiry and Design

3.2.4. A Identify and use the nature of scientific and technological knowledge.

- Provide clear explanations that account for observations and results.

READING, WRITING, SPEAKING, AND LISTENING

1.1 Learning to Read Independently

1.1.3.E Acquire a reading vocabulary by identifying and correctly using words.

1.1.3.G Demonstrate after reading understanding and interpretation of both fiction and nonfiction text.

1.5 Quality of Writing

1.5.3.B Write using well-developed content appropriate for the topic.

1.6 Speaking and listening.

1.6.3.A Listen to others.

- Ask questions as an aid to understanding,

1.6.3.C Speak using skills appropriate to formal speech situations.

- Use appropriate volume.
- Pronounce most words correctly.
- Pace speech so that is understandable.
- Demonstrate awareness of audience.

1.6.3.D Contribute to discussions.

MATH

2.3 Measurement and Estimation

2.3.3.E Determine the appropriate unit of measurement.

2.6 Statistics and Data Analysis

2.6.3.A Gather, organize and display data using pictures, tallies, charts, bar graphs, and pictographs.

2.6.3.B Formulate and answer questions based on data shown on graphs.

THE ANCHORS THIS UNIT COVERS ARE AS FOLLOWS:

READING

R3.A Comprehension and Reading Skills

R3.A.1.1 Identify and interpret the meaning of vocabulary.

R3.A.1.4 Identify and explain the main ideas and relevant details.

R3.B Interpretation and Analysis of Fictional and Nonfictional text.

R3.A.2.2 Identify and apply word recognition skills.

MATH

M3.B Measurement

M3.B.2.2 Estimate measurements of familiar objects

M3.E Data Analysis and Probability

M3.E.1.1 Answer questions based on data shown on tables, charts, and bar graphs.

M3.E.1.2 Organize or display data using tables, charts, bar graphs.

Unit Goals

- 1.) The students will understand how to use their listening skills.
- 2.) The students will know how to work safely in different science labs.
- 3.) The students will recognize the important parts of a speech.
- 4.) The students will understand what it means to be organized.

Unit Outline/Summary

Pretest:

The students will be given a pretest on light and sound. This will not be graded; it is to see what the students already know and what they do not know.

Lesson 1: Light

- Students will read light story out loud.
- What is white light?
- Experiment with prisms.
- Completing worksheet in packet.

Lesson 2: Reflection and Refraction

- Talk about shadows.
- Discuss reflection.
- Discuss refraction.
- Experiment with water and a straw.

Lesson 3: Absorption

- Absorption definition.
- Discuss opaque.
- Prediction section of worksheet.
- Experiment with a banana and a flashlight.
- Observation section of worksheet.

Lesson 4: Sound; Vibration, Volume, Pitch

- Complete chart on ways I count on sound.
- Discuss how sounds are alike.
- Do all sounds sound the same?
- What is volume?
- What does pitch mean?
- Complete ear worksheet.
- Show different objects that make sounds.

Lesson 5: Traveling Waves

- Interesting question.
- How does sound travel?
- Sound travels through waves.
- Solids or liquids?
- Six different lab stations.

Hand in completed packet

Complete post test (same test as pretest)

Name: _____

Date: _____

Directions: Answer every question to your best ability.



1.) Which travels faster, light or sound?

- A. Light
- B. Sound
- C. Same speed

2.) How fast does light travel?

- A. 100,000 kilometers
- B. 200,000 kilometers
- C. 300,000 kilometers

3.) True or False: Reflection bounces off of what it hits.

4.) True or False: A mirror is NOT a reflector.

5.) True or False: A lamp is a reflector.

6.) What is the definition of opaque?

7.) What is the definition of pitch?

8.) What are two sounds that signal danger?

1. _____

2. _____

Name: ANSWER KEY

Date: _____

Directions: Answer every question to your best ability.



1.) Which travels faster, light or sound?

- A. *Light*
- B. Sound
- C. Same speed

2.) How fast does light travel?

- A. 100,000 kilometers
- B. 200,000 kilometers
- C. *300,000 kilometers*

3.) True or False: Reflection bounces off of what it hits.

TRUE

4.) True or False: A mirror is NOT a reflector.

FALSE

5.) True or False: A lamp is a reflector.

TRUE

6.) What is the definition of opaque?

NOT TRANSPARENT

7.) What is the definition of pitch?

HOWHIGH OR LOW A SOUND IS

8.) What are two sounds that signal danger?

- 1. **ANSWER WILL VARY**
- 2. **ANSWER WILL VARY**

Motivational Device for Unit



A motivational device as an introduction to a new unit is very important. The students' minds must be grasped as early in the unit so that they are willing to want to learn and in a fun way.

