



Primary 7 Integrated Science

Term 2

Theme: Matter and Energy

Topic 3/3 – Light Energy

Learning Outcomes: The learner:

- appreciates the importance of light as a form of energy in nature.
- develops the necessary scientific knowledge, principles and skills to solve problems related to light in real-life situations.

Light

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

Other uses of light

- It is used by plants for photosynthesis
- It is used in photography; photographs are taken only in light.
- Produces heat for drying of produce and clothes
- It is used in decorative lights
- It is used in photography

Exercise 1

State any four uses of light

Sources of light

- Natural sources of light: sun, stars, fireflies, glow worms
- Artificial sources of light: lamps, candles, electricity

NB. Moon is not a source of light because it only reflects light from the sun

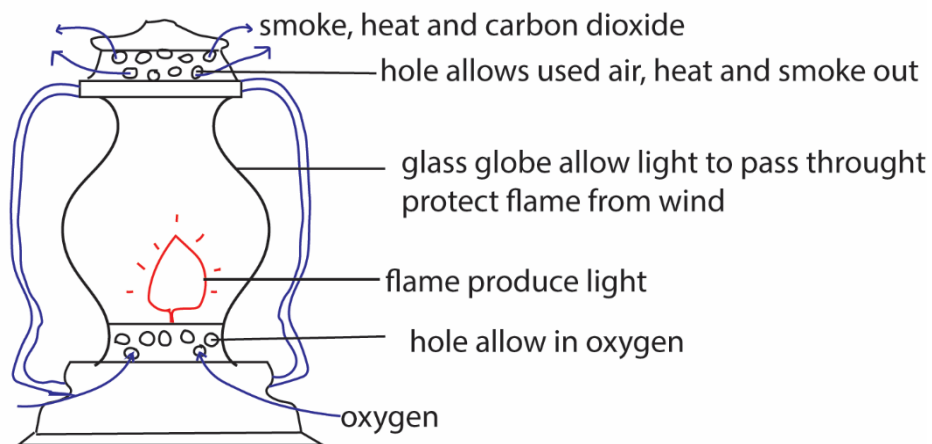
Exercise 2

Giving two examples each, distinguish between natural and artificial sources of light

Kerosene lamp

This is a type of lighting device that uses kerosene as fuel. Kerosene lamps have a wick or mantle as light source, protected by a glass chimney or globe; lamps may be used on a table, or hand-held lantern may be used for portable lighting.

Kerosene lantern

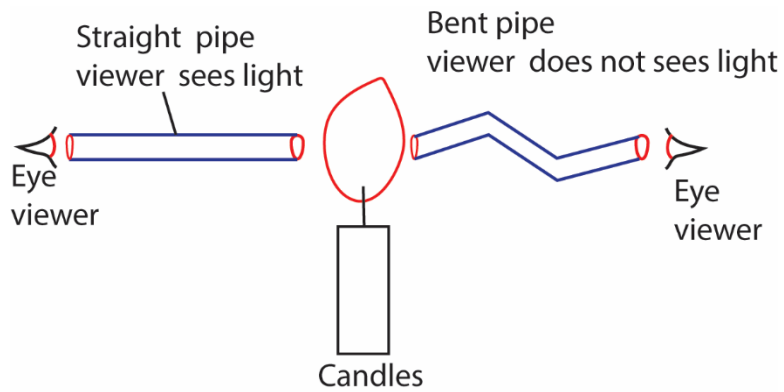


Properties of light

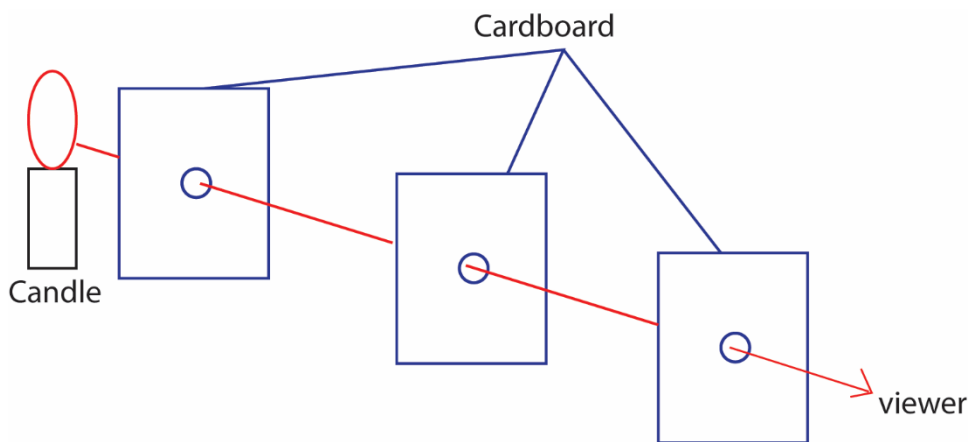
- (i) Light travels in a straight line
- (ii) Light can be reflected
- (iii) Light can be refracted

Experiment to show that light travel in a straight line.

- (i) Viewing candle light through a pipe.
With a straight pipe the viewer receives light while with a bent pipe the viewer does not receive light.



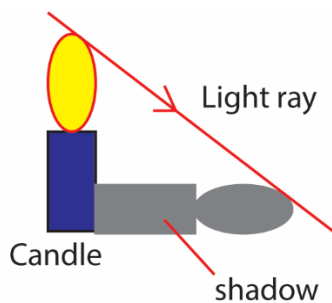
- (ii) Using cardboards with holes
 When the holes are in a straight line the viewer is able to see light



When one hole is removed from the line, the viewer is unable to see light.

- (iii) **Shadows**

A shadow formed when light traveling in straight light is obstructed by an opaque object.



Exercise 3

State four evidences that suggest that light travels in straight line

Effect of different materials on light

- (i) **Transparent materials** allow light to pass through for example clear glass, clear water, clear air.
- (ii) **Translucent materials** allows some light to pass through for example a patch of oil on paper, translucent glass
- (iii) **Opaque materials** do not allow light to pass through. Examples are brick wall. Tree, human being, stones.

Exercise 4

Using one example each what is the meaning of the following term

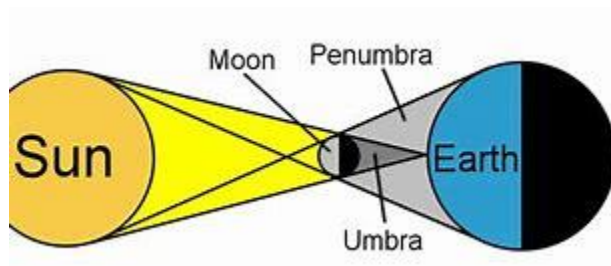
- (i) Transparent materials
- (ii) Opaque materials

Eclipses

The sun is a luminous object and thus a source of light. The earth and moon are opaque objects in the universe.

Solar eclipse or eclipse of the sun

When the moon rotates and comes between the sun and earth, it cast a shadow on the earth. This is also called solar eclipse

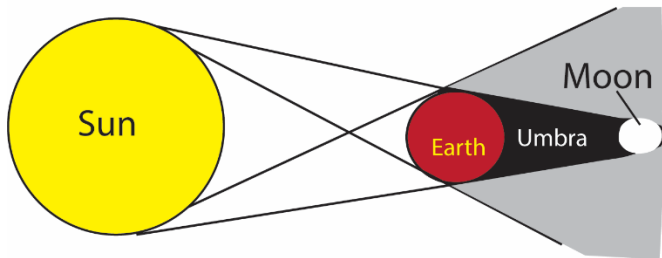


The dark shadow is called umbra while the lighter shadow is called penumbra.

Lunar eclipse or Eclipse of the moon

The earth comes between the sun and the moon, casting its shadow on the moon.

Lunar eclipse



Exercise 5

Draw

- (i) Eclipse of the sun
- (ii) Eclipse of the moon

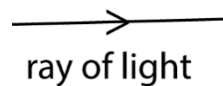
Ways of lighting a house

The house needs to be well lit during the day and at night. We can light our houses in the following ways:

- (i) Open the windows during the day to enable sunlight to light the house.
- (ii) Use **translucent** roofs. These are roofs made in a special way to allow light to pass through them. This type of roof allows sunlight to get into the house during the day.
- (iii) At night, there is no sunlight and therefore artificial lighting may be used. Examples of artificial lighting are: using fire from a torch, lamp, candle, gas lamp or electricity.

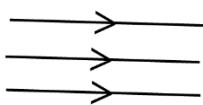
Light rays

The path taken or indicating the direction along which light energy travels is known as a ray of light. A ray is indicated with an arrow.

