GCSE

Biology A

Twenty First Century Science Suite

General Certificate of Secondary Education **J243**

OCR Report to Centres

June 2012

Oxford Cambridge and RSA Examinations

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This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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Overview

This was only the second time that this specification was available for assessment. In this session, papers A161 and A162 were available for candidates. As in the January session, the papers were intended to be more rigorous overall and contained three six mark questions that required much longer extended answers. It was pleasing to see that the vast majority of candidates made valiant attempts at these questions by writing down extended answers. Many candidates were able to demonstrate both knowledge and understanding and were able to score high marks on these questions. Centres are to be applauded on the preparation of their candidates for these new style papers.

Most Centres entered their candidates for the correct tier of examination. Weaker candidates that are entered for Higher Tier papers do not have a pleasant experience and find many of the questions too difficult to attempt.

The majority of candidates taking the new Biology papers in this session performed extremely well with, as to be expected, the longer six mark free response questions proving to be the most challenging. It was intended that candidates should feel that they had a positive experience in taking the examinations and it would seem that this proved to be the case. The papers were constructed to allow candidates to feel that they had every opportunity to demonstrate their knowledge and understanding while at the same time discriminating between candidates of differing abilities.

Candidates seemed to find the papers accessible and demonstrated sound knowledge and understanding of the course content. It was clear that candidates had been well prepared by their Centres. Questions towards the end of the papers were answered equally as well as questions at the beginning of the paper indicating that there was no evidence that candidates ran out of time, nor was there any evidence that candidates had been disadvantaged by language or cultural issues.

As always, there are lessons to be learned and specific points relating to each paper are picked up in the individual reports from each Principle Examiner. Some issues however occurred across the suite of papers and these are detailed below.

Candidates are well advised to read questions carefully. Each year a number of candidates lose marks unnecessarily because of their haste to complete the paper. It cannot be stressed too strongly that reading and re-reading the question is time well spent. Candidates would also be advised to pay similar attention to their answers. Answers should always be re-read to ensure that they do indeed answer the question on the examination paper. It was noted by some Principal Examiners that failure to re-read their answers had resulted in contradictions in some candidate's responses. This is a simple error that can be avoided. Re-reading answers also helps to avoid vague or imprecise answers. The use of the words "they" and "it" often do not clearly identify what the candidates are writing about. Re-reading highlights these issues to the candidates who can then correct them.

The use of questions that required extended answers proved to be challenging for many candidates. This challenge has increased in the new papers with three longer, six mark questions. All too often candidates answered the question by re-writing the question before starting their answer. This resulted in two problems for the candidates; running out of space in which to answer the question; then thinking that by writing out the question they had in fact answered it. This meant that some candidates either failed to score or performed badly on extended answer questions. It was clear however that most Centres are encouraging candidates to write more than in previous years. However, Centres and candidates should be aware that examination papers are scanned and marked online. Candidates who write out of designated

areas are at risk of their answers not being fully marked. This worrying trend has increased with the introduction of the three, six mark questions. Candidates would be well advised to ensure that they use the appropriate answer lines and spaces in which to write their responses. This is often exacerbated by candidates crossing out initial incorrect responses, and then cramming the answer into a much smaller space. This is another good reason why candidates should think carefully before beginning to answer the question.

When answering questions that include numerical calculations, candidates are always asked to show their working. It is vital that they do this. Candidates are very good at answering calculation questions intuitively or performing simple mental arithmetic and then writing down the answer. Providing the answer is correct, this is not a problem as they will gain full marks. However it is a very risky strategy. A simple mistake in their mental calculations will lose them all of the marks. If candidates had written down their working, the chances are that they would have salvaged at least one of the marks available for the question.

Candidates, particularly at foundation level, had a tendency to leave some questions blank where they had difficulty answering. This was particularly noticeable in questions that required longer answers. Leaving questions blank will guarantee that they get no marks for the question. At least attempting the questions opens up the opportunity of them scoring some of the available marks. Candidates should be encouraged to at least make an attempt with every question. Centres will be well aware that many of the questions in these papers consist of “Put ticks (✓) in the boxes next to the correct answers.” In order to increase the degree of difficulty of higher tier questions, candidates are not always told how many correct responses are required. The more astute candidates may well look to see how many marks the question is worth and then assume that the number of marks available for the question, must match the number of correct responses required. This is not necessarily the case. Some questions will award one mark for two correct responses. Some may award two marks for three correct responses. Candidates must be advised to answer each of these questions on their merit and place ticks next to those answers that they think are correct.

