



General Certificate of Secondary Education

Additional Science 4463 / Biology 4411

BLY2F Unit Biology 2

Report on the Examination

2008 Examination – January Series

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Additional Science / Biology Foundation Tier BLY2F

General

This was the first examination of the new specification. Most candidates, entered for the Foundation tier examination appear to have been entered appropriately. There were few papers which indicated that had the candidate taken the Higher tier paper they would have achieved a grade B.

Candidates should be advised to write in black ink or black ball point pen only as the scanning process involved in on-line marking does not pick up pale colours well. Candidates should be asked to ensure that their writing is clearly legible. Candidates with poor writing may use scribes, with approval, as a means of ensuring their answers can be read by examiners. Furthermore candidates should be advised to ensure that if their answers extend beyond the printed lines or space then they should keep these extensions away from the edges of the page as they may be removed during scanning.

Candidates should be advised against showing working outside the provided areas (eg next to graphs) as this may not be picked up and thus not credited. Candidates should also be reminded that when they are asked to put an answer from a list into a space, they should only insert one term per space given. Also, hybrid terms should be avoided and candidates are reminded to copy all terms carefully.

Question 1 (Low Demand)

Most candidates correctly identified the nucleus. However there was considerable confusion between 'cell membrane' and 'cell wall', for label B, although most of those who knew the difference regularly achieved all three marks in part (a). For label C, all of the possible structures were suggested, including 'chloroplast', all too often.

In part (b), many candidates did not recognise the significance of the labelling of mitochondria on the diagram and answered in terms of cell shape, muscle contractions or the close packing of the cells. A few suggested that energy was going to be released through the membrane. Only a small number of candidates gave excellent answers including all three marking points.

Question 2 (Low Demand)

Some candidates were disadvantaged by not having brought a calculator to the examination and failed to arrive at the correct answer, for part (a). Many candidates appear to think that it is not necessary to show their working. Had the correct figures (1500, 2000 and 500) been added, even if the wrong answer is achieved, one mark is awarded. There were some 'interesting' calculations with the correct figures misaligned, so that answers in the order of 8500 were arrived at. A few thought that multiplication would be a more appropriate way of dealing with the figures and arrived at clearly disproportionate answers.

In part (b), most candidates chose the correct day and went on to give appropriate reasons.

The function of sweating was described by the majority of candidates, in (c)(ii), although some believed it was 'to get rid of excess water', 'prevent dehydration' or 'cause weight loss'.

Question 3 (Low Demand)

As was expected, the difficulty of this question increased as candidates progressed through it. There were a considerable number of crossings out and replacement in the last two parts.

Question 4 (Low Demand)

Although most candidates appeared to be confident with the definitions, in part (a)(i), others appeared quite confused by the, perhaps subtle, distinctions and it was evident that these candidates needed to think their way through the process of investigation design. In part (a)(ii), many had clearly carefully learned the word equation for photosynthesis and were rewarded with both marks, others, less secure in their knowledge, named the correct substances in reverse order or renamed substances already in the equation on the page. A few made no attempt or included strange suggestions such as 'leaves'.

In part (b)(i) it was clear that many candidates had carried out this, or a similar, investigation and gave sensible suggestions concerning moving the lamp or plant/tube. Others, perhaps less familiar, made creditworthy attempts with suggestions of changing the electrical supply to the lamp. However, some who were less aware simply suggested 'measuring' the distance between lamp and plant, rather than changing it. In part (b)(ii) a minority of candidates chose not to use the graph axes in their descriptions and answered in terms of time or temperature, while others believed that moving the lamp closer to the plant increased photosynthesis solely because of an increase in temperature.

Some candidates, who had discussed changing distance between lamp and plant in part (b)(i) confused the light intensity axis and suggested that higher intensities, rather than higher distances, reduce bubbling. Weaker candidates often only described the first part of the relationship, omitting the levelling off, whilst some, recognising this stage, suggested that bubble production stops in higher light intensities.

In part (b)(iii), a wide variety of non-creditworthy suggestions were given, including that raw data should have been given, a hypothesis stated, the experiment repeated or that other factors such as carbon dioxide should have been investigated too. Those who gave full descriptions in part (b)(ii) frequently went on to answer part (b)(iii) correctly.

Question 5 (Low Demand)

In part (a) it was clear that many candidates were unfamiliar with the names of the enzymes, as a considerable proportion of candidates failed to achieve both marks.

Given that fructose is sweeter than glucose, many candidates only got as far as repeating this information in part (b). Alternatively they picked up the reference to "slimming foods" and suggested that 'fructose contains less fat' or 'fructose has less sugar', rather than the need for less of it in food to produce the same degree of sweetness.

Part (c) was regularly well done and many candidates achieved full marks. In some cases, those that did not gain all four marks chose to ignore the instruction to use only the information provided and so amended the enzyme properties given to such an extent that they were not recognisable or wrote comments about industrial uses of enzymes. A few candidates added explanations to their answers, some believing that the high cost of enzymes was an advantage as it meant higher prices could be charged for products. A common error was including "easily broken down" as an advantage.

Question 6 (Standard Demand)

This was the first of the two questions aimed at discriminating grade C candidates. Some candidates did not know what a pyramid is, in part (a), and drew food chains, often illustrated. Many drew pyramids with only three tiers, resulting in no marks being awarded. It was common for pyramids to be the correct shape but to have the organisms in reverse order, for number pyramids to be drawn or for the organisms to be written in random order. Many of these could be awarded one mark.

In part (b), the question concerned herring which was eaten, however many candidates referred to “uneaten parts, such as bones”, whilst many suggested losses by the herring, which had they been applied to the tuna would have scored marks. At this level it is expected that candidates will use biological terms such as ‘faeces’, ‘urine’ and ‘waste’, rather than colloquial terminology. In part (b)(i) a wide variety of ways of calculating the average increase was attempted, most of which were invalid. Some candidates recognised that the initial mass of the tuna needed to be subtracted from the final mass, but then omitted to divide their answer by 6. It was not uncommon for candidates to add up the masses for each month, or even multiply them, resulting in totals of many tonnes. The mark available for correct working, with the wrong answer was rarely given. In part (b)(ii) a variety of uncreditworthy responses was seen, in particular references to mass of the tuna, how long they take to grow and lines of best fit, along with suggestions to repeat the investigation, extend it beyond six months or to use different fish.

There was a widespread idea in part (c) that tuna were being force-fed or that they would be less fresh as a result of being ‘kept for six months’. Here the examiners were looking for some understanding of the impact of science on society, with ideas about cruelty, ethics, and concern for the welfare of the fish or the quality or taste of the tuna being acceptable. Many candidates recognised this and gave suitable answers, however answers such as ‘unnatural’ or ‘unkind to fish’ were considered too vague.

Question 7 (Standard Demand)

As previously mentioned, candidates are reminded that only one answer should be given in spaces. Furthermore, if they wish to change an answer, they should clearly cross out the original and write an alternative, rather than attempting to overwrite their original response, as these can often look unconvincing.

In part (b), the examiners ignored a wide variety of ‘substances’ entering and leaving the container. These included carbon dioxide, water, microorganisms, heat and sunlight. However many included either ‘air’ or ‘oxygen’ in their list although very few went on to explain that this allowed respiration to occur.

‘Nutrients’ or ‘minerals’ were frequently referred to in part (c), often both in the same sentence. It was good to find some candidates referring to specific examples such as ‘nitrates’ and ‘magnesium’. However other candidates also included inappropriate substances which the examiners did not allow, suggesting that plants absorb vitamins and proteins through their roots.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.