Magnification:

The magnification of an object is how many times bigger the image is when compared to the object.

Microscopes

Magnification Ma

Increasing the magnification increases the size of an image, but doesn't always increase the resolution.

Light microscopes:

Poor resolution as a result of the relatively long wavelength of light.

So an electron microscope was created and has two main advantages:

- electron beam has a very short wavelength and the microscope 1. can therefore resolve objects well = high resolving power
- As electrons are negatively charged the beam can be focused us-2. ing electromagnets

Measuring cells:

We can measure the size of objects using an eyepiece graticule (a glass disc placed in the eyepiece of a microscope). A scale is etched on the disc. Graticule needs to be calibrated for the lens using used. To calibrate it you need to use a stage micrometer.

Transmission electron microscope

In a TEM, the beam passes through a thin section of the specimen. Parts of this specimen will absorb electrons and make

A complex staining process is required and even the image isn't in colour Specimen must be extremely thin

Image may contain artefacts (result from the way the specimen was prepared) 2D images



Scanning electron microscope

All limitations of TEM apply to SEM but specimens don't need to extremely thin because electrons don't penetrate

Electrons are scattered on the specimen and the pattern depends on the contours of the specimen surface

We an build a 3D image of the pattern.

Basic SEM has a lower resolving power

