LIGHT

Defination-

Light is a form of energy that enables us to see objects around us.

Properties of light-

It travels in a straight line and can reflect, refract, and undergo various phenomena.

Key Definitions

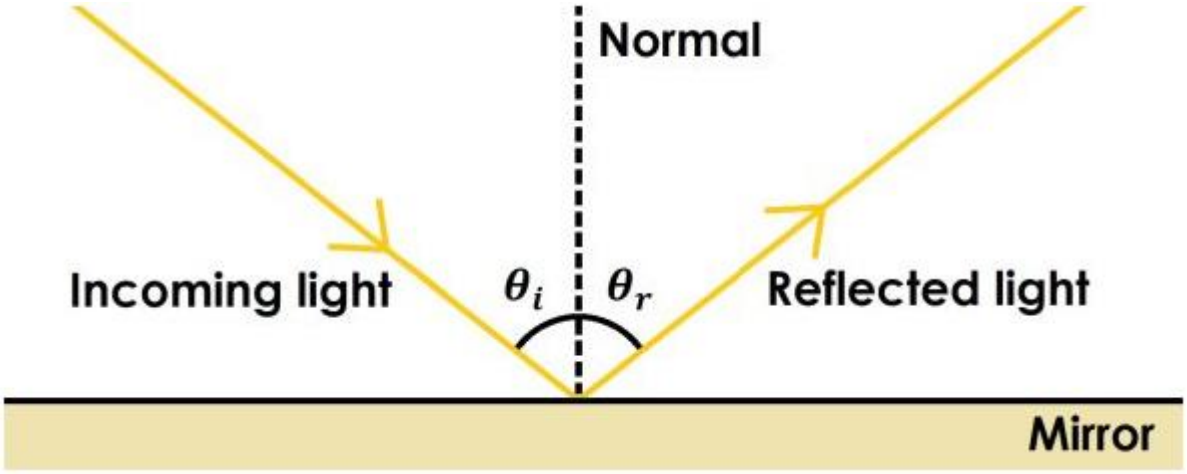
Incident Ray: The ray of light striking a surface.

Reflected Ray: The ray of light bouncing off the surface.

Normal: A line perpendicular to the surface at the point of incidence.

Refection of light-

When light bounces off a surface.

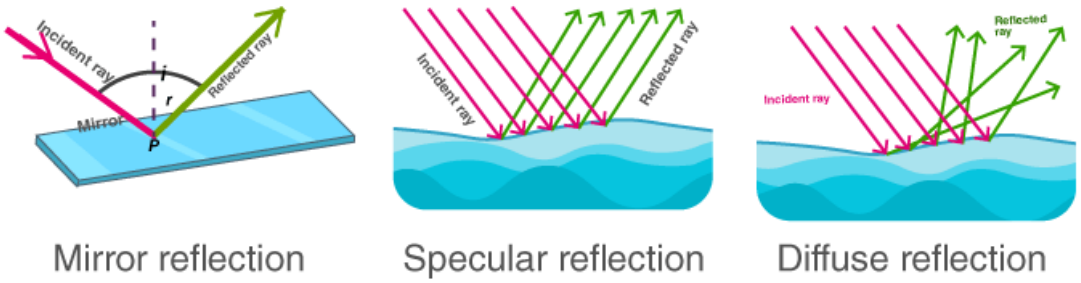


Laws of Reflection:

1. The angle of incidence equals the angle of reflection.
2. The incident ray, the reflected ray, and the normal lie in the same plane.

Types of Reflection

- **Regular Reflection**: Occurs on smooth surfaces like mirrors; forms clear images.
- **Diffused Reflection**: Occurs on rough surfaces; no clear image is formed.



Mirror reflection Specular reflection Diffuse reflection

Mirrors

1 Plane Mirror:

Forms virtual, erect, and same-sized images.

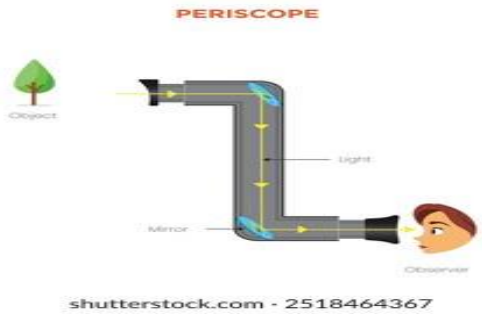
The image is laterally inverted.

