Compound Microscope

A microscope is an essential tool in the study of life sciences. It allows to see things that are too small to be seen with the unaided eye.

A simple magnifier contains only one lens so it provides limited assistance to an object. A simple magnifier or a simple microscope is essentially a converging lens of small focal length. Greater magnification can be achieved by combining two lenses in a device called a **compound microscope.**

It consists of one lens, the *objective,* that has a very short focal length f_o of about 1 cm and a second lens, the *eyepiece,* that has a focal length f_e of a few centimeters (see Fig. 1). The two lenses are separated by a distance D that is much greater than either f_o or f_e. The object, AB, which is placed just outside the focal point of the objective, forms a real, inverted image A'B', and this image is located at close to the focal point of the eyepiece.

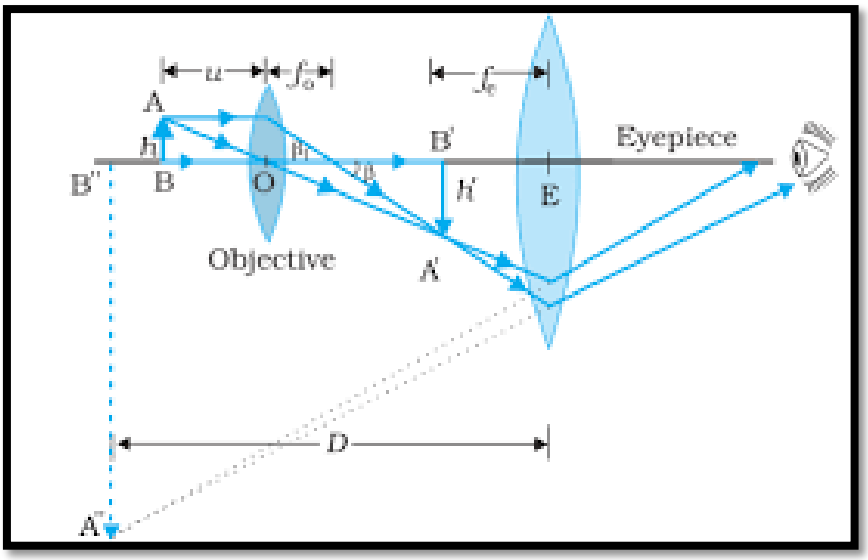

Fig. 1: *Ray diagram for the formation of image by a compound microscope.*

Magnifying power: The ratio of the angle subtended at eye by the final virtual image, to the angle subtended at the eye by the object.
Magnifying power, $M = \beta/\alpha$. Here β is the angle subtended by the eye by final image and α is the angle subtended by the eye by object.

Various other factors such as illumination of the object, contribute to the quality and visibility of the image. In modern microscopes, multi component lenses are used for both the objective and the eyepiece to improve image quality by minimizing various optical aberrations (defects) in lenses.