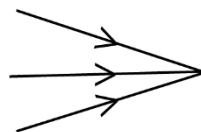


Beam of light

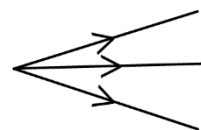
A group of light rays is called a beams. There are three types of beams namely



(a) Parallel beam



(b) Converging beam



(c) Diverging beam

Exercise 6

Draw the followings

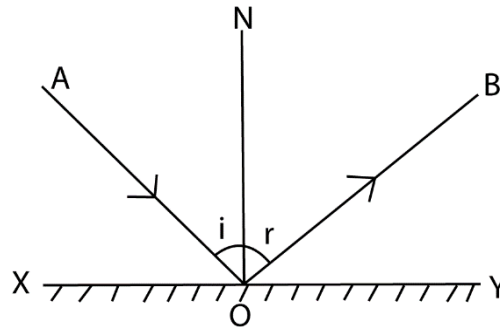
- (i) Parallel beam
- (ii) Convergent beam
- (iii) Divergent beam

Reflection of light at a plane mirror

Reflection is the bouncing back of light energy when it meets an obstacle

Laws of reflection of light

Consider a ray of light AO incident on a plane surface and then reflected along OB as shown.



O - point of Incidence.

AO - incident ray

OB - reflected ray.

ON - normal to the reflecting surface

$\angle i$ - angle of incidence

$\angle r$ - angle of reflection

Laws of reflection

LAW 1:

The incident ray, the reflected ray, and the normal at the point of incidence all lie in the same plane.

LAW 2:

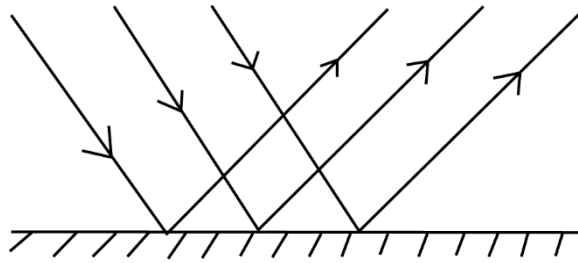
The angle of incidence is equal to the angle of reflection.

Exercise 8

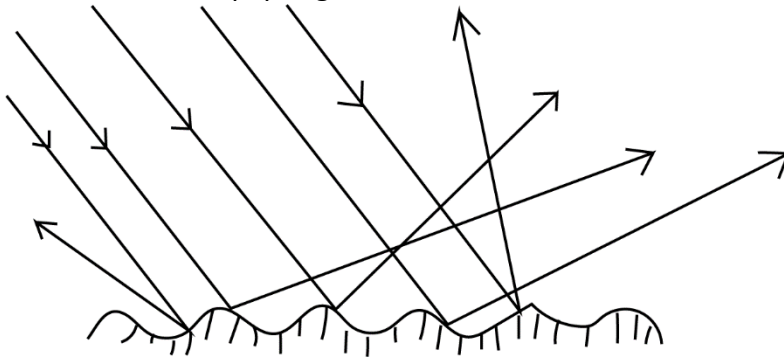
Using a diagram explain any two laws of reflection.

Types of reflection:

- (i) **Regular reflection:** This occurs when a parallel beam of light incident on a smooth surface such as a plane mirror gets reflected as a parallel beam as shown.



(ii) **Diffuse / irregular reflection:** This occurs when a parallel beam of light incident on a rough surface such as a paper gets reflected while scattered in different directions as shown



Differences between regular and irregular reflection

Regular reflection	Irregular reflection
Occurs on smooth surface	Occurs on a rough surface
Parallel incident beam is reflected parallel	Parallel incident beam is scattered after reflection
Reflected beam is very bright	Reflected beam is dull

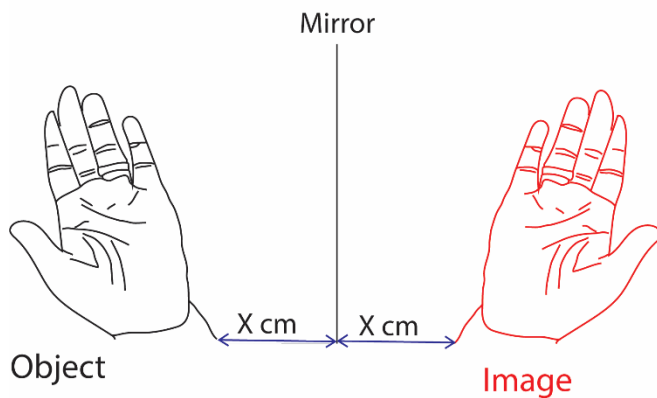
Properties of images formed by a plane mirror

- (i) They are upright
- (ii) They are the same size as the objects
- (iii) They are equal distance from the mirror as the mirror as the object
- (iv) They appear behind the mirror
- (v) They are laterally inverted.

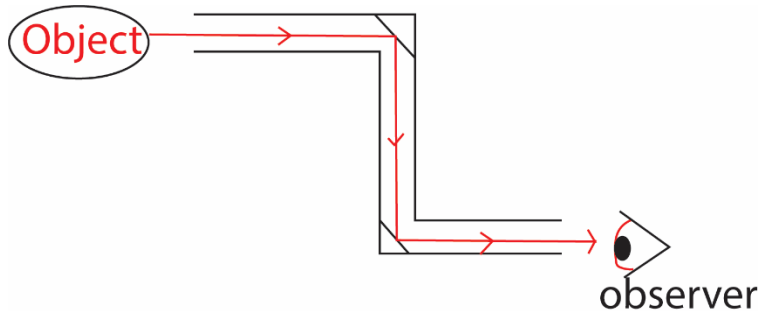
Exercise 9

- (a) Draw the following (i) Regular reflection (ii) diffuse reflection
- (b) State any two properties of image formed by a plane mirror.

Image formed by plane mirror



The periscope



It is an instrument used to observe things around corners. It is commonly used by submarines to see objects on the sea or ocean.

Refraction of light

Refraction is the bending of light rays as it travels from one medium to another. The medium can be water, air glass.

Principles of Refraction

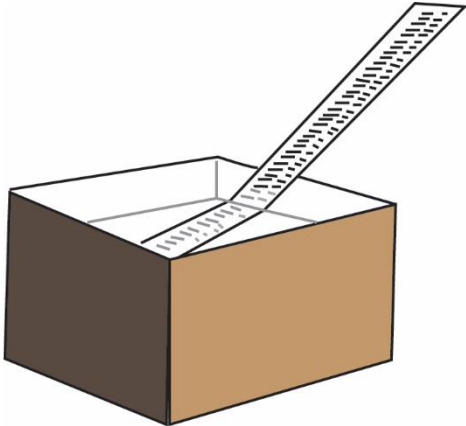
1. **Change of direction** – When light passes from one medium (like air) into another (like water or glass), it bends or changes direction.
2. **Speed change** – Light travels at different speeds in different materials. It slows down in denser materials (like glass) and speeds up in less dense materials (like air).
3. **Towards or away from the normal** –
 - When light enters a denser medium (air → glass), it bends **towards the normal** (the imaginary line at right angles to the surface).
 - When light enters a less dense medium (glass → air), it bends **away from the normal**.
4. **Reversibility** – The path of light is reversible. If light travels back through the same path, it will follow the same direction.

5. **Law of Refraction (Snell's Law)** – The ratio of the sine of the angle of incidence to the sine of the angle of refraction is constant for the same two media.

Applications of refraction of light

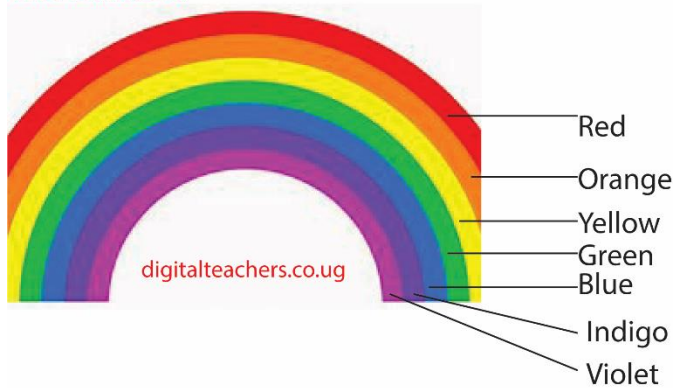
Refraction of light can be observed under the following condition

- (a) A ruler placed in water appears bent at the surface of water



- (b) Floor of swimming pool appear shallower.
(c) Things appear larger in water
(d) A coin put in water appear raised.

The rainbow



It is formed due to dispersion/split of light by rain droplets

The splitting of white light to form a band of seven colors is known as **dispersion of white light**.

The band of colors is known as a **spectrum**

The rainbow spectrum can be remembered from acronym “ROYGBIV” starting with topmost color red.

