



Examiners' Report Principal Examiner Feedback

Summer 2025

Pearson Edexcel International GCSE
in Biology (4WBI2) Unit 2BR

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Overall paper comments

This was the first sitting of this paper and examiners were generally pleased with how candidates accessed the questions. There were many good responses seen across all items in the paper with clear evidence that candidates knew the specification well and could apply their knowledge to the contexts provided. A range of mathematical skills were seen with some candidates demonstrating excellent mathematical ability while others struggled a little with skills such as calculating percentage change or plotting a line graph. In many cases candidates engaged well with the command verbs for questions giving complete explanations where this was needed. However, in some cases candidates did not read the full stem of the question thoroughly and ended up misinterpreting the question and so missed out on achieving marks.

Question 1

Module 2 Biology always starts with a series of comprehension style questions, and the passage sets the context for the questions. The topic of this passage was the genetics of the Murray Grey breed of cattle.

Q1(a)(i)

Most candidates were able to correctly name the nucleus as the location of DNA in the cell. Some incorrect answers included stating “gene” or naming another organelle such as the ribosome.

Q1(a)(ii)

The majority of candidates scored at least one mark for this question about the structure of DNA. Most candidates achieved the first marking point for identifying the double helix, though there was variation in how the second point was awarded. Candidates scoring zero typically gave generic statements about genetics rather than DNA structure. Some compared DNA to RNA by referencing thymine or deoxyribose sugar but did not meet the marking criteria.

Q1(b)

Performance was mixed on this question with just over half of candidates scoring the mark for correctly giving the term homozygous. Relatively little confusion with heterozygous was seen but more common were responses where candidates had incorrectly used related genetics terminology such as “dominant” or “recessive”, showing a lack of familiarity with the key vocabulary for this topic.

Q1(c)

Many candidates scored highly, with responses scoring two or three marks far more frequently seen than those scoring one mark. Some candidates missed the third marking point through failing to reference multiple repetition. Weaker responses often drifted into survivability and natural selection and did not correctly address the context of the question so failed to gain any credit.

Q1(d)

Candidates generally did well on this percentage change calculation with half of responses scoring full marks. Where a mark was lost this was usually for division by the incorrect value.

Q1(e)

This question asked candidates to explain why most mutations have no effect on phenotype. This proved challenging for candidates, with many responses scoring zero marks. Candidates struggled to use the correct terminology to express their ideas leading to some confused responses which did not gain credit. Many responses failed to address the range marking points, often linking only points one and two or two and three but not all three together.

Question 2

This question was about the use of microorganisms in food production, particularly that of *Lactobacillus* in the production of yoghurt.

Q2(a)

The idea of the need to remove bacteria from the milk was well understood by candidates with the vast majority of responses scoring the mark for this question.

Q2(b)

Candidates found this question challenging. There was frequent confusion seen in responses between a decrease in pH and a decrease in acidity. Many lost the second marking point through misunderstanding the breakdown of proteins, referring to digestion by enzymes rather than the effects of the lactic acid. The third marking point was most often achieved, usually for a description of a change in temperature. Few candidates scored two marks, though many incorrect answers were close to the required points.

Q2(c)

Many candidates achieved high scores on this question asking for identification of three improvements that could be made to a given method. Ideas around using a wider range of temperatures, stated methods for maintaining a constant temperature and increasing incubation time were all seen frequently. Overall, this question was very well answered.

Question 3

This question was about feeding relationships in an Arctic ecosystem. Candidates had to interpret a food web and use their knowledge to identify a food chain with specific features as well as explain the effects of an environmental change on a named species.

Q3(a)

Nearly all candidates scored at least one mark on this question requiring them to identify organisms from a food web which fit the descriptions given. Candidates were most confident identifying the primary consumer and an organism that photosynthesises. Identification of an organism in the fourth trophic level was more challenging, and this

tended to be the mark lost. Many candidates incorrectly identified the killer whale instead of the seal or sea birds for this response.

Q3(b)

This question was generally done well by most candidates with the majority of responses scoring both marks. Where candidates did score but not gain full credit this was usually for a food chain that did not include the Arctic cod, but did have the correct number of trophic levels. A few cases were seen where candidates had not interpreted the question correctly with some pyramids seen as well as some food webs.

Q3(c)

Candidates performed well on this question across the board with many excellent responses seen. Many candidates correctly linked loss of habitat and food sources leading to a population decrease. Some gained the third marking point via additional guidance despite incorrect reasoning. Common incorrect answers referred to climate change or fossil fuel use, showing that candidates had not interpreted the question correctly.

Question 4

This question focused on the different components of blood. It asked candidates to identify a specific type of red blood cell as well as discussing the functions of other components of blood.

Q4(a)

Candidates generally did well on this multiple-choice question with more than half of responses correctly identifying the phagocyte from the diagrams provided.

