# GCE A Level Examiners' Report

Biology

A Level

Summer 2025



## Introduction

Our Principal examiners' report provides valuable feedback on the recent assessment series. It has been written by our Principal Examiners and Principal Moderators after the completion of marking and moderation, and details how candidates have performed in each component.

This report opens with a summary of candidates' performance, including the assessment objectives/skills/topics/themes being tested, and highlights the characteristics of successful performance and where performance could be improved. It then looks in detail at each unit, pinpointing aspects that proved challenging to some candidates and suggesting some reasons as to why that might be.[1]

The information found in this report provides valuable insight for practitioners to support their teaching and learning activity. We would also encourage practitioners to share this document – in its entirety or in part – with their learners to help with exam preparation, to understand how to avoid pitfalls and to add to their revision toolbox.

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[1] ***Please note that where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.***

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## Executive Summary

Overall, the standard of candidates' responses to questions was good and the mean score increased on all three components.

Many candidates demonstrated a sound ability to process, analyse and interpret data and information. More able candidates were able to express themselves well using appropriate scientific terminology. Some excellent descriptions of biological processes were seen. However, a significant minority of candidates were not able to recall the correct scientific terminology required or gave vague answers which were not creditworthy.

Better scoring candidates in all units were able to use all the information given to them in the form of text, images and tables in order to describe trends and explain biological ideas / processes (AO2) and also to reach conclusions (AO3). However, this was not true for a significant number of candidates across all components. Candidates should be reminded to try and interact with all the information given to them. It is there to help them, and they should try and use it in their answers.

Maths skills were generally good again this year. The Hardy Weinberg and Simpson's Biodiversity calculations were completed well by most candidates. However, there were a few areas however which could be improved upon. These included the understanding of a log scale graph, the plotting of a bar graph, the understanding of significant figures and the differences between probability and ratios. Candidates should take care to express their answers in the way the question requests and to round answers correctly. This led to an unnecessary loss of marks for some.

Practical skills again caused issues for some candidates this year. A number did not seem to be very familiar with the specified practicals stated in the specification. This was particularly true for the mineral deficiency practical in Component 1 and the scientific drawing required in Component 2. Again this year evaluative skills were seen to be lacking in a significant number of candidates. There was little understanding of limitations of a method and few candidates could clearly describe the purpose of a buffer in an enzyme experiment.

Candidates should take care to read the question carefully, take note of the number of marks available and structure their answer accordingly. There were a number of cases where this did not occur and candidates seemed to answer the question they hoped they might have been asked.

All components are required to assess synoptic elements from the other two components and also core concepts. It is vital that candidates understand this and revise the contents of the core concepts alongside each component. This was sadly lacking particularly with regard to the core concepts which should form the foundation of all the topics which follow.

Performance on the option questions was improved this year, which was pleasing to see.

Clarity is also important; candidates must not rely on examiners knowing what is meant by a vague response. Candidates should be encouraged to re-read each response to make sure it makes sense and is clear and answers the question being asked. They should also take care to make their handwriting as clear as possible. If additional space is required for an answer candidates should write it on the additional page provided and ensure it is correctly labelled.

# BIOLOGY

## GCE A level

## Summer 2025

## COMPONENT 1: ENERGY FOR LIFE

### Overview of the Component

- All three Assessment Objectives are assessed in this paper within practical and theoretical contexts.
- Elements of each topic within this component are assessed together with practical skills appropriate for this component and mathematical skills set in the context of the topics
- Based on item level data, most questions had high facility factors with only a small number of questions causing significant problems.
- Compared with 2024, the paper seemed more accessible with more low tariff questions. There were, however, also more questions requiring extended answers.

### Comments on individual questions/sections

### Question 1

This question assessed candidates' knowledge and understanding of ATP synthesis via the electron transport chain within a practical context. Most parts of the question were answered well. However, there was some evidence of a lack of understanding of the need for bringing solutions to the same temperature before mixing and the purpose of a control experiment. Good answers to the practical questions demonstrated that the candidates were familiar with the dehydrogenase practical set out in the lab book but it was evident that many candidates had not carried out this practical or could not apply their practical skills on a theory paper**.**

### Question 2

This question was set in the context of microbes and tested microscopy skills and the oxygen requirements of bacteria. Synoptic elements were also tested from Component 2 (classification) and Component 3 (tissue fluid formation). Candidates demonstrated a good understanding of the oxygen requirements of the bacteria but were less confident when explaining the term tentative in terms of classification and gave few details about techniques that could be used to provide better evidence. The apparatus required to calibrate a microscope was not well known. Applying their knowledge and understanding of tissue fluid formation was generally poor. Candidates need to be aware that there will be some questions testing synoptic content on each paper.