The same spectrum like that is rainbow obtained by dispersion light through a glass prism

Dispersion of white light in glass prism

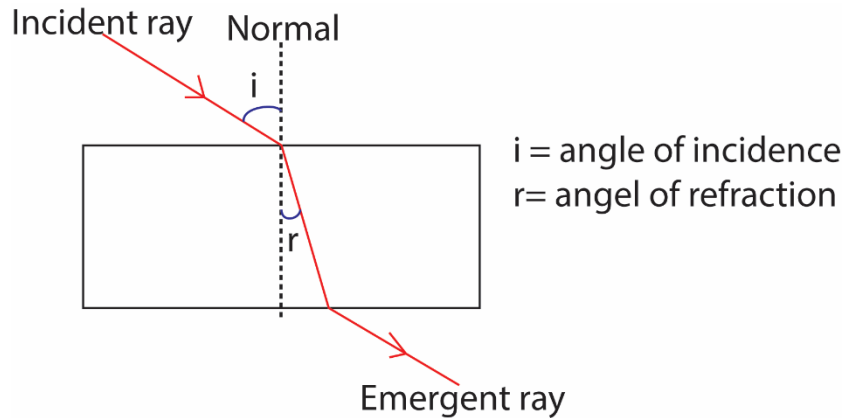


Exercise 10

- (a) What is refraction of light
- (b) State any two examples of daily life for refraction of light.

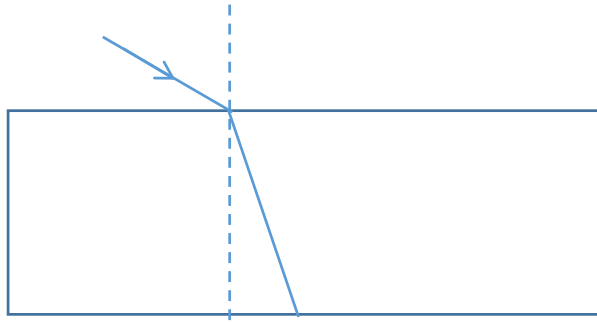
Refraction of light in a glass block

When light travels from a less dense medium e.g. air to a denser medium such glass light rays bend towards the normal as shown below



Exercise 11

Complete the following diagram to show the movement of light through a glass block.



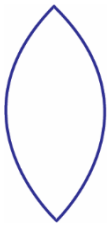
Lenses

Lenses are made of transparent materials.

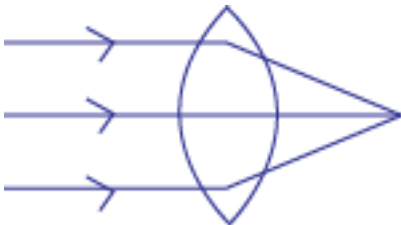
They have curved smooth surfaces that help them to refract light that passes through them

They are two main types

(a) Convex or converging lens



When light passes through a convex lens, it refracts light in such a way that the rays from the lens meet at one point.

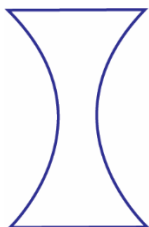


Uses of convex lens

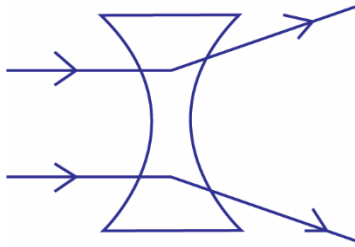
Convex lenses are used in

- (i) Correction of long-sightedness
- (ii) In lens camera
- (iii) binoculars

(b) Concave or diverging lens



When light passes through a concave lens, it refracts light in such a way that the rays from the lens spread out in all



Uses of concave lens

- (i) Correct short sightedness

Exercise 12

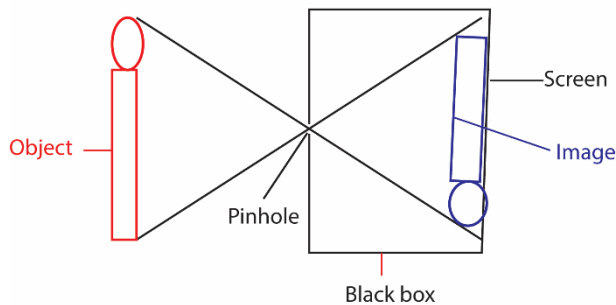
State any one application of each of the following lenses

- (i) Converging lens
- (ii) Diverging lens

Pinhole camera

It is a dark box or a tin which allows light through a tinny hole made on one side of the box or with a pin. At the end of the box or tin there is a film or a screen

Pinhole camera



Properties of image formed by a pin hole camera

It is real

It is inverted

Exercise 13

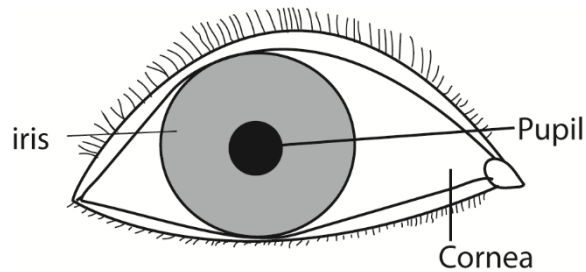
- (i) State any two properties of images formed by pinhole camera.

- (ii) Suggest any two ways the size of the image formed by a pinhole camera can be varied.

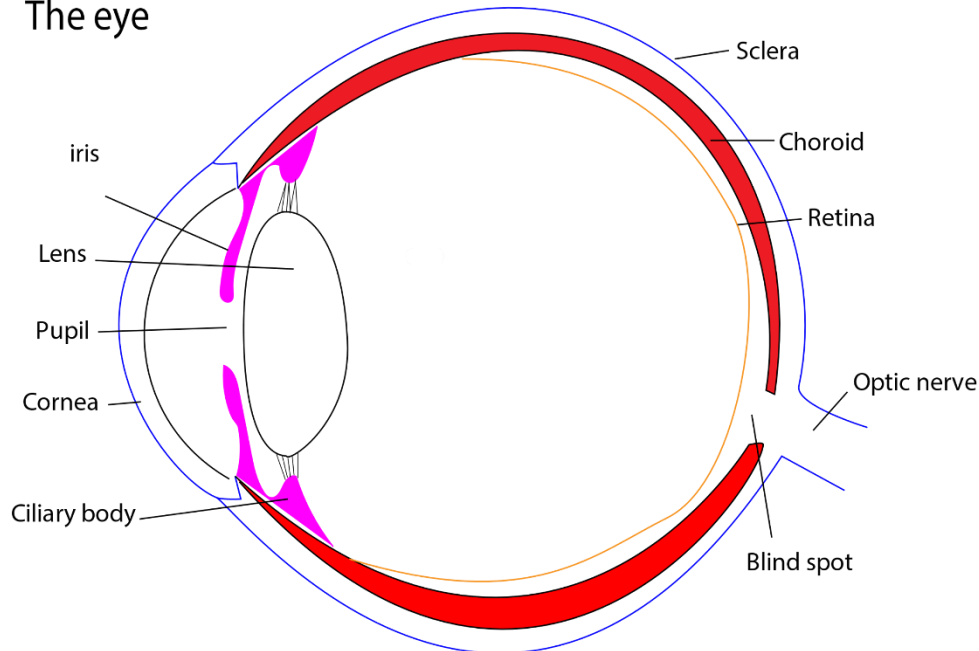
Eye

The eye is a sense organ for sight.

The external parts of the eye are shown in figure below



The eye



Functions of the parts of the eye

- (i) Eyelids are covers of the eye. They close to protect the eye from danger.
- (ii) Lens refracts and focus light to the retina
- (iii) Iris adjust the size of the pupil and thus the amount of light that enters the eye
- (iv) Retina is where the image forms
- (v) Pupil allows light to pass through into the eye.
- (vi) Optic nerve is a sensory nerve that sends sight message from the eye to the brain for interpretation of what we see.
- (vii) Pupils allow light into the eye.

Characteristics of images formed in the eye

- They are upside down
- They are smaller than the object (diminished)
- They are real

Exercise 14

State the functions of the following parts of the eye

- Pupil
- Iris
- Lens
- retina

Controlling amount of light entering the eye

The amount of light entering the eye is controlled by the iris.

In bright light, the iris circular muscles contract and pupil constricts.

