

Environmental and Land-Based Science

General Certificate of Secondary Education **GCSE J650**

Report on the Units

June 2010

J650/R/10

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

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Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

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B491/01 Plant Cultivation, Foundation Tier

General comments

All candidates answered the exam on paper rather than on line and unfortunately some of the photographs did not appear as clear as they would on-screen. This was taken into account when marking the papers.

Most students wrote in extended prose where the question required it and there were very few no responses.

Comments on individual questions

The first six questions were objective questions. Question 2 and 6 were common with the higher paper.

- 1 This question, targeted at low demand, was aimed at providing an 'easy' lead into the paper. Most candidates correctly identified 'water' as required for seed germination but many struggled with 'oxygen'. Many candidates linked plants with photosynthesis and so gave 'light' as the second requirement whilst a significant minority thought that 'compost' was needed.
- 2 This overlap question differentiated well. Good candidates understood that 'pollen' was a gamete and therefore contained half the number of chromosomes of a somatic cell. The rest of the candidates clearly guessed because the three remaining answers were chosen with equal frequency.
- 3 A large number of candidates interpreted the diagrams correctly and were able to match up the organ of asexual reproduction with the diagram. Most candidates correctly identified the 'bulb' but a significant number failed to recognise the 'runner' and the 'rhizome'.
- 4 Candidates found this question challenging and are still failing to identify which tools should be used for basic cultivation tasks. Few candidates scored all three marks although most gained at least one.
- 5 An easy question with a good visual cue that most candidates were able to interpret as pest damage. A small number of candidates are still failing to understand the difference between a pest and a disease so this was the best distracter.
- 6 This question was poorly answered suggesting that candidates still do not understand the basic differences between organic and inorganic fertilisers. Each of the three wrong answers was chosen with equal frequency suggesting that there is no common misconception.

Questions 7 to 14 were short answer questions. Questions 7, 8 and 13 were common with the higher paper.

- 7 This was also poorly answered on the whole with some candidates failing to interpret the question and writing about the best conditions for growing carrots. Many other candidates merely wrote down the conditions for storage without an explanation, despite the question emphasising that both were needed. Of those candidates that did answer the question correctly there were a lot of low level responses such as the carrots 'going off' or

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'becoming mushy'. A small number of students gave some excellent responses using the correct scientific terms.

- 8 Most candidates made an attempt to explain the advantages of the planting pattern however a significant minority had not read the question carefully and so wrote about the growth of the sweet corn. Too many candidates still get confused between pollen and seeds and use these terms interchangeably. A few good candidates used the correct technical terms mentioning anthers and stigmas but credit was given to ideas about the efficiency of pollen transfer.
- 9(a) Many candidates gained both marks on this question with some using technical terms such as 'tilth'. However a large number were still using rakes for weeding.
- 9(b) Most candidates gained at least one mark on this question, being able to interpret the diagram and recognise the hazards. Care must be taken that candidates do not put the same marking point twice merely wording it slightly differently.
- 10 Due to the nature of the shading on the seed packet it does appear on the paper that the beans could be planted out in both March and June so both responses were accepted. The most common mistake was to interpret **M** as May and not March.
- 11 Most candidates were able to interpret the table correctly and gained a mark on this question.
- 12 This was well answered on the whole with most candidates identifying 'Gardeners Delight' as the best choice. Some candidates failed to achieve the second mark because they either did not give three reasons or they mentioned information that was not relevant such as taste.
- 13 Most candidates scored at least one mark on this question. They were able to interpret the data and conclude that more weeds grew when the carrots were further apart. The better candidates also extended their answers to explain about competition. Fewer candidates picked up the obvious fact that there were more carrots planted if they were closer together. A significant minority failed to interpret the data and merely quoted figures for yield and % cover from the table without using these figures.
- 14 Most candidates either gained both marks on this question or failed to score. The candidates that failed to score misinterpreted the term nutrient and instead listed 'carbon dioxide', 'water', 'light' etc as conditions needed for healthy plant growth.

Questions 15, 16 and 17 required longer responses. Question 16 was common with the higher paper.

- 15(a) This question was poorly answered as usual. Most candidates do not know the basic structure of a flower and get confused between seeds and pollen. Candidates often wrote about the leaves suggesting that they had misunderstood what the diagram was showing.
- 15(b) Few candidates gained even the easy marks relating to bright/scented petals and the presence of nectaries due to the black and white nature of the diagram and consequently an inability to interpret it.
- 16 Those candidates who read the question carefully scored well on this paper with a wide range of answers being accepted from yield to species of plant grown. However many candidates read the part about ICT and automatically wrote about sensors controlling humidity, light, temperature etc.

- 17 Few candidates gained all three marks on this question despite it being targeted at E/F/G level and requiring only basic knowledge. A significant minority are still responding with single word answers despite the room being given for extended prose. Marks were lost if candidates gave vague answers such as 'good colour' rather than being specific and mentioning green leaves. No marks were awarded for comments on the shape or height of the plant because this is dependant on the species and students had to qualify responses about fruits and flowers by writing that there would be lots of them rather than they would just be present.

B491/02 Plant Cultivation, Higher Tier

General comments

Many candidates are still being inappropriately entered for this paper without any real grasp of the scientific or practical aspects of plant cultivation. Consequently they were scoring very low marks.

The first six questions were objective questions. Questions 2 and 6 were common with the foundation paper.

Comments on individual questions

- 1 Few candidates scored both marks on this question. Many candidates have a good understanding of why plants need the three macro nutrients N, P, K but they are less confident in identifying deficiency symptoms. Potassium caused the most confusion because candidates were looking for some reference to fruits and flowers.
- 2 This overlap question differentiated well. Good candidates understood that pollen was a gamete and therefore contained half the number of chromosomes of a somatic cell. The rest of the candidates clearly guessed because the three remaining answers were chosen with equal frequency.
- 3 Few candidates understood the process of fertilisation in flowering plants. The most common misconceptions were that the entire pollen grain passed down the pollen tube rather than just the nucleus. In addition, few candidates knew that the ovary developed into the fruit after fertilisation and the three other answers were chosen with equal frequency. Most candidates gained a mark for correctly identifying that the ovule is fertilised.
- 4 This was a good discriminator because many candidates did not read the question carefully enough to realise that lime **increases** soil pH making response **A** incorrect. **B** and **C** acted as strong distracters.
- 5 Candidates still find the topic of asexual reproduction a difficult one and in particular rhizomes. Few candidates correctly identified the rhizome in the photo but those that did, on the whole, managed to pick the correct method of artificial propagation.
- 6 This question was poorly answered suggesting that candidates still do not understand the basic differences between organic and inorganic fertilisers. 'Does not cause pollution' was the most common misconception amongst higher tier students so this acted as a strong distracter.

