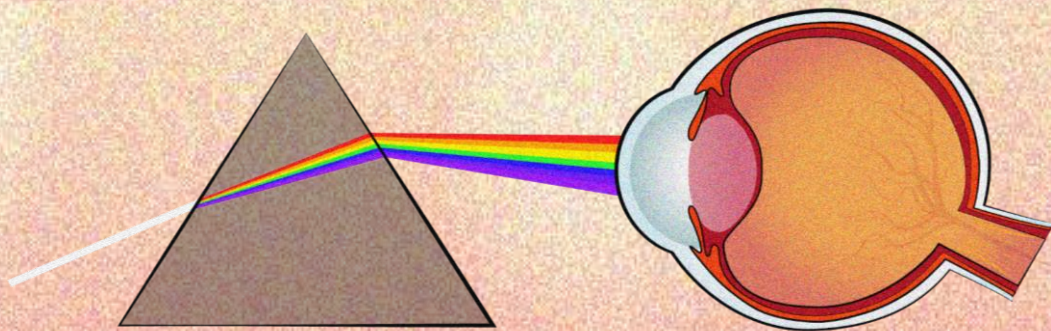


Topics

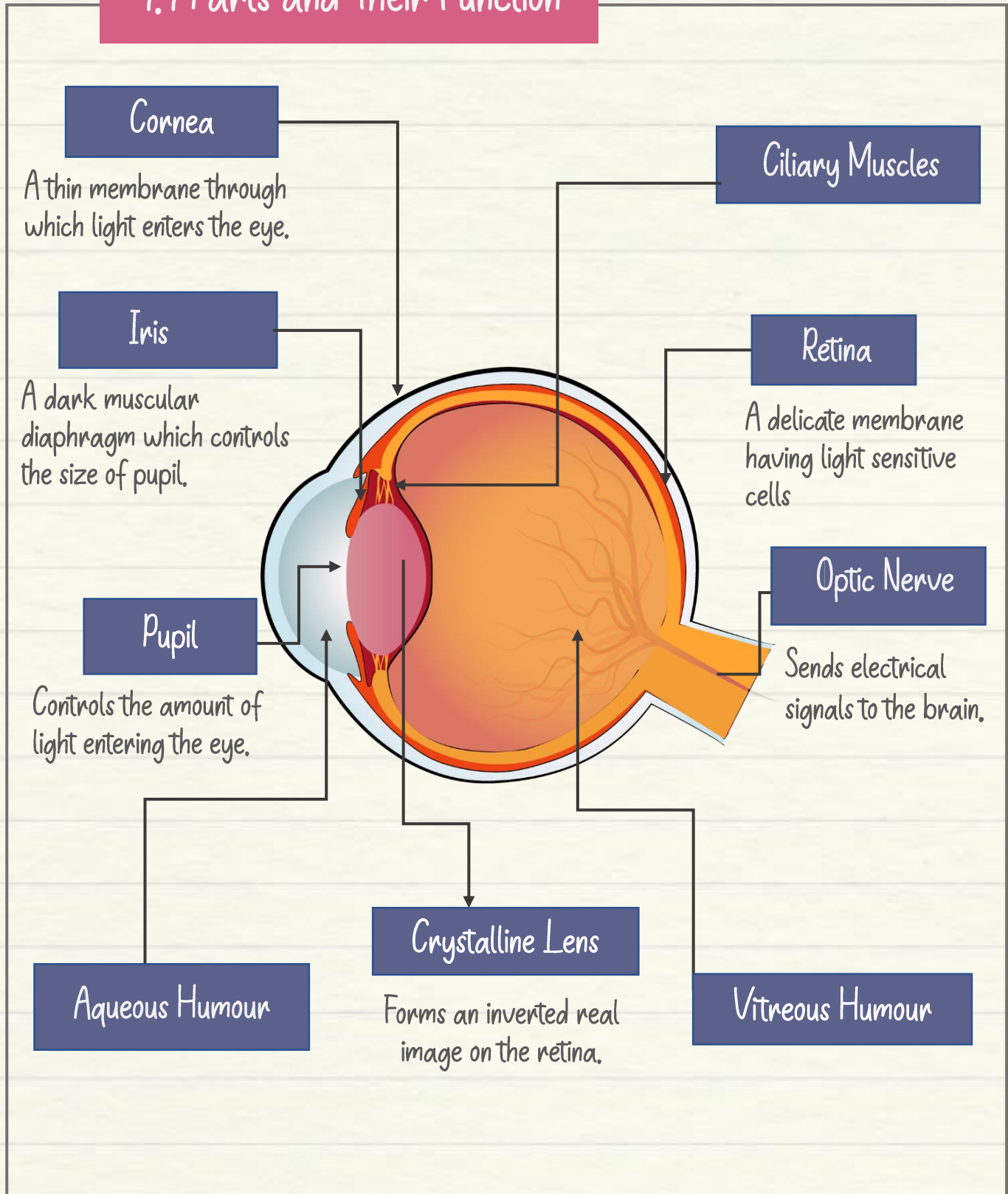


1. The Human Eye
2. Defects of Vision
3. Refraction of Light Through a Prism
4. Dispersion of Light
5. Atmospheric Refraction
