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Examiners' Report/ Principal Examiner Feedback

June 2010

GCSE

360Science

GCSE Biology
Structured Paper B3 (5029)

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5029 Biology Examiners' Report
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This paper consisted of 14 questions. Most questions were accessible to the candidates. Some excellent answers to questions were seen throughout the paper reflecting how well the subject matter had been understood. There was some evidence of good practice seen such as underling key words and bullet points to ensure that, for example, three points were made when there were three marks available.

Question 1
Adaptations for feeding behaviours
This question asked candidates to suggest two features that alligators have which help them to catch fish. Many students made reference to the eyesight of the alligator being binocular and able to judge distance. Some of the weaker students pointed out a relevant feature, but could not explain how it helped to catch fish. A lot of "sharp teeth" were for "tearing through flesh and bones" rather than to grip the fish.

Question 2
Definitions
Most candidates successfully completed this join-the-boxes question.

Question 3
Yoghurt
Most candidates successfully completed this cloze question.

Question 4
Mammal traps
Part a) asked candidates to suggest one other measurement a scientist may apart from the length of the mammal. Many then gave the length of the mammal as their response. Most candidates got the mark for weight or mass but some repeated the information from the stem and implied the scientist should identify the mammals.
In part b) candidates were asked to explain how releasing the mammals near to where they were caught increases their chance of survival and helps them to behave normally. Most got a mark for the idea that the mammal was familiar with the territory but didn't always explain why this was a benefit for the second mark.
In part c) most students scored at least one mark for mentioning learned behaviour or for food. Very few stated that the mammal went into the trap by chance, or that the animal would go in even if there were no food.

Question 5
Obesity
Most candidates worked the calculation correctly but there were some of the expected errors. The most common wrong answer was 60 which often gained one mark for the calculation. The affects on the body showed a good knowledge of the side effects of obesity and some showed a high level of detail including the increased risk linked to specific cancers.

Question 6

Finch and cactus spine

In part a) most candidates could explain how the finch used the cactus spine to get food. Those who did not were fond of stabbing the prey.

Many candidates failed to get the mark for the definition of a tool in part b) as they were too vague. "Something used" was popular but not worthy of credit.

In part c) some candidates implied the sand was washed off the seed, but did not actually state that.

Question 7

Stem cells

In part a) most candidates used the term "not rejected" or "accepted". Very few failed to gain credit here.

In part b) many stated the brain cells had been replaced with good ones that work, missing that it was the dopamine produced by them that was the key.

Part c) proved difficult for most. Many stated that insulin was produced by bacterium, that the stem cells did not contain the gene for insulin. Very few were able to use the biology that underpinned the question. A few understood that adult stem cells were able to differentiate into only a few types of cell.

Question 8

Imprinting

Most candidates successfully described the initial trend in the data but failed to explain the levelling out on 5^{th} and 6^{th} attempt. A lot of students used all the space as they explained the trend by linking it to habituation even though this wasn't required. Part b) was generally answered well.

In part c) habituation was well explained although the mark for the mouse stepping on green by mistake/randomly was rarely achieved. For part d) those students who scored 1 got the mark for mp2. 8d was often misread and students went into details about avoiding squares or blue objects.

Question 9

Dolphin behaviour

Candidates found this question accessible and the answers, even when insufficient, showed that they related to the question.

Part a) was very well answered. In part b) nearly everyone got credit for saying that the dolphin would associate the ball with a reward. The idea that this would then be reinforced, and the fact the dolphin would carry out the task with out a reward eventually was mostly missed. Part c) was answered well, with most candidates giving valid reasons for and against.

Question 10

Parental care in alligators

Part a) was very well answered. In part b) many candidates described giving the babies the skills needed to survive rather that the increased survival rate being linked to the ability to reproduce which was the required response. The hiding of eggs in the sand was mentioned by several as being the mother's contribution to survival rather than the journey to the river.

In part c) most answers were about the dangers from predators. A few answered in terms of the dangers to the babies rather than to the mother, referring to either being swallowed or bitten by the mother, or not heard in the nest when they hatched. A good response was "spending too much time out of the water may mean she doesn't feed properly".

Question 11
Wolf territories

This question was very accessible to candidates. It would appear that many had seen the "Yellowstone" series on television.
Candidates scored well on parts a) and b).
In part c) most correctly stated that the behaviour was a sign to warn off other wolves. Some students implied it was to keep other animals out rather than wolves and did not gain credit.
In part e) the most frequent response was about the idea of lots of eyes looking out for the predator. Candidates often didn't give enough information for 2 marks. Some candidates also suggested the idea of the herd being intimidating. Others suggested that being in a herd makes it harder for the predator to spot/kill the animals or the idea that it confused the predator without explaining why.

Question 12
Golden rice

Candidates are asked to give two advantages and two disadvantages of genetic modification of food crops, with golden rice being given as the context. Candidates answered this very well and hit several mark points for each. Increased crop yield was probably the most common answer. Often candidates incorrectly linked pesticide resistance to a decrease in the use of pesticides. There were a lot of answers about the process being unnatural.

Question 13
Bacteria as vectors for genes

This question proved challenging for many candidates and discriminated well.
In part a) some candidates repeated the stem of the question including details of the enzymes e.g. ligase. Other errors included the idea of inserting the plasmid rather than infecting the plant. A lot of students knew it was Agrobacterium which was involved and often got the second mark for infecting the plant.
In part b) some students managed to obtain the mark for cloning or asexual reproduction. Where candidates recognised that it was involving the extraction of the gall cells they hit most of the mark points and usually got maximum marks, providing some very good answers.

Question 14
Recombinant DNA technology

This last question, was looking for quite specific answers showing detailed understanding. It gave candidates an opportunity for extended writing. The concepts proved challenging for many candidates and discriminated well, allowing those who were well prepared to give a detailed logical account of the process.
Many candidates got two marks for the idea of cutting the human insulin gene out with restriction enzymes. Unacceptable answers referred to the use of stem cells or the

idea of inserting the correct insulin gene back into the human. Relatively few candidates could correctly explain the involvement of sticky ends in the process. Some answers were vague with the idea that ligase and enzymes are used to cut out the gene and stick it into a plasmid without defining the specific roles. Students often got the mark for the use of a fermenter under optimum conditions. They rarely correctly explained that the plasmid had to be removed from the bacteria before manipulation and being put back into the bacteria and some answers missed this step and implied that the plasmid is fermented.

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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