OCR
RECOGNISING ACHIEVEMENT

GCSE

Environmental and Land-Based Science

General Certificate of Secondary Education **J650**

OCR Report to Centres

June 2012

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General Certificate of Secondary Education

Environmental and Land-Based Science (J650)

OCR REPORT TO CENTRES

Overview

This was the last examination on the J650 specification. A new ELBS specification, J271, replaces the current examination. The content matter of the core and options has been updated and rearranged. Candidates will be required to take the core paper and one option paper at the higher or foundation level. In line with other science qualifications, the examination includes more emphasis on extended writing.

When ELBS was first introduced one of the aims was to stimulate candidates through both subject content and assessment. Centres have made great progress in presenting the coursework electronically rather than using paper, and the standard of work has improved year on year. The improvement has been particularly noticeable with the foundation candidates where previously there have been problems with writing.

All Principal Examiners commented on the advantages of candidates taking the exam using the CBT format and it is to be hoped that more Centres will avail themselves of this option in the new specification.

Candidates continue to lose marks by not reading the stem of the questions and failing to respond correctly to the key command words such as suggest, describe and explain. In the new examination there are marks on the theory papers for spelling, punctuation and using English correctly. This includes the use of scientific terminology.

Data response questions, a feature of the ELBS papers, were again well answered this year. In the new examination they will contain a greater mathematical emphasis.

The problems over the entry policy for the higher tier mentioned in the last report were not such an issue in this examination series.

The examination provided evidence of excellent teaching going on in Centres. This is helped by the current range of support material and inset training.

B491/01 Plant Cultivation (Foundation Tier)

General Comments

Some candidates answering on paper were hampered by poor writing skills, which made their responses very difficult to read; the CBT option would be much better for them. Many candidates struggled on the simple maths questions and either did not attempt them, misinterpreted data or simply did the wrong calculation. Simple marks were lost because candidates did not always read the stem of the question carefully and ticked the wrong number of boxes or gave the wrong information. In addition, some candidates struggled to understand the command words such as 'describe' and 'explain'. There were also a large number of zero marks awarded where candidates failed to even attempt some of the questions. Finally, few candidates used the correct technical or scientific terminology, such as 'wilting' and 'dominant' when answering questions.

Comments on Individual Questions

1   The difference between methods of asexual reproduction was poorly understood by many candidates. Most candidates recognised the bulb but got confused between the runner and rhizome.

2   This question was well answered with most candidates scoring both marks. The most common mistake was getting A and C the wrong way round.

3   Most candidates recognised the final statement 'They come from only natural sources' as correct with statement 5 'They improve the growth of crops' being the strongest distracter. This is probably due to misreading the question and answering about fertilisers in general.

4   Candidates still lack basic knowledge of flower structure and so were unable to recognise the sepals and their function in the flower. Response A was the strongest distracter.

5   Many candidates found this question difficult. Many candidates correctly identified that 'The allele for tall plants is dominant', however, the most common distracter was response 3 'The allele for red flowers is stronger'. This shows a poor knowledge of common scientific terms.

6   Candidates did not understand the term *nutrient* and many put light and water as answers.

7   This question was poorly answered due to candidates' inability to use the correct terminology. Candidates wrote about leaves being 'bright' or the 'correct colour' and not being 'crispy' or 'dried up'.

8   This question was well answered with many candidates stating a valid reason for lack of germination. The most common incorrect answers were lack of light or type of compost.

9   This question was poorly answered with candidates still writing about 'fair tests' or making results more accurate. There were very few candidates who could calculate a mean from the data. Some used the incorrect data, yield with/without fleece, and others used their calculator incorrectly dividing 14.4, rather than the total, by 4. In addition, many candidates lost marks due to an inability to round up correctly.

10   Few candidates appreciated the way in which the fleece works and so assumed that the increase in yield was due to an increase in temperature.   There was a high level of ''no response'' answers to question **10b** and a wide range of responses from those candidates who did respond. Many candidates assumed that the farmer has access to long range weather forecasts and so would use these to determine whether to use the fleece.

11   This question was well answered by most candidates who were able to describe the importance of double digging. However, many candidates failed to use technical terms, writing about making soil 'soft' and 'smooth'. A lot of candidates also failed to gain full marks because they wrote in detail about how to sow seeds on the vegetable plot.

12   Some candidates still struggle with recognising the use of different garden tools. B was the most common distracter.

13   This was well answered by many candidates although some still did not understand the idea of storing potatoes and answered as if the potatoes were still in the ground. Many students wanted to put them in a greenhouse to grow better and for more light. Many candidates lost marks by failing to give a reason for their advice on storage. Some candidates were put off by the idea that it was a shed and therefore would be dirty.

14   This question was well answered by the majority of candidates.

15   This question was well answered by the majority of candidates.

16   Candidates struggled with this question and most of them opted for answer C.

17   Some candidates gave excellent answers for this drawing on their knowledge of wind/insect and self pollination to explain the results. Many candidates however, either described **or** explained the data and did not do both. It was clear in some answers that the candidates did not understand the term *yield* and so were not able to interpret the data.

18   This question, which is taken directly from the specification, was very poorly answered. Very few candidates could correctly identify the anther or stigma and could not explain how they were adapted for wind pollination. Many candidates are still confusing seeds and pollen.

19   This question was well answered with many candidates appreciating the need for the correct PPE. Some candidates did not read the question and wrote about potential leaching in rivers and contamination of the surrounding environment which came directly from the stem of the question. In addition, candidates were concerned that over application could damage the plant.

B491/02 Plant Cultivation (Higher Tier)

General Comments

Many candidates struggled on the simple maths questions such as calculating a mean. Some candidates lost marks because they did not read the stem of the question carefully and ticked the wrong number of boxes or gave the wrong information. In addition, candidates struggled with the command words, being unable to distinguish between 'describe' and 'explain'. Candidates were still not using correct scientific or technical terminology such as 'wilting' and 'dominant'.

Comments on Individual Questions

Question numbers refer to CBT paper.

1   Many candidates did not have a basic knowledge of flower structure and so were unable to recognise or state the function of the sepals. Responses A and B were the strongest distracters.

2   The level of difficulty of this question was increased by the negative wording in the question. Many candidates chose option B.

3   Candidates were unable to recognise the methods of asexual reproduction from the descriptions. Runner was most frequently identified correctly with rhizome and bulb being confused.

4   This question was well answered by most candidates.

5   Again, candidates found this difficult because they were looking for incorrect responses.

6   Most candidates answered this question without looking at the information in the diagram. They opted for A or D, despite the diagram showing a plant with large leaves and thick stem.

