

## 5 Important Properties of Waves & Light

1. **Rectilinear Propagation** – refers to the fact that light travels in a straight line if unhindered.

2. **Reflection** – light will ‘bounce’ off a smooth shiny surface.  
angle of incidence = angle of reflection!

3. **Diffraction** – waves will ‘bend’ as they travel through openings or around obstacles.

If the opening is much larger than wavelength, then there is little diffraction.

If the opening is much smaller than wavelength, then there is much diffraction.

(Picture – page #534 -- Fig.11.3a)

4. **Refraction** – is the bending of waves as they enter a new medium

Waves will bend towards the normal as they slow down (or enter a more dense medium)

Waves will bend away from the normal as they speed up (or enter a less dense medium).

\*\*  $n$  = refractive index = optical density. Greater ‘ $n$ ’, the greater the density, the more light slows down.

*for example:* go from high ‘ $n$ ’, to low ‘ $n$ ’, the light is speeding up  $\rightarrow$  will bend away.

5. **Dispersion** – is the breaking up of visible white light into its components (ROYGBIV)

Red, orange, yellow, green, blue, indigo, violet

R	O	Y	G	B	I	V	
Longest $\lambda$							Shortest $\lambda$
Lowest frequency							highest frequency
Least energy							most energy

- This happens with white light because different colours have different refractive abilities. Red refracts the least and blue refracts the most.