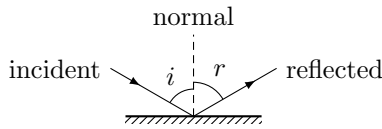


Physics formulas for class 10 are based on CBSE (NCERT).

### 1: Reflection of Light

#### Laws of Reflection:

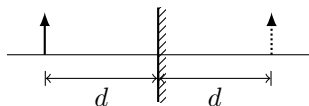
1. Incident ray, reflected ray, and normal at the point of incidence lie in the same plane



2. The angle of incidence is equal to the angle of reflection i.e.,  $\angle i = \angle r$

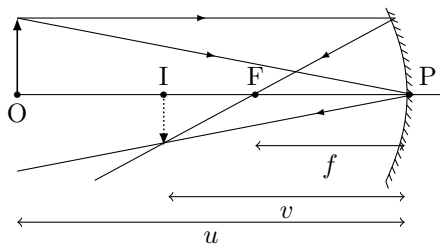
#### Reflection from a Plane Mirror:

1. The image is virtual. The image and the object are equidistant from the mirror.



2. The object size is equal to the image size i.e., magnification is 1.

#### Reflection from a Spherical Mirror:



1. New cartesian sign convention (i) the distances are measured from the pole P (ii) the distances in the direction of incident ray are positive.
2. Focal length is equal to half of radius of curvature i.e.,  $f = R/2$
3. The object distance  $u$ , image distance  $v$  and focal length  $f$  are related by the mirror formula:

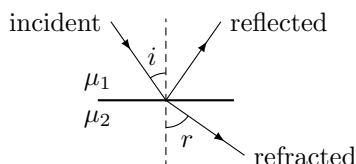
$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

4. The magnification is the ratio of image height to the object height. It is given by  $m = -v/u$ .

### 2: Refraction of Light

**Refractive Index:**  $\mu = \frac{\text{speed of light in vacuum}}{\text{speed of light in medium}} = \frac{c}{v}$

#### Laws of Refraction

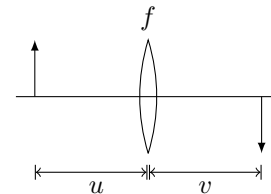


1. Incident ray, refracted ray, and normal at the point of incidence lie in the same plane
2. The angle of incidence is related to the angle of refraction by **Snell's Law:**

$$\frac{\sin i}{\sin r} = \frac{\mu_2}{\mu_1}$$

**Lens formula:** The object distance  $u$ , image distance  $v$  and focal length  $f$  of a lens are related by the lens formula

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}, \quad m = \frac{v}{u}$$



**Power of the lens:**  $P = \frac{1}{f}$ ,  $P$  in diopter if  $f$  in metre.

### 3: Electricity

**Current** in a wire is equal to the charge flowing per unit time in it i.e.,  $i = Q/t$

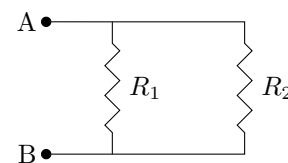
**Potential difference** between two points is the work required to move a unit charge from one point to the other i.e.,  $V = W/Q$ .

**Resistance** of a wire of length  $l$  and cross-sectional area  $A$  is given by  $R = \rho l/A$ , where  $\rho$  is the resistivity of the wire material.

**Ohm's Law:**  $V = iR$

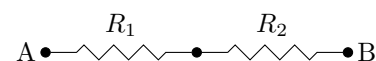
**Resistors in Parallel:** The equivalent resistance  $R_{eq}$  of two resistors connected in parallel is given by

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$$



**Resistors in Series:** The equivalent resistance  $R_{eq}$  of two resistors connected in series is given by

$$R_{eq} = R_1 + R_2$$



**Electric Power:**  $P = V^2/R = I^2R = IV$

**Heating Effect:** The heat generated in time  $t$  is given by  $H = Pt = I^2Rt$

