

# **Additional Applied Science A Twenty First Century**

General Certificate of Secondary Education **J632**

## **Report on the units**

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**January 2008**

**J632/MS/R/08J**

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### GCSE Additional Applied Science A

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# A324/01 – Additional Applied Science A – Life Care – Foundation Tier

## General Comments

Overall this paper was challenging enough and there were no signs that any group had been disadvantaged by the language or any cultural issues. A minority of candidates scored almost full marks, and everyone was able to find something that they could answer. There was no suggestion that the candidates had been under any time pressures and very few sections were left unanswered.

## Comments on Individual Questions

- Q 1 Part (a): This question was generally answered very well with most candidates recognising the sample with the parasite and scoring full marks.  
Part (b): This question elicited a mixed response. Many candidates scored full marks but some displayed poor recall and were unable to distinguish between an artery and a vein.
- Q 2 Part (a): A few candidates failed to read the question properly and offered sugar and diabetes as the chemical and condition, rather than providing an alternative combination. The majority of candidates scored one mark either for the chemical, which was usually protein, or for the condition, which was usually pregnancy. Those who scored both marks generally did so for protein and kidney infection/failure.  
Part (b): Most candidates scored both marks for this section with ease of use as the advantage and lack of accuracy as the disadvantage. Whilst some individuals correctly referred to the non-quantitative aspect of test strips or problems with matching up the colours, a few confused the lack of accuracy/non-quantitative with the test being unreliable.
- Q 3 Part (a): The majority of candidates correctly identified the breathing rate, heart rate and weight, but were tempted by the length of the umbilical cord rather than the number of fingers and toes.  
Part (b): Most appreciated the need to check that there was nothing wrong with the baby, but only the more able individuals were able to see that the information would need to be made available to other health practitioners at some stage in the future.
- Q 4 Part (a)(i): Most were able to understand that the nurse was trying to get information about possible medical conditions or medication that the injured person might be taking. This was frequently phrased as finding out if she was allergic to anything. There were some vague answers about trying to find out what had happened but these were not awarded the mark unless the rest of the answer indicated that the nurse was trying to ascertain the severity of her condition in order to implement the triage system.  
Part (a)(ii): This question was generally very well answered with lots of references to good communication skills or calm and sympathetic. However, there were a number of incorrect references to the need for good medical knowledge which may be desirable, but is not really a personal quality.  
Part (b): Generally very well answered with candidates really appreciating the triage concept.  
Part (c)(i): Most candidates were able to suggest an example of a non-invasive technique although credit was not given to a generalised answer of 'scan'.

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Part (c)(ii): This question was less well answered than expected. Some tried to answer in terms of it being safer because there was no harmful radiation whereas others gave vague answers about uses of non-invasive techniques, such as, 'to look at a baby if you are pregnant'.

The better individuals appreciated that they avoided the need for surgery but the advantage of this was to reduce pain, very few made the link to faster recovery time or reduced infection risk.

Part (d): Very few scored full marks for this section although the majority correctly identified the muscle. The humerus was the bone most frequently mislabelled with candidates confusing it with the leg bones.

Part (e)(i): A large number of candidates were awarded this mark but their answers were not very well expressed. Few appreciated that active intervention aimed at the injury was required.

Part (e)(ii): Only the best scored three marks for this section although the majority scored at least one mark. The most common references were to stretches or light weights with some giving additional information about the nature of the exercise or giving the idea of progression. A worrying number of suggestions included boxing, press-ups and other unsuitable activities for an injured shoulder.

Q 5 Part (a): This section was generally well answered although some candidates simply repeated the same point twice, therefore limiting themselves to one of the available marks.

Part 9b): Most candidates obtained at least one mark for this section by identifying a public health campaign. References to BUPA or weight watchers were not considered examples of public health campaigns. Only the better candidates were able to provide a suitable description of the aims of the campaign.

## A324/02 – Additional Applied Science A – Life Care – Higher Tier

### General Comments

The overall performance of the candidates was good but there was a small but significant number for whom the Higher tier paper was not the most appropriate tier of entry. Generally, the candidates were able to demonstrate a good understanding of health care provision. As ever, a number of students lost marks through not reading the set questions carefully enough and not reviewing their answers to check for obvious errors. There was no evidence of any candidates having insufficient time to complete the paper. It would be helpful if schools emphasised the importance of clear handwriting and following the guidance about writing within the framework of the paper.

