CHAPTER - 1

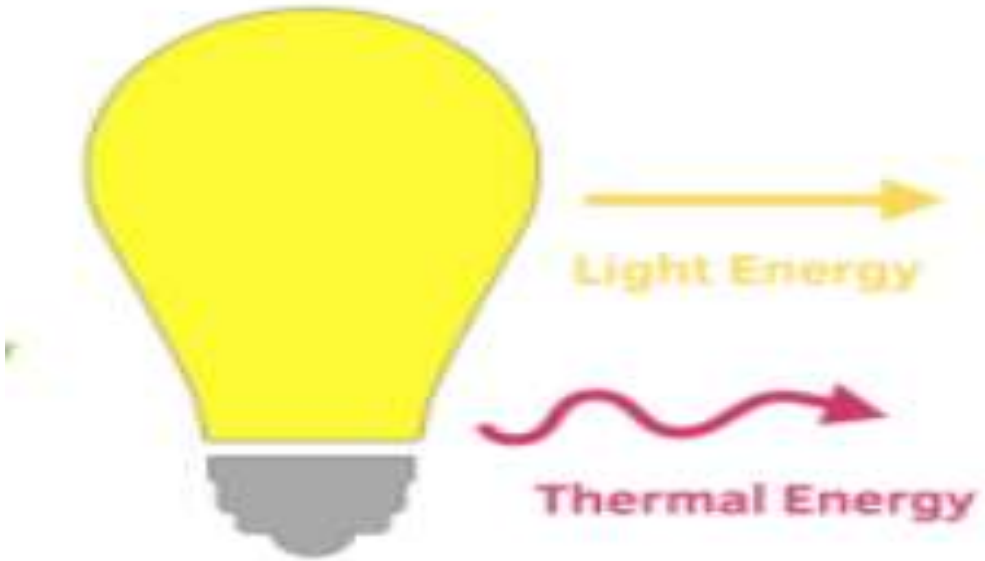
LIGHT

What is light?

- Write in your own words.

What is light?

- Light is a form of energy.
- For examples: Light energy & Heat or Thermal energy
- Light also travel in a straight line.
- Light creates sensation on our eye to see the objects.



LIGHT TRAVEL IN A STRAIGHT LINE:-

- Observe light coming from sun.
- Observe light coming from a laser light.
- By placing any opaque object in front of light coming from point source produce sharp shadow.
- In these examples you can see that path followed by light is a straight line. Hence, we can say that light travel in a straight lines.

Speed of light:-

- Speed of light in vacuum (free space) is **300000 km/s**.
- It is maximum speed of light.
- Speed of light is represented by “c”
- that is c = 300000 km/s
- c = 300000000 m/s or **3×10^8 m/s**

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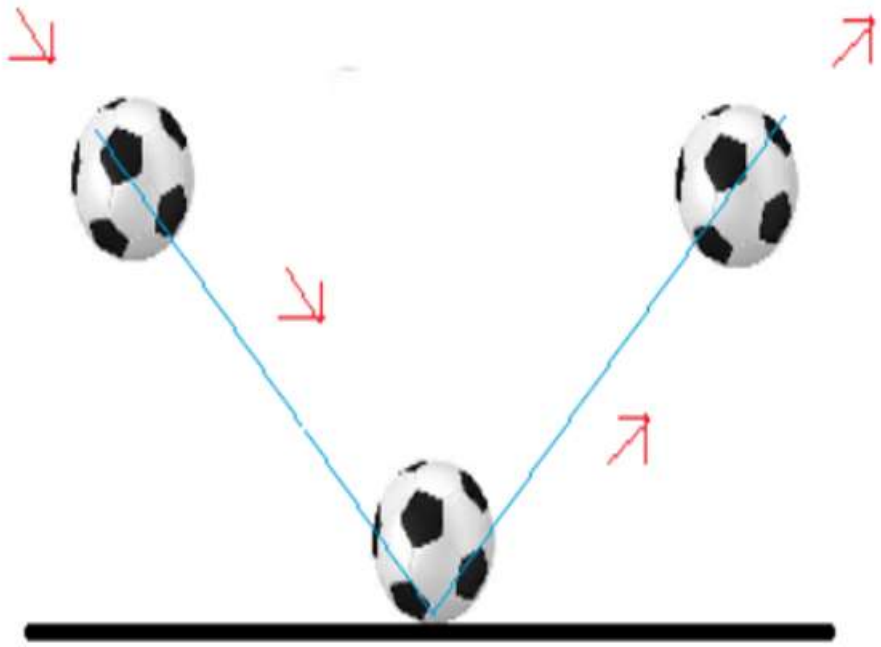
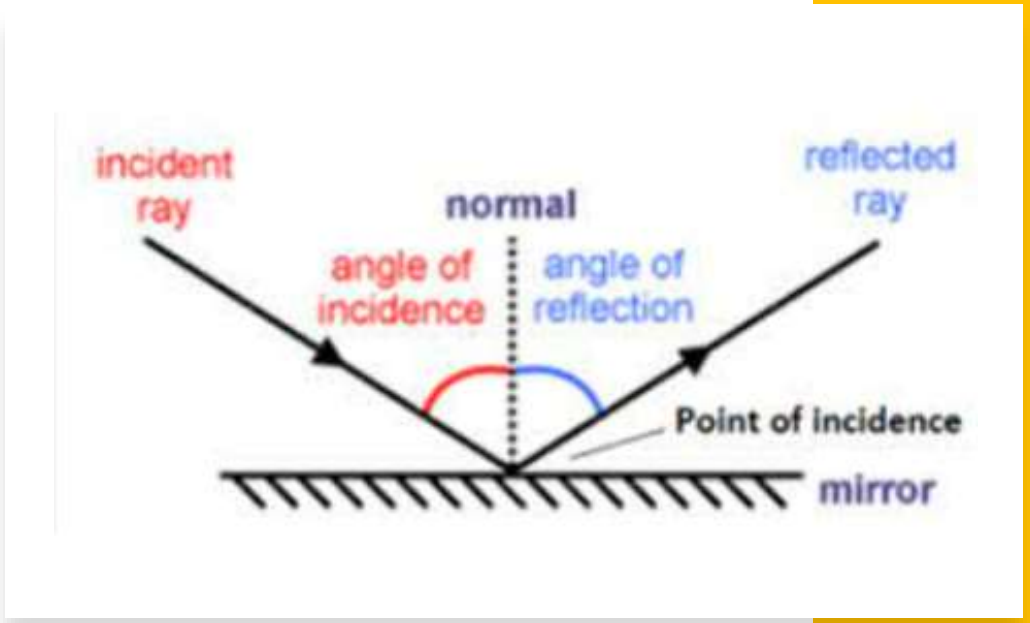
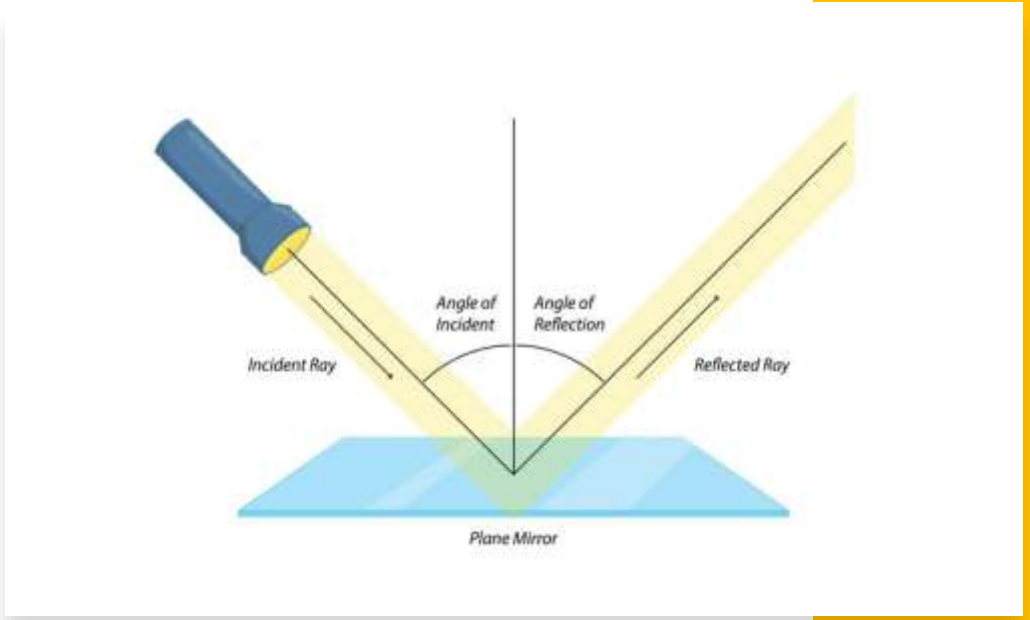


