

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.

## Genetics and Variation

■ **Students often write:**

*"Gametes have the same number of chromosomes as body cells."*

✓ **Correct answer:**

Gametes are HAPLOID — they contain HALF the normal chromosome number (23 in humans, not 46). Body cells are diploid (46 chromosomes). Meiosis halves the chromosome number to produce haploid gametes.

■ **Examiner insight:**

Body cells = diploid = 46. Gametes = haploid = 23. Fertilisation restores diploid (23 + 23 = 46). This prevents chromosome number doubling every generation.

■ **Students often write:**

*"A mutation always causes disease."*

✓ **Correct answer:**

Most mutations are NEUTRAL (no change in amino acid due to degeneracy of the genetic code) or have very minor effects. Some are harmful, a very small number are beneficial. Only mutations in certain critical genes cause disease.

■ **Examiner insight:**

Mutations are random and mostly neutral. They are also the RAW MATERIAL of evolution — without mutations, there would be no variation for natural selection to act on.