Questions 7 to 14 were short answer questions. Questions 7, 8 and 10b were common with the foundation paper.

- 7 This question was poorly answered on the whole with some candidates failing to interpret the question and writing about the best conditions for growing carrots. Many other candidates merely wrote down the conditions for storage without an explanation despite the question emphasising that both were needed. Of those candidates that did answer the question correctly there were a lot of low level responses such as the carrots 'going off' or 'becoming mushy'. A small number of students gave some excellent responses using the correct scientific terms.

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- 8 Most candidates made an attempt to explain the advantages of the planting pattern however a significant minority had not read the question carefully and so wrote about the growth of the sweet corn. Too many candidates still get confused between pollen and seeds and use these terms interchangeably. A few good candidates used the correct technical terms mentioning anthers and stigmas but credit was given to ideas about the efficiency of pollen transfer.
- 9(a) Most candidates were able to carry out this simple calculation although a significant minority suggested that the gardener could buy 9 packets of seeds because they rounded up, not down. There were a lot of candidates who were writing out long sums on the paper suggesting that they had not taken calculators into the exam.
- 9(b) Some candidates lost marks on this question either because they forgot the gardener had bought 8 packets of seeds and worked out the percentage for just one packet, or that they did not read the seed packet and missed the percentage germination information altogether.
- 10(a) This question was well answered on the whole. Marks were often lost however because candidates failed to read the question carefully and stated the relationship between row spacing and weeds instead of carrot yield.
- 10(b) Most candidates scored at least one mark on this question. They were able to interpret the data and conclude that more weeds grew when the carrots were further apart. The better candidates also extended their answers to explain about competition. Fewer candidates picked up the obvious fact that there were more carrots planted if they were closer together. A significant minority failed to interpret the data and merely quoted figures for yield and percentage cover from the table without using these figures.
- 11 Despite the fact that the calculation was shown, many candidates were unaware of how to work out a percentage increase. All answers were given with equal frequency suggesting that in many cases candidates merely guessed at the answer.
- 12 Many candidates gained both marks on this question. They were able to interpret information on the fertiliser bags and recognise that carrots would need high levels of phosphates. The most common misconception was that fertiliser **C** would be best because it contained high levels of all three nutrients.
- 13(a) There was a high level of 'no responses' for this question and few candidates that did answer it were able to explain the meaning of the term phenotype despite it being on the specification.
- 13(b) Again, there were a large number of no responses. In addition, some of the candidates that did attempt an answer used terms like 'dominant' and 'recessive' without mentioning genes. There were some excellent answers which included environmental influences as well as genotype.
- 14 A significant number of candidates could not identify structure **X** or explain its function. Some candidates named it incorrectly but managed to gain a mark for the correct function. Candidates are still getting confused between the terms pollen and seed showing that they do not fully understand the process of sexual reproduction in flowering plants.

Questions 15 to 18 required longer responses. Question 17 was common with the foundation paper.

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- 15 This question was higher demand and those candidates that attempted it did so very well. They managed to work out the crosses and determine the results of self pollination. They also understood the terms genotype and phenotype and used these correctly. However, many candidates either gave very low level answers or left it blank as a no response.
- 16 This was not answered very well by most candidates despite the question testing knowledge directly from the specification. A large number of candidates clearly did not understand the term 'humidity' and wrote about the effect of temperature on plant growth. The majority of those candidates who did understand the term gave very low level answers with plants 'drying out' or 'drowning'. A small number gave excellent responses, correctly identifying the problem of increased fungal infections and the effect on transpiration. However, candidates must take care that they do not imply that fungal infections only occur in high humidity.
- 17 Those candidates who read the question carefully scored well with a wide range of answers being accepted from yield to species of plant grown. However many candidates read the part about ICT and automatically wrote about sensors controlling humidity, light, temperature etc.
- 18 Again this was poorly answered because candidates did not read the question carefully. Few responses referred to how environmental monitoring could save money and/or improve efficiency. Responses that included the use of sensors, such as light probes, needed to expand on this to mention how they could either be used to increase the rate of photosynthesis and therefore growth or, that they would ensure lights were only switched on when levels dropped enough to inhibit photosynthesis, thus saving money.

B492/1 Amenity Horticulture, Foundation Tier

General comments

The B492 papers have a specific focus on the commercial aspects of horticulture and look at the application of science within this context. While the number of candidates who are entered for this paper is smaller than some of the other units, it is pleasing to see that there is increasing evidence that candidates are being prepared with this commercial focus.

The Foundation and Higher papers are designed to have some questions in common to allow for comparison. It is noted however that there was still a distinct difference in level of articulation on common questions between the two papers. The questions asked fell into four categories: objective, short answer, data analysis and extended writing.

It should be noted that questions requiring suggestions and opinions do require factual support. Superficial answers did not gain credit. Awareness of the mark allocation is also important in such questions. These often have 3 marks which indicate that more than one idea or comment is needed and that elaboration is required.

It is particularly pleasing to see that there is evidence of candidates being prepared to answer questions right across the specification although there still seems to be some gaps in knowledge from candidates linked to certain centres. Specific examples will be cited in the following report.

Comments about individual questions

- 1 Cloches: aimed at low demand. Many candidates were able to identify that the main benefit was to provide warmer conditions for germination.
- 2 Reasons for potting on a plant: an overlap question which was clearly less well understood. Many candidates erroneously selected that potting on encouraged side shoot development rather than the correct answer of providing more nutrients.
- 3 Life cycle: stronger candidates were more likely to give the correct answer of 'biennial'.
- 4 Type of mower: a better answered question than in previous papers. Candidates, on the whole, were able to identify that the mower shown did not have wheels so therefore was a 'hover'.
- 5 Selling of plants: directly related to the commercial aspect of the specification. Stronger candidates understood the need to market the product by price labelling and getting staff to talk to customers about the plants.
- 6 Signs of over-watering: a concept not so well understood by candidates. (This was an overlap question with the Higher Tier paper)
- 7 Identification of hazards: well answered by most candidates. Even those who were reluctant to write much on the paper were able to show their knowledge on this question.
- 8 Regrowing of plants in old soil: it is pleasing to see more confident responses from candidates than when similar questions have been set in the past. Weak candidates often spoke about "the soil being old" which was not given credit. Stronger candidates identified both the likelihood of a shortage of nutrients and the build up of pests or diseases.