## Question 3

Photosynthesis is a major topic in this component. Elements of this question tested Core Content (1.1 Biochemicals) - naming the elements required for protein synthesis was not a problem but there was a lack of knowledge of the role of elements in plants. Practical skill associated with the mineral deficiencies practical as set out in the lab book again demonstrated a lack of familiarity with the technique. Candidates were asked to draw a bar chart of some of the results provided. Many candidates did not gain full marks. Errors were made in plotting, choosing scales for the y axis and in labelling axes. However, many candidates gave well-reasoned answers when asked to explain the effects of a deficiency of manganese and iron. Weaker answers to this question gave the theory but did not apply the theory to the question context.

## Question 4

Human impact on the environment was assessed in this question in the context of planetary boundaries. About half the candidates could state the consequence of exceeding a planetary boundary and most could explain the role of photoautotrophs and saprotrophs in the carbon cycle. Food webs and feeding relationships were well understood except that very few could state that the arrows in a food chain indicate the direction of energy transfer. While candidates had no problem with calculating the mass of ‘Aphide’ many could not explain the reason for washing fruit and vegetables to avoid humans ingesting toxic levels, especially in the context of the question (synaptic transmission). Core content on immobilised enzymes and biosensors was less well understood, again due to not setting their answers in the context of the question.

## Question 5

This question was on respiration but with some core content questions on isomerism, enzyme inhibition and protein structure. The only parts of the question that had lower facility factors were (a)(iv) which asked candidates to calculate the ATP yield from a molecule of triacetin, and (d)(i) which tested the purpose of a buffer in enzyme experiments. When calculating the yield of ATP candidates in general did not make use of the diagram of the Krebs Cycle so did not use the correct numbers. Practical skills again demonstrated a lack of familiarity with enzyme practicals.

**Question 6**

Conservation is an important part of caring for wildlife. The term endangered and the causes of extinction were well remembered. Calculating the time taken reach a target population did not cause problems despite the formula using logarithms. However, understanding that immigration would reduce the time taken to reach a target population was not well understood. Most candidates stated that removing fences would increase predation / poaching / competition for food. Each of these would increase the time taken to reach the target population rather than decrease as asked in the stem of the question.

**Question 7**

There were three parts to the QER on succession. The first part asked candidates to use correct terminology to describe the process of primary succession. The best answers displayed an excellent use of the terms, but many candidates made generic statements without using the correct terms. In the second part of the question a lack of detail lost candidates marks when trying to explain why biodiversity increases during succession. The best answered part of the question required candidates to use the information provided to explain how managed forest can balance human demand for timber with the need for conservation. Overall, a well answered question (mean 5.9 / 9).

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**COMPONENT 2: CONTINUITY OF LIFE**

## Overview of the Component

The assessment included content on the female reproductive system, genetic engineering of wheat with tobacco genes, flowers, PCR and genetic fingerprints, seeds, codominance, mutation, assessing biodiversity practical, and pollen formation and meiosis. There were many good, concise answers to some of the longer questions.

The following aspects of the assessment were well answered.
Female reproductive system and hormones (Q1a and bi)
Flower structure (2ci and ii)
Seeds and practical (Q4)
Codominance (5b)
Nucleotide substitution (Q5diii and iv)
Meiosis (part of Q7)

The following aspects of the assessment were less well answered.
Scientific drawing (Q2a)
Genetic engineering (Q2aiv)
Interpreting information (5dv)
Limitations of a scientific method (Q6b)

**Comments on individual questions/sections**

**Question 1**

In response to part (a) of this question, the majority of candidates were able to identify the first three sites, but a surprising number misidentified the site of the placenta forming as B (an ovary). For (b)(i) many gave the correct response but, predictably, there were many who gave oestrogen and progesterone. In (b)(i) candidates just needed to give the ways in which the human milk was more beneficial for (more lactose, less saturated fat) without any explanation. Less protein is not a benefit.

**Question 2**

In (a), candidates responded to the instruction to "produce a scientific drawing of the granum shown in image 2.1" poorly. Very few drawings bore a resemblance to the image. If candidates drew six plates with no extra structures (except for the possibility of surrounding ribosomes) they were given two marks. If a generic granum with no extra structures was drawn, one mark was awarded. Many candidates drew a whole chloroplast which is not in the figure and so were not awarded a mark. The most common incorrect label mark was for the stroma being located inside rather than outside the granum. Many candidates could use the graph to describe tobacco starting to photosynthesise at its maximum rate very quickly after exposure to high light intensity but wheat taking a lot longer to reach maximum rate of photosynthesis. They could then go on to explain that this led to more photosynthesis so more products (often named such as glucose) that could be used for growth. Less well tackled was 2(a)(iv). Candidates still insist that restriction endonuclease cuts genes, even though the question states that the enzyme cuts genes out. Isolates the gene is fine. Rubisco is the enzyme, not the gene, so cutting rubisco out is incorrect. A little more care in the use of terminology would have gained many candidates more credit.