6. Scattering of Light



1. Human Eye

1.1 Parts and Their Function

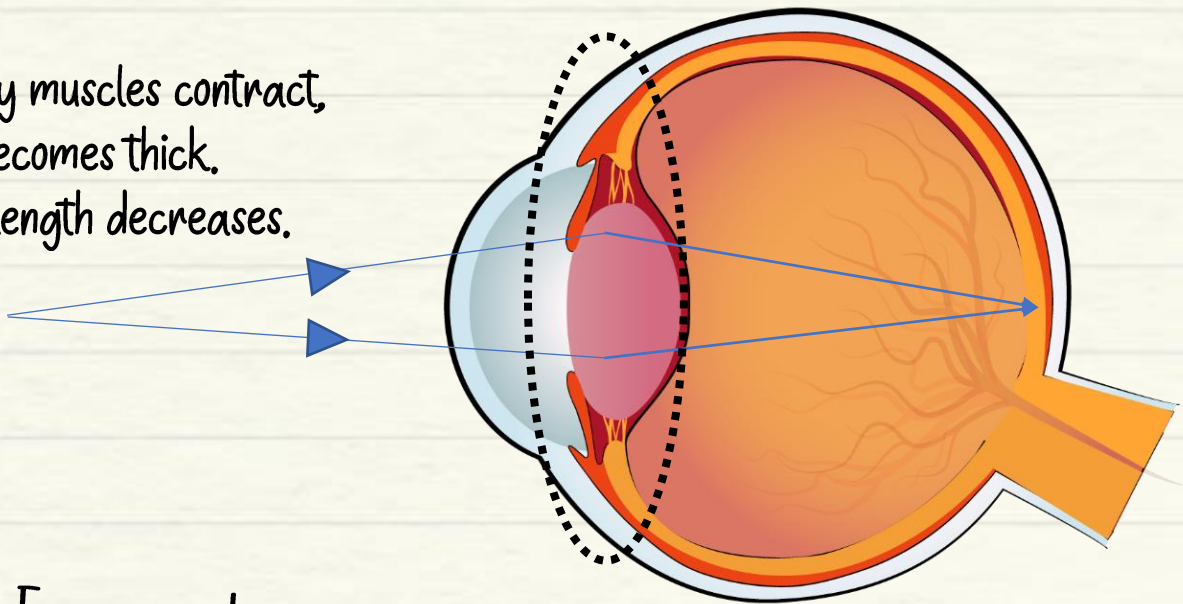


1.2 Power of Accommodation

Power of accommodation

The ability of eye lens to adjust its focal length.