This unit is covering science on the topics of light and sound. I am going to introduce this unit to the students by having many different objects that we are going to be using throughout our lesson around the room. The students are going to rotate in groups around the room to see, touch, and play with these different objects. The objects that are going to be sitting out are as follows: alarm clock, prism, water, straws, cups, lamp, banana, and a flashlight. There is also going to be two interactive bulletin boards in the room. The students are permitted to complete one of the bulletin boards.

This is going to be a fun unit for the students because the majority of it is hands on. The students are going to enjoy themselves while having fun, but also being safe at the same time.



Lesson 1

(Light)

Academic Standards

SCIENCE

3.1 Unifying Themes

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1.5.3.B Write using well-developed content appropriate for the topic.

1.6 Speaking and listening.

1.6.3.A Listen to others.

- Ask questions as an aid to understanding,

1.6.3.D Contribute to discussions

MATH

NONE

Anchors

READING

R3.A Comprehension and Reading Skills

R3.A.1.1 Identify and interpret the meaning of vocabulary.

R3.A.1.4 Identify and explain the main ideas and relevant details.

R3.B Interpretation and Analysis of Fictonal and Nonfictional text.

R3.A.2.2 Identify and apply word recognition skills.

Objectives

1. Students will understand light waves and how they work with 95% accuracy.
2. Students will be able to describe a prism and how it affects light colors with 96% accuracy.
3. Students will be able to identify a color spectrum and the colors it contains with 95% accuracy.

Motivational Device

Ask the students what they think is the fastest thing in the universe. This will get their minds running and wondering what the topic is going to be about.

Content

1. What do you think is the fastest thing in the universe?

- A. Students' answers will vary.
 - a. The correct answer is light.
- B. Light is the fastest thing in the universe and travels 300,00 kilometers per second.
 - a. How far do you think 300,000 kilometers is?
 - b. Students' answers will vary.
- C. The correct answer is seven times around the world in less than one second.
 - a. This is like being a superhero.

2. Today we are going to be learning about light.

Look around your classroom. What do you see? You probably see your classmates and your teacher. You might even see a clock, a whiteboard, and some desks. Do you know what you would see without light? Nothing! That's right! Light is everywhere. And that is a good thing! Without light, we would not be able to see anything.

Light is a form of energy. It travels very fast! It travels even faster than sound. Light can travel in a straight line. Have you ever used a flashlight? When sitting in a dark room or walking in the dark woods, flashlights can really come in handy. When you flip the power switch on a flashlight, where does the light shine? It shines straight ahead.

Light can also bounce. Think about the moon. On its own, the moon has no light source. Yet almost every night, the moon lights up our streets and shines down on Earth. How does it do this? The light from the moon is really light from the sun. Sunlight bounces off the moon and shines down on us each evening.

3. Almost everything you do depends on light and the science of light, which is called optics.

4. Light is a form of energy that you can see. There are also light waves, which are made of electricity and magnetism. These waves are very tiny and you are unable to see them.

5. Does anyone know what the light from the sun or a light bulb is called?

A. It is called white light.

6. Today we are going to do an experiment. Something special happens to white light when it passes through a prism.

A. What is a prism?

a. It is a triangle shape of something; such as plastic or glass.

B. Have the students turn to the page in their workbooks that says Prism Colors.

C. Have the students gather around the lamp that is placed on the table.

Make sure that the students are not too close to the area.

a. Place the prism by the light bulb without the light being on and let the students observe what is going on.

b. Have the students predict what would happen when the light is turned on.

c. Then turn the light on and let the students see what is going on. The students should see that there are rainbow colors coming through the prism.

d. Have the students go back to their seats and fill out their observation and draw a picture of what they saw.

7. Discuss the colors that the students have observed.

A. What were the colors that you observed and the order they were in?

a. These colors that you have observed are called the spectrum. Each color has a different length of wave

B. Have you ever seen anything like this before?

a. Students should say rainbow.

C. A rainbow is made of tiny raindrops, which work like millions of tiny prisms to split up sunlight.

Differentiated Learning activities

In my classroom there are a total of eighteen students; nine boys and nine girls. Out of the eighteen students there is one child that is Mexican, and one that is Vietnamese. The socio-economic status throughout my classroom is on a stable level. There is only one student that has a scholarship to attend the school. All of these students speak excellent English and have no trouble completing work. There are only three students that have disabilities in the subjects of handwriting, math and speech.

The student that has a disability in reading will be placed beside a strong person in that subject. This will allow the disabled student ask for help if needed.

The advanced students will be reading the passage and answering question. They will also help out the students that are struggling.

Instructional Resources

A. Lamp

B. Prism

C. Worksheet

Formative Assessment

Students will be assessed on their reading of the passage. They will also be assessed on their participation during our science experiment.

Reflection

Light



Look around your classroom. What do you see? You probably see your classmates and your teacher. You might even see a clock, a whiteboard, and some desks. Do you know what you would see without light? Nothing! That's right! Light is everywhere. And that is a good thing! Without, light we would not be able to see anything.

