Light dispersion

Light dispersion is when visible light is separated into different component colors through some type of medium. The most famous example of this would be the rainbow which we can see from time to time after rain, or a prism. Visible white light consists of different components of different frequencies which constitutes the colors we can see. With different frequencies, the bending varies upon passage through some object like prisms which causes light dispersion. Light travels through vacuum at c (speed of light= 3.00*10^8 m/s), but less than c for traveling through other materials. The Index of refraction n can be expressed in the following equation: n= c/v, where c is the speed of light in vacuum, and v is the speed of light in the substance. However, it is important to recognize that the velocity of light in the medium and therefore the index of refraction is dependent on the frequency of the light. Which brings us back to light dispersion in that the differences in the index of refraction of the varying colors are responsible for. For example, for some type of glass, the n value for the frequency for violet is 1.53. And the n value for the frequency of red light is 1.51. This results in the violet light travelling slower than the red light because of the absorption and reemission of the lights through the glass which ultimately results in the dispersion through a prism. Also the amount of overall refraction resulted through a prism is often called the angle of deviation. It is the difference between the angles made from the light entering the prism and exiting it. Colors with shorter wavelengths will have more deviation than colors with longer wavelengths. Also the dispersion of a material is measured by something called the Abbe number (V) which gets lower as dispersion gets stronger. It can be expressed as the following equation:

$$V_D = \frac{n_D - 1}{n_F - n_C},$$ YOU SHOULD EXPLAIN WHAT THE DIFFERENT SYMBOLS MEAN

Also light dispersion is responsible for the chromatic aberrations in lenses which is when a lens will not focus different colors in the same place because of the difference in refraction indices.