

Examiners' Report
June 2013

GCSE Biology 5BI3F 01

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June 2013

Publications Code UG036858

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Introduction

This is the first time that the B3 units have been examined in the science 2011 specification. It was only taken by candidates doing biology GCSE but next year it will also be one of the units taken as part of further additional science. The paper consists of 60 marks assessed by a variety of questions including multiple choice, short answer and extended answer questions worth 6 marks each. Candidates should answer all questions in a time period of 1 hour. The extended answer questions are also marked on their quality of written communication (QWC) so candidates should ensure that their answer includes good use of spelling and grammar and also that the answer is written with clarity.

The paper contained questions from all three topics from the unit. These include human evolution, viruses and bacteria, the use of plants for food and biofuels, food production by micro-organisms, the menstrual cycle and animal behaviour and communication.

The candidates accessed both extended writing responses well and were able to demonstrate a good level of knowledge and understanding on both topics. Both calculation questions were well answered with candidates demonstrating the interpretation of a pie chart for one question and a percentage calculation for the second.

Candidates of all abilities were able to extract information about human evolution from the table. For the graph on bacterial growth not all candidates demonstrated the ability to draw a curve of best fit although most managed to read the value for the number of bacteria at four hours from the line they had drawn. Candidates found it more difficult to explain one benefit for the questions on the use of fungus as a biological control mechanisms or the use of plants to make biofuels, often not managing to give a linked explanation. Very few candidates could give more details of the role of micro-organisms in the production of yogurt beyond thickening of the milk. There was significant confusion over the benefits of using chymosin to produce cheese, candidates focused more on the process of cheese making rather than the benefits of using chymosin extracted from genetically modified yeast. Very few candidates could give the sex chromosome content of an egg cell despite the fact that many knew that the genotype of a female was XX by the correct completion of the Punnett square. Although most candidates were aware of the stages of the menstrual cycle, making the link between the role of the hormone and the stage caused more problems. Candidates were able to give the communication methods used by animals and there was a wide variety of examples of animal behaviour given with the behaviour of birds during courtship most commonly used.

Question 1 (a) (ii)

This question asked candidates to suggest possible uses for stone tools. Consequently, there are a number of different correct responses which could have been given including hunting, preparation of food and building. Cutting, sharpening or shaping other tools and starting fires were also acceptable answers. The majority of candidates were awarded two marks for giving examples which related to hunting, the preparation of food or the uses of tools to cut or shape other tools. Occasionally candidates gave very similar uses which were covered by the same mark point for example skinning animals and preparing food. Although relatively rare, the most common error which prevented candidates from gaining any marks occurred when the question was misread and candidates suggested the ways in which stone tools discovered now are used rather than the ways in which stone tools were used.

(ii) Suggest **two** possible ways in which stone tools were used. (2)

1 to hunt animals for food.

2 to be used to make new tools
Carve stone etc make things



ResultsPlus Examiner Comments

In this example the candidate has been given maximum marks for giving two different uses of stone tools.

(ii) Suggest **two** possible ways in which stone tools were used. (2)

1 Evidence for human evolution

2 For research in Science and Museums.



ResultsPlus Examiner Comments

In this example the candidate has misread the question and described the way in which stone tools discovered now are used rather than suggesting the ways in which stone tools were used.

Question 1 (b) (ii)

This question was accessed well by candidates with most being awarded maximum marks for describing the changes that have occurred during human evolution. Most common responses referred to an increase in height and an increase in brain capacity but candidates also referred to changes in body posture with walking or standing more upright. This question allowed candidates to demonstrate the ability to extract information from a relatively complex table.

(ii) Using the information in the table, describe the changes in body structure that have occurred during human evolution.

(2)

During human evolution two changes in body structure that occurred was the average brain size and average adult male height.



ResultsPlus
Examiner Comments

This candidate was not awarded any marks as they did not clarify how the brain size and height had changed.



ResultsPlus
Examiner Tip

Read through your answers carefully to check for mistakes.

