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Department of Education

Regional Office IX, Zamboanga Peninsula



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AUGUST

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 Para sa Uban*

SEPTEMBER

Madaginton

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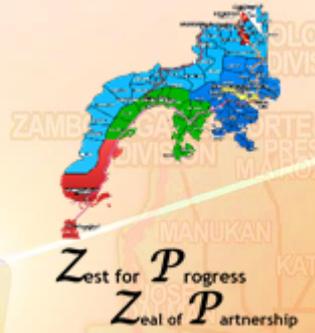
NOVEMBER

Masaligan

DECEMBER

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4



SCIENCE

Quarter 3 - Module 8

THE PROPERTIES OF LIGHT



Name of Learner: _____

Grade & Section: _____

Name of School: _____

Science- Grade 4
Support Material for Independent Learning Engagement (SMILE)
Quarter 3 - Module 8: The Properties of Light
First Edition, 2021

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What I Need to Know

The universe is filled with living and non-living things that release light. In Grade 3, you were able to describe the different sources and uses of light in everyday life.

After going through this module, you are expected to:

1. Investigate the properties and characteristics of light. (**S4FE-IIIh-5**)

Specific Objective:

Describe the basic properties of light: light travels in a straight path, light can be absorbed, reflected, and refracted; and light is made of colors.

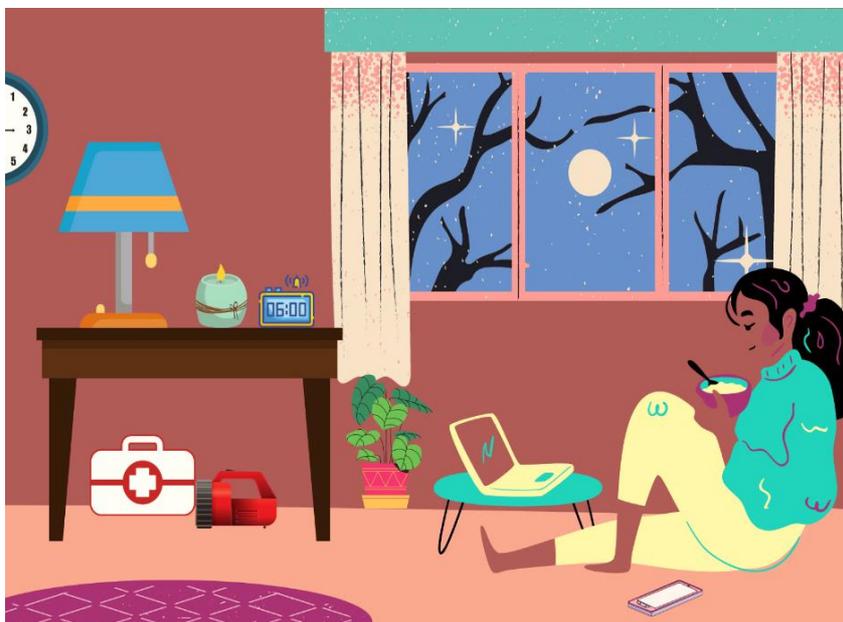


What's In

The light that occurs in nature is natural light, while light that is created by people or objects is artificial light. What have you learned about these sources of light in the lower grade level?

ACTIVITY 1: LIGHTS ON!

Directions: Circle the light sources in the picture. Then list them under the correct column as artificial or natural light.



Natural Light

Artificial Light



What's New

ACTIVITY 2: SOME LIGHT READING

Direction: Read the poem to know more about the properties of light. Then answer the guide questions that follow.

Let There Be Light

By: Rhyza Jae Mayormita

There is light in the morning when the sun is shining so bright.
There is light from stars that sparkle and moon that glows at night.

Light travels so fast in straight line called rays.
Light rays stop when an object so opaque gets in the way.

Light bends when through different materials it enters
like when it passes from the air into the water.

Light bounces off as it hits objects like a ball bouncing on the ground.
This is so wonderful so we can see things all around.

Light allows us to see ourselves in front of the mirror.
Oh! I thank God for light, we see life in glorious colors.

Guide Questions:

1. What is the main source of light in the morning? _____
2. What are the sources of light at night? _____
3. Does light travel? _____. What does the poem tell us about the path that light travels? _____

4. What happens to the path of light when it enters from one material like air into another material like water? _____

5. What does light do that allows us to see everything around us?



What Is It

The poem tells us some of the important properties or characteristics of light. Let us know more about light and its basic properties.

PROPERTIES OF LIGHT

1. Light travels in a straight line

A group of Grade 4 pupils conducted a mini-laboratory activity **to see how light travels**. Below is the activity procedure the pupils followed. If you have the materials at home, you can also do the same activity with the help of an adult.