REFLECTION OF LIGHT:-

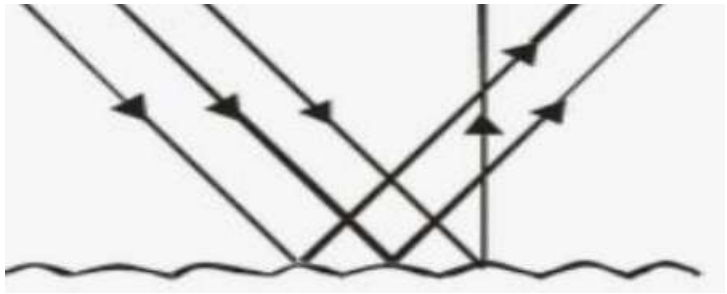
- When light rays approaches a smooth polished surface (mirror) then light rays bounces back, known as the reflection of light.





MORE ABOUT REFLECTION OF LIGHT:-

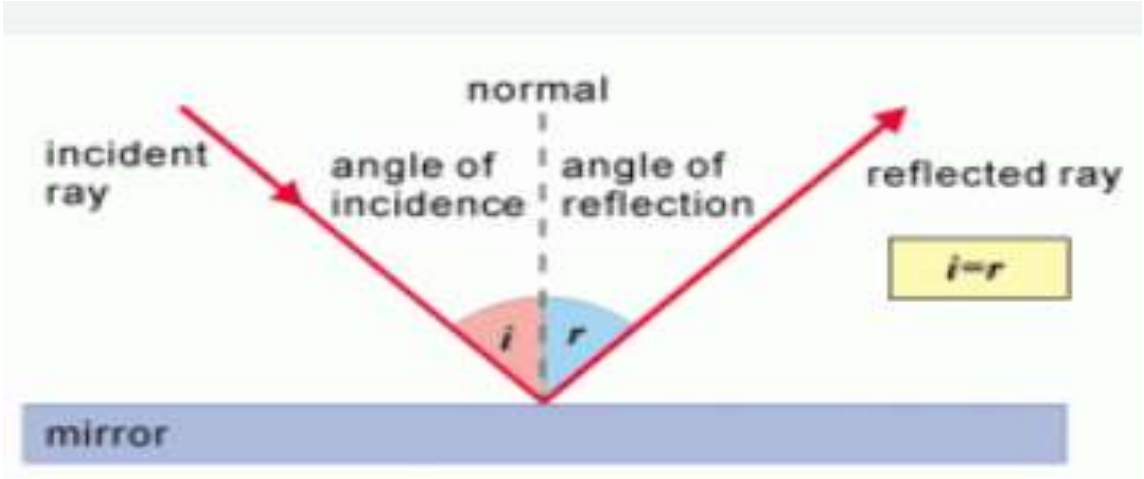
- Reflection of light from rough surface is known as diffuse reflection or irregular reflection.



- When light falls on a **black surface** then no reflection of light. That is black surface absorb light. For example- black paper, black cloth etc.
- Diffuse reflection help us to see the colourful world.
- Regular reflection produce glow on our eye, and we cannot see comfortably.