(ii) Using the information in the table, describe the changes in body structure that have occurred during human evolution.

(2)

The brain size has increased during human evolution. Also the height has increased over time from 1.5 to 1.8



ResultsPlus
Examiner Comments

This candidate was awarded maximum marks for extracting two different pieces of information from the table and describing two changes in body structure that had occurred during human evolution.

Question 1 (b) (iii)

This question also required candidates to use the information table on human evolution to suggest a brain size for *Australopithecus africanus*. This question was very well answered with more candidates giving a value towards the top of the range to reflect the fact that 2.5 million years ago is closer to the time period where *Homo habilis* inhabited earth, but a mark was given for any value between 400 and 450 cm³. The unit was given on the question paper.

Question 2 (a) (1)

Nearly all candidates correctly identified that exposure to the cow pox virus led to the 8-year-old boy becoming immune to small pox and received maximum marks.

Question 2 (a) (2)

Most candidates recognised that the boy's body produced antibodies to stop the virus causing an infection. Occasionally candidates confused pathogens with antibodies.

Question 2 (b)

Candidates did less well with this question showing a few misconceptions. The most common marks given were for the ideas that immunisation can cause side effects or allergic reactions. Candidates sometimes referred to the immunisation causing a reaction in the body, which is the desired effect of an immunisation, they needed to clarify that they meant a negative reaction. Candidates also appear to think immunisations can cause serious diseases rather than a mild form of the disease or that they might not make a child immune which would not be a reason not to have an immunisation. References to immunisation causing illness were too vague and were not awarded credit.

(b) This newspaper extract is from 2012.

As a parent, you have to think about the advantages and risks when making the decision about whether your child should be immunised.

Suggest why a parent might decide **not** to have their child immunised.

(2)

a very small amount of children can be allergic
and children may suffer from mild
symptoms of the disease.



ResultsPlus
Examiner Comments

This response was given maximum marks. The candidate has recognised the possibility of an allergic reaction and has clearly clarified that the child may get a mild form of the disease they were being immunised against.

(b) This newspaper extract is from 2012.

As a parent, you have to think about the advantages and risks when making the decision about whether your child should be immunised.

Suggest why a parent might decide **not** to have their child immunised.

(2)

The vaccine may not work and the child may not become immune. The child could become ill from the side effects caused by a vaccine.



ResultsPlus
Examiner Comments

This candidate was awarded one mark for suggesting that immunisations can cause side effects. The idea that it may not work is not a correct reason for deciding not to immunise a child.

Question 2 (c) (iii)

This question was accessed well by candidates as most could recognise that the trend of the graph showed that the number of bacteria was increasing over time. A few candidates incorrectly stated that the number of bacteria doubled each hour.

(iii) Describe the trend shown in the graph.

(1)

As the number of hours go by the number of bacteria increases.



ResultsPlus
Examiner Comments

The response was given maximum marks for recognising the trend shown in the graph.

(iii) Describe the trend shown in the graph.

(1)

At each hourly interval the amount of bacteria doubles, ~~for the first~~



ResultsPlus
Examiner Comments

This candidate was not awarded the mark because the number of bacteria does not double each hour.