### Comments on Individual Questions

- Q 1 Candidates tended to give very general answers to this question failing to see the significance of the nurse rather than a non specialist questioner. Consequently answers often included references to finding out what happened rather than details about the patients medical history/allergies etc.  
Part (b) was well answered, candidates being well aware of prioritising life threatening injuries.  
In part (c)(i) most candidates could correctly name a non-invasive technique but few gained 2 marks on the (ii) part of the question. Few identified surgery and its associated risks as being an invasive procedure.  
Good candidates were able to correctly identify the bone and muscle arrangement in the shoulder. There were, however, a worrying number of femurs appearing in the shoulder joint!  
Defining the role of a physiotherapist (e)(i) challenged many of the candidates – most failed to link the role to using physical methods/manipulations to treat the injury.  
Part (e)(ii) asked the candidates to describe a **set** of exercises so the idea of progression through a series of exercises was being looked for. A simple explanation of a gentle stretching exercise gained one mark and a more detailed explanation through several exercises a second mark with progression/implication of progression being the third marking point. High impact exercises such as boxing/weight lifting/press ups were not thought to be appropriate to help strengthen a damaged shoulder.
- Q 2 In (a)(i) only the very best candidates were able to successfully select an effect caused by the letter of their choice and then go on to explain the result of that effect. Most candidates scored full marks on a(ii) as there were a wide range of possible answers available but a few failed to read the question carefully enough and repeated 'measure heart rate' or 'pulse' in their answer.  
In (b)(i) the majority of candidates correctly identified 'hypothermia' but in b(ii) only the very best candidates then linked low body temperature to a slowing in enzyme activity/metabolic rate.  
Many candidates gained 2 marks in part (b)(iii) by linking shivering to heat energy from muscle contraction. Some correctly explained how vasoconstriction reduced heat loss but it is concerning to still see (often centre specific) references to blood vessels moving up and down in the skin. Candidates must also take care not to repeat the stem of the question as their answer for example – shivering keeps the baby warm can only ever gain one mark and candidates need to think about how they can gain the second mark indicated on the paper. This is also where careful checking of answers can help.

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- Q 3 Question 3 (a) was well answered and the majority of candidates were able to score at least 3 of the 4 available marks. Nitrates rather than nitrites was a common error. Similarly most candidates were able to identify the potential impact of the blood pressure medication either directly on the diabetes or as an interaction with the diabetes medication in 3(b)(i). Both 3 (b)(ii) and (iii) were generally well answered with many candidates gaining 3 of the 4 available marks. Only the better candidates, however, identified in (b)(iii) that the high blood pressure was more dangerous than the potential side effects. Benefits outweighing the risks was a common one mark response lacking any further information to gain a second mark.
- Q 4 Mathematical calculations continue to challenge many candidates and many candidates failed to score on 4 (a)(i) or (ii) and a significant number made no attempt at either part. 4 (a)(i) in particular should not have been difficult for a Higher tier candidate. In 4 (b) only the better candidates correctly identified that both breakfast had virtually the same energy content but that the porridge had less sugar and therefore more slow release carbohydrate reducing the need to snack during the morning. Less considered answers simply stated that sugar coated cereal had more sugar without explaining the significance of this. The porridge also had twice as much protein content.
- Q 5 Most candidates gained one mark in Q5 for identifying raising awareness but very few then went on to gain the second mark by linking this to the money saved by not having to have treatment programmes in place.

## A325/01 – Additional Applied Science A – Scientific Detection – Foundation Tier

### General Comments

The paper was constructed in two parts, with questions 1aii, and 3 being common with the higher tier paper.

Most candidates performed quite well. It was clear that they had been well prepared for the examination and managed to complete all of the questions in the time allowed.

The paper is now marked by electronic marking after first being scanned and then fed electronically to examiners. It is now more important than ever that candidates use legible writing and restrict their responses to the boxes, spaces and lines that have been provided rather than writing in margins and other areas that may not be visible to examiners in the electronic copy.

### Comments on Individual Questions

Q 1 Part (a) required candidates to be able to use a scale. More able candidates successfully determine the required measurements whereas less able candidates simply used a ruler to measure the sizes and thus did not score. The fact that the answers they were getting for the burglar's foot size were completely unrealistic should have been a clue to the candidates that their answers were incorrect.

Part (b) was well done with most candidates correctly identifying suspect B.

Part (c) was well done by those candidates who read the question. However all too often candidates failed to record the words 'record images' and instead wrote about the role of the Scene of Crime Officer and what kind of evidence they may collect. This lost marks unnecessarily for some candidates who would be well advised to read questions carefully before attempting to answer them.

Q 2 Yet again too many candidates failed to read the question. Answers were provided for candidates to use but all too often candidates wrote their own answer and risked losing valuable marks. Candidates who used the statements to help them answer the question performed quite well but common errors included not knowing the use of the objective lens and why the objective lens is lowered before focussing.

Q 3 In part (a) most candidates found this section quite difficult and a variety of different options were chosen by candidates.

In part (b) most candidates scored both marks but a surprising large number were unable to distinguish between magnification and resolution and gave the answers C and B the wrong way round. Candidates would be well advised to learn to distinguish between the magnification and resolution.

In part (c) most candidates scored both marks but all too often an incorrect label was given or the question was not even attempted. This can only be because of careless reading by the candidate as this was not a difficult question. Yet again candidates would be well advised to read the paper most carefully.

Part (d) was mostly well done but too many candidates lost marks because they either added or subtracted the numbers, failed to calculate  $5 \times 15$  correctly or gave an incorrect response while not showing their working. Candidates need to know that calculators are permitted and that showing correct working but a wrong answer will still score at least one of the two marks.

