

Additional Applied Science A

Twenty First Century Science Suite

General Certificate of Secondary Education **J632**

OCR Report to Centres

June 2012

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

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

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Overview

Although legacy papers will be available for candidates in January 2013, this was the final session for these papers which will now be superseded by papers written for the new specifications. The overall entry was down on previous years and this was anticipated as candidates are now being taught and entered for the new specifications.

Most Centres entered their candidates for the correct tier of examination although it was noticeable in the higher tier of Agriculture and Food that this was not always the case. Weaker candidates that are entered for higher tier papers do not have a pleasant experience and find many of the questions too difficult to attempt.

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

Candidates seemed to find the papers accessible and demonstrated sound knowledge and understanding of the course content. It was clear that candidates had been well prepared by Centres. It was clear that many Centres were making good use of past papers when preparing candidates. Questions towards the end of the papers were answered equally as well as questions at the beginning of the paper indicating that there was no evidence that candidates ran out of time. There was also no evidence that any candidates had been disadvantaged by the language or by cultural issues.

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

Candidates are well advised to read questions carefully. Each year a number of candidates lose marks unnecessarily because of their haste to complete the paper. It cannot be stressed too strongly that reading and re-reading the question is time well spent. Candidates would also be advised to pay similar attention to their answers. Answers should always be re-read to ensure that they do indeed answer the question on the examination paper. It was noted by some Principal Examiners that failure to re-read answers had resulted in contradictions in some candidate's responses. This is a simple error that can be avoided.

The use of questions that required extended answers proved to be challenging for many candidates. This challenge is going to increase in the new papers with three longer, six mark questions. All too often candidates answered the question by re-writing the question before starting to answer. This resulted in two problems for the candidates; running out of space in which to answer the question; then thinking that by writing out the question they had in fact answered it. This meant that many candidates either failed to score or performed badly on extended answer questions. It was clear however that most Centres are encouraging candidates to write more than in previous years. It is important to continue this trend as the papers for the new specifications contain three, six mark questions.

There was mixed evidence concerning mathematical performance. In Health Care and Agriculture and Food, performance seemed to have improved. However in Harnessing Chemicals and Communications, performance seemed to have fallen. When answering questions that include numerical calculations, candidates are always asked to show working. It is vital candidates do this. Candidates are very good at answering calculation questions intuitively

or performing simple mental arithmetic and then writing down the answer. Providing the answer is correct, this is not a problem and will gain full marks. However it is a very risky strategy. A simple mistake in mental calculations will lose candidates all of the marks. If candidates had written down their working, the chances are that they would have salvaged at least one of the marks available for the question.

Candidates, particularly at foundation level, had a tendency to leave some questions blank that they had difficulty answering. This was particularly noticeable in questions that required longer answers. Leaving questions blank will guarantee candidates get no marks for the question. At least attempting the questions opens up the opportunity of scoring some of the available marks. Candidates should be encouraged to at least make an attempt with every question.

Centres and candidates should be aware that examination papers are scanned and marked online. Candidates who write out of designated areas are at risk of their answers not being fully marked. Candidates would be well advised to ensure that they use the appropriate answer lines and spaces in which to write their responses. This is often exacerbated by candidates crossing out initial incorrect responses, and then cramming the answer into a much smaller space. This is another good reason why candidates should think carefully before beginning to answer the question.

Centres will be well aware that many of the questions in these papers consist of "Put ticks (✓) in the boxes next to the correct answers." In order to ramp up the degree of difficulty of higher tier questions, candidates are not always told how many correct responses are required. The more astute candidates may well look to see how many marks the question is worth and then assume that the number of marks available for the question must match the number of correct responses required. This is not necessarily the case. Some questions will award one mark for two correct responses. Some may award two marks for three correct responses. Candidates must be advised to answer each of these questions on their merit and place ticks next to those answers that they think are correct.

In Additional Applied Science, terms are often used that have a dual use in everyday life. The meanings of these words are however often different from common use. This is particularly noticeable in the Communications unit. It is important that candidates are taught the correct specific meanings of these words. Candidates also need to be aware that imprecise answers will not score. The use of the words "they" and "it" often do not clearly identify what the candidates are writing about. As in previous sessions, questions which required candidates to have memorised a piece of knowledge proved to be much harder than those which required candidates to process information supplied in the question. Vocabulary is still a problem for many candidates. Several modules require candidates to use many specialist terms which do not appear elsewhere in GCSE Science. These terms are also used in the new specifications. Centres might usefully consider more testing of these special words as part of their teaching.

With regard to the Work Related Portfolio, most Centres correctly returned the samples with clear labelling and the record card attached. However there are still some Centres that make clerical errors when transferring marks. It is important that these are checked before being sent to OCR. This year most portfolio work was well organised and presented using treasury tags which allow moderators to easily read and locate the work. This is good practice and is also advised for future submissions of the new specifications. **For next summer, tasks will be set by OCR under the new Controlled Assessment procedures and Centres must check the new unit entry codes and other requirements.**

The following reports provide more detail on how candidates performed on specific papers and skills assessment, highlighting areas of concern and applauding improvements from previous years. It is hoped that this trend will continue into the new specifications.

Please encourage your staff to read these reports.

The reports are available on line at www.ocr.org.uk

A324/01 Life Care (Foundation Tier)

General Comments:

The overall performance of the candidates was good and there was no evidence to suggest a shortage of time. It was pleasing to see an increasing number of individuals achieving full marks for the calculation.

It would be beneficial to advise candidates to distinguish between adaptations and functions, and ensure they appreciate the meaning of a non-invasive technique.

Comments on Individual Questions:

Question No.

- Q1(a)** The majority of candidates ticked three boxes to score full marks for this question, although a few were foiled by the distracter claiming that fitness clubs 'made you healthier'.
- Q1(b)(i)** This question was generally well answered although judging by the numbers of crossing out, a considerable number of candidates missed the 'medical history' reference and only returned to it once they encountered the 'lifestyle history' in part (ii). The most common responses involved the type of medication and any illnesses or injury Jasmine might have had. Less able candidates scored one mark by asking about specific medical issues such as 'do you have asthma'?
- Q1(b)(ii)** Most candidates scored both marks by referring to smoking habits, alcohol consumption or the amount of exercise Jasmine does. Credit was not given to drinking habits if they were not linked to alcohol.
- Q2(a)(i)** The more able candidates ringed the three components of blood and scored three marks.
A few candidates were unsure of how many components to ring and lost marks by only selecting the red and white blood cells, whilst others were convinced that starch is a component of blood.
- Q2(a)(ii)** A pleasing number of candidates calculated the volume of blood correctly or at least scored the mark for correct substitution of the values. The most common misconception arose from the cube of the cm^3 which led some individuals to multiply the 75 by 3.
- Q2(b)** Some gave excellent answers referring mainly to movement, support or protection, whereas others had no idea and gave the names of various bones.
- Q3(a)** There was an improvement in the candidate's knowledge of the lungs and associated structures, with most scoring two or more marks. Weaker candidates labelled the alveoli as lung and some still confused ribs and intercostal muscles.
- Q3(b)(i)** This question was very poorly answered. There were a number of individuals who did not even attempt an answer. Those who tried to answer attempted to describe the function of alveoli rather than how they were adapted to carry out this function. Just a few candidates scored a mark for referring to their thin walls, or to there being lots of them.