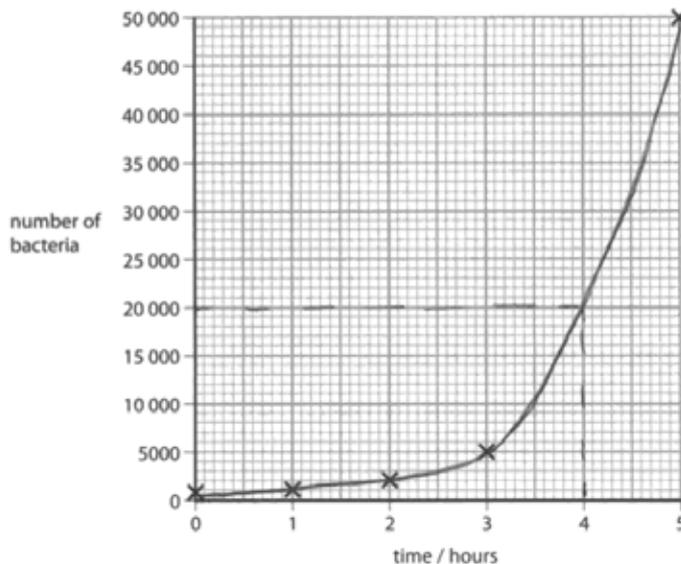
ResultsPlus
Examiner Tip

Ensure that references to data are accurate.

Question 2 (c) (i)-(ii)

Candidates were awarded one mark for drawing a curve of best fit which passed through all the points and the second mark for reading from the graph to find the number of bacteria present after 4 hours. Candidates who made a mistake on the curve of best fit were able to obtain the second mark for correctly reading from their line and this mark was given more frequently than the first mark. Occasionally candidates' curve of best fit did not pass through all the points, most frequently missing completely the value for 5 hours with a line extrapolated from 3 hours given instead.

(c) The graph shows the number of bacteria growing in a fermenter during a period of five hours.



(i) Draw the curve of best fit on the graph.

(1)

(ii) Use your curve of best fit to estimate the number of bacteria at four hours.

(1)

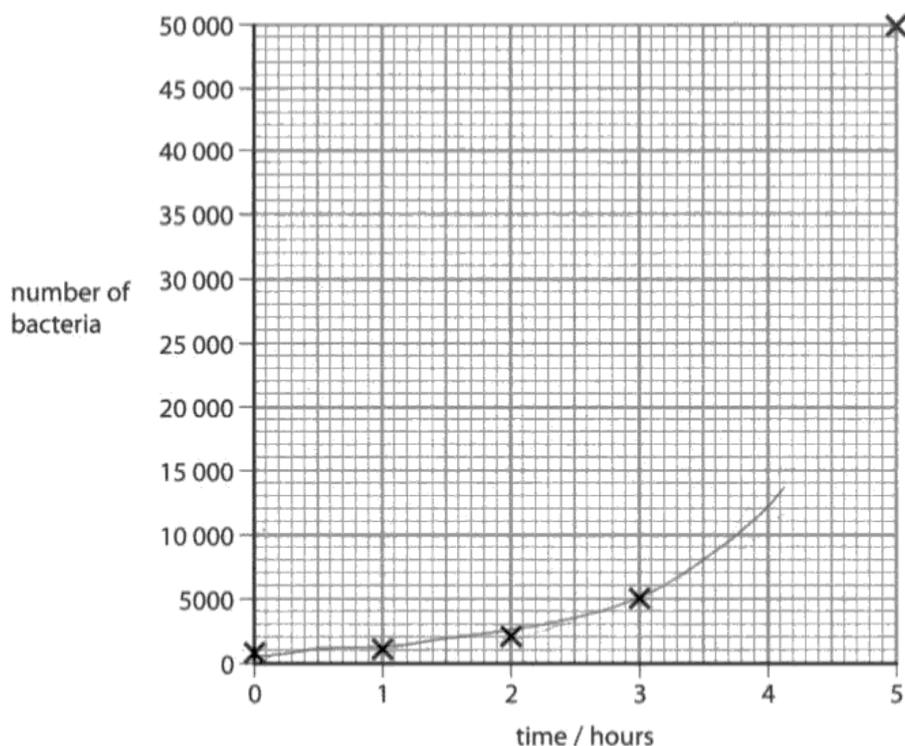
~~20,000~~ 20,000



ResultsPlus
Examiner Comments

This candidate has drawn a good curve of best fit which goes through all of the points then has correctly read 20 000 bacteria present after 4 hours using their curve of best fit and were therefore awarded maximum marks.

(c) The graph shows the number of bacteria growing in a fermenter during a period of five hours.



