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# Examiners' Report
# June 2014

# GCSE Biology 5BI1F 01

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# Introduction

This is the now the seventh paper in this specification for the qualification of Science GCSE at the Foundation Tier level. The paper focussed upon a range of skills in terms of mathematical skills and knowledge based skills. Candidates were asked to analyse data and resource their answers accordingly. Topics that were assessed came from all aspects of the B1: Influences on life unit including Evolution and Variety, The Carbon Cycle, Homeostasis, Drug use and the effects upon the Nervous System and Disease.

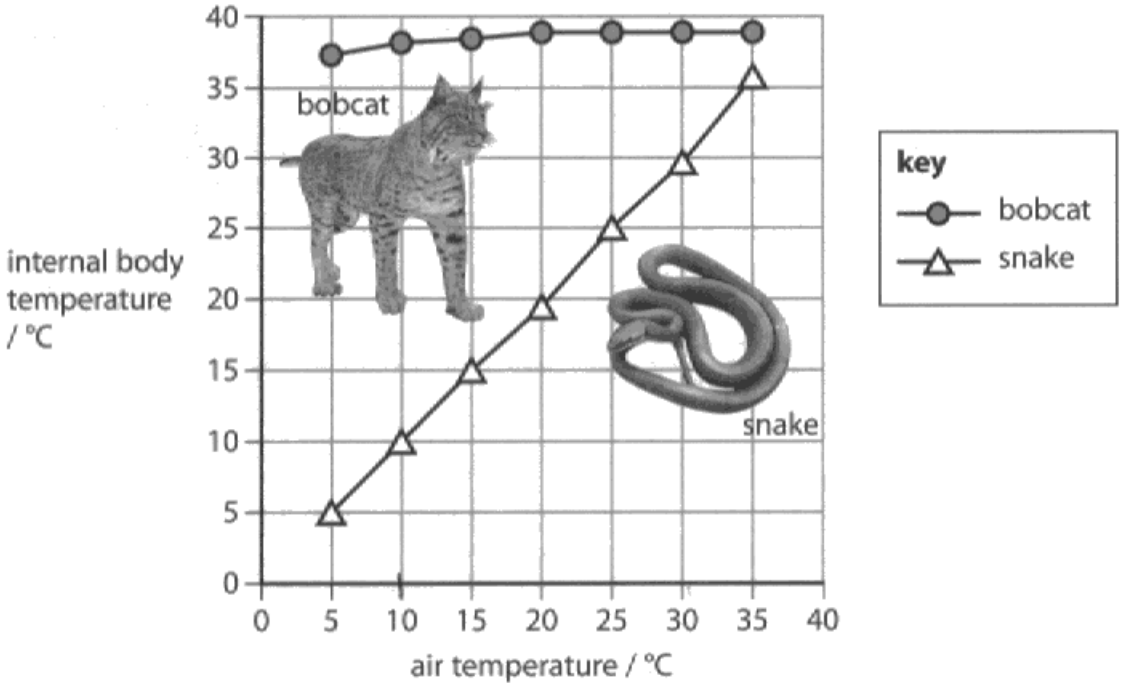
It remains clear that candidates still require training on how to answer specific questions in relation to the command words that are set and that merely rearranging the question stem in their answer will not score credit.

This report aims to highlight what each question was targeting. It also includes some examples of answers where the mark scheme answers have been achieved and also where it was felt the candidate required more information to score marks.

## *Question 1(a)(i)*

This question asked candidates to use mathematical skills to calculate the increase in body temperature of an animal from the graph. Candidates were expected to retrieve the numbers 30 and 10 and subtract the latter from the former to achieve the answer 20. This question was answered very well by most candidates.

**1** The graph shows the effect of air temperature on the internal body temperatures of a bobcat and a snake.




(a) (i) Calculate the change in the internal body temperature of the snake between an air temperature of 10 °C and 30 °C.

(2)

10 - 29

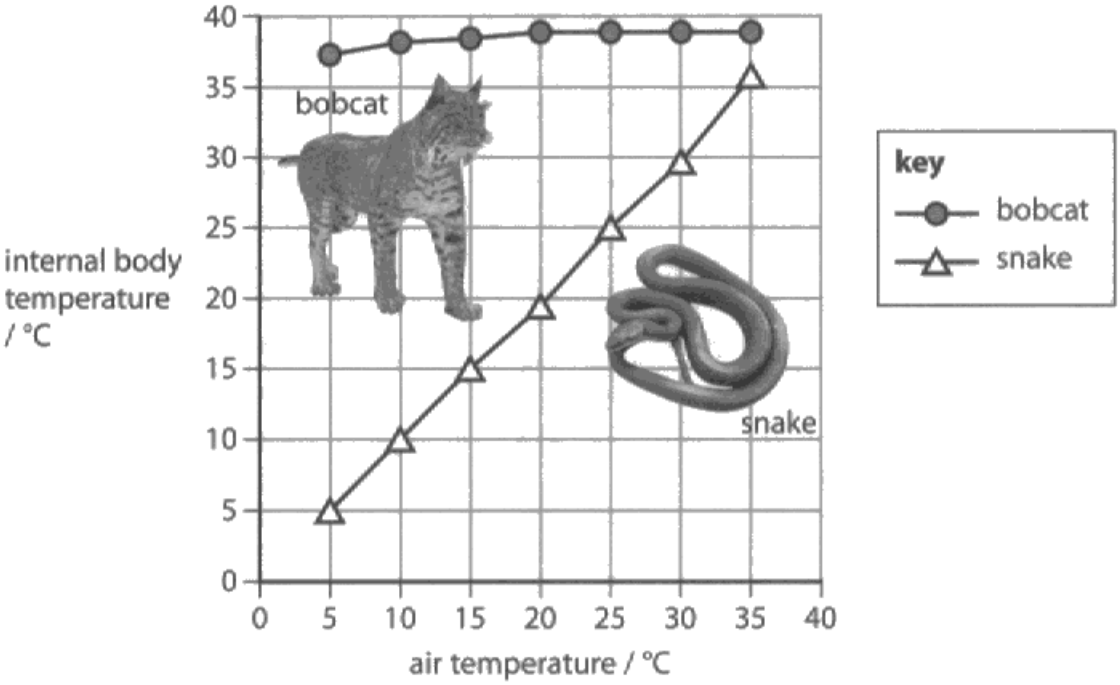
answer = 19

**ResultsPlus**
**Examiner Comments**

This candidate has read the graph correctly as it was suggested that the graph could be seen as 30 or 29. They have then taken these two numbers and answered correctly (19 or 20) on the answer line.

This candidate has scored 2 marks.

1 The graph shows the effect of air temperature on the internal body temperatures of a bobcat and a snake.




(a) (i) Calculate the change in the internal body temperature of the snake between an air temperature of 10 °C and 30 °C.

(2)

30 - 10 = 20

answer = 20

**ResultsPlus**
**Examiner Comments**

This candidate has taken the two numbers from the graph (30 and 10) and subtracted these successfully.

This candidate has scored 2 marks.

