

Dispersion of Light



When light passes through a transparent medium, dispersion is defined as the splitting of the light beam into its seven constituent colours.

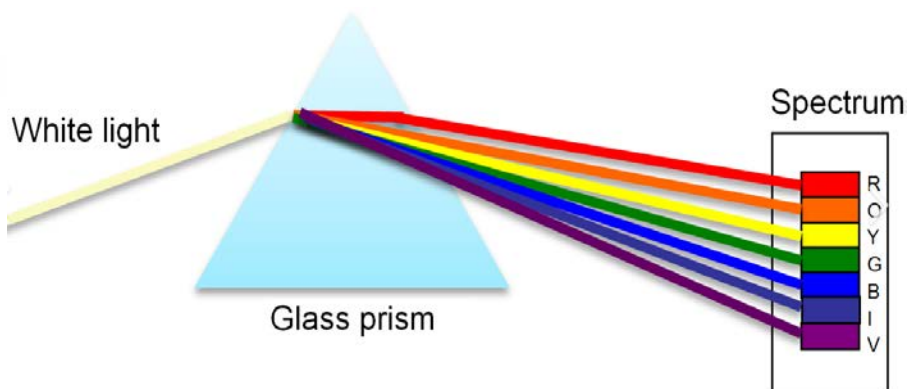
Sir Isaac Newton described this occurrence in 1666 A.D. When sunlight passes through a glass prism, he discovered that white light is made up of seven distinct hues.

A rainbow against a dark stormy sky is a sight to behold. A clear glass prism or a diamond employs the same method to colourize white light.

This is due to a phenomenon known as '**Dispersion of Light**,' which occurs in conjunction with refraction.

The band of seven colours formed on the paper screen due to dispersion of white light is called **spectrum of white light**.

The spreading of white light into its complete spectrum of wavelengths is known as **dispersion**. The spectrums of colours are: Violet, Indigo, Blue, Green, Yellow, Orange, and Red.



Dispersion of Light



- Newton was the first to experiment with light flowing through a prism.
- He allowed sunlight to pass through the prism, expecting to see white light on the other side of the screen, but instead saw the spectrum of light after dispersion.
- He had a little intuition about the relevance of this, but he chooses to do something else to prove it.
- By adjusting the size of the intake, he was able to enable just one color (and hence only one wavelength of light) to flow through the prism. Obviously, the light ray was refracted and did not disperse farther.
- As a result, he recognised that various colors of the light spectrum bend differently because they have distinct wavelengths.
- He discovered that violet bent the most and red bent the least due to their shorter and longer wavelengths, respectively.



Causes of dispersion of white light

- Lights of all colours travel at the same speed in vacuum. But, in any transparent medium such as glass, water, etc., the lights of different colours travel with different speeds.
- The red light travels the fastest, and the violet light the slowest of all the seven colours.
- As a result the red light bends the least, and the violet light bends the most.
- This unequal bending of lights of different colours causes dispersion of white light (or sunlight).