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A-Level Biology

How to Answer Every Question - Exam Technique Guide

Edexcel Biology (9BI0) | A-Level | 9 question types

THE NILE METHOD - every question, every time

1. Read the COMMAND WORD first - it tells you the skill (state / explain / evaluate).
2. Check the MARKS - roughly one developed point (or mark-scheme line) per mark.
3. Match the ASSESSMENT OBJECTIVES the marks reward (AO1 knowledge / AO2 application / AO3 evaluation).
4. PLAN before long answers - jot points, then write in clear PEEL / chain-of-reasoning paragraphs.
5. Use precise terminology, evidence and (where relevant) named studies or data.
6. For evaluation, write developed chains and a justified judgement - not a list.

Multiple choice · "Select the correct answer"

TESTS	AO1 recall and AO2 reasoning · 1 mark each (Papers 1-3 open with MCQ)
METHOD	**1.** Read the stem fully and decide your own answer BEFORE looking at the four options. **2.** Treat each option as a true-or-false statement; cross out the ones you can fault. **3.** For data or calculation stems, work the figure on the question paper, then match it to an option. **4.** If two options look close, find the single word or value that makes one wrong and eliminate it. **5.** Never leave it blank - once you are down to two, commit; there is no negative marking.
STRUCTURE	Eliminate three distractors, then shade ONE lozenge fully. If you change your mind, fully erase the first mark.
MODEL	*A respiring cell raises its rate of glycolysis. The product entering the link reaction is pyruvate (option C) - not lactate, ethanol or acetyl coenzyme A, which form later or anaerobically.*
PITFALLS	› Picking the first option that sounds right without checking the other three. › Leaving two lozenges partly shaded so the scanner reads neither.

Name / state recall · "Name / State / Give"

TESTS	AO1 knowledge · usually 1-2 marks
METHOD	**1.** Give the exact biological term - one precise word or short phrase is enough. **2.** Match the number of answers to the marks: 2 marks means two distinct points. **3.** Do not write a sentence or an explanation; a name or state question rewards recall only. **4.** Use correct spelling for terms the mark scheme will not accept loosely (mitosis, meiosis, glycogen, glucagon).
STRUCTURE	One labelled term per mark, separated clearly. No working, no justification.
MODEL	*Name the bond joining two amino acids: a peptide bond. State the type of reaction that forms it: condensation.*
PITFALLS	› Confusing similar-sounding terms such as glycogen and glucagon, or mitosis and meiosis. › Writing a long explanation for a 1-mark name and still missing the actual term.

Describe · “Describe”

TESTS	AO1 knowledge · 2-4 marks; says WHAT happens, in order
METHOD	**1.** Identify the trend, structure or process the question asks you to set out. **2.** Give one creditworthy point per mark, in a logical sequence. **3.** Quote the data where a graph or table is given - state values with units and the manipulated variable. **4.** Use precise terms (active transport, semi-conservative, depolarisation) rather than vague description.
STRUCTURE	Point 1 → Point 2 → Point 3, each a separate mark-scheme line. For graphs: overall trend, then any change of gradient, then a figure with units.
MODEL	*The rate rises steeply from 0 to 30 °C, peaks at about 40 °C, then falls sharply to zero by 60 °C - a typical enzyme temperature-rate curve.*
PITFALLS	› Explaining WHY when the command is only describe - you earn no extra marks and waste time. › Describing a graph in words without quoting a single value with its unit.

Explain · “Explain”

TESTS	AO1 and AO2 · 3-4 marks; link a REASON to a RESULT
METHOD	**1.** Spot the observation or result the question gives you - that is what you must account for. **2.** Build a cause-to-effect chain: each step must connect to the next with 'so', 'because' or 'therefore'. **3.** Name the biological mechanism (diffusion gradient, enzyme-substrate fit, water potential) driving each step. **4.** End the chain back at the stated result so the examiner sees the reasoning is complete.
STRUCTURE	Cause → mechanism → consequence → observed result. Every link earns a mark only if it is justified, not merely stated.
MODEL	*Adding salt lowers the water potential outside the cell, so water leaves the cytoplasm by osmosis down the gradient, the cell loses turgor and the tissue becomes flaccid.*
PITFALLS	› Describing the change instead of explaining it - listing events with no 'because'. › Breaking the chain by skipping the mechanism, e.g. jumping from salt to flaccid with no osmosis step.

Application / Suggest · “Suggest”

TESTS	AO2 applied to an unfamiliar context · 2-4 marks
METHOD	**1.** Accept you are not expected to recall the answer - apply known biology to the new scenario. **2.** Read the stem for the specific detail (organism, tissue, condition) and use it explicitly in your answer. **3.** Transfer a principle you do know (selective reabsorption, negative feedback, natural selection) onto the case. **4.** Give a plausible, biologically reasoned suggestion - several valid answers may be credited.
STRUCTURE	Relevant principle → applied to the stem's specific detail → logical consequence in this context.
MODEL	*The drug may block the sodium ion channels, so depolarisation cannot reach threshold, no action potential passes along the neurone and the pain signal is not transmitted.*
PITFALLS	› Giving a generic textbook answer that ignores the named organism or condition in the stem. › Stating a guess with no biological mechanism behind it.

