



Al-Mustaqbal University

Department of Optics Techniques

Medical and optical physics 1

First stage

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➤ Lecture 3**Mirrors**

Introduction: Mirrors, with their smooth and reflective surfaces, exhibit the fundamental optical phenomenon of reflection. When light encounters a mirror, it follows the laws of reflection, bouncing off the surface at an angle equal to the angle of incidence. This interaction with mirrors underlies their diverse applications, roles in scientific experiments and optical instruments, continue to be integral components in both practical and scientific realms.

Mirrors: Mirrors are reflective surfaces that can be used to form images by reflecting light. There are several types of mirrors, each with its own unique properties and applications an example of this is as shown in Figure 1.



Figure 1 shows some shapes of mirrors

Types of Mirrors

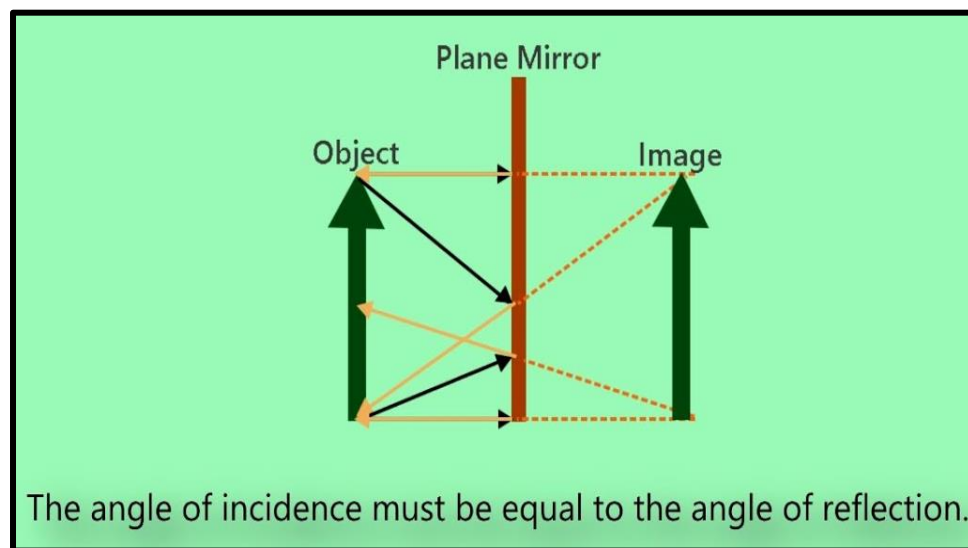
We can see that the different types of mirrors are used in a variety of ways in our day-to-day lives, from a looking glass to a road safety mirror. In order to understand the concept of a mirror, one must know what the phenomenon behind the mirror is and what makes it a reflecting material.

Types of Mirrors: The two of the most prominent types of mirrors are:

1. Plane Mirrors.
2. Spherical Mirrors.

Plane Mirrors: A plane mirror is a flat, smooth, and reflective surface that reflects light in a predictable manner. It is characterized by its even and polished surface, which results in specular reflection, where incident light rays are reflected at the same angle relative to the mirror surface.

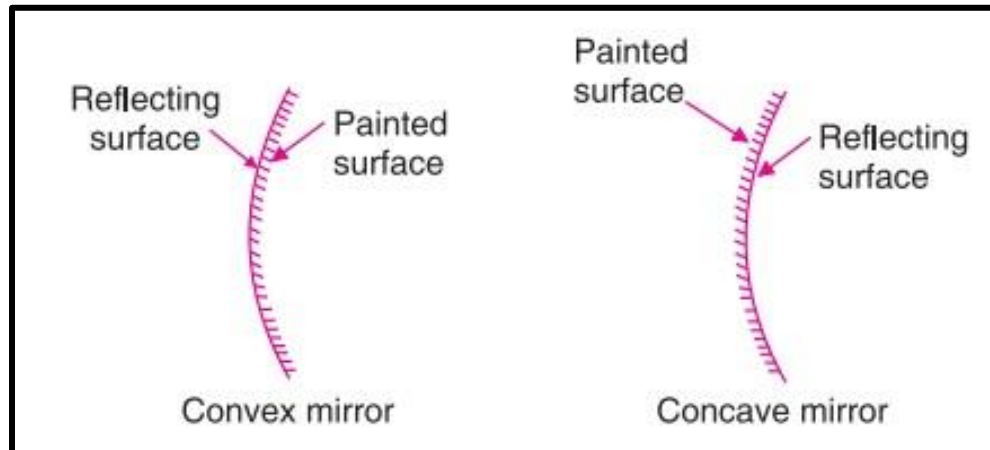
Properties: Produces virtual images that are the same size as the object. Reflects light uniformly.