- Lateral Inversion

- Multiple reflection

Kaleidoscope: Uses multiple reflections to form patterns.

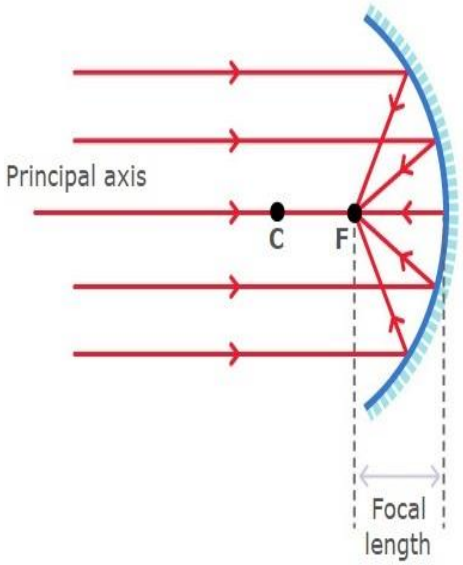
Periscope: Uses mirrors to see objects not in direct line of sight.



2 Spherical Mirrors:

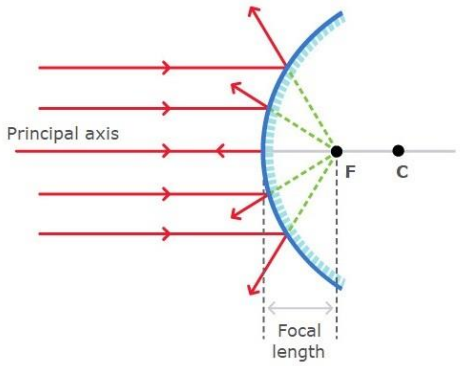
Concave Mirror: Forms real/inverted or virtual/erect images depending on the position of the object.

Reflection of light on a concave mirror



Convex Mirror: Forms virtual, erect, and smaller images; used in rear-view mirrors.

