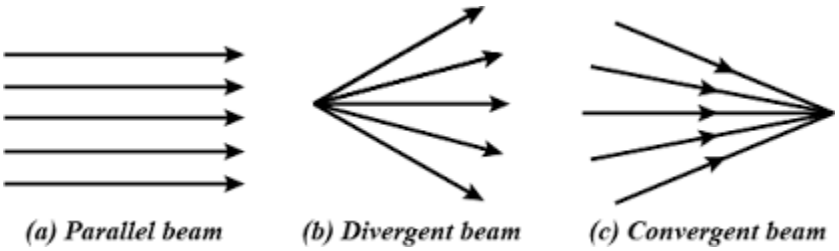
CLASS- X	TOPIC- CHAPTER 10 LIGHT (REFLECTION)
SUBJECT- PHYSICS	PREPARED BY- MRS.JITENDER V SKARIA

1. Light: It is a form of energy which produces the sensation of sight.

- **Light exhibits dual nature i.e., wave as well as particle nature.**
- **It travels with a speed of 3 x 10^8 m/s in vacuum.**

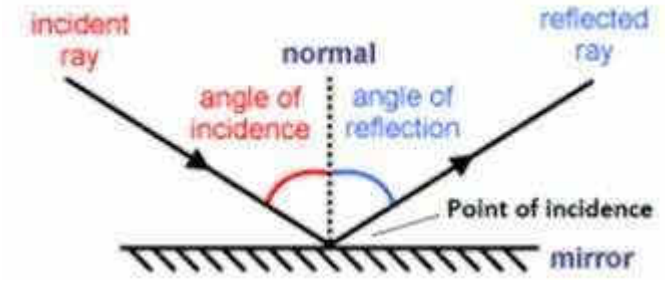
2. Beam: A beam is a bundle of rays, which originates from a common source and travels in the same direction.



(a) Parallel beam *(b) Divergent beam* *(c) Convergent beam*

. Reflection: When light falls on a surface, it bounces back to the medium. The phenomenon is called reflection.

- **Incident ray: Ray of light coming from a source towards the reflecting surface.**
- **Reflected ray: Ray of light which is reflected back by a reflection surface.**
- **Normal: Perpendicular drawn to the reflecting surface.**
- **Angle of incidence: The angle between incident ray and normal at the point of incidence.**
- **Angle of reflection: The angle between reflected ray and normal at the point of reflection**



Laws of Reflection

- **The angle of incidence is equal to the angle of reflection.**
- **The incident ray, the normal to the mirror at the point of incidence and reflected ray, all lie in the same plane.**
  These laws of reflection are applicable to all types of reflecting surfaces including spherical surfaces.
- **Light undergoes either diffuse or regular reflection.**

- **Regular and diffused reflection:**

- **Regular reflection: When the reflection surface is smooth and well-polished, the parallel rays falling on it are reflected parallel to another one; the reflected light goes in one particular direction and is also parallel to each other. This is regular reflection. E.g., plane mirror, reflection from still water etc**

- **Diffused reflection: When the reflecting surface is rough, the parallel rays falling on it are reflected in different direction. Such a reflection is known as diffuse reflection or irregular reflection. For example, reflection of light from the wall of a room or tree etc**

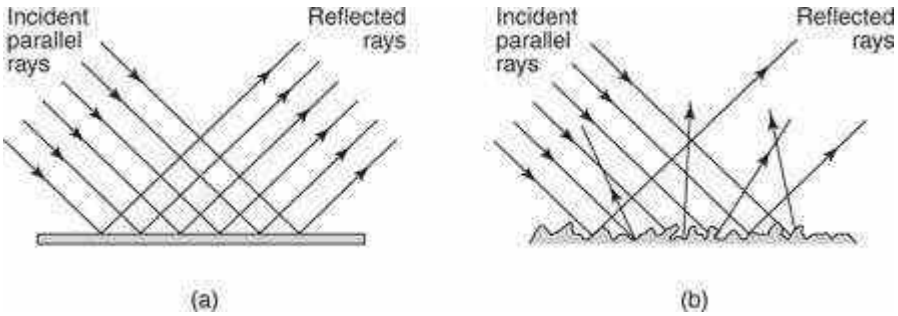
- 

Image: Image is the point where light rays meet or appear to meet.

Image can be of two types:

1. **Real image– A real image occurs where rays converge, i.e., light rays actually meet at image. They can be projected on screen**
2. **Virtual image - virtual image occurs where rays only appear to converge,.i.e., light rays appear to meet at image. They cannot be projected on screen**

Property of image formed by plane mirror:

i) Image is virtual and cannot be projected on screen

ii) Image is erect

iii) Image is of the same size as the object

iv) Laterally inverted

v) Distance of image and object from the plane mirror is same

Spherical mirrors:

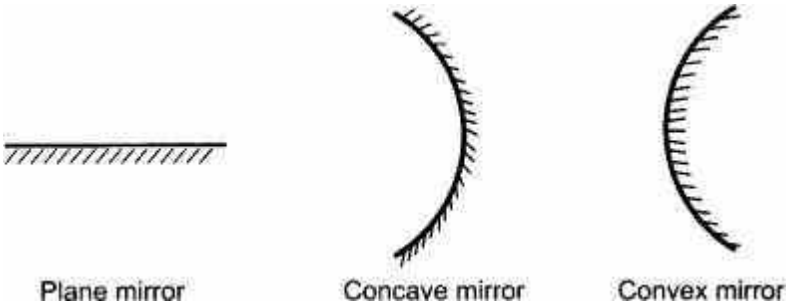
The curved surface of a shining spoon could be considered as a curved mirror. The most commonly used type of curved mirror is the spherical mirror. The reflecting surface of such mirrors can be considered to form a part of the surface of a sphere. Such mirrors, whose reflecting surfaces are spherical, are called spherical mirror.