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- 9 Positioning of a greenhouse: some good responses but also a range of more generalist answers which did not gain marks.
- 10 Name two plants for tubs: a free response with a broad range of possible answers. All considered on their merit but tulips and daffodils were rejected (wrong season). Candidates were allowed either latin or common names. Stronger candidates did well on this question although certain centres appeared to perform badly suggesting a greater emphasis needs to be given here.
- 11 Choosing a tree: again a free response question, this time common with the Higher Tier paper. As with question 10, some centres had difficulty in naming a tree. Some responses were rejected as being too generalist, "fir tree" for example, as many could be unsuitable. Some candidates were able to name a tree but not give an additional reason why it is suitable. Aesthetics (however expressed) would have sufficed.
- 12a & b Data response questions: a simple task of reading information from the table which was accessible to most candidates.
- 12c Data response: a more complex question requiring candidates to realise that the tallest plants were more likely the ones to need staking.
- 12d F1 hybrids: once again a concept poorly understood by the cohort.
- 13a & b Growing a crop commercially (data response): while the basic data was not too complex, some candidates had difficulty in relating this type of information to some of their other practical activities. There seemed little understanding that an activity such as hoeing (or thinning) would reduce the number of plants remaining. Often responses related back to germination.
- 14 Cutting the lawn - hazards: clearly a task that all candidates understand. Even if candidates have not attempted many questions, the topic and the picture stimulus did help most to attain 2 marks.
- 15 Making a lawn from seed: some very disappointing responses. The examiners felt they would have had difficulty in following the instructions to gain a successful result. Marks were given for remembering to water.
- 16a Asexual propagation of a tuber: (overlap question) directly from the specification but poorly understood and few marks given except for a few candidates who appeared to know a number of details suggesting they had done this as a practical task.
- 16b An easily accessible longer response question. Stronger candidates generally scored better marks identifying a range of reasons above and beyond the killing of the plant.

B492/2 Amenity Horticulture, Higher Tier

General comments

The B492 papers appear to be taken by a smaller proportion of candidates than some of the other optional papers, candidates often also taking B491. While there may be overlapping themes, the 'Amenity Horticulture' papers have a commercial focus to them placing scientific concepts into a business situation where concepts of 'profit' and saleability will also feature.

The Foundation and Higher Tier papers have some questions in common which allows comparability, although it is noted that there was significant difference in level of articulation on common questions between the two papers. Questions asked fell into four categories: objective, short answer, data analysis and extended writing.

It should be noted that questions requiring suggestions and opinions do require factual support, superficial answers do not gain credit, particularly within the commercial context. Candidates are again reminded to refer to the mark allocation for a question. This may help to indicate that more than one idea or comment is needed or that elaboration is required.

It is extremely pleasing to see that areas which previously had been perceived to be poorly covered within the specification, are now areas where candidates are gaining more marks. There are certain aspects, such as recommending plants, which are still showing weaknesses.

Previous concerns over the number of candidates incorrectly entered onto the Higher paper have been somewhat addressed but the examiners would like to remind centres to consider this carefully when making entries.

Comments on individual questions

- 1 Re-potting of houseplants: (overlap question with the Higher Tier) stronger candidates were able to identify the requirement for extra nutrients.
- 2 Peat alternatives: a basic knowledge recall question on a current 'hot' topic.
- 3 Peat alternatives: another good discriminating question, linking into current themes.
- 4 Biological control: again, well understood by stronger candidates who gained 2 marks. Most candidates were able to score 1 mark.
- 5 Retailing decisions: a concept well understood by most candidates.
- 6 Retail layout: another concept well understood. Weakest candidates opted to put a mark on an area of floor space which was rejected.
- 7 Over-watering of a houseplant (common question): a patchy response by candidates, perceived to be on a centre by centre basis.
- 8 Disadvantages of polytunnel growing: again, a patchy response.
- 9 Selection of a tree: (overlap question) generally poorly answered, Even with examples of plants in the specification this question was not answered well. Trees had to be suitable for the purpose (omitting Oak or Beech for example). The second mark was awarded for valid criteria for choice including aesthetic issues.

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- 10 ICT use: most candidates able to identify a condition although some struggled to justify why ICT was used. Although a range of responses were allowed the best candidates related issue of accuracy to the answer.
- 11 Polycarbonate: this is now a topic well-known by centres and is being taught well.
- 12 Adjustment to a hover mower: while many candidates understood the need to raise the height of the cut, only those at Higher attainment typically identified that this has to be achieved through the removal of spacers adjacent to the blade in the machine because the mower has no wheels.
- 13 Care of cut flowers: generally well answered by candidates although examiners were looking for more detail than "put them into water".
- 14 Maintenance plan for roses: most candidates understood the general concepts. Stronger candidates gave more eloquent answers. Some candidates failed to achieve full marks for a failure to say WHEN.
- 15a F1 hybrids: (overlap question) few candidates could explain the advantages of an F1 hybrid. Weaker candidates tried to relate the answer to the table.
- 15b Staking: an overlap question causing little difficulty for candidates on this paper.
- 16 Calculation-based questions: few issues, with stronger candidates able to demonstrate their knowledge and gain higher marks.
- 17 Asexual reproduction: this question was poorly answered, although those that did it well seemed to know a large amount of detail, perhaps relating to practical tasks at their centre.
- 18 A longer answer question giving candidates the chance to write at length and many did! It was clear that this is a topic taught well in many centres and the candidates were able to write with confidence implying a clear knowledge of the subject.

B493/01 Management of the Natural Environment, Foundation Tier

General Comments

Candidates were generally well prepared for this paper and the quality of response was pleasing. It was encouraging to see an attempt being made at all the questions with very few questions left blank. In the longer answer questions there was some good use of subject specific vocabulary.

The work of some candidates was poorly presented and in a few instances barely legible. In preparation for future examinations some candidates would benefit from instruction on presentation. While candidates do not lose marks for untidy presentation, writing on lines and keeping within the given space does give a better impression. Candidates would benefit from developing how to structure longer answers to questions. It was clear that many had an understanding of the ideas needed to answer these questions but were unable to gain full marks due to lack of articulation. The drafting of answers should be encouraged. If a question has three marks candidates should assume three marking points and structure the answer accordingly. One way this can be achieved is to use bullet point answers.

There was some degree of misinterpretation in certain questions. The pictures provided to illustrate questions 12, 13 and 20 were a distraction to a number of candidates. Answers given by these candidates were specific to the picture rather than the question. Answers to questions 11 and 15(a); 15(b) were often a reiteration of information given in the question. In question 21, many candidates gave good answers about the effects of monoculture but did not qualify for a mark because they were not effects on the **landscape** as asked.