(i) Draw the curve of best fit on the graph.

(1)

(ii) Use your curve of best fit to estimate the number of bacteria at four hours.

(1)

12,000 bacteria.



ResultsPlus
Examiner Comments

This candidate has not drawn a curve of best fit through all of the points but has extrapolated the line to 4 hours and has read the number of bacteria present after four hours accurately from their line. One mark was given for part 2(c)(ii).

Question 2 (d)

Most candidates were able to score one or two marks for this question for giving the conditions required for the rapid growth of bacteria. The most common answers were warm and damp. It was good some candidates using the term optimum to describe temperature or pH. Occasionally candidates referred to the temperature as hot which was not given a mark. A requirement for aseptic conditions was also given as an answer showing a

misconception that bacteria only grow in clean environments. Some candidates only described one condition when the question asks for the conditions required for optimum growth.

(d) Describe the optimum conditions for the rapid growth of bacteria.

(2)

Bacteria need warm temperatures because they can reproduce faster in warm temperatures. ~~and~~



ResultsPlus
Examiner Comments

This response scored one mark for warm temperatures.



ResultsPlus
Examiner Tip

The question asks candidates to describe the conditions needed for the rapid growth of bacteria and is worth two marks. This should suggest to candidates that they need to describe two conditions.

(d) Describe the optimum conditions for the rapid growth of bacteria.

(2)

Damp, warm environment.



ResultsPlus
Examiner Comments

This short response accurately describes two conditions needed for the rapid growth of bacteria and was awarded maximum marks.

Question 3 (a) (i)

This calculation required candidates to obtain data from the question and the pie chart and use the data to calculate the number of people the Pacific and Asia region who do not have enough food. The first mark was awarded for totalling the 20 million + 295 million + 55 million and the second was for subtracting 370 million from 950 million. An error carried forward mark was given where candidates showed the correct working but made an error in the calculation demonstrating the importance of showing workings in calculation questions. Most candidates were able to achieve maximum marks on this question which required basic maths skills. Candidates who missed out on maximum marks often picked up one mark if they had included their workings.

- (i) Calculate the number of people living in the Pacific and Asia region who do not have enough food.

(2)

590 million



ResultsPlus Examiner Comments

This response is incorrect but is close to the correct response. It is likely to be due to an error in either step one or two of the calculation. Had the candidate shown working they are likely to have been awarded 1 mark.

- (i) Calculate the number of people living in the Pacific and Asia region who do not have enough food.

(2)

$$\begin{array}{r} 295 \\ 55 \\ 20 \\ \hline 950 - 370 = 640 \end{array}$$

640 million



ResultsPlus Examiner Comments

This candidate has shown their working and has picked up the first mark for totalling 370 million correctly despite calculating the final answer incorrectly.



ResultsPlus Examiner Tip

Always show your working.

Question 3 (a) (ii)

This question asked candidates to suggest a reason why a country may not have enough food to feed its population and around half the candidates were awarded the mark. The mark was given for a reason why crops might fail, or less frequently for the idea of an increasing population. Reasons given for crop failure included drought, adverse temperatures or pests. There were a number of vague answers which were not worthy of credit. Answers referring to climate or conditions needed to be clarified to receive the mark. Additionally, a lack of money needed to be linked to buying food for the population as many poor countries can feed their population as growing crops is relatively low cost. References to over-populated and high population numbers were too vague as many countries with large population can feed their population.

(ii) Suggest why a country may not have enough food for its population. (1)

Crops being eaten by pests



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Examiner Comments

This response gives a reason why crops might fail and could result in a country not having enough food for its population.

Question 3 (b) (ii)

This question asks candidates to explain one benefit to the farmer of using a fungus to kill insects. Marks were awarded for the idea that killing the insects prevents them eating the crops which leads to a higher yield and therefore more profit. Alternatively candidates could have explained that it reduces the need for the farmer to use chemicals so the food produced has lower levels of chemicals; this explanation was rarely seen. Some candidates repeated the question including the idea that the fungus killed the insects and this often restricted the candidates to one mark. There were also some very good responses that linked all three points; that it prevented the crops being eaten, increasing yield and profit. Candidates need to be more aware that an 'explain' question is looking for a justification or reason behind the advantage or benefit they have given in order to access full marks on these style of questions.

