CONVEX and CONCAVE LENSES: NAME_____

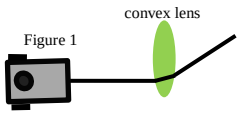


Figure 1

AIM: To observe how lenses change the paths of light rays.
This practical activity involves **ray tracing**. If, for example, a light ray appears like Figure 1, you will need to

1. Trace the curve of the lens.
2. Place two <u>small</u> dots on the incident ray and two on the refracted ray (see figure 2).
3. Remove the light box and then, using a ruler, draw in where the light rays were, using your dots as a guide. Make sure the rays you draw extend all the way to the lens.

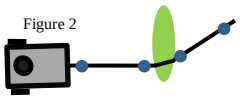
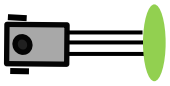


Figure 2

EQUIPMENT: Light Box, transformer.


Figure 3

EXPERIMENT 1 – CONVEX LENSES



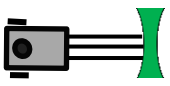
(a) Position the light box at the edge of this paper and turn it on. Place the triple-ray-forming plate into the slot and adjust the box to ensure that the three rays being emitted are parallel. Place the **thinner** convex lens about 10cm from the front of the light box and align it so that the central ray passes straight through it. Trace the incident and refracted rays and note the spot where the refracted rays meet. This spot is called the **FOCAL POINT** of the lens. **Mark in** the focal point. **Label** the incident rays and the refracted rays. Use little arrows to indicate direction. →

How far is the Focal Point from the <u>middle</u> of the lens? _____ (This distance is called the **FOCAL LENGTH** of the lens.)

(b) Repeat the above procedure for the **fatter** convex lens. Mark in the focal point. What is the focal length of the fatter convex lens? _____

EXPERIMENT 2 – CONCAVE LENSES

(a) Repeat the above procedure for the concave lens.



Once you have drawn the rays, trace the refracted light rays (which should all be spreading out) back behind the lens. Use dotted lines. They should all meet at the same spot, which is called the "virtual focus". Mark in the virtual focus. How far is the Virtual Focal Point from the lens (the Focal Length)? _____