Part (e)(i) was correctly answered by about half the candidates. Too many thought that either the nucleus or particles within the nucleus were electrons.



Part (e)(ii) was not well answered. The simplest response required to score two marks was that electron microscope used electron whereas light microscopes used light. Candidates who just referred to using electron could score the second mark by extending their answer to qualify how electron were produced or what effect they had on magnification or even resolution. All too often candidates stated that electron microscopes were used to look at atoms and electrons.

- Q 4 In part (a)(i) most candidates gave the correct answer of red. However there were too many responses that included many other colours. Few candidates scored well in part (a)(ii) even though there was a one in three chance of getting the right answer. Part (c) proved to be another example of candidates not reading the question. The question asked for an example of a 'test kit' and all too often candidates simply wrote about blood or urine samples which did not score. Part (d)(i) produced some good answers and credit was given for the correct idea of quantity or amount or even producing numbers. However answers that said it gives you a number of results did not score. Part (d)(ii) candidates provided a variety of responses to this question which was not surprising as it was intended to test the more able candidates, many of whom gave the correct answer. Part (d)(iii) also proved to be a testing question which was unusual for this type of question as candidates normally perform well when sequencing statements. Only the more able candidates scored full marks. Part (d)(iv) was not well done. Candidates should know that graphs of this type should be straight line graphs that if extrapolated go through zero. Curved lines of best fit did not score. Many candidates failed to plot the three points accurately and subsequently lost the first mark. Those candidates who failed to realise that this should be a straight line graph also had problems identifying the outlier and thus many lost a second mark. Finally too many candidates lost the third mark because they read the graph from the horizontal rather than the vertical axis. The question specifically stated an absorbance of 0.6 but this was often read as a concentration of 0.6 thus the mark was lost. All three parts of the graph question were marked independently so a candidate was not penalised twice for getting one part wrong.

- Q 5 Both parts (a) and (b) were well answered with most candidates scoring both marks. Part (c) was very well answered making a nice easy end to the paper.

## A325/02 – Additional Applied Science A – Scientific Detection – Higher Tier

### General Comments

The paper was constructed in two parts, with questions 1(b) and 3 being common with the foundation tier paper.

Most candidates appeared to have been entered correctly for this paper. Candidates managed to complete all of the questions in the time allowed.

The weaker candidates scored well on question 3.

### Comments on Individual Questions

- Q 1 This question was intended to be an easy start to the paper. However few candidates managed to score full marks.  
In part (a) most candidates scored full marks. Some failed to score any marks by just stating that they would record the footprint.  
Part (b), which was an overlap question with the foundation tier paper, was not well answered. Many candidates estimated the length of the footprint and therefore gave an answer of 20 cm. Some did not give appropriate units for their answer.  
In part (c) some candidates did not give ways in which the information could be recorded. Answers in terms of the evidence which the police might collect were common.  
Candidates would be well advised to read questions most carefully before attempting them.
- Q 2 Parts (a) & (b) of this question were answered well by most candidates.  
In part (c) many candidates did not make the connection between selecting an objective lens and choosing magnification.  
Part (d) was not well answered. Only a few candidates answered in terms of avoiding damage to the lens and the slide. Some candidates gave answers in terms of magnification which did not gain any credit.
- Q 3 This question was an overlap question with the foundation tier paper and was intended to target C and D grade candidates.  
Part (a) was correctly answered by most candidates. Some did not gain credit because they ticked more than one box.  
Part (b) was well answered. Some candidates had the answers to parts(i) and (ii) the wrong way round.  
In part (c) most candidates scored full marks.  
In part (d) whilst many scored full marks, some appeared to struggle with the multiplication and only scored one mark. Candidates should be encouraged to show their working out because those who gave an incorrect answer without any working out lost any chance of scoring the first mark.  
In part (e)(i) most candidates correctly identified an electron but some also circled the nucleus and therefore did not gain credit.  
Part (e)(ii) was not well answered. A common incorrect answer was the idea that an electron microscope looks at electrons.
- Q 4 In part (a) most candidates correctly determined the distances moved by the solvent and sweetener X.  
In part (b)(i) whilst most candidates scored the mark for the correct answer or scored the mark via error carried forward from correctly using their answers to part (a)(i) & (ii), some candidates worked out the Rf value by dividing the largest number by the smallest.

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Most candidates gave the correct answer to (b)(ii).

Parts (c) and (d) did not appear to cause most candidates any difficulty, but some answered the question in terms of sweeteners instead of drinks.

Part (e) was well answered by the more able candidates. There were some good answers in terms of either solubility or mobile phase. Answers which did not gain credit often made reference to the amount of sweetener present.

In part (f)(i) whilst many candidates gained credit for the idea of a comparison, few developed their answer sufficiently to score the second mark.

In part (f)(ii) many candidates gave one credit worthy response, but very few gave two responses that enabled them to score both marks.

Q 5 For some candidates this proved to be a difficult question.

Part (a) was not well answered. The common error being that candidates did not make reference to the idea that proficiency tests are carried out to ensure that all laboratories are testing to the same standard.