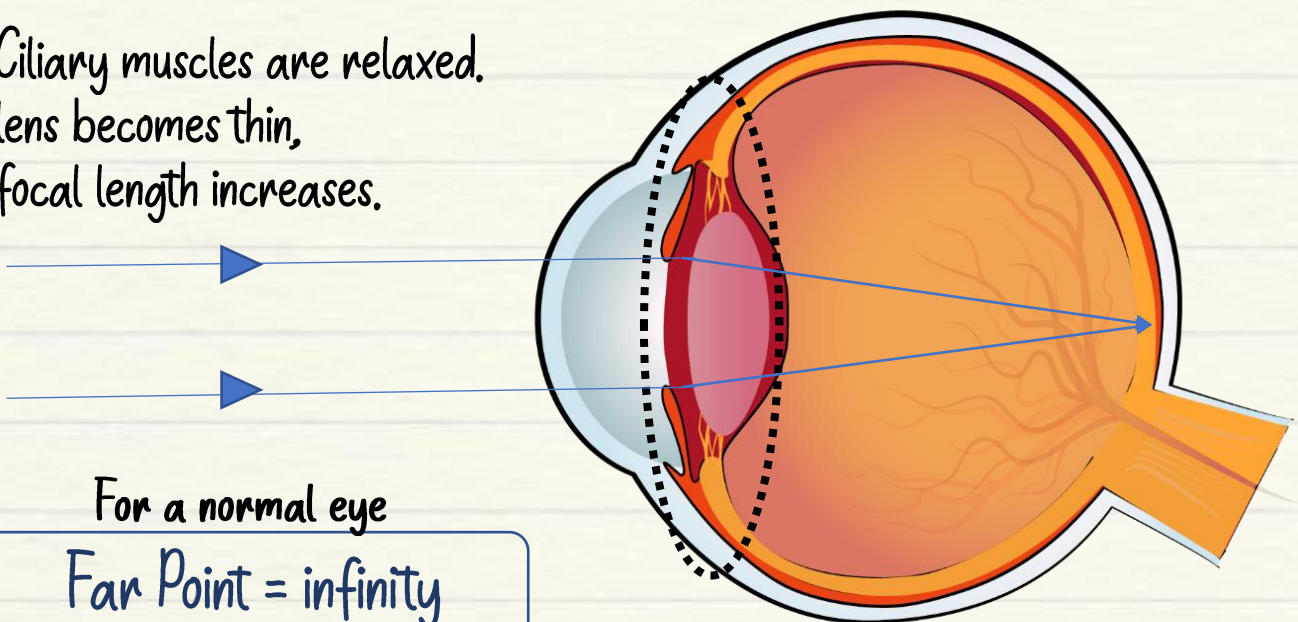
Ciliary muscles contract,
lens becomes thick,
focal length decreases.



For a normal eye

Near Point = 25 cm

Ciliary muscles are relaxed,
lens becomes thin,
focal length increases.