7   This question comes directly from the specification; however, few candidates could identify the different structures or understood how germination proceeds. There were no common misconceptions and many responses appeared to be simple guesses.

8   This simple question was well answered by the majority of the candidates who gave a range of valid responses. However, some candidates failed to relate the answer to the scenario given and wrote about pollination.

9   Few candidates scored full marks on this question. Many did not appreciate the difference between phenotype and genotype and those that did often used different letters to express dominant and recessive alleles. A small minority of candidates gave excellent explanations using the correct scientific terminology. There was a high level of 'no responses' on this question.

10   This question was poorly answered with candidates still writing about 'fair tests' or making results more accurate.

11   There were very few candidates who could calculate a mean from the data. Some used the incorrect data, yield with/without fleece and others used their calculator incorrectly, dividing 14.4 by 4 instead of the total value. In addition many candidates lost marks due to an inability to round up correctly.

12   Some candidates did not appreciate the way in which the fleece works and so assumed that the increase in yield was due to an increase in temperature. Some also misinterpreted the question and stated that there was a greater increase in yield because there was a large difference in the values with and without fleece.

13   Candidates struggled with this question and most of them opted for answer C.

14   Some candidates gave excellent answers for this drawing on their knowledge of wind/insect and self pollination to explain the results. Many candidates however, either described **or** explained the data and did not do both. It was clear in some answers that the candidates did not understand the term *yield* and so were unable to give valid answers.

15   Candidates are still getting confused between self pollination and cloning. Many responses were very vague and lacked correct scientific terms.

16   Many candidates had a good understanding of the fertiliser ratios and either appreciated the fact that peas need high potassium for formation of seeds or low nitrogen because they are legumes. Weaker candidates took a stab in the dark and went for general purpose 1:1:1 fertiliser. Some candidates thought that the peas would need high phosphate for root/nodule formation.

17   This was poorly answered with very few candidates gaining two marks. More candidates understood the process of flocculation to improve drainage than the importance of the effect of pH on nutrient availability. A simple understanding of how pH alters the solubility of ions would suffice. Again candidates showed a poor understanding of technical terms.

18   Candidates answered part **a** well but struggled with part **b**. Some did not understand the term *batch* and so gave unrealistic answers in the 1,000s. Some did not appreciate the need to round up and left the answer as a decimal.

19   This was poorly answered with many candidates still confusing humidity and temperature. Other candidates did not interpret the question correctly and talked about water being absorbed through the roots. Few candidates showed an understanding of the importance of leaf turgor and transpiration.

20   This question was well answered by many candidates. However, despite this question being asked on many previous exam papers there were a significant number of candidates still writing about ideal *growing* conditions for the fruit/vegetables rather than *storage* conditions. Other candidates did not read the command word and either described or explained. Some candidates lost marks by not writing about three different conditions for the three marks available.

21   This question was well answered with many candidates appreciating the need for the correct PPE. Some candidates did not read the question and wrote about potential leaching in rivers and contamination of the surrounding environment which came directly from the stem of the question. In addition, candidates were concerned that over application could damage the plant.

B492/01 Amenity Horticulture (Foundation Tier)

General Comments

The B492 paper of the Environmental and Land Based Science GCSE is an optional paper. This paper, based around amenity horticulture gives an applied focus to the scientific principles within this qualification, often looking at topics from a commercial context.

The paper consists of 36 marks; a mixture of multiple choice, short answer questions, calculations and longer response questions, giving candidates a range of opportunities to demonstrate what they know. A number of questions are common between the higher and foundation papers allowing for a comparison of performance for those achieving a C grade.

It is acknowledged by the examiner that the teaching coverage of the whole specification has improved during the life of this qualification, with fewer examples of candidates being unable to provide answers on topics.

While it is acknowledged that there are numerous individual situations, the comments below highlight general trends in the way questions were answered by this cohort of candidates.

This examination was available in both CBT and paper formats, the question numbers quoted relate to the paper-based version.

Comments on Individual Questions

1   Targeted at F grade, this was a relatively straightforward question requiring candidates to identify signage as being the most effective way of increasing plant sales.

2   a)   Requiring candidates to select annual lifecycle as meeting the description, this was answered well by most candidates.

     b)   More discriminating in its demand, (and a common question) stronger candidates were able to match the characteristics of hanging basket plants correctly.

3   Plant breeding: Aimed at E grade, this concept was identified correctly as relating to selective breeding.

4   Matching equipment to growing condition monitoring. While most candidates were able to link thermometer to temperature, only higher performing candidates were successful in matching all three, the measurement of humidity proving to be the most difficult.

5   Siting of a greenhouse: A topic which appears to have been taught well in most Centres. High numbers identified the correct scenarios.

6   (Overlap question). This was not a well understood concept, many erroneously identifying drought resistance as the main attribute of ryegrass.

7   Choice of lawnmower: Many could identify the advantages and limitations of an electric cable and expressed it well. Less understood were the issues relating to refuelling or the issue of weight.

8   Alternatives to peat in composts: A poorly understood concept, many incorrectly confusing fertilisers, often an additive to base materials rather than the base materials themselves.

9   Replanting issues: Covered well in many Centres, higher performing candidates had an understanding of nutrition, and pest and disease build-up risks.

10   Benefits of pest and disease control: Poorly understood by many candidates. Few identified the commercial reasons for timely control.

11   Defining plant production terms: While higher performing candidates were able to provide descriptions of all three terms, some weaker candidates did not appear to be able to give good definitions, often merely using the phrases within the question.

12   Naming a bedding plant: A wide range of acceptable answers. The mark scheme extended to include ornamental flowering plants which are short, annual and summer flowering. Many erroneously named daffodils (wrong season) or dandelions (not commonly regarded as being ornamental).

13   Data questions

        a)   A relatively straightforward data question, requiring both month and year to be named.

        b)   Well answered by many higher attaining candidates.

        c)   Good reasons were given by many candidates relating to seasonality, but less related answers to supply and demand.

        d)   Gaps in data: A good question to ascertain whether candidates understood the life cycle of the daffodil.

        e)   A good proportion of candidates were able to identify mark-up on cost prices. Success often related to overall grade.

14   Care of hanging baskets: A topic poorly understood by many candidates. While most were able to suggest regular watering was needed, many incorrectly wished to remove the compost.

15   Popularity of lawns: Aesthetic reasons were poorly understood, although maintenance was a common correct answer.

16   Extended answer question: This question required a good wide range of advice, some candidates lost marks for providing advice that was too similar (i.e. wear gloves, wear goggles).

B492/02 Amenity Horticulture (Higher Tier)

General Comments

The B492 paper of the Environmental and Land Based Science GCSE is an optional paper. This paper, based around amenity horticulture gives an applied focus to the scientific principles within this qualification, often looking at topics from a commercial context.

