

Examiners' Report/ Principal Examiner Feedback

November 2010

GCSE

360Science

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

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

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5016H Additional Science/ 5028H Biology (Structured B2) Examiners' Report

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General Comments

All questions seemed accessible to the majority of candidates although there was evidence of some questions being left blank and a significant number of candidates wrote vague responses that gained no marks.

Many candidates showed a good understanding of the subject and some excellent answers were seen, showing a good knowledge of the processes covered and a clear understanding of the biological principles involved. Overall, candidates produced answers that were similar to the last few series of examination papers.

Poor spelling, for example, neculs or Nullue for nucleus, agly for algae, and ufanasia, for eutrophication lost a significant number of candidate's marks. There were some illegible scripts and more blank answers than expected.

Statistics quoted are for an average of both 5016H and 5028H.

Question 1

59% of candidates scored 1 mark here with a further 30% scoring both marks available. It was pleasing to see that so many candidates could state a factor that would increase growth within the plant in question. Many of these candidates could link, for example, carbon dioxide levels to photosynthesis and it was disappointing that they could not extend their response to explain how changing this factor would bring about the increased growth, for example, simply stating in (b) that carbon dioxide is used in photosynthesis. A significant number of answers stated increasing light level would increase growth although the stem of the question clearly stated that the plant received sufficient light. Some candidates repeated their answer for part (a) in part (b). For example, in (a) add more minerals to the soil and in (b) this will give the plant more minerals.

Question 2

It was pleasing to see so many excellent lines of best fit in part (a) and only the occasional candidate who drew theirs without a ruler. Some of these still gained a mark in part (b) by reading off their projected number of bird species in 2025 accurately. 64% gained both marks available with a further 28% scoring just one mark. A significant number of candidates showed good practice by drawing on the graph to aid accurate scale reading.

48% of candidates scored one mark in part (c), usually for stating that reforestation will increase or maintain habitats. Some candidates lost marks by using unscientific terminology like homes, and a few misread the question and discussed deforestation. 20% of candidates gained 2 marks usually by extending the habitats point to explain that there would thereby be more food or there would be more places to avoid predators.

Question 3

55% of candidates scored at least one mark in part (a) with those picking up one mark usually just stating that the two sides of a DNA molecule were held together by four bases/ naming

the four bases. 30% of these extended their response to name the way the bases paired up and a significant number stated that the bases were held together by hydrogen bonds, evidence that teachers are giving a clear understanding of DNA structure. Some candidates lost marks by just writing 'bases', whilst some disqualified their answer by talking about amino acids, ribosomes or uracil holding the molecule together.

Part (b) scored less well than expected with 21% scoring one mark and just 6% gaining both marks available. Too many candidates disqualified their answer with references to bases, triplets and other molecules making the protein up. A significant number also treated this question as a 'spot the difference' question, giving answers like the top one has a black parallelogram.

Question 4

Part (a) was well answered with 27% scoring one mark and 65% scoring two marks. The standard of answer was generally better written here with very few not explaining to which type of cell they were referring. As expected, candidates knew that the nucleus and cell membrane was common to both animal cells and plant cells. There were a few candidates who knew that cell walls were specific to one of the types of cell, but sadly chose animal cells. Lists of structures and processes were also seen with some of these disqualifying, for example plant cells have chloroplasts for respiration, which animals do not do. A few vague answers, for example, "they don't both have cell walls", were seen.

44% of candidates scored in part (b) with glucose being used for 'respiration / producing energy' a common response, with, 'making starch to store the glucose' less commonly seen. Some excellent answers showed a good understanding of this area, for example " the glucose will be respired releasing energy that will be used for active transport. Many candidates seemed to see plants and glucose and jump straight to photosynthesis without thinking about what the question was asking. A few also showed that they had not fully read the question giving 'to make protein', some with excellent details of how nitrates were needed for this even though the stem of the question clearly told them that and asked for another way that plants use glucose.

In part (c) 46% of candidates scored one mark with a further 23% scoring both marks available. Excellent responses were seen explaining why energy was needed to move the ions against a concentration gradient by active transport, with only a few getting active transport details the wrong way around. It is interesting that when a similar question was asked in a previous examination, the idea of nitrates needed to be in solution as ions was seen regularly. In this series, it was very rarely seen. There were still a significant number of candidates who stated that the nitrates were absorbed through the leaves, some of them stating that the nitrates came from the sun.

