



GCSE

BIOLOGY

8461/1H – Paper 1 Higher
Report on the Examination

8461
November 2020

Version: 1.0

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General Introduction to the November Series

This has been an unusual exam series in many ways. Entry patterns have been very different from those normally seen in the summer, and students had a very different experience in preparation for these exams. It is therefore more difficult to make meaningful comparisons between the range of student responses seen in this series and those seen in a normal summer series. The smaller entry also means that there is less evidence available for examiners to comment on.

In this report, senior examiners will summarise the performance of students in this series in a way that is as helpful as possible to teachers preparing future cohorts while taking into account the unusual circumstances and limited evidence available.

Overview of Entry

This examination had a total entry of 723 compared to an entry of 108 260 last year. This year, the percentage of entries from private students was over 20 times higher than usual. The percentage of entries from Further Education were 3 times higher and those from independent schools were on a par with previous years.

Despite the small cohort, the mean mark awarded this year was broadly comparable to the previous series. Generally, the standard of written communication seen was weaker in this year's cohort compared to last.

Comments on Individual Questions

Questions 1 and 2 were common with Biology Paper 1 Foundation Tier.

Question 1 (standard demand)

The reference to 'energy' in **01.2** triggered some confusion, with some students discussing respiration rather than considering the context of photosynthesis.

In **01.5**, reference to 'human error' on its own was insufficient and students should always be reminded to add qualification. The concept of denaturation in **01.8** was misunderstood by several students (nearly 60% of students scored no marks), with plants denaturing, cells denaturing and 'it' denaturing commonly seen.

Students are advised to read and follow all of the instructions given when asked to draw a graph, as in **01.9**, many students missed key tasks despite them being listed clearly. Students need to understand how to draw a line/curve of best fit when the plots do not fall on a straight line and students generally could be more accurate when plotting points, particularly those that are not whole numbers. A few students plotted the three individual repeats for each temperature rather than the mean, which meant that no plotting marks could be awarded.

Question 2 (standard demand)

The use of the term concentration gradient was confused by many students throughout this question. Movement 'along/across' a concentration gradient gives no clear indication of direction and requires further qualification; movement to/from a high/low concentration 'gradient' is incorrect. Some students described cells moving, instead of ions or particles.

Students should take care when reading the command word for each question. **02.3** asked for explanation(s), and without this, level 2 and level 3 could not be accessed. Many students referred incorrectly to the cell walls of the alveoli or capillaries being thin, and several didn't refer to walls; the alveoli being thin was not creditworthy. Some students stated that the alveoli contained villi. It is important to note that the alveoli having 'moist linings' is not a creditworthy answer to a question about adaptations for gas exchange. The gas exchange surfaces are moist **due** to diffusion, and therefore, a moist surface is a feature of the lungs but not a feature that maximises the diffusion of gases.

Question 3 (standard, standard/high & high demand)

Several students thought that prokaryotic cells lacked ribosomes in **03.2** and there was a lot of confusion regarding the description of the prokaryotic DNA. Many students described this as 'strands' and a loop in the same sentence.

In **03.6**, weak use of language in expressing the movement of the chromosomes in stage 2 led to very few students gaining high marks in this question (36% scored zero marks). Many talked about chromosomes moving to different ends of the cell without making it clear that one chromosome **set** goes each way. In stage 1, many students stated that the subcellular structures simply 'divided' or 'increased'.

Question 4 (standard, standard/high & high demand)

Full marks were rarely seen in **04.2** with many students confusing or interchanging key terminology. There was frequent repetition of the words 'lock and key' without explanation; reference to 'fit' as though the word equated to 'join'; and reference to 'specific' as though the word equated to 'complementary'. In this unusual series, as some students may have begun their AS level studies, reference to activation energy was seen, although this would not usually be expected at GCSE level.

As in previous years, many students missed heating the Benedict's reagent (or only heated it to low temperatures such as 30 °C) in **04.4**. Students' understanding of the structure of starch was generally weak, with many thinking that glucose is broken down to form starch. In addition, many students stated that photosynthesis 'creates' energy or that the glucose provides the energy for photosynthesis. Many students thought that light was needed for starch to be made. Students should be reminded to use descriptive terminology when describing variables; 'amount' is not creditworthy at this level.

Question 5 (standard, standard/high & high demand)

Some students referred incorrectly to herbivores as predators in **05.2**. In **05.4**, many students were able to correctly name two reasons for the symptoms, but explanations were either not worded well or underdeveloped. Several students were unclear about the distinctions between chlorosis, chloroplasts and chlorophyll.

Very few students answered **05.5** correctly (89% scored zero marks), because they were so focussed on the nitrates mentioned in the question that they missed the other requirements of the bacteria. Many students found the novel context regarding root nodules perplexing and didn't score any marks.

Question 6 (standard/high & high demand)

Throughout this question many students missed out on marks because they had not read the stem of the question, and its supporting information, carefully enough. In addition, when the use of data is specifically asked for in a question, students need to provide the appropriate data to achieve full marks.

In **06.7**, many students could not comprehensively name one function of the liver, with many confusing its role with that of the kidney. Some students thought that digestive enzymes were produced in the liver and that bile neutralises the acid within the stomach, rather than in the small intestine.

Question 7 (standard/high & high demand)

Many students unnecessarily explained how monoclonal antibodies were produced for **07.1**, and very few scored marks on this question. Many students misunderstood the context of the question, and indicated that the mAbs would be injected into the slide. Some students thought that the mAbs were made of lymphocytes. In **07.2**, several students incorrectly stated that the mAbs themselves or lymphocytes would engulf the pathogen.

In **07.3**, many students were able to access Level 2, however, a number of students made blanket statements about clinical trials that applied to all participants. Several students were unable to clarify the difference between patients and healthy volunteers, with some using confusing terminology such as 'healthy patients'.

Concluding Remarks

Generally, the standard of this paper was broadly comparable to previous years. Students generally scored well on simple recall of knowledge questions (AO1) and the topics of cell structure, photosynthesis and movement across membranes were well answered. Most students were able to apply their knowledge effectively in straightforward questions (AO2), but some found application of knowledge to new situations more difficult. Many student's understanding of the structure and function of enzymes is limited and a lack of clear knowledge meant that some students articulated answers poorly on paper. Many students struggle to answer AO3 questions, particularly where complex data needs to be analysed or improvements to practical techniques need suggesting. A lack of precision when quoting, plotting or describing data is common.

As in previous years, details of the Benedict's test for sugar and iodine solution test for starch had not been recalled well, indicating that many students understanding of this practical activity was below expectations. Students continue to find the role of the liver in the human body a challenge.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.