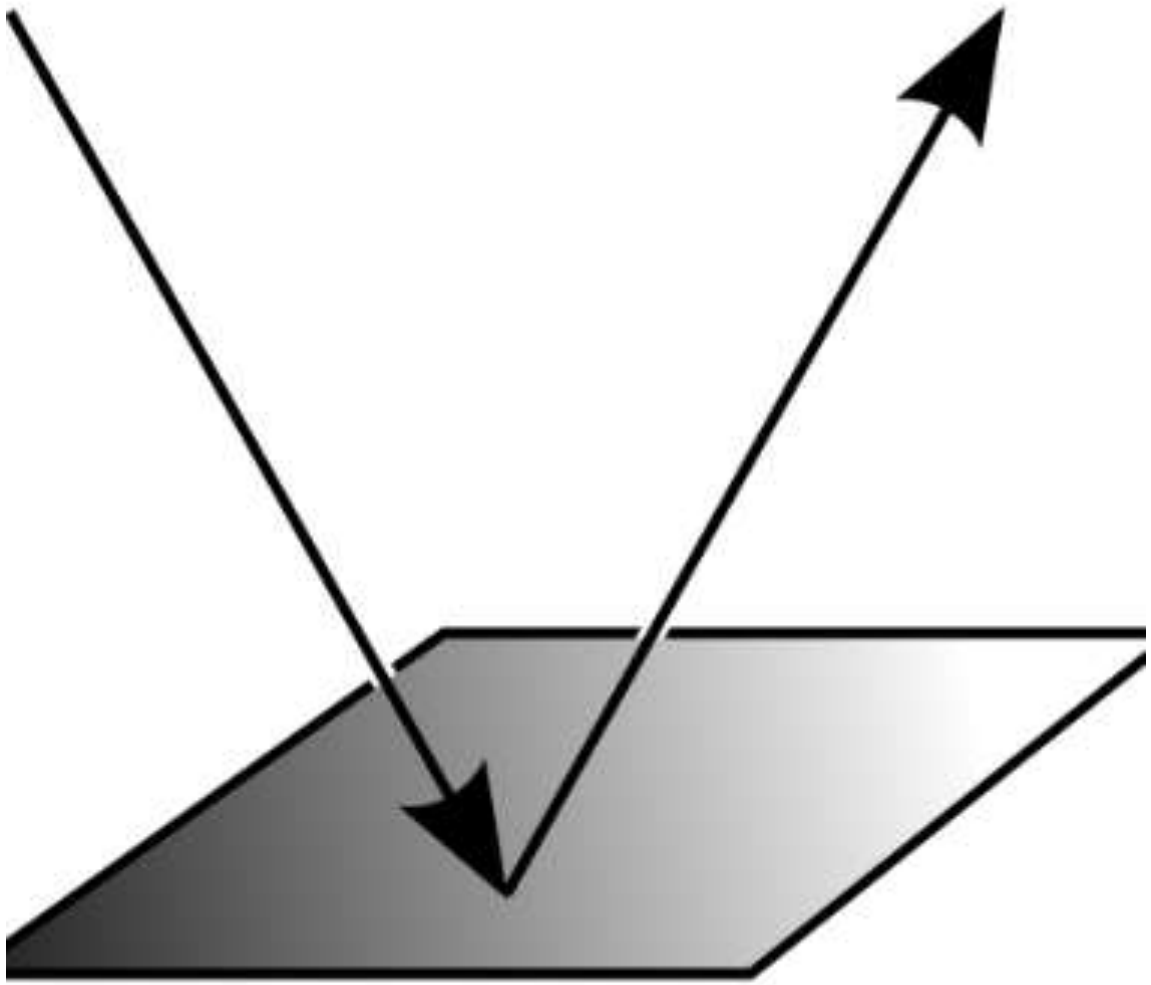
LAWS OF REFLECTION OF LIGHT:-

- There are two laws of reflection:
- 1. The angle of incidence is equal to angle of reflection. (i = r)
- 2. The incident ray, the reflected ray and the normal all lies on the same plane.



HW: 08-01-2024

- Write name of the process.
- Draw normal and label the diagram.



Luminous objects:-

- Luminous objects are those which emit light on their own. They won't take the help of other objects to emit the light.
- Example:- stars, burning candle, light bulb etc.

Non-Luminous objects:-

- A non-luminous object is one that does not produce its own light, although it can still reflect light from other sources.

- Example:- Object like the moon that does not give out or emit light of their own is Non- luminous object.
- Other examples of Non-luminous bodies are **pen, pencil, chair, wood** etc

PERISCOPE : -

- It is an optical device, which enables an observer to view the surrounding objects from a lower level.

WORKING PRINCIPLE : -

- A periscope is an instrument based on the principle of multiple reflections.