Most recognised that the GM wheat would produce a higher yield although some stated that this was due to the wheat being resistant to insect attack. The concern needed to have the health risk qualified i.e. the wheat needed to be eaten. Part (c) was answered well. Insect pollinated flowers were described well, but the anthers had to be inside/enclosed by the petals/flower not the plant.

## Question 3

Most candidates gave a reason for knowing the components present as being important for allergy sufferers. Some gave a religious concern (e.g. presence of pork or shellfish) and some gave an ethical/personal choice concern (e.g. vegans not wanting meat/dairy). However, many gave needing to know the calorific or nutritional value. The question just asks about the components of the food, not the mass of each ingredient.

In (a) (ii), the similarities and differences were well answered. They both use DNA polymerase was fine for a similarity. Taq polymerase is a type of DNA polymerase so saying one used Taq polymerase and the other used DNA polymerase did not gain a mark for a difference. PCR using Taq polymerase and DNA replication in the cell using human DNA polymerase was given credit. Candidates should be encouraged to use a ruler to be as precise as possible when referencing graph values in their answers. A line up from three and a half hours was the only acceptable vertical line (210 minutes being three and a half hours). A wide range of answers for the mass of DNA was accepted as many candidates seemed to be unfamiliar with a log scale.

Overall, candidates seemed able to interpret Image 3.2 although many had the arrow pointing upwards with the explanation that smaller fragments would travel further. The base pair ladder has 1000 at the top and 100 at the bottom. The contents of the pie were often correctly identified as beef and horse (some candidates refused to accept that horse would be in a pie), but lamb, chicken and pork were often added even though none of their bands matched up with those present in pie meat. There is/are other unidentified meat/s present.

## Question 4

This was a well answered question on the paper. It simply required candidates to recall the substances used in the germination of a seed and interpret an iodine test in relation to that germination. Many candidates scored well on this question. Using gloves or safety goggles does not gain credit for the risk reduction when using a scalpel. The calculation for (c)(i) was good but a mark could be lost for not giving the answer to two significant figures. Unfortunately, many candidates wrote that water entering the seed would cause a decrease in the total dry mass.

## Question 5

This was a long question assessing all of the AO skills and core content. Part (a)(i) was core content and can be found in CC3a of the Teachers' Guide. The section on the plasma membrane mentions "the extracellular surfaces of the proteins can be glycosylated to form a glycocalyx." Parts of the question also refer to the core content on enzymes. In (a)(ii) the specificity of enzymes was tested. Some candidates referred to the active sites of N-acetyl and galactose so lost credit. Later on in 5(d)(v) candidates had to carefully read all information available before attempting to answer the question. Those that did realised that homozygous mutated FUT 1 alleles would lead to a non-functioning FUT 1 enzyme. Precursor enzyme is not converted to Carbohydrate H. A person can have enzymes A and B present, but if there is no Carbohydrate H present, there is nothing to convert to Carbohydrate A or B. The best candidates gave excellent descriptions of this. Many gave answers that did not come anywhere near coherent explanations. This proved to be an excellent discriminator. Most of part (d) tested core content on DNA codes and mutations. A significant number of candidates had the base U in DNA for part (i). Some neglected to mention bases in part (iii) and some lost a mark for not giving an example in part (iv) although most candidates correctly identified at least two codons from the table that coded for the same amino acid to gain both marks.

The majority of candidates handled the co-dominance question in part (b) well. For (ii) some gave ratios, not probabilities so did not gain a mark. Candidates often gained full marks for the Hardy-Weinberg calculation. If they had gone down the wrong path, credit was given for converting the answer to the frequency given on the 3$^{rd}$ line being converted to a % on the 5$^{th}$ line, even if the 3$^{rd}$ line was incorrect. For the population not being at equilibrium, just "the population is isolated" did not gain a mark. People need to move in and out of the population. A mutation would not cause a 3% increase in blood group O percentage in the UK in four years so was not accepted. Some realised that one blood group being donated more than another would skew the estimate in (iv). Small numbers donating did not gain credit.

## Question 6

It was pleasing to see that most candidates had little difficulty recognising that random numbers reduced bias in sampling. It was disappointing that fewer candidates than expected knew that species richness is just the number of species present. Working out the Diversity Index was reasonably successful although a small number of candidates forgot to subtract a gained answer from 1 leading to an answer of 0.13. This was given partial credit.

