

# Examiners' Report/ Principal Examiner Feedback

June 2010

GCSE

360Science

GCSE Additional Science  
Multiple Choice Paper B2 (5015)

GCSE Biology  
Multiple Choice Paper B2 (5027)

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5015 Additional Science/ 5027 Biology Examiners' Report  
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### Overview

Overall candidates at both Foundation and Higher tier performed particularly well on a large number of questions within their respective tiers with responses implying an improvement in their understanding and knowledge in specific topic areas where students were previously weaker. Both tiers responded well to the mathematical and graphical questions where analytical skills were needed to arrive at the correct answer.

### Foundation tier - Questions 1-16

The number of correct responses to the first four questions on the paper was surprising and slightly disappointing. Candidates have previously shown a fairly good understanding of this topic and, apart from question 2, barely 50% of candidates arrived at the correct answers. 45% of students understood that recycling would conserve natural resources with nearly as many (40%) misconceived in thinking that it would prevent global warming. Only 48% of students were aware that the chloroplast is the site which absorbs sunlight for photosynthesis and although statistics for previous examination papers indicate that candidates have a fair understanding of cell structure some reinforcement of the function of component parts might be considered.

87% of candidates used their mathematical skills to answer question 5 correctly which is very encouraging. A similar percentage understood the reason for an increase in heart rate (question 6) and students are clearly familiar with the reason why some athletes take steroids where, for question 8, a fantastic 95% of students arrived at the correct option. On the contrary, few candidates understood the ribs and diaphragm to be the structures responsible for moving air into the lungs. Only 39% chose the correct option in this case.

Questions 9 to 12 caused few problems although nearly twice as many candidates thought that DNA coded for bases (option B) as opposed to protein for question 11.

Only the more able candidates were able to correctly respond to questions 15 and 16 with 34% and 39% respectively arriving at the correct answer. Students have previously shown a very good understanding of the effects of excess carbon dioxide in the atmosphere i.e. contributing to global warming and this was again reflected to some extent in the number of correct responses given for question 14. However, question 15 aimed to take their understanding a step further by asking them to apply their knowledge of global warming to a global context. More students (40%) thought that global warming would increase the size of the holes in the ozone layer. Similarly for question 16, more students (45%) thought that burning coal was the main cause of eutrophication with 39% of candidates choosing the correct option.

### Overlap - Questions 17-24

Statistical data indicates that the overlap questions were good discriminators in most cases with the more able Foundation Tier candidates performing well across all questions. Students of all abilities within the Higher Tier produced a significantly

larger number of correct responses compared to the Foundation Tier students. Question 18 posed the greatest problem for both tiers where nearly an equal number of Foundation Tier students opted for the incorrect distracters B and C (31% and 30% respectively) both of which are a greater percentage than that for the correct option D (28%). Although more Higher Tier candidates (44%) chose the correct answer for this question, the spread of choices across the other options showed a very similar pattern to that shown by the Foundation Tier students for the same options. This is slightly disappointing as the statements given are probably the most common that students will come across in their learning and it should have been quite clear to more candidates that both statements were correct.

Students performed as expected at this level of the paper for questions 20 to 24. Interpretation of the graph was carried out well by all abilities with 65% of Foundation Tier students and 85% of Higher Tier students correctly choosing option D. Applying their understanding of the graph was only slightly more tricky for some students although a good number of students at both tiers made a successful attempt in answering question 21 and this was also reflected in the remainder of the questions in this section.

#### Higher tier - Questions 25-40

D/C grade candidates seemed not to perform as well on the first question of this tier with only 54% able to recognise how energy transfer could be maximised at Thanet Earth. This was reflected, albeit to a lesser extent, in question 27 where 34% of candidates failed to answer correctly and similarly for question 29 where 22% out of 33% of students thought that greenhouses prevented carbon dioxide from being released into the atmosphere. 67% of candidates recognised the link between the increase in transport with an increase in global warming.

It was quite pleasing that 60% of students correctly interpreted the graph given for question 30 although 25% arrived at option D by not looking carefully enough at the labels on the graph. Although students are clearly improving in their graphical analysis and any subsequent related mathematical calculations it may be worthwhile stressing to students that all details on graphs are important and should be considered when choosing a response.

The more able students in the Higher Tier correctly responded to question 34 - 49% of candidates decided that only two of the three statements were correct whereas 34% only identified one statement as being correct. The statistics given for question 36 and 37 are more promising than what they have been in previous series and this indicates a better understanding of the processes involved in cloning mammals although a fair number of students are still unsure of protein synthesis (question 38). Options A, B and C drew an almost equal spread of responses - 28%, 29% and 33% respectively. Clearly only the most able candidates were able to identify the process taking place and its location with others seeming to guess their answer.

More students (57%) were aware that the molecule being formed was mRNA although the genetic code on the molecule being copied clearly shows it to be DNA.

The final question on this paper proved to be a real discriminator with only the A/A\* students correctly identifying the total number of amino acids found in both alpha chains of haemoglobin.

## Grade Boundaries - June 2010

### Multiple Choice Papers - GCSE Additional Science

#### Raw Mark Grade Boundaries

5015/5027	Max mark	A*	A	B	C	D	E	F	G
H	24	21	19	17	16	13	11		
F	24				17	14	11	9	7

5017/5037	Max mark	A*	A	B	C	D	E	F	G
H	24	19	17	13	10	7	5		
F	24				16	13	11	9	7

5019/5047	Max mark	A*	A	B	C	D	E	F	G
H	24	19	16	14	12	8	6		
F	24				16	13	10	8	6

#### 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

### Structured Papers - GCSE Additional Science

#### Raw Mark Grade Boundaries

5016/5028	Max mark	A*	A	B	C	D	E	F	G
H	30	20	16	12	9	6	4		
F	30				18	15	12	10	8

5018/5038	Max mark	A*	A	B	C	D	E	F	G
H	30	20	15	11	7	5	4		
F	30				18	15	12	10	8

5020/5048	Max mark	A*	A	B	C	D	E	F	G
H	30	20	18	14	11	8	6		
F	30				19	16	14	12	10

#### 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

## Biology, Chemistry and Physics Extension Papers

### Raw Mark Grade Boundaries

5029	Max mark	A*	A	B	C	D	E	F	G
	60	48	43	38	34	29	24	20	16

5039	Max mark	A*	A	B	C	D	E	F	G
	60	55	49	42	36	30	25	20	15

5049	Max mark	A*	A	B	C	D	E	F	G
	60	50	44	38	32	26	20	15	10

### Uniform Mark Grade Boundaries for these units

Max UMS	A*	A	B	C	D	E	F	G
120	108	96	84	72	60	48	36	24

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