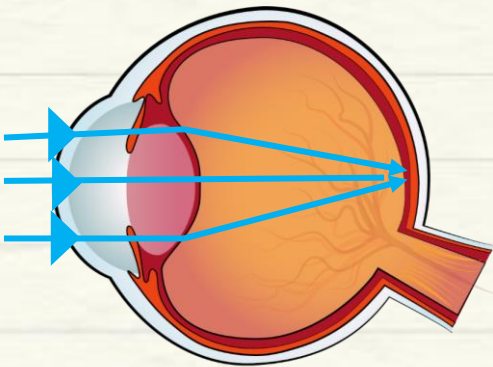


For a normal eye

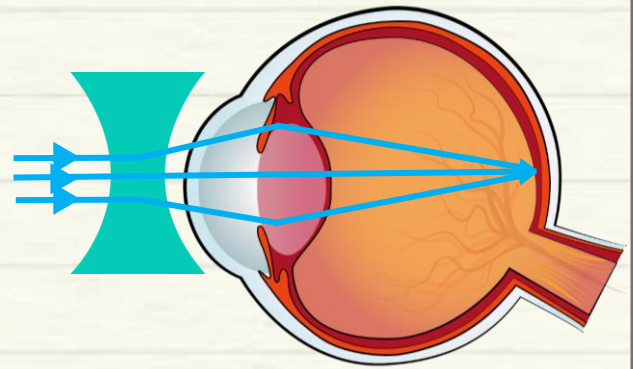
Far Point = infinity

2. Defects of Vision

2.1 Myopia (Near-Sightedness)

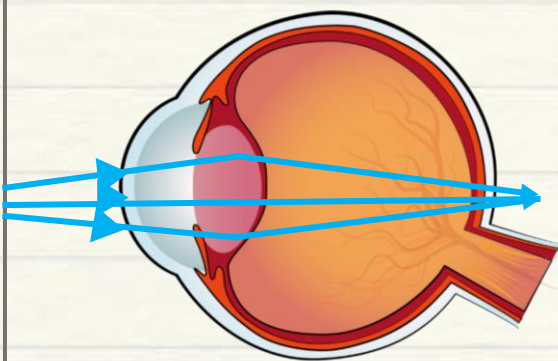


Light focuses in front of retina

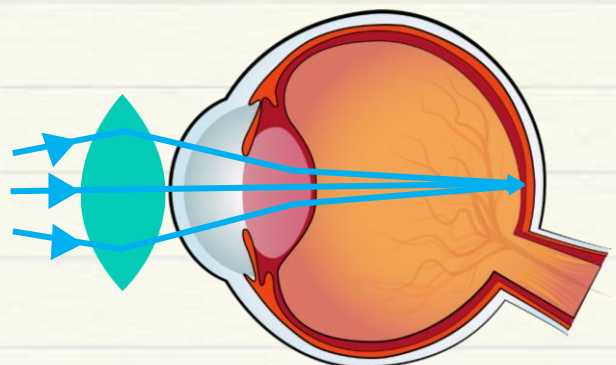


Corrected with Concave Lens

2.2 Hypermetropia (Far-Sightedness)



Light focuses behind retina