- Q3(b)(ii)** Most candidates were more comfortable with this question and were able to gain credit for stating that breathing would become more difficult. The better individuals were able to pick up the second mark for realising that the mucus would also reduce oxygen uptake or gas exchange.
- Q3(c)** This question was very well answered with a selection of conditions ranging from asthma through dementia and diabetes to autism.
- Q4(a)(i)** The majority of candidates scored at least one mark by recognising that Maureen was prioritised because she had a head injury or was unconscious. Some stated that her injury was more serious or gave examples that she should be treated before a broken toe or pulled muscle.
- Q4(a)(ii)** This was very well answered with the vast majority scoring at least one mark either for reassurance for Maureen when she regained consciousness, or for providing information to the hospital staff.
- Q4(b)(i)** The responses to this question were very mixed. A number of candidates showed an excellent understanding of non-invasive techniques and their answers explained that they are techniques which are used to examine an individual internally without the need for an operation.
- Q4(b)(ii)** Despite the confusion in (i) this section was generally well answered with the majority suggesting an X ray.
- Q4(b)(iii)** This proved an easy one mark for most candidates. The most common responses were that they were quicker to carry out and that they did not involve cutting people open. There were a few references to safer techniques due to reduced risk of infection which was a very good answer.
- Q5(a)** Most candidates scored at least one of the available marks by describing some form of exercise. The better ones were able to pick up the second mark by referring to repetition or increasing the intensity. For example, Misha should start out walking or gently jogging and then increase the speed or distance every week.
- Q5(b)** Again, most candidates scored a mark for recording data or using a fitness instructor/physiotherapist to monitor Misha's progress.
- Q5(c)** There was a lot of variation in the quality of responses to this question. A few candidates appreciated the possibility of further injury or illness, and some accepted that progress may not be up to expectations. Few answered clearly enough to gain full marks for this section. Common responses were to make sure he is fit enough to return to the army or to concentrate on different parts of his body.

A324/02 Life Care (Higher Tier)

General Comments:

This paper gave candidates a good opportunity to demonstrate their knowledge and understanding of health care provision and there was pleasing evidence of good preparation for this examination. There was very little evidence of entries at an inappropriate tier. There is now a significant bank of past papers for this specification and many Centres appear to be using these to good effect to familiarise candidates with the style and demands of questions set. There was no evidence of any candidates having insufficient time to complete the paper or of being disadvantaged by language or cultural issues and a full range of marks was generated by the questions set. Good use of scientific language was seen and candidates are becoming more adept in their mathematical skills. As in previous reports, an important message that Centres must pass back to their candidates is to emphasise the importance of clear handwriting and following the guidance about writing within the framework of the paper as scripts are scanned and marked on-line. There was continuing evidence of candidates not following this advice. Should candidates require more space they should use additional pages.

Comments on Individual Questions:

Question No.

- Q1(a)** This was well answered with most candidates scoring at least two of the four marks available.
- Q1(b)(i)** Candidates needed to read this question carefully and realise that they were being asked to identify the key structural elements of the alveoli that had a role in their function. Many just quoted the functions of the alveoli.
- Q1(b)(ii)** Many candidates correctly identified that the alveoli would be blocked by mucus but only the highest achieving went on to describe what effect this would have regarding gas exchange.
- Q1(c)** This was well answered with many candidates correctly identifying a condition, asthma and diabetes being the most popular choices.
- Q2(a)** Examiners were looking for some form of exercise that involved the legs that was then repeated/built up in duration or intensity to increase the patient's fitness levels.
- Q2(b)** Few candidates correctly named a fitness test that could be used to monitor progress but marks were gained for identifying the need to record, repeat and therefore compare performances to monitor progress.
- Q2(c)** This was a familiar style of question and was well answered.
- Q3(a)** This was well answered and often gained full marks. Candidates showed in their answers that they had knowledge based on practical experience of using the urine test sticks.
- Q3(b)** Pregnancy was correctly identified by many candidates but there were a significant number of incorrect 'diabetes' answers.

- Q3(c)** Many candidates realised that information programmes raise awareness but did not go on to explain how a reduction in illness would be cost beneficial in the long term. Some candidates appeared to not understand the term 'cost effective'.
- Q4(a)** Some candidates failed to gain a mark for hypothermia as it was impossible to distinguish an 'o' from 'er' in their writing of the word hypothermia. A hopeful scramble of letters in the middle of the word, leaving the choice to the examiner will always fail to gain the mark. Candidates need to write unambiguously in these situations, particularly as both key words are given as choices.
- Q4(b)** Few candidates identified the need to assess all the teenagers before treating the most seriously injured first.
- Q5(a)** It was disappointing to see how few candidates could correctly identify that the ovaries release eggs that are fertilised in the oviduct. A common misconception was that the eggs are fertilised in the uterus.
- Q5(b)(i)** Many candidates gained one mark in this answer. As a two mark question candidates need to ensure they have two clear responses to the question set to gain all of the marks.
- Q5(b)(ii)** Candidates needed to actually describe a named public health campaign to gain full marks in this question. Many could correctly name a campaign but failed to go on to describe any aspect of it. 'Five a Day' and 'Fit for Life' were common examples used. Some candidates were unaware what a public health campaign was and there were a significant number of responses quoting the NHS as a public health campaign.
- Q6(a)** There was a pleasing improvement in the number of correct responses to this mathematical section. There were very few examples of candidates not attempting this section – again an improvement on recent examinations.
- Q6(b)** This was a challenging question for many candidates and it involved using the data generated in the previous answer rather than just the candidates own opinion. An error carried forward was allowed from the previous calculation.

A325/01 Scientific Detection (Foundation Tier)

General Comments:

Most candidates made a very good attempt at answering questions. However the mean was down by two marks on the June 2011 paper and the entry had reduced by about half. Almost all candidates managed to score many of the marks on these questions with a significant number performing well.

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

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

Comments on Individual Questions:

Question No.

- Q1(a)** This was an easy start to the paper and most candidates managed to score both marks for giving the correct sequence and identifying the responsibility of each agency.
- Q1(b)** This proved to be slightly more challenging but most candidates managed to score at least one of the two marks available.
- Q1(c)** This question was also answered well. Two marks were awarded for all five correct responses. Four or three correct responses gained one mark.
- Q2(a)** This was well answered. Where errors did occur, they were mostly about mislabelling the lamp.
- Q2(b)** Most candidates scored both marks for correctly calculating the magnification to be $\times 750$. Common errors involved multiplying 15×50 incorrectly or even adding the two numbers together. Candidates who simply gave the correct answer, with no working, were credited with both marks. However this is a dangerous strategy as a simple mistake could result in a lost mark that would have been awarded for realising that 15 should be multiplied by 50.
- Q2(c)** Only a third of candidates managed to score full marks on this question. Correct responses included "quicker to set up", "electron microscopes are more expensive" and "they can examine living material". All three correct responses were required for two marks.