**ResultsPlus**
**Examiner Tip**

Candidates are advised to always show their calculations in the mathematical based questions. Candidates could therefore score a "method mark" even if the incorrect answer is placed on the line.

## *Question 1(a)(ii)*

This question asked candidates to suggest why the internal body temperature of an animal varied widely. The candidates were expected to suggest that a snake is a poikilotherm (cold-blooded was accepted here) and that the snake uses external influences to change its internal temperature. Many candidates stated that snakes were cold-blooded / poikilothermic. Only a small number of candidates stated that the snake would use its environment to control its temperature which was disappointing.

(ii) Suggest why the internal body temperature of the snake has a wide range.

(2)

the Snake is cold-blood also known as Poikilotherms and cannot keep its internal body temperature Constant.

**ResultsPlus**
**Examiner Comments**

This candidate has stated that a snake is cold-blooded and has also stated that snakes are poikilothermic. They have also scored another mark for stating that snakes do not control their own internal temperature.

This candidate has scored 2 marks.

(ii) Suggest why the internal body temperature of the snake has a wide range.

(2)

The Snake has a very long body and its harder to keep it all the Same heat. It will have to do alot more moving because it doesnt have legs.

**ResultsPlus**
**Examiner Comments**

This candidate has incorrectly stated that a snake is long and therefore its temperature will vary. This response was seen relatively frequently and does not score credit. There is no comment upon the fact that snakes do not control their own internal temperature or that they are poikilothermic.

This candidate has scored 0 marks.

## *Question 1 (b)(ii)*

This question asked candidates to explain how sweating would help a homeotherm regulate their body temperature. The mark scheme states that candidates should comment upon the fact that sweat contains water and that this water evaporates removing heat as it evaporates. Many candidates did comment that sweat evaporates but many failed to mention that the sweat contains water and that heat was removed as the sweat evaporated. Many candidates merely stated that sweating allowed homeotherms to "cool down" which did not score any marks.

(ii) When the bobcat gets too hot, it can sweat through the skin on its paws.

Explain how this helps the bobcat to regulate its internal body temperature.

(2)

the sweat is cooler than it's body temperature thus cooling the bobcat down.

**ResultsPlus**
**Examiner Comments**

This is an example where a candidate has only stated the result of sweating. This did not score any marks as the stem of the question does hint to this.

(ii) When the bobcat gets too hot, it can sweat through the skin on its paws.

Explain how this helps the bobcat to regulate its internal body temperature.

(2)

When the bobcat sweats through his skin on paws, the water/sweat will evaporate helping lose heat energy and then cooling him down.

**ResultsPlus**
**Examiner Comments**

This candidate has stated that sweat contains water and that this evaporates. The candidate has then made a comment that heat energy is lost. This is an excellent answer and scored 2 marks from the available 3 despite stating all three points.

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**Examiner Tip**

Candidates are reminded that they must use biological terms if they are to score well overall. Here is a good example of efficient use of biological terms such as evaporate.

## *Question 2 (a)(ii1)*

This question asked candidates to choose a word from 6 potential answers and place their chosen word into the sentence provided. This item sought candidates to choose the word "mucus" as a barrier that was sticky and traps pathogens. This question was answered very well by most candidates.

The human body has many physical barriers to protect itself from the influenza virus.

These barriers include ..cilia.. which is sticky and can trap

**ResultsPlus**
**Examiner Comments**

This candidate has chosen an incorrect word from the potential 6. Cilia is not sticky and its primary role is not to trap pathogens.

The human body has many physical barriers to protect itself from the influenza virus.

These barriers include ..mucus.. which is sticky and can trap

**ResultsPlus**
**Examiner Comments**

This candidate has chosen the correct word and placed it in the correct place in the sentence. Their handwriting is clear which is a must when papers are scanned into the marking system. This candidate has scored 1 mark.

## *Question 2(a)(ii2)*

This question asked candidates to choose a word from 6 potential answers and place their chosen word into the sentence provided. This item sought candidates to choose the word "cilia" as the item which moves trapped pathogens out of the body. This question was answered well by many candidates.

The body has antibodies which can move any trapped influenza viruses out of the body.

**ResultsPlus**
**Examiner Comments**

This candidate has chosen an incorrect word from the potential 6 on offer. Antibodies do not move trapped viruses out of the body.

The body has Cilia which can move any trapped influenza viruses out of the body.

**ResultsPlus**
**Examiner Comments**

This candidate has correctly chosen the word "cilia" and placed this in the correct area of the sentence. It is important to note that only one word should be chosen. Some candidates placed two answers in the space provided and they scored zero marks for this.

This candidate scored one mark.

**ResultsPlus**
**Examiner Tip**

Candidates must remember that their answer here must come from the box provided and that it must be written in a legible handwriting style. Too many candidates are still also placing more than one word here.

## Question 2(a)(iii)

This question asked candidates to suggest why a doctor would not provide a virus sufferer with antibiotics. The answer expected was the idea that antibiotics would not be effective against the virus. There were many ways that the candidate could have stated this and examiners were asked to keep this in mind. Many candidates stated that antibiotics only work on bacterial infections which was credit worthy as well.

(iii) Suggest why a doctor would **not** give antibiotics to a person suffering from the influenza virus.

(1)

Because the body has natural ways to remove the virus.

**ResultsPlus**
**Examiner Comments**

Many candidates made this statement that the body would control the viral infection without the need for medication. This was not a mark point and therefore this candidate has failed to access the mark for their response.

## Question 2(b)

This question asked candidates to describe how chemical defences are used within the human body. Examiners were expecting to see a chemical defence method mentioned (either hydrochloric acid or lysozyme) and the effect on bacteria / infections of this defence mechanism. Many candidates stated that "germs" were killed or destroyed; the word "germ" was not credited as it is not a standard biological term. Many candidates mentioned the defence mechanism but did not state how the defence mechanism prevents infection.

(b) Describe how the human body uses its own chemical defences to prevent infection.

(2)

the eyes have tears which contain lysozyme that kill any pathogens trying to enter. the stomach contains hydrochloric acid which can kill most ~~any~~ pathogens ~~in it~~ that

**ResultsPlus**
**Examiner Comments**

This answer was very impressive as the candidate has stated both chemical defences and how the defence prevents infection. Lysozyme is spelt correctly which was pleasing and this "kills pathogens" was the second marking point.

This candidate has scored 2 marks.

(b) Describe how the human body uses its own chemical defences to prevent infection.

(2)

The body uses chemical defences such as hydrochloric acid to prevent infections such as salmonella

**ResultsPlus**
**Examiner Comments**

This candidate has only stated a chemical defence and therefore has not gained the function mark of "killing bacteria". Many candidates did the same as this candidate and were only able to score one mark.

## *Question 2(c)*

This question asked candidates to describe how antiseptics can be used to prevent infection. Once again examiners were expecting to see a method mark; some form of "antiseptics can be sprayed onto the surface of a kitchen" would be an answer that was given credit. The result of this action was credit worthy for the second mark; "killing the bacteria / infection" was expected. Many candidates did not mention the method that could be employed but did state that antiseptics can kill pathogens.