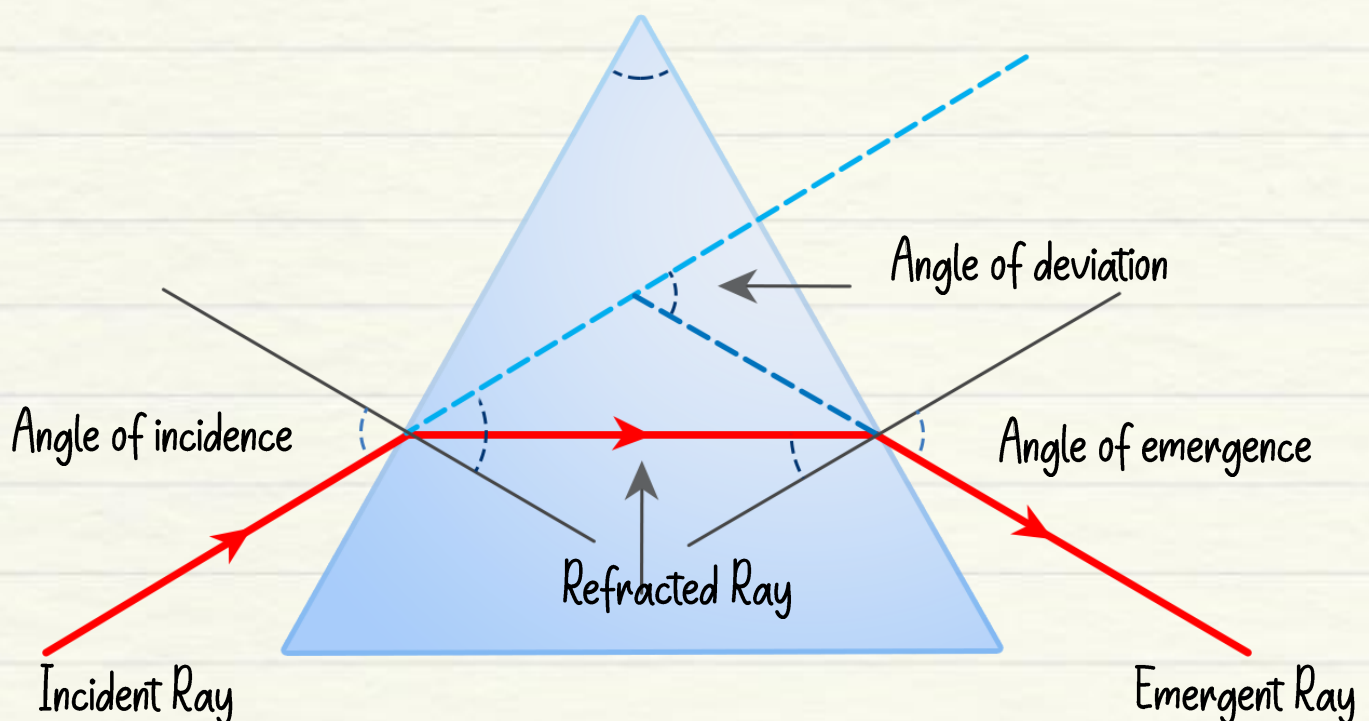
Corrected with Convex Lens

2.3 Presbyopia

- Gradual weakening of ciliary muscles due to ageing.
- The near point moves away.



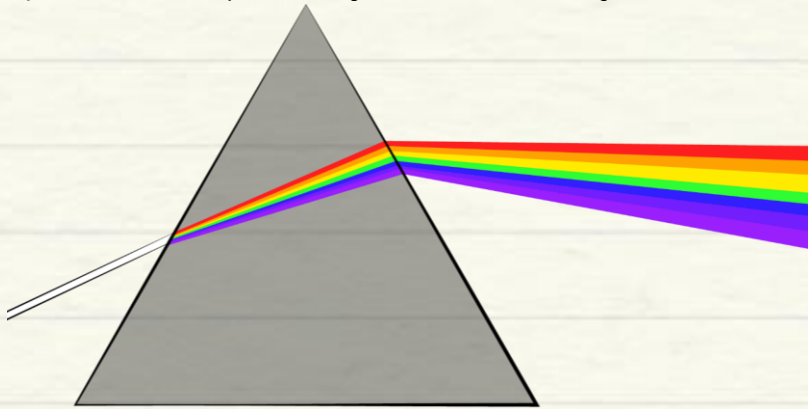
3. Refraction of Light Through a Prism



4. Dispersion of Light

4.1 Dispersion of Light Through a Prism

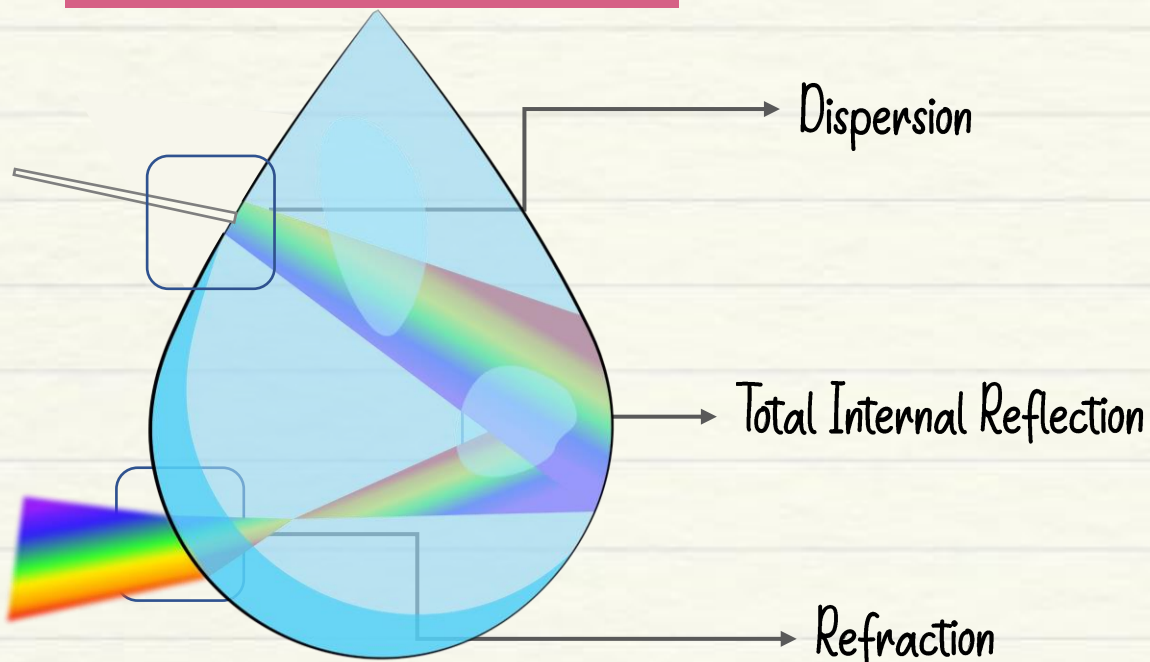
Dispersion: Splitting of white light into seven colours.



