

Light

Shadows

A Pinhole Camera

Mirrors and Reflection

Light

Light is form of energy that enables us to see things around us.

Luminous Objects

The objects that give out light of their own are called as luminous objects. These glows in the dark and have their own source of energy. Example: Sun, stars, candle flame, electric light bulb, campfires, and fireflies.

Non-Luminous Objects

The objects that do not have light of its own are called as non-luminous objects. These objects reflect the light that falls on them from the luminous objects. For example: Moon, walls, desk and posters.

Why moon is a Non-luminous object?

Moon seems to shine at night and provides us with a little bit of light that might help us to find our way around in the dark. But in reality the Moon does not produce its own light; it is just reflecting sunlight that is falling onto it. The Sun can shine on the Moon even when you cannot see the Sun because of the special positions that the Sun, Moon and Earth are in. Sometimes non-luminous objects that reflect light are called illuminated objects.

Transparent, Translucent and Opaque Objects

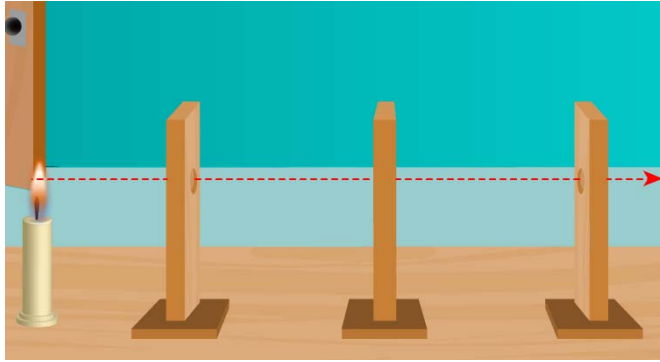
Objects that allow light to pass through them completely are called as transparent objects like a transparent glass. They do not cast any shadows as they do not block the light.

Objects that allow light to pass through them partially are called as translucent objects like a butter paper or a tracing paper. They cast faint shadows as they block the light partially.

Objects that do not allow light to pass through them are called as opaque objects like a wood, rubber ball. They cast dark shadows as they block the light.

Rectilinear Propagation of Light

The light always travels in a straight line. Take three wooden boards and drill a hole at the same position in each of them evenly. Now take a candle and place it behind the boards such that the flame of the candle can be seen through the hole. Arrange the boards in such a manner so that they superimpose each other. What did you observe? Yes you are correct the candle flame could be seen through the holes in the boards. Now let's see another example. Take a ball and two wide hollow tubes. One bent and one straight. Try to see the ball through both the tubes. You will notice that ball is visible through the straight tube but cannot be seen through the bent tube. This explains rectilinear propagation of light.



Shadows

When an opaque object comes in the path of the light, a shadow is formed.

Essential conditions for Shadows:

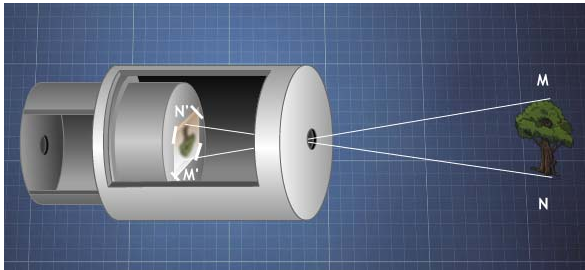
- Sources of light
- Opaque objects
- Screen

Characteristics of Shadows

- The shadows give only an outline of the object
- They require a screen for the shadow to cast.
- They are dark in colour and not of the colour of the objects.
- The size of the shadow varies according to its distance from the source of the light.

Pinhole Camera

Pinhole camera is an optical device that forms an image without using a mirror or lens. The light rays entering through the holes of the roof act as a pinhole camera as they produce images of the sun when they fall on the ground. The image formed by a pinhole camera is always real, inverted and diminished.



Pin hole camera

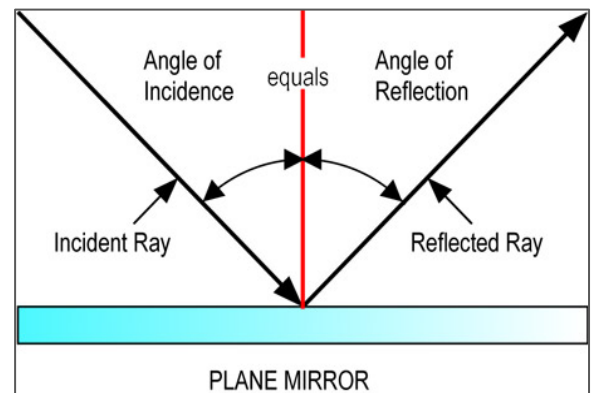
Mirrors and Reflection

Mirrors are capable of reflecting sufficient light to form an image of an object placed in front of it.

When the light rays from the object hit the mirror and bounce back, it is called reflection.

Laws of Reflection

- The light rays meet the mirror at the point of incidence and makes angle of incidence with the normal while the reflected ray from the mirror forms the angle of reflection with the normal.
- The incident ray, reflected ray and the normal all lie in the same plane. The angle of incidence is equal to the angle of reflection.



Reflection through a mirror