The paper consists of 36 marks; a mixture of multiple choice, short answer questions, calculations and longer response questions, giving candidates a range of opportunities to demonstrate what they know. A number of questions are common between the higher and foundation papers allowing for a comparison of performance for those achieving a C grade but extends up to A* grade.

It is apparent that teaching coverage of the whole specification has improved during the life of this qualification with fewer examples of candidates being unable to provide answers on topics, although this still exists in certain Centres.

While it is acknowledged that there are numerous individual situations, the comments below highlight general trends in the way questions were answered by this cohort of candidates.

This examination was available as either paper or computer based (CBT) versions. However, the question numbers quoted relate to the paper-based version.

Comments on Individual Questions

1   (Common question). A straightforward question testing knowledge of the properties of a summer bedding plant.

2   Targeted at D and C grades, most candidates were able to identify the best reasons for potting on. A topic which was covered well by most Centres.

3   Use of cold frames: Candidates could identify the cost saving and flexibility of their use rather than larger structures.

4   A topic less well understood, a number of responses did not correctly identify the benefits of speed with the use of genetic engineering techniques.

5   (Common question). As with the foundation paper, this was tackled quite well; the use of the hygrometer was the piece of equipment least well understood.

6   Benefits of ryegrass: Another common question, well understood by this cohort.

7   Mechanical control of weeds: A broad range of permissible answers allowed. No major issues.

8   Choice of lawn mower: While most candidates focussed on issues related to the cable, there was less certainty with other advantages and disadvantages.

9   Replacements for peat: A very topical issue which will become more pertinent for the sector in coming years, this was a topic poorly answered by candidates who were unsure of some of the viable alternatives. Some candidates confused the question with the use of fertilisers.

10 A high demand question requiring candidates to identify the need to raise the height of the cut and how to do this on a hover mower. The latter was certainly not well covered.

11 Recommendation of a street tree: A patchy response, some Centres appeared to be able to answer this well while others had vague responses such as "fir tree", which were rejected.

12 Reasons for pruning: Some candidates gave responses related to the stem of the question (shape and size), beyond that, most others answered this question well.

13. Benefits of aluminium framed greenhouses: Aspects such as reduction in maintenance were highlighted regularly, but advantages such as better light transmission (due to thinner glazing bars) were rarely mentioned.

14 (Common question). As with the Foundation paper, there was a lack of understanding of the cycle of growth in daffodils relating to a potential glut and over-supply in April.

15 A series of data-based questions.

   a) A relatively simple data analysis question which caused few issues.

   b) Requiring more complex evaluation, candidates needed to refer to both the chemical control and rate of application to gain credit.

   c) Well answered by higher performing candidates, this is a common scenario with the use of growth retardants.

16 Longer response question: There was an increased general understanding in the use of ICT over previous papers. Not all candidates still identify the labour saving potential of ICT use.

17 Use of internet: Some good responses relating to the evaluation of quality or difficulties in transport, both of which have been barriers to this type of commerce. Plant retailing is also seen by many to be a leisure activity.

18 Propagation of bulbs: A poorly understood topic, an area where many less well prepared candidates dropped marks.

B493/01 Management of the Natural Environment (Foundation Tier)

General Comments

Candidates performed well in this examination, showing a good range of knowledge across the whole paper. All questions were attempted and there was no evidence of weakness in any part of the specification. Responses to the extended writing questions were pleasing as candidates expressed their ideas at length.

Candidates taking the CBT will have found the photographs clearer than on the paper examination and in colour. They also had greater scope for extended writing as the response area enlarges to incorporate the text; it is not a finite number of lines as on the paper examination. Responses on the CBT were often easier to mark as there was no issue with legibility of handwriting.

Advice for improving performance of future candidates can be summarised as the following:

- Read the question fully before answering it to establish what is required.

- For questions that require more than a single word answer use correct punctuation. Start the answer with a capital letter. End sentences with a full stop.

- Incorporate subject specific vocabulary in responses to extended writing questions.

Comments on Individual Questions

Each of the question numbers is given for the paper examination followed by the CBT examination.

1/1 The paper began with a photograph showing radio masts. Candidates were asked to identify the type of pollution being made by the masts. This question was aimed at grade G. Many candidates correctly identified the pollution as visual. Noise pollution was a frequently chosen distracter. Air pollution was also selected by a number of candidates, while smell was rarely given as the answer.

2/2 Question 2 maintained the focus on pollution. Candidates were asked to identify the most likely causes of air pollution from a list of five answers. Most candidates chose the correct answer of burning rubbish on a bonfire.

3/3 The majority of candidates were able to identify the advantage of using larger and more powerful machines. A few thought that the advantage was soil compaction. Other distracters were seldom chosen.

4/4 Many candidates gained both available marks by linking the predator, fox, to its prey, the partridge. Others gained the marks by linking the partridge to grasshopper or slug. Quite a few candidates did not read the question carefully. As a result they tried to link each organism in the predator list to each organism in the prey list.

5/5 This question asked why the increasing demand for energy in the UK may lead to a shortage in the future. It was well answered with the majority of candidates selecting the correct answer.

6a/6 About half the candidates were able to show that they knew peas and beans were legumes by selecting the answer from the table. All other distracters were chosen in roughly equal numbers. Some candidates gave the answer as five years which was not an option given on the table.

6b/7 In this question candidates were asked to identify the reasons why gardeners grew legumes. Most selected the correct reason although all three remaining distracters were used.

7/8 Candidates were asked to link fertiliser, herbicide and pesticide to the harm each one can cause. Most candidates gained one mark for making one correct link, usually fertilisers to excessive plant growth. A number managed to get all three links correct and gain two marks.

8/9 Candidates were asked to give two advantages of intensive farming. Most of the answers given were plausible and a number of candidates gained both available marks. Some lost marks by giving single word answers such as 'cheaper' or made unqualified statements such as 'all the chickens are together'.

9/10 The photograph provided good stimulus to this grade F and G question about adaptations. Most candidates cited sharp talons, good eyesight or a sharp beak as the adaptations. Others correctly identified binocular vision, silent flight and good hearing as further adaptations.

10a/11.1 For this short answer question candidates were asked to give a meaning to the term *mixed cultivation*. Many were given a mark for providing an answer that showed some understanding of the term.

10b/11.2 The second part of this question asked for an advantage of using mixed cultivation rather than monoculture. Candidates struggled to find really good answers, resulting in too many generalities such as 'saves money', 'allows crops to grow better' or 'uses less land'. A few correctly identified build up of pests or depletion of the same nutrient.

