



# **Examiners' Report**

## **Principal Examiner Feedback**

**Summer 2018**

**Pearson Edexcel International GCSE  
in Biology (4BI0) Paper 2BR**

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## Examiner Report International GCSE Biology 4B10 2BR

The examiners commented on the knowledge and understanding shown by many of the candidates on this summer's papers. Many candidates were able to successfully apply their knowledge and understanding to unfamiliar contexts. Centres have worked hard to prepare students for the examination and this was reflected in the responses of many of the candidates. Few candidates failed to attempt all questions. There was no evidence of candidates being short of time on this paper.

Question 1 provided a passage on Mosquitoes and the Zika virus. In item (a) most candidates were able to state at least one structure that is found in all viruses. The better candidates were able to earn both marks for reference to nucleic acid and a capsid or protein coat. In part (b) over half of the responses could correctly give the placenta as the organ that the Zika virus passes across to get from the mother to the fetus. In (c) candidates were asked to explain how vaccinating a woman could prevent her baby being born with microcephaly. This item discriminated well between the candidates across the grade range. Almost all gained some credit with only the best gaining all the marks for explain that vaccination would introduce an inactive virus or antigen to the mother. This would lead to the production of memory cells. If the woman is subsequently exposed to the virus a secondary immune response results in which antibodies are produced faster and in greater quantity thus destroying the Zika virus. Some candidates just described antibody production or wrote about killing the virus. In part (d) almost all candidates were able to suggest what is meant by the term specicide. In part (e) most candidates could earn 1 mark for suggesting how the release of sterile male mosquitoes would reduce the amount of reproduction and thus the spread of disease. Only the best responses scored both marks for explaining sterile males would not produce sperm so less fertilisation would happen. Some students wrote about the offspring inheriting sterility. In part (f) most candidates could explain why mosquitoes can be described as primary consumers and secondary consumers. The weakest responses believed that mosquitoes are secondary consumers because they are consumed by other organisms. The last item from question 1, part (g), required candidates to explain the benefits of using sound sensors to help reduce outbreaks of disease. This item also discriminated well with only the top students gaining full marks for explaining that the sensor would only release insecticide if the species carried the pathogen, thus killing only the Zika carrying mosquitoes, reducing insecticide release so having less effect on food chains.

In question 2 candidates were given diagrams of two flowers. In part (a) most responses earned some credit and many full marks for using the diagram to explain which of these flowers is insect-pollinated. Some weaker responses wrote about nectar, scent or pollen production. In item (b) candidates had to

place in order the six stages in the process of plant reproduction. Almost all candidates scored and about one third gained full credit.

Question 3 gave candidates data about body mass and energy requirements in some bird species. In part (a) candidates had to explain which species is most at risk of being killed by cold weather. The majority of answers scored at least 2 marks with the best responses explaining that the Coal tit has the smallest body mass, and the greatest energy requirement per unit mass. It has a larger surface area to volume ratio therefore loses more heat, therefore energy from respiration is used to maintain body temperature. In part (b) students were given a diagram of two different sets of apparatus used to determine the energy content of bird food. Candidates were asked to explain why method B produces more accurate results than method A. Almost all answers gained marks with most scoring 3 or 4 marks. The best candidates were able to list the features in apparatus B and explain how each one improved the accuracy of the result. So for example apparatus B had an oxygen supply so that the bird food sample could be completely combusted.

Question 4 presented candidates with data on the effect of pesticide on the number of insects living in soil. In part (a) most candidates could correctly calculate the percentage change in the number of insects when pesticide is used. Likewise, in part (b), almost all could identify the number of insects as the dependent variable. In part (c), however, most candidates could score 1 or 2 marks but very few gained all 4 marks for describing a method the student could use to obtain a valid comparison of the number of insects in each wheat field. The best responses described how random numbers could be generated and these used to randomly sample several sites in each field. That the sampling should be done at the same time of day and at the same part of the growing season. Some students wrote about controlling abiotic factors which would be difficult to achieve in a wheat field. In part (d) students were asked to explain how the process of selective breeding can be used to increase grain size. Candidates were equally divided into each score with the best responses explaining the selection of plants with large grains, growing these and using them as parents. Selecting the offspring with largest grains and repeating this process over many generations. Some weaker students described natural selection, GM or even vegetative reproduction as appropriate methods.

In question 5 candidates were given a statement by a doctor about eating foods for a balanced diet. In part (a) (i) candidates were asked to explain the biological reasons for including oils and fats only in small amounts. Most responses earned credit with many gaining full marks for explaining that high lipid diet can lead to arteries being blocked and increased risk of heart disease and strokes. In part (a) (ii) fewer candidates gained full marks for suggesting why carbohydrates such as bread should be wholegrain if possible. The best

students referred to the presence of fibre to aid peristalsis in the gut and prevent constipation. In part (a) (iii) most candidates gained full marks for explaining why it is especially important for pregnant women to include milk and dairy products in their diet. In part (b) most candidates knew what is meant by a balanced diet but often failed to score both marks because they could not remember or list all of the required components. In part (c) most candidates could explain why a manual worker needs higher amounts of lipid and carbohydrate for his energy use but fewer included more protein required for increased muscle growth.

Question 6 (a) gave candidates a table to complete with some components of blood and their functions. All candidates scored well on this item with many scoring all the marks. Common errors, in those who failed to gain full credit, were production of antigens or confusing the role of lymphocytes and phagocytes. The final item on this paper 6 (b) required students to describe the structural differences between red blood cells and white blood cells that help them carry out their functions. This final item discriminated very well between the candidates with most scoring at least 1 mark but then only the top 10% gaining all 4 marks. The best responses described the features of the cells and how each feature enables them to carry out their function. Such as red cells having a biconcave shape enabling absorption of large amounts of oxygen or white cells having a nucleus that enables them to produce antibodies.

