

REFRACTION

Name: _____

Aim: to observe the refraction of light as it passes from air to perspex;

to measure the angles of incidence and the angles of refraction of six different light beams.

Apparatus: Light box, single-ray-forming plate, 12 V power supply, semi-circular Perspex prism.

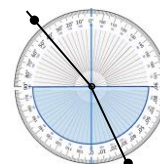
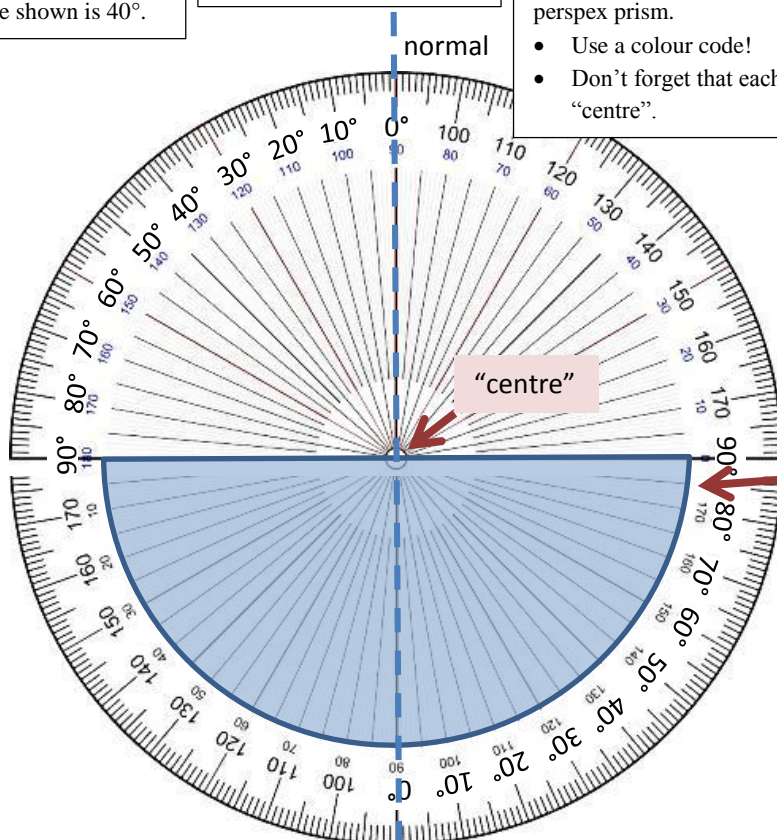
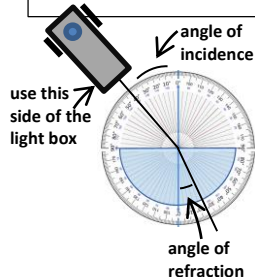
Method:

1. From the flat side, **direct a single ray** of light towards the “centre” of the semi-circular perspex prism (at the angles **shown in the table** below). The angle of incidence in the example shown is 40°.

2. **Record the angle of refraction** for each angle of incidence **in the table**.

3. **Mark in the path** of the **six rays** by
(a) placing a dot on the incident ray and a dot on the refracted ray and then
(b) ruling **two** lines to connect the dots after you remove the perspex prism.

- Use a colour code!
- Don't forget that each line will connect each dot to the “centre”.



Note: The ray exiting the perspex prism shouldn't refract because it exits at an angle of incidence of 0°.

Angle of Incidence (i)	Angle of Refraction (r)	Angle of deviation (i - r)	i / r	sin i (to 3 decimal places)	sin r (to 3 decimal places)	sin i / sin r (to 2 decimal places)
0°			-	-	-	-
15°						
30°						
45°						
60°						
75°						
Average						

Questions:

1. What happens to the angle of refraction and the angle of deviation as the angle of incidence increases?

2. The refractive index of perspex (also called PMMA and Plexiglas) is 1.49. What do you notice about the values of sin i/sin r in your table?

3. What are some possible sources of error in this prac?