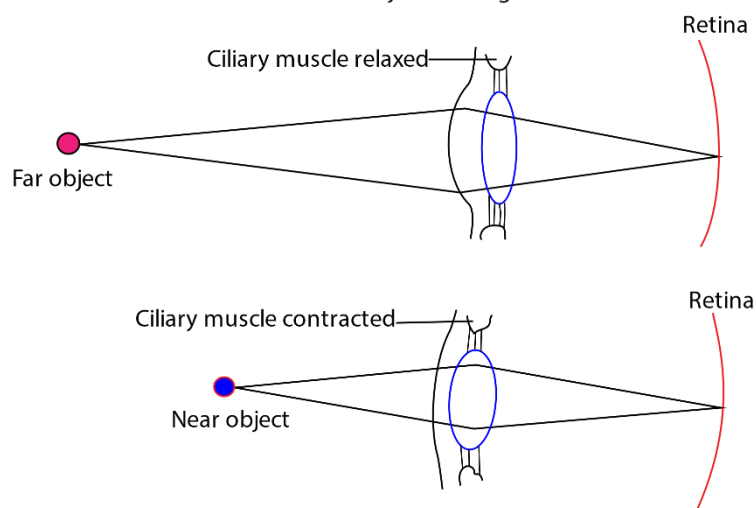
In dim light iris radial muscles contract and the pupil widens.

Accommodation

Is the ability of the eye to see near and far objects

- To see near objects, the ciliary muscle contract releases the tension on the lens allowing it to adopt a more spherical shape. The lens then refracts light strongly.
- To view distant objects, the ciliary muscles relax, the suspensory ligament exert a pull on the lens and it flattens.

The figure shows the lens shape changes depending on whether a distant or near object is being viewed

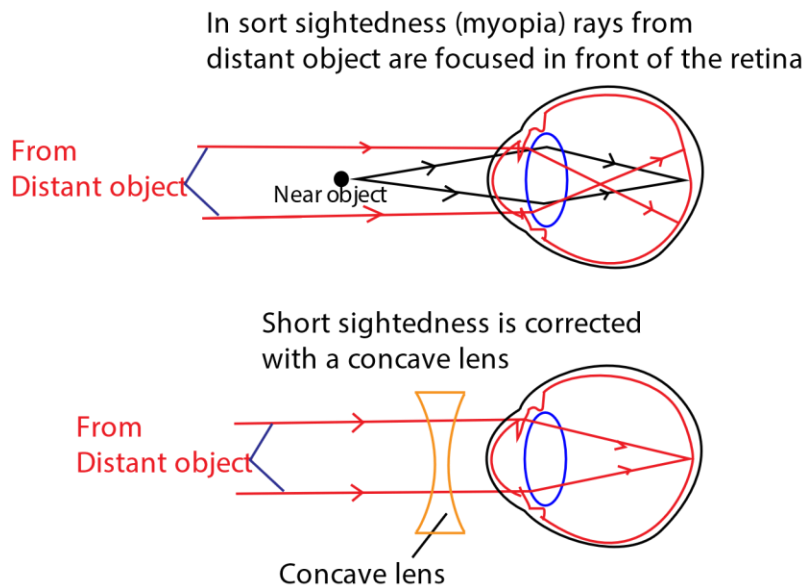


Eye defects

Short sightedness is inability to see distant objects clearly because rays from a distant object are focus in front of the retina.

- Causes**
- (i) Lens too strong
 - (ii) Eyeball too long

Correction: by use of a concave or diverging lens

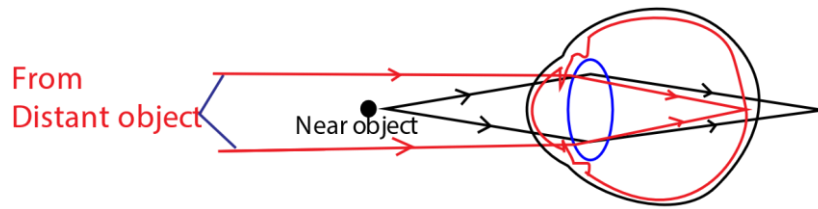


Long sightedness is inability to see near objects clearly because rays from a near object are focused behind the retina

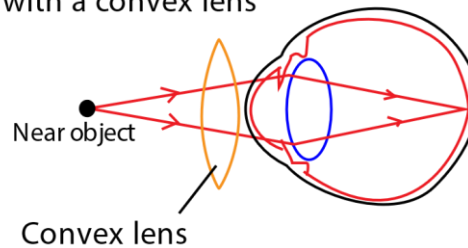
- Causes**
- (i) lens too weak
 - (ii) eye ball too short

Correction: by use of a convex lens

In long sightedness (hyper myopia) rays from near object are focused behind the retina



Long sightedness is corrected with a convex lens



Exercise 15

Name one lens that can correct each of the following eye defect.

- (i) Short sightedness
- (ii) Long sightedness

Astigmatism

This is a condition in which a person is not able to see both vertical and horizontal objects clearly at the same time. It is caused by having

Causes

The unevenly curved cornea

Correction of astigmatism

By wearing spectacle which have special cylindrical lenses

Color blindness

This is a condition when one is not able to differentiate between some colors.

Common diseases

Conjunctivitis (red eyes)

It is a contagious disease caused by virus or bacteria

Spreading by touching the eye with infected fingers

Sign and symptoms

- (i) The white of the eye becomes pink
- (ii) Burning, itching and pain of the eye
- (iii) Tears in the eye

Control

- Isolation of a sick person
- Avoid sharing basin, towels and shaking hands with infected persons.

Trachoma

It is an infectious disease caused by bacteria known as chlamydia

The disease is spread by touching the eye with infected person or by houseflies.

Symptoms

- Mild redness, Painful itching of eyes
- Eye turns reddish with tears
- Discharge from the eye containing pus after sleeping
- Eyelid swelling
- scarring

Control

- Isolation of a sick person
- Avoid sharing basin, towels and shaking hands with infected persons.
- Properly wash the eye with water and soap.
- Proper hygiene

Treatment: tetracycline ointment

River blindness

It is caused by a protozoa (*Onchocerca vivus*). The disease is transmitted by black flies also called Jinja flies. The flies lives on the banks of fast flowing rivers.

If untreated it leads to blindness.

Symptoms

- Swelling on the skin
- Itching skin
- Skin rash
- Damaged iris

Control

- Keeping away from black flies infected river banks
- Clearing the bushes around the house
- Spraying the black flies with insecticide
- Antibiotics

Cataracts

In this condition, the lens of the eye become grey and opaque. A person with cataract does not see clearly.

It is corrected by an operation where the grey layer is removed.

Night blindness

It is caused by lack of vitamin A in one's diet.

The affected person cannot see well especially in the evening and at night

It is corrected by eating food with vitamin A such as carrots, mangoes, pawpaw, liver and onions.

Sty

It is a small swelling which forms on the eyelid

It looks like a small boil. It is caused by bacterium.

Control

Proper hygiene

Exercise 16

Name the causes of the following eye conditions

- (i) Night blindness
- (ii) Trachoma
- (iii) Cataract
- (iv) Color blindness

Strength of the eyes

The strength of the eyes is measured by how clearly one can see far or near objects in a hospital, eye checking involutes' standing about two and a half metres away from a board with letters written in different sizes. A person is then required to close one eye and read the letters as they are pointed out by the **optician**. Thereafter, one is supposed to close the second eye and read with the other eye.

This test identifies:

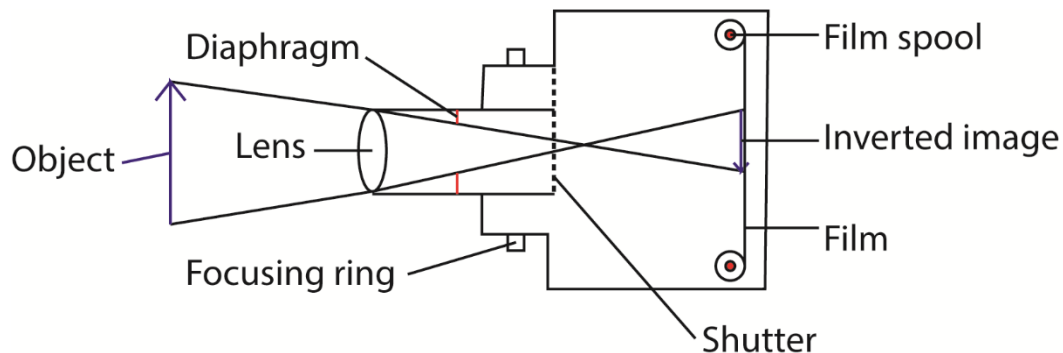
- (i) People who are long sighted; that is, those that can see distant objects clearly and are unable to see objects that are very near.
- (ii) People who are short sighted; that is, those that can see near objects clearly and are unable to see objects that are very far.
- (iii) Blind people that cannot see at all.

Care for the eye

- Avoid looking directly at the sun or bright light.
- Wash your eyes regularly

- Avoid reading too bright or too dim light because both spoil the eye.
- Eat food containing vitamin A.
- Avoid sharing handkerchiefs, eye glasses and face towel
- Wear sunglasses in bright light.