Activity Procedure:

- Poke a hole at the center of three index cards using a puncher.
- Place each card into the clay to create a "stand" for the card.
- Arrange the three cards in a row to stand vertically at an equal distance from each other.
- Place a flashlight at one end of the row of cards and turned out the light in the room.

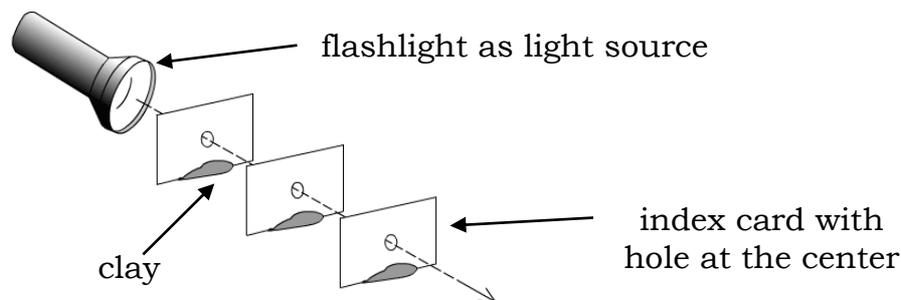


Image Source: <https://www.ducksters.com/science/experiment-light-travel.php>

The pupils then answered the guide questions at the end of the activity. Do you agree with their answers?

Guide Questions:

1. Were you able to see the light through the index cards? Why?

Answer: Yes. The holes are aligned and the light travels through the holes in a straight line.

2. What does the activity tell us about the path that light travels?

Answer: Light travels in a straight line.

3. What would happen to the light path if the holes were smaller? Bigger?

Answer: The light would still travel in a straight line. The path of light is smaller or thinner if the holes were smaller. The path is bigger or thicker when the holes were bigger.

The pupils observed that light from a light source (like a flashlight) could travel through the air and travel straight. Do you know that light travels so fast it takes only 8 minutes and 17 seconds for light from the Sun to reach the Earth when the Sun is 150 million kilometers away from the Earth?

2. Light can be reflected. (Reflection)

Which line in the poem "Let There Be Light" tells us that light can be reflected?

The **bouncing of light by any smooth surface is called reflection of light**. Throwing a ball against the wall can help us understand how reflection works. *You can try this activity at home with an adult.*

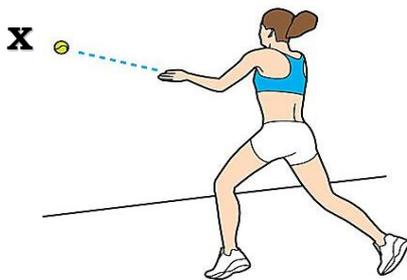


Figure 3. Woman throwing a ball at the target on the wall.
<https://www.health.com/fitness/get-fit-with-a-tennis-ball>

Activity A: Hit the Target! Mark a target on the wall (like drawing an X) at your shoulder height. Where do you stand if you want to bounce the ball against this target and have the ball come back to you, so you can catch it yourself? Correct! You stand directly in front of the target. What happens if you stand off to the side, closer to the wall, and throw the ball against the target at an angle? The ball could bounce off to the opposite side. When you throw the ball at an angle, it will bound off at an angle away from you.

Now you are going to "throw" a ray of light against the mirror. Does the light behave like the ball? It sure does.

We see everything in the natural world because it reflects the light of the Sun. We can even see the Moon because the sunlight is reflected off the Moon's surface.

Mirrors are fascinating things to play and work with in order to understand the properties of light. Since mirrors have shiny surfaces, the light that hits a mirror reflects back allowing us to see our reflection. The image that we see in the mirror is a reflection. Below are activities you can do at home to explore how light travels in straight line and that light is reflected.

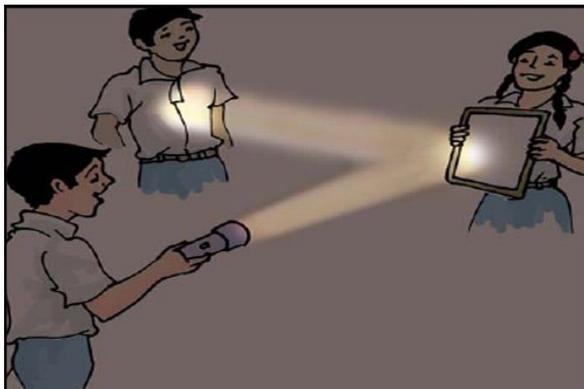


Figure 4. A mirror reflects a beam of light.
Activity and Image Source: <http://aven.amritalearning.com/index.php?sub=99&brch=290&sim=1453&cnt=3310>

Activity B: Mirror Puzzle! Do this activity at night or in a dark room with supervision of an adult. One holds a mirror in his or her hand at one corner of the room. Stand at another corner with a flashlight in your hand. Cover the glass of the flashlight with your fingers and switch it on. Adjust your fingers with a small gap between them so that you can get a beam of light. Direct the beam of the flashlight onto the mirror that your friend is holding. Do you see a patch of light on the other side?