- Q3(a)** This was all about observational skill. Credit was given for describing the overall shape as round, spherical or circular, and then going on to describe the texture to include dents, holes or dimples. Any reference to size or simply saying it has a 'pattern' was not credited. Few candidates were awarded both marks.
- Q3(b)(i)** Although many candidates scored this mark, a worrying number did not. An important skill that candidates should use with this type of question is estimation. Many candidates simply attempted a measurement and made fundamental errors. Rather than realising that the measurement could not possibly be correct they simply wrote the answer down and moved onto the next question. Estimation is a skill that all candidates should be taught to use.
- Q3(b)(ii)** Examiners were instructed to use error carried forward on this question. That means that any incorrect response to the previous question, if correctly scaled was awarded the two marks. However this is another example of where it is most important for candidates to show their working in order to avoid losing yet another mark.

Question 4 was an overlap question with the higher tier paper.

- Q4(a)** Most candidates correctly answered this question, but a surprising number thought that electron microscopes use both electrons and light and thus failed to score the mark.
- Q4(b)** This was not answered well. Candidates' responses seemed to be randomly scattered across all four options thus indicating that most candidates simply made a guess. While guessing is better than no response, it does highlight an area of the specification that not all the candidates understand.
- Q4(c)** Although most candidates scored one of the marks, few went on to score both. Also a significant number of candidates failed to read the question and only gave a single response.
- Q4(d)** This was not well answered and most candidates failed to score. Those that did were usually only awarded one of the two marks. Good answers included the inaccuracy of the human eye, cards having fixed colours with no in-between shades, or even reference to colour blindness.

Question 5 was overlap question with the higher tier paper.

- Q5(a)(i)** The whole of part (a) involved understanding two-way chromatography and thus proved to be quite challenging. However in part (i) many managed to identify G as the correct answer.
- Q5(a)(ii)** This was surprisingly answered almost as poorly as part (i). This was often due to the fact that candidates failed to realise that no dye was left on the base line. Thus 3 was a common incorrect response.
- Q5(a)(iii)** Few candidates managed to correctly identify the answer of seven dyes. A common error was to count the dyes on both runs thus overestimating the true number.
- Q5(a)(iv)** This question was not well answered. To gain credit, candidates had to realise that any dyes with similar R_f values would fail to separate if only solvent 2 had been used. Only the most able candidates were able to score this mark.

- Q5(b)** This was another difficult question that only more able candidates answered correctly. If candidates had learned simple definitions this would have been a straightforward question and provided what should have been an easy mark.
- Q5(c)** A significant number of candidates gave no response to this question, presumably because of its difficulty. Good responses were rare. Where they did occur, they included reference to quantitative data, using small samples, analysing gases and liquids and being able to collect samples of the separated substances.
- Q6(a)(i)** This should have been as easy question to finish off the paper. However correct responses were rare and simply required the word 'alkaline' or 'pH greater than 7' to be awarded the mark.
- Q6(a)(ii)** Candidates also struggled with this question, however some did state that numbers or absolute values were not provided. Good answers stated that it told you it was alkaline but not its pH number.
- Q6(b)** Credit was given for any correct response but overwhelmingly the most common answer was universal indicator.
- Q6(c)** Candidates performed rather better on this question with most scoring at least one of the two marks. The most common correct answers were diabetes and pregnancy testing.

A325/02 Scientific Detection (Higher Tier)

General Comments:

Although this examination was relatively short, there was no evidence that candidates were short of time. Most candidates were able to make some response to all questions.

Comments on Individual Questions:

Question No.

- Q1(a)** Most candidates were able to describe one example of the work of at least one of the agencies but some marks were lost by naming a job rather than describing an activity. Other answers were too vague such as 'protecting the environment' or 'checking the standard of food'.
- Q1(b)** Most candidates were able to correctly identify some of the stages in collecting and storing scientific evidence but many could not distinguish between how these processes were done from why they were done.
- Q1(c)** Candidates struggled to describe examples of good laboratory practice with candidates often describing a reason for appropriate activity such as 'to stop accidents' or 'clean equipment is more reliable' rather than an example of good practice.
- Q2(a)** Almost all candidates knew at least some of the parts of the microscope. Common errors included magnifying lens for objective lens or zoom knob for focussing knob.
- Q2(b)** The advantages of a light microscope were well known but examples of disadvantages were less well done with vague references to clarity or quality of image.
- Q3(a)** Most candidates realised that Jane had produced the outlier but many chose Sunita due to the extra decimal place given.
- Q3(b)** The idea of estimation of the 3rd decimal place was not well understood with only the better candidates suggesting that she had estimated a value between the markings on the measure.
- Q3(c)** Good candidates were able to successfully calculate an area of 29.4 m^2 from the given length and breadth. Some were confused by the spaces for area and units and gave 29 for area and 4 for the units. Others struggled with the units – m appeared frequently as did cm^2 .
- Q3(d)** Candidates who understand that if uncertain measurements are multiplied together then the uncertainty will increase were few and far between. Many thought that the certainty would decrease due to errors in calculation.
- Q4(a)** Most knew that an electron microscope used a beam of electrons only but a few thought it would use light as well as electrons.
- Q4(b)** Although most correctly identified an atom as being a positive nucleus with negative electrons, many thought it was a negative nucleus with positive electrons.

- Q4(c)** The purpose of colorimetry was not well understood, with many thinking that it could be used to find the pH of substances and others only chose one use when two were asked for.
- Q4(d)** The idea of checking colour using cards was not well understood with many thinking about Universal Indicator rather than matching shades of colour. The most common mark obtained was the idea of the subjective nature of using the human eye. Very few considered that there could not be an infinite number of cards meaning that matches would be between two cards.
- Q5** Responses showed that candidates still find the concept of chromatography difficult and this was not a high scoring question.
- Q5(a)(i)** Many could identify G as the insoluble dye but a surprising number chose A.
- Q5(a)(ii)** Candidates were more successful in counting the colours separated from dye X although some had problems working out the starting position of dye X for the second run.
- Q5(a)(iii)** Only the stronger candidates were able to count the total number of dyes separated by the two-way method.
- Q5(a)(iv)** Very few candidates could identify the dyes which would not have been separated if only solvent 2 had been used in a one-way process. Almost every combination of dyes was suggested.
- Q5(a)(v)** Candidates were more successful in calculating the R_f value for dye X in solvent 2. Some did not use the scale given and some put the values the wrong way round to give an answer of 2 instead of 0.5.
- Q5(b)** Many candidates were unable to correctly connect both phases with the correct description, connecting the mobile phase with dyes was a common error. A significant number made multiple connections.
- Q5(c)** Too many advantages given for gas chromatography were too vague eg 'faster', 'better', 'more accurate'. Some did realise that the data would be quantitative and others that it could be used to separate gases and volatile solids.

A326/01 Communications (Foundation Tier)

General Comments:

The vast majority of candidates managed to attempt an answer for all of the questions on this paper, apart from the calculations. There was no evidence that candidates did not have enough time. No candidate appeared to have been entered for the wrong tier.

This module includes a lot of specialist vocabulary which candidates are unlikely to meet in other parts of their science education. Many of these terms, such as compression and digital have several meanings in every day life. It is therefore important that Centres make sure that as each of these terms is introduced in the course, its specialist meaning for the module is emphasised.

Too many candidates were unable to earn the marks for those aspects of the paper which involved numbers. This suggests that they have not had enough practice at doing calculations; this is significant because numerical work is an important component of the assessment of the new Additional Applied Science exam.