The lens camera



Parts of a lens camera

1. The **lens** focuses light from the object to the film
2. **Diaphragm** is a hole of adjustable size and controls the amount of light entering a camera
3. The **photographic film** has a light sensitive chemical on which the image is formed
4. **Focusing ring** adjusts the position of the lens to focus light on the film
5. **Shutter** opens to allow in light.

After taking the photographs and the film is filled up, the film is removed and developed in some chemicals in the darkness to form a negative. From the **negative**, photographs are printed.

Exercise 17

Name the corresponding parts of a lens camera to the following parts of the eye

- (i) Pupil
- (ii) Lens
- (iii) Retina
- (iv) eyelids

Characteristic of images formed in a lens camera

- (i) They are upside down or inverted.
- (ii) They are real
- (iii) they are diminished

Comparison between the mammalian eye and a lens camera

Similarity

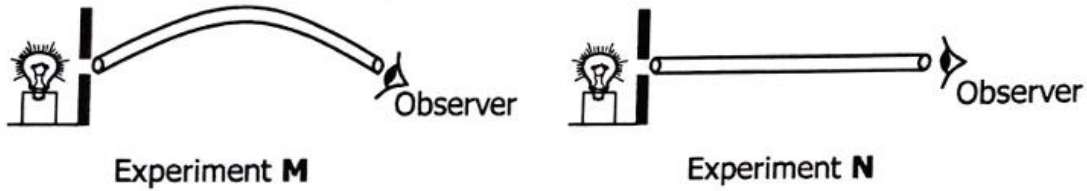
- 1. Images formed are upside down or inverted.
- 2. Images formed are real
- 3. Images formed are diminished
- 4. Both contain focusing convex lens

Differences

Eye	Lens camera
1. The pupil admits in the light	The shutter admits in light
2. Images forms on the retina	Image form on film
3. Eye covered with eyelids	Shutter protects the light from the camera
4. Lens focuses by change of shape	Lens focuses by change of distance from the camera.

Revision exercise

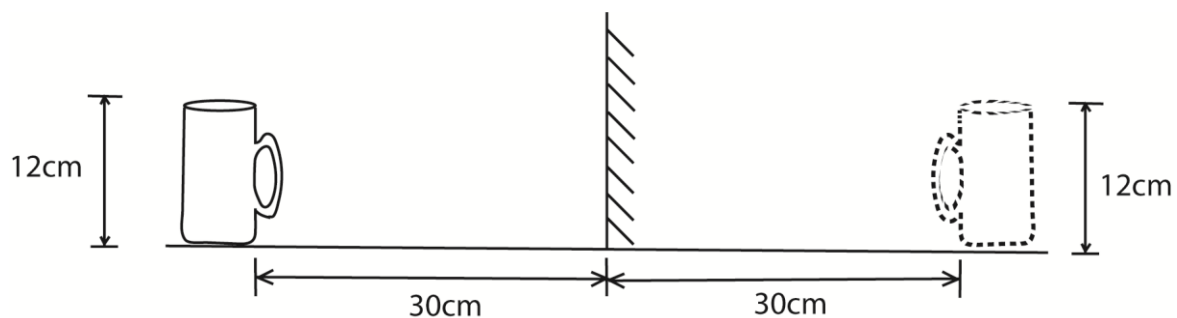
1. The diagrams below show experiments that were carried out on how light travels. Use them to answer the questions that follow.



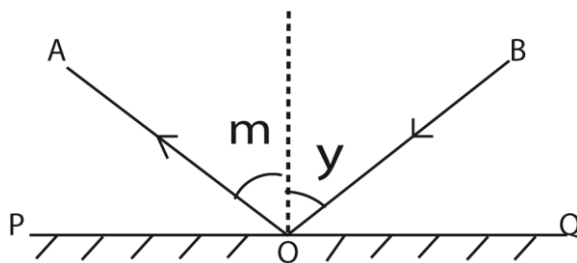
- (a) Identify the experiment in which the observer was able to see light.
Experiment N
- (b) State the principle of light demonstrated in the experiment above.
Light travels in straight line
- (c) Explain how the principle in (b) above results in the formation of shadows.
A shadow forms when light is blocked by an opaque object.
2. State the reason why a ray of light bends as it passes through a glass block.

Light bends in a glass block because it changes speed when moving between air and glass. This change of speed makes the ray of light change direction.

3. The diagram below shows a cup 12 cm high placed 30 cm in front of a plane mirror. Draw the image of the cup



- (b) The diagram below shows a reflection on a plane mirror PQ

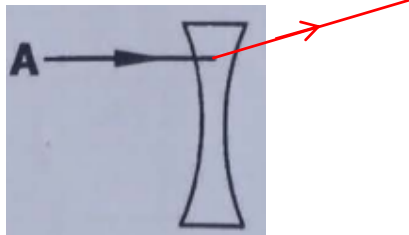


- (i) Name ray A.
- (ii) Emergent ray
- (iii) State the relationship between angles m and y
 $m = y$

4. State the effects of opaque objects on the beams of light.

Opaque objects block light forming shadows

5. The diagram shows a light ray A onto a lens. Use it to answer questions that follow



(a) Name the type of lens in the diagram above

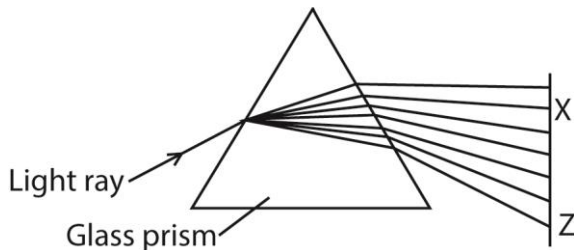
Concave/diverging lens

(b) Complete the path of the ray as it passed through the lens.

6. State the principle on which the periscope works.

Reflection of light

7. The diagram below shows how light is split into seven colors using a glass prism. Study it and answer the questions that follow.



(a) Name the colors X and Z

(i) X - Orange

(ii) Y - Violet

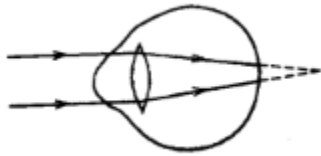
(b) Why do light bend at different angles as they leave the glass prism

They have different refractive indices

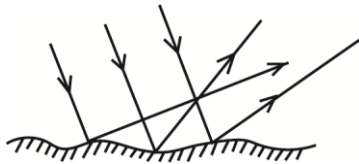
(c) Why do we usually see the above band of seven colors in the sky when it is raining lightly

Because light is splint into different colors by rain droplets

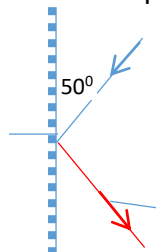
8. The diagram shows a defect of the human eye. Study and use it to answer the questions that follow.



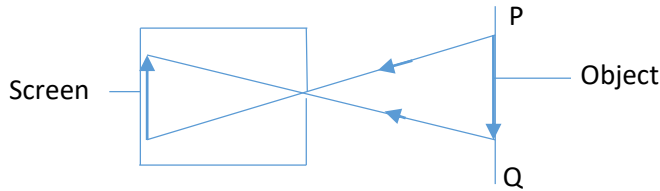
- (a) Name the eye defect shown above
Longsightedness
- (b) State the two causes of the eye defect shown above
- (i) Weak lens
 - (ii) short eye ball
- (c) What type of lens is used to correct the above eye defect?
Convex/converging lens
9. The diagram below shows reflection of light. Study and use it to answer questions that follow



- (a) What type of reflection is shown
Diffuse reflection
- (b) Why are the rays reflected as shown in the diagram?
The surface is uneven/is not smooth
10. A ray of light meets the surface of the mirror as shown in the diagram below. Draw a reflected ray. (Use of a compass not necessary)



11. Below is a drawing of a pin-hole camera with an image of an object formed on the screen.
The object is located along line PQ.

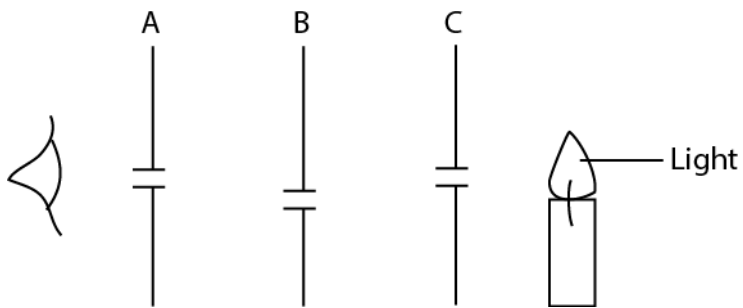


- Draw lines to show how the image is formed.
- Draw the object
- Compare the image and the object.

