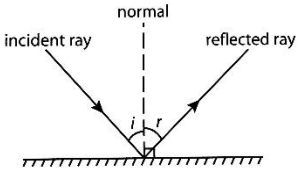
FOCUS 1 - Reflection of Light

- Reflection is the bouncing of light as it hits upon a surface.

Laws of Reflection

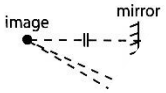
1st Law of Reflection
The incident ray, the reflected ray and the normal to the reflecting surface all lie in the same plane.



2nd Law of Reflection
Th

Mirrors

- An image formed in a plane mirror is
  1. laterally inverted,
  2. upright,
  3. at the same distance from the mirror as the object,
  4. the same size as the object,



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  speed of light in vacuum c to the speed of light in th
  v. The RI is also equal to the ratio of the sine of a
  of light travelling from vacuum into the medium.

$$n = \frac{c}{v} = \frac{\sin i}{\sin r}$$

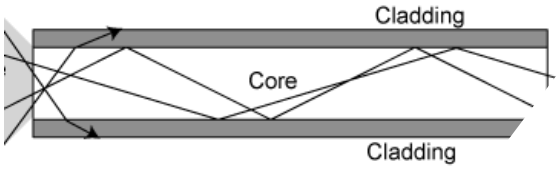
- The medium with a larger RI is sa
  light travels into an optically den

3. Total Internal Reflection

- When light travels into a
  from the normal. Whe
  critical angle c.
- The relationship b

- The follo
  1. Li
  2.

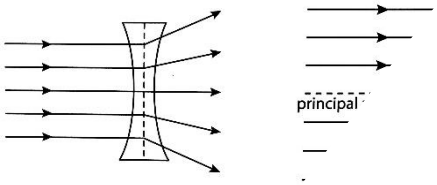
- One application of TIR is optical fibres. Optical fibres are made up of a core of glass or plastic with high RI, coated by another material of lower RI. Light travels along a fibre by total internal reflection at the boundary.
- In the communication industry, optical fibres can carry laser light which carries information such as telephone conversations, computer data and television pictures.
- Advantages of using optical fibres:
  - they can carry light round bends and in places where it would be difficult or dangerous to supply electricity (e.g. under the sea)
  - they can carry information over great distances at high speed.
  - they can carry more information than a copper wire cable.



FOCUS 3 – Refraction by Thin Lenses

- A lens is a piece of clear plastic or glass with curved surfaces.

Types of Lenses



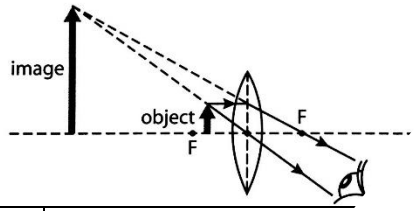
Diverging (Concave) Lens
- A Diverging Lens is thinner in the middle.
- A parallel beam of light that passes through a diverging lens will spread out (diverge).

Converging (Convex) Lens
- A Converging Lens is thicker in the middle.
- A parallel beam of light that pass through converging lens will meet (converge) at
- Terminology:
  - *(a) Optical Center (C) is the center of the lens.*
  - *(b) Principal Axis is a line through the optical center of the lens and is perpendicular to the cente*
  - *(c) When rays of light are traveling parallel and close to the principal axis pass through the ler point is called the principal focus, F.*
  - *(d) Focal Length (f) is the distance between the principal focus (F) and the optical center*

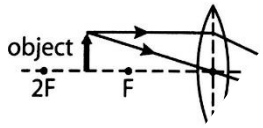
Ray Diagrams for Lenses

Construction Rules for Ray Diagram

Path I - A ray through the optical center will not be deviated.
Path II - A ray parallel to the principal axis is refracted by the ler
Path III - A ray through F is



Position of Object	Description
Between lens and F	Image is formed behind th same side as the lens. Ir is enlarged, upright ar



Position of Object	Des
Between F and 2F	Ir