



General Certificate of Secondary Education

Science B 4462 / Biology 4411

BLY1H Unit Biology 1

Report on the Examination

2009 Examination – January Series

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Science B / Biology Higher Tier BLY1H

General

There were eight questions on the paper. Questions 2 and 3 (termed Standard Demand) were common to Foundation and Higher Tiers. These were targeted at grades C and D. Questions 1 and 4(a) were also Standard Demand. The remaining questions were High Demand, targeted at grades B, A and A*.

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. 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.

Some examiners expressed concern about illegible handwriting. Although a very small percentage, candidates should be aware that if the examiner cannot read the script they will not be awarded any marks for that part.

Fundamental knowledge and understanding of 'How Science Works' in the world at large, as well as in the laboratory, were tested throughout this paper. This means that candidates should be reminded that it is essential to read all of the question carefully, analyse the information provided and think about their response before writing their answer.

Question 1 (*Standard Demand*)

Part (a) was correctly answered by nearly all of the candidates.

The majority gained the mark in part (b), the remaining candidates mainly losing the mark by referring to nutrients other than fat or saturated fat.

Part (c)(i) was correctly answered by nearly all of the candidates.

In part (c)(ii) a large majority of candidates gained both marks. The most common error was to state too much carbohydrates.

Question 2 (*Standard Demand*)

In part (a) many candidates gained both marks and half of the rest gained one mark. Common misconceptions included giving antibiotic or antigen rather than antibody, and repeating the question by giving protection rather than immune.

Two thirds of candidates in part (b)(i), gained both marks with most gaining one mark. However, there were of course many candidates who said that vaccination dropped by 70%. It was also intriguing that so many descriptions stopped at 2% for 1994, even though the questions specifically asked for 1995. There was also some confusion, in the weaker candidates, between the bar chart for MMR vaccination and the line for autism. This led to several candidates describing autism trends rather than vaccination.

In part (b)(ii) three quarter of candidates were able to use the graph and gain two marks by stating that autism numbers rose even when vaccination numbers dropped. Some candidates were rather insistent that there was a link between vaccination and autism but in the reverse direction ie vaccination prevents autism. Other candidates were given credit for suggesting a time-lag between vaccination and the onset of autism

Question 3 (Standard Demand)

In part (a)(i) half of candidates gained the mark. The most common correct response given was that it was a fake. Other ideas along the same lines were: not a proper pill, a pill that does nothing, it has no medicinal properties and an inactive form of NRT. Many candidates still thought of it as a drug eg it is a drug but not the one being tested.

Incorrect responses included statements such as it is another form of NRT or it is something to stop cravings or just it is extra help. Others suggested that a placebo was a type of person eg someone who does not need help or they do something on their own. There were a few candidates who did not attempt this question.

Half of the candidates gained the mark in part (a)(ii). These candidates had an understanding of the purpose of the placebo though some found it difficult to express their ideas. Most of these went down the psychological route with answers such as to see if they can give up by using their minds or the thought of taking a drug makes them give up. A few homed in on the blind testing idea with statements like so the smoker could not tell if they were given the NRT or not. Very few simply stated that it was a control and many of these tacked on the word variable. Several vague answers included a fair test or to make results more accurate. Many candidates imagined this to be just about the placebo eg to see how well the placebo worked or to test the placebo. Others missed the point altogether and thought the trial was to test the drug for side effects.

Just under half of the candidates understood reliability in part (b)(i). There was a full range of answers for this.

Some answers in part (b)(ii) were based on the idea that more reliable data came from the trials where the number given NRT and the number given the placebo were more equal as in the tablet and inhaler trials.

A few gave the response NRT in part (b)(i) and then in part (b)(ii) went on to explain that this was because the people taking the placebo were not being monitored or watched.

Several candidates gave what amounted to the total opposite of the correct response in part (b)(ii) and stated that the trial involving the smallest number of smokers was the most reliable because it was easier to collect the data. A number thought that reliability was shown by the number of smokers who gave up and answered part (c) here.

Half of the candidates gained the mark in part (c)(i), but only very few gained two marks in part (c)(ii). By far the greatest problem for candidates was the inability to appreciate the difference between percentage and an absolute number. This led to straightforward mistakes such as nasal spray correct in part (c)(i) but then answering in part (c)(ii) because 24 people gave up after using it. Many explanations were far more complicated but were basically along the lines of a low percent of a high number is better than a high percent of a low number showing that candidates imagined that it was the actual number of successes that measured effectiveness irrespective of the size of the sample.

Many answers implied that the relatively high number who gave up after using the nasal spray placebo also pointed to the NRT's effectiveness, though there were at least some candidates who appreciated that it was the difference between the NRT and the placebo results that was important. A number of responses to this question consisted of comments on the possible mode of action of their choice of NRT eg the spray gets to the nose quicker or the gum means they always have something in their mouth.