In part (b) candidates either realised that the question referred to different laboratories and responded in terms of common testing ideas, thus gaining credit, or appeared to miss the idea of different laboratories and responded in terms of what could be done within a single laboratory.

In part (c) some of the candidate's answers did not state how laboratory practice was improved.

In part (c)(i) common answers which were not creditworthy included references to the state of the equipment and general references about making sure everything works.

Part (c)(ii) asked the candidates to state how training staff improved laboratory practice. Whilst there were some good responses in terms of ensuring that tests were carried out correctly, there were also many answers in terms of the benefits to the staff themselves (E.g. staff more fulfilled, happier staff) which were not creditworthy.

Part (c)(iii) was well answered by many candidates. There were many ways of expressing the idea of keeping people safe.

# A326/01 – Additional Applied Science A – Communications – Foundation Tier

## General Comments

Although few candidates earned very low marks, equally few earned very high marks. This suggests that centres have done a good job matching candidates to their tier of entry. No candidate was disadvantaged by doing the Foundation Tier instead of the Higher Tier paper. Some questions require candidates to write their answers in extended prose, a difficult thing to do for many weak candidates. It doesn't help when they use the vocabulary of the subject incorrectly (for example, the word "fast" could mean "high data rate" or "high signal speed") or use slang (such as "USB" and "stick" for "memory stick").

Many candidates had difficulty in dealing with block diagrams. These are a central feature of the course, indispensable for making modern complex communications systems comprehensible. In particular, candidates need to be able to draw sensible block diagrams for their own examples, as well as discuss the function of each block.

It was disappointing to find that few candidates could deal with the numerical questions on the paper. Centres need to realise that calculations will feature in future papers, and it would be sensible to prepare their candidates for this.

Finally, it was evident in one question that many weak candidates were not reading the question clearly enough, and proceeded to answer a question of their own invention.

## Comments on Individual Questions

- Q 1 Only half of the candidates knew that block diagrams showed the flow of information for (a), with electricity being a popular wrong answer. However the majority of candidates were able to correctly match the name of a block with its radio receiver function for (b). Part (c) proved to be harder, with few candidates being able to place the blocks correctly for a radio transmitter - many weak candidates used the loudspeaker instead of the aerial as the output block.
- Q 2 Part (a) required candidates to write about a visual code used in communications. It was good to find that many of them were able to do this. Similarly, the vast majority of candidates were able to correctly sequence the stages of encoding and decoding for (b). Part (c)(i) required candidates to state advantages of digital transmission of data. Few of them were able to do this, with most candidates contenting themselves with imprecise statements such as "easier" and "faster". Very few candidates were unable to suggest a device for storing digital information for (c)(ii), possibly the easiest question of the whole paper.
- Q 3 Although most candidates were able to correctly identify the battery in (a)(i), a disconcerting number chose the switch instead. Only half of the candidates knew two advantages of using mains power for (a)(ii), with many assuming incorrectly that mains could deliver more power than a battery for the circuit. The block diagram of (b) caused difficulties for many candidates, with few being able to identify the switch and LED as the input and output devices. Only a minority of candidates were able to state an example of a communications system which employs optical fibres for part (c)(i), with mobile phones and TV controls as popular incorrect answers. Responses to (c)(ii) and (iii) also suggest that many candidates have little idea about optical fibres

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- Q 4 This was the first of two questions which also featured on the Higher Tier paper. Although the vast majority of candidates wrote answers to this question about product specifications, most of them only earned a mark or two. Sometimes this was because they assumed that the system being proposed was a radio broadcast, like Radio 1, instead of the two-way radio system described in the stem of the question. Too often, candidates would repeat their answers, with different wording, rather than offer a new idea. Their answers suggest that they had little idea of what a product specification is, let alone what would be desirable aspects of the product being proposed.
- Q 5 This question also appeared on the Higher Tier paper. The vast majority of candidates were able to earn two of the three marks for (a), with "screen" as a popular incorrect alternative to "frame". It was disappointing to find that almost no candidates were able to convert bytes into bits or calculate the refresh rate for (b), although it was rare to come across a script where a candidate had declined to attempt to answer the question.

## **A326/02 – Additional Applied Science A – Communications – Higher Tier**

### **General Comments**

This paper was designed for candidates operating at grade C or above. At least half of the candidates entered for this paper would have enjoyed the exam more had they been entered for the Foundation Tier instead of the Higher Tier. They would have found the questions much more accessible and been given more opportunity to show what they could do. As it is, a significant proportion of the candidates entered for the Higher Tier paper will have obtained no grade as a consequence of being entered for an exam beyond their competence.

Centres need to appreciate how much of the specification for this paper is dominated by the requirement that candidates research their own examples of various aspects of communications. It was evident from their responses that many candidates were poorly prepared for this.

Many candidates struggled with the idea of a block diagram to represent the flow of information through a system, often confusing it with a circuit diagram. Centres need to realise that it is only through the technique of the block diagram that this course can make the complex field of modern communications comprehensible at GCSE level.