Comments on individual questions

- 1 A nice easy introductory question supported with a clear photograph. Straight from the specification and targeted at low demand, virtually all candidates selected the correct answer.
- 2 A clear visual question that gave plenty of scope to get the correct answer. Candidates demonstrated a good understanding of the term 'producer' and many gained a mark. The Sun was a popular distracter and the cow, and, to a lesser extent, the rabbit, were also selected by a number of candidates. It was surprising that some candidates did not attempt to answer this question when it required no written input.
- 3 Nearly all candidates scored one mark by selecting the response; 'water'. 'Space' was the second most chosen response with the consequence that many candidates gained two marks. The distracter 'light' was chosen nearly as many times as 'space' suggesting that a number of candidates had not noticed the word **roots** in the stem of the question. Very few candidates gave 'CO₂' as a response and even fewer gave 'nitrogen gas'.
- 4 The majority of candidates scored one mark for the correct response to stage six 'compare with a colour chart'. Many gained the second mark by correctly identifying 'add distilled (deionised) water' as stage three. The other two distracters were selected in about equal numbers.

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- 5 An objective question targeted at grade F. The correct answer **B** (nitrate) was well supported. However it was almost matched in number by distracter **D**. The other two distracters were chosen infrequently.
- 6 The correct answer **C** (spraying) was the most popular choice. Distracters **A** and **D** were chosen in significant numbers while distracter **B** was hardly ever chosen. A few candidates gave two answers perhaps misinterpreting the emboldened **both** in the stem of the question.
- 7 The correct answer **C** was the most chosen response. The other three distracters were chosen in roughly equal numbers.
- 8 Candidates used all distracters in significant numbers. There was an indication that many did not know why GM crops might cause long term harm to the environment.
- 9 Most candidates appeared to have some idea about how plant roots could break up rocks during soil formation. Unfortunately many found it difficult to articulate a clear answer. As a consequence many answers were vague and sometimes ambiguous.
- 10(a) There was a wide selection of correct answers available. The main criteria for obtaining a mark was the use of an adjective such as strong, sharp, pointed, to describe the adaptation. Answers that gave a reason without the adjective, such as; 'adapted to crack open nuts' or 'so they can break food' were not credited with a mark.
- 10(b) Many adaptations were accepted as correct if qualified. The most common answers referred to camouflage. Single word answers such as wings, eyes and claws were not credited as the question asked candidates to **describe** the adaptation.
- 11 Candidates found this question difficult and there were not many correct answers. Most candidates expanded on the two advantages given in the stem of the question with answers such as; 'less labour intensive'; 'covers a bigger area'; 'saves time'. Other candidates gave answers that did not relate to the **advantages** of using a wide sprayer.
- 12 Many candidates gained a mark for the answer temperature. Fewer gained the second mark. There was too much reference to the pictures; 'in the house the chickens don't move much.' General answers about wider environmental conditions such as the weather were also commonly given.
- 13 In this question candidates took clues from the photographs so there was lots of reference to how the hedges looked, giving one mark. The second mark proved more elusive. Any references to pollution from tractors, being environmentally friendly by saving diesel or being safer were discounted.
- 14(a) There were some good answers to this question and it was pleasing to see several candidates develop the ideas of build up of toxins in a food chain. The main misconception was that the poison would kill plants.
- 14(b) Many of the candidates who got a mark for 14(a) also succeeded in getting a mark for this question. A number who gave an incorrect answer to 14(a) also failed to score on this part as they carried the error forward. The most common of these was to say it kills the plants in 14(a) and keep it away from the plants as the response to this question.
- 15(a) This question was not well answered. Candidates tended to quoted from the introductory information for the question; 'has a rich source of nitrogen' or they gave

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vague answers relating to it being natural. There were several references to not containing pesticide and not killing slugs.

- 15(b) A few candidates gave the preferred answer 'acts as a mulch.' Others gained a mark by identifying that the layer would prevent light reaching the weeds. Many just reiterated the introductory information giving answers such as 'forms a carpet layer' or 'absorbs water.'
- 16(a) Candidates showed that they were adept at reading tables. Most managed to select the correct answer of hazel dormouse to this low demand question.
- 16(b) The second question from the table was aimed at a low demand. It proved slightly more challenging and consequently there were fewer correct answers.
- 16(c) It was pleasing to see how many candidates were able to interpret a graph. The majority of candidates got this low demand question right. A number spelt 'hare' as 'hair'.
- 17 There were few correct answers to this question although most candidates attempted to provide an answer. The majority of answers were based around there not being enough data or specific data; 'you don't know how large or small the farms are'.
- 18(a) To answer this question correctly the data needed thought and manipulation. Many candidates were successful in obtaining the correct response of 'dairy'. 'Sheep' was a popular distracter. The other distracters were seldom chosen.
- 18(b) The second part of question 18 also required manipulation of data. To get the correct answer candidates had to compare two columns of data. Many selected the correct combination of dairy and sheep.
- 19 Most candidates scored one mark for identifying that fossil fuels are a finite resource. The second and third marks were more elusive although many obtained one of them with reference to the limitations of alternative sources. Candidates who wrote about global warming and green house gases were not rewarded. There were no examples of reference to increasing demand from developing countries.
- 20 In this question candidates found it difficult to score both of the available marks. Most thought the bustards should be reintroduced but were unable to articulate two clear arguments in support of their introduction. There were too many vague generalities; 'they care about birds'; 'they can look after them,' or repetition of information given in the stem of the question. Those who did not support their introduction were generally also unable to give two distinct reasons why they should not be introduced.
- 21 The final question began by asking for a definition of monoculture. Many got a mark for defining monoculture although there was a lack of precision in their answers. There were lots of good effects of monoculture, often about habitat but many of these did not answer the question which wanted some reference to the **effects on the landscape**. Too many candidates were distracted by the pictures and focused their answers exclusively on sunflowers.

B493/02 Management of the Natural Environment, Higher Tier

General Comments

Candidates were generally well prepared for this exam and there were a lot of good answers. It was pleasing to see candidates attempt all questions with very few questions left blank. The quality of science used in the longer answer questions was good. There were many examples of the use of subject specific vocabulary. Words such as sustainable, biodiversity and competition were used appropriately.

There were a minority of candidates entered for the higher paper who would have been better served by the foundation paper. The work of a few candidates was poorly presented. Candidates should be encouraged to write legibly, keep their writing on the lines and keeping within the given space. More consideration should be given to the structure of sentences in longer answer questions. Drafting answers prior to writing them on the paper would improve the quality of response. Generally the number of marks awarded for a question relates to the number of marking points. It is often good practice to bullet point each answer given. Many of the adaptations and benefits given as an answer to question eleven were not as a result of living in **exposed** places as the question asked.