Spherical mirror are of two types

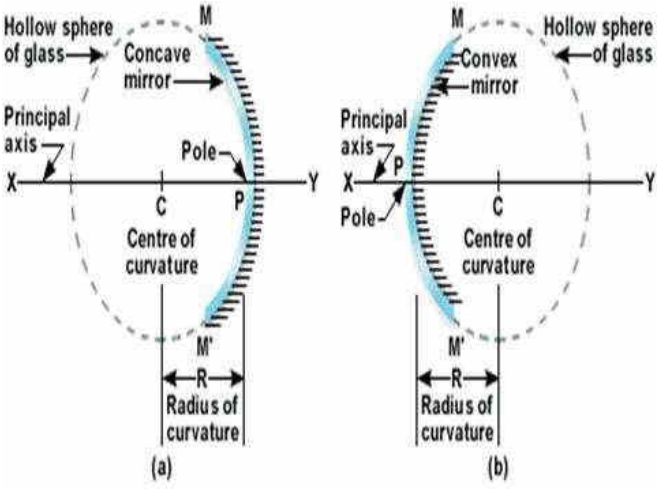
- **Concave mirror**
- **Convex mirror**

Concave Mirror: A spherical mirror, whose reflecting surface is curved inwards, that is, faces towards the centre of sphere, and is called a concave mirror.

Convex Mirror: A spherical mirror, whose reflecting surface is curved outwards, is called a convex mirror.



Terminologies related to spherical mirror



- **Centre of curvature (C): The centre of a hollow sphere of which the curved or spherical mirror forms a part is called centre of curvature.**
- **Radius of curvature (R): The radius of sphere of which the reflecting surface of a spherical mirror forms a part is called the radius of curvature of the mirror.**

- **Pole (P): The centre of the reflecting surface of spherical mirror. The pole is usually represented by the letter P.**
- **Principal axis: It's an imaginary line passing through the centre of curvature and pole.**
- **Aperture: The diameter of the reflecting surface of the spherical mirror is called its aperture.**
- **Principal focus (F): A point on the principal axis of a spherical mirror where the rays of light parallel to the principal axis meet or appear to meet after reflection from the spherical mirror is called principal focus.**
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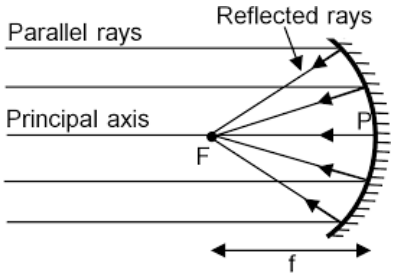
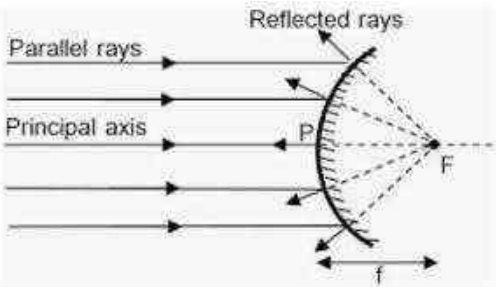




- **Focal length (f): The distance between the pole and principal focus (F) of a spherical mirror is called the focal length of the mirror. It is denoted by f.**

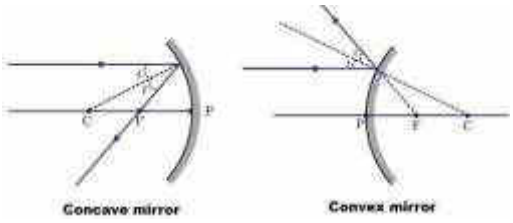
R=2f

Radius of curvature= 2×focal length

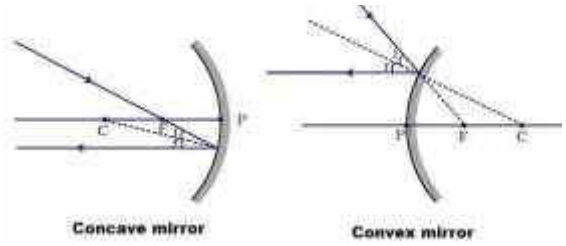
f=R/2

Rules for reflection of rays by spherical mirrors

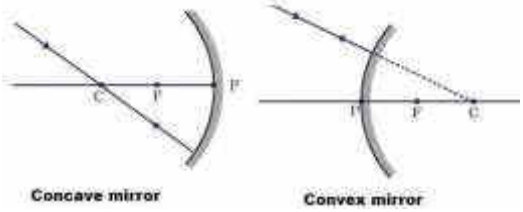
(i) A ray parallel to the principal axis, after reflection, will pass through the principal focus in case of a concave mirror or appear to diverge from the principal focus in case of a convex mirror.



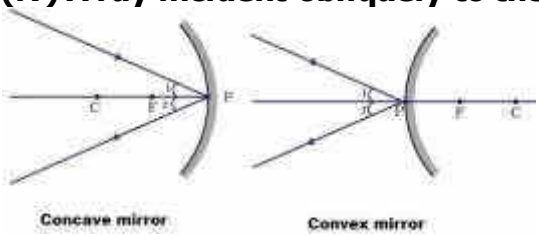
(ii) A ray passing through the principal focus of a spherical mirror, after reflection, will emerge parallel to the principal axis.



(iii) A ray passing through the center of curvature of a spherical mirror, after reflection, is reflected back along the same path.



(iv) A ray incident obliquely to the principal axis is reflected obliquely following the



laws of reflection, i.e., angle of incidence is equal to angle of reflection.