In part (d) 75% of candidates scored at least one mark, usually for stating that excess nitrates are washed into aquatic systems. Many then went on to give vague answers for example this causes algae which ends up killing fish. At this level, we expect answers for this topic to be relatively detailed and use scientific terminology correctly. It was not uncommon to see "mega growth, mega death, and mega decay", presumably a quote, but without qualification, e.g. relating the increased growth to algae and the decay by bacteria, is too vague to be credited.

Question 5

In part (a) many candidates attempted to answer the question by paraphrasing it, for example, you need to maintain populations so that they do not die out. Others gave vague answers including 'biodiversity' which were insufficient to be awarded a mark. Some very good answers were seen, showing a clear understanding of the interdependence of species with a significant number of candidates citing current or possible future uses of species. 34% of candidates scored 1 mark here, with a disappointing 2 gaining the second mark available. Part (b) was also answered less well than expected with only 29% of candidates giving a clear understanding of what a living indicator is. Many vague statements were seen about living indicators showing 'something' or rephrasing the stem and saying that they are a beetle that tells you about the quality of farmland. An example by itself was not credited here as it did not answer the question, although many candidates gained the mark by using a good example to clarify their otherwise vague definition.

Question 6

Almost 50% of candidate scored 1 mark here with more correctly identifying the cooling jackets than the harvesting outlet. A further 15% gained both marks available. Some candidates thought that gases would accumulate at the bottom and that structure B would let them out and a few stated that it was to remove waste.

This question along with (c) produced the highest number of blank responses on the paper, which although only a relatively small number was still disappointing. The answers left unanswered was possibly due to the question needing candidates to know the key term 'aseptic techniques' This is in the glossary and so candidates should be familiar with it. However a significant proportion of candidates who did attempt the question answered in terms of maintaining optimum conditions, which supports the possibility that 'aseptic techniques' was an unfamiliar term. 28% of candidates scored one or two marks here, with steam cleaning and filtering the air being the main creditable answers seen. Many candidates lost marks through writing vague answers or by writing a list which contained incorrect answers, for example sterilising air, the nutrients and the microorganisms. A few excellent answers were seen. Some candidates misread the question and wrote the answer to part (c) here.

This again was less well answered than expected with 33% gaining one or two marks. A few candidates gave excellent answers reflecting comprehensive teaching of this topic. However, too many candidates gave simplistic, vague or unqualified answers, for example "to kill all the microorganisms", "to clean it", or "to stop microorganisms growing. Some candidates again confused aseptic with optimum conditions.

Question 7

This question worked well with 46% of candidates scoring 1 (18%) , 2 (14%), 3 (8%) or the full 4 (6%) marks available. 55% of candidates failed to score any marks with vague responses, or ones that confused mitosis with meiosis. Some candidates just missed the last marking point where the answer required them to state two and genetically identical daughter cells were produced by just stating, for example, that "identical cells are made". Excellent answers included a clear, logical sequence of detailed points. This final question often demands the

sequencing of the stages of a process which shows accuracy and detail and candidates need to be aware of this and practise such questions with attention to key words and phrases. Some answers, the jumbled ones and the excellent accounts of wrong areas, like cloning or the differences between mitosis and meiosis, suggested that the candidates had learnt some processes verbatim rather than studied and understood them.

Grade Boundaries - November 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	22	19	16	14	11	9		
F	24				18	15	13	11	9

5017/5037	Max mark	A*	A	B	C	D	E	F	G
H	24	19	16	13	10	8	7		
F	24				15	12	10	8	6

5019/5047	Max mark	A*	A	B	C	D	E	F	G
H	24	21	18	15	12	10	9		
F	24				16	13	11	9	7

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	19	16	13	10	7	5		
F	30				18	15	12	10	8

5018/5038	Max mark	A*	A	B	C	D	E	F	G
H	30	22	18	14	10	7	5		
F	30				17	13	10	7	4

5020/5048	Max mark	A*	A	B	C	D	E	F	G
H	30	20	17	14	11	8	6		
F	30				18	14	11	8	5

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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