Controlled Assessment was not assessable for GCSE Biology this session but Centres need to remember that next summer, tasks will be set by OCR under the new Controlled Assessment procedures and Centres must check the new unit entry codes and other requirements.
The following reports provide more detail on how candidates performed on specific papers, highlighting areas of concern and applauding improvements from previous years. It is hoped that this trend will continue.

Please encourage your staff to read these reports and use them to inform their teaching.
The reports are available on line at www.ocr.org.uk

A161/01 Modules B1, B2, B3 (Foundation Tier)

General Comments

This is the second time the new specification A161/01 examination has been set. The examination was demanding but most candidates were clearly well prepared, there were very few misinterpretations of rubric. However, particularly in question 5, candidates would benefit from a better reading of the information presented in the question stem and it is recommended that Centres focus on this skill in preparation for examinations. Generally the candidates' confidence was shown by there being fewer no responses and even the rigorous longer six mark questions were well attempted, usually within the spaces provided. These questions gave candidates the opportunity to demonstrate their knowledge and understanding. As might be expected at this level there was good knowledge of key terms and genetic diagrams were well known by the vast majority of candidates but explanations were often confused or unclear. Explaining natural selection proved particularly problematic for most candidates. There was no indication that running out of time was an issue for candidates.

Comments on Individual Questions

1 (a) The terms dominant and recessive were well known, as was that there are pairs of chromosomes in body cells. However, that sex cells only contain one allele was less well understood.

1 (b) Most candidates showed an incomplete knowledge of the relationship between DNA, genes, chromosomes and characteristics. Often candidates who knew chromosomes are very long DNA molecules did not also know genes are sections of these long molecules, or *vice versa*. This suggests further concentration on these ideas would benefit candidates.

1 (c) Many candidates could correctly draw a Punnet Square, although a few candidates used incorrect letters e.g. X and Y, or failed to show that the fertilised egg cell contained two copies of the gene. A few candidates produced alternative diagrams, most of which were incorrect. However, explanations were often very confused; many assumed that "a" alleles were faulty and would lead to genetic disorders. Candidates often stated there was a 75% chance of inheriting a dominant allele and 25% get a recessive allele, even though they had clearly shown the alleles in their diagrams.

1 (d) (i) Most candidates managed to spot a mistake, usually that it is not possible to predict exactly when someone will get a disease, but rarely gained the second mark by going on to explain why. Very few candidates recognised that some diseases are not genetic but caused by pathogens.

1 (d) (ii) This question was well answered with many candidates getting one mark for one argument without going on to give a second argument even though there were clearly two marks for the question.

2 (a) This question proved to be difficult for most candidates. Embryonic stem cells can develop into all cell types whereas adult stem cells cannot was not well known.

2 (b) This question discriminated well with many candidates understanding the role of the environment. Fewer candidates could explain the effect of having identical alleles, often saying only that the twins came from the same egg or sperm. Better candidates were able to explain both factors clearly.

2 (c) (i) Few candidates spotted that the difference between the heights of pairs of identical twins was less than between sets of twins. However, many gained marks for stating that identical twins were not always identical heights.

2 (c) (ii) Many candidates suggested the study could be improved by measuring more twins but few went on to suggest other improvements such as measuring non-identical twins or female identical twins so three marks were rarely awarded.

3 (a) This question discriminated well with better candidates being able to identify the two correct answers. A commonly chosen incorrect answer was “other microorganisms that take advantage of the situation”.

3 (b) Most answers contained too little detail to gain Level 3 marks. Where technical vocabulary was used there was considerable confusion particularly between antigen and antibody. References to the use of medication were surprisingly common.

3 (c) The idea that the benefit outweighs the risk was rare. Some candidates gave details of how new drugs are tested.

3 (d) (i) Many candidates did not understand the meaning of severity.

3 (d) (ii) Describing the correlation proved to be difficult for many candidates who offered an explanation rather than a straightforward description.

3 (d) (iii) Many candidates were confused by the historical nature of the question and answered in terms of more package holidays to Spain than Russia.

4 (a) Very few candidates knew the term homeostasis.

4 (b) This question was well answered with many candidates gaining full marks. The most common error was putting effector first in the diagram.

