Living/dead cells

Electron

Higher magnification/resolution – see smaller things in more detail

Dead cells only

4. **number/size/scale – estimations + when to use them**

cm x 10 = mm mm x 1000 = µm µm x 1000 = nm

image = actual x magnification

1. Measure image
2. Put into equation
3. Convert units

Estimate by rounding numbers to check answer is right

5. **relationship between quantitative units in relation to cells:**
   a. **milli 10^{-3}**
   b. **micro 10^{-6}**
   c. **nano 10^{-9}**
   d. **pico 10^{-12}**
   e. **calculations with numbers written in standard form**

6. **Core Practical: Investigate biological specimens using microscopes – magnification calculations & labelled scientific drawings from observations**

Light microscope

Thin slice – allows light to pass through it

Clean slide & use pipette to put drop of water on it – secures specimen in place (use tweezers)

If specimen transparent: add drop of stain – makes it easier to see

Place cover slip – press down gently so there's no air bubbles

Clip slide onto stage

Select lowest-powered objective lens

Focus: Coarse adjustment knob – move stage up so slide is just beneath objective lens

Look through eyepiece, move stage downwards until nearly in focus

Fine adjustment knob – until clear image

Calculate field of view: position clear ruler on stage, measure diameter of circular area visible

For greater magnification – swap to higher-powered objective lens, refocus & recalculate field of view

Scientific drawing

Sharp pencil – outlines of main features (no colouring/shading)

Keep in proportion

Label important features – straight lines that don't cross

Include magnification used and scale

7. **Enzymes**

Biological catalyst – large protein molecules that speed up reactions

Lowers activation energy required for reaction to start

control: digestion / respiration / photosynthesis