Applications: Commonly used in everyday mirrors, dressing mirrors, and reflective surfaces in optical devices.

Spherical mirrors: are curved mirrors that have the shape of a section of a sphere. There are two main types of spherical mirrors: concave mirrors and convex mirrors.

Properties: Follows the principles of reflection depending on the mirror's curvature.



Applications: Various applications in optics, astronomy, and imaging systems.

▪ **Spherical mirrors are of two types as:**

1- Concave mirrors: It is a spherical mirror whose inner surface is the reflective surface.

Properties: Can produce both real and virtual images depending on the object's position. Enlarges the size of the object.

Applications: Used in makeup mirrors, shaving mirrors, and as reflective surfaces in telescopes and satellite dishes.

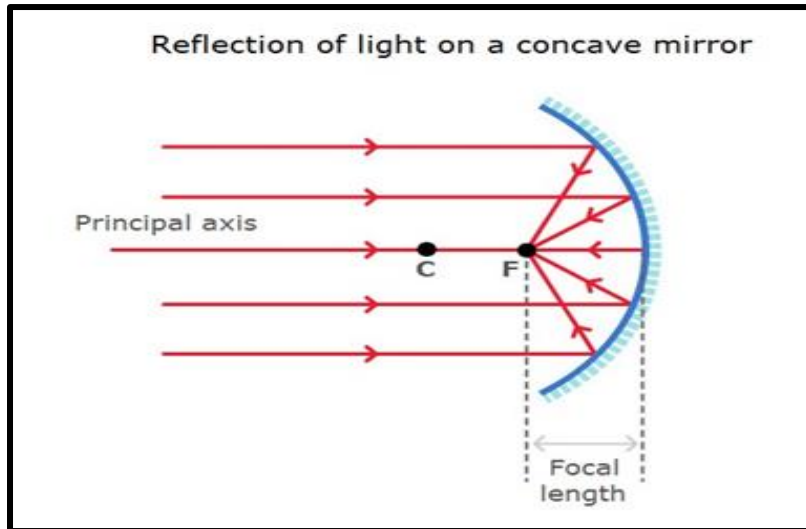


Figure is shows the formation of images in concave mirrors

2- **Convex mirror:** It is a spherical mirror whose outer surface is the reflective surface

Properties: Always produces virtual images that are smaller than the object. Provides a wider field of view.

Applications: Commonly used as safety mirrors in parking lots, stores, and roads to provide a broader view of the surroundings.

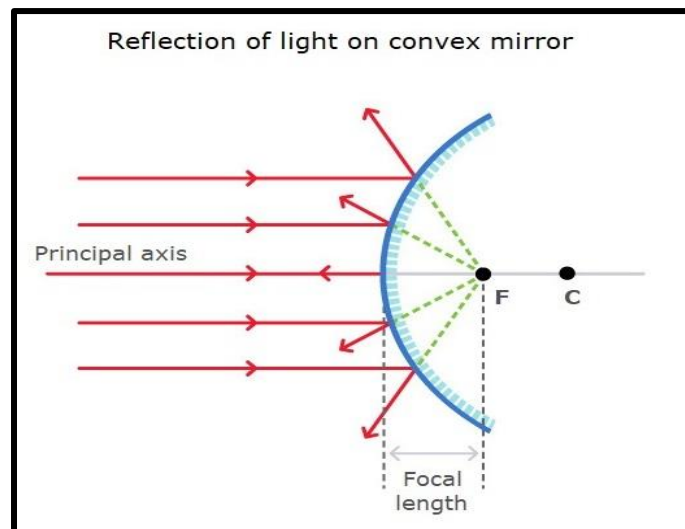


Figure is shows the formation of images in convex mirrors