Activity C: Comb the Light! Fix a comb on one side of a board or book and fix a mirror on the other side as shown in Fig. 5. Spread a dark colored sheet of paper between the mirror and the comb. Keep this in sunlight or send a beam of light from a flashlight through the comb. What do you observe? Do you get a pattern similar to that shown in Fig. 5? This activity gives us an idea of the manner in which light travels and gets reflected from a mirror.

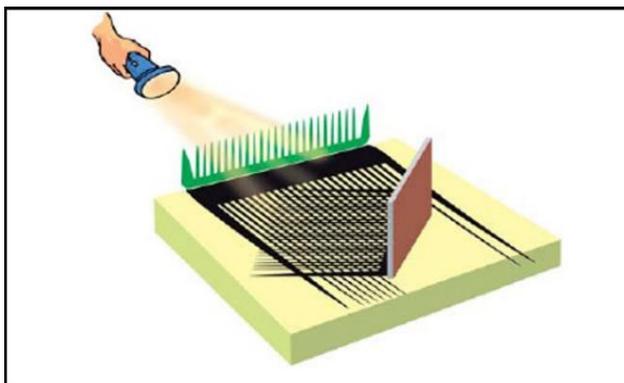


Figure 5. light travelling along straight lines and getting reflected from a mirror

Activity and Image Source: <http://aven.amritalearning.com/index.php?sub=99&brch=290&sim=1453&cnt=3310>

3. Light can be refracted. (Refraction)

Light rays usually travel in straight lines but when they pass from one material to another, they can be forced to bend by changing direction and continue on a new straight path. **The bending of light is called refraction.** This happens because light travels at different speeds (how fast or how slow light travels) through different materials. When light moves from one material to another, the change in speed as it slows down or speeds up causes the light rays to bend. Some materials, such as water or certain shapes of glass, can bend light rays so that the white light we normally see is separated into the colors of the rainbow.



Image Source: <https://pixabay.com/photos/pencil-bent-pencil-pencil-in-water-2403662/>

Activity D: The Eye Bender! Half-fill a transparent glass with clean water. (You can actually play around with different levels of water to see how that affects light refraction.) Place a pencil in the glass of water. Look at it from the top. It is straight all the way down, right? Now, look at it from the side. Is it still straight? It is suddenly bent or crooked!

What other light activities can you do at home to explore refraction?

Do you know that rainbows are the colors produced by refracted light? A rainbow is the much-loved multi-colored arc we sometimes see in the sky after a sun shower. A rainbow forms as a result of reflected and refracted light in drops of water in the atmosphere.

Do you ever wonder why we can see the color of objects? Why are leaves green? Why does a red rose appear red and the sky blue?

4. Light is made up of colors. The colors may be reflected or absorbed.

Light can be absorbed.

The way objects reflect and absorb light explains why objects appear colored. Sunlight is a mixture of colors (much like the colors of the rainbow), which combine to form a brilliant white light. Some surfaces reflect all of the light, while other surfaces absorb some of the colors. A white ball looks that way (white) because it reflects all of the light (and all of the colors of light) that hits it. A black ball does not reflect any light at all but absorbs all of the light. No light (no color) is reflected is reflected into our eyes. So, the ball appears black. A colored ball (or any colored object), such as a red ball, absorbs all types of light except red light, which reflects into our eyes. Thus, we see the ball as red!

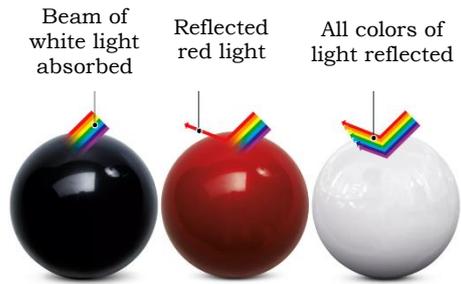


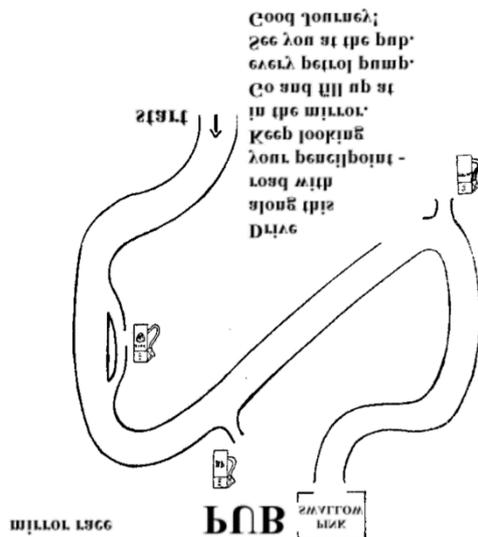
Image Source: <https://www.dkfindout.com/us/science/light/seeing-color/>



What's More

ACTIVITY 3: THE MIRROR MAZE

Direction: Get a mirror and hold it firmly above your eyes, or high in front, so that you, looking in the mirror, look down upon the maze map below. Then following the instructions given and answer the activity questions.