### **Comments on Individual Questions**

- Q 1 This question about product specifications also featured on the Foundation Tier paper. It was not well answered, with only a minority of bright candidates able to earn all of the marks. Too often, candidates would lose marks by not being precise enough, or providing shallow responses.
- Q 2 Although many candidates could draw a correct voltmeter symbol for (a)(i), only the brightest knew that it should be connected in parallel to the LED. Similarly, only bright candidates were able to apply the power formula correctly for the LED for (a)(ii). As expected, very few candidates earned both marks for (a)(iii), often by failing to mention that the LED was destroyed by too much heat or power. It was disappointing to find so few candidates able to complete the block diagram of (b)(i) correctly, with many assuming that the battery was the input device instead of the switch. Few candidates scored marks in (b)(ii), often confusing block diagrams with circuit diagrams.
- Q 3 Even bright candidates had difficulty in earning all of the marks for (b)(i), often getting the tuner and modulator round the wrong way. Part (b) about the process of frequency modulation proved to be beyond most candidates, with none of them earning all three marks. Too often, they concentrated on the effects of frequency modulation, rather than describe the process. As expected, few candidates could define bandwidth in (c)(i), but it was disappointing to find that so few candidates of all abilities could not write down the frequency of a radio broadcast in the VHF band.
- Q 4 It was pleasing to find that the vast majority of candidates could name a digital code for (a). Bright candidates were able to give good responses to (b), but weak candidates often lost marks through their inability to express themselves clearly. A significant minority of candidates were unaware of the meaning of the term 'range' in communications. Part (c) required candidates to present a block diagram of a simple video system. Very few of the diagrams had arrows to indicate the flow of information, and the descriptions of the function of each block often failed to mention how it transformed the information passing through it (i.e. the camera converts the image into an electrical signal). Most weak candidates scored no marks at all for this part of the question.

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- Q 5 This question also featured on the Foundation Tier paper. As expected, the majority of candidates managed (a) correctly, but it was disappointing to find that only the brightest candidates knew how to convert information in bytes into bits. It was disappointing to find that the majority of candidates were unable to calculate the refresh rate for the screen

# A334/01 – Additional Applied Science A – Agriculture & Food – Foundation Tier

## General Comments

This is the first time this specification has been offered to all schools. The specification is based on Products from Organisms from the Pilot Science E. This pilot specification was examined seven times. The entries increased from about 500 in the Pilot to 2200 in this new specification. The overall performance of the candidates was quite good, at least matching previous performances in the Pilot.

Although a significant number of candidates did not attempt parts of the last question on selective breeding this was probably due to lack of knowledge rather than a lack of time. Many candidates struggled to work out simple calculations in question 3.

For many candidates a better examination technique would have led to a significant improvement in their grade. Common errors included failure to read the question carefully enough, for example

- writing disadvantages instead of advantages in question 3(b)(ii)
- writing reasons for contamination instead of precautions in question 4(a)
- writing single word answers where an explanation or description was required in question 3(a)(iii).

Scripts are now scanned and marked on line. Teachers should remind their students to restrict their answers to the allocated spaces and not write in the margins. Candidates often change their mind about an answer and write "the red line / word is correct" Unfortunately the scripts are not scanned in colour so it is impossible to decide which answer is intended.

## Comments on Individual Questions

- Q 1 This question was based on AP2.1, understanding the agriculture and food industries. In part (a), the majority of candidates were able to correctly link up the stages and descriptions in the chain of food production, scoring maximum marks. In part (b), many candidates were unclear about the role of factory inspectors and wrote vague statements such as "To see if everything is OK" or "To check standards". A clear reference to checking hygiene/health/safety was required. In part (c), very few candidates were able to name an organisation which supports a part of the food industry. Less than 10% of the candidates scored this mark. In the specification, other examples quoted are British Potato Council and Meat and Livestock Commission. Candidates named every supermarket and corner shop. Part (d), on the advantage of a quality mark, produced a wide range of responses, with many candidates confusing it with health and safety. The answer "it is safe to eat" was not accepted.
- Q 2 This question was based on the gift of a goat to help people in developing countries. In part (a) candidates responded well to this question on how a goat can help a farmer, producing a wide range of acceptable answers. In part (b) most candidates were able to state factors which could affect the health of a goat. Vague answers such as "weather" or "pollution" were not accepted.
- Q 3 This question was based on growing tomato plants. It was common with Higher Tier and targeted at Grades D/C.



In part (a) (i and ii), candidates were required to calculate the total mass and average of the tomato crop. Despite calculators being allowed, many candidates struggled to work out an answer. A common error was to put the decimal point in the wrong place. It was disappointing to note that about 40% of candidates were unable to correctly calculate these answers.

In part (a)(iii) many candidates struggled to explain why the crop of tomatoes from the greenhouse was better than the crop from the garden. A common error was to write down “more light” or simply “light” instead of being able to control conditions such as light, temperature, carbon dioxide, water. See AP2.2.10.