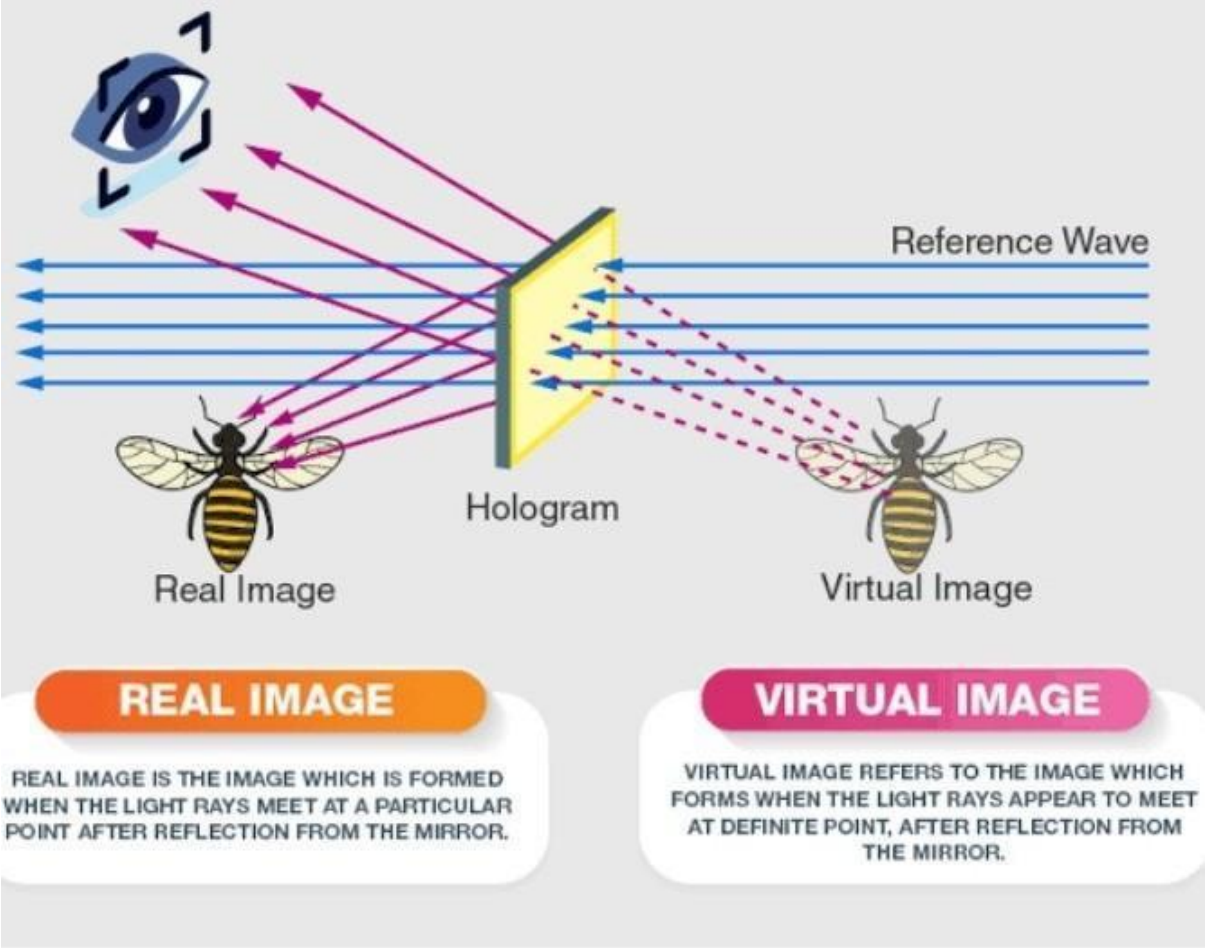
Reflection of light on convex mirror



Images

Real Image: Formed when light rays actually meet; can be projected on a screen.

Virtual Image: Formed when light rays appear to meet; cannot be projected.



Lenses

- ✓ Convex Lens (Converging Lens):

Focuses parallel rays to a point.

Forms real or virtual images based on object distance.

- ✓ Concave Lens (Diverging Lens):

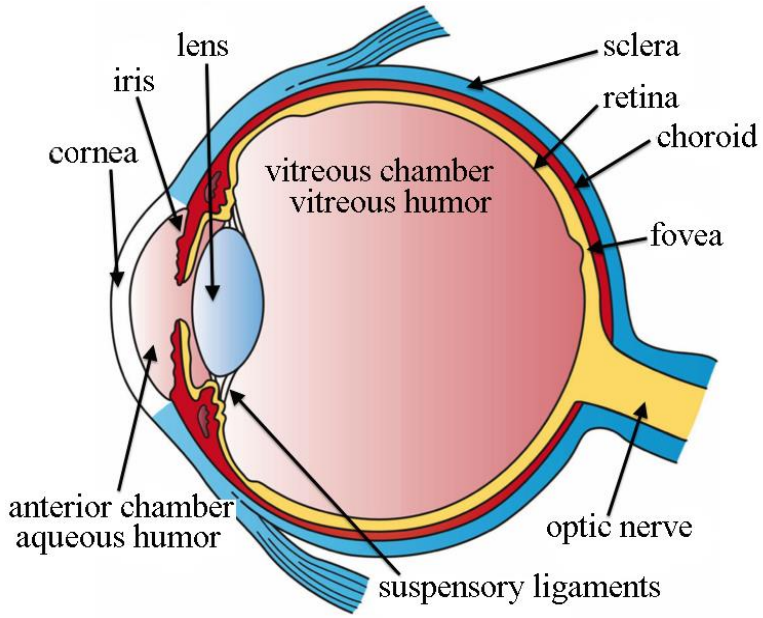
Spreads out parallel rays.

Forms virtual, erect, and smaller images.

Dispersion of Light

Splitting of white light into its constituent colors (VIBGYOR) by a prism.

Human Eye and Vision



- The eye lens forms an image on the retina.
- **Persistence of Vision**: The image persists on the retina for 1/16th of a second.
- **Defects of Vision**:
    1. **Myopia (Short-sightedness)**:

       Cause:

       The eyeball is too elongated, causing the image to form in front of the retina.

       The lens of the eye becomes too curved or thick.

       Corrected using a concave lens.
    2. **Hypermetropia (Far-sightedness)**:

Cause:

The eyeball is too short, causing the image to form behind the retina.

The lens of the eye becomes too flat or less curved.

Corrected using a convex lens.

3. **Astigmatism**:

   Cause:

   Irregular shape of the cornea or lens, causing light to focus at multiple points on the retina.

   Corrected using cylindrical lenses.