Eduqas Physics – Component 3

Module 3: Refraction of light

This topic covers refraction of light, and how Snell's law relates to the wave model of light propagation. The concept of total internal reflection is studied and its application to multimode optical fibres. This topic also looks at how the introduction of monomode optical fibres has allowed for greater transmission rates and distances.

You should be able to demonstrate and show your understanding of:	**Progress and understanding:**			
	1	**2**	**3**	**4**
The refractive index, n, of a medium being defined as $\frac{c}{v}$, in which v is the speed of light in the medium and c is the speed of light in a vacuum				
The use of the equations: $n_1 v_1 = n_2 v_2$ and $n_1 \sin\theta_1 = n_2 \sin\theta_2$ (regarded as Snell's law)				
How Snell's law relates to the wave model of light propagation and for diagrams of plane waves approaching a plane boundary obliquely, and being refracted				
The conditions for total internal reflection				
The derivation and use of the equation for the critical angle $n_1 \sin\theta_c = n_2$				
How to apply the concept of total internal reflection to multimode optical fibres				
The problem of multimode dispersion with optical fibres in terms of limiting the rate of data transfer and transmission distance				
How the introduction of monomode optical fibres has allowed for much greater transmission rates and distances				
SPECIFIED PRACTICAL WORK				
Measurement of the refractive index of a material				