14. Light and the Formation of Shadows

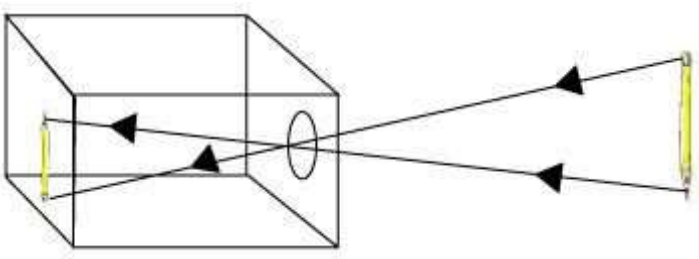
- The objects emitting their own light are called **luminous object.** Example - sun, stars etc.
- Emission of light by an organism is called **bioluminescence**.
- The objects that do not emit their own light are **non-luminous objects**. Example - planets, chairs etc.
- The objects that are produced by the humans to emit light are called **artificial light emitting objects.** Example - bulbs, LEDs

- Light travels only in a straight line in all directions.
- This phenomenon is called the **rectilinear propagation of light**.
- Light emanating from a source (bulb) travels in all directions.
- The formation of image in a pinhole camera is a proof of **rectilinear propagation** of light.
-

Medium	Speed of light (in m/s)
Air/ Vacuum	3×10^8
Water	2.25×10^8
Glass	2×10^8

1. Light always travels along a straight line. This is called **rectilinear propagation** of light.
2. Bouncing back of light from any polished surface is known as **reflection of light**.
3. Any polished or shiny surface can change the path of light. A mirror, a shiny plate or spoon, water, etc. can change the path of light.
4. Reflection of light from an object makes the object visible.
5. The image formed by a plane mirror is **erect**, of the **same size** as the object, and at the **same distance** behind the mirror as the object is in front of the mirror.
6. The left of an object appears right and the right of the object appears left in the image formed by a plane mirror. This is called **lateral inversion**.

- A **pinhole camera** is a simple optical device that forms an image without using a lens or a mirror.
- The image formed by a pinhole camera is **real**, **inverted**, and **diminished**.



- The formation of image in a pinhole camera is a proof of **rectilinear propagation** of light.
- Image form in the pinhole camera shows the colours of the object.

- A shadow is always dark and does not depend on the colour of the object. It is obtained only on a screen.
- We need a source of light and an opaque object to see a shadow on a screen.
- The formation of shadow shows that the light rays travel in a straight line.
- The size and nature of the shadow of an object depend upon its position from the source of light.
- **Sundial** is an instrument that measures the time of a day by the position of the shadow of an object cast by the sun.

1. Newton's colour disc is a disc that consists of sections of seven colours of the rainbow. These are arranged sequentially and in a circular order. Each colour occupies a small section or pie of the disc equally.

2. When we rotate the disc with at a high speed, it appears white because of the persistence of vision.

3. Persistence of vision is the phenomenon of eye by which an image formed is considered to remain for approximately 1/16th of a second on the retina.

4. Primary colours are the three colours that combine to give white colour. They are not formed by combining colours. Red, blue and green are primary colours.

5. Colours that form by combining of two primary colours are called secondary colours.

6. Secondary colours are known as complementary colours if their combination with primary colours gives a white light.
7. A transparent object acquires the colour of light which is allowed to pass through it.
8. An opaque object acquires the colour of light which is reflected by it.