(c) Describe how antiseptics can be used to prevent the spread of infection in a kitchen.

and trap harmfull

(2)

antiseptics kill baeteria and ~~pref~~ prevent it spread-ing and multiplying

**ResultsPlus**
**Examiner Comments**

This candidate has stated that antiseptics can kill bacteria which was credited. Many candidates also mentioned that the bacteria would no longer be able to spread or multiply; however this was not on the mark scheme and did not score credit.

This candidate has scored one mark.

(c) Describe how antiseptics can be used to prevent the spread of infection in a kitchen.

(2)

antiseptics can prevent the spread of infection in a kitchen because antiseptics work for ~~these diseases~~ disease that are outside of the body, so you could wipe the kitchen desktop with antiseptics and it would kill the bacteria on it.

**ResultsPlus**
**Examiner Comments**

This is an excellent response. The candidate has stated that the worktops can be wiped for the first mark and that this action would kill the bacteria on the worktop for the second mark. The first area of their answer did not negate their answer and therefore this candidate has scored two marks.

## *Question 3(a)(ii)*

This question asked candidates to analyse the diagram of a plant cell and name the organelle labelled. Examiners were expecting to see the word nucleus and this question was accessed very well by many candidates.

Some candidates did place "nucleus containing DNA" which was acceptable and examiners were asked to keep this in mind.

(ii) Structure **X** contains chromosomes.

Name structure **X**.

(1)

Nucleus

**ResultsPlus**
**Examiner Comments**

This candidate has written the correct answer on the answer line and this answer is clearly written.

Question 3aii_278968_01.png

(ii) Structure **X** contains chromosomes.

Name structure **X**.

(1)

Gene

**ResultsPlus**
**Examiner Comments**

This candidate has disappointingly placed the wrong answer on the answer line. The nucleus does contain chromosomes that have genes on them; yet this was not the answer that was sought.

This candidate has scored zero marks.

## *Question 3(b1)*

This question asked candidates to choose a word from the 6 on offer and place this word into the sentence space where appropriate. The answer examiners expected to see was "autotrophs" as these make their own glucose using light.

Many candidates scored well on this item.

Organisms in the Kingdom Plantae are autotrophs because they make their own glucose using sunlight.

**ResultsPlus**
**Examiner Comments**

This candidate has placed the correct word from the 6 on offer into the appropriate area on the script. It is very clear to mark and the handwriting is well received.

This candidate has scored one mark.

Organisms in the Kingdom Plantae are multicellular because they make their own glucose using sunlight.

**ResultsPlus**
**Examiner Comments**

This candidate has placed the incorrect word from the 6 on offer. Plants are multicellular but their answer does not link to the idea of glucose production using sunlight.

This candidate has scored zero marks.

## *Question 3(b2)*

This question asked candidates to choose a word from the 6 on offer and place it into the space provided in the relevant sentence. The word examiners expected to see was "saprophytes" as fungi feed on dead and decaying organisms. This was not answered as successfully as the previous item of question 3b.

Fungi do not belong to the Kingdom Plantae because they are saprophytes, which means they feed on dead and decaying organisms.

**ResultsPlus**
**Examiner Comments**

This candidate has successfully chosen the correct word from the 6 on offer and placed it into the appropriate space on their script. Their answer is clear and the handwriting legible.

This candidate has scored 1 mark.

Fungi do not belong to the Kingdom Plantae because they are unicellular, which means they feed on dead and decaying organisms.

**ResultsPlus**
**Examiner Comments**

This candidate disappointingly has chosen an incorrect word from the 6 on offer. Fungi are not always unicellular and this answer does not describe how fungi feed.

This candidate has scored zero marks.

## *Question 3 (c)(i)*

This question asked candidates to analyse the diagram and focus on plant shoot 2. Candidates were expected to describe the fact that the shoot had grown towards the light. Stating phototropism was an acceptable alternative. Some candidates stated that the plant shoot had "moved" towards the light which is incorrect and was not credited.

(i) Describe what has happened to plant shoot **2** in response to light.

(1)

as the auxins have reacted to light they have moved to the shaded side.

**ResultsPlus**
**Examiner Comments**

This candidate has stated the action that has caused the change in angle growth rather than merely stating the reaction. The science is correct but the answer is not applicable here.

This candidate has scored zero marks.

(i) Describe what has happened to plant shoot **2** in response to light.

(1)

shoot 2 has grown towards the light.

**ResultsPlus**
**Examiner Comments**

This candidate has provided a concise and clear answer using legible handwriting. They have used the keywords "grown towards" and therefore secured the mark for this item.

## *Question 3(c)(ii)*

This question asked candidates to scientifically explain why plant shoot 2 had responded to unilateral light in such a fashion. Examiners were expecting to see the mentioning of the plant growth substance "auxin" and that this moved to the shaded side of the plant shoot. The result of elongation on this side was credited for a further mark. Candidates who stated that this was called phototropism also scored a mark for this statement.

It was pleasing to see many candidates stating the name of the growth substance auxin yet many did not appreciate that it moved in response to the unilateral light and this caused the angle change.

(ii) Explain how plant shoot **2** responded to light.

(3)

the auxin built up on the shaded side of the stem and this causes the stem to elongate making one side of the stem longer than the other.

**ResultsPlus**
**Examiner Comments**

This candidate has made three linked comments regarding the shoot angle and scored 3 marks for this response. They have stated the name of the growth substance as auxin and that this would have been found on the shaded side of the stem causing the elongation. An excellent answer that is both concise and accurate.

This candidate has scored three marks.

**ResultsPlus**
**Examiner Tip**

This candidate has clearly understood the command word "explain". This command word requires candidates to suggest why something has occurred. They should be using the word "because" as this then ensures they provide a reason for a concept.

(ii) Explain how plant shoot **2** responded to light.

(3)

Auxin in plants ~~moredwhich~~ helps the plant to grow towards the light.

**ResultsPlus**
**Examiner Comments**

This candidate has stated the name of the plant growth substance but has unfortunately not provided further content on the action of auxin. It is pleasing that the candidate has remembered that auxin is involved however.

Candidates should remember that for three marks more content would be expected.

## *Question 3(c)(iii)*

This question asked candidates to suggest why the angle change would be beneficial for the plant. Examiners were expecting to see candidates mention that the extra light would provide more light energy for the process of photosynthesis. Responses such as "making more food" or "making more glucose" were acceptable. However, any candidate who chose to answer "more growth" did not score credit for this.

This item was answered very well.

(iii) Suggest why this response is beneficial to the plant.

(1)

So the plant has more light for ~~to~~ photosynthesis.

**ResultsPlus**
**Examiner Comments**

This is an excellent response as the candidate has stated the fact that the plant would receive more light and use this light for photosynthesis. This answer is very well written, coherent and concise. The handwriting is legible and due to the correct answer this candidate scored one mark.

(iii) Suggest why this response is beneficial to the plant.

(1)

because then it can keep growing

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**Examiner Comments**

This candidate has only stated that the plant can continue to grow. This is not strictly incorrect however it is not the answer required as the plant would still grow without the phototropic response.

