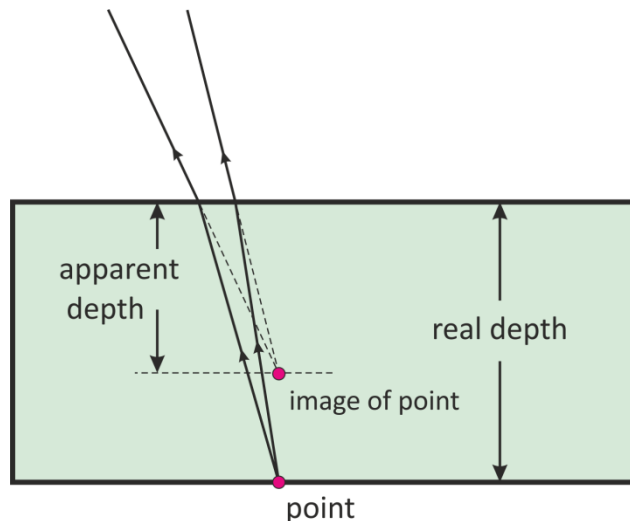


Answer on Question #39549, Physics, Optics

A glass slab is placed over a page of letters in which the letters are printed with different colors. Which letter would appear to be maximum raised and which one minimum raised?

Answer:

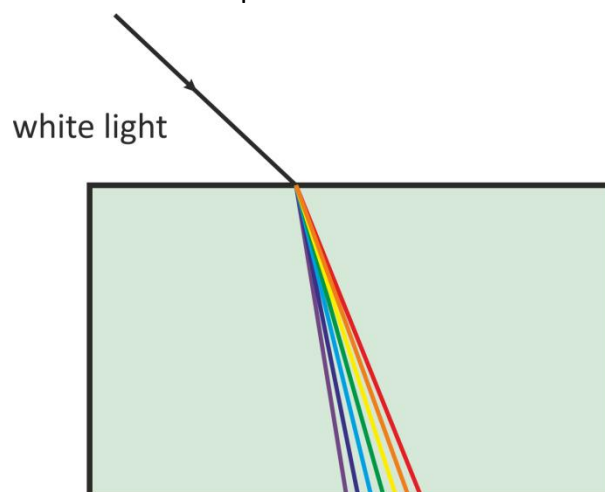
As light from the letters leaves the top of the block it is refracted so that it enters the eye at a more horizontal angle than if viewed directly. This causes the brain to 'see' (locate) the image at a higher position than the real position of the letters as if they had been brought closer to the eye.



$$\text{Refractive index} = \frac{\text{Real depth}}{\text{Apparent depth}}$$
$$n = \frac{d}{d'}$$

For visible light, the n value does not show a large variation with wavelength, but nonetheless it shows a variation. For instance for some types of glass, the n value for wavelengths of violet light is 1.53; and the n value for wavelengths of red light is 1.51.

Since refractive index differ for different colored light, so, apparent depth d' will be different and hence, images will be formed in different planes.



The refractive index n is maximum for the violet colour and apparent depth would, therefore, be the least. Hence the violet colour letter would be raised to the maximum. The red letter would be minimum raised.