

# Examiners' Report/ Principal Examiner Feedback

June 2010

GCSE

360Science

GCSE Additional Science  
Structured Paper B2 (5016H/1H)

GCSE Biology  
Structured Paper B2 (5028H/1H)

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information, please call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our website at [www.edexcel.com](http://www.edexcel.com).

If you have any subject specific questions about the content of this Examiners' Report that require the help of a subject specialist, you may find our **Ask The Expert** email service helpful.

Ask The Expert can be accessed online at the following link:

<http://www.edexcel.com/Aboutus/contact-us/>

Alternately, you can speak directly to a subject specialist at Edexcel on our dedicated Science telephone line: 0844 576 0037

June 2010

Publications Code UG023392

All the material in this publication is copyright

© Edexcel Ltd 2010

**5016H Additional Science/ 5028H Biology Examiners' Report**  
**Structured paper B2**  
**June 2010**

This paper consisted of seven questions with 1 and 2 in common with the 1F paper. Most questions were accessible to candidates, although there was a significant number of cases where candidates confused the requirements, e.g. describe and explain in question 6.

The candidates in this series seemed to either produce a good answer or gave responses that were completely wrong many suggesting that candidates need to be trained to review their responses effectively. Candidates entered for 5028H scored slightly higher than candidates entered for 5016H on average on most questions. It was pleasing to see candidates using techniques like underlining key words in the body of the question.

"How Science Works" is also examined throughout the paper. Teachers may find it helpful to revisit the criteria for this aspect as some candidates do seem to find it difficult.

Generally, candidates might often be well-advised not to "answer in full sentences" where they may spend three lines re-stating the question before getting to the point. A candidate with big handwriting has nearly filled the available space in Q5a, for instance, by writing, "Mineral ions are absorbed from the soil into root hair cells by..." and has added nothing to her answer, which might better start, "By active transport..." There were a significant number of questions referred to the principal examiner for illegible writing and candidates need to be reminded of the need to make their answers clear and neat.

### **Question 1**

#### **Heart rate and respiration**

1a) 87% of candidates were credited with at least 1 mark on this question with almost 50% gaining both marks available. The question was designed to test an understanding of how heart rate is affected by exercise and it was pleasing to see some comprehensive answers hitting all the available marking points.

1bi) 55% of candidates correctly completed the aerobic respiration, many of them adding energy.

1bii) Slightly fewer candidates (41.6%) could complete the anaerobic respiration equation correctly with many adding carbon dioxide to lactic acid which disqualified the mark.

### **Question 2**

#### **Stem cells**

2a) 56% of candidates correctly explained the use of stem cells to scientists. Most of those who did not score here, gave the consequential possible use of stem cell research.

2b) 76% of candidates gained at least one of the two available marks here. Many that just scored one stated two very similar answers that were covered by the same marking point. For example, growing a new organ and growing a new limb.

2c) over 80% of candidates scored marks here with the idea that embryos were already alive and therefore had rights. Answers that did not score were vague and along the general idea that "it is wrong".

### Question 3

#### Diffusion of glucose

3a) almost 65% correctly identified the gas as carbon dioxide with the majority of the others giving the logical alternative of oxygen.

3b) When answered well, candidates showed a clear understanding of the process of diffusion. However, it was disappointing to see so many misconceptions here with over 50% of writing vague answers and some candidates writing answers that showed a poor understanding of the principles involved. For example, "red blood cells pick the glucose up in the lungs and then move it by osmosis into the muscles", or "the wall of the plasma is thin so glucose just moves", or finally, "it travels in the veins until it intrudes into the muscles". There was some confusion from a significant number of candidates referring to the cell membrane as a cell wall.

### Question 4

#### Dwarf wheat

4a) This question was answered very well by 47% of candidates giving clear answers showing a clear understanding of the process of selective breeding. Most candidates who did score here gave an answer worthy of both marks available. Many of the candidates who did not score here confused the process of selective breeding with genetic engineering or cloning. It was also disappointing to realise that many candidates could not focus on the question which asked them how to describe how selective breeding could produce dwarf wheat and discussed breeding individuals with high yield or drought resistance.

4b) It was disappointing, for a question that comes straight from the specification, to see answers like, "the dwarf wheat is closer to the ground so nutrients reach the wheat grains quicker" and " the dwarf wheat is further from the sun so dries out less", and "the wheat is shorter, so more can be fitted into the field". The 35% that did score here gave clear answers showing that they were well prepared for the examination.

4c) Again this was disappointing in the way candidates answered this question with only 37% gaining at least one mark. Many answers just repeated the stem with answers like "it is drought resistant so will survive droughts" regularly seen. Candidates need to be trained to extend their answers more so that they cover the consequences of the underlying science on these higher grade questions.

### Question 5

#### Plant roots

The first part of this question was not answered well with 33% gaining marks in part a) although almost 60% gaining credit in part b). Magnesium and nitrates were the best answered section with very few candidates being able to state how plants use potassium.

### Question 6

#### Sewage outfall

This was a hard question with a complex set of graphs to analyse. 52% of candidates managed to score at least one mark here, predominantly for stating that ammonia levels rises and then fell or stating that low oxygen kills aquatic organisms. Few then developed their answers to encompass other marking points although those that did found it easy to gain at least three marks by explain algal blooms and the subsequent consequences on the river. The main problem for many candidates was that they described, rather than

explained the graphs. This possibly suggests that more preparation of what questions require could be beneficial to candidates.

### **Question 7**

#### **Meiosis**

7a) was well answered with 62% correctly identifying meiosis as the process used to produce sperm.

7b) 56% of candidates scored at least one mark here with most gaining two marks, usually for stating that "four, haploid" cells were produced. 14 % of these went on to gain the third mark available, usually by stating that there were two divisions in meiosis compared to just one in mitosis.

## 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

Further copies of this publication are available from  
Edexcel Publications, Adamsway, Mansfield, Notts NG18 4FN

Telephone 01623 467467  
Fax 01623 450481

Email [publications@linneydirect.com](mailto:publications@linneydirect.com)

Order Code UG023392 June 2010

For more information on Edexcel qualifications, please visit [www.edexcel.com/quals](http://www.edexcel.com/quals)

Edexcel Limited. Registered in England and Wales no.4496750  
Registered Office: 190 High Holborn, London WC1V 7BH