

# Class 10 Science: Chapter "Light" Notes — made by Yogita Bora

## Introduction to Light

- Light is a form of energy that enables vision and travels in straight lines (rectilinear propagation)
- It is an electromagnetic wave and does not require a medium to travel

## Nature of Light

- Light exhibits dual nature: wave (interference, diffraction) and particle (photoelectric effect)
- Visible light wavelength:  $4 \times 10^{-7}$  m to  $8 \times 10^{-7}$  m

## Reflection of Light

- Reflection: Bouncing back of light from a surface into the same medium
- Types:
  - Regular (specular): Mirror-like, forms clear images (mirrors, water)

- Irregular (diffused): From rough surfaces, no clear image, but surface becomes visible

## Laws of Reflection

- Angle of incidence = Angle of reflection
- Incident ray, reflected ray, and normal lie in the same plane

## Mirrors

- Plane mirror: Flat surface, forms virtual, erect, and laterally inverted images
- Spherical mirrors: Part of a sphere (concave or convex)
  - Concave: Can form real or virtual images, used in headlights, shaving mirrors
  - Convex: Always forms virtual, diminished images, used in rear-view mirrors

## Refraction of Light

- Bending of light when it passes from one medium to another due to change in speed
- Important terms: Optical density, principal focus, focal length, lens formula

## Key Formulas

- Mirror formula:  $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$
- Magnification:  $m = \frac{\text{height of image}}{\text{height of object}} = \frac{v}{u}$
- Lens formula:  $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

## Applications

- Mirrors and lenses are used in daily life: rear-view mirrors, spectacles, cameras, microscopes