Comments on Individual Questions:

Question No.

- Q1** A surprising number of candidates were unable to identify the LDR in the circuit diagram. The block diagram was poorly completed by too many candidates. Weak candidates assumed it was a system process diagram, so used words such as light and sound instead of LDR and buzzer. Similarly, many candidates assumed that the switch or the battery was the input device. However, it was good to find that many candidates knew that the arrows showed the direction of flow of information - a pleasant change from previous exams which have tested this piece of understanding. The majority of candidates were able to provide a sensible example of a communication system which uses sound. Many candidates felt obliged to use all three numbers in the table in their calculation of power when only two were required. Only a minority of candidates knew that if the battery stayed the same, then the voltage remained unchanged, but a majority agreed that to increase the power of a component it was necessary to provide it with more current. Finally, although most candidates were able to draw a series circuit, only a minority were able to draw it with the correct symbols for a battery, buzzer and switch.
- Q2** As always, only a minority of candidates were able to successfully identify the correct frequency for microwave communications. The vast majority of candidates knew that the central block of the diagram had to be the modulator, but many forgot that they were dealing with a transmitter and incorrectly put the aerial in the first box. Very few candidates correctly matched the two types of signal to their correct description - having linked digital to two values, many felt compelled to link analogue with one value. As ever, many candidates confused the term encrypted with the term compressed, with only a small minority of candidates able to explain what encryption was. Finally, most candidates incorrectly thought that digital signals transferred information faster than analogue ones. They also thought, incorrectly, that using digital signals made it easier to communicate. However, most candidates knew that email often went through optical fibre, and many could describe a communication system which uses copper wire as the link, as well as give a good reason for its use.

- Q3** It was good to find that most candidates could correctly identify the hazard symbols as well as state that electrocution was the hazard associated with mains electricity. Although many candidates could provide two sensible actions for avoiding this hazard, it was worrying that a significant minority assumed that protective clothing would do the trick. Most candidates knew that batteries allowed for portability, with only a small minority repeating the question stem and mentioning safety.
- Q4** This was the first of two questions which also appeared on the Higher Tier paper. It was therefore designed to be harder than the previous questions. Although nearly all candidates were able to identify the aerial and loudspeaker as the input and output devices for the radio receiver, many were confused about the function of the tuner, amplifier and demodulator. However, the majority of candidates could explain why each radio station in an area is allocated a separate frequency in the electromagnetic spectrum. Although many candidates confused quality with quantity, most were able to say something sensible about the day-to-day effects of their example of a high quality communications system.
- Q5** This question also appeared on the Higher Tier paper. It was not well answered by the vast majority of candidates. Many of them failed to correctly identify the input and output devices for a broadcast TV system, and many confused the transmitter with the receiver. Very few candidates could correctly identify the encoder, with many suggesting processor, implying that the system would have to have two of them. Most candidates failed to provide enough detail about how pictures are built up on a video screen; although pixels were often mentioned, their arrangement in rows across the screen was not.

A326/02 Communications (Higher Tier)

General Comments:

Most of the small number of candidates who sat this paper were entered for the correct tier. The majority felt able to answer all of the questions, albeit often incorrectly. There was no evidence that candidates ran out of time.

Many candidates found the mathematical aspects of the paper challenging. Higher Tier papers rarely ask candidates to plug straightforward numbers into familiar equations. Most calculations will require transposition of formulae as well as the use of standard form for quantities significantly smaller or greater than one.

Comments on Individual Questions:

Question No.

- Q1** This was the first of two questions which also appeared on the Foundation Tier paper. It was therefore designed to be easier than the last three questions of the Higher Tier paper. Most candidates were able to correctly match the majority of the parts of the radio receiver with its function, with most confusion being caused by the tuner and demodulator. Similarly, most candidates were able to explain why only one station in an area is allowed to broadcast on a given frequency. Although only a minority of candidates were able to supply an example which has improved quality, rather than quantity, of communication, most were able to say something sensible about how it affects their lives.
- Q2** This question also appeared on the Foundation Tier paper. It was well answered by the majority of candidates, with a few getting confused between the transmitter and the receiver. Very few candidates could correctly identify the encoder, with many suggesting processor, implying that the system would have to have two of them. Most candidates failed to provide enough detail about how pictures are built up on a video screen; although pixels were often mentioned, their arrangement in rows across the screen was not.
- Q3** Only the strongest candidates were able to earn full marks for the block diagram - many candidates assumed that the battery or the switch was the input device, despite being told that the circuit contained a light sensor. Most candidates knew what the arrows of the block diagram show. Too many candidates tried to use all of the numbers in the table to calculate the current, and many were unable to transpose the formula. Candidates who are entered for Higher Tier papers need to have this skill; few calculations will require them to plug numbers straight into a familiar formula. Although many candidates could draw a series circuit, their failure to use the correct symbol for a buzzer often lost them the mark. Few candidates were able to work out the voltage across one component in a series circuit from the voltage across the other.

- Q4** Most candidates found this question hard. The initial calculation involved numbers in standard form, as well as transposition of a formula - well beyond the capabilities of most candidates. Very few candidates were aware that diffraction of waves from a dish aerial reduced the strength of the signal received at the orbiting satellite. Although most candidates were able to put a microphone and an aerial in the correct places of the block diagram, only a few were able to put in a modulator as well. Although some candidates were able to earn full marks for their explanation of signal compression, too many confused compression with encryption. Finally, only a minority of candidates were able to say anything sensible about signal-to-noise ratio, suggesting that few of them had met the term before.
- Q5** Although the majority of candidates were able to correctly identify the safety symbols, almost none were able to say anything sensible about the operation of an earth leakage device. Many assumed that it allowed electricity to escape safely to ground, probably confusing it with the earth wire in a mains connection. Only a minority of candidates were able to give two advantages of using batteries instead of mains electricity - many candidates think that buying new batteries is less expensive than using the mains.

A334/01 Agriculture & Food (Foundation Tier)

General Comments:

The number of candidates who entered this examination was slightly less than in previous sessions. The overall performance was slightly better than in previous examinations. Overall marks ranged from 0 to 35 out of a possible 36.

Candidates performed mathematical calculations better than in previous years. There was a noticeable improvement in candidates' answers to questions about plants.

Common errors included not reading the question, resulting in writing obvious incorrect answers eg Q1(b), 1(d)(iii). Candidates also sometimes wrote vague answers eg Q3(c), 3(d)(ii), or did not read the supplied information eg Q4(b).

Comments on Individual Questions:

Question No.

Question 1 was about microorganisms.

- Q1(a)** The majority of candidates realised that the microorganism involved was yeast but few knew that sugar would be its food. Water was a common incorrect answer.
- Q1(b)** Many candidates realised that the yeast respired but fewer knew that carbon dioxide would be produced. Nitrogen was a common incorrect answer.
- Q1(c)** About half of the candidates chose the correct word equation for aerobic respiration but only a few could explain their choice.
- Q1(d)** Most candidates were able to name one type of microorganism but many failed to explain their action on food (they feed on it and contaminate it with their waste). There were many confused answers involving baking bread.

Question 2 was about growing cucumbers. The maximum of ten marks was achieved by some candidates.