In part (b)(i) candidates found it difficult to decide whether looking up mineral deficiency was a qualitative, semi-quantitative or quantitative test. Many examples are stated in the specification AP2.5.2. In (b)(ii) many candidates wrote down single words for advantages of chemical and predator control of greenfly, leaving the meaning unclear. Answers such as “chemicals kill them” and “predators eat them” were also common. Some candidates also wrote down disadvantages of their use instead of advantages. Very few candidates realised that a predator would target only the whitefly (leaving useful insects alive).

In (b) (iii) most candidates realised that “biocontrol” would be a useful word, although a common error was to ring “biofly”.

- Q 4 This question was based on an outbreak of food poisoning.  
Part (a): This question on precautions to prevent contamination was generally well answered. Some candidates confused precautions with reasons and explained why contamination could happen.  
Part (b): Candidates were required to complete the word equation for aerobic respiration. There was some confusion with photosynthesis, with candidates writing the reverse reaction. It was disappointing to note that 60% of candidates did not score any marks for this question.  
Part (c): Candidates were required to calculate the number of microorganisms after 2 hours. Many candidates realised that there would be 6 divisions but then simply multiplied by 2 instead of working out the sequence of 1, 2, 4, 8, 16, 32 and 64.  
Part (d): Few candidates were able to name a useful microorganism such as yeast or *Penicillium*.
- Q 5 This question was based on selective breeding of cattle. Some candidates produced very good answers showing a good knowledge and understanding.  
In part (a) the main problem with selective breeding is that it requires many generations of offspring. Few candidates realised this but offered other acceptable answers.  
In part (b) some candidates did not understand or appreciate the phrase “..improve productivity..” and wrote general information about selective breeding.  
In part (c) (i and ii) many candidates wrote good answers to explain artificial insemination and its advantages. The number of blank responses was noticeable. However this was often linked to poor answers to parts a) and b) and probably due to a lack of knowledge rather than a lack of time.

## A334/02 – Additional Applied Science A – Agriculture & Food – Higher Tier

### General Comments

This is the first time this specification has been offered to all schools. The specification is based on Products from Organisms from the Pilot Science E. This pilot specification was examined seven times. The entries increased from about 200 to 800 in this new specification. The overall performance of the candidates showed reasonable targeting by staff, with few very poor scripts.

As in Foundation Tier, many candidates had problems with simple calculations in question 2 despite being allowed the use of a calculator.

As in Foundation Tier, for many candidates a better examination technique would have led to a significant improvement in their final grade. Common errors included failure to carefully read the question, resulting in,

- writing disadvantages instead of advantages in question 2(b)(ii).
- writing very low quality answers in question 4(a)(i, ii, iii).
- writing single word answers instead of a description or explanation in question 2a(iii).
- writing a description instead of an explanation in question 4d.

Scripts are now scanned and marked on line. Teachers should remind their students to restrict their answers to the allocated spaces and not write in the margins. Candidates often change their mind about an answer and write "the red line / word is correct". Unfortunately the scripts are not scanned in colour so it is impossible to decide which answer is intended.

### Comments on Individual Questions

- Q 1 This question was based on AP2.1, understanding the agriculture and food industries. Part (a) required the candidate to name the steps in the food production chain and it produced a good spread of responses with most candidates scoring 2 or 3 marks. In part (b) candidates were asked to suggest a reason for a factory inspector's visit. This question was also in the Foundation Tier. As expected there were fewer vague responses such as "to check if everything is OK". In part (c) candidates were asked to name an organisation that supports a food product and explain its role. Few candidates were able to do this. The specification gives four examples, see AP2.1.8.
- Q 2 This question was based on growing tomato plants. It was common with Foundation Tier. In part (a)(i and ii), candidates were required to calculate the total mass and average of the tomato crop. Despite calculators being allowed, many candidates struggled to work out an answer. Misplacement of the decimal point was a common error. In part (a)(iii) In general, candidates produced better quality answers than in Foundation to explain why the crop from the greenhouse was better than that from the garden. However, there was still a misconception that a greenhouse provided more light instead of being able to control it. In part (b)(i) deciding whether looking up symptoms of mineral deficiency was a qualitative, semi-quantitative or quantitative test seemed to be a guess, with only about 50% of candidates identifying the correct answer. Many examples are given in AP2.5.2. In part (ii) most candidates realised that chemical control of whitefly would be easy to apply or quick acting, but few could offer an advantage for predator control (such as targeting only the whitefly). In part (iii) biocontrol was a popular choice for a computer search, although some candidates were tempted by "biofly".