(ii) Explain **one** benefit to the farmer of using this fungus to kill insects on crop plants. (2)

Increases yield of crop, meaning because less ~~of~~ crops are being eaten by insects.



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Examiner Comments

This candidate has made a linked explanation that preventing the crops being eaten leads to a higher yield and received maximum marks.

(ii) Explain **one** benefit to the farmer of using this fungus to kill insects on crop plants.

(2)

It will stop the insects eating the crop.



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Examiner Comments

This question is worth two marks and an explanation of the benefit to the farmer of stopping the insects eating the crop is needed for the second mark.

Question 3 (c) (i)

This question asked candidates to explain why growing plants for biofuels can cause food shortages. The responses needed to include the idea that the land used for biofuel plants could have been used to grow crops. Many candidates who recognise this achieved both marks. The question revealed a common misconception that crops are being used for biofuels and not food production, indicating that candidates think the same crops are used for both purposes. These responses were not worthy of credit.

(c) (i) Plants can be used to make biofuels.

Explain why growing plants for biofuels can cause food shortages.

(2)

because the space taken up for growing biofuels stops plants for food being planted, therefore we do not have as much food.



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Examiner Comments

This candidate has clearly identified that biofuel crops take up space that could have been used for food plants and received maximum marks.

(c) (i) Plants can be used to make biofuels.

Explain why growing plants for biofuels can cause food shortages.

(2)

Because the plants are being used for fuel instead of feeding people.



ResultsPlus

Examiner Comments

This response highlights the misconception that crops are being used for biofuels rather than food production and was not credited either mark.

Question 3 (c) (ii)

This question expected candidates to explain one advantage of using plants to make biofuels. There are several advantages which could have been identified but to receive the second mark candidates needed to explain the advantage they had given. This was frequently not done and meant very few candidates achieved maximum marks. For example, biofuels being renewable is an advantage which can be explained by the idea that the plants can be re-grown quickly or that it means non-renewable fossil fuels are not used up. The idea that biofuels are carbon neutral needed to be linked to the idea of them removing CO₂ during growth. The misconception that biofuels do not release harmful gases when they are burned was seen and there were many vague references to biofuels not polluting the atmosphere which did not gain marks.

(ii) Explain **one** advantage of using plants to make biofuels.

(2)

An advantage of using plants to make biofuels is that we will not run out of biofuels because plants are ~~from~~ renewable they are as they can be grown easily



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Examiner Comments

This candidate was given maximum marks. They have given the advantage of biofuels being renewable and linked this to the idea that they can be easily re-grown.

Question 4 (a) (i)

Most candidates were able to gain the mark for this question which required students to interpret a graph showing the time taken to make yogurt at different temperatures and to identify the optimum temperature to produce yogurt as 42°C (a margin of error of +/- 1°C was allowed). A few candidates did not read the scale with sufficient accuracy and gave the answer 40°C. Additionally some candidates misinterpreted the graph, giving a temperature of around 60°C.

Question 4 (a) (ii)

This question asked candidates to describe the production of yogurt, including the points that it is bacteria which convert lactose into lactic acid which lowers the pH and causes the milk proteins to coagulate. A number of less scientific terminologies were accepted for the final mark point including 'thickening' and 'clotted'. This question revealed a significant lack of detailed knowledge with very few candidates scoring more than one mark for the idea that micro-organisms thicken the milk. Some of the good responses indicated that the candidates had actually produced yogurt as part of their practical work, this was clearly beneficial in scoring well on this question.

(ii) Describe how microorganisms change milk into yogurt.