Light is a form of energy. It travels very fast! It travels even faster than sound. Light can travel in a straight line. Have you ever used a flashlight? When sitting in a dark room or walking in the dark word, flashlights can really come in handy. When you flip the power switch on a flashlight, where does the light shine? It shines straight ahead.

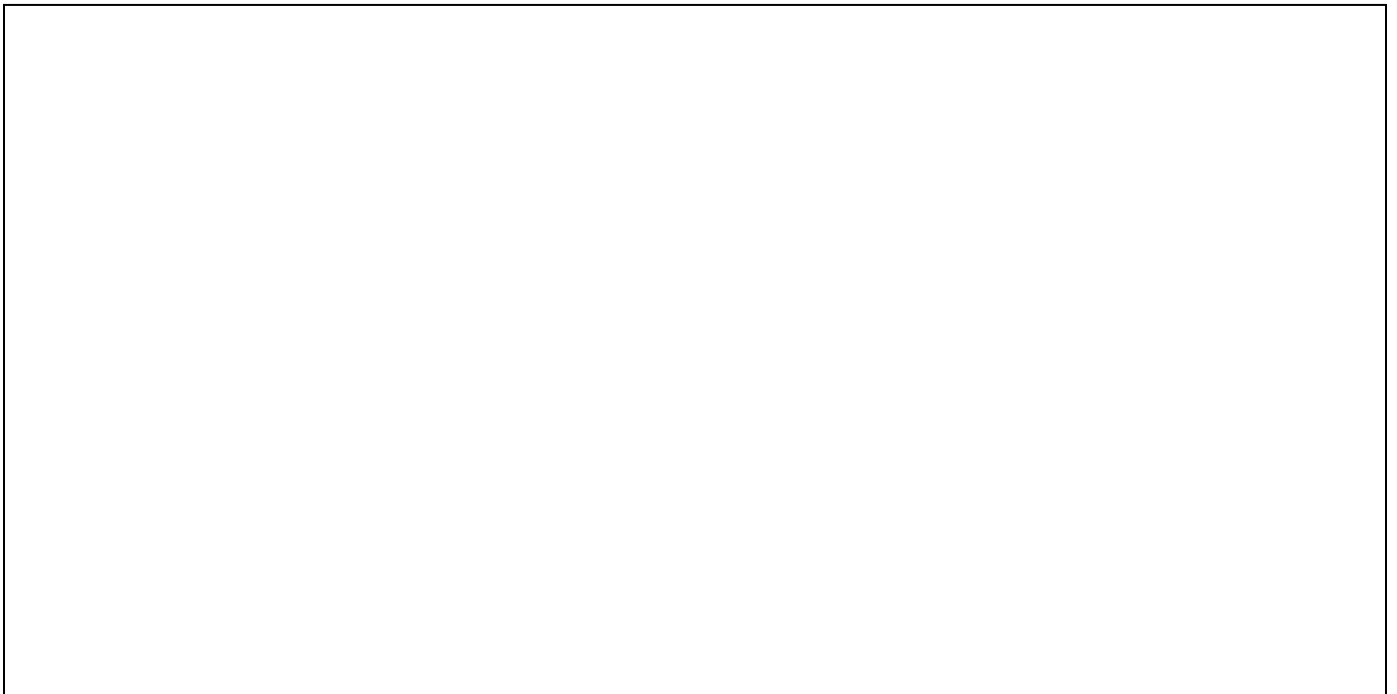
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Prism Colors

Prediction:

Observation:

PICTURE



Lesson 2 (Reflection and Refraction)

Academic Standards

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- Ask questions as an aid to understanding,

1.6.3.D Contribute to discussions.

MATH

2.3 Measurement and Estimation

2.3.3.E Determine the appropriate unit of measurement.

Anchors

READING

R3.A Comprehension and Reading Skills

R3.A.1.1 Identify and interpret the meaning of vocabulary.

R3.A.1.4 Identify and explain the main ideas and relevant details.

R3.B Interpretation and Analysis of Fictonal and Nonfictional text.

R3.A.2.2 Identify and apply word recognition skills.

MATH

M3.B Measurement

M3.B.2.2 Estimate measurements of familiar objects.

Objective

1. Students will be able to identify the difference between reflection and refraction with 95% accuracy.

Motivational Device

Place mirrors and flashlights on each desk and have the students play with them. This will show reflection and refraction and the students wont know until we work through the lesson.

Content

1. Have you ever saw your shadow and it looked smaller than normal or have you ever looked at your legs in a swimming pool and your legs looked bent when they weren't?

2. Today we are going to work with reflection and refraction dealing with light.

Does anyone know what these two words means?

A. Reflection – when light bounces off smooth surfaces.

B. Refraction – the turning or bending of any wave.

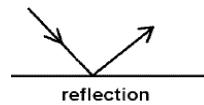
3. We are going to start with reflection.