Q4(b)(i)

The function of blood plasma was well understood by some candidates although there were mixed responses to this question in general. Many vague responses simply cited “nutrients” without detail, this did not gain marks as a generic umbrella term such as “nutrients” also encompasses incorrect answers to the question. Some listed specific products of digestion or waste products but addressed only one marking point.

Q4(b)(ii)

This question was done well with most candidates scoring at least one mark, this was usually for the identification of an increased number of white blood cells. Where two marks were scored this was generally for linking the idea of increased white blood cell numbers to more being produced by the body. The third marking point was seen less often, although many candidates expressed the idea of white blood cells being needed to “fight the infection” this was too close to the information given in the stem of the question and lacked the specificity to meet the requirements for this particular mark.

Q4(b)(iii)

The function of red blood cells was well understood by the vast majority of candidates and very few responses were seen which failed to score. Most candidates correctly

linked red blood cells, haemoglobin, and oxygen transport. Ideas about respiration were seen in many answers though the fourth marking point was often missed due to no reference to the respiration being aerobic.

Question 5

This question was about human reproduction, candidates needed to know the function of the amniotic fluid as well as the different hormones involved in the menstrual cycle and testosterone.

Q5(a)

This question had mixed responses. Where one mark was scored this was usually for correctly stating the function of amniotic fluid. Correct naming was seen less often, with many candidates giving incorrect responses. Where no marks were scored this was usually due to confusion between the role of the amniotic fluid and the placenta with some responses stating that the fluid contained nutrients for the fetus to absorb.

Q5(b)(i)

Around half of candidates were able to correctly determine which day of the cycle ovulation occurred and give a response within the stated range. Common incorrect responses related to other landmarks on the graph – for example the lowest point in the curve for oestrogen at 17 days or the peak of progesterone at 21 days.

Q5(b)(ii)

Most candidates were able to score at least one mark for this question, with scores spread evenly across the possible range of marks. Many clear, concise responses gained four marking points for explaining the effects of both hormones on the uterus lining and on FSH/LH. Weaker answers described hormone levels on certain days or roles in secondary sexual characteristics rather than menstrual cycle effects. Almost no candidates achieved the sixth marking point; many mentioned menstruation after a drop in progesterone but omitted oestrogen.

Q5(c)

Most candidates were able to give at least one effect of increased testosterone. The most frequently seen ideas were those around increase growth/muscle mass, vocal changes and increased growth of body/facial hair. Many repeated the same marking point in different words (e.g. “taller” and “more muscle”), which limited the marks they could achieve for the question. Others gave unrelated points such as increased aggression, sex drive, or adult traits like baldness. A frequently missed point was specifying body or facial hair rather than just “more hair” meaning that some answers missed the mark due to lack of specificity.

Question 6

This question was about measuring biodiversity. Candidates had to describe a practical method for comparing population sizes as well as analyse data about two different forests to evaluate how useful it was in comparing biodiversity in the two areas.

Q6(a)

Candidates answered this question well with some valid methods provided. Some candidates lost out on the second marking point for mentioning throwing quadrats, which is not a valid method of randomisation, but many still scored three marks.

Q6(b)

This longer answer question asked candidates to evaluate how useful a given set of data was for comparing the biodiversity in two different forests. This meant that candidates needed to use their understanding of the term biodiversity and how data can be used to analyse the biodiversity of an environment. Very few candidates explained what biodiversity is or measures in their responses which was disappointing. Among low scoring responses, many simply gave numerical comparisons taken directly from the data without moving to other points, this limited the marks that could be awarded. Some explained differences in terms of food webs, ecological relationships, or abiotic factors rather than methodological issues in data collection. The strongest responses picked up on the details of when the samples were collected and used this to help support their evaluation with many making suggestions for how the data could be made more useful – for example by also recording the abundance of each species as well as just the number of species found – this showed a deeper understanding of the topic.

Question 7

This question was about how plants respond to different stimuli – particularly in terms of shoot and root growth. As part of this, candidates needed to read data from a graph and use it in a calculation.

Q7(a)(i)

Candidates found this question challenging. Confusion about B responding to light or phototropism led to many missed marks. It is important that candidates read the information provided in the question and use it to inform their responses. Where candidates did score marks, it was usually for the comparison between the length of the stems on plants A and B. The strongest responses linked this idea to the plant growing faster to find a source of light.

Q7(a)(ii)

This question was answered well with a full range of scores seen. Many candidates used this as an opportunity to demonstrate their thorough understanding of the topic with some very detailed response seen. Many high-scoring responses correctly described auxin movement and elongation on one side. In lower scoring responses there was some confusion seen over root versus shoot tips and between negative geotropism and positive phototropism.

Q7(b)

This question was addressed well by candidates with many correctly naming the growth response.