Comments on individual questions

- 1 The first question, aimed at standard demand, was common to the foundation and higher paper. Virtually all candidates got the answer correct and as expected there were considerably more correct answers given by the higher tier candidates.
- 2 The second question asked candidates to identify why growing GM crops might cause long term harm to the environment. It was pleasing to see the majority of candidates getting the question right. Other distracters although seldom chosen were chosen equally.
- 3 This question on the nitrogen cycle was not particularly well answered. Candidates may have been unfamiliar with the representation as the cycle can be presented in a number of ways. Slightly more candidates got a mark for placing the **F** correctly than the **D**. This could be attributed to there being two possible places where the **F** could be marked correct. [nitrogen in the air to leguminous plants and nitrogen in the air to organic remains].
- 4 In this question candidates tended to get both answers correct or neither answer correct. This suggests that the topic may have been taught more thoroughly in some centres than others.
- 5 Candidates were obviously familiar with pyramids of numbers as many got the choice of **A** correct. Distracters **C** and **D** were chosen by a number of candidates while **B** was selected very infrequently.
- 6 This question was aimed at high demand with the expectation that it would challenge candidate's interpretation of the photograph. This proved to be the case as it did not attract many correct responses. Distracter **A** was chosen as many times as the correct answer of **D**. Distracter **C** was used the least.

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- 7 In past papers candidates have shown a good understanding of eutrophication. Responses to this question suggest that they struggled to understand the concept of the question. As a result responses **A**, **B** and **C** were chosen in equal numbers. Virtually no one selected distracter **D**.
- 8 The number of correct responses to this grade A question was pleasing. Candidates were able to demonstrate an understanding of the relationship between pH, ions and the availability of nutrients to plants. Distracter **D** was a popular second choice while distracters **A** and **B** were seldom chosen.
- 9(a) The overwhelming response was to correctly say that the bait could poison other animals. A few referred to the toxins building up in food chains. Run off from the poison getting into streams was not credited with a mark.
- 9(b) Most candidates gained a mark for this part of question 9 by suggesting that the bait should be used sparingly in the places slugs commonly frequent.
- 10(a) Many candidates gained a mark by saying that the treatment does not rely on artificial chemicals. There were a number who fell short of the mark by saying it was natural or by quoting from the information given in the question.
- 11 Many of the responses identified 'prickly' as the adaptation and 'protection' as the benefit. This does not answer the question as it is not a direct adaptation to living in exposed places. However, when the marking scheme was standardised it was agreed to give candidates credit for this answer. The anticipated response of 'preventing waterloss' was cited as a benefit by a number of candidates.
- 12 Most responses indicated that candidates understood the general concepts of competition for food or habitat. However these ideas were often poorly articulated. Unqualified generalities such as 'unbalance the ecosystem' or 'upset the food chain' were not credited.
- 13 There were not many good answers to this question. Candidates tended to discuss the effect of the tyre on the ground or repeat the stem of the question.
- 14 Candidates came up with some innovative answers but there were few good keys. As a consequence 3 marks were seldom awarded. It was pleasing to see a good understanding of soil types and their characteristics. These were usually displayed as tables. Many candidates gained one or two marks depending on the depth of information displayed in the table.
- 15(a) Candidates showed good skills at manipulating information from a table. Most got this question correct.
- 15(b) Another well answered question that required understanding of information displayed in a table. Most candidates identified the correct answers of 'dairy' and 'sheep'.
- 16(a) Although candidates were asked to show how they derived the answer to this question a mark was awarded for the correct answer without qualification. A pleasing number of candidates gave the correct answer although 'medium' was selected by a number of candidates. 'Large' was not selected by any of the candidates in the scripts marked.

- 16(b) A high demand calculation question that produced an encouraging number of correct answers. Wrong answers were often random numbers with no supporting calculation. '38' was the answer given by a number of candidates who added together the three numbers in the end column 'never'.
- 17(a) Most candidates chose the correct answer; water vole, citing the decline in numbers from information on the table. Other answers were credited if the explanation was valid. 'Red Squirrel' was a popular answer due to low numbers and competition.
- 17(b) This question was aimed at high demand and it proved to be the most difficult question on the paper. Most candidates gave the incorrect answer; harvest mouse, often without qualification. A number of candidates tried to calculate the answer usually by trying to find 71% of 1.4 million. Of the few candidates that gave the correct answer of 'water vole' only a very few calculated the answer correctly.
- 18 Most candidates were able to give a definition of monoculture although the descriptions tended to lack clarity. There were many good suggestions about the effects of monoculture. However these did not always relate to the **effects** on the landscape.
- 19 This question gave candidates a wide choice of fuels and energy sources to write about. Those who chose 'energy from wind farms' generally scored two marks for reference to the energy source being renewable and not producing pollution. Answers provided for the use of hydrogen referred to it being clean. Those who chose to write about straw, woodchips or algae were unable to give two credible reasons for why they might help solve the problems. Few candidates chose to write about coal gasification.
- 20 The final question gave candidates the opportunity for extensive writing. Most made good use of this and filled the available space. Unfortunately not many were able to write a clear argument that warranted the full 3 marks. A number gave two good points and most were able to gain one for a reference to the effect on the environment. There was some good use of scientific vocabulary and the terms biodiversity; adapted; habitats; ecosystem; competition; and sustainable were all put into context. Misconceptions that were not credited included dams being advantageous to control water levels and the provision of food on Fridays.

B494/01 Care of Animals, Foundation Tier

General comments

This year the questions were organised in the paper by type -objective, short answer, data and extended writing. This, together with an increasing level of difficulty in the sections, was introduced to provide structure and expectation to help candidates find their way through the paper.

It cannot be emphasised enough that candidates should be trained to read the introductions to questions. They act as stimulus material but also set the parameters for the question. For example Q9 described a situation which made certain answers clearly wrong. Q12 asked candidates to 'state and explain', without the explanation the mark was not awarded. Q14 stated 'use information in the table to answer the question', so candidates who gave their own reasons did not score marks.

It was pleasing to note the success all candidates had in dealing with the data questions. The fact that they were set in unfamiliar situations did not put off candidates from attempting an answer.

There were some good responses in the final questions that required extended writing but the majority of candidates remain uncomfortable with this answer format. A format that is likely to be given greater priority in future specification revisions.

Comments on individual questions

- 1 An easy visual opening question with an almost all candidates giving the correct response.
- 2 Another straight forward question which involved putting given statements into the correct boxes.
- 3 This question, directly related to the specification, did differentiate between candidates. Perhaps candidates who have shown small animals had an advantage. 'Markings', was the correct response, 'behaviour' the choice of many.
- 4 This question was the least well done of the objective questions. Possibly this was because it tested traditional biology. Only a fifth of candidates could correctly label the caecum. However, twice that number knew its function.
- 5 This question also tested biology but the use that animals made of protein in their diet was better known.
- 6 A common question that discriminated well across the papers. BSE was the distracter that attracted the most wrong answers.
- 7 Another common question that discriminated well across the papers. As in the higher paper, the most common wrong selection was, 'to provide the animal with cellulose'.
- 8 This question which required candidates to complete a health check card prompted a good response, many scoring full marks.
- 9 The introduction and picture gave some clues as to what were reasonable answers to this question. 'Animals cannot reach the bowl', is clearly not reasonable from the picture. The fact that quite a tall drinker is shown does indicate it could be knocked over. It is stated that