The image is inverted

Both the image and the object are real

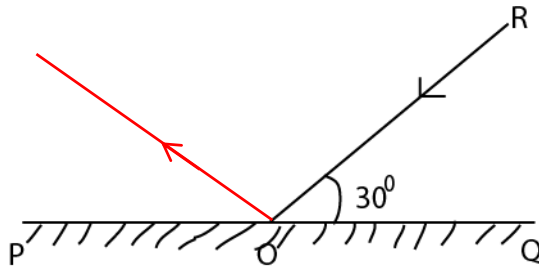
12. In the diagram below, A, B, C, d. are cards with small holes as shown below. Student at E is trying to see the light at A through the holes.



Why can't the light be seen at E?

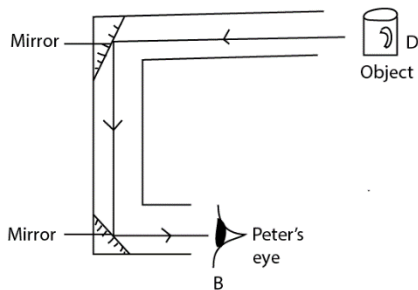
The holes are not in line to allow light through

13. The diagram below shows light falling on a plane mirror. PQ. Use it to answer question that follow



Complete the drawing accurately, to see the reflected ray.

14. The diagram below represents an instrument used in science. Use it to answer the questions that follow:



(a) How is peter at position B able to see the object at D?

By reflection from/on the mirrors

(b) What type of mirrors are used in this instrument?

Plane mirrors

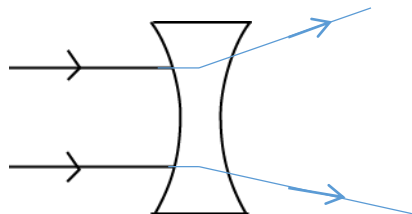
(c) What is the name of this instrument?

Periscope

(d) Give the situation where this instrument is used?

To view objects at the surface of water by people in submarine

15. Complete the rays through the lens in the diagram below.



16. The diagram below shows a lantern lamp. Use it to answer question 42



17. (a) How does paraffin move up through the wick?

By capillary action

(b) Name two forms of energy produced by this lantern lamp.

Light energy

Heat energy

(c) What is the use of part marked S.

Allow in oxygen to support burning

18. How does the lens shown below affect light rays?

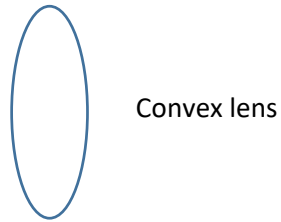


It diverges light rays

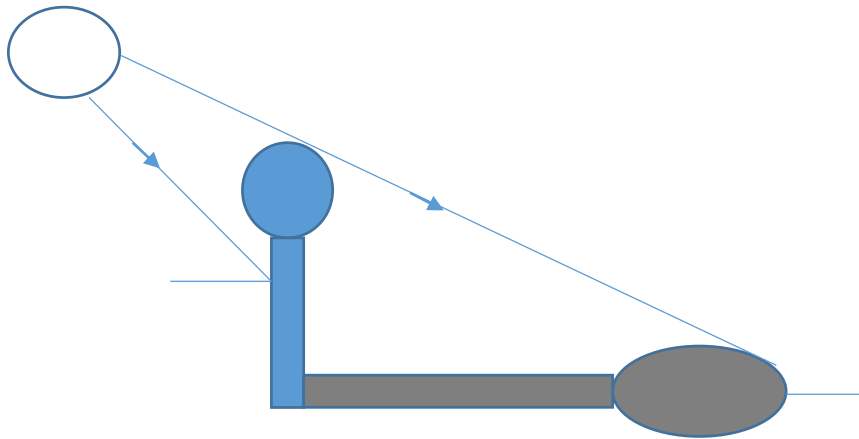
19. Why is the moon not regard as a star?

Does not give out its own light, it only reflects light from the sun

20. 25. Musa is long-sighted. Draw the type of lens he should use to correct his eye problem.



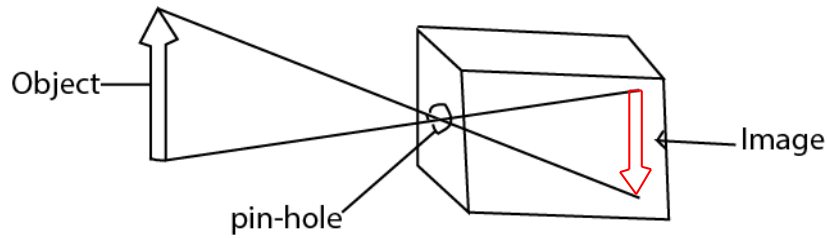
54. Draw a diagram showing how a shadow is formed. Label your diagram correctly



21. In the space provide, draw a convex lens

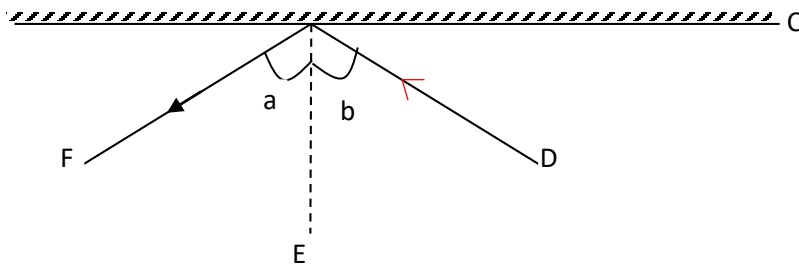


22. The below shows a pin-hole camera with an object. The image been left out. Complete the diagram drawing the image in the pin-hole camera.



The diagram below shows a ray of light striking the mirror

Study it and answer question that follow



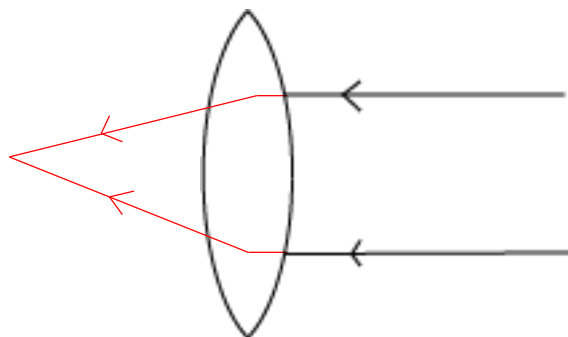
- (a) Name the part marked **C**: mirror
- (b) Put an arrow on line **D** to show the diagram of the ray of light
- (c) If angle $b=40^\circ$, what is the size of angle **a**?

$$a = 40^\circ$$

- (d) Give a reason for your answer in (c) above.

Because angle of incidence is equal to angle of reflection

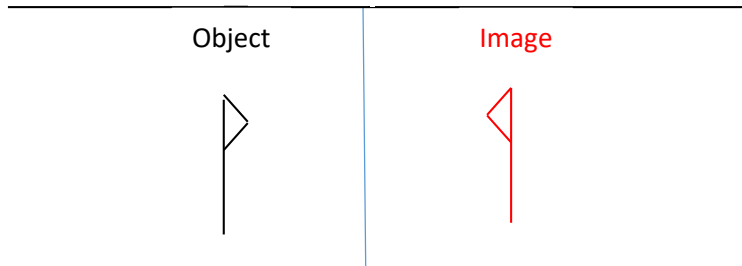
The diagram below shows parallel rays striking a convex lens. Study it and answer question 15 and 16.



23. Complete the diagram to show the path of the rays after passing through the lens
 24. What eyes defect does this type of lens correct?

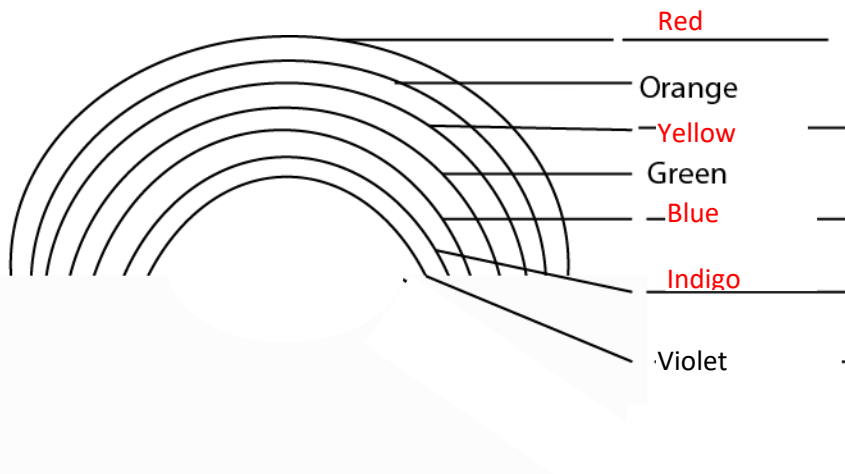
Long sightedness (hypermetropia)