A. Does anyone know of anything that they can see their reflection in?

a. students answers will vary

B. Light reflects when it bounces off any object.

a. draw this on the board to show visual learners what you mean.



b. Demonstrate this for students to see.

c. Turn the lights off in the room and turn the lamp on at the front of the room.

d. Point out that the light comes from the bulb and hits something and then reflects off that object and then to your eyes for visibility.

4. Suppose your body blocks the sun's light when you are outside and it has nothing to bounce off of, what would you see?

A. The students should answer with nothing, because it has nothing to bounce off of.

5. The main point of reflection is that it has to have something to bounce off of.

A. Have the students name some examples of things in the classroom that the light is bouncing off of so they are able to learn.

6. Now switching over to refraction.

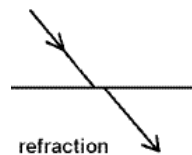
7. Can you predict what kinds of things might happen to a light beam when it passes from air to other liquids, or through other materials such as glass?

A. Students answers will vary.

8. This is what it looks like when refraction is taking place

A. Draw this diagram on the board beside reflection so they are able to see the difference.

a.



9. Refraction takes place when something is bending or turning the light wave.

10. We are going to do a demonstration to show what refraction is.
- A. Students will be split into groups of three and will be given a clear plastic cup.
 - a. Have the students' measure out two cups of water into the plastic cup.
 - B. Have the students predict what they think will happen if the straw is placed inside the cup.
 - C. Have the students place the straw in and observe what the straw looks like.
 - a. The straw will look bent.
 - D. Ask the students why this is happening.
 - a. The students should answer by saying that the plastic and water bent the light waves making the straw look bent.

Differentiated Learning activities

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The students that are struggling will be placed in a group with strong people in that particular area. The teacher will be walking around and checking on these students periodically to make sure that they are completing their sheet correctly and if they are not the teacher will guide them.

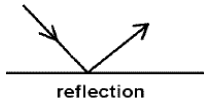
Instructional Resources

- A. 10 cups
- B. 10 straws
- C. Paper
- D. Pencils
- E. Chalk Board
- F. Chalk
- G. Lamp
- H. Measuring cups

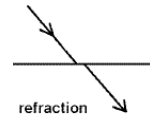
Formative Assessment

The students will be assessed on their participation in the science activity and also their worksheet that is to be completed. They will also be assessed on their group work.

Reflection



Characteristics of Light



Definitions:

Reflection:

Refraction:

Objects that reflect:

- 1.)
- 2.)
- 3.)
- 4.)
- 5.)

Objects that refract:

- 1.)
- 2.)
- 3.)
- 4.)
- 5.)

(Prediction) What do you think will happen to the straw when it is placed in a glass of water?

(Observation) What happened to the straw when placed in the glass of water?

Lesson 3 (Absorption)

Academic Standards

SCIENCE

3.1 Unifying Themes

3.1.4.E Recognize change in natural and physical systems

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3.2.4. A Identify and use the nature of scientific and technological knowledge.

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1.6.3.A Listen to others.

- Ask questions as an aid to understanding,

1.6.3.D Contribute to discussions.

MATH

2.6 Statistics and Data Analysis

2.6.3.A Gather, organize and display data using pictures, tallies, charts, bar graphs, and pictographs.

2.6.3.B Formulate and answer questions based on data shown on graphs.

Anchors

READING

R3.A Comprehension and Reading Skills

R3.A.1.1 Identify and interpret the meaning of vocabulary.

R3.A.1.4 Identify and explain the main ideas and relevant details.

R3.B Interpretation and Analysis of Fictonal and Nonfictional text.

R3.A.2.2 Identify and apply word recognition skills.

MATH

M3.E Data Analysis and Probability

M3.E.1.1 Answer questions based on data shown on tables, charts, and bar graphs.

M3.E.1.2 Organize or display data using tables, charts, bar graphs.

Objective

1. Students will understand how absorption works with 98% accuracy.

2. Students will be able to identify items that do and do not absorb light with 95% accuracy.

Motivational Device

Ask the students if they have every tried to look through something but they were unable to see through it even if there was light put on it.

