

P7 Monday 29th June 2020.

Lesson one and Two.

Topic 6: Light Energy

VOCABULARY

- | | |
|------------|-------------|
| • Beams | Translucent |
| • Opaque | Shadows |
| • Lunar | Periscope |
| • Optical | |
| • Spectrum | Prism |

LIGHT

Light is a form of energy that enables us to see.

NB: We see things around us because light **from them** is reflected into **our eyes**.

Light as a form of energy.

Light is a form of energy because it is capable of doing work.

Importance of light in the environment.

- ✓ Sunlight enables plants to make their own food.
- ✓ It enables us and other animals to see
- ✓ Our skins are able to make vitamin D.
- ✓ It is used for photography.
- ✓ We use artificial light on the streets to control traffic

SOURCES OF LIGHT.

- 1. Natural sources of light.**
- 2. Artificial sources of light.**

Natural sources of light

These are sources of light provided by nature.

Examples of natural sources of light include

- ✓ Sun, Star, Erupting volcanoes, Lightning, Glow worms, Fireflies

Nb:- Of the above, some are very hot e.g. sun and stars, erupting volcanoes.

- Others are not hot at all e.g. fireflies, glow worms

ii. Artificial sources of light

These are sources which are made by people.

Examples of artificial sources of light.

- ✓ Solar lamps, Electric lamps, Fluorescent tubes, Electric tubes, Hurricane lamps, Fire
- Objects that produce light are divided into two;

i) **Luminous objects**

ii) **Non luminous objects.**

Luminous objects/ Direct sources.

These are objects that produce their own light

Examples are sun, stars, erupting volcanoes, lamps, torches, hot charcoal etc

Non luminous objects/ indirect sources.

These are objects that reflect light from other sources of light.

Examples of non luminous are the moon, the planets, and mirrors.

The speed of light

The speed of light in normal air is 300000km/sec.

Light travels faster in materials less dense than air e.g. warm and slowly in materials that are denser than air e.g. glass, water.

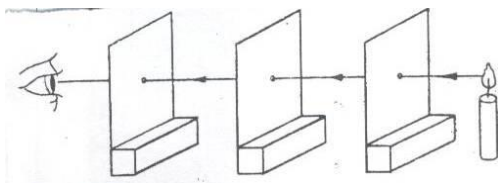
➤ TOPICAL QUESTIONS

1. State any two sources of light.
2. How is the sun useful to human beings?
3. Cite any two examples of non luminous objects.

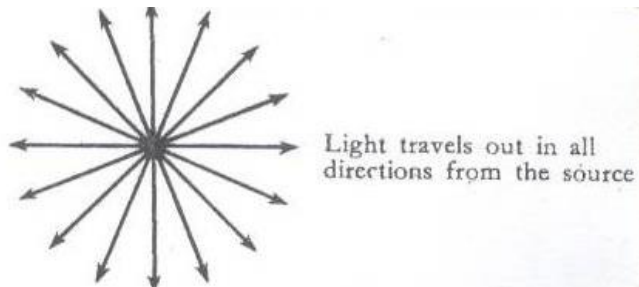
LESSON THREE

Propagation/properties of light.

1. Light travels in a straight line



2. Light travels from a source in all directions.



RAYS

A ray is a path taken by light.

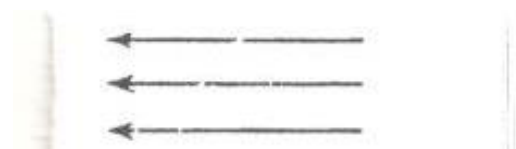


BEAMS OF LIGHT

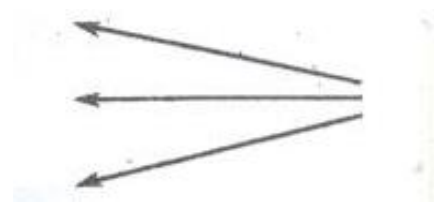
A beam is a group of light rays traveling in the same direction.

Types of beams

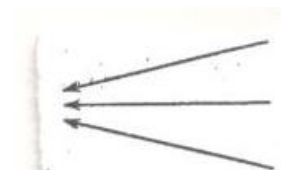
i. Parallel beam



ii. Divergent beam



iii. Convergent beam



EFFECTS OF DIFFERENT MATERIALS ON LIGHT.

✓ **Transparent objects**

These are materials that allow all light to pass through them

Examples of transparent materials

1. Clear glass
- ii. Clear still water.
- iii. Air.

✓ **Translucent materials**

These are objects which allow little light to pass through them.