Red Light
bends the least

Violet Light
bends the most

4.2 Formation of Rainbow

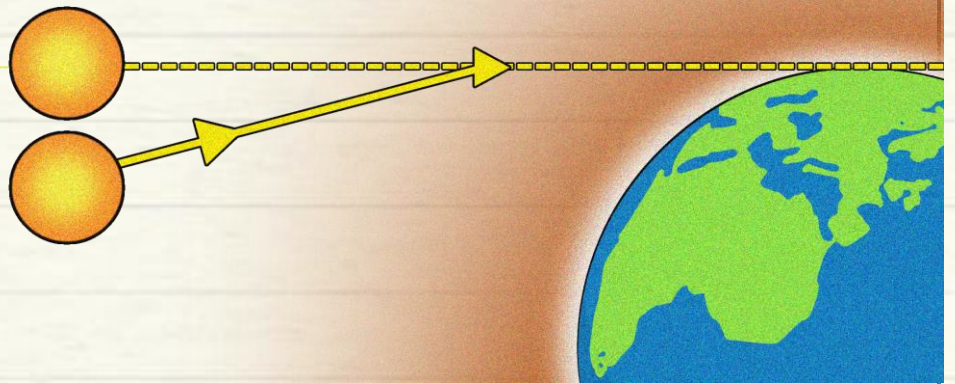


5. Atmospheric Refraction

It happens due to difference in optical densities of different atmospheric layers.

5.1 Advanced Sunrise and Delayed Sunset

The Sun is visible to us about 2 minutes before sunrise and 2 minutes after sunset.



5.2 Twinkling of Stars

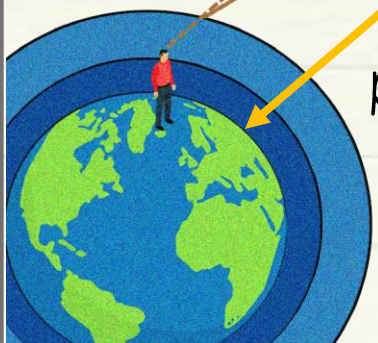
Apparent star Position

Star

Ray path

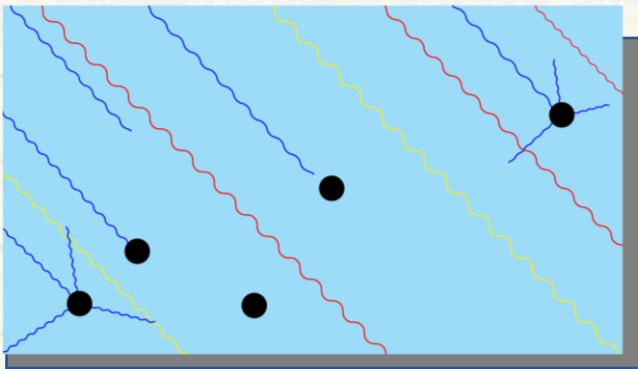
Continuous change in the apparent position of stars