(3)

The bac microorganisms convert the lactose in the milk into lactic acid, which causes the milk to thicken and taste sour, and that ma



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Examiner Comments

This was a very good response and the candidate received maximum marks for recognising that lactose is converted into lactic acid causing the milk to thicken.

(ii) Describe how microorganisms change milk into yogurt.

(3)

Microorganisms help thicken the milk making it into yoghurt.



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Examiner Comments

This response scored one mark for thickens the milk.



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Examiner Tip

Questions worth 3 marks require more detail. Try to include one fact for each mark.

(ii) Describe how microorganisms change milk into yogurt.

(3)

Lactobacillus is added once the milk has been pasturised and cooled. This turns the lactose in the milk into lactic acid which helps the milk clot to produce yogurt. This is all done in a fermenter with special microorganisms.



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Examiner Comments

This is an excellent answer which received three marks for giving an example of the bacteria which turns lactose into lactic acid clotting the milk.

Question 4 (c)

This question was not well accessed by candidates across the paper, with only half the candidates achieving one or two marks. The question asked candidates to describe the advantages using micro-organisms to produced food. The most frequently awarded mark was for the idea that it is quick with those gaining two marks referring additionally to independent of climate. Some candidates referred to health benefits of the food which is not the cause in comparison to many other food products, such as plants, so was not awarded credit.

(c) Many other foods are made using microorganisms.

Describe the advantages of using microorganisms to produce food.

(2)

It is cheap, quick, easy to care for, it can be made in most climate conditions. The microorganisms use waste materials from industries as food.



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Examiner Comments

This is an excellent response which makes reference to the idea that producing food using micro-organisms can be done quickly, independent of climate and using waste products from other processes.

(c) Many other foods are made using microorganisms.

Describe the advantages of using microorganisms to produce food.

(2)

an advantage you would be that you don't have to have any maintenance costs for looking after the microorganisms, for example: a cow or pig you would have to feed, look after and have space to keep, microorganisms don't need that work on them.



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This response highlights one of the misconceptions seen in the responses to this question. Fermenters are expensive to run and require monitoring.

Question 4 (d) (ii)

This question was not well accessed by candidates and revealed many misconceptions. The question asked for the benefits of producing cheese using the enzyme produced by genetically modified yeast. The most common answers were 'cheaper' or 'suitable for vegetarians'. The idea of not needing to kill calves or fewer religious objections were seen less frequently. Many candidates referred to the process of making the cheese being quicker rather than giving the benefits of using the enzyme extracted from genetically modified yeast. There were a number of misconceptions shown such as that the use of the enzyme makes the cheese healthier or that it makes a lactose-free product, which showed there was confusion with other areas of topic 3 from the specification.

(ii) Describe the advantages of making cheese using the enzyme produced by genetically modified yeast.

(2)

The enzyme is a catalyst which can be used in a reaction to make cheese, but the enzyme will not all be used up and can be reused in the cheese production. Catalysts will speed up the reaction, so the cheese production will be faster. (Total for Question 4 = 10 marks)



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This response highlights the misconception that producing the cheese using chymosin is faster rather than comparing the cheese produced using chymosin with traditional methods.

(ii) Describe the advantages of making cheese using the enzyme produced by genetically modified yeast.

(2)

The cheese is cheaper to make.
You can make vegetarian cheese where
as usually you need to use cow lining

(Total for Question 4 = 10 marks)



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Examiner Comments

This is an example of a good response which describes two advantages of using the enzyme, chymosin, produced in genetically modified yeast including the production of vegetarian cheese and a reference to reducing the cost of cheese production.

Question 5 (b) (i)

Most candidates accessed this question very well despite very few knowing that the genotype of an egg cell was one X chromosome in 5(a)(i). The question required candidates to insert the genotype of male and female gametes into a Punnett square and complete the Punnett square to show the genotype of the offspring. An error carried forward mark was given for candidates who reversed the genotypes of the parents but successfully completed the Punnett square.

