**Investigating Depth Illusions**

Aim: To observe how refraction can change the way we view objects under water

Equipment:

* Opaque plastic bowl
* A small rock
* 400mL beaker
* Water

Method:

1. Fill the beaker with water.
2. Place the rock in the bottom of the plastic bowl.
3. Push the bowl to the back of the laboratory bench.
4. Stand close to the laboratory bench and look at the rock.
5. Slowly move away from the bench until the rock is just out of sight.
6. Have another person slowly pour water from the beaker into the plastic bowl, without moving the bowl or your head.
7. Describe what happens as water is poured into the bowl.
8. Look at the rock at the bottom of the bowl and describe any differences between the image you saw and the rock.

Results and Discussion:

1. Describe what happened to the rock as you added water.
2. What differences could you see between the actual rock and the image you saw?
3. Explain why adding water brings the rock into view. Draw a diagram to show why you are able to see the rock.

**Finding the Critical Angle of a Perspex Block**

Aim: To measure the critical angle of Perspex

Equipment:

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

Method:

1. Connect the light box to the power pack and turn it on.
2. Place the semi-circular Perspex block in the blank space below.
3. Place the single slit slide in the light box.
4. Shine the light ray onto the **middle** of the **curved side** of the block. It should pass straight through without refracting.
5. Slowly rotate the **block** until it reaches a position where the light ray does not leave the block, but passes along the straight edge.
6. Without moving the light box or block, use a pencil to carefully trace around the block, mark the path of the incident ray and the point where it meets the straight edge of the block.
7. Remove the block and draw in the normal.
8. Use a protractor to measure the angle if incidence. This is the critical angle.

Results: (Draw you diagram in the space below)

Discussion:

1. The critical angle of Perspex is 43°. Did your experimental results reflect this? Why or why not?
2. Replace the block in the same position. What happens when the angle of incidence is greater than the critical angle? Draw what you observe.