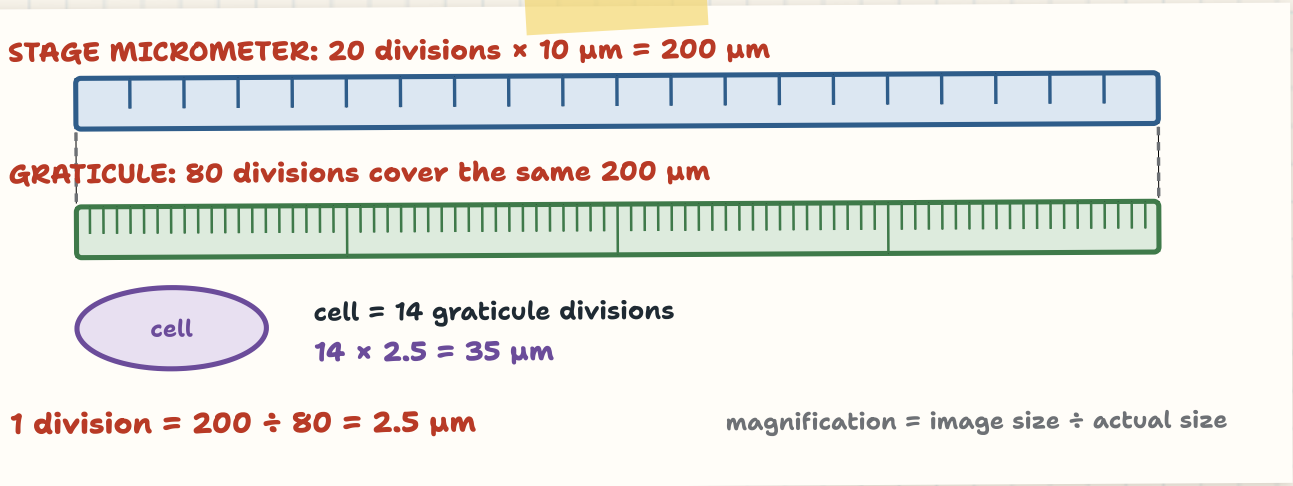
Magnification vs Resolution Calculations

Calibrate the graticule against the stage micrometer, convert to the same units, then use image size over actual size.



Key terms

magnification	how many times larger the image is than the real object: image size ÷ real size.
resolution	the ability to see two points that are close together as separate points.
eyepiece graticule	a ruler inside the eyepiece whose divisions have no fixed size; its value changes with each objective lens.
stage micrometer	a slide with a ruler etched on it; its divisions have a known length (here 10 µm each).
calibration	lining up the two scales to find the value of one graticule division; do it at each magnification.
same units	both sizes must be in the same units before dividing; mm to µm means multiply by 1000.

I can...

- [ ] Measuring the size of an object viewed with an optical microscope
- [ ] Difference between magnification and resolution
- [ ] magnification = size of image / size of real object

EXAM TRAP

Never say a higher magnification gives a clearer image: clarity is resolution, size is magnification. Always convert to the same units and give the unit.

4 marks: what earns them

1. Calibration: 20 x 10 = 200 micrometres for 80 graticule divisions, so 1 graticule division = 2.5 micrometres
   Not: 10 µm per graticule division; a value with no unit
2. Cell length = 14 x 2.5 = 35 micrometres
   Not: 35 with no unit; 140 µm (uncalibrated)
3. Magnification is how many times larger the image is than the real object (image size / real size)
   Not: how clear the image is; how much detail is seen
4. Resolution is the ability to distinguish between two points that are close together (as separate points)
   Not: how big the image is; how good the magnification is

Remember

Clarity = resolution. Size = magnification.
Same units first, every single time.
Calibrate, convert, then image ÷ actual size.

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