**ResultsPlus**
**Examiner Tip**

Candidates must be aware that they need to be specific with the terminology that they use. This candidate has not been successful here as they have only used the word "growth" which was not specific enough.

## *Question 3(d)*

This question asked candidates to state the force that causes roots to grow downwards into any soil. Examiners were expecting to see the word "gravity" as this is the force acting on roots. Gravitropism or geotropism were also acceptable alternatives here.

This was one of the more successful items on the examination paper.

(d) State the force that acts on plant roots causing them to grow downwards into the soil.

(1)

gravity

**ResultsPlus**
**Examiner Comments**

The candidate has correctly placed the correct force / word on the answer line and this is married with legible handwriting. An ideal response.

(d) State the force that acts on plant roots causing them to grow downwards into the soil.

(1)

Positively geotrophic (gravitrophic)

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**Examiner Comments**

An excellent scientific response seen here as the candidate has not only stated the geotropic response but also stated that this is a positive response. A very pleasing response and it scores the mark available.

## *Question 4(a)(i)*

This question asked candidates to use their mathematical skills to calculate the missing reaction time for one of the volunteers in the investigation. Candidates were provided with two of the reaction times and also the mean reaction time. This question posed many candidates with a difficult concept and therefore they did not score any of the marks for the item. Candidates clearly used trial and error to access the answer here and examiners were looking for the answer 45ms.

| volunteer | 1st reaction time / ms | 2nd reaction time / ms | 3rd reaction time / ms | mean reaction time / ms |
|---|---|---|---|---|
| A | 17 | 25 | 24 | 22 |
| B | 45 | 38 | 40 | 41 |
| C | 62 | 70 | 63 | 65 |

(i) Calculate the missing reaction time for volunteer **B**.

(2)

45+38+40=123

123÷3=41

answer = 45 ms

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**Examiner Comments**

This candidate has scored both marks associated with this item as they have correctly calculated the missing trail reaction time of 45ms by using trial and error.

What was also pleasing to see was that this candidate has also shown their calculations.

| volunteer | 1st reaction time / ms | 2nd reaction time / ms | 3rd reaction time / ms | mean reaction time / ms |
|---|---|---|---|---|
| A | 17 | 25 | 24 | 22 |
| B | 45 | 38 | 40 | 41 |
| C | 62 | 70 | 63 | 65 |

(i) Calculate the missing reaction time for volunteer **B**.

**(2)**

Add them all together ÷ 3

answer = 45 ms

**ResultsPlus**
**Examiner Comments**

This candidate has scored both of the marks as they have correctly calculated the missing reaction time. The difference here is that they have not shown their calculation as stating "add them all together / 3" is not a calculation.

## *Question 4(a)(ii)*

This question asked candidates to describe the effect of the drug on the reaction times of the volunteers in the investigation. Examiners were expecting candidates to state that the higher the dose of the drug the faster the reaction time. Candidates were also asked to use information in the table so data or comments upon the data were expected for the second mark of this item. Unfortunately many candidates did not use the information from the table.

Candidates must remember that if reaction time becomes faster then it does not increase, it in fact decreases. Many candidates negated their comments by stating this.

(ii) Using information from the table, describe the effect of this drug on reaction time.

**(2)**

The drug quickens your reaction time than normal because A was the fastest reaction time and had taken 2 doses of the drug whereas C didn't take the drug and had the slowest reaction time. the drug quickens the signals from the brain to the nervous system.

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**Examiner Comments**

This is an excellent response from this candidate as they have stated that the drug has quickened the reaction time and they have also used information from the table to qualify their answer. The answer is written concisely and coherently with no errors.

This candidate has scored 2 marks.

**ResultsPlus**
**Examiner Tip**

The question asks for candidates to use information from the table. Many candidates did not take on board the advice. If a question asks this then there will be marks available for data manipulation or comment. This must be adhered to.

(ii) Using information from the table, describe the effect of this drug on reaction time.

**(2)**

With volunteer A there reaction time was a lot faster as the effect of the drugs speeds up reaction times. As compared to volunteer C who did not take any drugs there reaction time was a lot slower.

**ResultsPlus**
**Examiner Comments**

This candidate has stated that the effect of the drug is to speed up the reaction time and they have also qualified this with information from the table in a concise fashion. They have used words such as "faster" and "slower" in order to show a comparison.

This candidate has scored 2 marks.

## *Question 4(a)(iii)*

This question asked candidates to explain how the drug created faster reaction times. Answers that stated there was an increase in the speed of neurotransmission / electrical impulses or that there was an increase in the amount of neurotransmitter were credited for the first marking point. Any candidates that stated that the synapse was involved were also credited for the second marking point.

This question posed many issues for many candidates. Many candidates did not recognise that electrical impulses would increase their speed; and merely stated that "signals would be faster" - which was not accepted.

(iii) Explain how this drug causes a change in reaction time.

**(2)**

This drug taken, must be a stimulant. Stimulants effectively increase the rate at which nerve and electrical impulses travel. This decreases the time in which it takes for you to react, making reactions faster.

**ResultsPlus**
**Examiner Comments**

This candidate has stated that electrical impulses speed would increase in rate and therefore decreasing the time taken to react. They have not stated that these would travel faster across the synapse but have scored one mark for the earlier comment.

(iii) Explain how this drug causes a change in reaction time.

(2)

This increased the reaction time by ~~stopping some~~ speeding up the electrical signals in the brain and the synapse crossing.

**ResultsPlus**
**Examiner Comments**

An excellent response here by this candidate as they have stated that electrical signals would speed up and that this occurs at the synapse crossing.

It was felt that this candidate could have ensured that their handwriting be improved so their correct answers were easier to assess; nevertheless, this candidate has accessed both marking points.

## *Question 4(b)*

This question asked candidates to describe the role of the reflex arc in protecting the body from danger. Examiners were expecting to see candidates comment upon the fact that a reflex arc is an automatic or involuntary response that ensures a faster reaction than normal. Candidates also gained credit for stating that only the spinal cord was used (or the brain bypassed) and that the use of relay neurones was an important feature.

This question was well accessed by many candidates.

(b) Describe how a reflex arc helps to protect the human body from danger.

(3)

A reflex arc is a movement generated without the use of the brain. If someone steps on a pin, they automatically move their foot to avoid further pain or damage. The brain is not involved in this process to speed up the reaction and minimalise risk.

**ResultsPlus**
**Examiner Comments**

This response gained three marks as the candidate has stated that the brain is not used in the reflex arc response. They have also clearly stated that the movement or response is automatic and the reaction process is sped up. An excellent concise and clearly written response.

This candidate has scored three marks.

(b) Describe how a reflex arc helps to protect the human body from danger.

(3)

A reflex arc helps to protect the human body by sending nerve pulses ~~from~~ to the ~~brian~~ brain to tell the brain whats happening. The brain then sends a nerve pulse back to the reflex arc telling it to carry away from something or dont do it.

