

Examiners' Report/  
Principal Examiner Feedback

June 2011

International GCSE  
Human Biology (4HB0) Paper 02

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## **International GCSE Human Biology 4HB0 02 Report - Summer 2011**

### **General**

This was the first paper of the new International GCSE Human Biology Specification and it provided a good transition from the legacy O level papers. One overall weakness noticed was that many candidates did not provide extensive accounts on the one question that was a free response question of the type seen on the legacy O level paper. This type of question will appear from time to time and candidates should be aware of this. There was no evidence that there was insufficient time for candidates to answer the questions.

Another area of concern was the poor quality of diagrams in answer to question 1 (a)(i). Candidates can reasonably be asked to draw diagrams and so should come equipped with a sharp pencil and a ruler to draw straight lines.

### **Question 1**

Many candidates were unable to accurately label three pieces of apparatus. The labels that were accepted included conical flask, bung, glass tubing and T piece or mouth piece. It appeared that many candidates may not have seen this particular piece of apparatus before and so were at a disadvantage. The assembly of the apparatus should have shown the mouthpiece connected to one short and one long tube in the flasks and the liquid should have been covering the long tubes in each flask.

Most candidates could name the liquid as limewater or bicarbonate indicator and the majority recognised that it was used to detect the presence of carbon dioxide as it changes from a clear to a milky colouration. Those candidates naming bicarbonate indicator usually described the correct colour change.

The marking of the liquid in the two flasks was often not well drawn and it should have covered the long tubes in each flask but not the short tubes.

Very few candidates could suggest an appropriate safety precaution with many stating that goggles should be worn rather than referring to the need to be careful in sucking in to avoid any intake of the indicator.

### **Question 2**

In answer to part (a) (i) many candidates described the presence of the disease being confined to a particular geographical area. The focus should have been on the disease always being present in an area rather than the area itself.

Whilst many candidates could locate the position of the thyroid gland as being in the neck, few made any reference to it being in front of the trachea and so, failed to secure the second mark. A minority of candidates confused the thyroid gland with others in the body.

The name of the hormone thyroxine was usually given by candidates though a variety of spellings of the word were observed.

Whilst the majority of candidates who answered part (b) correctly referred to the relationship between iodine intake and the incidence of goitre as described in the passage, a number gave a general comment about an inverse relationship which, whilst it was given some credit did not score full marks.

The significant part of the passage that should have been quoted by candidates in answer to part (c) is that referring to the trials in the USA and the relevant figure of 0.2% developing goitre despite taking iodine supplement. Whilst many did this a significant minority instead, referred to the last sentence in the account which was not evidence and indicated a misunderstanding of what was being said.

### Question 3

The definitions in part (a) caused problems for candidates. Relatively few made any reference to a sex-linked condition being caused by the presence of an allele on the X chromosome. Further the concept of it being passed on to subsequent offspring was also only mentioned by a minority of candidates. The term carrier proved to be difficult as many candidates were unable to express themselves clearly. The idea of both dominant and recessive alleles being present was mentioned by only a few candidates, though many did understand that a carrier does not express the recessive allele in the phenotype or as it was more often put, that the blood still clots.

Part (b) was answered correctly by the vast majority of candidates though far too many referred to the prevention of entry of *germs* or *foreign bodies*. Marks are not awarded for such terms.

The majority of candidates scored marks for the genetic cross in part (c). However, in a sizeable number of cases this was because the Examiners employed the error carried forward concept of marking in which if a candidate makes a mistake, that mistake is only penalised once rather than throughout the whole of the answer. However, one common error was that many candidates in stating the phenotype of the male haemophiliac referred to him as an *infected* male. This is incorrect as an infection can only be caused by a pathogenic organism and haemophilia is a genetic condition/disease. The terms haemophiliac or carrier should always be used as appropriate in this type of question.

### Question 4

The counting of teeth and the calculation of the percentage decayed was done very well by most candidates. However, the answers to part (a) (iii) were very variable, with a number of candidates unable to suggest three reasons. In a number of cases candidates referred to fluoride in both drinking water and in toothpaste. Fluoride, if it is to be effective in reducing tooth decay, needs to be added to drinking water and the effectiveness of the brushing of teeth is in the brushing rather than any additives.

Descriptions of tooth decay were very variable. The majority of candidates noted that food can remain stuck to or between teeth. However, far fewer were able to identify the fact that it is the sugar component of the food on which the bacteria act using it for respiration and in the process producing lactic acid as a waste product. Far too many had the bacteria acting on the food rather than the sugar. Candidates should be reminded that the lactic acid *dissolves* the enamel. Although the terms *corrode* and *erode* were allowed the term *decays* the tooth was not allowed. Candidates should be encouraged to use the term *dissolves*.

The majority of candidates scored marks for part (c) with many recognising either that food becomes trapped between the teeth or that these teeth are more difficult to brush. Far fewer referred to the larger surface area of the teeth as a result of the presence of cusps.

Answers to part (d) often lacked the correct information about the number of teeth found in a boy's jaw. A general comment that there are fewer teeth in the jaw of a boy was accepted but it would have been nice to have seen a greater number of candidates referring to the lack of wisdom teeth in a boy's jaw.

### Question 5

Very few candidates scored 6 or 7 marks in answering this question. Whilst most candidates made comment about acid rain formation resulting in the death (or more often 'damage') to plants, far fewer discussed the fact that the acid rain dissolves buildings constructed of limestone. Answers often degenerated into a vague 'damages buildings' response. Few candidates made reference to the irritation of the lungs by sulphur dioxide or its role in triggering asthma. A significant number of candidates put both gases together and answered in terms of them both causing acid rain. A majority of candidates commented that carbon monoxide combined with haemoglobin in preference to oxygen but overwhelmingly failed to mention that this combination was irreversible and the effects are damage/death of brain cells which are highly sensitive to oxygen starvation.

### Question 6

The main problem with part (a) (i) was a failure to include relevant units despite the fact they are given on the graph. With part (a) (ii) candidates failed to indicate the average *over the 25 year period*. Instead, many simply put a cross at one point on the graph.

The better candidates, in part (b), were able to express clearly two differences but in many cases candidates just gave reverse points for their two answers i.e. saying the same thing the other way around and in many cases not referring to death *rate* but absolute numbers.

In answer to part (c) reference should have been made to emphysema, bronchitis or the paralysis of the cilia leading to increased mucus accumulation and lung infection.

Part (d) was poorly answered by most candidates. The effect of smoking is to increase blood pressure over a prolonged period and a narrowing of the *coronary* blood vessels.

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