- Q2(a)** It was disappointing to note that a significant minority did not know that growing cucumbers was an example of horticulture, with "arable" and "poultry" being popular incorrect choices.
- Q2(b)** Most candidates scored at least one mark in attempting to sequence stages in the chain of food production. However there was some confusion over "processing" and "transporting to factory".
- Q2(c)** The role of factory inspectors was well known.
- Q2(d)** Almost all candidates scored at least one mark in identifying the correct stages in a plant's life cycle (pollination and fertilisation). A common incorrect answer was "germination".
- Q2(e)(i)** It was pleasing to note that most candidates were able to calculate the average length of the cucumbers (37cm).

- Q2(e)(ii)** This was well answered with candidates correctly identifying “photosynthesis” as the process causing extra growth.
- Q2(e)(iii)** The majority of candidates were able to name a different method of measuring yield.

Question 3 was about keeping goats. Parts of the question were targeted at Grades D/C and were included in the Higher Tier examination. The maximum of eleven marks was achieved by some candidates.

- Q3(a)** Most candidates correctly calculated both masses of mohair and wool (4 and 2 kg).
- Q3(b)(i)** Candidates were required to use the information provided to suggest other reasons for keeping goats rather than sheep. There was an equal spread of marks; zero or one or two. Candidates who failed to score tended to quote the reason already identified (more valuable), or wrote a vague answer.
- Q3(b)(ii)** The majority of candidates were able to suggest one other reason for keeping sheep. Candidates who failed to score quoted profit, the reason already supplied.
- Q3(c)** Vague answers such as “weather” and “location” were not accepted. “Predators” was a common incorrect answer.
- Q3(d)(i)** The majority of candidates were able to score two or three marks when describing the main stages in artificial insemination. There was some confusion with IVF.
- Q3(d)(ii)** The majority of answers explaining the advantage of controlling the timing of the animal’s birth tended to be too vague. Answers such as “so they will know when it is born” were not accepted. Answers including idea of preparation (booking vet, helping with birth) and idea of timing (avoiding births in bad weather, to coincide with markets) were expected.

Question 4 was about using nettle plants. Parts of the question were targeted at Grades D/C and were included in the Higher Tier examination. The maximum of six marks was achieved by some candidates.

- Q4(a)** The majority of candidates scored at least one mark in identifying examples of sustainability.
- Q4(b)** Surprisingly, many candidates did not use the information provided to identify a plant material (cotton) which could be used to mix with nettle fibres.
- Q4(c)** The majority of candidates were able to identify at least one reason why nettles were a good crop.
- Q4(d)** Only a minority of candidates were able to explain the importance of a quality mark to a company.

A334/02 Agriculture and Food (Higher Tier)

General Comments:

The number of candidates who entered this examination was less than in previous sessions. The overall performance was similar to previous examinations.

Overall marks ranged from 2 to 27 out of a possible 36.

The performance in questions targeted at topics identified at Higher Tier in the specification was very poor. It was clear by vague responses that many candidates were not prepared for these topics and had been entered for the wrong tier. It would not have been a very pleasant experience for many candidates answering questions on a topic in which they had no knowledge or understanding.

Common errors included not reading the question, resulting in writing obvious incorrect answers eg Q1(b). Candidates also often wrote vague answers eg Q1(c), (d)(ii), 2(c) and did not read or understand the supplied information eg Q3.

Mathematical responses were mixed.

In Q1(a), which required a fairly simple manipulation of information, the majority of candidates scored the mark. However, in Q2(b)(i) which required a calculation of percentage increase, very few scored any marks, with the majority of candidates attempting random calculations.

Comments on Individual Questions:

Question No.

Question 1 was about keeping goats. Parts of the question were targeted at Grades D/C and were included in the Foundation Tier examination. The responses to these questions were similar to those in Foundation. The marks ranged from two to twelve out of a possible thirteen marks.

- Q1(a)** The majority of candidates correctly calculated both masses of mohair and wool (4 and 2 kg).
- Q1(b)(i)** Candidates were required to use the information provided to suggest other reasons for keeping goats rather than sheep. The majority of candidates scored either one or two marks. Candidates who failed to score tended to quote the reason already identified (more valuable), or wrote a vague answer.
- Q1(b)(ii)** About half of the candidates were able to suggest one other reason for keeping sheep. Candidates who failed to score quoted profit, the reason already supplied.
- Q1(c)** Vague answers such as “weather” and “location” were not accepted. “Predators” was a common incorrect answer.
- Q1(d)(i)** The majority of candidates were able to score two or three marks when describing the main stages in artificial insemination. There was some confusion with IVF.
- Q1(d)(ii)** The majority of answers to explain the advantage of controlling the timing of the animal’s birth tended to be too vague. Answers such as “so they will know when it is born” were not accepted. Answers including idea of preparation (booking vet, helping with birth) and idea of timing (avoiding births in bad weather, to coincide with markets) were expected.

- Q1(e)** The majority of candidates scored one mark for explaining how organisations such as the Meat and Livestock Commission support the food industry. Very few scored the second mark by identifying research.

Question 2 was about growing cucumbers.

- Q2(a)** Candidates had to complete the stages in the life cycle of a flowering plant. Some candidates wrote the stages in the wrong order and many candidates simply did not know any names of the stages.
- Q2(b)(i)** Candidates had to do a percentage increase calculation of cucumber length. Because of random calculations it was virtually impossible to award one mark for partially correct working.
- Q2(b)(ii)** It was surprising to note the poor responses in explaining why the cucumbers with extra light grew more. Few candidates were able to link up the increased light with increased photosynthesis and therefore more food for growth.
- Q2(c)** Many candidates were able to identify other factors which could increase cucumber length.

Question 3 was about using nettle plants.

- Q3(a)** Candidates were required to process the information about nettle plants to explain how growing nettles was an example of sustainable agriculture. The majority of candidates simply quoted sentences from the article without any explanations.
- Q3(b)** In previous examinations candidates have shown a reasonable understanding of “supply and demand”. However few candidates gave a complete answer to explain how price is affected by supply and demand. Vague answers such as not identifying an increase or decrease were common.
- Q3(c)** The majority of candidates were able to identify a problem with marketing the new fabric.

Question 4 was about genetic modification (GM) and the use of fermenters. There was a very poor response to this question.

- Q4(a)(i)** By using the information in the diagram, many candidates were able to identify the genetic material being transferred.
- Q4(a)(ii)** Very few candidates knew that the genetic material was isolated using enzymes to cut it from DNA. A common answer was “put it in a bottle”.
- Q4(a)(iii)** Again very few candidates were able to explain why chymosin was produced. Candidates were expected to know that the transferred gene coded for a particular protein such as chymosin.
- Q4(a)(iv)** Only a handful of candidates realised that GM yeast would not be eaten but its product (chymosin) would be.
- Q4(b)(i)** For the majority of candidates, a standard diagram of a fermenter was a new experience. The majority of answers appeared to be guesswork.
- Q4(b)(ii)** In explaining the advantage of a batch culture system, most answers were about easier/faster/cheaper rather than producing small batches/different products.

A335/01 Harnessing Chemicals (Foundation Tier)

General comments:

This paper is probably the last of its kind as the specification has now been replaced. The number of candidates entering was just over one thousand which represents a considerable contraction on previous numbers.