11/12 A photograph showed a cloud of soil behind a moving tractor and candidates were asked to suggest two ways the farmer could reduce soil erosion by the wind. The question was not particularly well answered, although a number of candidates gained the two marks available. 'Work on damp soil', 'work when it is less windy', 'drive more slowly' and 'plant hedges' were common answers. A few candidates were credited for suggesting that soil erosion would be reduced by planting. Impractical ideas such as covering the soil or compacting it were not given credit.

12/13 Aimed at the higher end of the grades, this question asked for two advantages of using chemical weed killer. Few candidates were able to provide two clear advantages. Comments tended to be general statements about weed killers that could apply to some cultural methods. Commonly given credible answers related to chemical weed killer being quicker to apply and less labour intensive than using cultural methods.

13a/14.1 A practical procedure was given for finding the mass of water in a sample of soil and candidates were asked to say why the sample was heated repeatedly until its mass did not change. The most common answer referred to the step being required to make it a fair test, a comment that on its own could not be given credit. Candidates needed to refer to the step being needed to ensure that all the water had been removed from the sample.

13b/14.2 The second part of this question asked how the mass of water in the soil sample could be calculated. Some candidates did not relate their answer to the given procedure, resulting in answers such as 'drain the water out' or 'filter the water out'. Some candidates who did understand what was required got the subtraction wrong by saying take the starting weight from the end weight.

14a/15 Targeting grade G. For this data analysis question, candidates had to interpret information given on a pie chart. Almost all respondents were able to correctly identify the woodlice as being found in the greatest numbers.

14b/16 A second data analysis question from the pie chart. Almost all candidates were able to see that slugs and earthworms were found in equal numbers.

15a/17.1 This question required candidates to subtract one six figure number from another. Most were able to carry out the subtraction and give the correct answer.

15b/17.2 Candidates were asked to select the percentage by which the length of hedge had decreased between 1998 and 2007. It was encouraging to see over half of all respondents giving the correct answer. This indicates that many candidates have a good grasp of the concept of a percentage.

16a/18 Many candidates gave the correct answer to this question, demonstrating their ability to extract information from a table.

16b/19 Candidates were asked to use information in the table to describe one other situation where the farmer needs to apply 6 tonnes per hectare of lime. Many identified the situation correctly. The mark was only awarded if all parts of the situation (soil type, crop and pH) were given.

17/20 This question proved to be a good discriminator; the more able the candidate, the more marks gained. There were many good answers about the potential hazards associated with carrying equipment and it was apparent that Centres have covered hazards in detail. Most candidates included how to lift safely in their answers and many also explained how to carry tools or a spade safely. Suitable footwear and avoiding trip hazards were other popular answers.

18/21 For this question about electricity sources most candidates elected to explain how the wind is used to generate electricity. There were a few examples of crops being burnt in power stations and water turbines and wave generators. Explanation of the electricity generation process was often rudimentary, but credit was given for simple answers.

19a/22.1 Candidates did not score very well on this question, because two environmental conditions had to be identified to gain the mark. Although many were able to cite temperature, oxygen concentration or pH, few managed to match one of these to another correct answer. Good monitoring ideas such as humidity and wind speed were not credited as they did not relate to conditions in the pond as specified in the question.

19b/22.2 The final question asked candidates to explain how ICT can be used to monitor environmental conditions. A few gave the anticipated response by writing about the use of monitoring probes connected to data loggers or computers. Others tended to focus on how computers could be used to store and display data or find out information about environmental conditions rather than monitor these conditions.

B493/02 Management of the Natural Environment (Higher Tier)

General Comments

The overall performance by higher tier candidates was very pleasing. Almost all entries were at the appropriate level. Candidates attempted all questions and there were very few questions left unanswered. Responses were good across the whole range of questions, showing breadth and depth of understanding.

As with the Foundation Tier examination, candidates will have found the photographs clearer on the CBT. There was also greater scope for extended writing on the CBT as the response area enlarges to incorporate the text.

Advice for improving performance of future candidates can be summarised as the following:

- Read the question fully before answering it to establish what is required.

- For questions that require more than a single word answer use correct punctuation. Start the answer with a capital letter. End sentences with a full stop.

- Incorporate subject specific vocabulary in responses to extended writing questions.

Comments on Individual Questions

The question numbers are given for the paper examination followed by the CBT.

1/1   The paper began with an objective question targeting grades B and C. From a list of six sentences, candidates had to choose the two pieces of advice that would reduce the impact of pesticide on the environment. Most candidates were able to identify both correct answers. The majority of the remainder identified one of the correct answers.

2/2   This was an overlap question with the Foundation paper. Many candidates gained both marks for correctly matching fertiliser, herbicide and pesticide to the harm they can cause. Very few were unable to make one correct match.

3/3   Candidates were asked to identify two renewable sources of energy from a list of seven possible choices. Virtually all correctly selected solar as one source. The second source, crops, was the second most popular answer although less than half of the candidates made this choice. Natural gas, nuclear and peat were selected by some candidates. Coal and oil attracted very few responses.

4/4   In this objective question, candidates had to select two true statements about clay soil. Virtually all scored one mark for identifying that it feels sticky when wet. Many also realised that it retains nutrients. Other distracters were chosen in small numbers. 'Its particles do not stick together' was the least used distracter.

5/5   From a list, candidates had to identify the type of bacteria that returns nitrogen to the atmosphere. The correct answer was the most popular choice. Nitrogen fixing was the most commonly chosen distracter, while 'denitrating' was very seldom chosen.

6/6   This question asked candidates to identify the pyramid of biomass for a given food chain. Less than half of respondents got the answer right; either they did not read the question carefully and gave the answer for a pyramid of numbers (distracter D), or they did not know what a pyramid of biomass looks like. Distracter C was the least chosen.

7/7   For the first of the short answer questions, candidates were told that weeds can be controlled by using chemicals or by using cultural methods. They were then asked to suggest two advantages of using chemical weed killer. Many were able to say that using chemical weed killer was less labour intensive and could be applied quicker than using cultural methods.

8a/8.1   Candidates were given the step by step method for an investigation to find the mass of water in a sample of soil. They were asked to explain why the soil had to be heated and reweighed (repeating steps 3 and 4) until the mass did not change. About half of all respondents realised that repeating steps 3 and 4 ensured that all the water had evaporated. The common answer of 'to make it a fair test' was not credited unless correctly qualified.

8b/8.2   The second part of this question asked candidates to say how the mass of water in the soil could be calculated. More than half of respondents gave the correct answer. Some gave procedures that did not relate to the experiment, while others tried to overcomplicate the answer.