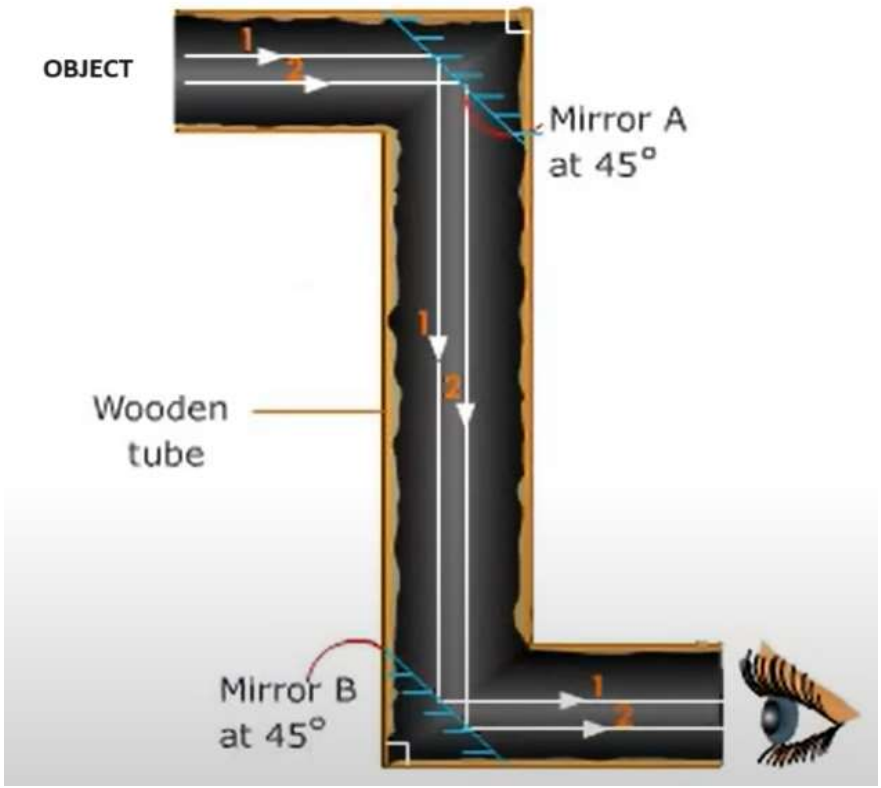
USE : -

- Periscopes were widely used in submarines and trenches to observe enemy movements without being seen.

USE OF PERISCOPE:-

- **In Submarine navigation.**
- **In land and sea warfare.**
- **In armed vehicles.**
- **Elsewhere to enable an observer to see his surroundings while remaining under cover.**
- **Behind armour, or submerged.**

DIAGRAM OF PERISCOPE : -



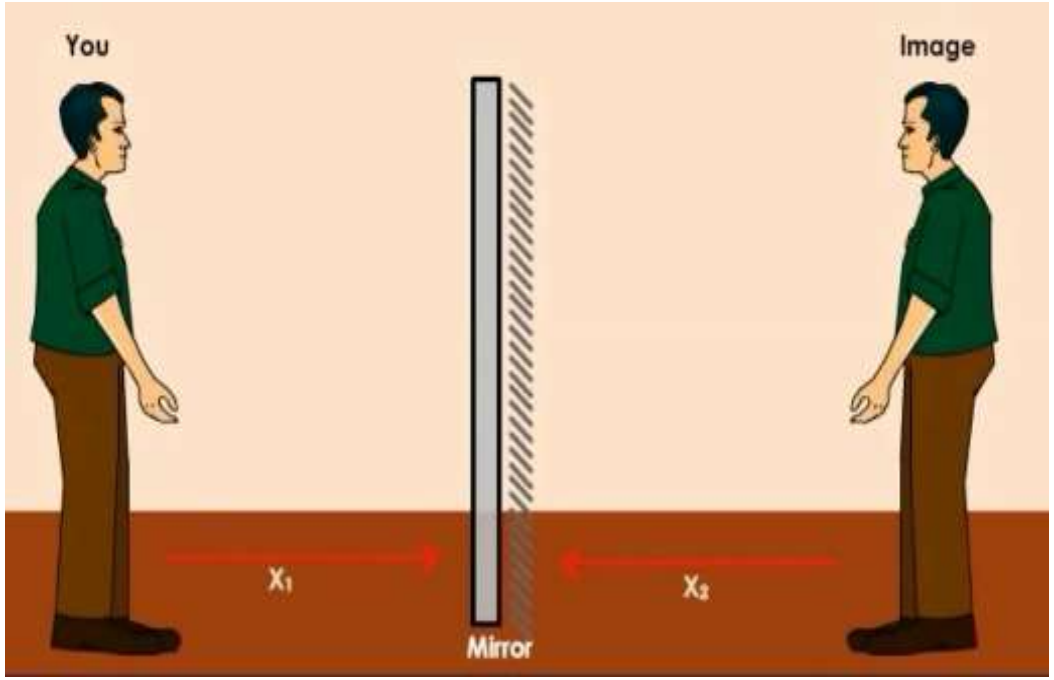
Real image:-

- An image which can be form on screen is known as real image.
- Examples- Image forms by projector on screen of your classroom.

- **Virtual image:-** An image which cannot be forms on screen is known as virtual image.
- Examples- The image in the plane mirror

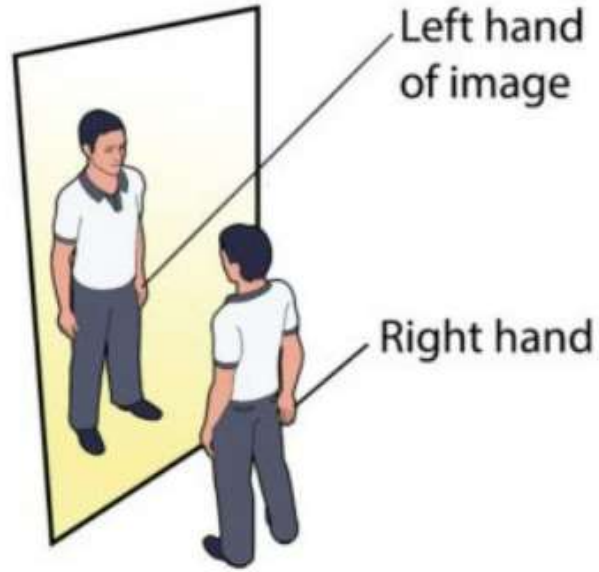
Image formed by plane mirror : -

- The image has the same size as the object.
- The image is up-right but laterally Inverted (Left / Right).
- Image is at the same distance from mirror as the object.
- Plane mirrors form virtual images.



Laterally Inverted : -

The interchange of the left and right sides in the image of an object in a plane mirror is called the lateral inversion.