Questions:

1. What is the name of the race?

2. What are you supposed to do with your pencil point to reach your destination?
A. walk B. run C. drive
3. Where are you supposed to make some stops before reaching your destination? _____
4. What is your final destination?

5. Where is it located?
A. petrol pump B. pink swallow

Did you have some fun doing the activity? That is not magic at all. It is science and you see how reflection works with mirrors! Amazing, right?

___ 8. A pupil is able to see the image of a tree in a pond or (any water surface) on a very fine day because light that hits the surface of the pond water _____.

- A. is absorbed
- B. bounces off
- C. passed through the water
- D. is powerful

___ 9. What is white light?

- A. anything that makes light
- B. all light colors mixed together
- C. created when object block light
- D. a shiny surface that reflects light

___ 10. Light travels very fast and in a straight line.

- A. True
- B. False



Additional Activities

This is an optional activity that you might want to do at home with the supervision of an adult. The activity will allow you to investigate about white light being made of different colors (that of the rainbow).

ACTIVITY 6: SPINNING THE WHITE LIGHT

What You Need: 7 crayons: red, orange, yellow, green, indigo (blue + purple), and violet (purple); scissors; 24-inch strong and thin string; sharpened pencil

Procedure:

1. Color each section of the wheel using the colors shown.
2. Cut out the wheel traced from a s-sized plate or mouth glass. Using a pencil, carefully poke two small holes in the center of the wheel as shown (Figure 1).
3. Thread the string through the holes and tie the ends together. Center the circle on the string (Figure 2).
4. Explore with family members how to make the spinner spin properly (Figure 3).

Figure 1



Figure 2

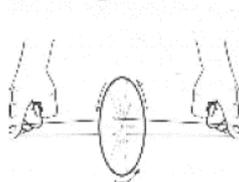
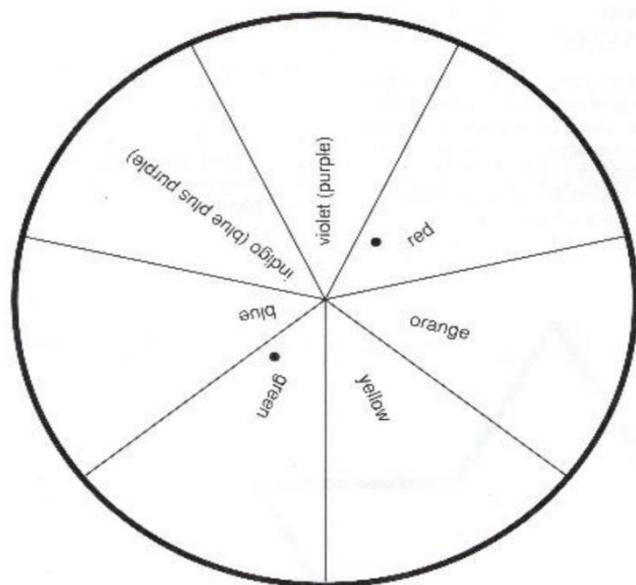
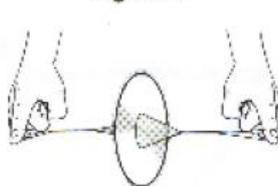


Figure 3



Answer Key Gr4Q3 Module 8

Activity 1

the moon, star, lamp shade, candle, alarm clock, flash light, cellphone, laptop

Natural Light - the star; and all other objects are artificial light or light sources

Activity 2

1. Sun
2. Moon and stars
3. Yes, straight line/path
4. Bend(s)
5. Bounces off objects

Activity 3

1. Mirror race
2. C. drive
3. Petrol pump (gas station)
4. Pub
5. B. pink swallow

Activity 4

- | | |
|------|-------|
| 1. B | 6. F |
| 2. E | 7. H |
| 3. D | 8. C |
| 4. I | 9. A |
| 5. J | 10. G |

Activity 5

1. Write your name in CAPITAL LETTERS
2. LOVE should be written as 
3. A, I, O, T, U, V, W, X

Assessment

- | | |
|------|----------|
| 1. A | 6. B |
| 2. B | 7. B |
| 3. B | 8. B |
| 4. A | 9. B |
| 5. A | 10. True |

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