9/9   There were many good answers to this question, which asked for two reasons for having green belts. Candidates realised that green belts provide boundaries between built-up areas or act as reservoirs of biodiversity. Consequently many gained both available marks.

10a/10   From a table showing actual and projected electricity production for Europe, candidates were asked to suggest why the production for 2020 could be different to the projected value. Answers were generally quite protracted and lacked precision. There was too much reference to figures given in the table and not enough focus on why production could be different to projections. Few related their answer to specific renewable energy resources.

10b/11   The first data analysis question asked candidates to calculate the percentage increase in tidal power from 2005 to 2020. While it was pleasing to see that most attempted the question, there were few correct answers. Credit was given for correct formula even if the answer was incorrect.

10c/12   It seemed that few candidates were familiar with the generation of electricity from tides. Many thought that tidal power only made a small contribution to electricity production because there was not a lot of energy in the tide or it did not provide a constant flow of energy. Others confused tidal power with wave power and said that we did not have big enough waves.

11/13   Virtually all candidates gained one mark for attributing excessive plant growth in the stream to fertiliser run off. The second farming practice leading to excessive plant growth proved much more difficult to identify. A few candidates came up with viable alternatives such as run-off from manure or slurry getting into the waterway.

12/14   Candidates were asked to suggest two ways that local and national governments may influence changes in land use. There were few good answers to this question, which was targeted at grade A. The main error came from candidates trying to formulate an answer from the data in the chart that accompanied the question. Marks were awarded for answers that referred to legislation change and financial incentives or penalties.

13a/15.1 A straightforward data question that required candidates to subtract one six figure number from another. Most respondents were successful in this action.

13b/15.2 Most candidates were able to select the correct value for the percentage by which the length of managed hedgerows had decreased between 1998 and 2007. There was evidence that some candidates had carried out a calculation to find the correct answer.

14a/16.1 To get the correct answer to this question, candidates had to undertake addition and subtraction of decimals. Many gave the correct calculation. A few made no attempt to provide an answer.

14b/16.2 Targeting grade B, candidates were asked to calculate the mean percentage loss of permanent grassland between 2005 and 2008. About half of all respondents gave the correct answer to three decimal places. Candidates who rounded up or down were given a mark.

15a/17.1 Gaining a mark for this question proved a little difficult as candidates had to provide two correct answers. Most were able to identify water temperature, oxygen level or pH as one environmental condition that could be monitored. This was not always matched with a second condition that applied to a pond. Light penetration, water clarity and mineral content were all given credit.

15b/17.2 There was good understanding of the use of probes as monitors with a link to a computer for storage and analysis. A few candidates used the example of control in a greenhouse to illustrate how the system could work.

16/18 The final question gave candidates the opportunity for extended writing by asking for arguments for and against GM crops. There were many very good answers and candidates scored well. The question was a good discriminator as the more able candidates gained more marks. It was obvious from the quality and depth of answers that this topic interested candidates and had been covered in depth by many Centres.

B494/01 Care of Animals (Foundation Tier)

General Comments

The paper followed the established format of previous sessions.
The questions were organised in the paper by type – objective, short answer, data and extended writing. The questions within each section were arranged with an increasing level of difficulty.

The candidates' overall performance did not vary significantly from last year.

The questions that tested knowledge that was linked to practical work with small animals were done better than those that tested science.

The responses to the objective questions were good. The only questions that posed problems to candidates were Q4 and Q6 on digestion and diet. Candidates doing the electronic paper must make sure they drag and drop answers accurately onto diagrams.

In short answer questions and extended writing questions that require explanations, one word answers will not suffice. For example Q9 and Q21.

Candidates dealt with the data questions well. These questions are often set in unfamiliar situations and it was pleasing to note that the weaker candidates were not deterred from attempting an answer. Q16, that asked candidates to make conclusions from some data, did pose some problems.

There were some good responses in the final questions that required extended writing, especially in Q18 where the candidates could use their practical experience to advantage. The new specification places more emphasis on extended writing and candidates should be encouraged to continue to develop their writing skills.

Centres should encourage candidates to use scientific language rather than colloquial terms in their answers, for instance – faeces rather than 'poo' and obese rather than 'tubby'.

Comments on Individual Questions

1   A straightforward visual question to start the paper. The correct answer was D, showing the handler providing both support and security. A, was a common wrong answer, although the bird was supported by the handler it could easily fly away.

2   This question, together with question 3, was about suitable housing for small animals. They were both well done. The hamster was the correct answer.

3   The bottle attached to the cage wire was the most suitable way to provide water to small animals. Open dishes can spill and become soiled with bedding and faeces.

4   This question tested knowledge of the digestive system – basic biology, which candidates found testing. Most knew where teeth were in the drawings but under half correctly put them on the rabbit – birds do not have teeth. The nature of the crop and caecum were not well known so were placed largely at random on the drawings. The crop was often placed in the stomach of the rabbit or on the neck of the bird. There were problems in accurately identifying the position of the caecum as opposed to the appendix. Credit was given for identifying the caecum of the hind gut in birds although, here again, labelling was often

inaccurate. Some candidates lost marks by trying to label the three structures on both diagrams so negating any correct answers.

5   Most candidates correctly identified health as an important feature to consider when choosing a pet cat for the family. The second choices covered most other options equally. Temperament was the expected response.

6   This was a common question and as expected it was answered better by the higher candidates. The standard specification requires an understanding of the difference between roughage, succulent and concentrate foods. A straight forward teaching point but one which does pose problems to candidates. The types of food were labelled to help candidates who could not identify the foods in the pictures.

7   The completion of the Health Card was a low level demand question which had a wide range of acceptable answers. The behaviour had to be defined 'irritable' and/or 'inactive' rather than 'abnormal' or 'unusual'.

8   A straightforward recall question. The part of the cats' diet that was missing was carbohydrate. 'Fibre' was a common wrong answer; although important in omnivore diets, is not essential in meat eaters like the cat.

9   A well answered question. Any reference to toys or individual things in the cage gained a mark. Comments relating to' plenty of space to fly in' were not credited.

10   This question posed problems, despite being set on the low demand statement,' the basic differences in reproduction in mammals and birds'. The expected answer for small animals was 'young fed via the placenta / umbilical cord' and for birds, 'the embryo feeds / develops in the egg'. A mark was given for mammals are born and birds hatch. Surprisingly, the fact that mammals suckle their young with milk was mentioned by very few candidates. The common feature in the reproduction of birds and mammals, 'internal fertilisation', was perhaps a little more difficult but having sperm, eggs and oviducts were also credited.

11   This was the least well done question on the paper. Very few candidates identified a fungal disease. Ring worm was the expected answer which some candidates knew. Those with experience of fish correctly identified gill fungus. Fungal infection of nails and claws were also mentioned.

