
GCSE

COMBINED SCIENCE: TRILOGY

8464/B/2F – Paper 2 Biology Foundation
Report on the Examination

8464
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General Introduction to the Autumn Series

This has been another 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

A small and atypical cohort of students chose to take the autumn series of examinations. The number of entries for the Foundation Tier was only 223 compared to the usual summer entry of over 150 000.

Comments on Individual Questions

Questions 6 and 7 were common with Combined Science: Trilogy Biology Paper 2 Higher Tier.

Question 1 (low demand)

This question assessed the genetics section of the specification. Nearly all students could recall or calculate the number of chromosomes in a sperm cell when told the number of chromosomes in a human body cell. **01.2** was more challenging with few students being able to correctly link the words 'gene', 'genome' and 'nucleus' with the meaning of that word. Of these, nucleus was the most common correct response.

Most students knew the term heterozygous, but few could give the genotype in **01.5**. Many students correctly completed the Punnett square, however interpreting this to give the correct probability was more difficult, with an answer of 50% frequently seen.

Question 2 (low & standard demand)

This was based on Required Practical Activity 6. It was clear that many students did not appear to understand the method given. When asked for two control variables, many students copied steps from the method that were not applicable.

Most students could identify the receptor and effector in this situation. It was more challenging to describe the effect of drinking coffee on reaction time, with many students stating reaction time increased. **02.7** required students to identify the smallest change in reaction time. A common incorrect answer was student 5, who showed the lowest reaction time, but not the smallest change. Most students knew that the anomalous result should not be included when calculating the mean. Common incorrect responses referred to rounding the anomaly up or down.

Question 3 (low demand)

Many students could not give the food chain. Some students obtained one mark out of two for having the organisms in the correct order, but used dashes or commas instead of arrows. More students could give the primary consumer in the food chain. Reading from the graph was generally answered well. Fewer students could complete the sentences about evolution.

Question 4 (low & standard demand)

Students found this question challenging. The maths skill of using standard form was usually correct, however, parts requiring recall and application of knowledge relating to classification, decay and causes of extinction were not as well answered.

Question 5 (low & standard demand)

Few students could give one way that deforestation can increase carbon dioxide levels in the atmosphere. Methane was the most common correct answer given to **05.2**. Common incorrect responses included nitrogen, oxygen and hydrogen.

Students found it difficult to give two ways the production of meat releases carbon dioxide. The most common correct answer referred to fuel used to cook meat. Respiration of the animals was not a common response. Frequent misconceptions were that the animals release carbon dioxide when they are killed or cut open. Some responses were too vague at this level, therefore 'transport' was insufficient, but 'fuel is burnt or used to transport the animals/meat' was acceptable.

In **05.4** students were expected to compare the carbon dioxide released during the production of all three diets and use data from the graph. Students who did not compare all three diets and use the data could not access level 2 (for 3 or 4 marks). Responses that indicated only which diet released most or least carbon dioxide during production generally only gained 1 mark. If all three diets were compared and correct calculations of the differences from the graph were given, then 4 marks was awarded.

Question 6 (standard demand)

This question was about hormones and contraception. Early parts of the question requiring recall of correct terms such as 'endocrine' were not answered well. Common incorrect answers were digestive system, respiratory system or attempts to name the organs. The vast majority knew that hormones travel in the blood. Some students knew the hormones were likely to be in the plasma, which was creditworthy. Inaccuracies in responses such as 'in red blood cells' did not gain the mark. Confusion was seen regarding the term 'glands' in **06.5** in this context, with a wide range of other parts of the reproductive system being named.

There was a generally a good attempt at evaluating a new contraceptive method with existing methods in **06.7**. In this question students needed to consider both advantages and disadvantages compared with named existing methods of contraception to access 5 or 6 marks. Clear guidance relating to the command words used in AQA GCSE Sciences examinations is available. Students were not given information regarding the efficacy of the new contraceptive, but some students attempted to compare the efficacy with existing contraceptive methods.

Question 7 (standard demand)

Generally, students could interpret the graph and describe the trends between 2008 and 2011 in terms of years, such as 'it increases to 2008' however, fewer could correctly extract relevant data, such as the money spent in millions of pounds in 2008 or 2011. References to trends beyond 2011 were ignored. Some students tried to give economic or 'levels of concern' reasons for the trends which did not answer the question. When 'describe' is used as a command word the answer does not require an explanation.

In **07.2** students were asked to calculate the percentage change, and given the equation. Some students did not appear to read the appropriate figures from the graph. The most common error was not giving the answer to two significant figures. This is prompted in the question and on the answer line. There were indications that some students are confused between decimal places and significant figures.

Knowledge about uses of peat was very limited, with most students not being able to give one use of peat taken from peat bogs. The most common correct answer related to peat in compost. Misconceptions of the term biodiversity were frequently seen in **07.4**, with answers referring to diversity in the human population or vague answers relating to recycling or climate change that would not directly increase biodiversity. Suggestions that would maintain, or decrease the rate of biodiversity decline, such as 'stop hunting' may maintain, but not increase biodiversity, and therefore were considered to be insufficient at this level.

Concluding remarks

It was clear that in the unusual teaching circumstances leading up to this exam, it had not been possible for more some topics and practical work to be covered in the typical way. It was a small and seemingly atypical cohort of students who have chosen to take the autumn series of examinations. Gaps in both knowledge and skills were evident.

Mark Ranges and Award of Grades

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