The question paper itself had a broad range of questions and was of a similar standard to previous papers. The performance of the candidates was comparable with previous examinations on this specification.

Candidates did not show a thorough enough understanding of equation or formula construction. Calculations were generally not well done.

Scientific equipment was not well recognised from drawings.

Basic scientific methodology was not explained well.

Comments on Individual Questions:

Question No.

- Q1** Most candidates were able to identify the correct symbol for Calcium (Ca) from the list given but found great difficulty in constructing a formula for a compound (sodium sulfate) from a list of items that included the ratio of the atoms written in the correct order and the symbols for the atoms. More practice at this can be achieved through using formulae both in words and symbols every time a chemical compound is used so that the candidates become familiar with the format required. The definitions of types of mixture showed a good grasp of their meanings but the examples often fell short of expectations. Perhaps a list of the standard mixture examples could be given to the candidates to learn. The calculation required the recognition that 250 ml was a quarter of a litre and then using that ratio to go from 5g (in 250ml) to 20g (4x5) in a litre.
- Q2** It was clear that few candidates had used or remembered the use of indicators. Marks were given for an appropriate indicator choice to show that the reaction had become neutral. Methyl orange, bromothymol blue and universal indicators were all credited along with the correct colour change. Word equations were not well constructed, despite the whole of the left hand side being embedded in the question stem. This is always a difficult area for foundation candidates and it continues to be so. Remote mixing (magnetic stirrer + flea) and manual mixing (swirling etc.) of the reaction mixture were poorly explained. This perhaps reflects the pressures on practical work or demonstrations in schools at present. The identification of the acids and alkalis that are required to make salts was well done, showing that the candidates were able to break down the salt names and make sensible predictions from the list of acids and alkalis. The salt purities were not recognised very well. The question was really about the appropriate use of chemicals linked to their purity and cost. A simple visual analysis of road salt and any of the others would have revealed obvious differences, showing the gritty/sandy nature of road salt compared to the progressive purity of the others.
- Q3** The definitions for bulk and fine chemicals remain uncertain as do examples, this time for bulk chemicals. This sort of question has been asked many times before so it is rather disappointing that the candidates did not perform better with either definitions or examples. The final calculation for percentage yield proved difficult; 5.1 kg of ammonia is produced instead of the expected 34kg, so examiners were looking for recognition of the ratio and then turning this into a percentage. Several candidates wrote out the formula required (no credit) but were often unable to substitute the appropriate numbers from the data and then complete the calculation. It was obvious again that a good proportion of candidates did not have the luxury of a calculator to help them through the working.

A335/02 Harnessing Chemicals (Higher Tier)

General Comments:

The paper was challenging but no candidates appear to have been disadvantaged by language or cultural issues. A number of candidates found the examination difficult and a few of these failed to respond to most of the questions. These candidates might have been better served if they had been entered for the foundation tier. Apart from these, most candidates attempted all of the questions, so there was no indication of time pressure or other constraints.

Comments on Individual Questions:

Question No.

- Q1** Responses to this question made clear that many candidates were not familiar with the practical steps of titration as a technique to prepare a soluble salt from an acid and an alkali. Most candidates were not familiar with the pipette as an instrument for dispensing accurately a specific volume of solution, specifying a measuring cylinder at best. More of the cohort could identify a burette from its description. Although a wide range “universal indicator” is not really suitable for monitoring this reaction, this was accepted as being common practice at this level.
- It was disappointing that quite a lot of candidates at this level seemed unable to give a full word equation for the neutralisation reaction in part (bi) – and some made the question much more challenging by attempting to write symbol equations instead. Many candidates had good ideas about mixing the reagents in a titration – but a worrying number seemed to think that adding an emulsifier was an appropriate strategy.
- Most candidates were clearly familiar with the process of obtaining crystals from a solution in part (c) although quite a lot assumed that they needed to filter off an insoluble solid at some point.
- The formulae in part (d) were very poorly done with some candidates scoring one mark for the “easy” one (NaNO_3) but few getting both marks. This is in spite of all three being on the list of formulae in the specification which candidates should know.
- Part (ei) was done well by many candidates, but the extra step required in part (eii) produced much less impressive scores.
- Q2** A large proportion of the candidates made a good start to this question by correctly interpreting the trends in the graph but the calculation in part (b) was much more challenging. It was rare even to find candidates correctly identifying the 50% yield in part (bii), which was disappointing. Some candidates had considered the issues involved in scaling up industrial processes to a bulk level, but in part (c) many appeared to be unsure of the type of decisions involved. Similarly, the environmental impact question in part (d) left more than half of the candidates struggling for sensible ideas.
- Q3** The first part of this question drew a few poor responses, even from candidates who were very successful elsewhere, but it was generally well understood. A pleasing development was the number of candidates who understood the differences between living, non-living and never lived sources in part (a). The diagram of fractional distillation was well understood – although candidates found it hard to articulate the disadvantages of a batch process in this context.
- Finally, the action of an emulsifier (to prevent separation rather than to promote mixing) was often only partially explained in part (c) although it was expected that the context would have been quite commonly studied.

A336/01 Materials and Performance (Foundation Tier)

General Comments:

This paper is designed for candidates operating in C – G grade range.

Two thirds of the marks on this paper were awarded to objective type questions and one third of the marks were awarded for 'free response' answers in which candidates had to write their own responses. In general candidates performed better on the objective type questions.

There was no evidence of candidates having time difficulties with the vast majority completing all questions in the time allowed. It was also clear that the vast majority of candidates were entered for the correct level paper.

Candidates should be aware that the marking is done from scanned images of their scripts. Consequently, if candidates change their minds, any alterations must be made clearly and unambiguously. Any marks that are ambiguous – possibly made with the intention that the examiner could give credit to either of two possible responses, where only one is correct will not gain credit.

Other points that Centres should consider are that candidates should be encouraged to give an answer, especially with the 'tick box' type of question. Failure to read the question as to how many ticks are required also caused problems for some candidates.

Comments on Individual Questions:

Question No.

- Q1** Part (a) was fairly well answered with the majority of candidates knowing that the 'BS' mark on a product meant that it could be relied upon for either quality or safety, they could also give the name or initials for a product standards organisation. In (b) candidates had more difficulty in explaining why the knowledge of the property of a particular material was needed and so wrote about a material being 'good' for a job as opposed to, say, 'strong' or 'light' etc. In part (c) the majority could explain that aluminium was less dense and tougher but in (cii) weaker candidates often reused the terms they had given in (ci). The idea of a safety margin in (d) was not well understood, for instance a lift was often used as an example but candidates then only wrote that 'it would break' or 'it would not work' if overloaded they did not convey the idea that the lift would be designed to take more weight than that stated.
- Q2** Parts (a) and (b) were well answered but in part (c) many candidates stated that polystyrene was a good conductor of heat and tin a bad conductor, they obviously did not understand that something that feels warm is probably an insulator and something that feels cold is taking heat away from the hand and is therefore a conductor of heat. Although well answered, part (d) did produce some unexpected pairings such as brick being wood or milk being a polymer.
- Q3** Part (a) was well answered but in part (b) many candidates only scored one mark for knowing the name of a specialised glass and its use but not giving the property. Part (c) was very poorly answered especially in part (ci) where the rays were drawn in all directions and from many different points on the right hand side of the lens. Similarly the circle to show refraction occurred at many points along the ray.

