**Investigating Refraction**

Aim: To investigate the path of light rays during the process of refraction

Equipment:

* Hodson light box
* Power Pack
* Rectangular Perspex block
* Single slit slide
* Protractor
* Pencil and ruler

Method:

1. Use the protractor to construct a normal (90°) for each incident ray shown.
2. Place the Perspex block in the space below with one edge on the line, so that incident ray 1 hits the block in the **middle** of the surface.
3. Trace along the bottom surface of the block.
4. Aim a single light ray at the face of the block along incident ray 1.
5. Mark where the light ray exits the other side of the block and place two more dots down the light ray.
6. Draw in the refracted ray and connect the two rays to show the path the light took through the block.
7. Repeat steps 2 to 6 for incident rays 2 and 3.

Results:

*i1*

*i3*

*i2*

Place block

on this line.

Processing Results and Discussion:

1. Describe what happened to the incident ray that followed the normal (*i1*). Explain why this happened. (Hint: think about which part of the light ray slows down first)
2. Using the normal lines you drew earlier, measure the angle of incidence and the angle of refraction for incident rays 2 and 3 as the light **enters** the Perspex block. (Remember to measure the angle between the light ray and the normal.)

ϴ*i2* = \_\_\_\_\_\_\_\_\_\_\_ ϴ*r2* = \_\_\_\_\_\_\_\_\_\_\_

ϴ*i3* = \_\_\_\_\_\_\_\_\_\_\_ ϴ*r3* = \_\_\_\_\_\_\_\_\_\_\_

1. What do you notice about the way the light bends for both these incident rays? Explain why this happened. (Hint: think about which part of the light ray slows down first)
2. Draw the normal for each of the refracted rays as they **leave** the Perspex block.
3. Measure the angle of incidence and the angle of refraction for incident rays 2 and 3 as the light **leaves** the Perspex block. (Remember to measure the angle between the light ray and the normal.)

ϴ*i2* = \_\_\_\_\_\_\_\_\_\_\_ ϴ*r2* = \_\_\_\_\_\_\_\_\_\_\_

ϴ*i3* = \_\_\_\_\_\_\_\_\_\_\_ ϴ*r3* = \_\_\_\_\_\_\_\_\_\_\_

1. What do you notice about the way the light bends for both these incident rays? Explain why this happened. (Hint: think about which part of the light ray speeds up first)