Question 5 (b) (ii)

This question required candidates to identify that the chance of having a female child was 50% from the Punnett square in 5(b)(i). Most candidates were awarded the mark for this question.

Question 5 (c)

This question asked candidates to use their own knowledge and the information in the diagrams, which included the relative thickness of the uterus lining and the levels of oestrogen and progesterone during the menstrual cycle, to describe the stages of the menstrual cycle.

For Level 1, candidates needed to give some detail of the stages of the menstrual cycle which could have included the breakdown of the lining of uterus, building up the lining of the uterus or maintaining the lining of the uterus. Alternatively they could have described the change in hormone levels during the menstrual cycle. For Level 2, candidates needed to link the role of one of the hormones to one stage of menstrual cycle and for Level 3 they needed to describe the role of oestrogen and progesterone in the control of two stages of the menstrual cycle. This could have included that oestrogen is responsible for building up the lining of the uterus, progesterone maintains the lining of the uterus or that a decrease in the level of both hormones triggers menstruation.

Most candidates were able to access Level 1 and some went on to access Level 2 or 3 by making connections between hormones and the stages of the menstrual cycle. There were some very good responses which included the role of FSH and/or LH which is higher content only but was credited and these candidates often achieved Level 3.

Using the information in the diagram and your own knowledge, describe the stages of the menstrual cycle. (6)

On day 1~~st~~ of the cycle, the uterus lining sheds, which is called a period. On day 7, oestrogen is released from the ovaries, which thickens the uterus lining again, ~~ready for~~ and progesterone is released from the empty follicle in the ovaries. This maintains the thickness

of the uterus ~~stage~~ ^{lining}, to get ready for a fertilised egg. If an egg has not been fertilised by day 28, the drop in oestrogen triggers progesterone to drop, and the uterus lining sheds again, ~~and~~ which is when the woman has another period.



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Examiner Comments

This is a good example of a Level 3 answer. The candidate has referred to the stages of the menstrual cycle including the role of oestrogen building up the uterus lining, the role of progesterone in maintaining the uterus and the drop in both hormone levels triggering menstruation.

Using the information in the diagram and your own knowledge, describe the stages of the menstrual cycle.

(6)

Between days 1 and 7 the ~~lining~~ lining of the uterus wall breaks down and this is ~~what~~ what is known as a period (menstruation), between 8 and 14 days the uterus wall begins to build back up ready for a fertilised egg, at day 12 the ~~egg~~ egg is released into the ~~ut~~ uterus. Between days 15 and 21 this is ovulation. ~~days~~ days 22 to 28 is when the woman's uterus begins to break down again if no fertilised egg is released causing the ~~cycle~~ cycle to start again.



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Examiner Comments

This candidate has described the stages of the menstrual cycle but has not referred to the role of oestrogen or progesterone so only achieved Level 1. The diagram refers to the thickness of the uterus lining and the hormone levels and it is important that candidates use all the information available to answer this style of question.

Question 5 (d)

This question required candidates to explain what happens to the uterus lining if a woman becomes pregnant. This was accessed well by candidates and many achieved one mark for knowing that the uterus lining is maintained but few linked this to high levels of progesterone. The idea that it provides a place to support the embryo during development was accepted but idea that it protects the embryo was seen in a number of responses but was not awarded credit.

Question 6 (a) (i)

This question required candidates to count the 12 worms on black squares and calculate that 12/20 as a percentage is 60%. Most candidates were able to identify that there were 12 worms on the black squares. The second mark was given for 12/20 and the final mark for the correct answer and many candidates were able to correctly calculate the final percentage. This question highlighted the importance of showing working to pick up the first and possible the second mark even if the final calculation was incorrect.

Question 6 (a) (iii)

This question asked candidates to suggest why the behaviour shown in the tray with coloured squares increased the survival of the worms. The marks were given for the idea of camouflage or that the worms were a similar colour to the black squares and this decreased the chances of predators seeing or eating the worms. Many candidates recognised that the worms survived because they were not eaten by predators but did not link this to the idea of camouflage or colour of the worms and very few candidates scored two for this question.

