Cells

Microscopes

optical

Principles

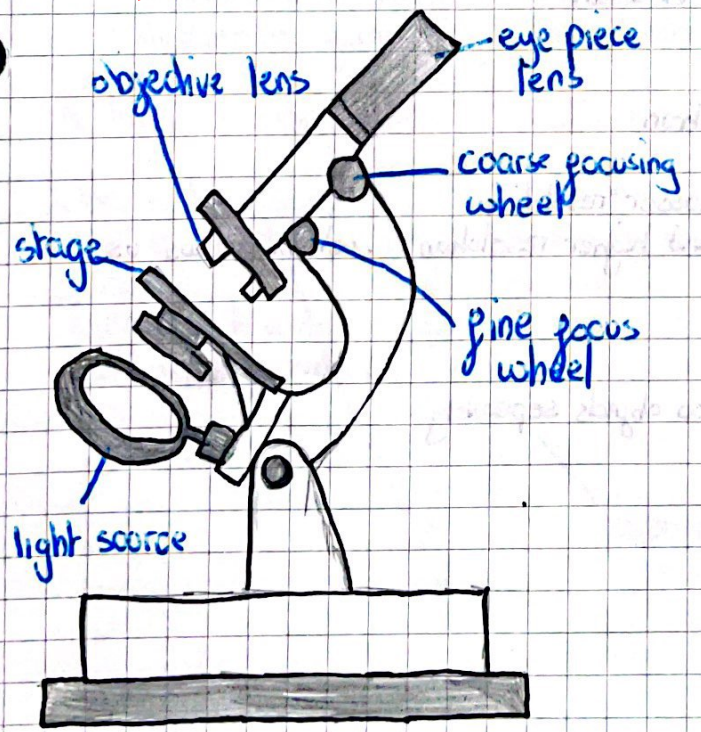
↳ The prepared specimen must be thin so it is only one layer of cells
↳ This will enable enough light to pass through
↳ Light waves pass through (or onto) the specimen

Limitations

↳ Lighter (not the 'microscope') has a longer wavelength
↳ So a lower resolution
↳ lower magnification

Advantages

↳ Can view live specimens
↳ coloured images
↳ Preparations (process) rarely damage the specimen



scanning electrons

Principles

↳ Specimen is preserved & stained
↳ Place in a vacuum
↳ Uses an electron wave length
↳ Electron wavelength is shorter .. higher resolution (than optical)
↳ Electrons bounce off the surface (then are detected to create an image

Limitations

↳ Electrons scattered (by molecules in air), so electrons are in a vacuum ... so there is no oxygen, so no respirations, so cannot examine living organisms
↳ More complex & time consumming specimen preperation procedure ... which may damage the specimen - alteration of the specimen's apperance are called 'artefacts'
↳ Black & white image (no colour)

Advantages

↳ Electron wavelength is shorter
↳ ... so higher resolution (than optical)
↳ ... so can study more detail (than optical)
↳ Can study 3D structures
↳ Higher magnification (than optical)