12   A common question. Many candidates lost marks by not explaining how the features of the carrying case they selected were fit for purpose. Comments such as, 'the wire grill provides ventilation and air for the animal' or, 'the handle enables the cage to be easily and safely carried' gained the marks.

13   Another common question that required candidates to complete a table on the hazards of working with animals. The way to prevent getting tetanus is to avoid being bitten by having thick gloves or by careful handling. The tetanus 'jab' is not a routine vaccination; only those regularly working with animals are vaccinated. Wearing plastic gloves when handling animals prevents disease such as salmonella being passed onto skin by faeces. General statements like, 'get disease' and 'get germs' did not receive a mark.

14   A straightforward data response question requiring candidates to read from a graph.

15   Another data response question which this time, required candidates to make a conclusion from a table.

16   This third data response question required candidates to make conclusions from two sets of bar charts. Few linked their conclusions to the number of prosecutions with and without injury. Most just referred to the key. The most obvious conclusion is that prosecutions with injury were always greater than prosecutions without injury. That the former also steadily increased over the 10 year period, while the prosecutions without injury increased, decreased and then stayed the same gained marks.

17   A calculation question that required candidates to show how they arrived at their answer. There were different ways of approaching the problem. To work out how much room one fish would need, 50 divided by 4, and then multiply by 10. Others calculated that 10 fish required $2^1/_2$ times the water than the 4 fish needed so multiplied 50 by $2^1/_2$.

18   This question produced some very good accounts that were clearly based upon practical experience. The need to approach animals quietly and slowly and supporting them underneath and making them feel secure were well appreciated. Many candidates referred to washing hands before handling the animal. Only a few candidates failed to notice the emboldened text which emphasised that the question was about causing harm to the animal not the handler.

19   Not all candidates have the practical experience of taking small animals to show but the specification lists what is expected of the show animal namely correct markings and conformation. Good health and grooming are also factors the judges look for. The question was marked in such a way so that candidates taking the paper exam, who did not have colour pictures of the budgerigar, were not disadvantaged. Candidates who described the budgerigar's crest in terms of fur and hair did not achieve the 'crest' mark.

20   A common question which proved more challenging than expected. Two types of record that should be kept when looking after animals were required for one mark. Health records, breeding records, feeding records, growth records and production records were the mark scheme headings. Age and sex are not on going records so were not credited. Behaviour needed to be qualified.

21   This was a common follow up question asking for explanations why computers provided a more efficient way of keeping records. Comments which could equally apply to paper records did not gain marks e g 'safer', 'more accurate', and easier'. Explanations were needed as to why computers were more efficient – they can be accessed quickly, records are easy to update, they can store a mass of information, they can quickly organise data into required formats and they allow for rapid multiple access.

B494/02 Care of Animals (Higher Tier)

General Comments

The paper followed the established format of previous sessions.
The questions were organised in the paper by type – objective, short answer, data and extended writing. The questions within each section were arranged with an increasing level of difficulty.

The responses to both the objective and short answer questions were good. The only question that posed problems to candidates was Q12.

Some candidates lost marks by not paying attention to the question rubric – Q 2 & 3, Q6 and Q13.

Candidates dealt with the data questions well. Some of the data questions were set in an unfamiliar format and it was encouraging that this did not put off candidates from attempting an answer. Candidates need to be taught to identify trends in data as well as making conclusions.

There were some good responses in the final questions that required extended writing. The new specification places more emphasis on extended writing and candidates should be encouraged to continue to develop their writing skills. When asked to explain or discuss in long answers, candidates must include information to back up their ideas. Q21 was a case in point.

Centres need to appreciate that the higher paper is designed to differentiate between A*, A and B grades, not to identify C grades. There was evidence that some candidates should not have done the higher paper. 11% scored under 10 marks.

In short answer questions and extended writing questions that require explanations one word answers will not suffice. For example Q9 and Q20.

Some questions tested knowledge which was linked to practical work – Q 2 & 3, Q5, Q10 and Q21. It was clear from the answers given to these questions that most candidates had had experience in the care and handling of small animals.

Centres should encourage candidates to use scientific language rather than colloquial terms, for instance – faeces rather than 'poo' and obese rather than 'tubby'.

Comments on Individual Questions

1   This was a common question with the foundation paper and as expected it was answered better by the higher candidates. The standard specification requires an understanding of the difference between roughage, succulent and concentrate foods. A straightforward teaching point but one which does pose problems to candidates.

2   Most candidates were aware that controlling lice by spraying was the least effective method illustrated.

3   This follow up question was often misread by candidates. Some answered about hazards to the chicken rather than the handler. Others considered the hazards of two of the types of treatments. Many also ignored the fact that the handler was pictured dealing with chickens and suggested a hazard was being bitten. The spray getting into the handlers eyes and on the skin were the expected answers which could be prevented, respectively, by goggles and gloves.

4   A straightforward recall question. Anaemia is the condition caused by a lack of iron. Scurvy was a common wrong   response.

5   A well answered question. Only a few candidates were tempted by the distracter 'need to calculate average weights'.

     Those with practical experience realised the importance of keeping animals still when trying to weigh them.

6   Digestion is a common science topic so it was expected that a greater number of candidates would get the correct answer. A common mistake was to confuse the functions of the small and large intestines.

7   This question referred to the previous diagram of the digestive system and asked about the working of the caecum. A high level question that resulted in an encouraging number of correct answers – fermentation and methane. Frequently cited distracters were metabolism and ethane.

8   A high level question on enzymes that was answered well by the better candidates. All the distracters were plausible so they did require careful analysis.

9   A common question. Most candidates achieved full marks for explaining the features of the carrying case they selected and how it was fit for purpose.

10   Another common question that required candidates to complete a table on the hazards of working with animals. The way to prevent getting tetanus is to avoid being bitten by having thick gloves or by careful handling. The tetanus 'jab' is not a routine vaccination; only those regularly working with animals would be vaccinated. Wearing plastic gloves when handling animals prevents disease such as salmonella being passed onto skin by faeces. Catching a virus disease such as Orf was also given credit. General statements like, 'get disease' and 'get germs' did not receive a mark.

11   The main risk from keeping livestock in intensive conditions is the **spread** of disease. Intensive husbandry does not cause disease. Many answers related to 'unnatural' conditions prompting stress and aggression. These only gained credit if they were qualified with specific detail. The second expected answer was damage to the feet and hocks.

12   This question proved to be the most difficult on the paper, even to those candidates who knew the meaning of 'ad lib' feeding. Such feeding does not provide a balanced diet which is particularly important for developing embryos in terms of protein and minerals. The other reason concerns the weight of the mother and the size of the offspring – obese mothers with large young can have problems at birth.