25. The diagram below shows an object 2 metres away from the mirror.



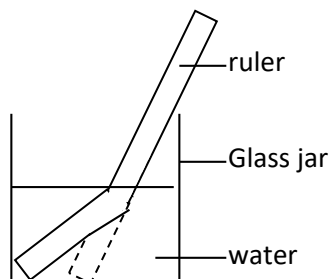
26. The diagram below the even colors of a rainbow

Completer the missing bands in the spaces provided in the diagram below



The diagram below shows a glass with water and a straight ruler in it

Use it to answer question 6



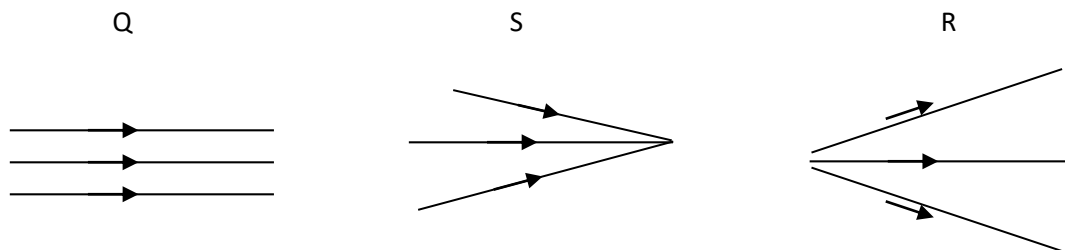
27. What causes the ruler to appear bent?

The ruler appears bent due to refraction of light

28. Give any one reason why white objects are seen easily even at a distance.

They reflect light

29. The illustration below show different types of light rays. Use them to answer questions that follow:



(a) Name the following rays of light.

(i) Q **Parallel rays**

(ii) S **Converging rays**

(b) Suggest the type of lens that can be used to make light rays move as shown in R above.

Concave lens/diverging lens

(c) What eye defect is corrected by a lens which makes rays move as shown in R?

Short sightedness

30. What determines the size of the image in a pinhole camera?

- **Distance of the object from the pinhole**

- **distance of pin hole from the screen**

31. (a) Name one natural and artificial source of light.

(i)Natural: sun, star, glow worm, fireflies, lightening, volcanic eruption

(ii)Artificial: electric bulb, candle, lamp, television set, torches

(b) Why is the moon not regarded as a source of light?

The moon does not produce but reflex light from the sun

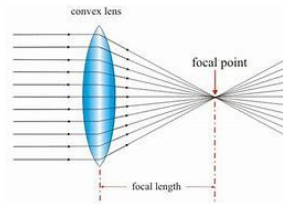
(c) Give one way in which reflection of light is important to man.

- Enables man to see objects
- Used in periscope
- Dressing mirror
- Saloons
- Side mirror to see rear cars
- Supermarket to see thieves
- Driving mirror
- The diagram below shows a method of making a magnet.

Study it and use it to answer question 21.

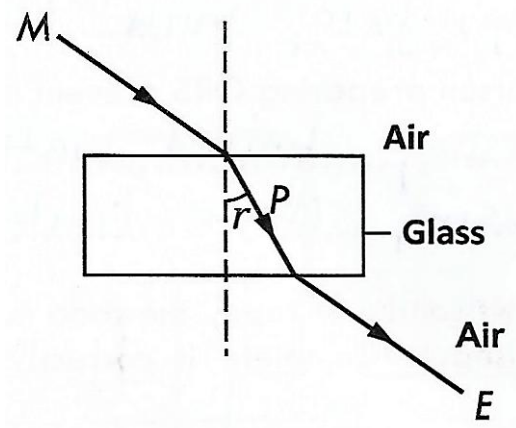
32. Name the type of lens used to correct long sightedness

Convex lens or converging lens



The diagram below shows how light passes through a glass block.

Study and use it to answer question 25.



33. (a) Name the rays M and P

(i) M – incident ray

(ii) P – Refracted ray

(b) Name the angle marked *P*

Angle of refraction

(c) Give a reason why ray *P* bend as shown in the diagram

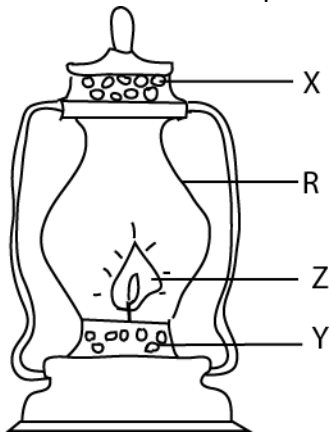
Light is moving from less dense medium to a denser medium

34. In the space provided below, draw a lens used to correct short sightless.



35. The diagram below shows a kerosene lamp

Study and use it to answer the questions that follow



(a) Name the part marked with letter Z.

Flame or fire

(b) Why is the part marked R make of glass?

To allow light to pass through

(c) Give the importance of the parts marked X and Y when the lamp is in use.

(i) **To let out carbon dioxide, heat and smoke**

(ii) **To let in fresh air**

36. The table below shows part of human eye in A and that of a lens camera in B.

A	B
Iris	Shutter
Pupil	Film
Eye lid	Diaphragm
Retina	Aperture

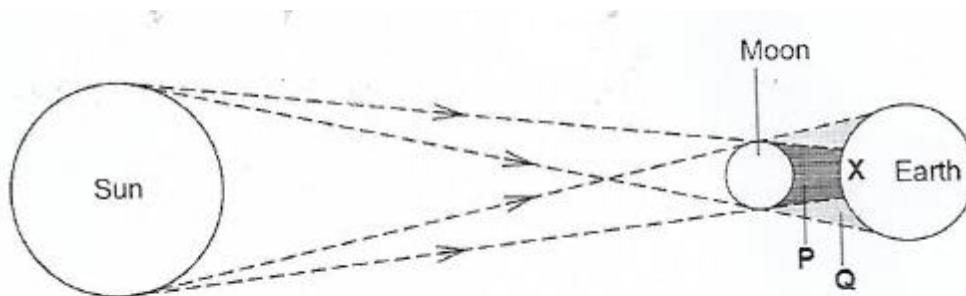
For each of the parts of the human eye, write the part of the lens camera from B which performs a similar function.

- (i) Iris **diaphragm**
- (ii) Pupil **aperture**
- (iii) Eye lid **shutter**
- (iv) Retina **film**

37. What happens to light rays when they meet a convex lens?

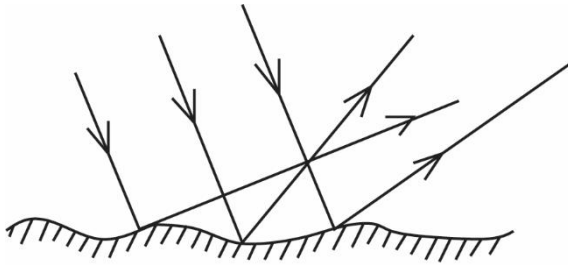
They converge.

38. The diagram below shows a type of eclipse. Study and use it to answer the questions that follow



- (a) Name the type of eclipse shown in the diagram above
Eclipse of the sun
- (b) Name the shadows marked P and Q
 - (i) P - **Umbra**
 - (ii) Q - **Penumbra**
- (c) What happens to a person who would be in part X during the eclipse?
Would be in total darkness

The diagram below shows reflection of light. Study and use it to answer question



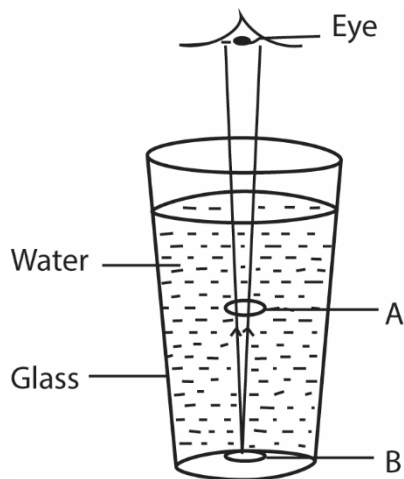
39. What type of reflection is shown above?

Diffuse/ irregular reflection

40. Why are the ray reflected as shown in the diagram above?

It occurs on rough surface

41. The diagram below shows an object in glass of water. Study and use it to answer the question that follows.



Why does the object seem to appear at point A yet it is at point B?

Because of refraction of light

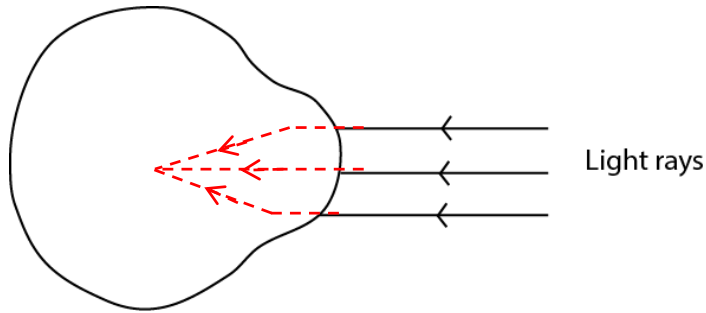
42. Name one body organ in man that makes use of light energy from the sun.