- Q4** Part (a) was well answered so it was a surprise that few could write down the name of a composite or explain what it was used for or what it was made from. Many incorrectly gave 'cement' as a composite. Similarly in (c) few could explain what an alloy was and apart from safety could not explain why something is made to a product standard although in part (iii) a majority could state that the aluminium alloy made the bicycle stronger.
- Q5** Few knew the words 'plastic' and 'elastic' in part (a). In (bi) '10' was a common incorrect answer. In the calculation in part (bii) many made the correct substitution but then proceeded to incorrectly use their calculators and got the answer 450mm.

A336/02 Materials and Performance (Higher Tier)

General Comments:

This paper contained a collection of standard questions, which, with practice of past papers, should have made very accessible. There was evidence that many candidates had indeed studied past papers, with some very clear answers being given to the wrong questions. The answers to Q5 were good examples of this.

Candidates' ability to recall specification terms and descriptions is weak. In many cases the questions that ask for reference to properties defined and described by the specification, are answered in general terms from the candidates' own experience, rather than from taught material.

Comments on Individual Questions:

Question No.

- Q1** Many candidates were able to name a composite material, with carbon fibre, glass fibre and concrete being the favourites, although the composition of these was not so well known. The specification definition of an 'alloy' was given by a very small minority of candidates, although for this paper less exacting descriptions were accepted.
- Q2** All but the weakest candidates were able to give appropriate answers to part (a). Part b) caused more problems, with some candidates reading from the 'x' rather than the 'y' axis. A common error for part b(ii) was to give the answer 450, which suggests that candidates have entered the correct numbers into their calculator, but fail to see that $60/(4 \times 30)$ will be a number less than 1.
- Q3** Part a(i) was poorly answered by the majority, with a range of alternative and incorrect answers. Part a(ii) was more successful. In part (b) few candidates were able to select both correct answers for part (i), and in part (ii) candidates used imprecise language such as 'wider' or 'expands', rather than the more precise 'thickens' when describing the eye lens. Many candidates guessed at the order for part (c). Part (d) unfortunately elicited responses that carried on from the theme of lenses in the other parts of this question, and the practical applications of optical fibres were not appreciated. It was also surprising that the standard question on contact lenses in part (e) produced few correct responses.
- Q4** There was a better understanding of momentum than has been evident in the past in the answers to part (a). However, candidates still find it very difficult to apply criteria to a different scenario as required in part (b), which was poorly answered. The standard calculation involving momentum in part c(i) was rather more successful than usual, which was encouraging. Higher tier candidates should be able to substitute quantities into the equation and recognise that when a vehicle stops, its velocity is zero. Candidates also lost track of the very simple response expected for part c(ii) of simply stating that momentum was less.
- Q5** This question was not well answered. Responses to part a(i) were varied, showing experiments to demonstrate conduction as well as expansion, with the latter often partially incomplete. There were a substantial minority of diagrams demonstrating the stretching of materials or measuring electrical resistance, which suggests that past papers have been studied, but perhaps not well understood. Few candidates were able to access part (b). The most successful responses referred to bimetal strips or thermometers, although often the materials used were mistaken.

A337 Work Related Portfolio

General comments

This is the final assessment session for the Work Related Portfolio for the specification J632. Candidates have produced a wide range of innovative practical work and interesting work related research. The interest and enthusiasm of many candidates has been portrayed by highly detailed and often original portfolio work. It is hoped that Centres will continue offering Additional Applied Science to their candidates through the new GCSE Additional Applied Science Specification J251.

Moderation manager was used to select the samples for moderation again this session and moderators found that the majority of Centres returned the requested samples efficiently and most were clearly labelled with both Centre number and candidate number. Most work was attached to the A337 Applied Record card, although moderators did receive several samples without the marks adequately recorded. It is essential that for this specification and the new Additional Applied Controlled Assessment that the recording sheet is fully completed and attached to the candidates' work.

Several clerical errors where the marks sent to OCR were not the same as the marks on the Work Related Portfolio Record Card were noticed and corrected. Centres are advised to check their recording and arithmetic for all submissions of practical assessment.

This year most portfolio work was well organised and presented using treasury tags which allow moderators to easily read and locate the work. This is good practice and is also advised for future submissions of the new specifications.

Annotation of candidates' work in the form eg A(a) 6 (ie the marking criteria reference) is useful to moderators in allowing them to easily locate the work and to see the assessment decision for both the assessment strand covered and the level reached. This practice should be encouraged again for the new Controlled Assessment.

Centres are reminded that OCR offers a free coursework consultancy service where up to three full or part completed portfolios will be moderated and the Centre is issued with a report on the assessment completed by the Centre. This will be offered for the new Controlled Assessment for the new Additional Applied and Centres are encouraged to use this service.

Scaling which occurred this session was mainly due to assessment at the higher mark bands. Work was not sufficiently detailed; data collected by candidates was limited or not recorded to a suitable level of precision and reliability. Several evaluations were seen which were not at a high enough level for A grade work. For the Work Related Report, Centres need to ensure they have fulfilled all the criteria of the strand to reach the top mark (eg 6 marks can not be achieved if collection of relevant information does not include a practitioner or workplace source.)

Standard Procedures

Centres are continuing to provide their candidates with a wide range of interesting standard procedures which included measurement of vital signs (temperature/blood pressure etc), testing for diabetes, testing milk quality, chromatography, colour change of indicators, investigation of unknowns (linked to forensic) colorimetry, measurements from electrical circuits and measurements of physical properties of materials eg density, strength etc.

Good practice was seen by Centres where suitable instructions for the standard procedures were attached to candidates' work and candidates clearly knew how to record their measurements or observations to support the fourth mark. Good practice again was shown where statements from Centres, indicating that candidates had followed instructions safely and without guidance, supported the assessment.

The guidance previously given on the allocation of the fourth mark, that this mark is allocated for detailed observations and appropriate degree of accuracy, was in the majority of cases being followed. In recording observations eg for Benedict's test rather than recording just a colour, a colour change of both the colour before and the colour after should be recorded. Whenever there is a precipitate this needs to be stated.

A measurement needs to be accompanied by the correct unit, written in the correct way. Please again note that if units are given in a table provided then the fourth mark can be given for just numerical accuracy, however if no units are provided to candidates, the results recorded must be supported by appropriate units and to the appropriate degree of accuracy.

It is hoped that Centres moving over to the new specifications will be able to understand and use the new marking criteria for the standard procedures.

For the new specification Element 1 Set of Standard Procedures candidates will need to follow four standard procedures from a choice of eight which are posted on the OCR website. Each standard procedure is marked out of 6 marks giving a total of 24 marks for this element.

Suitability Test

A familiar range of suitability tests were again offered this session. The suitability of a thermometer, the best indigestion tablets and the urine testing were amongst the most popular.

Good practice was again seen where Centres allowed candidates the opportunity to plan their own experimental work and complete a variety of different tasks rather than repeating the same test or task many times. Candidates should also be encouraged to explore more imaginative improvements to apparatus and techniques and not merely focus on repetition as a means to increase reliability of conclusions.

