

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.

Pathogens and Disease

■ **Students often write:** *"You can take antibiotics to treat flu or COVID-19."*

✓ **Correct answer:** Antibiotics ONLY work against bacteria. They target bacterial structures (e.g. cell walls) that viruses do not have. Flu and COVID-19 are caused by viruses, which have no cell wall and live inside host cells — antibiotics cannot target them.

■ **Examiner insight:** Antibiotic + virus = ZERO effect. This is one of the most important public health messages in biology. Saying antibiotics kill viruses is not just wrong in an exam — it contributes to antibiotic resistance in real life.

■ **Students often write:** *"Bacteria produce toxins which are the pathogens."*

✓ **Correct answer:** Bacteria ARE the pathogens. The toxins are chemicals PRODUCED BY bacteria that cause the symptoms of disease. The bacteria themselves are the pathogens; the toxins are what make you ill.

■ **Examiner insight:** Pathogen = the organism causing disease (bacterium, virus, fungus, protist). Toxin = poisonous substance released by bacteria that causes symptoms. The distinction matters in exam questions.

The Immune System

■ **Students often write:** *"After vaccination, antibodies remain in the body to protect you."*

✓ **Correct answer:** After vaccination (or infection), MEMORY CELLS remain in the body long-term. These cells can rapidly produce large quantities of antibodies IF the pathogen is encountered again. The antibodies themselves do not persist indefinitely.

■ **Examiner insight:** The key to long-term immunity is MEMORY CELLS, not circulating antibodies. If asked what provides long-term immunity: memory (lymphocyte) cells. This distinction gains marks in extended answer questions.

■ **Students often write:** *"Antibodies are the same as antigens."*

✓ **Correct answer:** Antigens are proteins on the SURFACE of a pathogen that trigger an immune response. Antibodies are proteins PRODUCED BY lymphocytes that bind specifically to antigens. They are completely different things with complementary shapes.

■ **Examiner insight:** Antigen = protein on the PATHOGEN (the "flag" that identifies it). Antibody = protein made by YOUR immune system that matches that flag. Anti-BODY fights the anti-GEN.

■ Students often write:	<i>"Vaccination gives you the disease so your body can fight it."</i>
✓ Correct answer:	Vaccines contain a HARMLESS version of the pathogen — dead or weakened pathogens, fragments of the pathogen, or genetic instructions to make a pathogen protein. They stimulate an immune response WITHOUT causing the disease.
■ Examiner insight:	Vaccines train the immune system without causing illness. This is the whole point. Never say a vaccine "gives you the disease" — this is factually wrong and causes vaccine hesitancy in real life.

Drug Development

■ Students often write:	<i>"Double blind means the patients don't know if they're taking the real drug."</i>
✓ Correct answer:	In a DOUBLE-blind trial, BOTH patients AND doctors/researchers do not know who is receiving the real drug and who is receiving the placebo. In a single-blind trial, only the patient does not know.
■ Examiner insight:	Double = BOTH sides blind. Single = only patients blind. Double-blind prevents doctors from unconsciously treating groups differently AND prevents the placebo effect from influencing results.

■ Students often write:	<i>"The placebo is a weaker version of the drug."</i>
✓ Correct answer:	A placebo is an inactive, inert substance with NO pharmacological effect — typically a sugar pill or saline injection. It is not a weaker dose of the drug; it contains no active ingredient.
■ Examiner insight:	Placebo = fake treatment. Used to separate the actual drug effect from the psychological benefit of believing you're being treated (the placebo effect). Any improvement in placebo group = psychological, not drug-related.