**ResultsPlus**
**Examiner Comments**

This response in contrast was poor as the candidate has stated that the brain is used which is incorrect. They have not mentioned that the response is faster or automatic. This response did not score any marks.

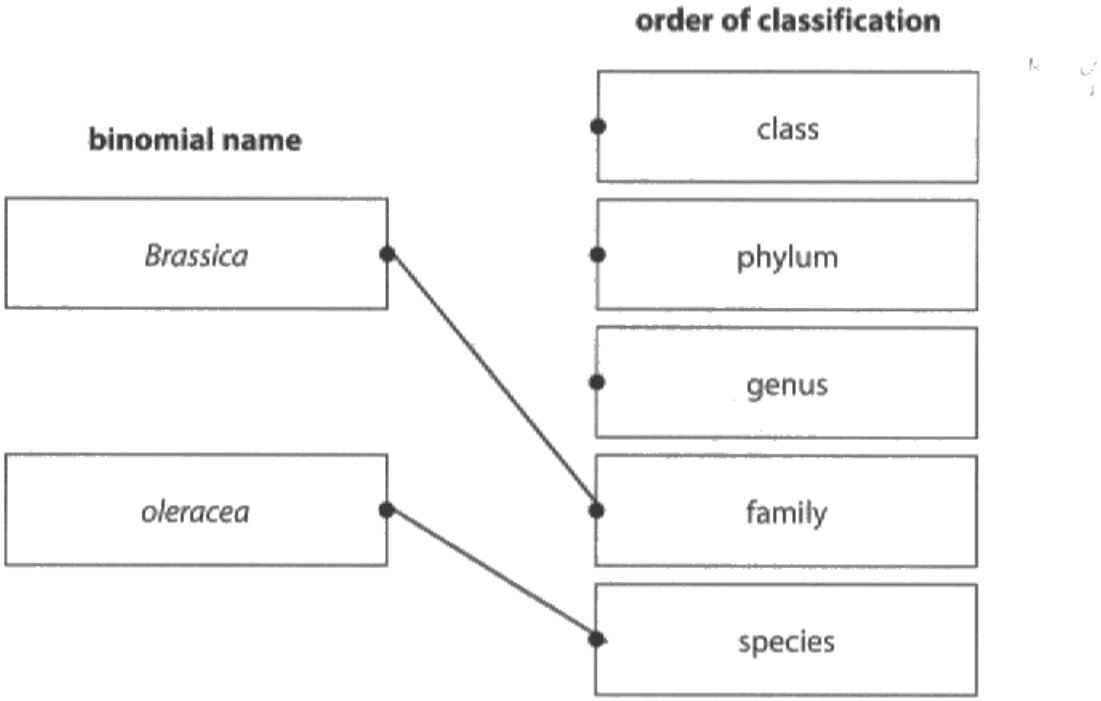
## *Question 5(a)(ii)*

This question asked candidates to draw two lines from each of the binomial name boxes to the order of classification that it is associated with. The question asked for candidates to draw just one line from each box; however, some candidates drew many lines and therefore did not score. Brassica is the genus and oleracea is the species in this classification item. Many candidates scored well here.

(ii) The binomial name given to the original species is *Brassica oleracea*.

Draw **two** straight lines to link the parts of the binomial name with the correct order of classification.

(2)

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**Examiner Comments**

This candidate has successfully associated oleracea with the species box; however they then went on to associate Brassica as the family name which is incorrect and therefore they have scored one mark.

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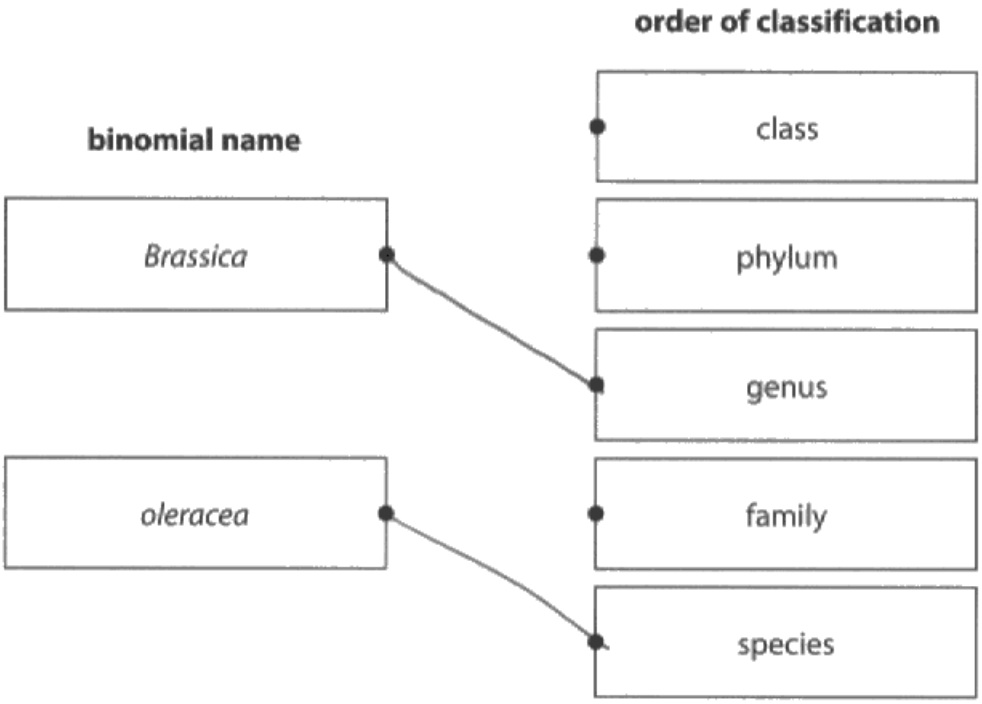
**Examiner Tip**

Many candidates have followed the advice by drawing only two lines. The advice to candidates is that they must follow these instructions or they will lose marks. Straight lines are very important as well.

(ii) The binomial name given to the original species is *Brassica oleracea*.

Draw **two** straight lines to link the parts of the binomial name with the correct order of classification.

(2)




**ResultsPlus**
**Examiner Comments**

An excellent response. The candidate has clearly drawn two lines correctly. This is what we expect to see.

## *Question 5(a)(iii)*

This question asked candidates to explain the meaning of the genetic term mutation. To score the marks available candidates were expected to comment that a change in the DNA would have occurred. Many candidates struggled on this question as they merely stated that a "change" had occurred but did not state that this occurred in the DNA and therefore did not gain credit. If any candidate stated that the DNA or genes had been manipulated or had "gone wrong" they would have scored one mark.

(iii) Explain the meaning of the term **mutation**.

(2)

This is when the DNA changes by the cause of out side Interferance.

**ResultsPlus**
**Examiner Comments**

This is a very pleasing response to see as the candidate has even qualified their answer with an explanation - however, clearly they received no extra credit for this. The candidate has stated that the DNA has changed and therefore scored 2 marks.

(iii) Explain the meaning of the term **mutation**.

(2)

Mutation is when a living thing is mutated so changes into something else.