Centres still need to ensure that where candidates are aiming for higher mark bands they do explain the purpose of the test, with sufficient detail to gain higher marks. It is recommended that in the thermometer suitability test where the higher marks are being aimed for, candidates use a water bath as a control, to lift the level of the practical work.

Care still needs to be taken to ensure that single step experimental procedures are not considered to be complex and the reliability of the data collected is suitably checked. Conclusions need to link to the purpose of the test and to fully explain how 'suitable' the test/material /device chosen is.

The interpretation of the requirements for a suitability test rather than an investigation continues to improve.

For the new specifications Element 2 Suitability Test candidates will be required to complete one suitability test from a choice of three which are posted on the OCR website.

The tests offered will cover one from each section

- ***Comparing the properties of more than one material or substance for a particular purpose***

- **Comparing different procedures for a particular purpose**
- **Testing the suitability of a device for a particular purpose**

The Suitability Test will be assessed under six headings Strand A to Strand F

- **Strand A Researching the purpose of the test**
- **Strand B Planning and risk assessment**
- **Strand C Collecting data**
- **Strand D Processing and analysing data**
- **Strand E Evaluating**
- **Strand F Justifying a conclusion**

Each strand is assessed with a mark 0 to 8, giving a total of 48 marks for this element.

Strand A and Strand B

Most candidates were appropriately assessed up to 6 marks as they were able to adequately identify the workplace or vocational aspect of their test, with a suitable description of the desirable properties or characteristics. For 8 marks however candidates were not always giving a full description of the desirable properties with an explanation of why these are necessary. Care needs to be taken that when the higher marks are awarded work is sufficiently detailed and appropriately written to reflect the awarding of high grades.

Moderators are encouraged to support the Centre's assessment of Strand B, however if annotation on candidates' work is given to support Strand B(a) -candidate autonomy and independence, this would further confirm the assessment decisions. In order to achieve 8 marks candidates should be showing evidence of independent thought in their approach to the experimental task.

Strand C and Strand D

In Strand C, candidates are now showing that they are devising their own format for 6 marks and this can be further supported by annotation by the Centres. Correct recording of data with units, carrying out appropriate repeats and showing that data is adequately precise and reliable are also being demonstrated by candidates gaining 6 marks. For 8 marks Centres need to ensure that evidence shows that data has a high level of precision and reliability and that it is linked with the requirements of Strand A. Several candidates were not referring back to all of the criteria they referred to at the start.

When writing a conclusion candidates need to link clearly to the purpose of the test and also to the related scientific theory, consequently many candidates scored 4-6 marks, with very few giving enough detail to score 7-8 marks. Centres still need to check that this strand is not over marked. Care needs to be taken by candidates so that for the higher mark band they include a correct conclusion from the overall pattern of the results with a clear link to the purpose of the test and a discussion of any limitations. Simple statements were seen but not the depth needed to support the higher mark bands.

For Strand D (b) again limited evidence was seen on an evaluation of the method used to assess the most suitable material/procedure or device. Candidates need to focus more on the requirements of the criteria if they want to achieve the higher mark bands. Work needs to show detailed descriptions and explanations.

Strand E

Generally moderators supported the assessment for the structure and organisation of reports, but care still needs to be taken to ensure that candidates do not automatically gain 6 marks for including contents and numbering the pages. Several submissions are still being seen where

contents do not link to the work recorded. In addition work should be effectively organised and the level of the report should allow the inclusion of sufficient appropriate scientific vocabulary. For 8 marks the report should reflect a high quality piece of writing that is well presented and structured and can support full and effective use of relevant scientific terminology. The key to a high level report is that it is focused on a chosen audience. There was again a considerable amount of generous assessment for this strand.

Work Related Report

In this session there seemed to be a lot of Centres covering health related topics; midwifery being the most popular. Unfortunately, there did not seem to be as much evidence that candidates had been on visits and there seemed to be a lot of Internet research. Interviews were quite varied with some questionnaires not really focussing on the needs of the assessment criteria.

- ***For the new specifications Element 3 Work Related Report candidates will be required to complete one Work Related Report which will be posted on the OCR website.***

The Work-related Report will be assessed under six headings Strand A to Strand F

- ***Strand A Collecting primary data information***
- ***Strand B Collecting secondary data information***
- ***Strand C The work carried out***
- ***Strand D Skills used in the work place***
- ***Strand E Scientific knowledge applied in the workplace***
- ***Strand F Quality of the presentation***

Each strand is assessed with a mark 0 to 8, giving a total of 48 marks for this element.

Strand A

It is essential that candidates interview or talk to a practitioner on a visit where 6 marks and above are being aimed for. Best practice is where candidates have prepared suitable questions or have issued questionnaires and they integrate and use this information in their report.

For Strand A (b) (c) references now are generally well recorded and direct quotations sufficiently identified throughout the text. Detailed references should show ISBN numbers for books, and for online references full web site addresses and dates of internet access should be included. A fully detailed reference should allow the reader to be able to access the information used, directly from the reference quoted, a bibliography here also supports good practice. The citing of references within the text and referencing illustrations and charts, continues to improve and candidates have been taught how to do this.

Strand B

Candidates need to appreciate the use of their own words are preferred to excessive downloaded information. Where information is taken directly from websites it is important that candidates do include references directly beneath this extracted data. Some good work was seen for 8 marks where candidates had clearly described the skills, qualifications and personal qualities required and explained the relevance of the qualities required for the work described.

Strand B(b) includes a description of the nature of the work and its purpose and place in the wider organisation, in several seen scripts candidates were still not including how the work fitted into the wider picture.

Centres still need to ensure candidates are describing the impact of a financial or regulatory factor. Candidates who wish to access 8 marks need to check that work is fully reflective of the higher level criteria. Explanations rather than descriptions are necessary and lengthy descriptions are not always indicative of 8 marks. Higher grade candidates should be showing suitable selection and focused detail.

Health and safety continues to be a useful regulatory factor, however again the impact of this on the work still needs to be focused on. There was still evidence however that in some candidates' work the financial and regulatory factors were merely identified and there was no clear link to the 'impact' on the work described. This meant that the 6 marks awarded to candidates for Strand B(c) were not upheld.

Strand C

For Strand C, work moderated again is indicating that candidates are now linking the scientific knowledge to the work involved. Good practice was seen where the level of scientific knowledge explained by candidates linked to the specific job roles. Good detail was seen related to midwifery but it is important that candidates do not just cut and paste pages of interesting information on pregnancy but they select the relevant information which directly underpins the work of a midwife.

For Strand C (b) candidates gave several good descriptions of technical skills applied in the workplace. Good practice was seen where candidates had focused on one example and had fully described this skill. The addition of visual material helped some candidates explain their chosen skill.

Strand D

Care needs to be taken when awarding 8 marks for Strand D (b) that the visual material is suitably 'informative' and used appropriately; suitable labelling and related notes written by the candidates could support the higher marks. Graphs and charts can be used to convey information. Again, when awarding 8 marks the candidates need to be showing full and effective use of the relevant scientific terminology. Spelling, punctuation and grammar should be almost faultless. Candidates gaining high marks need to be producing accurate scientific reports written to a high standard.

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