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# Examiners' Report/ Principal Examiner Feedback

June 2011

## International GCSE Biology (4BI0) Paper 2B

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# International GCSE Biology 4BI0 2B Report - Summer 2011

The new specification for International GCSE Biology was examined for the first time in Summer 2011. We are very pleased to welcome new centres and to welcome back centres who have taught 4325/4437 International GCSE and 7040 O level.

Once again this year the examiners were very impressed by the knowledge and understanding shown by the candidates on the paper. Candidates were also able to demonstrate application of knowledge and understanding, analysis, evaluation and investigative skills. Many centres have worked hard to carefully prepare candidates for the examination and this was evident in the biological knowledge and understanding and evaluative and analytical skills shown.

The paper gave a balance of question types and topics and the proportion of marks for each Assessment Objective matched those published in the specification.

## Question 1

Most candidates were able to access the questions based on the comprehension with ease. Part (a) required recall of the names of two blood vessels and only the weaker candidates failed to name the aorta and pulmonary artery correctly. Candidates clearly understood the reasons why the batteries are placed outside the body. Most correct answers made reference to the fact that they can easily be replaced or recharged. In part (c), a surprising number of candidates made reference to the left side of the heart containing blood that was deoxygenated and at lower pressure, showing confusion about heart anatomy. A pleasing number of candidates appreciated that exercise requires increased oxygen supply to respiring muscle cells and that changing the speed of the pump would facilitate this need. In part (e), the most common correct responses made reference to the shortage of hearts or problems associated with tissue compatibility. References to ill health, age or cost issues were not credited. This comprehension required students to understand a term they may not have seen before. Credit was given for any reference to the device being in the ventricle. Candidates who quoted that the device was in the heart or between the ventricles were not credited.

## Question 2

This question examined student understanding of the eye. The conjunctiva was correctly recalled by only the best candidates, with most responses naming part A as the cornea. Part B, the lens, was easily recognised by most but, part C, the ciliary muscle, was often wrongly recognised as the suspensory ligaments. The examiners were looking for references to the ciliary muscles contracting and the lens shape changing to be more convex in order for credit to be given in part (b). Many candidates gained full marks, though their choice of terminology was often lacking in precision. Part (c) (i) and (ii) were done well with the most popular description being the pupil reflex in bright light. It was pleasing to note that the candidates were very knowledgeable about the hormones listed in the specification and, as such, part (iii) was well answered. However, there were some who were confused about the respective roles of progesterone and oestrogen when referring to the uterus wall, and about FSH and LH with regard to the timing of ovulation.

**Question 3**

Almost all candidates correctly calculated the percentage change to be 32%, with the better candidates pointing out that was minus 32%. Credit was given for either response. The graph plotting was impressive with most creating linear scales, drawing neat lines through the points, getting the correct orientation and labelling of the axes, plotting the points accurately and using a key to identify each plotted line. In describing the change in dry mass, most recognised that it decreased in both the large and small mesh bags, but only the better candidates appreciated that the decrease was greater in leaves kept in the large mesh bag. Part (d) challenged student knowledge of the nitrogen cycle and the examiners were pleased to note that at least half the candidates recalled the role of denitrifying bacteria in reducing nitrate ions in soil.

**Question 4**

Part (a) was well-answered with most being able to work out that the student measured the temperature twenty times in the beakers outside the box, and that the thermometer reading was 54 $^{0}$C after 10 minutes kept inside the box. Part (b) was more challenging, but many were able to note that the independent variable was linked to the positioning of the beakers inside or outside the box, and that the dependent variable was the measurement of temperature. The examiners were pleased to note that in part (iii) many students made reference to the need to keep other variables constant to ensure a fair test that allows a valid comparison of the results to be made because no other variable, other than the independent variable, is having an influence on the results. Students also seem to have a decent grasp on what the term accurate means with most making reference to parallax error, stirring the water or using a thermometer with finer divisions. Other acceptable responses were rewarded. Weaker students wrote about the need for replication and answered the question as though reliability was being asked, not accuracy. Part (d) was challenging to candidates. Many did appreciate that animals kept outdoors would lose more heat and that this would need to be replaced by respiration of food if the animals were to maintain their body temperature. However, the expression of these ideas was often convoluted and difficult to decipher. Candidates are encouraged to think carefully about their ideas before starting to write their answers in order to improve the clarity of their responses.

**Question 5**

There were many excellent answers to part (a) by students who knew all the salient facts about tissue culture, notably the use of explants to culture on nutrient agar under sterile conditions, combined with the further use of plant growth regulators and the provision of sensible abiotic factors. Weaker candidates merely repeated the stem of the question and gained little credit with the rest of their answer. Most often they would confuse tissue culture with some other biological process, often selective breeding. Part (b) was more accessible with most appreciating that the process of genetic modification involved the transfer of genes using enzymes and vectors to produce plants with desirable qualities, most often named as high yielding or pest resistant. Again, weaker candidates wrote about selective breeding and lost credit as a result. They also rephrased the stem of the question and stated that the term genetic modification means that genes are modified. Candidates need to be more aware that rephrasing the stem of a question will not gain credit.

**Question 6**

Most candidates knew that platelets were involved in blood clotting and that having too few would result in excessive bleeding. Most recalled that phagocytes ingest and digest pathogens and also that lymphocytes produce antibodies. Part (c) was the most challenging component of this question with only the best candidates gaining full marks by making reference to antibodies being produced sooner and in greater quantities helping to speed the response to infection as dictated by the secondary immune response.

## Grade Boundaries

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