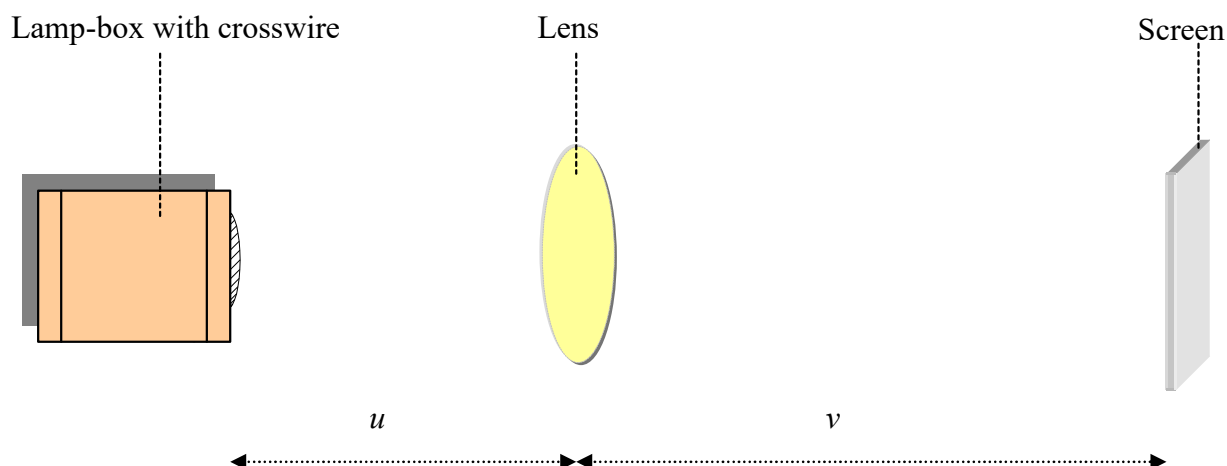# MEASUREMENT OF THE FOCAL LENGTH OF A CONVERGING LENS

Apparatus

Converging lens, screen, lamp-box with crosswire, metre stick, retort stand.

Lamp-box with crosswire   Lens   Screen

u v

Procedure

1. Place the lamp-box well outside the approximate focal length – see notes.
2. Move the screen until a clear inverted image of the crosswire is obtained.
3. Measure the distance u from the crosswire to the lens, using the metre stick.
4. Measure the distance v from the screen to the lens.
5. Calculate the focal length of the lens using $\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$.
6. Repeat this procedure for different values of u.
7. Calculate f each time and then find the average value.

Results

u/cm	$\dfrac{1}{u}$/cm^{-1}	v/cm	$\dfrac{1}{v}$/cm^{-1}	$\dfrac{1}{f}$/cm^{-1}	f/cm

Average $f =$

Notes

The approximate method for finding the focal length is recommended as a starting point for this experiment. The approximate method is described in the Appendix.

A microscope lamp makes a very suitable strong light source that can be used in daylight. Cover the glass of the lamp with a piece of tracing paper. The tracing paper can be attached with some bluetack. Use 'peel-and-stick' letters to create an 'object' on the tracing paper. If the 'object' is a simple three-letter word then the inversion of the image will be obvious.