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- the hutch is wooden so a wet floor can lead to disease and possible rotting. Open dishes can always be contaminated by excreta and bedding.
- 10 Those candidates who had experience of handling animals had no difficulty with this question. Leather gloves are used with mammals to prevent damage from bites and rubber gloves are suitable for most reptiles. Marks were awarded for correct reasons rather than the type of glove selected, which could vary with the animal chosen.
 - 11 This was an example of a question that required the reading of the introduction to achieve the correct answer. The run had an open top and was used in good weather. Thus candidates who stated 'the animals were exposed to the cold and rain' did not score a mark. Similarly, 'if the lid was left open the animals would escape' gained no marks. Dangers from predators and possible disease transference were the answers wanted. No shade in hot weather was credited.
 - 12 A common question. Here it was important for candidates to react to the command 'explain'. 'Place the animal in a cage' did not get a mark without explanation. The animal is placed in the cage to prevent it distracting the driver or prevent it being thrown about the car when moving. There were many good answers: 'covering a travelling cage with a blanket to prevent stress'; 'securing boxes to prevent them getting thrown about'; ensure boxes are well ventilated and; they are not enclosed in boot which can overheat in summer', were some examples. On long journeys it is important to provide stops for exercise, feed and water. However, it is not advisable to put food, and especially water, in travelling cages as it can spill. The animals could choke when drinking on the move.
 - 13 A straightforward data response question requiring candidates to extract information from a table. Over 90% of candidates achieved full marks.
 - 14 This was a slightly more demanding data question in which candidates had to evaluate information given in a table. This was correctly answered by about three quarters of candidates.
 - 15 A straightforward reading from a histogram was correctly done by almost half of candidates.
 - 16 Candidates do have difficulty working out percentages. The correct choice was only given by about a fifth of candidates.
 - 17 It was expected that most candidates doing this unit would have had first hand experience of a breed of animal and would be able to describe how it differed from other breeds. A lot of answers were very vague and too brief, eg Highland Terrier - white, small and barks a lot. The reference to colour is valid but some description of conformation - head and body shape, together with the style of coat was needed for further marks.
 - 18 Many candidates read this question giving emphasis to 'small' rather than 'pets' in the introduction. Their answers 'can be kept in a small space', 'easier to keep and cheaper to feed' were not given credit. The question was set directly on the specification statement about the reasons for keeping small animals - namely for pets, food, research, competition, conservation or hunting. Many gave reasons that are feature of pets and these were not credited. eg 'company' and 'pleasure'.
 - 19 There were some good descriptions of selective breeding. The point needed to be made that it was the breeder who was choosing the features of the animals bred. Such a selection must be continued for several generations with similar animals but not from the immediate offspring, as some suggested for this would lead to inbreeding. Line breeding as a strategy was mentioned by a few candidates.

B494/02 Care of Animals, Higher Tier

General Comments

This year the questions were organised in the paper by type: objective, short answer, data and extended writing. This did not noticeably affect performance.

It cannot be emphasised enough that candidates should be trained to read the introductions to questions. They act as stimulus material but also set the parameters for the question. For example Q10 asked candidates to 'state and explain', without the explanation the mark was not awarded. In Q17(a) the question said 'look at the bar charts', so candidates who looked at the line graphs did not score marks.

Comments on individual questions

- 1 A common question that discriminated well across the papers. BSE was the distracter that attracted the most wrong answers.
- 2 Another common question that discriminated well across the papers. As in the foundation paper the most common wrong selection was, 'to provide the animal with cellulose'.
- 3 A tick the box question which almost every candidate answered correctly as, 'hay'.
- 4 Another tick the box question. That the function large intestine was to absorb water was known only by the better candidates.
- 5 This question although discriminating clearly confused candidates of all abilities. The diagram showed stages in a generalised life cycle and required candidates to select those stages that took place inside a female mammal and inside a bird's egg. The answers wanted were: 'fertilisation and embryo development', in the mammal and 'embryo development', in the egg. Some candidates ignored the life cycle terms and described the process of reproduction for the mammal and bird in the boxes. Others felt obliged to use all the terms in the boxes despite the introduction stating terms could be used once, more than once or not at all.
- 6 A sentence completion on enzyme action which most candidates correctly completed. 'Dissolve', was a common wrong choice.
- 7 This was the most difficult of the objective questions. Several candidates gave vitamins (the right answer) together with mineral (a wrong answer) Thus they cancelled each other out and no mark was awarded.
- 8 A question testing application and one that was poorly answered even by good candidates. The answers varied according to the animals studied.
- 9 This was an example of a question that required the reading of the introduction to achieve the correct answer. The run had an open top and was used in good weather. Thus candidates who stated 'the animals were exposed to the cold and rain' did not score. Similarly 'if the lid was left open the animals would escape' gained no marks. Dangers from predators and possible disease transference were the answers wanted. No shade in hot weather was credited.

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- 10 A common question. Here it was important for candidates to react to the command 'explain'. 'Place the animal in a cage' did not get a mark without explanation. The animal is placed in the cage to prevent it distracting the driver or prevent it being thrown about the car when moving. There were many good answers: 'covering a travelling cage with a blanket to prevent stress'; 'securing boxes to prevent them getting thrown about'; ensure boxes are well ventilated and; they are not enclosed in boot which can overheat in summer', were some examples. On long journeys it is important to provide stops for exercise, feed and water. However, it is not advisable to put food, and especially water, in travelling cages as it can spill. The animals could choke when drinking on the move.
- 11 The clue to the answer was in the stem 'feeding well yet losing weight'. This pointed to parasites but it could include a disease like cancer or any other condition that does not show external symptoms. The answer to (b) depended on the answer to (a) and the mark scheme allowed for error carried forward.
- 12(a) This part question was poorly answered with generalities rather than the required explanation. ICT controls the temperature using a heat sensor linked via a computer to a thermostat.
- 12(b) In this part the reason for controlling the temperature in the vivarium suggested by many candidates was because reptiles are cold blooded. Rather fewer gave the significance of this, namely that reptiles cannot regulate their temperature from within as mammals can.
- 13 Genetics is not mentioned on the specification but it is required for other units. This being so the introduction had to provide a lot of information. This did not seem to put candidates off and a good majority got the correct answer to part (a). The disadvantages of line breeding were quite well known but marks were not given for inaccurate answers eg 'causes mutations' or 'makes offspring weak'.
- 14 This was another example of a question where the reading of the introduction was necessary to achieve the marks. The adaptations given needed to be related to the hutch illustrated and had to include explanation as to how they improved the living conditions. Many adaptations suggested were not improvements eg put holes in the side to let air in and cut a window in the top to let in the light. Not unless, that is, the front had been preciously filled in to prevent draughts for as shown the hutch illustrated had plenty of air and light. Many suggested putting the hutch on legs to stop draughts which would not work.
- 15 A straight forward reading from a histogram.
- 16 A slightly more demanding data question. A lot of candidates are unable to work out percentages. About a fifth of candidates gave the correct choice
- 17(a)(i) The question clearly stated 'look at the bar charts'. Many candidates described the trends of the line graphs or opted for describing charts and then the graphs, rather than describing the trends shown by the bar charts. Part (ii) proved to be difficult. Too often it is the graph that is looked at to get an understanding of what is happening and the figures on the axis are ignored. The reptiles even at their highest number were only a third of the bird numbers, so more birds were imported than reptiles over time.
- 17(b) In this part question an estimate was asked for so answers either side of 76% were credited.

