*This is the **Higher Combined** version — includes Higher Tier content. Some Separate-only details are omitted.*

Microscopes are essential tools for studying cells and sub-cellular structures.

Required Practical: Preparing and observing stained specimens under a light microscope.

- Light microscope: max ×1500, resolution ~200nm, can view living cells
- Electron microscope: much higher magnification and resolution, samples must be dead
- Magnification = image size ÷ actual size
- 1 mm = 1000 µm — always convert units before calculating
- Staining (iodine, methylene blue) makes cell structures more visible

Key Terms

Magnification	How much larger the image appears compared to the actual object
Resolution	Ability to distinguish two separate points as distinct

■ **Exam Tip:** Show all working in magnification calculations. State units in your answer. Common error: forgetting to convert mm to µm.