We can't see through translucent objects because they scatter light passing through them.

Examples of translucent materials.

- i. Frosted glass
- ii. Ground glass.
- iii. Coloured glass.
- iv. Oiled paper.
- v. Smoky air.
- vi. Thin cloth.
- vii. Tracing paper.

Effects of translucent objects on light.

They allow little light to pass through them.

They diffuse the light

✓ **Opaque objects**

An opaque object is that which does not allow any light ray to go through it.

Examples of opaque objects

1. A wall.
2. A hard paper.
3. Wood.
4. Stones.
5. Human Body
6. Metals.

Effects of opaque objects in light

They obstruct light and form shadows.

➤ **TOPICAL QUESTIONS**

1. State any two sources of light.
2. How is the sun useful to human beings?
3. Suggest any two types of lenses.
4. Why is it important to keep our body organs used for seeing clean?

LESSON FOUR AND FIVE

SHADOWS

A shadow is a region of darkness caused by obstruction of light.

Formation of a shadow

a) **Shadow formed from a point of source of light.**

A total shadow is formed.

b) **A shadow formed from a source of light bigger than a point.**

Each point on the source produces its own shadow

All these shadows overlap to give a single shadow.

This single shadow has a darker inner portion and less dark outer portion

Parts of a shadow

i. **Umbra**- It is the darker part of a shadow.

It is formed by total obstruction of light

ii. **Penumbra**- It is the lighter part of a shadow.

Penumbra is formed by partial obstruction of light.

ECLIPSE

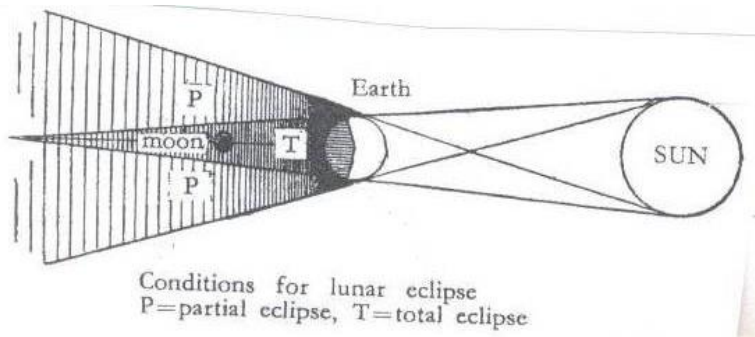
Is a total/ partial blocking of sunlight when the earth/moon is between the other bodies. The sun, the moon and the earth are the bodies commonly involved in the eclipse.

Types of eclipse

i. Solar eclipse

This is the eclipse of the sun.

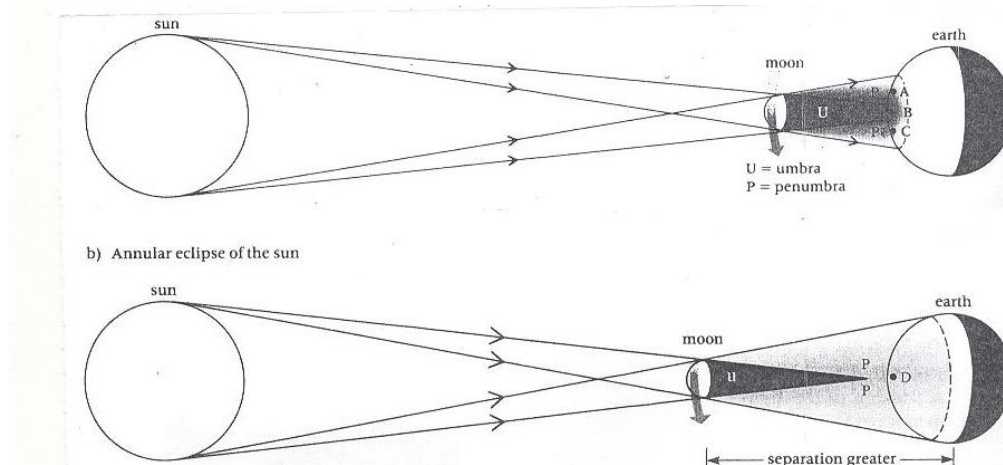
It occurs when the moon comes between the sun and the earth (SME)



ii. Lunar eclipse

This is the eclipse of the moon

It occurs when the earth comes between the moon and the sun (MES/SEM).