*Report on the Units taken in January 2008*

- Q 3 This question was targeted at tissue culture in plants.  
In part (a)(i), Most candidates realised why the nutrient medium had to be sterile.  
In part (a)(ii) Few candidates (about 10%) realised that a growth or rooting hormone is added to the medium. A common incorrect answer was “growth medium”.  
In Part (b), most candidates were able to offer at least one condition that needed to be controlled for the best growth.  
In part (c) many candidates did not appear to understand the phrase “commercial advantages” and simply described the process.  
In part (d)(i) It was surprising to read the poor responses to this question. Candidates were required to simply describe the process of taking cuttings. It was obvious that they had not done this in class. A typical incorrect answer was “Take a piece and plant it in soil”.  
Few candidates realised in (d)(ii) the differences between taking cuttings (a simpler process, no special equipment, sterile conditions nor needed) and using tissue culture.
- Q 4 This question was based on using a fermenter.  
Part (a): It was rather disappointing to read the many low quality answers such as “because it gets hot” to explain why the temperature rises, “to stop it getting hot “ to explain why the temperature needs to be controlled , “To mix it up” to explain why the mixture should be stirred.  
In part (b) some candidates simply copied name(s) from the diagram instead of naming conditions that must be monitored. “Acid/ base inlet” was a common answer, instead of “pH”.  
In part (c)(i) most candidates realised that a system of batch culture was used. In (ii), many candidates realised that the fermenter must be sterilised but struggled to give a good explanation.  
Part (d) was targeted at Grade A/A\* and few candidates gained marks. The majority of candidates simply described the shape of the curve without offering any explanation for its shape.

## A335/01 – Additional Applied Science A – Harnessing Chemicals – Foundation Tier

### General Comments

The examination was relatively short, covering 36 marks in 45 minutes. There was no evidence that candidates were short of time. Only a small proportion of the candidates left blank spaces. This seemed to be due to a lack of knowledge and understanding as against insufficient time. Any omission can have a large effect on the grade attained and so it is vital that all aspects of the specification are covered and that candidates are encouraged to attempt every question. Centres had targeted Foundation candidate entry well, with no evidence that any of the candidates should have been entered for the Higher Tier instead. Some candidates are still being entered for the paper who would possibly have been more suited to Entry level.

### *Recommendations for teaching*

1. Give candidates plenty of practice at answering questions from past papers.
2. Encourage candidates to learn all the definitions, such as 'organic' and 'bulk' and memorise the required examples.
3. Ensure that candidates have attempted a range of standard procedures; including weighing, filtering, heating using a water bath and that they are aware of safety hazards and precautions.

### Comments on Individual Questions

- Q 1 This question was attempted by all candidates. In part (a) the vast majority of candidates were able to identify the correct hazard symbol for a toxic and highly flammable substance. However a large number struggled to distinguish between the symbol for corrosive and irritant. Part (b) was very poorly answered. Most candidates suggested using a Bunsen burner with a safety flame.
- Q 2 Most candidates had the confidence to try to answer every part of this question. Part (a) proved surprisingly difficult for candidates of all abilities. The most common distracter was 'Ca'. In part (b)(i) the most common incorrect answers for this question were 'coal', 'crude oil' and colours such as 'green'. Among the best answers seen was 'ethanol'. Some candidates gave an example of a homologous series such as 'hydrocarbon' and were credited with a mark. Part (b)(ii) was very well answered. The most able candidates used the terms 'non-renewable' and 'not sustainable'. In part (c) most gained a mark for understanding that water had to be added to make an aqueous solution. A significant number of candidates said indigo was soluble. Possibly having seen the term 'dissolve' and yet not having fully read the sentence. Part (d): The most common distracter for this question was 'the cellulase is used up'.
- Q 3 Part (a)(i) was very well answered. The most common incorrect answer was '45'. This question was targeted at tissue culture in plants. In part (ii) most candidates were aware that sweeteners are added to make the tablets taste nice. One of the best answers provided was 'to cover up the taste of the other ingredients'. A small number of candidates said 'to add taste'. This was not awarded any marks. Part (iii) proved surprisingly difficult. Most believed that BP quality antacids were used as they are more effective. Part (iv) This was generally well answered. There was no common distracter for this question, with each incorrect answer selected in equal proportion.

Part (b)(i) was present in both the foundation and the higher tier paper. Many candidates knew that carbonates produced carbon dioxide and correctly gave its name rather than formula. Oxygen and hydrogen were the most common incorrect answers given. Part (ii) was very well answered with candidates having clearly read the stem of the question to find the answers. If they answered (b)(i) incorrectly they were not penalised again in this part of the question. Part (iii) was answered very well by the most able candidates. Many of the weaker candidates left this question blank.

In part (c) most gained a mark for understanding the need to check that they tablets are safe for consumption. Only the more able candidates gained the second mark.

Q 4 In part (a), a small number of candidates lacked the confidence to attempt this question. The vast majority gained one mark for correctly identifying a suitable reaction vessel. If a second mark was obtained it was usually for listing the stopwatch. There were some excellent answers from candidates who clearly recalled having performed the experiment.

Part (b)(i) was common to the higher tier. Most candidates plotted all four points accurately. The most common mistake made was to plot the final result at 70°C. Part (ii) was common to the higher tier and was poorly attempted by candidates of all abilities. A significant number drew a straight line through the points. Some drew the line through the origin. Most drew a curve, by free hand through all the points. Part (iii) was generally answered well. Those candidates who failed to obtain both marks usually referred to the change in time, instead of rate, with temperature. A small number stated how temperature changed with time

Q 5 Parts (a), (b) and (c) were common to the higher tier.

