

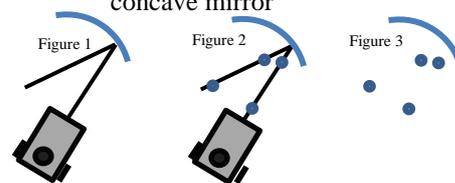
CONVEX and CONCAVE MIRRORS: USING THE LIGHT BOX AND OPTICAL SET

NAME _____

AIM: To observe and record how curved mirrors reflect light beams.

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 mirror.
2. Place two small dots on the incident ray and two on the reflected 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 mirror.

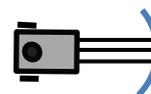


NOTE: it's a little trickier when there are many light rays, as will be the case in this prac!

Collect a light box and a transformer. Check that everything is present in the box. Plug the transformer in, connect the light box and switch on the power. You should have light. Tell your teacher if it is not working.

EXPERIMENT 1 – REFLECTION: CONCAVE MIRRORS

- (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 concave mirror about 10cm from the front of the light box and align it so that the central ray reflects back on itself. Trace the incident and reflected rays and note where they meet. This spot is called the **FOCAL POINT** of the mirror. **Mark in** the focal point.



How far is the Focal Point from the mirror? _____ (This distance is called the **FOCAL LENGTH** of the mirror.)

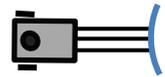
- (b) Repeat the above procedure for the less curvy concave mirror. Mark in the focal point.

What is the focal length of the second concave mirror? _____

Why do satellite dishes use concave reflectors?

EXPERIMENT 2 – REFLECTION: CONVEX MIRRORS

- (a) Position the light box on the edge of this paper and turn it on. Place the triple-ray-forming plate into the slot. Place the convex mirror (the concave mirror in reverse) about 10cm from the front of the light box and align it so that the central ray reflects back on itself. Trace the incident and reflected rays.



Once you have drawn the rays, trace the reflected light rays (which should all be spreading out) back behind the mirror. 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 mirror (the Focal Length)? _____

- (b) Repeat the above procedure for the less curvy convex mirror.

Mark in the virtual focus.

How far is the Virtual Focal Point from the mirror (the Focal Length)? _____