

Examiners' Report/
Principal Examiner Feedback

November 2011

360Science

GCSE Science
Multiple Choice Paper B1b (5006)

GCSE Biology
Multiple Choice Paper B1b (5026)

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5006/ 5026 (B1b) Examiners' Report November 2011

Overview

Foundation tier candidates performed well on the first half of the examination paper and generally performed as expected on the common tier questions. The majority of the questions which some foundation tier candidates found challenging covered topics that have proved to be a challenge to students historically namely those related to the components of the blood, nerve transmission and genetic engineering.

The performance of some higher tier candidates on a minority of the common tier questions and several of the questions on the higher tier was disappointing indicating a lack of understanding in aspects of their learning. The topics that the higher tier candidates found more challenging were those that have been highlighted several times previously in examiners' reports but despite this students are still clearly struggling with these concepts.

Foundation Tier

Foundation tier students generally performed well on the first set of questions on the paper with Q4 providing the most challenge. 58% of students arrived at the correct response with 27% of students thinking that an overdose of paracetamol caused brain damage. It was pleasing to see that a large majority of students gained credit for their response to Q3. This topic has previously posed a real challenge to students of all abilities but a slight tweak to the wording of the options clearly made it more accessible to foundation tier students.

Similar problems arose in the next section of questions, 'Richard's Blood', to those which have arisen previously with many students still very unsure of the function of blood components, particularly blood plasma. Only 27% of students were correct in their thinking that glucose is carried by the plasma although an almost equal percentage of students thought that white blood cells transported glucose around the body. A greater percentage, 32%, opted for platelets and 16% of students chose red blood cells as the component that transports glucose. There is clear misunderstanding here and it is not just confined to foundation tier students. Use of past papers and reinforcement of understanding through classroom teaching and independent work will help to instil the knowledge needed to tackle this topic that frequently appears in examination papers. Q10 also posed similar issues. 37% of students understood hormones to be chemical messengers that are transported by the blood and it is clear that candidates are unclear of the differences between the nerve and hormonal signals. Only 23% of students chose the second statement as the only correct statement for Q11 with the majority opting for statement 1. Although this statement appeared to have an advantage for using bacteria to produce human hormones, it also contained incorrect information – 'bacteria always multiply slowly' – which the students seemed to ignore in favour of the second part of this statement.

The responses to questions in 'The fight against disease' were generally as expected at this level of the foundation tier with approximately 50% of

students gaining credit for the majority of the questions answered. There still seems to be some uncertainty with technical terms related to immunity – some students are clearly confused between the first, second and third lines of defence and were, consequently unsuccessful in their responses to Q 12. Here, more students were under the impression that phagocytosis formed part of the first line of defence. 15% of students incorrectly chose option A and similarly, 16% of candidates responded with option D. Only a third of candidates answered this question correctly. Surprisingly, only 32% of students were successful in their response to Q15. This topic has previously proved to be very popular with students of all abilities and has, on the whole, always been answered very successfully. In this particular case, however, more students decided that only two of the statements about TB were correct, when they should have chosen all three.

Common Questions

Apart from Q21, the responses were as expected for both tiers of the paper with the higher tier candidates clearly outperforming those at foundation level. There still seems to be a little uncertainty with the structures of the reflex arc, with less able students on both tiers being less successful than those at a higher level. Q21 proved a challenge for both foundation and higher tier candidates. This topic has consistently caused confusion for students despite it being a straightforward recall question. The differences between the way that the nervous system transmits signals and the way that hormones relay information appears to be an area that students have always struggled with and frequent reinforcement would strengthen their understanding and help them to remember this factual information during examinations.

Higher Tier

Candidates performed particularly well on the first three questions in the first section of the higher tier of the paper and it was very pleasing that the vast majority of students were able to interpret the graph correctly to arrive at the right conclusion. Similarly, and despite the slight complexity in the wording of the options, 85% of students correctly chose option D for Q27 which indicates a much better understanding of the effects of carbon monoxide on the body than has been shown previously. Many students were unable to correctly identify the effects of hormone replacement therapy in helping people to give up smoking, with the majority thinking that it stops nicotine addiction and did not affect heart rate despite the question giving a hint that it reduced cravings. From their work on drugs, students should be aware that nicotine is a stimulant and it was disappointing that only 17% of students answered this question correctly. The questions on the role of sex hormones in the menstrual cycle were generally answered well, with many students now clearly familiar with the roles of oestrogen, progesterone and FSH. The statistics indicate that the role of hormones in contraception is less well understood with some students unable to correctly apply their understanding of the role of the female sex hormones in a different context. Q32 was a challenge to all but the best candidates, with only 25% gaining credit for their response.

Q34 was correctly answered by the majority of the students and this was very pleasing despite this type of question showing less successful statistics in previous examination series. Q35 was significantly less well answered. Very few students chose only statement 2 as the correct response with over double the number opting for both statements being correct. Students should be made aware that it is not always the case where both statements are correct in a question of this style – it often appears, from patterns observed in previous examination series, that choosing both or all statements available is the 'norm'.

The final section of the paper gained very good statistics which were as expected. Q36 was answered particularly well with 96% of students arriving at the correct response despite the amount of information available for analysis. Some students struggled with the calculation required for Q38 although this question was generally answered well with 68% of candidates gaining credit for their response. The final two questions provided good discrimination between grades, with only the top candidates scoring correctly. 37% of students corrected chose option D for Q39 and 36% of students were able to identify the effect of immunisation on the specific immune system.

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