Eye

43. In the table below, some of the diseases are given below with their symptoms and prevention/controls. Study it and answer the missing information.

Disease	symptoms	control
Trachoma	<ul style="list-style-type: none"> • Itching and irritation of the eyes and eyelids. • Redness of the eyes. • Swollen eyelids (sometimes thickened). • Discharge from the eyes containing mucus or pus. • Watery eyes or tearing. • Sensitivity to light (photophobia). • Eye pain due to inflammation. • Blurred vision in later stages 	Washing of eyes, avoid sharing articles with sick person, e.g. basin, towel, medical treatment
River blindness	Swelling on the skin, Itching skin, Skin rash, Damaged iris	Keeping away from black flies infected river banks, Clearing the bushes around the house, Spraying the black flies with insecticide

44. Complete the rays of light in the diagram below to show a condition of short-sightedness.



46. Why is a concave lens used to correct short sightedness?

It diverges light

47. Which part of the eye function like a film in a camera?

It is where the image is formed

48. State one way is the retina of human eye similar to the film of a pinhole camera.

Both form real images

Both form inverted images

49. Musa is long-sighted. Draw the type of lens he should use to correct his eye problem.



50. Which part of human eye works like a film in camera?

retina

51. Give any one use of wearing sun glasses.

Protect the eye from strong light

52. Give the difference between river blindness and night blindness

River blindness is caused by a worm while night blindness is due lack of vitamin A.

53. In the space provided below, draw a lens used to correct short sightless.



54. Name the human body organ that uses light for it to function.

Eye

55. Name the part of the human eye that works like the film in a camera.

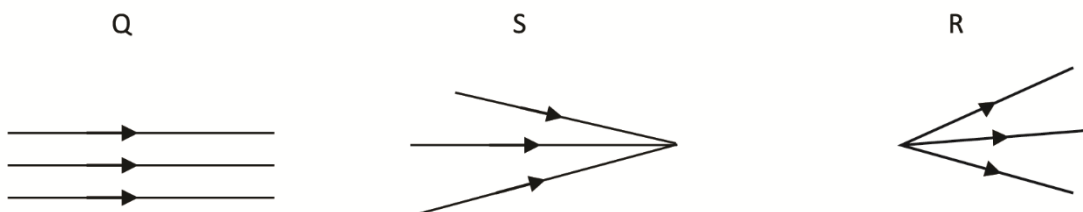
Retina

56. Apart from trachoma, name one other eye disease.

Red eye

River blindness

57. The illustration below show different types of light rays. Use them to answer questions that follow:



58. (a) Name the following rays of light.

(i) Q **parallel beam**

(ii) S **converging beam**

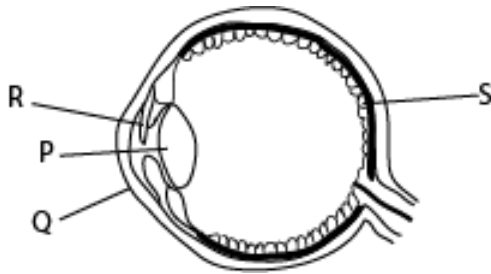
(b) Suggest the type of lens that can be used to make light rays move as shown in R above.

Concave/diverging lens

(c) What eye defect is corrected by a lens which makes rays move as shown in R?

shortsightedness

59. Below is a diagram of an eye. Study it and use it to answer question that follow.



(a) Name the part marked:

(i) **P: lens.**

(ii) **Q: cornea**

(b) What is the function of the part marked R?

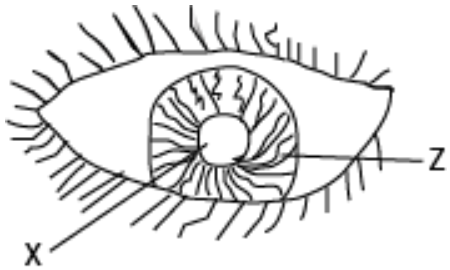
Regulates the size of pupil/light entering the eye

(c) Which letter on the diagram shows where images are formed?

Letter S

60. The diagram below is of a human eye.

Use it to answer question that follow



(a) Name the part marked with letter X

pupil

(b) Give the use of the part marked with letter Z.

Regulates the size of the pupil/amount of light that enters the eye

61. (a) Which part of the body is affected by each of the following diseases

(i) Scabies : skin

(ii) Trachoma : eye

62. Name the type of lens used to correct long sightedness

Convex/converging lens

63. The table below, shows source of food, the food nutrients in it and the related deficiency disease. Complete it correctly.

Source of food	The food nutrient	Related deficiency
Eggs, greens, fruit	Vitamin A	Night blindness

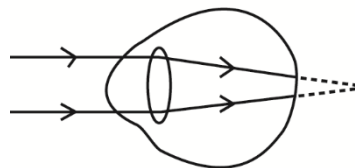
64. The table below shows diseases, the vectors that spread them and disease-causing germs. Study and complete it correctly.

Disease	The vector that spread them	<i>Disease-causing germ</i>
River blindness	Blackflies	Worm (Onchocerca volvulus)

65. The table below shows some common infection, organisms that cause it and the body part affected. Study and complete it correctly.

Common infections	Organism that cause it	Body parts affected
Trachoma	Chlamydia	Eyes

66. The diagram shows a defect of the human eye. Study and use it to answer the questions that follow



(a) Name the eye defect above

Long sightedness

(b) State two causes of of the eye defect shown above

(i) Short eyeball

(ii) Weak lens

(c) What type of lens is used to correct the above defect?

Converging/convex lens

67. The table below shows some common infections, organism that cause it and the body parts infected. Study and complete it correctly

Common infection	Organism that cause it	Body parts infected
Trachoma	chlamidia	eye
River blindness	onchocerca volvulus/worm	Worm (Onchocerca volvulus)

68. Give two similarities and differences between the eye and a lens camera

(a) Similarities

- (i) Images formed are upside down or inverted.
- (ii) Images formed are real
- (iii) Images formed are diminished
- (iv) Both contain focusing convex lens

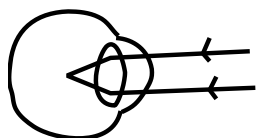
Differences

Eye	Lens camera
(i) The pupil admits in the light	The shutter admits in light
(ii) Images forms on the retina	Image form on film
(iii) Eye covered with eyelids	Shutter protects the light from the camera
(iv) Lens focuses by change of shape	Lens focuses by change of distance from the camera.

69. Give the functions of the following parts of the eyes

- (a) Lens – converges light to the retina
- (b) Iris – controls amount of light entering the eye/size of the pupil
- (c) Retina – it is where the image is formed
- (d) Pupil – allows light to enter the eye

70. Below is a diagram showing an eye defect.



(a) Name the eye defect shown in the diagram above.

Short sightedness

(b) Give reasons for your answer in (a) above

Light from distant object converges before the retina

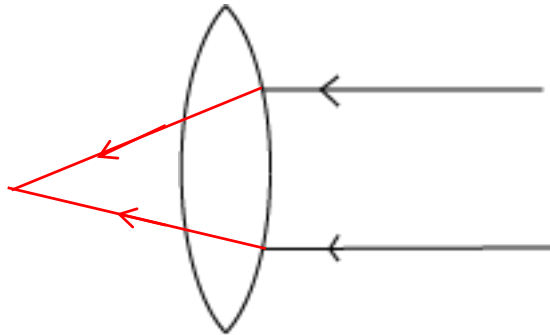
(c) How can this eye defect for your answer in (a) above corrected?

Using divergent lens/concave lens

71. Why is a concave lens used to correct short sightedness?

Diverges light so that it is focused on the retina

72. The diagram below shows parallel rays striking a convex lens. study it and answer questions that follow.



- (a) Complete the diagram to show the path of the rays after passing through the lens
- (b) What eyes defect does this type of lens correct?

Long sightedness

73. The table below shows part of human eye in A and that of a lens camera in B.

A	B
Iris	Shutter
Pupil	Film
Eye lid	Diaphragm
Retina	Aperture

For each of the parts of the human eye, write the part of the lens camera from B which performs a similar function.

(v) Iris *diaphragm*

(vi) Pupil *Aperture.*

(vii) Eye lid *shutter*

(viii) Retina *film*

74. State the eye disease which is spread by houseflies
trachoma

75. State any one characteristic of images formed on the retina

- Real
- Inverted
- Diminished

Thank You

Dr. Bbosa Science