Content

1. Have you ever tried to look through something but were not able to even if you put light on the object? (Let students talk about their examples)
2. What is absorption?
 - A. Absorption is the transfer of energy carried by light waves to particles in matter.
 - a. As a review what is matter?
 - A substance of which all objects are made.
 - B. An interesting fact is that you cannot see through opaque objects because light cannot pass through them. Opaque materials reflect and/ or absorb all light waves.
 - a. Opaque means not transparent
 - b. What are some examples of things that light cannot pass through?
 - Students answers will vary.
3. As a class we are going to make absorption happen with a banana and a flashlight with blue over the lens.
 - A. The students should turn to the page in their workbook that's labeled Banana Graphing.
 - a. As a class we are going to take a poll. How many students think that the banana will turn a different color? How many think the light will do nothing to the banana? How many think something other than these choices will happen to the banana? Write these answers on the spaces provided.
 - b. We are going to be making a bar graph on our prediction.
 - c. Have the students set up their bar graph with labels and a title.
 - d. Have the students complete their bar graphs.
 - B. Have the students close the curtains and take them into the closet where it is very dark and make sure you have the banana and the blue cellophane-covered flashlight.
 - C. Ask the students what they think will happen when the blue light is shined onto the banana.
 - a. Students' answers will vary.
 - D. Shine the blue light onto the yellow banana.
 - E. What color does the banana appear?
 - a. Black
 - b. Why does the banana appear black?
 - Students' will answers with many different answers.
 - The actual answer is because the yellow absorbed the blue frequency and because the room is dark, there is no yellow light reflected back to your eyes. Therefore, the banana appears black.

Differentiated Learning activities

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The teacher will be walking around and checking on these students periodically to make sure that they are completing their sheet correctly and if they are not the teacher will guide them.

Instructional Resources

- A. Banana
- B. Flashlight with blue cover
- C. Dark room

Formative Assessment

The students will be assessed on completed workbook page and their class throughout the lesson.

Reflection

Absorption

1.) Definition of Opaque:

2.) What do you think will happen when the flashlight with the blue covering is shined on it?

3.) What were your observations when the flashlight was shined on the banana?

4.) Try this at home with a different object and write your observations down.



Lesson 4
(Sound; vibration, volume, pitch)

Academic Standards

SCIENCE

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NONE

Anchors

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R3.A.1.1 Identify and interpret the meaning of vocabulary.

R3.A.1.4 Identify and explain the main ideas and relevant details.

R3.B Interpretation and Analysis of Fictonal and Nonfictional text.

R3.A.2.2 Identify and apply word recognition skills.

Objective

1. Students will be able to describe the difference between volume and pitch with 100% accuracy.

2. Students will be able to classify sounds with a high or low volume with 100% accuracy.

3. Students will be able to classify sounds with a high or low pitch with 100% accuracy.

Motivational Device

Place different instruments on the student's desk. Have the students handle these different instruments and pay close attention to the sounds that they are making.

Content

1. How would your life be affected if you were not able to hear anything?
 - A. Let the students tell how their lives would be affected.
2. Ways we count on sound activity
 - A. This chart will be placed on the board.

a.

Ways I Count On Sound	Communication
Danger Signals	Enjoyment

- B. The students are going to work with a partner and fill in all three categories (communication, danger signals, and enjoyment) with ways they count on sound.
3. How are sounds alike?
 - A. Sound happens when matter vibrates.
 - B. As a review what is matter?
 - a. A substance which all objects are made.
4. Do all sounds sound the same?
 - A. The answer is no.
 - B. Why do you think that all sounds do not sound the same?
 - a. Students answers will vary
 - b. The actual answer is because of volume and pitch.
5. What does volume mean?
 - A. The loudness or softness of a sound.
 - B. What is an example of a loud sound?
 - a. Students will give many different answers.
 - C. What is an example of a soft sound?
 - a. Students will give many different answers.
6. What does pitch mean?
 - A. Describes how high or low a sound is.
 - B. Do you know the difference between high and low pitches?
 - a. Students should reinforce their answer with that they learned in music class.
 - C. What is an example of a high pitch sound?
 - a. Students will give many different answers.
 - D. What is an example of a low pitch sound?
 - a. Students will give many different answers.
7. Now that we know the different types of sounds we are going to see how our ears work.
8. An earful of information activity.
 - A. Have the students turn to their Hand out the Earful worksheet.
 - B. Explain to the students that this is what the inside of your ear looks like.
 - C. Have a student read the passage.
 - D. Time to label the ear.

a. Explain to the students that they start with the first underlined word and write that on the first line. The second underlined word then gets written on the second line and so on.

E. Have the students' then complete number two on the sheet, completing sentences. After everyone has finished we will share the answers with the class.

9. We hear many different sounds throughout the day.

A. What was one thing you learned today that was interesting?

a. Call on different students to answer.

Differentiated Learning activities

In my classroom there are a total of eighteen students; nine boys and nine girls. Out of the eighteen students there is one child that is Mexican, and one that is Vietnamese. The socio-economic status throughout my classroom is on a stable level. There is only one student that has a scholarship to attend the school. All of these students speak excellent English and have no trouble completing work. There are only three students that have disabilities in the subjects of handwriting, math and speech.

The students that are struggling will be placed into groups with strong students. This will allow the weaker students to ask questions and complete the activity.

Instructional Resources

A. Chart sheet

B. Earful sheet

Formative Assessment

The students will be assessed on their group work and group discussion.

Reflection

Ways I Count On Sound

Communication

Danger Signals

Enjoyment

EAR WORKSHEET

Lesson 5
(Traveling Waves)

Academic Standards

SCIENCE

3.1 Unifying Themes

3.1.4.E Recognize change in natural and physical systems

- Describe the change to objects caused by heat, cold, light, or chemicals.

