4.7 Refraction and total internal reflection

Science inquiry

Visual/spatial Logical/mathematical

Light bends towards the normal when entering a material of greater refractive index.
Light bends away from the normal when entering a material of lower refractive index.

1 **Predict** where the path of each ray of light will continue in a, b, c and d (Figure 4.7.1).

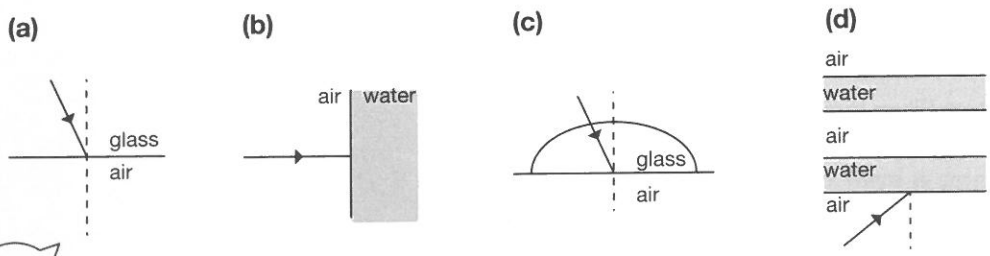

Figure 4.7.1

2 Figure 4.7.2 shows a ray of light being refracted through materials A, B and C.

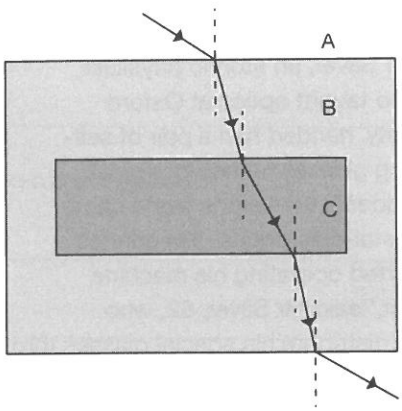

Figure 4.7.2

Analyse the diagram and list A, B and C from lowest to highest refractive index:

(lowest) _____, _____, _____ (highest)

3 For light travelling into a substance of lower refractive index, there is a critical angle at which the light is refracted at 90° to the surface. For angles larger than the critical angle, light is reflected from the surface. The critical angle for light passing from water into air is is 48.8°.

Predict the path that each ray will follow in situations a, b and c (Figure 4.7.3).

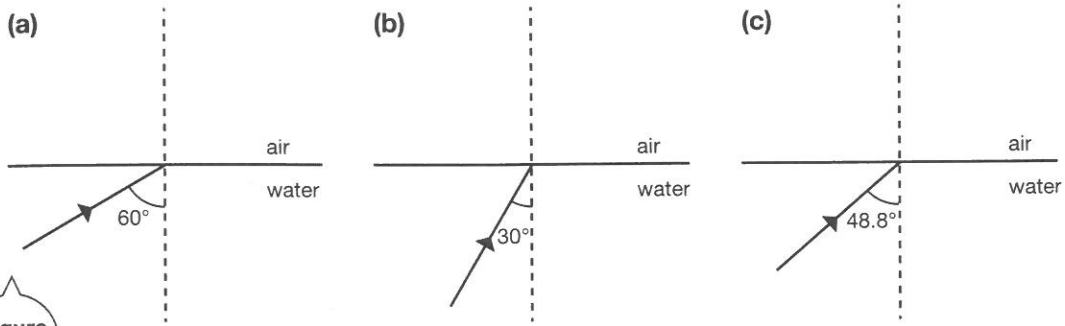

Figure 4.7.3