Calculation - magnification, rates, ratios · “Calculate”

TESTS	AO2 quantitative skills · 2-4 marks; working is credited
METHOD	**1.** Write the formula first, e.g. magnification = image size ÷ actual size, or rate = change ÷ time. **2.** Convert all measurements to the SAME unit before substituting (mm → µm: × 1000). **3.** Substitute clearly, then compute; carry units through every line of working. **4.** Round to the significant figures or decimal places the question specifies and state the unit. **5.** Sense-check the magnitude - a cell magnification should be hundreds or thousands, not 1.5.
STRUCTURE	Formula → unit conversion → substitution → answer with unit and correct significant figures. Show every line so method marks survive a wrong final value.
MODEL	*Image = 40 mm = 40000 µm; actual = 50 µm. Magnification = 40000 ÷ 50 = × 800.*
PITFALLS	› Mixing units (mm with µm) so the answer is out by a factor of 1000. › Writing only the final number - no working means no method marks if it is wrong.

Statistics - chi-squared and standard deviation · “Calculate / Analyse”

TESTS	AO3 statistical analysis and conclusion · 3-5 marks
METHOD	**1.** Choose the right test: chi-squared (χ^2) for categorical counts against an expected ratio; standard deviation to show the spread of a mean. **2.** State the null hypothesis: there is no significant difference between observed and expected. **3.** Substitute into $\chi^2 = \Sigma\ (O - E)^2 \div E$, computing each category before summing. **4.** Find degrees of freedom (categories − 1) and read the critical value at p = 0.05. **5.** Compare: if χ^2 exceeds the critical value, reject the null hypothesis - the difference is significant.
STRUCTURE	State H_0 → tabulate O, E and $(O - E)^2 \div E$ → sum → degrees of freedom → compare with critical value at p = 0.05 → accept or reject H_0 in words.
MODEL	*χ^2 = 3.2; degrees of freedom = 1; critical value at p = 0.05 is 3.84. As 3.2 is less than 3.84 we accept H_0: the deviation from the 3 : 1 ratio is not significant.*
PITFALLS	› Computing χ^2 but never comparing it to the critical value or stating a conclusion. › Forgetting the degrees of freedom, so the wrong critical value is read off the table.

Data and graph analysis · “Analyse / Evaluate the data”

TESTS	AO3 interpretation of experiments and results · 3-5 marks
METHOD	**1.** Quote specific figures from the graph or table - values with units and the variable they belong to. **2.** Describe the relationship (positive, negative, plateau) then go beyond it to interpret what it means biologically. **3.** Use error bars or standard deviation to judge whether differences are significant or could be chance. **4.** Evaluate the method: comment on controlled variables, sample size, anomalies and reliability before concluding. **5.** Only state a conclusion the data actually support - say if the evidence is insufficient.
STRUCTURE	Quote data with units → state the trend → interpret biologically → evaluate reliability or validity → cautious, evidence-based conclusion.
MODEL	*Yield rises from 12 to 28 g as nitrate increases to 60 mg dm^{-3}, then plateaus; the overlapping error bars above 60 mg dm^{-3} suggest that further increase has no significant effect.*
PITFALLS	› Describing the line shape without quoting a single value or unit. › Ignoring error bars or sample size and so over-claiming a 'significant' difference.

Extended response - 6 to 9 marks · “Discuss / Evaluate / Explain (extended)”

TESTS	AO1, AO2 and AO3 with marks for sustained reasoning · 6-9 marks (levels-based)
METHOD	**1.** Plan three to five linked points before writing - the marks reward a logical, connected line of reasoning, not a list. **2.** Cover the breadth the question demands: if it says 'explain and evaluate', do both sides. **3.** Develop each point as a chain: claim → biological mechanism → evidence or example → consequence. **4.** Use precise terminology throughout - this is what lifts an answer into the top level. **5.** For 'discuss' or 'evaluate', weigh the arguments and finish with a justified conclusion.
STRUCTURE	Brief framing → 3-5 developed chains with explicit links between them → a reasoned judgement that answers the exact question. Top-level marks need sustained logic, not scattered facts.
MODEL	*Aerobic respiration yields far more ATP than anaerobic because the electron transport chain and oxidative phosphorylation generate roughly 34 ATP, whereas anaerobic glycolysis nets only 2; therefore tissues with high energy demand, such as cardiac muscle, depend on a continuous oxygen supply.*
PITFALLS	› Writing a list of correct facts with no links - this caps you in the lowest level. › Answering only half a two-part command (explaining but never evaluating). › Vague terms ('it makes energy') instead of named processes (oxidative phosphorylation).