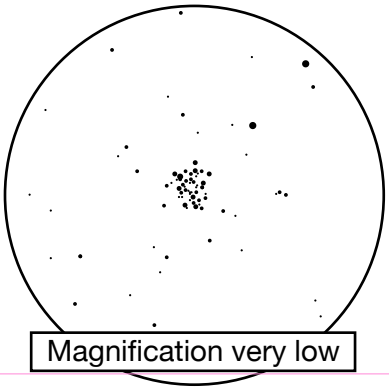
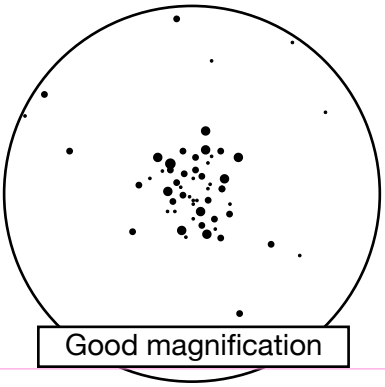
M = FO/FE

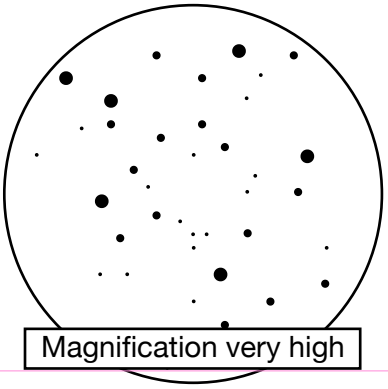
What magnification should I use?

Quick answer: As high of a magnification needed to compose an attractive scene in the eyepiece that shows meaningful detail while giving a bright, focused image with good contrast. The selected eyepiece must provide a comfortable viewing distance, i.e., the eye should not be too close to the eyepiece.

Magnification = Focal length of the objective lens or mirror (FO) ÷ focal length of the eyepiece (FE)


Magnification very low


Good magnification


Magnification very high

Start with the greatest focal length eyepiece available (such as one of 20–30 mm) and progressively use shorter focal length eyepieces until the best image is obtained.

Depending on the eyepiece design, **low magnification** gives a wide true field, which is useful for observing the whole moon, and large, extended objects such as some open clusters, nebulae, and galaxies.

- The wide true field aids in locating objects.
- Objects spend sufficient time drifting across the wide field to allow meaningful views.
- Generally, gives long eye relief (the distance from the focal point to the eyepiece).

High magnification is suitable for bright targets and those with indistinct edges spanning a small angular size. ***Useful only on nights with steady atmospheric seeing.***

- Gives short, sometimes uncomfortably short, eye relief (distance from focal point to eyepiece).
- Good for planets, lunar features, separating double stars.
- Good for small, dim galaxies or sections of large galaxies.
- Reveals faint stars lying near the cores of large globular clusters.