Q7(c)

This calculation question asked candidates to determine the rate of growth of a root in a given time period by using data provided in the form of a graph. This was generally done well with many candidates scoring full marks. Where a mark was lost this was usually for incorrect reading of the graph, or occasionally for division by the incorrect number of days. Where responses did not score a mark, it appeared that candidates did not know how to approach the problem, some attempts to use the graph were seen but the correct processes were not performed.

Question 8

This question was around the effects of fertiliser on crop yield. There was a more practical focus to this question, and candidates had to identify variables, plot data and explain why the results of an experimental model may not be applicable on a larger scale.

Q8(a)

This question asked candidates to identify the independent variable from the investigation given in the question. This was done well by many candidates although there was confusion between independent and dependent variables seen. In some responses candidates had the right idea but simply stated "fertiliser added" without stating mass, these responses could not be given a mark as there was not enough specificity.

Q8(b)

Candidates did well on this graph drawing question with the vast majority scoring at least one mark. The most commonly awarded score was four out of five marks, in these cases the lost mark was for the scale marking point – either for being too small, with the plotted points failing to cover over half of the grid or because the candidate failed to provide a clear break between zero and the start of the linear scale. Some did not label axes at all although where this mark was lost it was usually for the omission of units in the axis label.

Q8(c)

Most candidates managed to score at least one mark for this question although far fewer managed to gain a second or third mark. Many responses listed abiotic factors controlled in a greenhouse, addressing only the first marking point, or explained that there would be an effect without stating the direction of change inside or outside. It is important that candidates understand that glasshouses are designed to increase yield. Where more marks were scored this was usually due to the idea of the plants outside being potentially affected by pests or disease. Some incorrect ideas about pesticides outside the glasshouse potentially decreasing the yield of crop were seen but these were relatively rare

Question 9

This question looked at the differences between genetic and environmental variation as well as asking candidates to explain the process of natural selection as related to a specific feature of the desert hare allowing it to survive in a hot climate.

Q9(a)(i)

Most candidates could correctly identify the xylem as the tissue that transports water in plants.

Q9(a)(ii)

This three-mark question provided a good degree of challenge with an even split of marks seen across the full range available. Many low-scoring responses failed to specify measuring roots, though some gained the third marking point for a plausible length comparison. Many did not state using the same species/type of plant as a way of ensuring genetic similarity, and some suggested growing different plants in the same conditions, which showed a misunderstanding of the question. There were also some excellent responses which addressed all marking points correctly and scored full marks. The strongest of these had very good suggestions for ensuring that the plants were genetically similar such as taking cuttings or using techniques such as micropropagation to create genetically identical clones.

Q9(b)

Candidates addressed this longer answer question well with the full range of marks seen, although responses scoring full marks were much less commonly seen than all other scores. Among lower scoring responses with many omitted details relating to temperature regulation and instead describing hearing-related functions inappropriate to the adaptation shown. Implausible advantages such as hearing rain were frequent. Even amongst responses which scored highly few candidates achieved the third marking point for variation, and those who did often omitted “genetic” – in questions about natural selection it is key that candidates are specific about variation driving the process being genetic in order to gain credit.

Question 10

This question was about the processes in the kidney. Particularly how and why the concentration of different substances changes between the blood and the urine.

Q10(a)(i)-(iii)

These three multiple choice questions were well addressed by candidates with the vast majority of responses being correct for all three questions.

Q10(b)(i)

This calculation question asked candidates to use data from a table to work out the mass of glucose in a given volume of blood plasma. Many excellent responses scored both marks. Where candidates lost a mark, this was usually due to difficulty converting between the two units of volume.

Q10(b)(ii)

Most candidates managed to score at least one mark for this question about why protein does not end up in the urine, usually for the statement that protein is a large molecule. Some were confused about the direction of molecular movement in ultrafiltration, giving unclear descriptions involving the Bowman's capsule or incorrectly using "partially permeable membrane" instead of "basement membrane". Where responses did not score at all this was usually for incorrect interpretation of the question with some responses explaining that because protein is not a waste product it does not "need" to be in the urine or incorrectly stating that protein is reabsorbed.

Q10(b)(iii)

This question was very well done by candidates in many places. Although there was some similar confusion about the direction of movement seen as was the case in 10bii, this appeared to be less frequent. Where candidates did score marks, full marks were more frequently awarded than partial credit with many candidates addressing all four possible marking points in a three-mark question.

Summary comments

In future series candidates should:

- Make sure that they are fully familiar with all core practicals and key processes listed in the specification. Particularly when it comes to identifying variables in experiments described by the question.
- Understand what each of the command words listed in the specification requires, especially the difference between describe and explain.
- Read through each question carefully and be sure to answer in the context provided and not repeat information already given in the question.
- Ensure that they use key terms precisely and accurately, particularly around the specification points which topics related to genetics. Specificity of key terms is also important and generic terms such as “nutrients” should be avoided where more precise responses can be given.
- Explore all aspects of data when presented with data for extended answer questions, especially understanding that quoting of data provided with no further processing or explicit comparison is unlikely to gain credit.