3.2 Inquiry and Design

3.2.4. A Identify and use the nature of scientific and technological knowledge.

- Provide clear explanations that account for observations and results.

READING, WRITING, SPEAKING, AND LISTENING

1.1 Learning to Read Independently

1.1.3.E Acquire a reading vocabulary by identifying and correctly using words.

1.1.3.G Demonstrate after reading understanding and interpretation of both fiction and nonfiction text.

1.5 Quality of Writing

1.5.3.B Write using well-developed content appropriate for the topic.

1.6 Speaking and listening.

1.6.3.A Listen to others.

- Ask questions as an aid to understanding,

1.6.3.C Speak using skills appropriate to formal speech situations.

- Use appropriate volume.

- Pronounce most words correctly.

- Pace speech so that is understandable.

- Demonstrate awareness of audience.

1.6.3.D Contribute to discussions.

MATH

NONE

Anchors

READING

R3.A Comprehension and Reading Skills

R3.A.1.1 Identify and interpret the meaning of vocabulary.

R3.A.1.4 Identify and explain the main ideas and relevant details.

R3.B Interpretation and Analysis of Fictonal and Nonfictional text.

R3.A.2.2 Identify and apply word recognition skills.

Objective

1. Students will be able to identify that sound is a form of energy that travels in waves with 95% accuracy

2. Students will explain that sound waves can travel through different mediums, including solids, liquids, and gases with 90% accuracy.

3. Students will be able to summarize that sound waves travel in a given direction until an outside force or object gets in the way of its motion and reflects it with 96% accuracy.

Motivational Devices

Ask the students if they can listen to a radio on the moon or underwater in a submarine.

Content

1. Did you know that you can listen to a radio on the moon, but not underwater in a submarine?
 - A. Today we are going to be learning about sound waves and how this is possible.
2. Does anyone think they know how sound travels?
 - A. Students answers will vary.
3. Sound travels through waves. These waves we cannot see, they are like our light waves. This type of wave is called an electromagnetic wave.
4. Think of the bell in the hallway. When it rings the bell first vibrates and then it hits the air particles. It then begins to bounce off one air particle to another spreading the sound in all directions. As the sound travels further and further from the bell the sound becomes quieter. This is because the energy from the bell begins to die and stops bouncing off particles.
5. Do you think sound would travel faster through solids or liquids?
 - A. Students will either answer with yes or no
 - B. Sound actually travels through solids easier and faster because the particles are closer together.
6. Now we are going to do an activity in your light and sound booklets turn to the page that says "Sound Waves Seen".
 - A. You are going to fill the information out that is on the worksheet and also draw a picture of the lab station.
 - a. What do you see? What do you hear? What is the source of the vibration? What type of medium is the wave traveling through? In what direction does the wave appear to travel? What happens to the medium as the wave travels? (i.e., paper clips bounce, fingers vibrate when touching skin near vocal chords, etc.)
7. Next, walk through one lab activity with the class and model how to fill out the observation sheets. Tell students that all waves in these labs have a vibrating source that creates the wave. Also, emphasize that a vibrating source is needed for all sound waves. Keep activity cards at each lab station that clearly define student procedures for each lab:

Lab Station #1: Drum with paper clips on the top.(This can be made with wrapping paper over a coffee can if you don't have a real drum available.)
Students should tap on the drum and observe what happens to the paper clips.

* Students should tap on the drum. What do you see? What do you hear?

Lab Station #2: Touch side of your throat and say ahh.

* What do you feel as you say ahh? What do you hear?

Lab Station #3: Tuning fork in water.

* Gently strike the tuning fork on the pad and then place it in the water. Describe what you observe. What do you see? What do you hear?

Lab Station #4: Rubber band strung between two pegs or nails.

* Pluck the rubber band. What do you see? What do you hear?

Lab Station #5: Strike a fork with another utensil and bring it close to the ear.

* What do you hear? What do you see?

Lab Station #6: Steel yardstick or ruler on edge of a table.

* Hold one end of the ruler firmly against the top of the table. Snap the other end. What do you see? What do you hear?

8. Now divide the class into six groups with three students in each group and have them rotate through each of the lab stations, completing an observation sheet at each station. Allow 5 – 8 minutes for each lab activity. Make sure students clean up the materials at each station so that each group will be able to set up the materials appropriately.

9. Each group is going to present about a learning station. The students should follow their learning station presentation sheet located in their workbooks.

- A. Group 1 presents learning station 1
- B. Group 2 presents learning station 2
- C. Group 3 presents learning station 3
- D. Group 4 presents learning station 4
- E. Group 5 presents learning station 5
- F. Group 6 presents learning station 6

10. These are some additional points and questions the class should discuss:

A. What was the variety of mediums through which the waves traveled (solids, liquids, and gases)?

a. Explain to students that mediums are required to carry sound waves.