**ResultsPlus**
**Examiner Comments**

This is an example where a candidate has not been specific or scientific enough to score credit. Simply stating that a change has occurred did not score any marks as the genetic reference was required.

## *Question 5(a)(iv)*

This question asked candidates to state another cause of variation other than a mutation. There was a wealth of correct answers here ranging from diet to various environmental conditions and also disease and reproduction. This was answered very well.

What was surprising here was that some candidates were placing the word "mutation" onto the answer line despite the question stating "other than mutation....". Candidates doing this clearly scored no marks.

(iv) Mutation is one cause of variation.

State **one** other cause of variation.

(1)

Skin Colour

**ResultsPlus**
**Examiner Comments**

This candidate has stated a way in which variation could be seen rather than the cause of the variation. This was disappointing as there were many answers that were applicable here. Candidates are reminded about the need to read the question carefully so that they are aware of what is expected of them

(iv) Mutation is one cause of variation.

State **one** other cause of variation.

(1)

enviromental

**ResultsPlus**
**Examiner Comments**

This candidate has stated one of the correct answers. The cause "environmental" was the most popular answer amongst the candidates. The mis-spelling of the word did not discount the mark awarded.

**ResultsPlus**
**Examiner Tip**

This candidate succeeded here, but it must be remembered that when the item asks to state "one" cause then only one cause should be written. Many candidates thought it appropriate to write more than one cause and therefore did not score marks.

## *Question 5(b)*

This question asked candidates to use the diagram regarding pesticide application to explain how the presence of resistant insects provides evidence for the theory of evolution. Examiners will assess candidates' work through a levelling system where the response is categorised as either a limited, simple or detailed explanation.

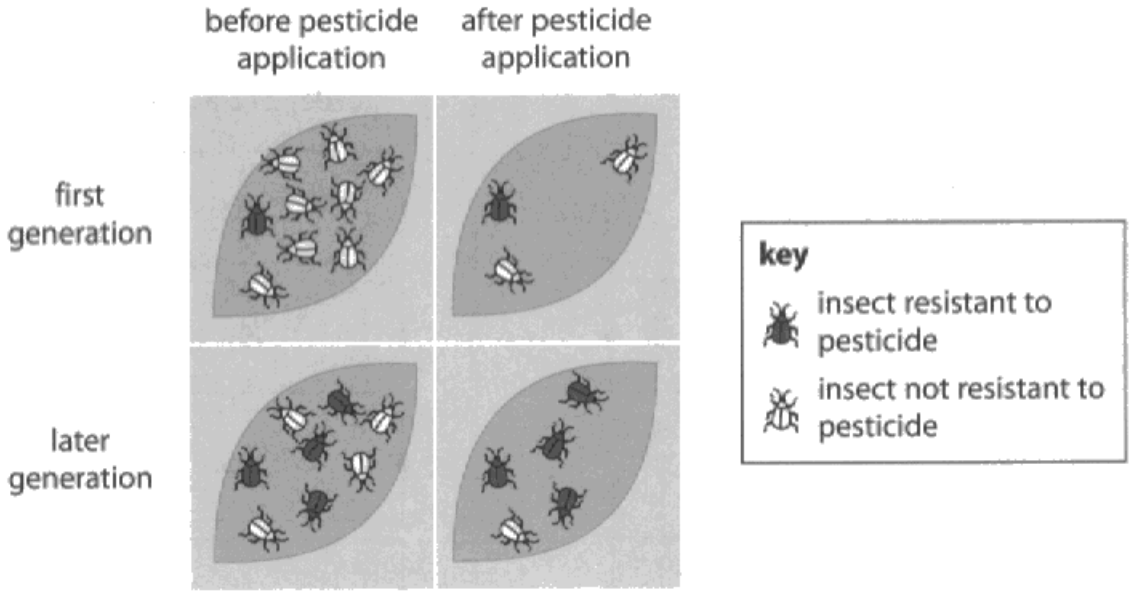
The indicative content that was expected to be seen included ideas such as a comment upon the diagram and the changes seen, survival rates, reproductive successes, advantageous adaptations and survival of the fittest. Many candidates were able to use the resource and described the changes seen with the resistant and non-resistant insects and that the resistant insects were able to survive and pass on their resistant genes. This was pleasing to see.

Many candidates were able to access Level 1 or Level 2 of the mark scheme, however, only a limited few scored the top level 5 or 6 marks.

The quality of written communication was assessed by taking into account the candidate's clarity and spelling, grammar and punctuation.

*(b) Farmers use pesticides to kill insect pests on vegetables.

The diagram shows how some insects may be resistant to a pesticide.



Use the diagram to explain how the presence of resistant organisms helps to support Darwin's theory of evolution.

(6)

Darwins theory of evolution suggested that organisms that slowly change through Variation, over population, struggle for existance, survival, Inhertance and gradual Change, would have a better Change to survive than those who didn't go through some of these prosesses. For example Withe the resistant organism, at first, there was only the one who ~~[illegible]~~ ~~[illegible]~~ was resistant, so it was the more evolved, more capable of survival than the insect who were not resistant, so they died off. So when the resistant insect reproduced it spread its mutation to the off spring who are now ~~[illegible]~~ also resistant, and are now have a higher population than the one who aren't resistant as they still die easier and so leaving only the fittest (resistant) This is natural ~~Selection~~ Selection.

**(Total for Question 5 = 12 marks)**

**ResultsPlus**
**Examiner Comments**

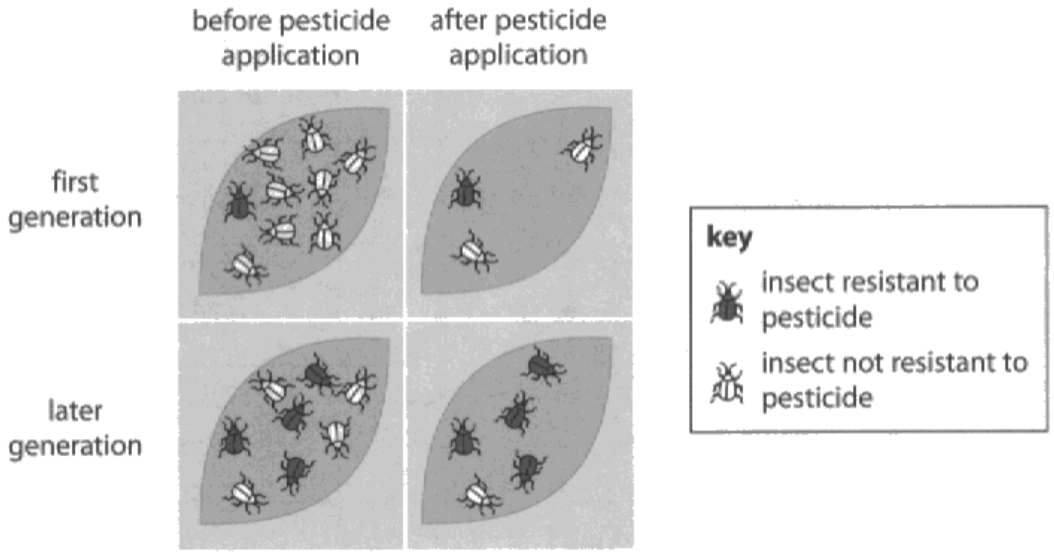
This candidate scored full marks as they have commented upon the changes seen in the diagram and also used many scientific terms to support their answer. Terms such as variation and survival are used correctly and the clarity of their answer is deemed successful and acceptable.

