Light

**Organise the method used to measure reflection and refraction:**

- Place the ruler near the middle of the A3 paper and draw a straight line parallel to its long side.
- Move the ray box or paper to change the angle of incidence. Do this until you see a clear ray reflected from the surface of the block and another clear ray leaving the opposite face of the block
- Set up the ray box, slit and lens so that a narrow ray of light is produced. In a darkened room.
- Draw around the transparent block. Be careful **not** to move it.
- Use the ray box to direct a ray of light at the point where the normal meets the block.
- This is called the '**incident ray**'.
- Mark the path of the incident ray with a cross and the reflected ray with another cross.
- Mark the path of the reflected/refracted ray with another cross and join the crosses together and measure the angles from the normal.
- Place the longest side of a transparent block against the first line, with the largest face of the block on the paper. The normal should be near the middle of the block.
- Use the protractor to draw a second line at right angles to this line. Label this line with an '**N**' for '**normal**'.

Improvements:

Suggest ways in which you could improve these in the experiment:

Accuracy:

Precision:
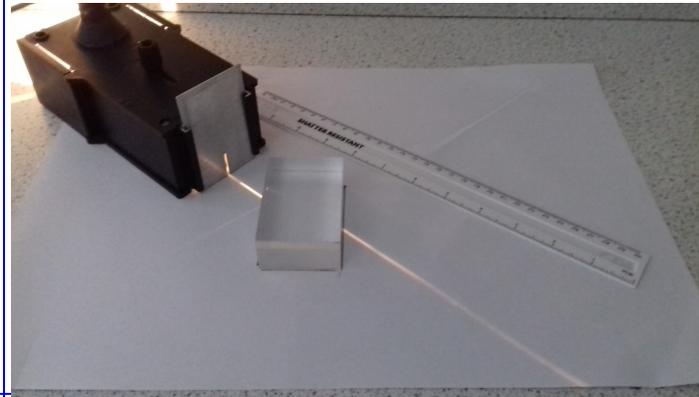
What are the variables in this experiment:

Independent:

Dependent:

Control Variables (describe how you might keep these from affecting your experiment):

Suggest how the refraction angle might change when the light goes:

Out of	Into	Towards/Away from Normal Line
Air	Water	
Water	Air	
Glass	Air	
Air	Glass	

Clue: the angle of refraction always goes towards the normal as it travels from a less dense substance to a more dense (e.g. air into water)

Plan
Without turning over (!) write a step by step plan for measuring the reflection and refraction of a glass block.

Calculating the resistance

Angle of incidence (°)	Angle of Reflection (°)	Angle of Refraction (°)
10	10	5
24	24	17
29	29	19
36	36	23
44	41	25

Which Result (s) are wrong in this table?

………………………….

Explain how you know:

…………………….

…………………….

Complete the following:
The angle of incidence is ………... the angle of reflection.

The angle of incidence is ……………. to the angle of refraction.

We always measure the angle from the ………………… line which is ………………….. to the surface of the object.