

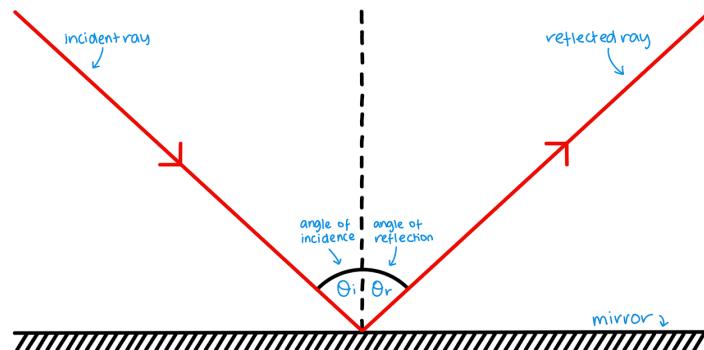
OCR (B) Physics GCSE

PAG 8: Interaction of Waves



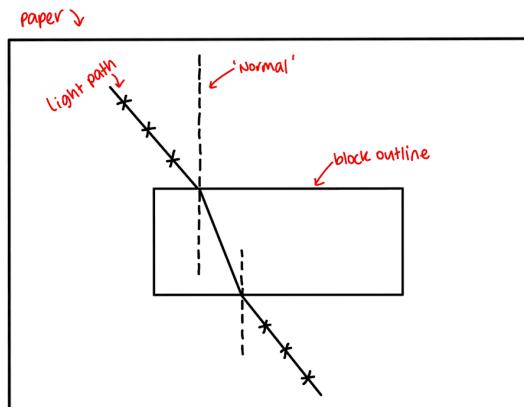
Investigating the reflection of light off a plane mirror and the refraction of light through prisms.

Reflection off a Plane Mirror



1. Position the plane mirror so that it is upright (perpendicular to the surface of the desk) and place a piece of paper flat on the desk in front of the mirror
2. Draw the normal on the piece of paper – a line **perpendicular to the surface of the mirror**
3. Ensure the experiment is conducted in a **darkened room**, or turn off the lights at this point.
4. Place a **thin single slit** in front of the ray box (a thick beam would be hard to measure accurately) and direct the incident light at the mirror
5. Draw the incident and reflected rays on the piece of paper by following the light
6. Use a **protractor** to measure the angle of incidence from the incident ray to the normal, and measure the angle of reflection from the reflected ray to the normal
7. You should find that the **angle of reflection = angle of incidence**

Refraction through a Prism



1. This experiment also needs to be conducted in a darkened room using a ray box with a thin slit to create a narrow beam



2. Shine the light through a prism, remembering to keep the prism in a **fixed position**; trace around it on a white piece of paper to keep it aligned, and so you can replace it if it slips out of position.
3. Use a **ruler** to draw the **normal**, perpendicular to the surface of the rectangular prism
4. Use a **protractor** to mark out the **angle of incidence** and do this for several values between 0 to 70° at regular intervals
5. Mark out the refracted ray for each angle of incidence and measure the **angle of refraction** using the protractor
6. Plot a graph of **sin i** against **sin r** and draw a line of best fit

The gradient of a $\sin(i)/\sin(r)$ graph will be equal to the refractive index of the material.