13   Another high level question but one that produced some encouraging responses. It asked how the care of the young budgerigar and chick would differ, the implication being care by owners rather than the birds themselves. Candidates were not penalised for referring to care by birds as long as the answer was accurate. The budgerigar chick has to be fed initially and it requires more warmth for longer than the hen chick. Hen chicks need confining from day one if reared without a mother.

14   A common data question which discriminated well at standard demand. A few candidates who got the right answer lost a mark for not showing their working as the question specified.

15   An unusual data response question that required candidates to make an estimate on data provided by a bar chart. This format did not appear to deter the candidates. Such a skill is useful when inspecting figures for the first time.

16   This question asked candidates to analyse a table of raw data and suggest two trends shown by the data. Many   could describe the data but not identify the trends. Only the best candidates linked their answers to the number of prosecutions, most just referred to the table headings 'injury caused' and 'no injury'.

17   The question asked candidates to use their knowledge of animal breeding to explain why it was difficult to prove a particular dog was a fighting breed. Credit worthy answers had to relate to breeding with explanations of why a visual phenotype did not necessarily constitute a fighting 'type'. Only the better candidates responded in this way.

18   This was a high level data question requiring close analysis of four statements which were possible conclusions from the data given. This was a format not asked before and favoured candidates with good reading skills.

19   A common question which proved more challenging than expected. Two types of record that should be kept when   looking after animals were required for one mark. Health records, breeding records, feeding records, growth records and production records were the mark scheme headings. Age and sex are not on-going records so were not credited.

20   This was a common follow up question asking for explanations of why computers provided a more efficient way of keeping records. Comments which could equally apply to paper records did not gain marks e g 'safer', 'more accurate', and easier'. Explanations were needed as to why computers were more efficient – they can be accessed quickly, records are easy to update, they can store a mass of information, they can quickly organise data into required formats and they allow for rapid multiple access.

21   The final extended writing question asked for a detailed account of the routine cleaning of a chosen animal. If detail was not forthcoming the marks were not awarded. It was clear from the answers which candidates were describing their own practical experience. A wide variety of animals were selected – mice, rats, rabbits, hamsters, guinea pigs, degus, snakes, tortoises and fish. Stable cleaning was given credit although the horse is not strictly a small animal.

B495/01 Livestock Husbandry (Foundation Tier)

General Comments

Candidates were generally well prepared for this paper with many using their practical experience to good advantage when answering questions.

Fewer candidates seem to have been entered for the wrong tier.

Once again, Centres who took advantage of the computer-based test enabled their candidates to best demonstrate their knowledge, without the problems of poor handwriting limiting readability for examiners.

Candidates who answered on paper frequently seemed to not have access to a calculator, which again put them at a disadvantage.

Comments on Individual Questions

1(a) An accessible start to the paper that caused few problems.

1(b) Most candidates achieved 1 mark, but few candidates were able to give a second advantage of plastic; being easier to clean was the most common answer.

2   The most common error here was to suggest that the fact that the cow was black and white told you it was a dairy animal. Most candidates identified the large udder or bony frame as being better indicators.

3   Most candidates gave suitable characteristics of all good housing for the first section and comments about size and access for the second. Candidates did not always clearly identify which house they were talking about in their answers.

4   Candidates generally recognised hardiness was of particular importance for free range animals.

5   Most candidates were able to give a bulk feed, but then lost the second mark by giving an answer such as pellets without giving a type of pellet, such as "layers pellets".

6(a) This was answered much better than is usual for genetics questions on the Foundation paper.

6(b) Not as well answered, with only half the candidates correctly identifying this as an F1.

7   Quite a complicated answer, which was generally answered very well. The most common error was to confuse ringworm with roundworm.

8(a) Very well answered, with most candidates being aware of the role of salmonella.

8(b) Washing hands was by far the most popular answer. Some candidates ignored "contact with animals" and gave answers such as "cooking food properly".

9   Most candidates gave at least two correct answers.

10(a) No issues.

10(b) Many candidates lost marks by only addressing feed intake or growth rate, but not both. Only better candidates identified that the growth rate went up initially, then declined with temperature. Some tried to 'explain' rather than 'describe'.

11(a) Very well answered.

11(b) Few candidates were able to calculate an average, with many not even attempting this question. It seems that several candidates were disadvantaged by not having access to a calculator.

12. Very few candidates were unable to make at least two valid comparisons between the two systems, but it was uncommon to see the four required to gain maximum marks.

13. Few candidates hit all four marking points, which were using a good number of hens, two populations (one inside, one outside), some idea about controls and a description of how you would compare the eggs.

B495/02 Livestock Husbandry (Higher Tier)

General Comments

Candidates were generally well prepared for this paper with many using their practical experience to good advantage when answering questions.

Fewer candidates seem to have been entered for the wrong tier.

Once again, Centres who took advantage of the computer-based test enabled their candidates to best demonstrate their knowledge, without the problems of poor handwriting limiting readability for examiners.

Candidates who answered on paper frequently seemed to not have access to a calculator, which again put them at a disadvantage.

Comments on Individual Questions

1(a) Most candidates were able to give a bulk feed, but then lost the second mark by giving an answer such as pellets without giving a type of pellet, such as "layers pellets". Some candidates defined both.

1(b) Most candidates achieved 2 marks, with better candidates getting all 4.

2 Very well answered by most candidates.

3 Quite a complicated question which was generally answered very well. The most common error was to confuse ringworm with roundworm.

4(a) Very well answered, with most candidates being aware of the role of salmonella.

4(b) Washing hands was by far the most popular answer. Some candidates ignored "contact with animals" and gave answers such as "cooking food properly".

5 Many candidates realised that all these conditions could be treated with antibiotics.

6 Most candidates gained the two marks for the similarities, but did not get both the marks for the differences; unacceptable answers such as "size" were often given, rather than saying the cattle pen is larger, which would have been more appropriate.

7 Only better candidates could name two female hormones, but most gave oestrogen.

8(a) No issues, apart from those candidates who did not have access to a calculator.

8(b) Few candidates realised that to work out the mean mass at the start of the experiment you needed to subtract the mean gain in mass from the mean mass, i.e. 2842g – 2796g. Most gave 2842g as their answer, i.e. the mass after 82 days.

8(c) A significant number of candidates gave the correct answer, $30kg/m^2$, but then did not go on to gain the mark as they did not explain that this meant that the birds had put on most weight for the least amount of food eaten.

8(d)   Generally well answered but candidates should be reminded that 3 marks for a question such as this clues them in to the need for three points to be made.

