

# 10<sup>th</sup> Class

## ➤ REFLECTION OF LIGHT

❖ **Introduction:** Light is a form of electromagnetic radiation that travels in straight lines. When light encounters a surface, it can undergo various interactions, one of which is reflection.

❖ **Reflection:** Reflection is the phenomenon where light bounces off a surface. It occurs when light rays strike a surface and are redirected back into the same medium. The laws of reflection govern this process:

1. **The Law of Reflection:** The angle of incidence ( $\theta_i$ ) is equal to the angle of reflection ( $\theta_r$ ). Mathematically, it can be expressed as  $\theta_i = \theta_r$ .

2. **Normal Line:** The normal line is an imaginary line perpendicular to the surface at the point of incidence.

3. **Incident Ray:** The incident ray is the incoming light ray that strikes the surface.

4. **Reflected Ray:** The reflected ray is the light ray that bounces off the surface after reflection.

❖ **Types of Reflection:** Reflection can be classified into two types:

1. **Regular Reflection:** Also known as specular reflection, regular reflection occurs when parallel rays of light strike a smooth surface and reflect in a parallel manner. It produces a clear and sharp image.

2. **Diffuse Reflection:** Diffuse reflection occurs when parallel rays of light strike a rough or irregular surface and reflect in various directions. It produces a scattered image and does not form a clear reflection.

❖ **Reflection in Plane Mirrors:** Plane mirrors are flat, smooth surfaces that reflect light according to the laws of reflection. When an object is placed in front of a plane mirror, a virtual image is formed behind the mirror. The image is virtual, upright, and laterally inverted.

❖ **Applications of Reflection:** Reflection of light has various practical applications in everyday life and technology, including:

- Mirrors in vehicles for rearview and side-view purposes.
- Reflectors for directing light in optical instruments and devices.
- Reflective surfaces in solar panels for harnessing solar energy.
- Reflective clothing and materials for safety in low-light conditions.

❖ **Conclusion:**

Understanding the reflection of light is essential in optics and everyday applications. The principles of reflection, including the laws and types of reflection, enable us to manipulate light for various purposes, from creating images to designing optical systems.