These are the errors that appear year after year in examiner reports. Knowing *what not to write* is just as important as knowing what to write. ★ marks Higher Tier only. Every mistake here has cost students marks in real exams.

Cell Structure

■ **Students often write:**	*"Bacteria have a nucleus but no mitochondria."*
✓ **Correct answer:**	Bacterial cells have NO nucleus at all — they are prokaryotic. DNA exists as a circular chromosome floating freely in the cytoplasm. They also have no membrane-bound organelles.
■ **Examiner insight:**	The nucleus is the defining feature of eukaryotic cells. Prokaryotic = no nucleus. Eukaryotic = has nucleus. Learn this first — it comes up every year.

■ **Students often write:**	*"Plant cells have a cell wall, chloroplasts and a vacuole — same as animal cells but with extra bits."*
✓ **Correct answer:**	Animal cells do NOT have a cell wall, chloroplasts or permanent vacuole. These three structures are present in plant cells only. Bacterial cells also have a cell wall but it is made of a different material (not cellulose).
■ **Examiner insight:**	Draw two circles. Label one "animal" (nucleus, cell membrane, cytoplasm, mitochondria, ribosomes) and one "plant" (all of those PLUS cell wall, chloroplasts, vacuole). Memorise the difference.

■ **Students often write:**	*"Mitochondria produce energy."*
✓ **Correct answer:**	Mitochondria are the site of aerobic respiration, which releases energy stored as ATP. Mitochondria do not "produce" energy — they transfer it from glucose to ATP.
■ **Examiner insight:**	Examiners want: "site of aerobic respiration" or "where ATP is produced by aerobic respiration." Saying "produces energy" is imprecise and may not gain the mark.

Microscopy

■ **Students often write:**	*"A higher magnification microscope shows more detail."*
✓ **Correct answer:**	Magnification (making things larger) is different from resolution (the ability to distinguish two separate points). A blurry image magnified 10× is still blurry. Electron microscopes have higher RESOLUTION, which is why they reveal more detail.
■ **Examiner insight:**	Resolution = detail. Magnification = size. High magnification + low resolution = bigger but blurry. Electron microscopes improved our understanding because of their superior resolution, not just magnification.

■ **Students often write:**	*Getting the magnification formula backwards: Magnification = Actual size ÷ Image size.*
✓ **Correct answer:**	Magnification = Image size ÷ Actual size. The IMAGE is what you see on paper. The ACTUAL size is what the cell really is. Image is always bigger, so dividing image by actual gives a number >1.
■ **Examiner insight:**	Triangle trick: put Image at top, Actual × Magnification at the bottom. Cover what you want. Always check: does your answer make sense? Magnification should be a big number (e.g. ×300).

Cell Division — Mitosis

■ **Students often write:**	*"Mitosis produces 4 cells."*
✓ **Correct answer:**	Mitosis produces exactly 2 genetically IDENTICAL daughter cells. It is MEIOSIS that produces 4 cells — and those cells are genetically different and haploid.
■ **Examiner insight:**	Mitosis = 2 identical. Meiosis = 4 different. If you confuse these, you will lose marks on multiple questions across the paper. Write it on your hand if you have to.

■ **Students often write:**	*"After mitosis, each daughter cell has double the DNA of the parent cell."*
✓ **Correct answer:**	After mitosis, each daughter cell has exactly the same amount of DNA as the original parent cell. DNA is replicated BEFORE division so that when the cell splits, each daughter gets one complete copy.
■ **Examiner insight:**	DNA replication happens DURING interphase (before mitosis begins). The point of DNA replication is so that both daughter cells end up with a complete, identical set.

■ **Students often write:**	*"Cancer is caused by cells dividing too quickly."*
✓ **Correct answer:**	Cancer is caused by MUTATIONS in genes that control the cell cycle. These mutations mean cells no longer respond to normal stop signals, leading to uncontrolled division. Speed is a consequence, not the cause.
■ **Examiner insight:**	Always mention mutations → cell cycle control genes → uncontrolled division. Three steps, not one. "Dividing too quickly" alone will not gain the mark.

Diffusion and Osmosis

■ **Students often write:**	*"Diffusion is the movement of particles from high to low concentration."*
✓ **Correct answer:**	Diffusion is the NET movement of particles from high to low concentration. The word "net" is essential — particles move in both directions randomly, but there is a net flow down the gradient. Without "net," the definition is technically incomplete.
■ **Examiner insight:**	"Net" appears on almost every diffusion mark scheme. It is a 1-word difference between full marks and zero on a definition question.

■ **Students often write:**	*"Osmosis is when water moves through a membrane." OR "Water moves from dilute to concentrated."*

✓ **Correct answer:**	Osmosis is the NET movement of water molecules from a region of HIGH water potential (dilute solution) to LOW water potential (concentrated solution) through a PARTIALLY PERMEABLE membrane.
■ **Examiner insight:**	Every word in the definition can gain a mark: NET / water / high water potential to low / partially permeable membrane. Saying "dilute to concentrated" is acceptable shorthand in many mark schemes BUT "partially permeable membrane" is almost always required.

■ **Students often write:**	*"In osmosis, the salt/sugar molecules move from the concentrated solution into the cell."*
✓ **Correct answer:**	In osmosis, ONLY water molecules move. The salt or sugar molecules are too large to pass through the partially permeable membrane. Students confuse osmosis (water movement) with diffusion (any particle).
■ **Examiner insight:**	Osmosis = WATER ONLY. If a question mentions salt moving, that is NOT osmosis. Only water moves in osmosis — this is what makes it special.

■ **Students often write:**	*"The plant cell lost water so it denatured."*
✓ **Correct answer:**	Denaturation applies to enzymes (or proteins), not to plant cells. When a plant cell loses water, it becomes PLASMOLYSED (the membrane pulls away from the cell wall). When it gains water, it is TURGID.
■ **Examiner insight:**	Only ENZYMES denature. Cells plasmolyse or become turgid. Students often misuse "denature" as a catch-all for "stopped working" — this loses marks.

Active Transport

■ **Students often write:**	*"Active transport moves substances from high to low concentration, like diffusion but faster."*
✓ **Correct answer:**	Active transport moves substances from LOW to HIGH concentration — AGAINST the concentration gradient. This is the opposite of diffusion. It requires ENERGY (ATP) and carrier proteins.
■ **Examiner insight:**	The defining feature of active transport is that it goes AGAINST the gradient. If you say "from high to low" for active transport, you have described diffusion and will score zero.

■ **Students often write:**	*"Active transport needs oxygen."*
✓ **Correct answer:**	Active transport needs ENERGY in the form of ATP. ATP is produced by respiration, which does need oxygen (aerobic) — but the direct requirement is ATP, not oxygen. If respiration is inhibited, active transport stops.
■ **Examiner insight:**	State: active transport requires ATP/energy from respiration. If asked why blocking respiration stops active transport, the chain is: no respiration → no ATP → no active transport.