4 (c) (i) This question was well answered with most candidates picking at least three correct words from the diary; respiration was the one most commonly missed.

4 (c) (ii) This proved to be a very difficult question with very few candidates realising that the suggested test would give no indication of how much water will be lost during the race.

5 (a) Only the better candidates knew the term species.

5 (b) (i) This question was very poorly answered. Many candidates were unable to explain natural selection. Many candidates did not mention the role of predators, many mixed up predators and prey, and fewer still described the importance of surviving long enough to pass on genes and so successful characteristics. Repeating the information on camouflage from the stem of the question was often the only thing discussed.

5 (b) (ii) Again candidates struggled to explain the role of predators and survival of the best adapted individuals. Many candidates ignored the information in the stem of the question and suggested that soot killed moths or that they didn’t like it so left only to return when they had got used to the pollution.

5 (b) (iii) Energy losses from food chains were not well known by the majority of candidates.

A161/02 Modules B1, B2, B3 (Higher Tier)

General Comments

This was the second of the new series of examination papers that included longer six mark questions. Most candidates seemed to be well prepared for these questions and made a very good attempt at answering them. This resulted in almost all candidates scoring some marks on these questions with a few managing to score Level 3 marks.

However the trend for candidates to write outside the allocated areas is increasing. All too often candidates write in any white space that they can find. This is nearly always caused as a result of the candidate failing to think the answer through before commencing to write. It is common to see most of the lines allocated filled with a repeat of the question before the candidate even begins to answer it. This is a very dangerous practice that is on the increase. Due to the fact that these scripts are marked electronically, examiners do not see the whole page by default and unless there is some indication that the candidate has written outside the allocated window, it is possible that the examiner will fail to spot additional text and the candidate could lose marks. It cannot be stressed too strongly that candidates should attempt to contain their answer in the space provided.

The paper was suitably challenging and discriminated well between candidates. Very few sections were unanswered suggesting that the paper was accessible to most candidates. The length of the paper is sixty marks but there was no evidence that any of the candidates ran out of time. It was also pleasing to see a decrease in the number of no-responses.

Comments on Individual Questions

1 (a) (i) This proved to be an easy start to the paper with most candidates scoring the single mark.

1 (a) (ii) This proved to be more challenging with only the most able scoring all three marks. Credit was given for Mary and Dave, Pete and Liz, and Jane. Candidates that listed eight or more names, failed to score even when giving the correct answers.

1 (a) (iii) This was answered well with most candidates scoring two marks. Candidates were not told that there were three correct responses. Any additional incorrect responses resulted in losing one of the marks allocated for a correct response.

1 (b) (i) This was generally well answered. Candidates were given credit for stating that males lived longer than females, that the survival ages were increasing, or that the age gap between males and females was decreasing. Correct reference to a part of the graph that was date related was also given credit.

1 (b) (ii) This required candidates to extrapolate the graph. Good answers that scored both marks related their prediction to an explanation. Answers such as “they will continue to rise because of improving health care” scored both marks. It is important that candidates identify command (trigger) words such as ‘predict’ and ‘explain’ and structure their response accordingly.

2 This was the first of the six mark questions. It is most pleasing to see that the vast majority of candidates engaged with these questions and scored marks. Good answers included several well described implications of genetic testing to both individuals and society as a whole. Clearly most Centres are rehearsing their candidates well in this section of the specification and good answers included risk, making choices, false results, freedom of information, insurance, job implications, morals and ethics.

3 (a) This was another multiple choice question but was only correctly answered by the more able candidates even though candidates were informed of how many responses were required. Able candidates correctly identified damage done to cells and the production of toxins.

3 (b) This was the second six mark question. Most candidates answered this question very well and some scored all Level 3 marks. Good answers included a clear account of the mechanism to include the role of white blood cells, antibodies and antigens. Good answers then went on to explain immunity in terms of specificity, memory cells and rapid response. More able candidates also thought the question through and structured their response before beginning to write. This was time well spent and all candidates should be encouraged to answer questions that require extended answers in this way.

3 (c) This was not so well answered. Candidates who stated that the benefits outweigh the risk and stated that lots of lives could be saved scored both marks. Vague answers referred to how dangerous the drug was or that cancer killed people and these responses did not score.

