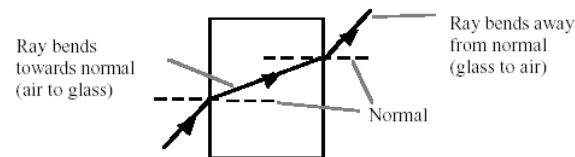


N5 WAVES & RADIATION

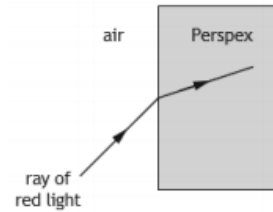
Refraction is when light travels from one material to another and it changes direction because it has undergone a change in speed.

- ✓ Light slows down when it enters a denser material e.g. when it travels for air into glass.
- ✓ The refracted and incident angles are always measured from the normal line.
- ✓ The wavelength of the light will decrease when it enters a denser material, e.g. when it travels from air into glass.
- ✓ Frequency does not change when a light passes into a new material.



Example

A student directs a ray of red light into a Perspex block to investigate refraction.

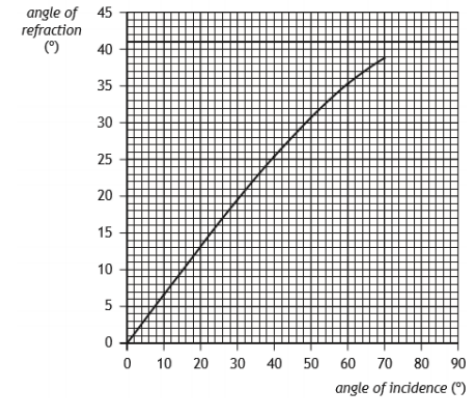


(a) Sketch the diagram and draw and label:

- (i) the normal;
- (ii) the angle of incidence i and the angle of refraction r .

Draw onto diagram (i) and (ii)

(b) The student varies the angle of incidence and measures the corresponding angles of refraction. The results are plotted on a graph.



- b(i) 8°
b(ii) 42°
c) Any one of:
- To obtain more reliable results
 - Eliminate rogue results/outliers
 - To allow an average/mean to be calculated
 - More accurate

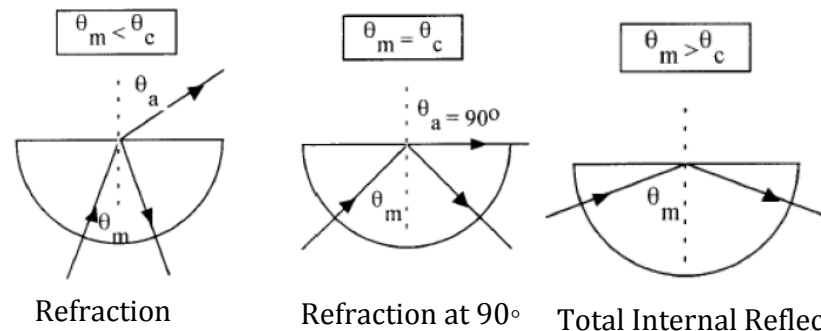
- (i) Determine the angle of refraction when the angle of incidence is 12°. 1
- (ii) Use the graph to predict the angle of refraction the student would obtain for an angle of incidence of 80°. 1
- (c) Suggest why it would be good practice for the student to repeat the investigation a further three or four times. 1

3. REFRACTION

Revision Questions for Next week

Now complete the Refraction Key Area questions on the past paper bank on google classroom.

Critical Angle (θ_c) - Angle of incidence at which the angle of refraction is 90 degrees.



Optical Fibres

Long, flexible pieces of glass - use the principle of total internal reflection. The rays of light always strike the internal surface of the glass at an angle greater than the critical angle.

