

Light: Reflection and Refraction Revision Notes

Reflection of Light

1. Laws of Reflection:

- The angle of incidence is equal to the angle of reflection.
- The incident ray, the reflected ray, and the normal to the surface at the point of incidence all lie in the same plane.

2. Types of Reflection:

- **Regular Reflection:** Occurs on smooth surfaces; the reflected rays are parallel.
- **Diffuse Reflection:** Occurs on rough surfaces; the reflected rays scatter in different directions.

3. Image Formation by Plane Mirrors:

- The image is virtual, upright, and of the same size as the object.
- The image distance from the mirror equals the object distance.

Spherical Mirrors

1. Types:

- **Concave Mirror:** Converges light rays; used in headlights, solar furnaces.
- **Convex Mirror:** Diverges light rays; used in rear-view mirrors.

2. Mirror Formula:

- $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$
- Where f is the focal length, v is the image distance, and u is the object distance.

3. Magnification (m):

- $m = \frac{h'}{h} = \frac{-v}{u}$
- Where h' is the height of the image and h is the height of the object.

Refraction of Light

1. Laws of Refraction:

- The incident ray, the refracted ray, and the normal to the interface of two media all lie in the same plane.
- The ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant (Snell's Law).

2. Refractive Index:

- $n = \frac{c}{v}$
- Where n is the refractive index, c is the speed of light in vacuum, and v is the speed of light in the medium.

3. Critical Angle and Total Internal Reflection:

- When light travels from a denser to a rarer medium, it is completely reflected at the boundary if the angle of incidence exceeds the critical angle.

Lenses

1. Types:

- **Convex Lens:** Converging lens; used in magnifying glasses, cameras.
- **Concave Lens:** Diverging lens; used in spectacles for myopia.

2. Lens Formula:

- $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

3. Magnification (m):

- $m = \frac{h'}{h} = \frac{v}{u}$

4. Power of a Lens (P):

- $P = \frac{1}{f}$ (in dioptres, where f is in meters)

These notes should cover the key points for quick revision on light, reflection, and refraction. For more detailed explanations and examples, you can refer to the full text on the [Physics Catalyst page](#).