

**Al-Mustaqbal University Colleg
Medical Physics Department**



General Physics/ lecture 10

First stage

Dr. Nasma Adnan

Dr. Aiyah Sabah

Dr. Fatema Sattar

M. Sc. Zahraa Ali

2021-2023

Lecture 7

Outline

- **Mirrors and their types**
 - **Lenses and their types**
-

Mirrors and their types

- ✓ A mirror is defined as a reflecting surface and can be explained by the law of reflection, which states that when a ray of light is made to fall on the reflecting surface, the incident ray, the reflected ray and the normal to the surface of the mirror all lie in the same plane and the angle of incidence is equal to the angle of reflection.

Terms Related to Mirrors

- **Incident ray:** It is defined as a ray of light that hits the surface.
- **Reflected ray:** It is defined as the ray of light that is reflected back after hitting the surface.
- **Normal ray:** It is defined as the ray that is 90° to the surface or the ray which is perpendicular to the reflecting surface.
- **Refracted ray:** It is defined as the incident ray which passes through a second medium resulting in the change of direction.
- **Angle of incidence:** It is defined as the angle between the incident ray and the normal at which the incidence occurs.
- **Angle of reflection:** It is defined as the angle between the reflected ray with respect to the normal at which the reflection occurs.

- **Angle of refraction:** It is defined as the angle between the refracted ray and the normal at which the refraction occurs.

Types of Mirrors

Following are the types of mirrors that are most widely used:

Plane mirror:

The images formed from a plane mirror are the reflected images in their normal proportions but reversed from left to right. These are the most widely used mirrors.

Convex mirror:

These are the spherical mirrors that are curved outward and the image obtained is virtual, diminished and erect for a real object.

Concave mirrors:

These are the spherical mirrors that are curved inward and the image obtained from these mirrors depends on the placement of the object

Lenses and their types

A lens is a transmissivity optical device that focuses or disperses light beams using refraction. A simple lens consists of a single piece of transparent material, while compound lenses consist of several simple lenses arranged along with a common axis. A lens can focus light to form an image, unlike a prism, which refracts light without focusing.

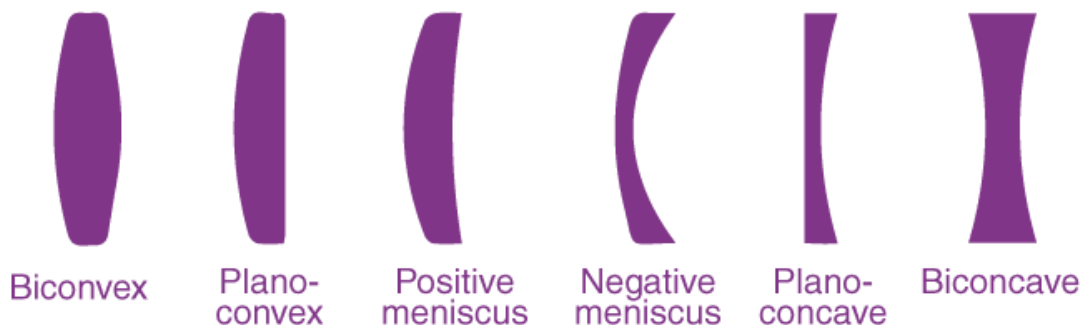
Types of Lenses

The lens classification depends on how the light rays bend when they pass through the lens. The two main types of lenses are:

- **Convex Lens (Converging)**
- **Concave Lens (Diverging)**

Convex lenses are thick in the middle and thinner at the edges. A concave lens is flat in the middle and thicker at the edges. A convex lens is also known as the converging lens as the light ray's bend inwards and converge at a point which is known as focal length. On the other hand, the concave lens is also known as a diverging lens because it bends the parallel light rays outward and diverges them at the focal point.

Simple lens and compound lens are the two classifications of lenses. Simple lenses are different from compound lenses based on their surface of curvature. Following are the different types of simple lenses.



Mirror	Lens
A mirror is a glass surface with a silvery backing, that produces an image through reflection.	A lens is a transparent substance of glass or plastic, bound by two surfaces, whose at least one surface is curved.
It can either be plane or curved	It is usually curved
The working principle of the mirror is the law of reflection	The working principle of the mirror is the law of refraction