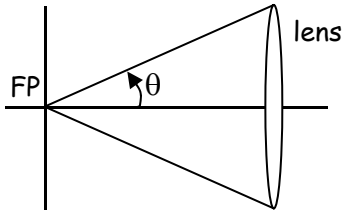
$$\eta_a = \frac{\text{diameter of bottom lens}}{2 \times \text{focal length}}$$

η_a X eyepiece magnification = line separation (in mm)

η_a = N SINθ where "N" is the index of refraction and θ is the half-angle of the maximum cone of light that can enter or exit the lens.



In microscopy, NA is crucial because it is the indicator of resolving power of a lens. More specifically, the finest detail that can be separated equals λ/NA, where λ is the wavelength of the light (an average of 550nm is generally used for white light since visible light ranges from 400nm to 700nm). Therefore, a lens with a larger numerical aperture will resolve smaller points than a lens with a smaller numerical aperture.