Refractive Index Increasing



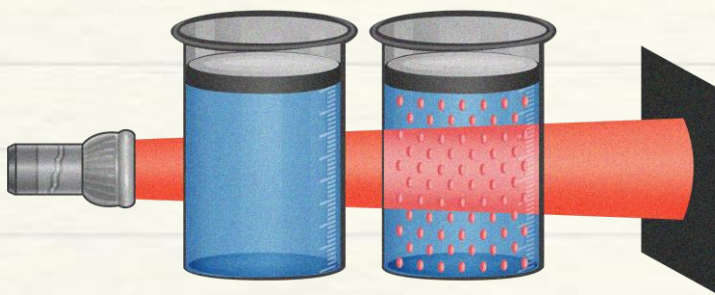
b. Scattering of Light

When light interacts with particles, it gets scattered



- This scattering depends on size of scattering particles.
- Very fine particles scatter mainly blue light
 - Particles of larger size scatter light of longer wavelengths.

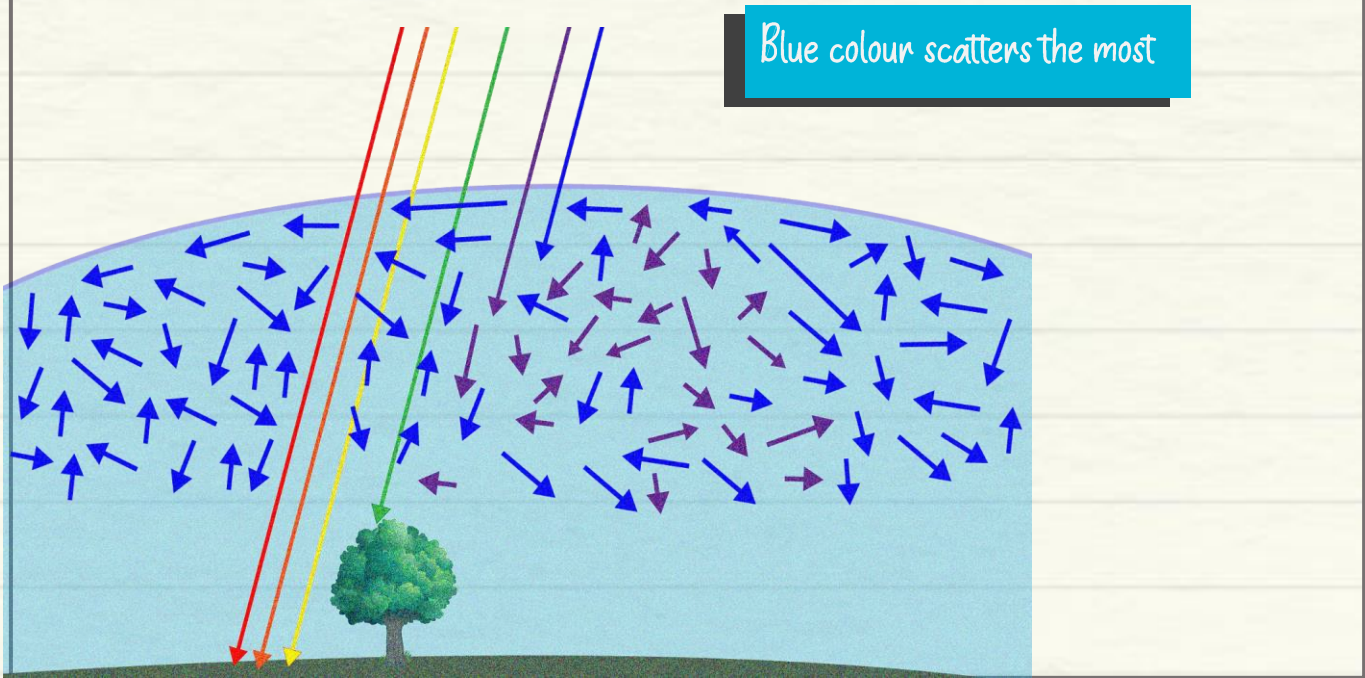