For (a) iv many spotted that biodiversity includes species evenness not just the number of species present. Many gave two or three good limitations, but few gave four relevant answers. There were two marks available for spatial limitations; the sampling area is only 20m x 20m for a car park of 60m x 30m (the habitats may vary in the unsampled area), only 10 quadrats or small quadrats were used in the sampling area. A minority still refer to quadrants. One mark was available for a temporal limitation; only carried out in March or only on one day (may change throughout the year being another alternative). Another common limitation was that only plants were taken into account, with animals were not taken into account being an alternative. Human error (not being able to identify the species) limitations were ignored.

**Question 7**

Candidates responded well to the QER nine-mark question, generally scoring in the upper two marking bands. The first part asked about mitosis and meiosis in the development of fully mature pollen grains in an anther. Many forgot mitosis producing the pollen mother cells. Mitosis later on is of the microspore nucleus to give the generative nucleus and tube nucleus. The second part asks about the events in stages B and C of the image. Many candidates gave a generic description of the whole of meiosis (and mitosis). Just events that were clearly credited to stages B and C were taken into account.

The final part often referred to genetic variation without qualification. Genetically varied cells/gametes/seeds/individuals were often not mentioned. The fact that meiosis gives haploid cells that fertilise giving diploid cells or maintaining chromosome number down generations was often absent.

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**GCE A level**

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**COMPONENT 3: REQUIREMENTS FOR LIFE**

## Overview of the Component

- The topics covered in this year's paper included the nervous system, transport in animals, plant transport, homeostasis and nutrition.
- There were some very good complete answers for some of the longer answer questions. Candidates answered well for elements of the nervous system and homeostasis.
- The extended response question allowed students to compare two organisms in relation to their circulatory system and link this to their lifestyles. Many candidates wrote clearly and placed the three aspects of the question in obvious sections.
- When the response required the use of evidence given in the questions, candidates did not regularly use the information. This resulted in fewer marks being gained as their conclusions were not based on this evidence.
- Some handwriting was particularly difficult to read, either being very small or messy. Candidates could be reminded that the scripts are scanned, and clear handwriting would remove any ambiguity from their answers.
- In several sections some candidates had drawn arrows to indicate they had answered further down on the page, or on another page entirely. This is totally acceptable, but they should be reminded that any such indicators should be clear and obvious.

## Comments on individual questions/sections

### Question 1

- Completing the table in section 1a proved no problem for most candidates. They were able to identify the components from the diagram well. Weaker responses confused the sensory and motor neurones, only gaining one of the two available marks.
- Descriptions of how the action potential was generated by the movement of ions was done well. Only a few candidates used K+ influx rather than Na+. Good responses completed the question hitting all the available marking points. Some failed to write that the influx of the Na+ into the axon was rapid. Other errors in the description included that the ions entered the membrane and writing repolarisation rather than depolarisation.
- Candidates were familiar with the hydra nerve net and the differences between the hydra and a human nervous system. Most could state that the hydra did not have a central nervous system, unmyelinated neurones or can detect fewer stimuli. The required response of bidirectional was not awarded for multidirectional.
- Part 1(c)(ii) was mostly answered well. Responses correctly identifying the hydra threshold was higher. Weaker responses only gave values for the threshold in human and hydra rather than stating the difference. Most responses identified there was no hyperpolarisation in the hydra trace. Stronger responses identified which organism they were writing about, although it was assumed if not mentioned they were describing the hydra trace.

**Question 2**

- Many candidates answered 2(a)(i) correctly as an increased surface area. Fewer hit the second available marking point of a reduction in the diffusion pathway. Strong responses gave both aspects even though the question was only 1 mark. It was good to see candidates responding fully. Some responses, although gaining the single mark already, had included references to the cell fitting in more haemoglobin or being flexible to fit through capillaries. This was not penalised, but candidates should read the question fully before answering as it appeared they were giving the adaptations of the erythrocytes.
- In 2(a)(ii) candidates needed to calculate the mean diameter. This was no problem for many. Some used only three of the values from the table rather than all of them. An error carried forward was allowed for the next section for calculating the mean actual size. Some candidates gained this, but many were unable to calculate the actual size using the scale bar – with formula which could not be credited or had converted incorrectly. Suggestions as to why the erythrocytes had different diameters were varied. Many candidates responded correctly that they were viewed in different planes. Some suggested they had been cut in different planes which was incorrect. Candidates had obviously practiced questions relating to organelles in a section, but the erythrocytes had not been cut. Others suggested the diameter varied due to the oxygen they were carrying.
- Candidates did not often use the data from the graph in 2(b)(i) to compare the two types of haemoglobin. Many could state that HbF has a higher affinity for oxygen or had higher saturation at lower partial pressures. Fewer candidates could clearly say that the foetus lives in a low oxygen environment (the uterus). Some candidates could say that HbF binds oxygen from the mother's blood, although some expressed this poorly. In 2(b)(ii) many could state that HbS had a lower affinity for oxygen, with some giving the reverse argument for HbA. Good answers included a data comparison and recognised that there was less percentage oxygen saturation at all partial pressures of oxygen. The use of the appropriate language in this section was often missing.
- Part (b)(iii) was answered badly as some responses continued with the idea of affinity. The question requires a link between the oxygen and respiration resulting in fatigue. Some responses were vague, saying that the body needed oxygen for necessary functions or was taken to where it was needed. Some very good responses were seen where clear links were made.