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- 18 There were some good descriptions of selective breeding. The point needed to be made that it was the breeder who was choosing the features of the animals bred. Such a selection must be continued for several generations with similar animals but not from the immediate offspring, as some suggested for this would lead to inbreeding. Line breeding as a strategy was mentioned by a few candidates.
- 19 This was well answered by those candidates who had experienced weighing at first hand. Several descriptions would not have given accurate results. The mark scheme looked for a reference to welfare and safe handling as well as calibrating the balance and weighing a container with and without the animal.
- 20 This question gave candidates the chance to discuss the risks to animals and children during contact and to suggest how these risks might be overcome. There were some very well argued answers. Rightly, risk assessments appear to be given a high profile in the teaching of this unit.

B495/01 Livestock Husbandry, Foundation Tier

General Comments

Centres should advise candidates that if they are asked to give one answer and if they give two responses, only the first will be marked even if it is incorrect and the second is correct.

With longer answer questions the number of marks gives a guide to the number of points the candidates should attempt to make in their responses.

Candidates should also have access to a calculator when sitting this examination as outlined in the instructions.

Comments on individual questions

- 1 Most candidates were able to answer this simple opening question.
- 2 Some candidates thought the calf kennels unsuitable for calf rearing. While some candidates may not have seen this system of calf rearing before it was expected that all candidates would have recognised the pig arks and realised these were not suitable.
- 3 The common error on this question was to suggest being tidy reduced disease rather than dry.
- 4(a) A poorly answered question given the number of times this has appeared on the paper in different forms. Most candidates confused the 'vagina' with the 'uterus'.
- 4(b) Many candidates thought fertilisation took place in the uterus; better candidates described the support role provided by the 'uterus' for the developing embryo.
- 5 As with most genetics questions this was poorly answered with many candidates incorrectly giving 'cross-breed' as their response.
- 6 A well answered question with only weaker candidates incorrectly giving 'high fibre' as a typical response.
- 7(a) A generally well answered question.
- 7(b) A question related to the importance of livestock health. Weaker candidates tended to give very general answers such as "we are going to eat them" without suggesting why this might be a problem.
- 8 While fertilisation was well known, insemination as a term, caused some confusion. Few candidates achieved both available marks for this question. Credit was given to answers involving artificial insemination if this included reference to the insertion of sperm into the female. Weaker candidates seemed to think insemination was an artificial process and fertilisation natural.
- 9 Weaker candidates still confuse the terms 'intensive' and 'extensive' but otherwise very well answered.

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- 10(a) A very well answered question with 'hand washing' being the most popular response.
- 10(b) A good range of acceptable answers.
- 10(c) Some candidates suggested 'not going near the animal' which was not an acceptable response. Any reference to suitable footwear was credited.
- 10(d) Better candidates gave responses involving supervision of children or preventing them accessing the farm. Putting machinery away was not an accepted response.
- 11 Only the best candidates were able to give two valid suggestions. Weaker candidates tended to give responses which did not relate to the upland environment.
- 12(a) Well answered.
- 12(b) Again well answered although some candidates tried to answer the question without reference to the table.
- 13 Candidates generally did well on **all** these mathematical questions or **none** of them. A few lost marks on simple mathematical errors which might have been avoided if the candidates had access to calculators.
- 14 Some good responses from candidates who are now expecting a question of this nature. Weaker candidates tended to make one suggestion without attempting more.
- 15 Many candidates did not attempt this question or simply described the cattle in the photographs.

B495/02 Livestock Husbandry, Higher Tier

General Comments

Centres should advise candidates that if they are asked to give one answer and if they give two responses, only the first will be marked even if it is incorrect and the second is correct.

With longer answer questions the number of marks gives a guide to the number of points the candidates should attempt to make in their responses.

Candidates should also have access to a calculator when sitting this examination as outlined in the instructions.

Comments on individual questions

- 1 Most higher candidates correctly answered this question although a significant number gave 'high fibre' as an incorrect response.
- 2 A good range of responses with only better candidates gaining all three marks. Common errors were 'tidy', rather than 'dry', and 'straw', rather than 'water'.
- 3 Generally well answered, although some candidates referred to egg formation or development, rather than the embryo's development.
- 4 Most candidates correctly identified 'parasites' as the most likely cause of the symptoms described.
- 5 Most candidates who answered this question incorrectly gave 'ovum' as their answer suggesting they were not familiar with this term for the egg.
- 6 Pleasingly, most candidates realised that body cells have twice the number of chromosomes of the gamete.
- 7 Given that we had not asked a question about gestation periods before it was pleasing that most candidates were able to work out the correct pairings to the animals.
- 8 While fertilisation was well known, insemination as a term caused some confusion. Few candidates achieved both available marks for this question. Credit was given to answers involving artificial insemination if this included reference to the insertion of sperm into the female. Weaker candidates seemed to think insemination was an artificial process and fertilisation natural.
- 9 Candidates lost marks by saying AI is cheaper than keeping a bull without saying why.
- 10 Some well thought through answers.
- 11 Most candidates linked density of stock to easier disease transmission.
- 12 Weaker candidates thought the animals/humans became immune to the antibiotics rather than the bacteria becoming resistant.
- 13 Weaker candidates could explain the role of a hormone but could not name one.

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- 14 Most candidates suggested 'hand washing' as a means of reducing salmonella, 'not touching the animals' was not accepted.
- 15 Better candidates were able to identify 'tetanus' as the disease for which routine inoculation is carried out.
- 16 While most candidates recognised the importance of tracing animal movements in controlling the spread of disease few could name either 'Defra' or 'Trading Standards'.
- 17 Many candidates did not realise that this was a question about selective breeding and got bogged down with detailed answers referring to dominant and recessive genes. References to genetic engineering were accepted.
- 18(a & b) Most higher candidates were able to correctly calculate these answers.
- 18(c) This proved a more challenging calculation for all.
- 19(a) Most candidates realised that production levels tend to follow the changes in the price of the milk.
- 19(b) Only about half of the candidates were then able to predict what would happen to the production of milk in 2008 as the price increased.
- 19(c) A well-answered question.

