Lenses – Finding the Focal Length of a Convex Lens

**Apparatus**

convex lens, piece of paper, window or light source at opposite end of room or corridor

**Action**

A student holds the lens up towards the window, and holds a piece of paper on the other side of the lens. They then move the piece of paper towards and away from the lens until a focused image of the outside or a distant object such as a tree is formed. From the distance between the lens and the paper they can then find the focal length of the lens.

**The Physics**

Hold the lens up to the window and hold a piece of paper behind it (on the other side of the lens from the window). Move the paper until you get a sharp image of the world outside the windows (or distant object such as a tree). When you have a sharp image, you measure the distance between the lens and the image (paper). This distance is the focal length of the lens.

(Using \( \frac{1}{f} = \frac{1}{o} + \frac{1}{i} \), and \( o = \infty \) so that \( \frac{1}{o} = 0 \), gives \( f = i \))

When the paper is held at a distance from the lens equal to the lens’s focal length, an image of the window forms on the paper.

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**Accompanying sheet**

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Hold the lens up to the window and hold a piece of paper behind it (on the other side of the lens from the window).

Move the paper until you get a sharp image of the world outside the windows, or a distant object such as a tree.

What is the focal length of the lens?