3 (d) (i) This should have been an easy question. Candidates were required to say something about how bad the flu is. However all too often candidates simply repeated the question and stated how severe the flu is and this was not credited.

3 (d) (ii) Candidates are getting better at describing a correlation. Most scored by stating that the greater the fatality rate the more deaths there were. The converse argument was also credited i.e. the fewer deaths, the lower the fatality rate. However some candidates failed to gain credit because they stated that this was a negative correlation. Candidates need to be instructed in the difference between a negative and a positive correlation. Candidates that simply stated it was a positive correlation were given credit.

3 (d) (iii) Credit was not given for any reference to vaccinations, mutations, climate or immunity. Good answers included people travelling less, living in remote locations, virus was less severe, smaller populations or epidemic lasted for a shorter time.

4 (a) Candidates tended to score either one mark or all three marks. It was pleasing to see that most candidates understand the idea of an open-label trial.

4 (b) This was generally well answered with few candidates not scoring at least one of the marks. Credit was given for firstly testing on human cells or tissues, then on healthy individuals, and finally on people with heart disease.

4 (c) This was the third six mark question. This question was targeted at grade A candidates and it did indeed prove to be a challenging question. Candidates who were answering at Level 1 tended to give answers based on benefit and risk. Good Level 2 answers referred to cost, life style choices as a way of treating heart disease, and giving healthy people a drug with possible side effects. Level 3 answers included the ethics of treating healthy people, that this was a question that science alone could not answer and argued whether the money should be spent on other medical resources, to benefit more people.

4 (d) (i) This was intended to be an easier question after the difficult six mark question. Most candidates correctly drew the bar on the graph to score the mark.

4 (d) (ii) Most candidates identified the correct answer as African-American.

4 (d) (iii) Most correctly stated two factors from a long list in the mark scheme. Answers that simply stated life style, health and environment were not credited.

4 (d) (iv) This was well answered with responses such as more exercise and better diet scoring marks.

5 (a) (i) This was not particularly well answered. Most candidates gave the appearance of simply guessing, which although is better than a no response, does not usually score the mark. Correct answers were when the F was written close to the second two down-arrows from the atmosphere.

5 (a) (ii) Correct answers were when the D was written below ground level on the right hand side of the image, close to the up-arrow. Candidates that wrote multiple letters were not credited.

5 (a) (iii) This was not well answered. Incorrect answers often included plants or the cow. Correct answers referred to microorganisms or bacteria.

5 (b) Most candidates managed to score at least one mark by stating photosynthesis or respiration.

5 (c) (i) Most candidates scored the first mark for stating that the carbon dioxide levels were increasing each year. However very few went on to say that the level both increased and decreased within each year.

5 (c) (ii) Credit was given for stating that advantages were that data was collected over a long period of time and for the idea that on a high mountain the data would not be affected by local pollution. The disadvantages included the idea that data was being collected from only one location and that this location was not typical of other areas across the globe.

5 (c) (iii) This was not answered well. Credit was given for either photosynthesis takes place in the summer and this absorbs carbon dioxide, or that more fossil fuels are burnt in the winter and that this releases carbon dioxide. Any examples that were not directly related to seasonal yearly changes were not credited as they did not match the changes shown by the graph.

A162/01 Modules B4, B5, B6 (Foundation Tier)

General Comments

Many candidates that sat this paper demonstrated a wide range of knowledge of the biology covered by this paper. Most completed the paper in the allocated time. There were several opportunities for candidates to show how to apply their knowledge in the Level of Response questions. It is important that candidates know that in order to access the higher levels they must answer all sections of the question set and it is not sufficient to repeat sections from the stem of the question without adding further detail. Many responses given in the extended questions were superficial and in order to improve, future candidates would do well to practise these questions, ordering their answers with sufficient detail to achieve the allocated marks.

Comments on Individual Questions

1 (a) (i) This question indicates the importance of showing "working out" as many candidates only wrote down the calculated percentage and when this is incorrect Examiners can often give credit for the correct use of formula even when the final answer is not correctly calculated.

1 (a) (ii) This question was testing candidates' ability to comment on the results of the experiment given. Many candidates knew that the answer to part a(i) supported the conclusion, however only half were able to explain why it supported the conclusion.

1 (b) In this question candidates had to choose two words from the list. In many cases where the mark was not awarded candidates had only written down one response rather than the two responses required for the mark.

