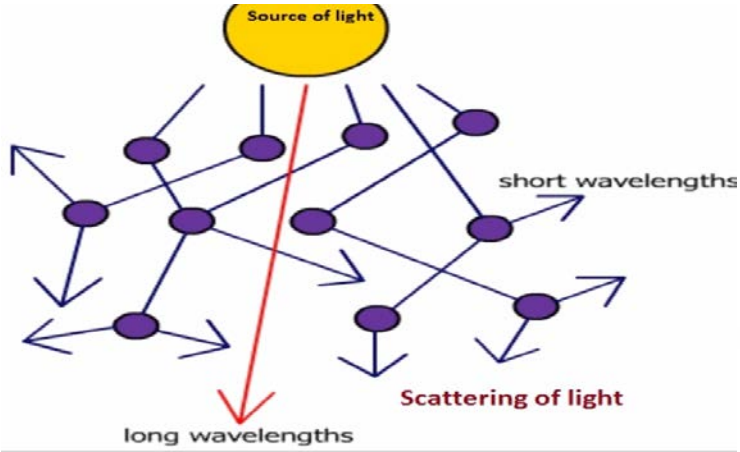
Scattering of Light

When sunlight enters the atmosphere of the earth, the atoms and molecules of different gasses present in the air absorb the light. Then these atoms re-emit light in all directions. This process is known as **Scattering of light.**

The atoms or particles that scatter light are called scatterers.



Law of Scattering:

The intensity of scattered light is inversely proportional with the fourth power of the wavelength of the incident light when the particle (Scatterer) is of smaller diameter than the wavelength of light.

Types of Scattering

The dispersion of light can be classified based on the energy of the scattered light. They are:

Elastic Scattering: If the energy of the scattered light is conserved, then such scattering is called elastic scattering. For example, Rayleigh Scattering and Mie Scattering.

Inelastic Scattering: If the energy of the scattered light is not conserved, then such scattering is called inelastic scattering. For example, Raman Scattering and Brillouin Scattering.

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Applications of Scattering in our daily life:

Blue colour of the sky:

When sunlight enters the atmosphere then it gets scattered. The wavelength of red light is the greatest and thus is scattered least. Violet rays are scattered the most followed by blue, green, yellow, orange respectively. Our eye is more sensitive to the blue light thus we see the sky as blue.

Red sky and sun on the time of Sunset or Sunrise:

At the time of sunrise or sunset, the position of the sun is very far away from the earth. The sunlight travels a longer distance through the atmosphere. Scattering blue light is more than red light. As a result, more red lights reach our eye than the blue light. Hence sunrise and sunset appear reddish.

White colour of clouds:

The clouds are nearer to the earth's surface and they contain dust particles and water molecules of a size bigger than the wavelength of visible light. These particles scatter all colours of incident white light from sun to the same extent and hence when the scattered light reaches our eyes, the clouds are seen white.