## Question 3

- For part (a), many candidates could clearly describe the method and state the colour change or that there was no colour change. Some responses stating that Benedict's would turn blue/black or lilac. Other responses omitted to say heat the Benedict's with the raffinose or to heat the acid with the raffinose. Many could recall that an alkali was used to neutralise. Several responses stated that adding an acid would neutralise the solution.
- In (b)(i) many gained all the available marks. However, several responses referred to the symplast and apoplast pathways and had not studied the diagram or read the question stating it was regarding sucrose transport.
- Part (b)(ii) seemed to cause problems. Many responses stating that the monosaccharides would be easier to move as they were smaller. The question said that the monosaccharides are converted into raffinose. However, this wasn't identified as the reason the sucrose concentration was then lower. Some candidates recognised that the concentration gradient would be maintained/steeper.
- Some very good responses to part (c) on how pressure is generated in the phloem. Responses included most of the marking points. Weaker responses had little information to give credit to e.g. not mentioning the xylem, instead writing about sink and source.
- In part (d)(i) most were able to identify the plant as a control. Fewer could say why it was used i.e. to show where the radioactivity went when there was no ringing.
- The responses to (d)(ii) which gained most marks were those where the plant(s) were identified from the table and then conclusions formed using the evidence. Many responses failed to use the information provided to form their conclusions.

## Question 4

- In part a, most could define and endoparasite, but ectoparasite responses were weaker with many writing 'lives on the host' or 'outside the host'. A more precise description was needed of the ectoparasite being on the surface of the host.
- In part b, many responses were good for taenia, clearly describing it absorbing the pre-digested molecules from the gut across its outer surface. Many responses for pediculus failed to write about taking blood from the host and needing to digest the molecules in the blood meal. Many answers referred to nutrients from the host's scalp.
- Part (c)(i) required identification that the pH of the duodenum was similar to the optimum for trypsin. Many could do this. Most could identify enterokinase, although there were some responses with poor spelling. Incorrect responses included hydrochloric acid, ATP, glucose and bile. Most were able to identify the peptide bond and label it using an arrow as instructed.
- In part (d)(i), many candidates realised that placing taenia in a saline solution would reduce osmosis into the organism. Incorrect responses included: it is the same as taenia's environment, saline has a neutral pH, give similar conditions to the body, so the pH decreases as salt is an acid and to reduce enzyme activity.
- Not many responses for (d)(ii) included that the pH decreases away from the optimum for trypsin. Many could state that the change in pH would denature/inactivate trypsin and prevent taenia from being digested. Several responses stated that if trypsin were denatured there would be more protein available for Taenia to absorb, since the human couldn't digest it.
- Many answers for (d)(iii) incorrectly stated competitive inhibition. Also, many who identified the type of inhibition correctly couldn't explain why this was.

**Question 5**

- Most candidates recognised that larger organisms have a lower surface area to volume ratio. The second marking point was gained in stronger responses with candidates clearly expressing deficient over the body surface would be insufficient to meet the organism's metabolic needs. Weaker responses didn't mention diffusion or link this to oxygen demand.
- Part (b)(i) was mostly answered well, but some candidates wrote ammonia/faeces/nitrogen as forms of nitrogenous waste for the bird. Many candidates were able to describe the relationship of water availability and urine concentration – they could then say why this was an advantage. Candidates appreciated that the log scale was used to accommodate a large range of values. Weaker responses given described that the numbers were too large, rather than commenting on the range of values.
- Part (b)(iv) had some strong responses from some. Others failed to notice that no details of ADH were required. Most were able to identify that the medulla was thicker which meant that the loops of Henle would be longer. Fewer were able to clearly explain the pumping of ions into the tissue fluid of the medulla, omitting where they were going. Whilst many recognised there was a water potential gradient, it was not always clear that the tissue fluid of the medulla was more negative due to those ions. Most responses indicated more water would be reabsorbed, but several failed to say where the water was reabsorbed from. It was noted that many candidates wrote that 'the loop of Henle' would be longer, they appeared not to realise that there are lots of these loops in the medulla. In part (c)(ii), most could state that clearance would decrease and the consequences being a build-up of the toxic particle. Several responses harked back to question 2(b)(ii) saying the person would be more fatigued.