1 (c) This was the first of the Level of Response questions. Candidates need to be reminded that in order to access the higher level marks in these questions all sections of the question must be addressed. In this particular question many candidates answered without mentioning any of the neurons involved and were therefore unable to access the higher levels. With such a question candidates are advised to practise what would be required for a higher Level of Response answer by sequencing their answers and ensuring all sections within the question have been covered.

2 (a) This was a well answered question and many candidates knew that a synapse was a gap between two adjacent neurons.

2 (b) (i) Many candidates were able to calculate the mean dose of the drug in trial B.

2 (b) (ii) Many candidates understood that trial B would block the reabsorption of serotonin as the mean dose was greater than 10mg.

2 (b) (iii) Most candidates found this question difficult. That the serotonin had not been reabsorbed was not appreciated.

2 (c) Candidates were asked to suggest an advantage/disadvantage of each method of mapping the brain. Answers to this question were very general and "playing God" was common as an ethical issue.

3 (a) (i) This was a well answered question and many were able to calculate the rate of reaction.

3 (a) (ii) Many candidates understood the term “optimum temperature” and were able to access this mark.

3 (a) (iii) Many candidates were able to score one mark on this question. This was normally for the rate of reaction dropping. Only some of the candidates were able to further develop this and describe the rate as levelling off. Some candidates explained why the rate dropped rather than describing the shape.

3 (b) This was a well answered question and some candidates who had lost the **a(ii)** mark scored on this section as an error carried forward.

4 (a) In this question, candidates had to choose correct responses to complete three separate sentences. It was encouraging to see that most scored at least one mark and many scored two marks. The response “chlorophyll” in the first sentence was the usual correct response.

4 (b) (i) Candidates who scored at least one mark in this question understood that a bigger leaf would have more chlorophyll or would be able to absorb more light. Only a few candidates were able to link this to the consequence of having more chlorophyll /absorbing more light.

4 (b) (ii) As Tom’s experiment was based on the leaves hanging down into test-tubes containing indicator solution it was surprising to see many candidates writing down light/water as the limiting factor in this experiment.

4 (b) (iii) Although less than half of the candidates were able to explain why Tom would repeat his experiment several times, those that did understood that this would allow him to identify outliers or anomalous data.

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4 (c) This question was not particularly well answered.

5 (a) (i) This question required candidates to complete the WORD equation for aerobic respiration and most followed the rubric writing words in the spaces rather than symbols. Many knew that oxygen was the reactant and that carbon dioxide was the product. Candidates scoring only one mark tended to write oxygen as their correct response.

5 (a) (ii) This question required candidates to complete the anaerobic word equation in yeast. Just under half of the candidates were able to identify that glucose was the only reactant or that the product was ethanol. Many candidates wrote down lactic acid as the product.

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5 (b) This was well answered, many candidates scoring both marks.

5 (c) This was the second Level of Response question on the paper, requiring candidates to link the properties of the structures to their role in aerobic and anaerobic respiration. Very few were able to answer this question and many repeated sections of the stem of the question without adding any more detail.

6 (a) Candidates scored at least one mark on this question, many scoring two. Candidates need to be reminded that describing results does not require them to be explained.

6 **(b)** It was encouraging to see that candidates were able to apply their knowledge to this novel situation.

7 **(a)** The third Level of Response question proved difficult for the majority of candidates. Many thought process A was mitosis and process B was meiosis and described the different stages of both. Process A is growth; process B is mitosis.

7 **(b)** This was poorly answered with many candidates discussing liver cells producing liver proteins and kidney cells producing kidney proteins.

A162/02 Modules B4, B5, B6 (Higher Tier)

General Comments

The paper was accessible to the majority of candidates. The free-response items were particularly challenging for many candidates. However, the most able candidates provided clear responses, presented in a logical order and based on a sound understanding of the concepts involved. Many candidates continued to use the space below the dotted lines provided for answers. This was not necessary and did not enable candidates to achieve more marks in many cases.

The majority of questions did not appear to generate errors due to the misinterpretation of instructions or rubric. Many candidates appear to have been well-prepared for this paper and completed all questions. Relatively few candidates changed their responses by crossing out initial attempts, particularly for objective questions involving the ticking of boxes. Candidates appeared to have sufficient time to complete the paper and the number of 'no responses' was relatively limited.

Comments on Individual Questions

1 (a) Although many candidates realised that the retina held the receptors in the eye, a number of candidates chose the iris or lens.