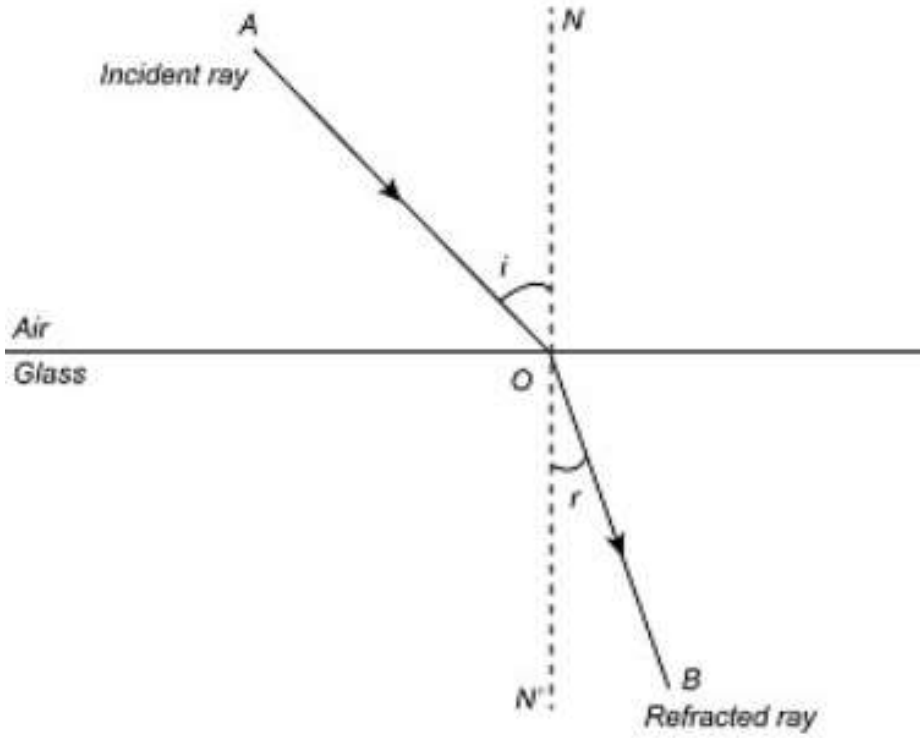


Which of the following describes an image formed in a plane mirror?

- i) Same distance behind mirror as object is in front
- ii) Laterally inverted
- iii) Same size as object
- **iv) All**

REFRACTION OF LIGHT:-

- The change in the speed and direction of light, when it travels from one medium to another medium is called refraction of light.



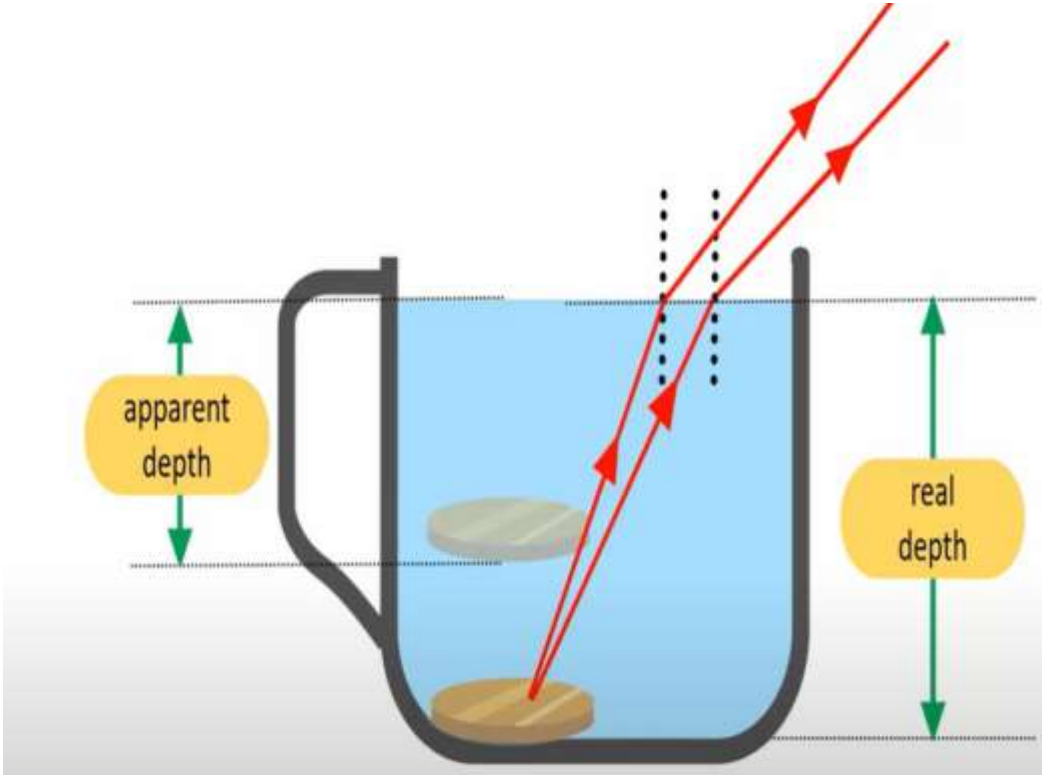
REAL & APPARENTH DEPTH : -

Real depth

The **distance** from the **actual position** of the coin in a **transparent medium** like water to the surface of water is called **real depth**.

Apparent depth

The **distance** from the **image** of an object in a **transparent medium** like water to the surface of water is called **apparent depth**.