**Question 6 (QER)**

- Responses where the three areas were addressed as separate sections produced answers which were more logical in their writing. Some responses scored very highly, hitting nearly all of the indicative content.
- Answers for the snail were in the main very good. The recurring issue with many responses was a misunderstanding between haemocoel and haemolymph. This resulted in the haemocoel bathing the tissues rather than the circulatory fluid. For the closed circulatory system of the squid, many could identify that the blood was contained within vessels and did not bathe the body tissues, plus had used the images to state that the squid had three hearts. Some responses were given which tried to describe the flow of the blood around the squid's circulatory system. This was not necessary in their answers. Good responses included details of the resulting pressure and flow rate in the squid.
- For the final section, weaker responses failed to mention the oxygen demand of the two organisms. Most could say that the squid hunted its prey but fewer expressed that the snail didn't need to hunt so had a lower oxygen demand.

**Question 7 (Option A - Immunology and Disease)**

- Most candidates were able to define infectious disease but far fewer were able to give correct definitions for toxin and antigen. These terms have very specific definitions, knowledge of which is a requirement of the specification. Centres should emphasise the importance of the key terms in this option.
- The maths question in part (b)(i) was well answered by most candidates. Some very good responses were seen to (b)(ii) with most candidates gaining the first mark point for identifying the correct antibiotic although fewer appeared to appreciate the significance of the overlap in data for the second mark point. Part (iii) was generally well answered with many candidates correctly identifying the relevant control variables.
- In this section (c) good responses were seen with an encouraging number of candidates able to recognise the difference in the modes of action of tetracycline and penicillin for part (ii). Some candidates gave good responses in (iii) although a number of candidates were unable to recognise that the overuse of antibiotics represented a selective pressure on the bacterial population and they tended to give stock answers on natural selection which did not access all mark points. Candidates should be encouraged to consider the context of the question carefully.
- Many candidates gave very good responses to part (d)(i) although several tended to give very detailed and quite extended answers to this. Candidates should be encouraged to be concise in their answers and to avoid spending too much time on one section. Most candidates gained the mark for how this type of immunity occurs but many failed to gain the first mark point for the type of immunity. Again, the importance of learning key terms and definitions should be emphasised to candidates.

**Question 8 (Option B - Musculoskeletal Anatomy)**

- Most candidates were able to state a function of the axial skeleton in (a). The majority of candidates gave good answers to parts (ii) and (iii) and no significant issues were encountered.
- Many good responses were seen in (b) and candidates were able to draw conclusions regarding the likely effect of the changes shown on image 8.2 on the process of muscle contraction. Many good responses were seen in part (ii) with a significant number of candidates gaining all the available marks. Part (iii) was also very well answered with most candidates gaining the available marks. It is clear from the responses in all parts of section (b) that many candidates had a very good understanding of the sliding filament theory and could apply that knowledge effectively.
- Section (c) was generally well answered although some candidates were let down by vague or inaccurate expression of their answers, in particular to part (ii) where candidates made reference to numbers of muscle fibres rather than proportions or relative numbers.
- Section (d) was also generally well answered. The majority of candidates were able to correctly interpret the X-ray image and most could name at least two disadvantages of surgery in this example.

**Question 9 (Option C - Neurobiology and Behaviour)**

- Most candidates were able to calculate the actual length of the mouse brain in (a) and gained the two marks available. Some candidates incorrectly measured the length of line Y as the length of the brain. Centres are advised to provide regular opportunities for candidates to practice measuring from diagrams and calculating actual size and magnification as these are maths skills often tested in exam questions. Part (iii) was generally well answered and candidates could relate the size of features on the homunculi to the degree of innervation dedicated to the relevant body part in that part of the cerebrum.
- Some variation was seen in the answers to (b) with some candidates giving answers in part (i) which referred to the advantages of fMRI scans specifically rather than brain scans in general. However, many gave good answers and gained both mark points. Candidates gave good answers in part (iii) and were able to relate the increased flow of oxygen to the increased demand for ATP for neurons in the coloured areas on the scan.
- Most candidates were able to relate the length of range bars to the reliability of the data in part (c)(ii) and many were also able to deduce the benefit conferred by the waggle dance duration to the bee colony in general. They could also distinguish between innate and learned behaviour and give examples. However, a significant number did give general examples of behaviour which were not relevant to primates specifically. Again, candidates should be encouraged to consider the context of the question.

**BIOLOGY**

**GCE A level**

**Summer 2025**

**PRACTICAL ENDORSEMENT**

## Overview of the Component

A number of centres were observed during the academic year, all of which demonstrated a good understanding of the requirements of Practical Endorsement. Aspects of good practice seen during the visits include:

- A suitable plan of practical work which was available to all members of teaching staff. The plan was often incorporated into the Scheme of Work but was also kept as a separate document in a few centres. The plan allowed for the development of skills within Practical Endorsement and covered all elements of each CPAC over the two years of teaching.