1. Write down the two types of eclipse

2. How is a lunar eclipse formed?

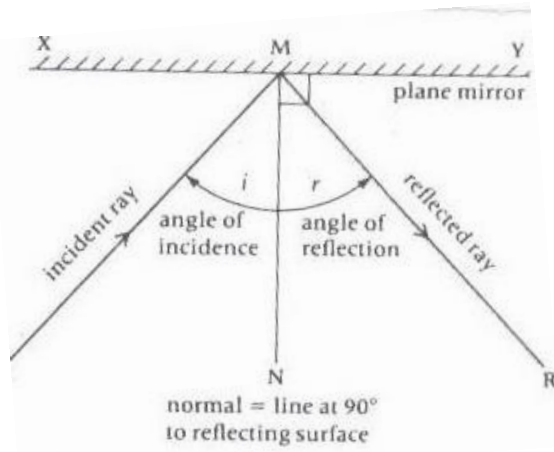
3.How are shadows important in our daily life?

Monday 6th july 2020

LESSON ONE AND TWO

REFLECTION

Is the bouncing back of light.



- The ray that hits the surface is **incident ray**.
- The ray that bounces off the surface is **reflected ray**.
- **The normal** is perpendicular between the incident ray and reflected ray.
- The angle between the normal and the incident ray is **angle of incidence**.
- The angle between the normal and the reflected ray is **angle of reflection**.

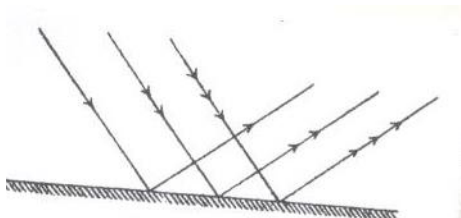
Types of reflection.

- Regular reflection.
- Irregular reflection/Diffuse reflection.

REGULAR REFLECTION.

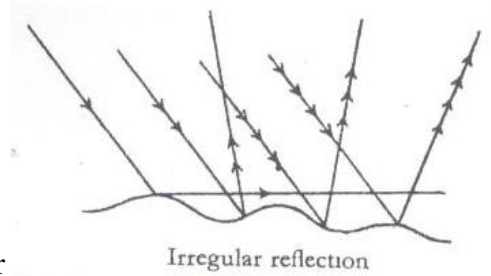
It occurs on shiny smooth surfaces.

The reflections are regular.



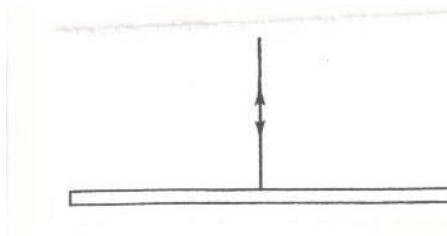
IRREGULAR/DIFFUSE REFLECTION

It occurs in shiny rough surfaces



The reflections are irregular

NORMAL REFLECTION



The laws of reflection.

- The incident ray, the reflected ray and the normal all lie in the same plane.
- The angle of incidence is equal to the angle of reflection.
- The ray travelling along the normal is reflected back along itself.
- An object appears a certain color because it reflects that color and absorbs the other colors.

questions

1. How can we keep our eyes clean?
2. Why is it important to use clean water when cleaning our eyes?
3. **Draw a diagram showing the effect on translucent objects on light.**

✓

LESSON 3 AND 4

➤ REFLECTION AND LIGHT

- Light coloured objects reflect more light than the dull ones.
- White light contains all the three primary colours of light.
- A white object absorbs no colour but reflects all.
- A black object absorbs all the primary colors and reflects none.
- An object which absorbs all the primary colors appears black.
- Black light means absence of any color.

When light falls on an object, the following can happen to it.

- It is reflected either regularly or irregularly.

- It can pass through a body totally or partially.
- It is either refracted or diffused.
- It can be absorbed either partially or completely.

The table shows why certain colours appear the way they appear

colour	Absorbs	Reflects	Appears as
Red object	Green, Blue	Red	Red
Blue object	Red, green	Blue	Blue
Green object	Red, blue	Green	Green
Black object	Red, Blue, Green(all)	None	Black.
White object	None	Red, Blue, Green(all)	White

Uses of reflection in our daily life.

- People can watch football match over the heads of the crowd using a periscope.
- Soldiers can see enemies without exposing themselves to them using periscopes.
- Submariners can see ships on the surface of the sea using periscopes.
- Mirrors are used on vehicles to see traffic behind and avoid causing accidents.
- Torches, car headlamps have concave reflectors.
- Solar cookers use a concave mirror to focus sunlight on spot and use it for cooking.
- Some shaving mirrors are concave as they magnify the image.

Questions

1. How does light move from one place to another?

2. Draw the following:

a) Diverging beam of light

b) converging beam of light

3. State types of reflection