

Examiners' Report/
Principal Examiner Feedback

January 2013

International GCSE
Biology (4BI0) Paper 1B
Science Double Award (4SC0) Paper 1B

Edexcel Level 1/Level 2 Certificate
Biology (KBI0) Paper 1B
Science (Double Award) (KSC0) Paper 1B

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International GCSE Biology Paper 4BIO 1B

The examiners would like to thank the centres for their continued support and dedication in preparing candidates for this examination. This report draws upon the experiences of the examiners marking the papers and should be read in consultation with the published mark schemes and the individual reports on centre performance available via Results Plus. In both papers, candidates were able to recall reason and apply their knowledge to answer the wide range of items set.

Question 1 (a) was intended to offer a gentle introduction to the paper and most candidates were able to gain two marks for correctly identifying the trachea and alveoli. Candidates did less well on item (b) with many interpreting the table on gases in the blood entering and leaving the lungs incorrectly. These candidates also then mismatched oxygen and carbon dioxide. Most could identify diffusion as the means of gas exchange in the lungs.

Question 2 provided candidates with a passage on selective breeding into which to fill in the appropriate words. Here performance varied between centres. Many candidates scored full marks but others scored poorly.

Question 3 showed a food chain from Asia and in (a) almost all the candidates were able to correctly identify the producer and secondary consumer. In (b) many candidates could correctly give two environmental factors that affect the growth of the rice. Some answers were too vague such as weather or climate and others mentioned biotic factors such as pests. In part (c) the more able candidates were able to explain how a pesticide would kill the beetles and therefore increase the rice yield. In (d) the best responses described how by releasing a predator such as an Asian toad the beetles would be eaten. Some candidates chose inappropriate predators such as cats or even wrote about fertilisers.

Question 4 gave candidates a photograph of a variegated leaf. In (a) almost all could describe the role of chloroplasts. Again, in part (b), most could name the structures in the diagram of the plant cell. The experiment described in part (c) should have been familiar to all candidates. However this item (iv) discriminated well between candidates and only the best could identify the appearance of the leaves after testing for starch. In parts (ii) and (iii) those candidates who had carried out investigations testing leaves for starch could answer well and those who had not seen this practical performed poorly. In part (iv) almost all could correctly identify iodine solution as the chemical test for starch.

Question 5 provided students with a copy of the Bristol scale used to diagnose problems with alimentary canal function. In parts (a) and (b) the more able candidates were able to suggest why the different form of faeces might be produced. In part (c) the question required candidates to describe how food is moved through the gut. Most responses gained some marks with the best responses describing peristalsis as contraction of the circular and longitudinal muscles in the gut wall. In (d) most candidates could name

the part where faeces are expelled but fewer could name the part where faeces are stored. In part (e) candidates needed to explain how egestion differs from excretion. Very few seemed to understand the differences and only the best candidates scored full marks. Many responses talked about faeces being excreted and few candidates knew what egestion was.

Question 6 described an investigation using a trap to compare organisms caught during the day with organisms caught at night. In parts (a) and (b) candidates needed to count the organisms and complete a tally chart and then use this data to plot a bar chart. Most candidates were able to do this and scored well. The most common errors occurred in the bar chart with candidates only plotting data from night time or not labelling the y axis on their chart. For part (c) (i) candidates needed to compare the data for day and night. Some did this well but others merely repeated the data from the table such as 7 woodlice in the day and 15 at night. Very few gained full marks in (ii) for explaining the changes in the number of woodlice. In part (d) only the best candidates could explain how the organisms could have preyed on each other, escaped from the trap reducing the number, or bred to increase the number. In part (e) most candidates could explain what a 'habitat' is but did much less well on 'population' and 'community'.

Question 7 (b) asked candidates to complete a table to show the features of bacteria, fungi and viruses. Most scored well on this item and on (b) which required linking characteristics of life with examples. In part (c) candidates had the opportunity to describe the events in the withdrawal reflex. Most who had learnt the components scored well.

Question 8 provided a genetics question on flower colour in peas. In part (a) almost all could identify the dominant phenotype and most could explain how they knew. In (b) candidates had to suggest how Mendel could ensure that the purple F1 plants self-pollinated. The best responses suggested how he could isolate the plants and transfer pollen using a paintbrush. In (c) (i) candidates had to use a genetic diagram to show the offspring of selfing the F1 plants. Most could do this but some failed to gain full credit as they did not clearly show the gametes or the phenotypes of the offspring. In (ii) most could calculate the ratio but only some could explain why the actual and observed ratio are different. In (d) candidates had to suggest how natural selection could affect the numbers of flowers since purple are more attractive to bees. Most candidates scored some marks with the best responses including the increased likelihood of purple pollen being carried and transferred to purple flowered plants. How this would lead to increased reproduction of purple flowered plants and how the purple allele would be passed to future generations and how this would increase purple flowers and reduce white flowers.

Question 9 was the experiment design question and candidates who had practiced such items performed well. Many centres have encouraged candidates to use the CORMS prompt. This has led to improved answers. However, merely writing down C and warm and cold or S and mass of food, will earn no credit. We still expect candidates to explain their method and they can use CORMS only as a prompt. They must explain clearly how to carry out the investigation.

Question 10 (a) required candidates to complete a table about red blood cells and white blood cells. Most scored well gaining 4 or 5 marks. In part (b) candidates needed to explain the benefits to an athlete of increased red blood cells following altitude training. Again candidates showed a good knowledge and understanding of how increased red cells would improve performance in long distance races. In part (c) candidates needed to suggest why performance is not improved in a sprint race. Many candidates scored 1 mark for noting the short duration of the race and the better candidates wrote about anaerobic respiration and less need for oxygen.

Question 11 concerned the kidney and use of a dialysis machine. In part (a) most candidates could name one substance removed by the kidney. This question sought to examine the ability of students to apply biological principles to an unfamiliar context and therefore discriminated well between candidates. . In part (b) (i) and (ii) candidates had to give one way that dialysis is similar to diffusion and one way in which dialysis is similar to osmosis. Most could describe dialysis and diffusion as being down a concentration gradient and many could also recognise the presence of a partially permeable as being common to dialysis and osmosis. In part (iii) the better candidates could explain how urea is removed from the blood by diffusion down a concentration gradient and across a partially permeable membrane. In part (iv) only the candidates with higher levels of understanding could suggest how the concentration of glucose in the dialysis fluid maintains the blood glucose level. In part (v) the best responses could describe ultrafiltration and selective reabsorption as processes that occur in the kidney but not in the dialysis machine. Part (c) (i) asked candidates to recall the blood vessels and the tube that are connected to a kidney. Many could name the blood vessels but some confused urethra with ureter or attempted an amalgam of the two. Finally, in part (c) (ii) only the most able could suggest that the transplanted kidney is placed in the lower abdomen as the kidney will be nearer the bladder, the ureter and blood vessels can be shorter and access is easier.

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