*Note: A suitable plan should contain the following details: the specified practical; the CPAC to be assessed in the practical and the proposed time in the teaching year where it would be carried out.*
*Centres are reminded that this plan must be available to the monitor during visits. Failure to produce one will always lead to a second visit!*

- Accurate and up-to-date Teacher and Candidate Records were maintained.

*Note: Most centres now record their outcomes in an Excel Spreadsheet, often showing the CPAC element. However, if teacher records do not show this level of detail (i.e., the element assessed) then teachers should annotate the candidate work showing the element achieved (e.g., CPAC 4(a) or CPAC 4(a&b)).*

- Candidates were informed of the CPAC assessed in each practical and understand the criteria for success.

*Note It is also good practice to give feedback (either verbally or in writing) so that candidates can improve their skills in future assessments.*

- Practical books were used in 'real time' at the bench by candidates when collecting experimental data. Practical books do not need to be in immaculate condition.

*Note: Candidates should avoid using scraps of paper to later transcribe neater versions into practical books*.

- Records of candidate performance show a progression in candidate attainment.

*Note: We do not expect to see every candidate getting every criterion each time they are assessed. Indeed, when this happens there will be legitimate concerns about whether the work has been appropriately assessed. We expect to see that there are places where candidate work is marked 'not achieved'. The key question is, 'Is the candidate competent at the end of the course?'. It is not, 'Is the candidate competent all the way through the course?'*

- There was evidence of standardisation across all subject teachers when Practical Endorsement is delivered by a team of teachers.

*Note: Standardisation is a requirement of Practical Endorsement and is recorded in the monitor's report of the centre. It must be implemented for a centre to pass the monitoring visit. This standardisation may be carried out by cross-marking of candidate work or by meetings in which some candidate work is discussed. Please expect questions on how you do this if visited by a monitor.*

- Descriptors of minimum standards necessary to achieve a CPAC in a practical were available to all teachers on the course. This is good practice and particularly helpful in large departments where there are many teachers of the subject.

*Note: See for example, CPAC Pen Portraits on the EDUQAS website.*

**Comments on individual questions/sections**

**Assessment of Practical Endorsement**

Centres should ensure candidates pass the Practical Endorsement 'by consistently and routinely' meeting the criteria. Candidates don't need to achieve a CPAC every time, but they should show skill development throughout the course. Evidence of passing each CPAC statement should increase, especially towards the end. It is important that assessment plans provide opportunities for candidates to demonstrate progress.

Some practical work will likely be done in small groups. When used for assessment, each candidate must provide evidence of meeting the criteria independently. Centres should ensure that group work allows for individual performance to be assessed.

**Notes on assessment of CPAC**

The Monitor struggles to add to previous comments. Centres should review the following comments closely to meet the expectations of PE.
Set high standards for CPAC skills early in the course. Clearly communicate expectations, explain any failures, and provide guidance for improvement.

**CPAC 1**

This CPAC assesses the candidate's ability to follow written instructions accurately. The monitor will respect the judgment of the teacher unless there is clear evidence of incorrect assessment. If a teacher needs to intervene or interpret instructions for a candidate, then this CPAC should not be awarded.

**CPAC 2**

This CPAC involves higher-level skills and requires careful planning to ensure sufficient development time before assessment. Your plan should show you know where and when you are going to assess each element of this CPAC. It is also important that sufficient time is given to candidates to develop the necessary skills before assessment occurs. Generally, we do not expect to see this CPAC assessed in the first two terms of an A level course. However, we do expect to see evidence of some assessment of this criterion by the end of the first year of the A level course. This skill may be evidenced by a candidate planning to carry out a procedure and then adapting their approach, as necessary. It is not necessary to assess every element of CPAC2 each time this CPAC is assessed. However, it is a requirement that each element of CPAC 2 is met during the course. If you are monitored, the monitor will look at the coverage of each element.

**CPAC 3**

Please be selective when you assess this skill in Biology. There are many opportunities, and you do not need to assess CPAC3 every time they do a practical. CPAC3(a) A simple written risk assessment is the most effective method of assessing 3(a). Before candidates are assessed, make sure they have been instructed in what makes a good risk assessment. Please read risk assessments produced by candidates carefully. Ask yourself the question, do you think that the risk assessment meaningfully identifies the main hazards and risks? Are all the significant risks identified and have suitable controls considered? If not, do not award the risk assessment. CPAC3(b) Direct observations of candidates working safely by the teacher working during practical sessions or fieldwork will be accepted by the monitor for 3(b).

**CPAC 4**

This CPAC deals with both qualitative and quantitative data.