1 (b) Most candidates selected the correct response. An alternative pattern of responses was not identified.

1 (c) Some candidates recognised that the axon was involved but chose 'fast' rather than 'slowly'. It is possible that they misinterpreted the sentences.

1 (d) (i) Candidates occasionally understood that a shorter distance is involved or that the brain is not associated with this feature but many failed to obtain the mark.

1 (d) (ii) It was unfortunate that many candidates did not respond fully to this item and struggled to identify the impact of damage to the spinal cord. Some were well-informed about the nature of the spinal reflex arc but many had an incomplete picture of the series of events involved.

2 (a) Most candidates selected the correct response. An alternative pattern of responses was not identified.

2 (b) A number of candidates rewrote the stem of this item in their response without any additional details. Responses indicated that candidates struggled to articulate their understanding of the unidirectional nature of the synapse. Some candidates considered that it is the 'impulse' that is secreted across the synapse.

2 (c) (i) This item did not present any problems for most candidates. They were able to identify trial B but occasionally failed to link this to the data provided in the table.

2 (c) (ii) This item was also well understood and candidates realised that the serotonin had collected in the synapses.

2 (c) (iii) Again, this objective item enabled most candidates to select the correct responses.

2 (d) Most candidates were fully aware of the techniques used to investigate brain structure and realised that many carried a risk. However, some candidates described brain surgery and considered that this was a technique used.

3 (a) Most candidates selected the correct response. Some candidates, however, calculated the difference between the two values.

3 (b) (i) The detailed response involved the full description, including the levelling off at zero. This was not appreciated by many candidates.

3 (b) (ii) Many candidates gave good descriptions of change in enzyme shape, denaturation, mismatch between substrate and active site and reduction in enzyme reaction rate. Not all details were included in some responses.

3 (c) It was reassuring to see that many candidates correctly identified pH with a good account of how this affects enzymes. Most referred to denaturation.

4 (a) This item presented a difficulty for most candidates. Those who correctly selected the right colours placed them in the incorrect order in their response. The item did require a number of steps before arriving at the correct conclusion.

4 (b) Many candidates gave a good and full response to this item but some, unfortunately, considered that the mesh prevented the diffusion of carbon dioxide into and out of the test tube.

4 (c) Most candidates selected the correct response. An alternative pattern of responses was not identified.

4 (d) Candidates tended to miss the link between the adaptation to dark conditions and the change in carbon dioxide levels. However, many appreciated that the leaves were ‘used to’ low light.

5 (a) (i) Most candidates selected the correct response. Some included lactic acid rather than ethanol.

5 (a) (ii) The overall pattern of responses showed a division in relation to this item. Some candidates recalled the balanced equation without a fault but others struggled and gave incomplete formulae and/or word equations.

5 (b) (i) Many confused cell membrane with cell wall and other responses referred to cytoplasm (or chloroplasts) instead of mitochondria.

5 (b) (ii) It was good to observe the way in which many candidates took the information provided in the table and linked it to their knowledge and understanding of aerobic and anaerobic respiration. They were able to consider each structure in a logical sequence and some candidates obtained all Level 3 marks. Others, unfortunately, repeated the information and struggled to make the correct links.

6 (a) Most candidates selected the correct response. An alternative pattern of responses was not identified.

6 (b) Most candidates selected the correct response. An alternative pattern of responses was not identified. However, some candidates selected the final option instead of the first.

6 (c) Most candidates selected the correct response. An alternative pattern of responses was not identified.

6 (d) Many candidates showed a good understanding of the process involved in this question and some gave additional and more demanding details. There was, in general, a good explanation of the coded message and DNA. It was unfortunate that some candidates were unable to progress through the question due to a misunderstanding about the location of protein synthesis or due to incorrect descriptions of bases located 'within' proteins.

7 (a) (i) Many candidates understood the link between auxin and the promotion of shoot growth/extension. However, most did not describe the equal distribution of auxin at the shoot tip under such conditions.

7 (a) (ii) Most candidates realised that the shoots would grow to face the other direction and some were able to link this to the redistribution of auxin. Unfortunately some candidates considered that auxin was destroyed by light.

7 (b) Most candidates selected the correct response because they realised that the Sun is moving through the sky in the garden and often included responses with reference to shading from plants and the pattern of light between daytime and evening.

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