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Examiners' Report/ Principal Examiner Feedback

November 2010

GCSE

360Science

GCSE Science
Multiple Choice Paper B1a (5005)

GCSE Biology
Multiple Choice Paper B1a (5025)

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5005 Science/ 5025 Biology (Multiple Choice B1a) Examiners' Report

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General Overview

Candidates generally made a good attempt at their respective tiers of the paper and apart from a few exceptions, the questions overall were answered fairly well. This was the case even for questions structured in a relatively new style and/or presented in a new context.

Foundation Tier – Questions 1 to 16

Many candidates scored well on the questions in the first section of this tier and the majority, 84%, were able to identify producers from the food web. It is evident from the statistics obtained for question 2 that some students are misreading the meaning of the arrows in the food web as those who answered incorrectly identified the grasshopper and beetle as predators of the spider. It was pleasing to see that a good number of students were able to analyse the effect on the food web of an increase in grasshoppers – 69% of students arrived at the correct option for this question.
Students made good attempts at correctly answering the question in the next section although it was disappointing to see that only 50% of candidates at foundation tier were able to recall that the nucleus contained the chromosomes (question 6). This was a very straightforward question, more so than those that followed where statistics indicate much better responses.
The section covering fossils under the title 'Sea monsters' gained varied responses with students obviously performing well on the questions using less scientific terminology. 51% of students answered correctly for question 10 where they identified natural selection as the process producing the features of the pliosaur. Interesting, 26% of students thought the features were brought about by genetic modification despite this technique not being introduced until quite a few thousand years after the extinction of this dinosaur. 48% of students had problems recalling features of fossils although it appeared to be the timescale that presented more of a challenge to students rather than the fossils being composed of mineralised remains.
Only a third of students answered questions 15 and 16 of the final section of the foundation tier correctly. Although they were able to use the diagram to answer question 14 well, the majority of candidates found it difficult to extend their line of thinking to conclude that the embryo was produced through sexual reproduction and was genetically different to its parents. Similarly, most had problems recalling the definition of alleles – 30% arrived at the correct answer with the remainder of responses being spread fairly equally across the remaining options.

Overlap Questions 17-24

Apart from the section on cloning both higher and foundation tier candidates performed well on the overlap questions with the significant exception of question 17. A very disappointing 18% of higher tier students and 11% of foundation students managed to extract information successfully from the evolutionary tree to conclude that there were no organisms that were of the same species as *Homo Sapiens*. As has

been found previously, students tend not to like choosing 'none' as an option although the reasons for this are unclear. Most students on both papers chose option D – three of the organisms were of the same species and this clearly shows misunderstanding in the binomial system for naming organisms. Students were clearly confused which part of the name represented the species in this particular case.
The statistics obtained for the section titled 'Cloned pigs' indicate a general lack of understanding of this area of the specification across both foundation and higher tier candidates. Less than half of higher tier candidates and under a third of foundation candidates were aware that the genetic information used to produce the pigs was obtained from a body cell. Similarly for question 22 students had real problems deciding which of the statements on using cloned organs for transplants was true which indicates a lack of knowledge of current scientific ethical issues. Interestingly, there was only an 8% difference in the number of correct responses made by higher and foundation tier students for this question. 29% of higher tier students arrived at the correct option compared to 22% at foundation level.

Higher tier Questions 25-40

The majority of students made a good interpretation of the genetic fingerprints, the first question on the higher tier paper, although the statistics obtained for the subsequent questions in this opening section were less pleasing. In previous series, students have performed well on questions which incorporate Punnett squares and related calculations although only the more able candidates were successful in answering questions 26 to 28 this time round. Only 52% of students were able to use the information in the stem of the question to arrive at the correct answer for question 26 and 57% of students were able to recall that there are 2 alleles for every gene for question 28.
The section titled 'Growth in organisms' produced statistics that would be expected at this stage in the paper. The response for question 30 was pleasing – BMI has not been tested previously but students were clearly able to interpret the graph and correctly carry out the calculation successfully.
Only the most able students identified that none of the statements were correct in relation to GM plants – 22% were successful here whereas 47% identified one statement as being related to GM plants. It may be the case that students are misconceived into thinking that GM plants are transgenic which may have swayed their decision in choosing the correct answer.
The final section of the paper again gave expected statistics and provided questions that were able to discriminate well between A/B grade students and also A/A* students. Question 40, for example, proved a challenge for all but the highest ability students; most students who answered incorrectly were under the impression that faulty alleles can be removed from all body cells!

Grade Boundaries – November 2010

Multiple Choice Papers – GCSE Science

Raw Mark Grade Boundaries

5005/5025	Max mark	A*	A	B	C	D	E	F	G
H	24	19	17	15	13	9	7		
F	24				18	15	12	9	6

5006/5026	Max mark	A*	A	B	C	D	E	F	G
H	24	17	15	13	12	8	6		
F	24				15	13	11	9	7

5007/5035	Max mark	A*	A	B	C	D	E	F	G
H	24	18	15	12	10	7	5		
F	24				17	14	11	8	5

5008/5036	Max mark	A*	A	B	C	D	E	F	G
H	24	19	17	15	14	9	6		
F	24				18	15	12	10	8

5009/5045	Max mark	A*	A	B	C	D	E	F	G
H	24	16	14	12	11	8	6		
F	24				14	12	10	8	6

5010/5046	Max mark	A*	A	B	C	D	E	F	G
H	24	17	15	13	11	8	6		
F	24				17	14	12	10	8

Uniform Mark Grade Boundaries for these units

	Max UMS	A*	A	B	C	D	E	F	G
H	40	36	32	28	24	20	18		
F	27				24	20	16	12	8

Note: On higher tier papers, the "allowed" grade E is calculated as half a grade width

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