B. Can sound exist in space outside of the space shuttle?

a. Explain that sound needs a medium, but space is a vacuum with no solids, liquids, or gases for sound waves to travel through or vibrate in.

C. Which waves could you hear in the lab and which could you not?

D. Where did the waves travel?

a. Explain that all the waves continued to move outward and would have continued in this manner unless they hit an object of a different density, especially a solid. The water in the pan hit the edges of the pan and bounced back. Elicit students' ideas about real-world examples of this—for example, echoes.

E. What do you think a sound wave would look like if we could see it? Have student volunteers come up to the board to illustrate. Then demonstrate that a sound wave looks like a slinky being pushed back and forth.

a. Explain to students that sound waves are also called electromagnetic waves.

Differentiated Learning activities

In my classroom there are a total of eighteen students; nine boys and nine girls. Out of the eighteen students there is one child that is Mexican, and one that is Vietnamese. The socio-economic status throughout my classroom is on a stable level. There is only one student that has a scholarship to attend the school. All of these students speak excellent English and have no trouble completing work. There are only three students that have disabilities in the subjects of handwriting, math and speech.

The students that are struggling will be placed in a group with strong people in that particular area. The teacher will be walking around and checking on these students periodically to make sure that they are completing their sheet correctly and if they are not the teacher will guide them.

Instructional Resources

- A. Drum
- B. A few paper clips
- C. Tuning fork
- D. Basin of water
- E. Rubber band strung between two pegs or nails
- F. Metal fork and spoon
- G. Steel yardstick or ruler
- H. Musical instruments
- I. A slinky
- J. A set of glasses and a spoon for each group of students
- H. Student booklets

Formative Assessment

The students will be assessed on their participation during the labs. They are also going to be assessed on their behavior during each lab.

Reflection

Presentation

Station Name:

Station Directions:

Prediction:

Observation:

Why did this happen:

What did you find interesting?

Speech

Sound Waves Seen

Lab Number: _____

Directions:

Answer the following questions while completing the lab. On the back of this sheet draw a picture of the lab and the materials in the lab center.

1.) What do you see?

2.) What do you hear?

3.) What is the source of the vibration?

4.) What type of medium is the wave traveling through?

5.) In what direction does the wave appear to travel?

6.) What happens to the medium as the wave travels? (i.e., paper clips bounce, fingers vibrate when touching skin near vocal chords, etc.)

My Light and Sound Workbook



Name: _____

Light



Look around your classroom. What do you see? You probably see your classmates and your teacher. You might even see a clock, a whiteboard, and some desks. Do you know what you would see without light? Nothing! That's right! Light is everywhere. And that is a good thing! Without, light we would not be able to see anything.

Light is a form of energy. It travels very fast! It travels even faster than sound. Light can travel in a straight line. Have you ever used a flashlight? When sitting in a dark room or walking in the dark word, flashlights can really come in handy. When you flip the power switch on a flashlight, where does the light shine? It shines straight ahead.

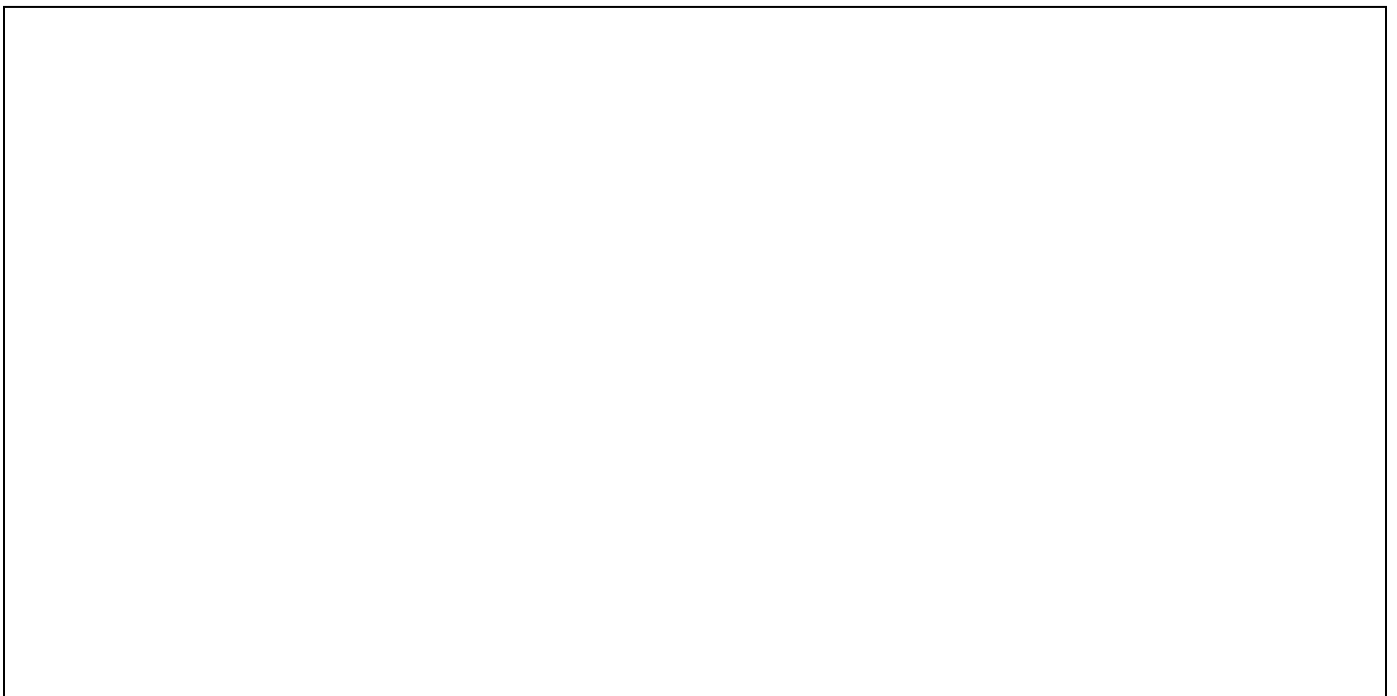
Light can also bounce. Think about the moon. On its own, the moon has no light source. Yet almost every night, the moon lights up our streets and shines down on Earth. How does it do this? The light from the mood is really light from the sun. Sunlight bounces off the moon and shines down on us each evening.