8(e)   Many candidates simply repeated their answers to the last question rather than attempting to *explain* them.

9   Few candidates made the link between the sight/smell of the boar triggering egg release in the sows.

10   Some very good answers, covering the need for paperwork, identification, hygiene, healthy animals, etc and linking these to preventing disease transmission and tracing sources.

B496 Coursework Portfolio

The last four years have seen Centres make great strides towards producing coursework of a pleasingly high standard. The best Centres set work which is appropriate to the ability of their candidates so enabling the candidate to reach their optimum performance and allowing maximum achievement. This has allowed the candidates to demonstrate their real ability. It has also stimulated enjoyment and productivity and provided a route for active learning for the whole course. This helps to make the coursework a valuable part of assessment and has allowed candidates to greatly improve their skills in applying aspects of science to the management of the environment and production systems. Candidates have, in most instances, progressed greatly in their ability to research relevant supportive information related to their investigation. The Work Related Report allowed them to hone their skills in using IT as a tool for investigating, recording and communicating their findings.

It is very evident in the case of a few Centres where the work has been produced in a traditional written report that this is less motivating to the candidates and the outcome is far less satisfactory.

The use of word and power point along with JPEG photographs and simple video clips help to motivate candidates and provide justification of the Centres marking. A few candidates do, however, spend too much time on animations of power points, which although fun, are not really needed. However, if such an approach provides a route for motivation it should not be discouraged. This approach is far better than poorly written and illustrated work being submitted as a paper or a scanned portfolio.

This year an increasing percentage of Centres have entered very able candidates with portfolios of a high standard, for which Centres can be proud. In almost all cases the work of the weakest candidates has shown pleasure and worthwhile learning and achievement.

Element 1. Practical Scientific Skills

Most Centres now present their skills as annotated photographs, usually incorporating a series of shots demonstrating how the candidate performed. The use of annotation by candidates made this work interesting to moderate and shows candidates understanding and application to the skill. The marking of skills showed better differentiation than in the past, although a few Centres have failed to show evidence of differentiation awarding full marks for skills as basic as watering a plant.
Centres are reminded to take particular note of the changes to the marking criteria for this area in the revised specification.

Element 2. Investigative Project

Most Centres opted for fairly simple but safe investigations which generally involved aspects of ecology, horticulture or animal husbandry. It was good to see far fewer Centres submitting more traditional biological investigations performed in the laboratory over short periods of time. The longer term investigations produced worthwhile reports which would also have enhanced the learning of the specification. For example, some candidates grew a crop, comparing different cultural techniques. Others reared animals, comparing different feeding regimes or breeds. Many Centres carried out interesting ecological studies. The better studies allowed the candidates to develop their own specific focus. Where Centres had a full day class field study the reports tended to become homologous and made it difficult to see the work as an individual scientific investigation. It would be a good idea when undertaking class field work to build time into the programme for candidates to collect data on an aspect related to the day but with an individual theme.

Skill P. Planning

Most candidates now use secondary data to support their plan. The better candidates made direct reference to their plan when establishing the methodology for their investigation. Few candidates, even at the upper end, really justified how their plan will ensure precision and minimise error. At all levels of ability, evidence of risk assessment was poor and this aspect must be corrected for the future.

Skill A. Processing and analysing data

These skills have become very well understood by both candidates and Centres. The more able candidates still failed to fully analyse the information shown in graphs and charts and did not link the outcome of observations to the science which underpins the investigations. More able candidates should make better use of mathematical approaches in the analysis of their data, this will be very important in the future.

Skill Q. The Quality of the practical part of the study collecting and obtaining

Most candidates collected extensive data but failed to show how this data was collected and how or why the data was adequate. Where an investigation was unrepeatable because of the task or because of the growing seasons, candidates needed to show an awareness of this and possibly use the data of other candidates carrying out similar work. This should be appropriately acknowledged.

Skill E. Evaluating

This is the most improved area, hopefully indicating Centres have made full use of previous Moderator Reports to Centres. The best evaluations were supported by comments clearly relating to the candidates work and where amendments and alterations were suggested, the reasons were fully justified. Good candidates made constructive critical comments and often used more research to support further change if the work was to be repeated.

Skill W. Quality of written report and presentation of data

Most Centres used the marking criteria appropriately. A few Centres' marking was generous, resulting in quite severe moderation. In some instances simple reports were submitted which were neat, tidy and correctly spelt but which often lacked the use of scientific and technical terms, and when present these terms were often not used appropriately. Care needs to be taken in awarding high marks for neat but superficial scientific reports.

Skill D. Determination, initiative and independence

Centres should be congratulated for using these marks in an effective way, rewarding diligent, hard working and self motivated candidates irrespective of their ability. It is pleasing to note that where some very able candidates had produced excellent investigations, Centres had not always awarded these candidates the highest marks for this strand but instead did award diligent, hard working candidates.

Element 3. Work Related Report

The Work Related Reports were, in most cases, interesting and appropriate. Where Centres used school based enterprises more able candidates found it difficult to access higher marks. Mini enterprises work well for weak candidates or as a way to deliver other aspects of the specification. However, to access the high marks candidates needed to compare their enterprise with a similar commercial enterprise or incorporate extensive research. Marking for the Work

Related Reports was accurate and although some Centres had problems identifying the best fit mark, especially in Strand B and Strand C, such problems tended to be averaged out in the marking of other strands, resulting in close agreement with the moderator.

Strand A. Information sources

For marks above 6, evidence needs to be recorded accurately. The candidates needed to show the ability to discriminate to identify a good range of references and sources. Some candidates failed to link the secondary data to the job role of a chosen person within the enterprise.

Strand B. Description of work place

Most candidates had no problem describing and identifying the work within the enterprise but failed to explain or analyse the purpose of a specific job and link it to the work practice of the wider organisation. Candidates had a poor understanding of the reasons which under pin the location of an enterprise and failed to show understanding of its impact on the wider society.

Strand C. Scientific knowledge and skills applied

In general, candidates used a lot of illustrative science to describe how science is used in the work place. However, candidates failed to stress the importance of scientific knowledge and explain how it underpins the work place. Technical skills were often treated in a superficial way and again Centres need to encourage candidates to explain and analyse how technology and the skills acquired by the employees affect the enterprise.

Strand D. Quality of presentation

Most reports were well structured and presented, although some candidates still forgot to number pages and use effective sub-headings and annotations. Visual material was used well with good annotations. Better candidates made good reference to pictures and charts so that they were used to convey information and ideas in an effective way. Some reports lost marks due to poor use of scientific vocabulary and failed to make full use of the relevant scientific terminology.