**ResultsPlus**
**Examiner Tip**

It must be remembered that candidates will be assessed here on the quality of written communication. Examiners expect to be able to read a candidate's work and that it is communicated effectively. The spelling, grammar and punctuation should also be used efficiently to be able to score the full marks available.

*(b) Farmers use pesticides to kill insect pests on vegetables.

The diagram shows how some insects may be resistant to a pesticide.




Use the diagram to explain how the presence of resistant organisms helps to support Darwin's theory of evolution.

(6)

because in the first generation more insects weren't resistant to pesticide and so alot was on vegetables but then when pesticide application was applied fewer insects landed on the vegetables but still more insects that weren't resistant was on the vegetables than the resistant insects.
However, In the later generation More resistant insects were on the vegetables meaning Darwins theory is correct as the insects are adapting to evolution.

**ResultsPlus**
**Examiner Comments**

This candidate has not made any attempt to explain the theory of evolution but they have commented upon the diagram and therefore accessed Level 1 of the mark scheme. The quality of written communication is acceptable and therefore this candidate has scored 2 marks.

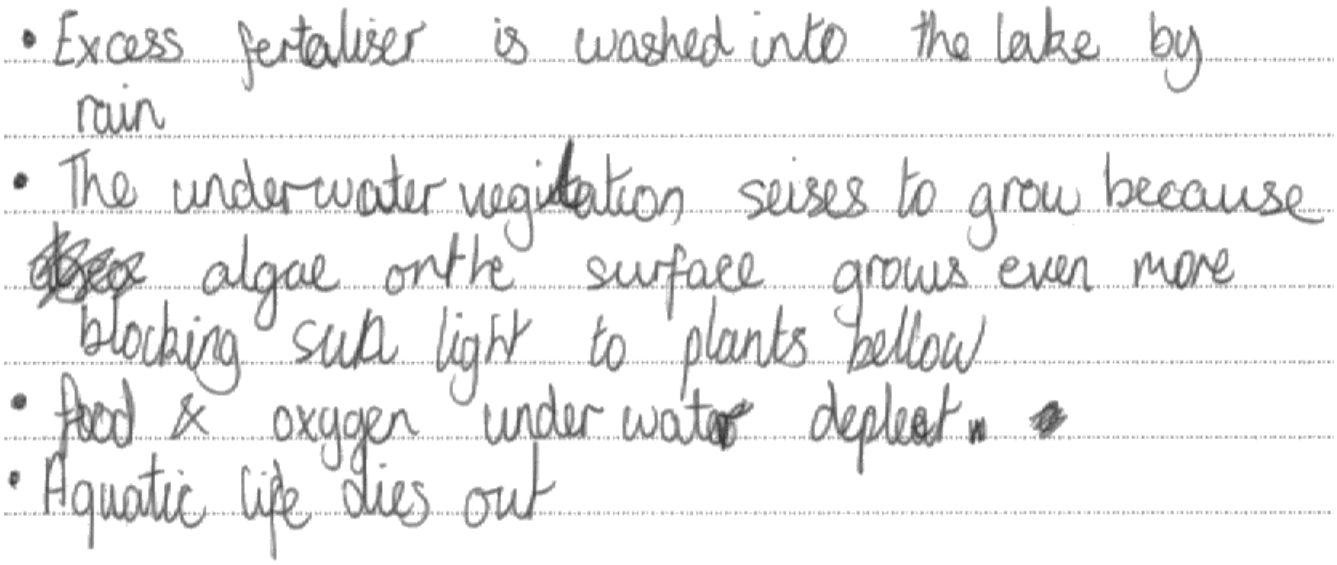
## *Question 6(a)(ii)*

This question asked candidates to explain the process of eutrophication and link this to the diagram that shows fish that have died on top of a lake. Candidates were expected to link their answer points in a fashion that best described the eutrophication process. Answers should have included the fact that nitrates would have leached into the lake causing an algal bloom. This algal bloom would block sunlight from penetrating the lake thus not allowing the underwater plants to photosynthesise. Any decomposers would then break down these plants and use the oxygen thus stopping fish from respiring.

Many candidates scored well here and many stated that the fertiliser washed into the lake causing a growth of algae on the surface. Very few candidates stated the role of decomposers and merely linked the lack of photosynthesis with the low oxygen level. This is a common misconception.

(ii) Explain why the overuse of fertiliser by the farmer caused the fish in the lake to die.

(3)




**ResultsPlus**
**Examiner Comments**

This candidate has stated that the fertiliser has washed into the lake causing the algae to grow even more on the surface thus blocking sunlight to the underwater vegetation. Despite the many spelling errors this did not negate any marking points.

This candidate has scored three marks.

**ResultsPlus**
**Examiner Tip**

Candidates should remember that if there is a question that clearly asks for linked response (as it is an answer that requires a process to be explained) then candidates must ensure that their answer reflects this. If a candidate had mixed up their links in the biological process it would be very difficult to award full marks.

(ii) Explain why the overuse of fertiliser by the farmer caused the fish in the lake to die.

(3)

by the farmer over ~~polluting~~ fertilising his field the ground could absorve it all therefore when its rained the ~~fertiliser~~ and the rain has been ~~washed into the lake through~~ absorved ~~it~~ therefore when it has heavily rained the water level has risen making the water table rise mixing the fertiliser into the lake water.

**ResultsPlus**
**Examiner Comments**

This candidate has only stated that the fertiliser enters the lake and has not made any comment about eutrophication whatsoever which was disappointing as this was the real effort for the question.

This candidate has scored one mark.