**CPAC4(a)** ‘making accurate observations’.

This CPAC was generally well assessed, although sometimes there were occasions where centres were rather lenient marking candidates’ diagrams. The following points should be borne in mind when assessing this CPAC:

- Observations should be made directly into candidate practical books. Do not award this CPAC if the candidate writes results onto scraps of paper and copies them up later.
- Do not award this CPAC if you provide a template table to the candidates for recording results. Where necessary, remove table templates to allow candidates to construct their own.
- The tables which candidates construct must have appropriate headings and units, where relevant. The units must be written in the table column head and not in the body of the table. If units are missing, do not award criteria.
- An important aspect of this skill in biology requires candidates to draw suitable diagrams. It is therefore important that centres teach candidates what is expected in a good diagram. Make sure candidates are taught what is expected in a good diagram.

Please be careful marking student diagrams. Has the candidate followed the guidance given? Does the diagram follow the expectations of good scientific diagrams? If not, don't award. Give feedback so the candidates have the opportunity of achieving the skill in the future. The following outlines some of the essential skills we expect in diagrams (those in bold are bare minimum to be award the skill).

- There should be a title – top or bottom of diagram
- Accuracy is key
- Sharp pencil used
- Continuous clear lines
- Key structures are labelled
- Scale present, if relevant
- Annotation lines should be straight (ruler used) and annotations written horizontally
- Annotation lines don't cross
- Shading not used

See also see page 18 of Microscopy skills resource).

**CPAC4(b)** 'obtaining accurate, precise and sufficient data...'

Please carefully check candidates' data:

- Is it recorded to appropriate precision? We still notice that some centres are too lenient on this. Make sure that recordings are to the correct number of decimal places. If data readings are not always consistently recorded by candidates, then do not award the criterion.
- Is there sufficient data? Is the data what you expect? Please set suitable standards at the beginning of the course. It does not matter if a candidate did not always achieve the criterion.

**CPAC 5**

This important higher-level skill should be assessed from early in the course. There is no shortage of suitable assessment opportunities. CPAC 5 has two elements:

- Uses appropriate software and/or tools to process data, carry out research and report findings.
- Sources of information are cited demonstrating that research has taken place, supporting planning and conclusions.

**CPAC5(a)**

There should be evidence of candidates processing data using graphs and calculations. Centres should also require candidates to use software (e.g., Excel, dataloggers) to draw graphs and/or to carry out statistical analysis. Candidates will likely need instruction on how to correctly use spreadsheets (e.g. Excel) to do this. Whether graphs are constructed on paper or using Excel make sure they are constructed correctly, i.e., there is a title, each axis is correctly labelled, points plotted correctly, an appropriate scale used, etc before awarding this element.

Processing data also involves carrying out calculations. This may involve transformation of data using mathematical equations, statistical analysis etc. Once again this can be done 'manually' or using spreadsheets. CPAC5(a) also includes 'carry out research and report findings'. The report does not need to be long; it may simply be the conclusion they draw from their data. However, neither is it is not appropriate to award this CPAC for a one-word answer. A conclusion requires a reasoned response to the data observed. The research might be internet or book based.

**CPAC5(b)**

This is not a difficult CPAC to evidence, but it is still often the most poorly evidenced skill in candidate work. It is important that candidates understand why this is an important skill to develop and the consequences of failing to do this in HE. Stress this to candidates. Please try to get candidates in the habit of evidencing research by giving references every time they source information. This should happen from early in the course. Make it become second nature to candidates. The information referenced may be, for data or a quote; the information may come from a textbook, journal, website EDUQAS data sheet.

**Summary**

- Successful delivery of Practical Endorsement needs careful thought and planning. Make sure that there are ample opportunities for candidates to evidence all elements of each CPAC statement over the two years of the course.
- Make Practical Endorsement a servant of the subject. Use Practical Endorsement as part of an assessment for learning strategy. Do not let it become an end in itself.
- Ensure that candidates are clearly informed which CPAC is assessed in a particular practical session and they understand what is required to succeed.
- Give suitable feedback to candidates so that they can improve their skills.
- Inform candidates on whether they have achieved Practical Endorsement before the final outcomes are submitted to Eduqas in accordance with JCQ requirements.

## Supporting you

### Useful contacts and links

Our friendly subject team is on hand to support you between 8.30am and 5.00pm, Monday to Friday.
Tel: 029 2240 4252
Email: science@eduqas.co.uk
Qualification webpage: AS and A Level Biology | Eduqas

See other useful contacts here: Useful Contacts | Eduqas

### CPD Training / Professional Learning

Access our popular, free online CPD/PL courses to receive exam feedback and put questions to our subject team, and attend one of our face-to-face events, focused on enhancing teaching and learning, providing practical classroom ideas and developing understanding of marking and assessment.

Please find details for all our courses here: https://www.eduqas.co.uk/home/professional-learning/

### Regional Rep Team

Our regional team covers all areas of England and can provide face-to-face and online advice at a time which is convenient to you.

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