Question 4 (Part (a) Standard Demand, parts (b) and (c) High Demand)

In part (a), about two thirds of the answers were correct for each part. Significant numbers of candidates did not attempt one or more of the parts.

In part (a)(i) those who did not know the answer usually gave something that was at least associated with the nervous system such as senses, stimuli, nerve or the most common incorrect answer sensory neurone. Detector was also frequently given.

Candidates usually managed to give a type of neurone in part (a)(ii), though brain and spinal cord were seen occasionally.

Part (a)(iii) was guesswork for many; as far as incorrect responses were concerned relay was more common than sensory.

In part (a)(iv) there was a fair amount of confusion here in the minds of those who did not give effector. Some simply gave a similar sounding word such as responder or reactor. Various parts of the nervous system were suggested as were whole limbs or hands or feet. In some cases the response itself was described, usually a movement of some kind, rather than a structure.

In part (b) half of the candidates gained both marks and a further sixth gained one mark. There were quite a number of detailed accounts of the production of neurotransmitters and the way in which they worked. However some described the whole or part of the reflex arc and others thought that the synapse actively sent signals to the brain or made the muscles contract. Sometimes the synapse was described as a response eg it is the moving away or it is the contraction of the muscle.

Half of candidates gained both marks in part (c) and a further third gained one mark. A significant number simply repeated the question eg they may put themselves in danger if the impulses don't reach the brain. Burning was the most common example of damage given and not noticing or not realising was frequently suggested as a consequence of this condition. There were some candidates who did not appreciate the difference between pain and injury thus answers such as they subject themselves to pain or they allow the pain to continue and sometimes even this results in serious pain.

Question 5 (High Demand)

It was pleasing to note that a sixth of candidates gained five marks for part (a) and several gained at least three marks. Many weaker students ignored the word agricultural in the question and framed answers in terms of industry, often justifying answers by a false definition of agriculture. Some lost several marks by failing to mention carbon dioxide and/or methane.

Many candidates limited the answer to one aspect eg what happens to the carbon dioxide in a forest and failed to gain many marks, when clearly they were capable of doing so. There was considerable confusion with the mechanisms involved in global warming. Many referred to light rather than heat or energy and lost marks. Most candidates simply referred to greenhouse gases trapping heat. However, there were many excellent full answers, which were concise and referred accurately to radiation by the Earth and re-radiation by greenhouse gases.

Natural selection is now understood by most candidates. It was pleasing to note that a third of candidates gained all three marks in part (b) and a further third gained two marks. Those candidates who started their answers with the idea of survival of the fittest usually failed to mention variation or mutation. Some who chose to illustrate variation did not state clearly what the variation was, simply stating eg those with long necks survived.

In part (c) the vast majority of candidates did not use the information which was given in the question that the modern penguin best adapted for cold conditions is the emperor penguin. Consequently only a sixth of candidates gained both marks and only a further tenth gained one mark. Many candidates attempted explanations in terms of surface area to volume ratio but expressed themselves inaccurately. Several candidates did spot the similarity to the emperor penguin, but did not always relate this to size while others assumed characteristics eg amount of blubber.

Question 6 (High Demand)

In part (a) it was pleasing to note that a quarter of candidates gained all four marks. However the question was generally answered either really well or very badly. Those pupils who knew the process made six or seven credit-worthy statements whereas a large number of pupils described the wrong process, such as embryo-splitting. Many candidates described the use of skin cells from a bull. Others thought that the nucleus from sperm cells should be used. Several thought that the cells were just cloned. Many expressed their ideas weakly and did not make clear where the nucleus was coming from.

In part (b) a few candidates gained all five marks and nearly half gained at least three marks. Candidates should be instructed that the evaluation should end with a conclusion and not start with it. A conclusion should contain some supporting evidence, even if this is simply a repetition of what has been already stated. This would encourage a thorough evaluation.

The pros gleaned from the passage were usually well expressed. Most candidates identified the economic benefits and safety points. Few candidates referred to the public misunderstanding the process, which is perhaps the most important for teachers to develop in students who will have a better understanding of these processes than perhaps many of the lawmakers!

Most students gave answers this year in terms of religious or ethical arguments rather than against God's will, but there were still a significant number who failed to gain one mark for this reason.

It is important that students present succinct arguments. Some candidates, who went into great detail on one marking point, felt that they had written enough when they had only gained two of the marks. This is further evidenced by the many students who wrote at great length for one mark, produced a conclusion and suddenly realised that there were many more points that could be made and added them, successfully, to the conclusion.

Mark ranges and award of grades

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