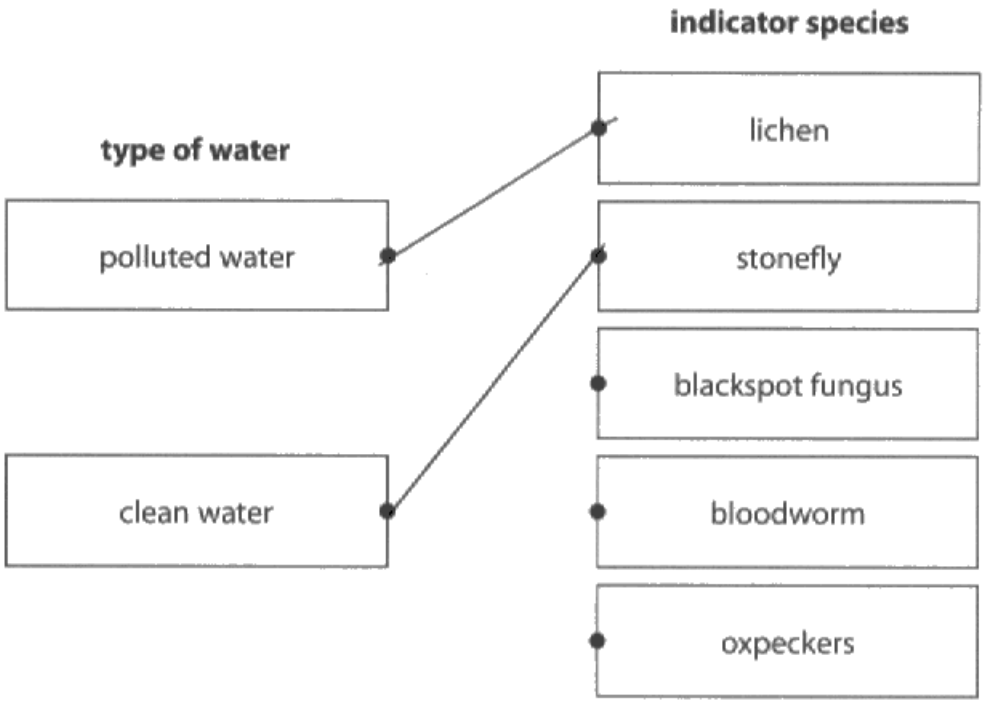
## *Question 6(a)(iii)*

This question asked candidates to draw one line from each type of water to the indicator species that is used to assess that type of water. Many candidates did well on this question. However, once again, some candidates drew more than two lines in total and therefore did not score at all.

(iii) The presence of indicator species in a lake can show levels of water pollution.

Draw **one** straight line from **each** type of water to the indicator species that would be found in that water.

(2)



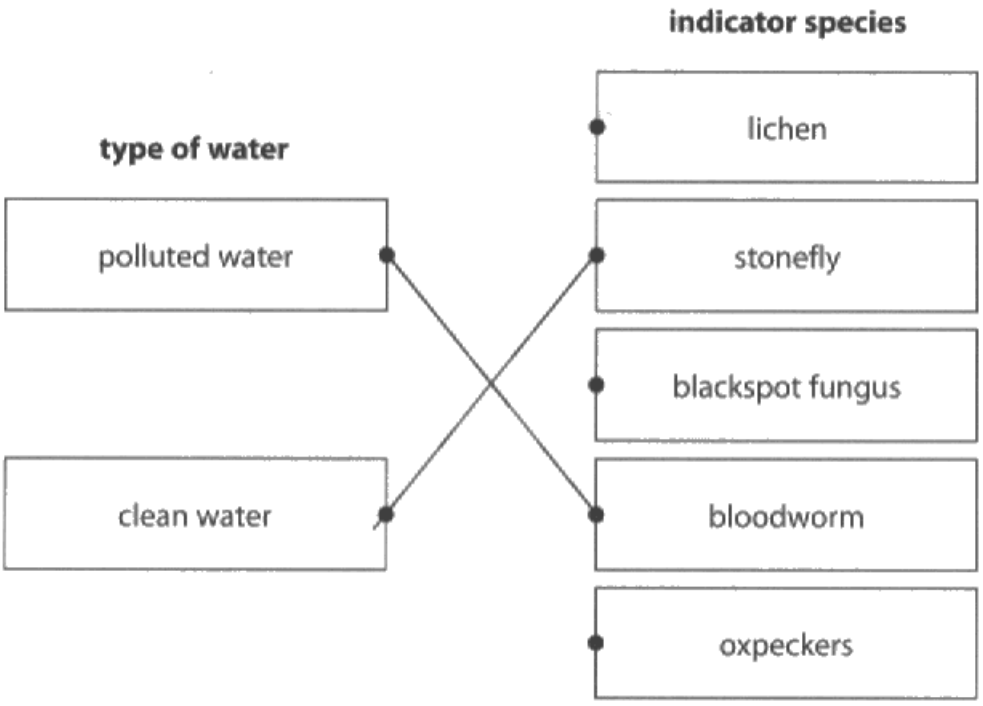

**ResultsPlus**
**Examiner Comments**

This candidate has used two lines, yet only one of these is correct. The clean water and stonefly is correct; however lichen are not used to assess polluted water.

(iii) The presence of indicator species in a lake can show levels of water pollution.

Draw **one** straight line from **each** type of water to the indicator species that would be found in that water.

(2)




**ResultsPlus**
**Examiner Comments**

An excellent response where the candidate has followed the instructions and successfully scored both marks for 2 correct answers and lines drawn.

## *Question 6(b)*

This question asked candidates to describe the Carbon Cycle. Responses were assessed using a levelling system whereby candidates were expected to comment upon three processes including photosynthesis, respiration, feeding, decomposition and combustion in detail to score maximum marks. A limited description would see candidates score either one or two marks and a simple description of at least two processes would score three or four marks.

The atmosphere is filled with carbon dioxide. $CO_2$ is removed from the atmosphere by many processes as well as being put back into the atmosphere by many processes. The three main are respiration, photosynthesis and combustion. Plants remove $CO_2$ from the atmosphere by photosynthesis. They convert carbon molecules into glucose. Animals come and feed from the plants in which case the carbon molecules are passed on. As animals perform many activities such as respiration and excretion, they release energy. The decaying waste produces $CO_2$ back into the air. As well as plants dieing and animals there bodies become into the decay process which means they release $CO_2$ back into the air. plants that decay are buried and become into a process of fossilization. This is where fossil fuels are burnt releasing $CO_2$ into the atmosphere. This is also known as combustion.

**ResultsPlus**
**Examiner Comments**

This candidate has successfully accessed full marks as they have made a detailed comment on many of the processes associated with the Carbon Cycle. Commenting on plants removing CO2 is pleasing to see and they have also stated that glucose is made in this process; very few candidates stated this so this was impressive. Decay and combustion are also described in detail and the whole answer has a good communicative nature.

This candidate has scored six marks.

*(b) Carbon is present in all organisms in an environment.

Describe the carbon cycle.

(6)

The trees release oxygen. Animals breath in the oxygen released and convert that oxygen into carbon. The trees will then absorb that carbon and use it in photosynthasis before releasing ~~oxy~~ oxygen as a ~~pro~~ product of photosynthasis. This cycle repeats and due to all animals converting oxygen into carbon, there is carbon present.

**ResultsPlus**

**Examiner Comments**

This response was seen as a weak answer that scored 2 marks. The candidate has stated that photosynthesis is used in the Carbon Cycle and this comment was rather limited therefore this candidate was restricted to Level 1 in the marking system.

This candidate scored two marks.

## Paper Summary

Based on their performance on this paper, candidates are offered the following advice:

- Ensure that mathematical skills are revised as there will always be an element of this assessed on every paper
- Always ensure that the more complex areas of the specification are revised as well, even at the basic level. In this paper this included evolution and variation
- Continue to ensure that the quality of written communication improves as there will always be marks awarded on the 6 mark questions
- Candidates must ensure that the context and the question is answered as appropriate. Command words must be understood
- Some candidates must appreciate that when the question asks them to draw only one line then only one line must be drawn. This also extends to when the question asks you to state only one biological term as well.

## 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



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