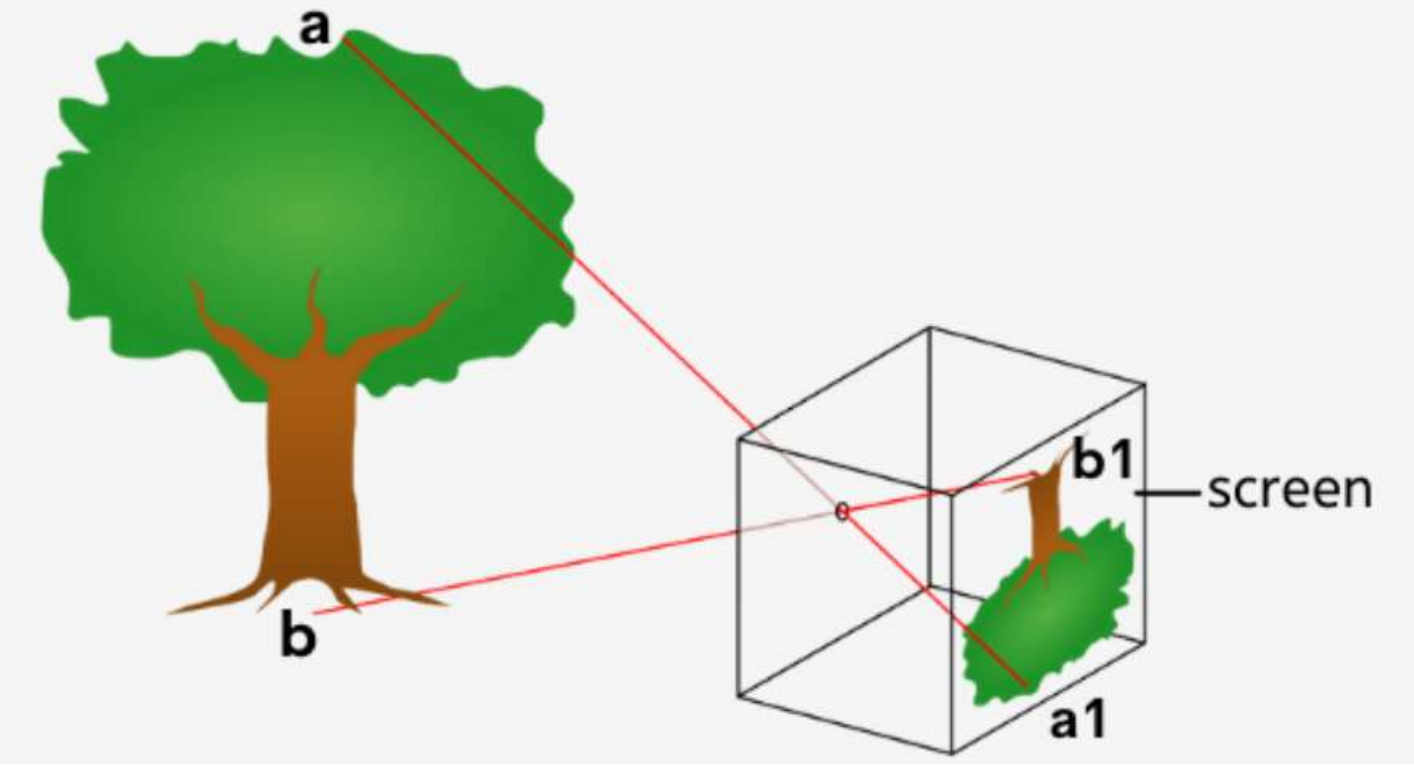
Question- if the moon is 384000 km from the earth and the sun is 150000000 km from earth. The speed of light is 300000 km/s. calculate the time taken for light to travel from
(a) the moon to the earth (b) the sun to the earth

- Ans. (a) 1.28 s (b) 500 s

- c= d/t
- t = d/c

WORKING OF PINHOLE CAMERA:-

- It consists of a light-proof box with a tiny hole in one end and some film or photographic paper on the other end. When light rays go through the tiny hole, it forms an upside-down (inverted) image at the back of the box.

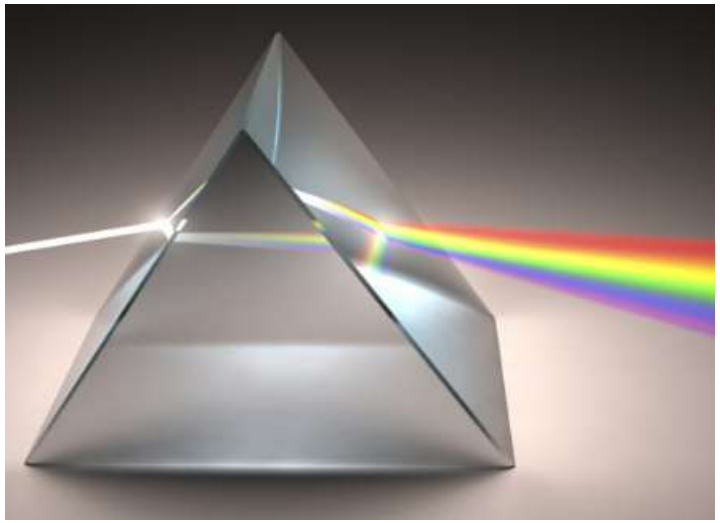


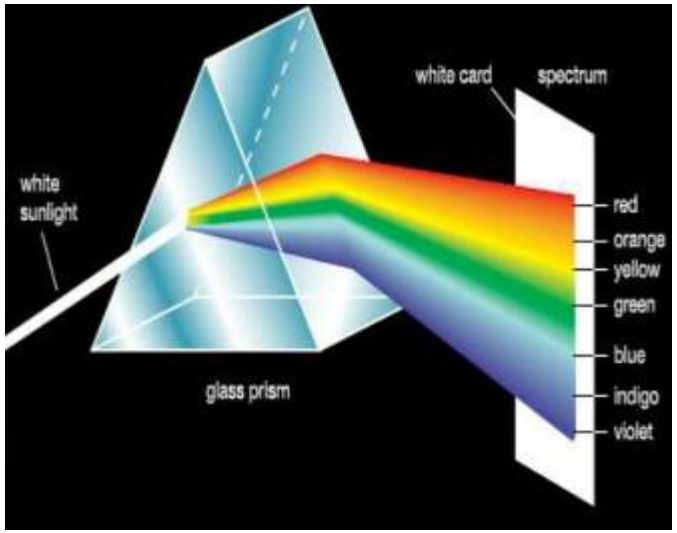
ASSESSMENT QUESTIONS:

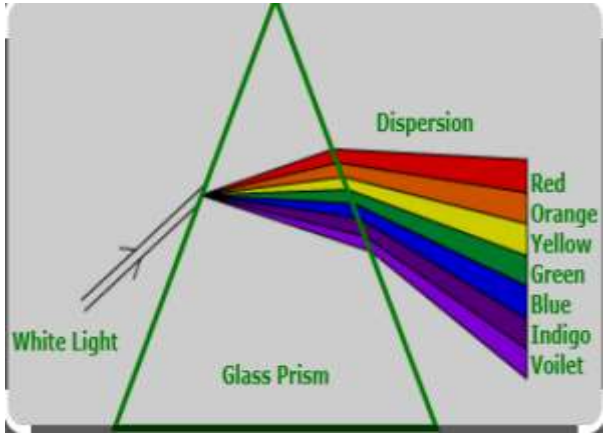
- Q.1 ……formed by a pinhole camera.
- Q.2 Working principle of pinhole camera is ……
- Q.3 Write three characteristics of image formed by pinhole camera.
- Ans.
- i
- ii.
- iii.