(iii) Suggest why this behaviour may help flatworms survive in the streams where they live. (2)

This behaviour may help the flatworms survive as they are camouflaged as they are relatively the same colour and won't be as easy to be found and eaten by a predator.



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Examiner Comments

This is a very good response and was awarded two marks for suggesting that camouflage helped the worms survive by reducing the chances of them being eaten by predators.

(iii) Suggest why this behaviour may help flatworms survive in the streams where they live.

(2)

In the streams, if they go into the darker areas they are less likely to be seen by a predator and therefore less likely to be eaten.



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This response was only awarded one mark because although the candidate has suggested why the worms survive they have not given a reason why they move to the dark squares.

Question 6 (b)

This extended writing question expected candidates to explain why animals use a variety of signals to communicate and to use examples to support their answer. The signals that candidates were expected to explain include visual, sound and chemical signals. For Level 1 candidates needed to explain one type of signal or a use of a signal. For Level 2 they either had to explain two types of signal or give more detail on one signal which included an example. For Level 3 they need to explain two different signals animals use to communicate with examples. The question was very accessible to all candidates on the paper with many producing detailed responses worthy of Level 3. Many of the examples given referred to communication in birds during courtship including the use of songs or displays to attract a mate. Other examples included different animal using sounds to deter predators. Fewer candidates referred to the use of chemical signals. Some candidates restricted themselves to Level 2 by giving several examples for the same communication method when the question asked for a variety of communication methods.

*(b) Animals communicate in order to survive and during courtship.

Explain why animals use a variety of signals to communicate.

Use examples to support your answer.

(6)

To survive, animals need to communicate.

They can do this in many ways:

- Sound - most animals do this as you don't have to see the other animal to communicate and it can be done over distance. e.g. birds use whistling and singing to warn other birds and to attract mates.

- Visual - a lot of animals use visual signs to show how they're feeling or to ~~flinch~~ scare off predators e.g. cats raise all of their hairs on their back to show they are scared or to scare off threats.
 - Chemical - certain animals can release chemicals, this is usually used in courtship to say that they're available. e.g. moths use a pheromone to attract a mate.
- (Total for Question 6 = 12 marks)



ResultsPlus

Examiner Comments

This is a very good example of a Level 3 answer. The candidate has used bullet points to separate their answer into the three forms of communication. They have illustrated each type of communication with an example and achieved maximum marks.

*(b) Animals communicate in order to survive and during courtship.

Explain why animals use a variety of signals to communicate.

Use examples to support your answer.

(6)

Animals use different ways to communicate because they need to warn other animals in the same species of any predatory/intruders approaching. For example elephants use a very low frequency sound that ~~not~~ humans or any other animals can't hear in order to warn about potential danger.



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Examiner Comments

This is an example of a Level 2 response. The candidate has given a detailed answer which includes an example of one type of communication method. To extend their response they needed to refer to visual or chemical communication.

Paper summary

Based on their performance on this paper, candidates should:

- always show the working when doing calculations as a mark can be awarded for errors carried forward in this case
- check the number of marks given for the question and ensure that they have included enough facts to match the mark awarded
- recognise that the word 'explain' means additional scientific information is needed that is linked to the answer given
- avoid vague answers which will not gain credit and candidates should ensure their answer includes a good level of scientific detail
- know the role of bacteria in the production of yogurt and the advantages of using micro-organisms to produce food
- draw curves or lines of best fit which pass through all the points where appropriate
- ensure that when reading values from a graph that they interpret the scale with a good degree of accuracy
- use all the information given in the question and when asked to refer to this in their answers
- think about the structure of the answer before starting to write when tackling the extended answers to ensure that the answer shows clarity of writing and flows, while remembering that accurate spelling and grammar in these questions is also important
- read the questions carefully and check answers include enough detail.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

Ofqual



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