B496, Portfolio

This year centres should be congratulated in the way in which they have used the specification to provide candidates with coursework opportunities appropriate to the skills and potential of the candidates. The majority of centres have used the mark scheme appropriately and marked in close agreement with moderating team. The portfolios have been presented in a way which enabled candidates to perform well and demonstrate their true motivation and abilities. However centres could help their candidates by implementing the moderator recommendations from the centre report on the moderation.

Practical Skill

Most centres are now differentiating skill marks more effectively. However some centres are failing to produce tasks with sufficient demand to allow candidates to justify a mark of 3. For all 3 marks, candidates must complete a series of practical tasks where they might need to make their own decision or amend a procedure to complete that task. Some centres are still providing group photographs where candidates are not identified (although a facial image is not required) and the nature of the procedure is far from clear. Although annotation is not specified it is a good 'learning vehicle', and when done, often demonstrates motivation, pride and ownership. Powerpoint is a very effective way of presenting the skills, and it is easy for candidates to annotate such presentations. It would be good to see some skills recorded as mini video clips, suitably compressed.

Work-Related Report

A wide range of reports were submitted this year ranging from the work of conservation bodies to farms, garden centres and the animal service industry. Many centres incorporated their own enterprise. It was evident that these motivate the weaker candidates, and when linked to a similar external enterprise, allow candidates to perform well across the ability range.

Strand A

The main problem is that candidates often fail to make clear in their introduction where and what the nature of the enterprise actually is.

This strand was accurately marked, however, many candidates are still failing to make full use of direct quotations, and use parts of the speech, but make no further reference to them. References are usually included in the text and as a bibliography, which is good practice and should be encouraged.

Strand B

Although in general this strand was accurately marked, some candidates failed to really describe the nature and purpose of the workplace and assume the reader knows about the enterprise, its location and purpose. Better candidates need to take care to clearly identify the impact of financial and/or regulatory factors and fully explain them. Addressing and developing this area further would allow many candidates to access higher marks.

Strand C

All too often moderators have to search for descriptions and knowledge of the science involved. Candidates fail to show how the science is underpinning the enterprise. Candidates also frequently fail to describe an example of a technical skill, explain how its application is linked to the workplace and show its impact on the enterprise. This skill is fundamental to the whole concept and needs to be developed; candidates need to demonstrate much more understanding in this area. Simple statements or extracts on science are insufficient – they must be used and related appropriately.

Strand D

Candidates performed well in this area, and it is obvious where centres encourage candidates to use an appropriate structure for their reports.

Candidates should be advised to take note of the marking specification, in particular for strand D, where marks are readily available and accessible to all. The use of page numbers, headers and footers is to be encouraged as are clear sub-headings particularly in power point presentations.

Investigative Project

The range of investigations, as in previous years, has been excellent, with some original and innovative work.

Laboratory-based investigations are acceptable. However, investigations linked directly to one or more sections of the specification which can be completed in a practical way related well to land-based science offer excellent motivational learning opportunities for candidates.

The project is worth 50 marks and when centres carry out simple investigations, such as growing radish in pots under different conditions, opportunities are often missed to engage candidates in experiential learning. Some centres appear to leave their investigations until very late in the course and may well disadvantage their candidates by this approach.

One simple fault is the failure to give a clear aim and purpose of the investigation at the start. Simply calling an investigation 'My Radish Experiment' is not helpful to the reader. 'An investigation to....' would be a much more appropriate way to start the investigation.

Skill P

As in the past many candidates still fail to make their aim clear and fail to use their background research to inform and guide their planning. It is important that candidates collect and use rather than simply coping and pasting background information. This must then be utilised to develop and explain their plan and hopefully result in a prediction underpinned by the relevant science, followed by a clear aim and workable plan which could be followed and repeated.

Skill A

Candidates present data in a range of interesting and usually appropriate ways but often fail to use or explain the data when drawing their conclusions.

Analysis is worded in general terms. Better candidates make full use of their data, fully explaining it, annotating graphs and charts and referring to significant points or trends. Comments and explanations can then be fully developed and candidates should not be reluctant to account for unexpected results. The science related to the investigation is not always explained but it is assumed the reader knows.

Skill Q

Centres should not use group data alone. Where an investigation necessitates group data, candidates must indicate clearly their part in the collection of the data, and if this is limited, they **must** collect some secondary related data. This data must be used and incorporated into their report.

Skill E

Candidates should address this as a separate skill and not mix and confuse evaluation and analysis.

All too often candidates make comments about obtaining more data or having a larger sample but show little or no understanding of how or why this might improve the accuracy and reliability of the investigation. There is often little or no attempt to identify and account for anomalous results or trends which were not expected. The nature of so many investigations naturally lends to an opportunity to suggest and/or explain, with reasons, how to improve the investigation and their procedures.

Skill W

Most reports were well presented. This skill is accurately marked by most centres. Candidates should be encouraged to use good communication and correct punctuation and grammar as this will embed good practice for the future.

Skill D

Teachers make full use of this area and only award full marks to those candidates who clearly have worked independently, in a motivated way and without direct support.

Portfolio Presentation

For most centres this has been excellent. However, for some centres, work is still presented as numerous files rather than complete reports making moderation a very difficult task. There are instructions available on the OCR depository portal for the format of file names and folders and how to upload the completed work. **DO NOT USE html** (from the original instructions in the specification) as the work is very difficult to access and photographs and charts are often difficult to open. Any annotation for the support of evidence for the marking can be made in the portfolio in a different colour/font on the candidate documents, or a simple file can be added to the uploaded portfolio ensuring the file naming protocol is generally followed.

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Please present each section of the portfolio as a continuous document in Word, Powerpoint, Excel etc.. Try to avoid Publisher if possible. Candidate record cards must be carefully loaded in each candidate's folder of work, following the guidance **exactly**. It is advisable to download a copy to a PC, follow the instructions for naming the file. Avoid using the same file name for all candidates as the upload facility defaults to the same candidate record card for all in the uploaded sample. The CCS160 form and any general comments are best added to the first candidate's folder thus saving the need to post this to the moderator.

The use of headers and footers aids considerably and avoids confusion. Some centres are still sending paper portfolios and this should not happen. Ensure the sample is uploaded onto the depository in good time following the instructions available in the 'Help' section of the OCR depository.

Much hard work has been put into the coursework again this year, this has been reflected in much more accurate marking and some work of a very high standard. Many weaker candidates produced work demonstrating positive achievement.

It has been good to see science applied so effectively to a wide range of land-based science activities and it is hoped that teachers will note these comments and use them to further develop this important and valuable part of the course.

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

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Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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