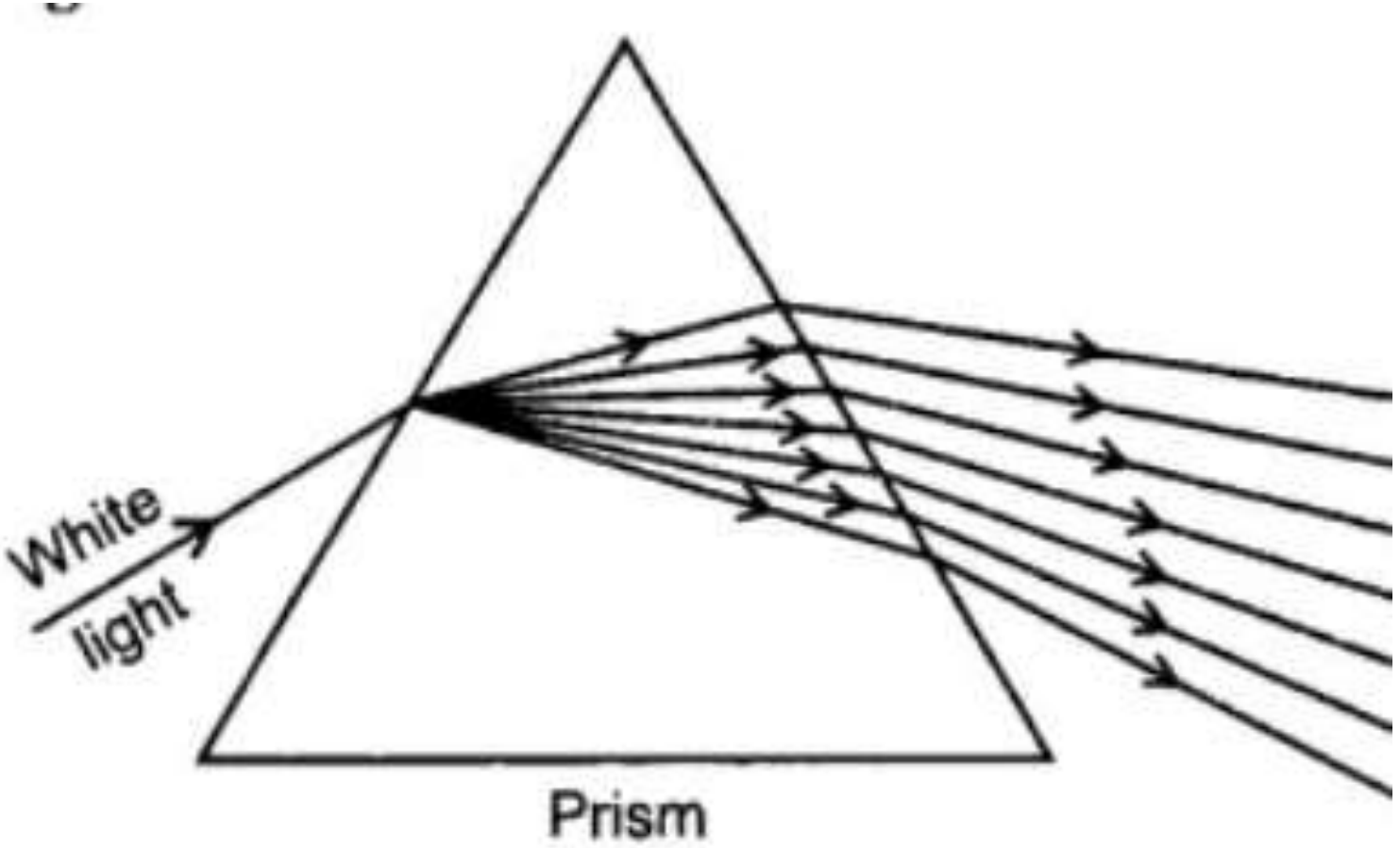
DISPERSION OF LIGHT:- (Prism)

- Splitting of white light into its component colours is called dispersion.
- Components colour are- violet, indigo, blue, green, yellow, orange and red.
- In short these seven colours are known as **VIBGYOR.**









Label the diagram:

Monochromatic light:-

- Mono refers to single, and Chroma means colour.
- Monochromatic light is a one colour light.
- Example- Laser light

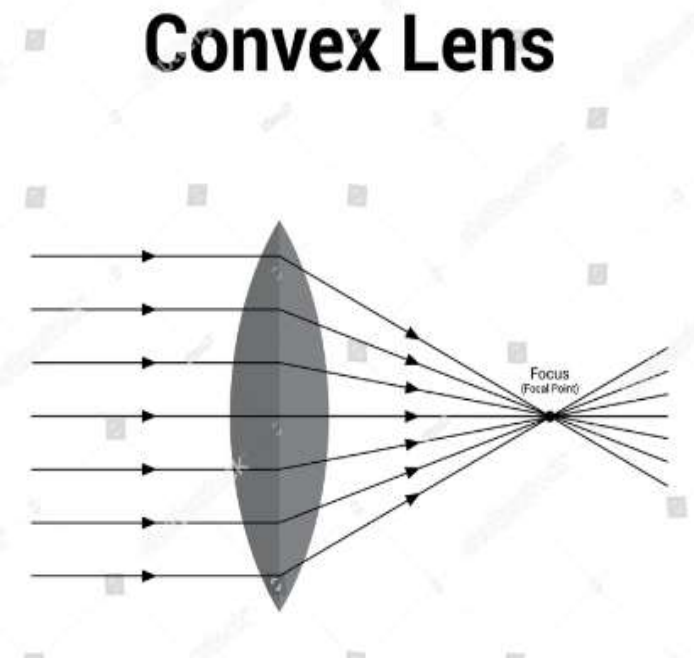
GL TOPICS

GENERAL LEARNING TOPICS

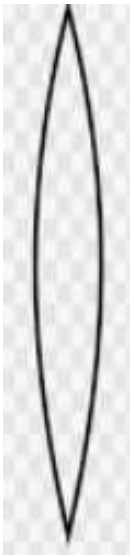
CONVEX LENS:-

- Convex lens is thin at edge and thick at middle.
- It converge light rays pass through it.
- It form real image of an object.
- **Convex lens is also known as converging lens.**