6.1 Tyndall Effect



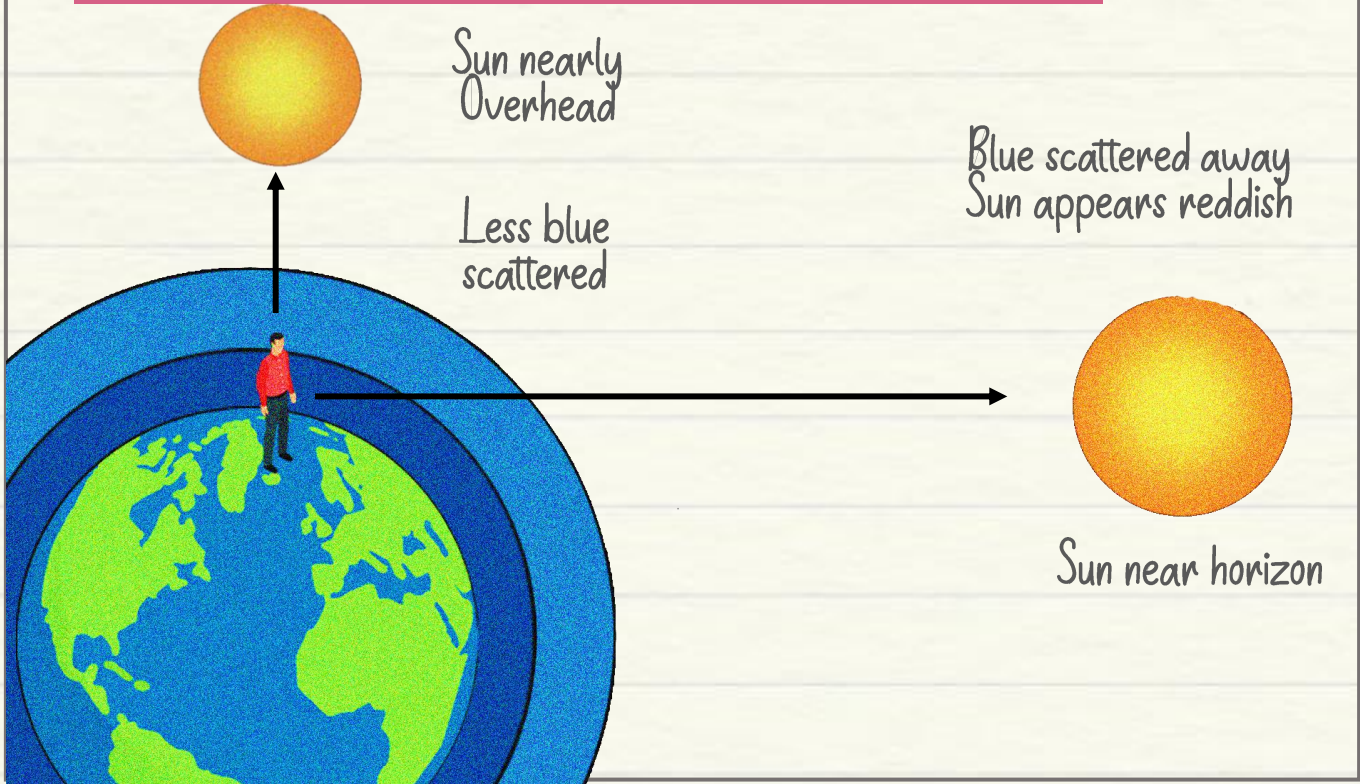
Scattering of light by colloidal particles give rise to Tyndall effect

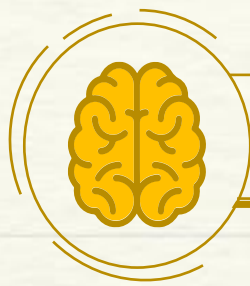
Path of light is visible through a colloid, but not through a solution.

6.2 Blue Colour of the Sky



6.3 Reddening of the Sun at Sunrise and Sunset





Mind Map