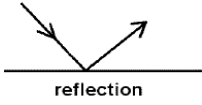
Prism Colors

Prediction:

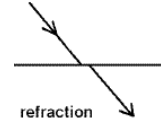
Observation:

PICTURE





Characteristics of Light



Definitions:

Reflection:

Refraction:

Objects that reflect:

- 1.)
- 2.)
- 3.)
- 4.)
- 5.)

Objects that refract:

- 1.)
- 2.)
- 3.)
- 4.)
- 5.)

(Prediction) What do you think will happen to the straw when it is placed in a glass of water?

(Observation) What happened to the straw when placed in the glass of water?

Ways I Count On Sound

Communication

Danger Signals

Enjoyment

EAR WORKSHEET

Absorption

1.) Definition of Opaque:

2.) What do you think will happen when the flashlight with the blue covering is shined on it?

3.) What were your observations when the flashlight was shined on the banana?

4.) Try this at home with a different object and write your observations down.



Presentation

Station Name:

Station Directions:

Prediction:

Observation:

Why did this happen:

What did you find interesting?

Speech

Sound Waves Seen

Lab Number: _____

Directions:

Answer the following questions while completing the lab. On the back of this sheet draw a picture of the lab and the materials in the lab center.

1.) What do you see?

2.) What do you hear?

3.) What is the source of the vibration?

4.) What type of medium is the wave traveling through?

5.) In what direction does the wave appear to travel?

6.) What happens to the medium as the wave travels? (i.e., paper clips bounce, fingers vibrate when touching skin near vocal chords, etc.)

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4.) What type of medium is the wave traveling through?

5.) In what direction does the wave appear to travel?

6.) What happens to the medium as the wave travels? (i.e., paper clips bounce, fingers vibrate when touching skin near vocal chords, etc.)

The students will be graded on the completion of their packets. The following rubric is what will be used when assessing the students. This rubric is placed as the last page in the students workbooks so they are able to see how they are going to be assessed.

Name: _____

Date: _____

Directions: Answer every question to your best ability.



1.) Which travels faster, light or sound?

- A. Light
- B. Sound
- C. Same speed

2.) How fast does light travel?

- A. 100,000 kilometers
- B. 200,000 kilometers
- C. 300,000 kilometers

3.) True or False: Reflection bounces off of what it hits.

4.) True or False: A mirror is NOT a reflector.

5.) True or False: A lamp is a reflector.

6.) What is the definition of opaque?

7.) What is the definition of pitch?

8.) What are two sounds that signal danger?

1. _____

2. _____

Name: ANSWER KEY

Date: _____

Directions: Answer every question to your best ability.



1.) Which travels faster, light or sound?

- A. *Light*
- B. Sound
- C. Same speed

2.) How fast does light travel?

- A. 100,000 kilometers
- B. 200,000 kilometers
- C. *300,000 kilometers*

3.) True or False: Reflection bounces off of what it hits.

TRUE

4.) True or False: A mirror is NOT a reflector.

FALSE

5.) True or False: A lamp is a reflector.

TRUE

6.) What is the definition of opaque?

NOT TRANSPARENT

7.) What is the definition of pitch?

HOWHIGH OR LOW A SOUND IS

8.) What are two sounds that signal danger?

- 1. **ANSWER WILL VARY**
- 2. **ANSWER WILL VARY**

Reflection