• RAY DIAGRAM:-



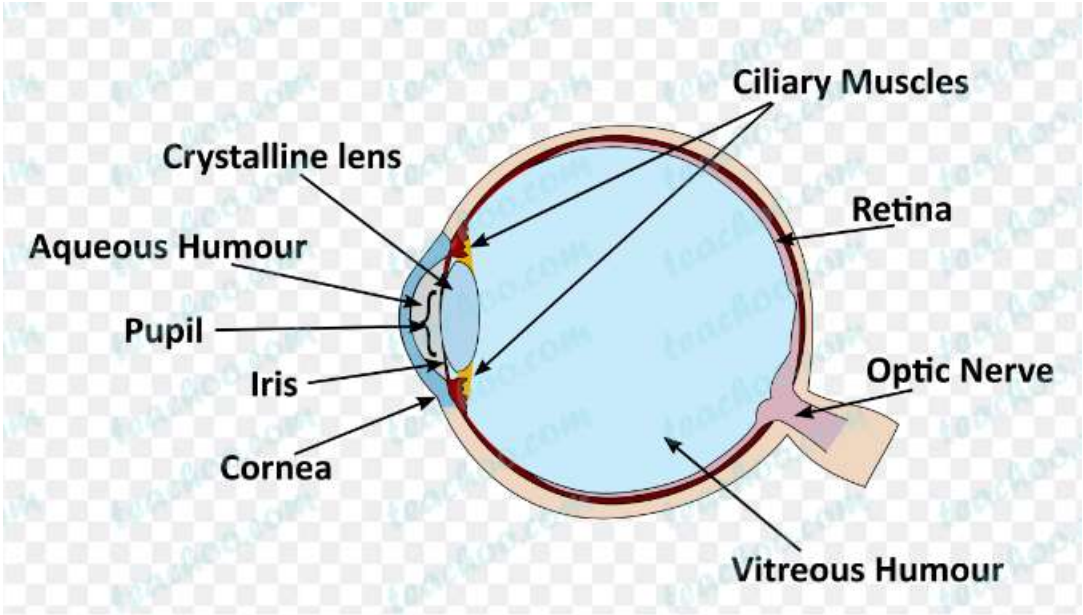
Convex lens

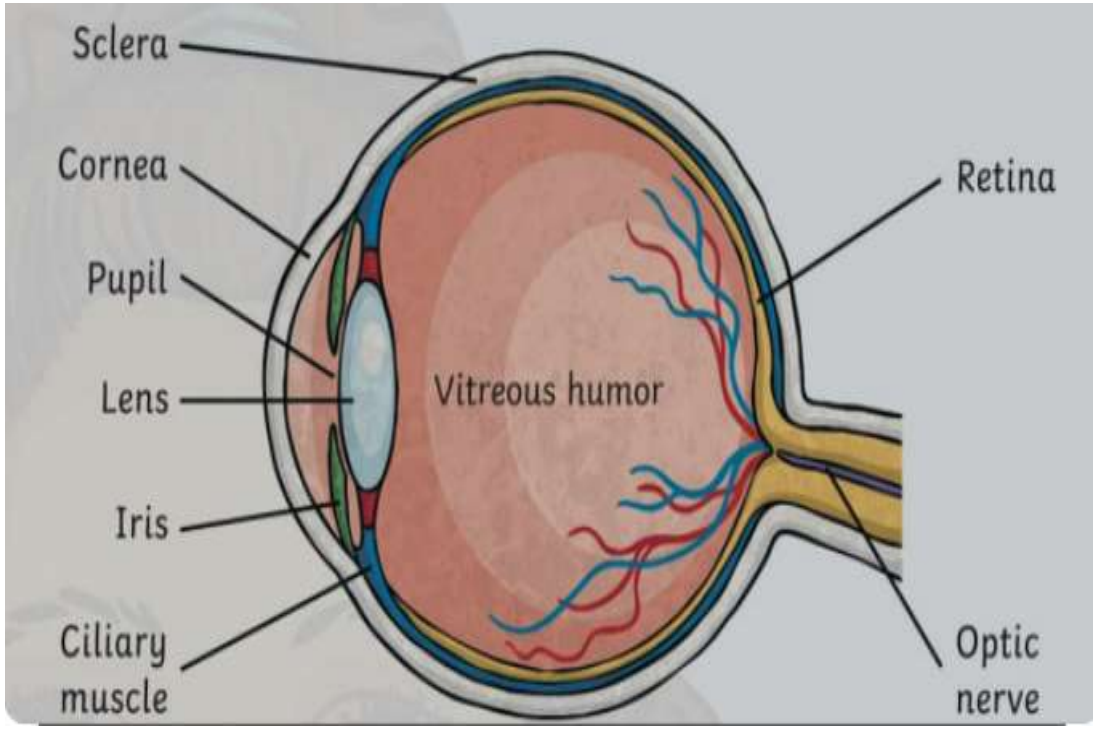


SYMBOL

HUMAN EYE:-

- Human eye is one of the sense organs in human body that reacts to light and helps in seeing objects.





HOMEWORK

Write function of various parts of human eye:-

PUPIL: ……

CORNEA:……

IRIS:……

LENS:……

CILIARY MUSCLES:……

RETINA:……

OPTIC NERVE:

……

END