In (a) more candidates were able to answer this question correctly than in previous sessions. A significant few still incorrectly believe that nothing will happen unless the mixture is warmed however.

Part (b) was answered well by most candidates. The most common incorrect responses involved candidates confusing the terms residue and solution.

Part (c) was very poorly answered by candidates of all ability. As in previous sessions the majority of candidates incorrectly believe that adding more chemicals will make the crystals larger.

Part (d) was answered very well by the more able candidates. Many of the weaker candidates gave no response. In (i), the addition of 15.7 to 1.1 was frequently seen among the incorrect answers to this question. In (ii), those candidates who attempted the question usually gained both marks having clearly shown all their workings. Part (iii) was very well answered by candidates of all abilities.

## A335/02 – Additional Applied Science A – Harnessing Chemicals – 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. However, many candidates struggled to give accurate definitions of important terms such as fine chemical, organic compound and functional group which had a significant effect on their achievement.

### Comments on Individual Questions

- Q 1 This question was attempted by all candidates.  
In part (a)(i) most candidates successfully selected sodium carbonate as the second soluble salt needed. A significant number incorrectly chose sodium chloride. In (ii), very few candidates understood the difficulty of extracting calcium carbonate from limestone meaning that it is easier to make it. Most discussed the problems of using limestone instead of calcium carbonate, answers based on the lack of purity or problems in using it indigestion tablets were common. In part (iii) the meaning of the term 'fine chemical' was generally well known although some again thought it was the purity that was important. In part (b)(i) most candidates knew that the gas produced when carbonates reacted with acids is carbon dioxide. The most frequently appearing incorrect gases were hydrogen and oxygen. In (ii), the symbol equation proved difficult for the candidates. The correct formulae for hydrochloric acid and/or carbon dioxide did appear but correct balancing was rare.  
Answers to part (c) did not usually address the international aspect and more often discussed the need for the tablets to be the same rather than the methods of testing. In part (d) there was a wide range of solid mixtures given, examples of painkilling tablets such as aspirin or paracetamol appeared most often
- Q 2 In part (a)(i) candidates were generally very accurate in plotting the points, the commonest error being to plot the final point at 70°C instead of 80°C. In part (ii) candidates were much less good at drawing smooth curves. Straight lines, 'join the dots' lines and multiple lines were all common. In (a)(iii) an encouraging number of candidates were able to use the graph to predict the time taken. Some candidates produced a value with no justification from the graph such as an extrapolation of the line.  
In part (b) Candidates did not show a good understanding of collision theory and answers rarely discussed the increase in successful collisions. Most marks were gained by stating that particles move faster and/or an increase in the number of collisions. Discussions of particles expanding were also seen.  
In part (c) Methods of changing the rate of reaction were well known with both changing the concentration and addition of a catalyst appearing frequently. The commonest misconception was to change the amount of reactants rather than the concentration.

- Q 3 Part (a): Warming the acid to increase rate of reaction was well known by most candidates  
Part B: Although many candidates were aware of the need to remove the excess copper oxide, too many answers were unacceptably vague. Incorrect or incomplete responses included 'to remove impurities', 'to remove the water or the solution' and 'to collect the solid'.  
Part (c): A significant number of candidates thought that you could make bigger crystals by using larger quantities of reactants.  
In part (d) the calculation was not well answered with complete answers infrequent. Some candidates managed to calculate the relevant relative molecular masses but then struggled to use ratios to connect them. Others tried to calculate percentage yields rather than the theoretical yield asked for.  
In part (e) most candidates were able to identify some factors that the chemical company should consider although answers were often not well expressed.
- Q 4 In part (a) candidates generally showed an excellent understanding of chemical formulae and most were able to successfully pick the correct one from the list.  
In part (b)(i) most candidates knew what the term organic meant although some thought that the chemical itself must be living or have lived rather than having been extracted from something which had. A few described it in terms of organic farming rather than organic compounds, the stem of the question made it clear which meaning was required.  
In part (b)(ii) candidates struggled to name another organic compound with plants, such as sugar cane, cotton and wood, or mixtures, such as crude oil being very popular. Many inorganic compounds also appeared. Ethanol was a popular correct choice. In (iii) most candidates knew that the use of coal and crude oil is not sustainable because they will run out.  
In part (c)(i) correct definitions of 'functional group' were rare with many describing a group of compounds rather than a group of atoms. In part (ii) candidates were more successful in identifying the functional group in ethanol than they were in describing the meaning.  
In part (d) almost all candidates knew that aqueous was connected with water but many gave confused answers such as descriptions of a dye or just 'a liquid'.

## **A336/01 – Additional Applied Science A – Materials & Performance – Foundation Tier**

### **General Comments**

This was the first major entry for this paper and while many responses reflected the unfamiliarity with this specification and its assessment the great majority of candidates obtained reasonable marks.

Awareness of work-related issues was good, and almost all candidates offered sensible and thoughtful suggestions where required, but basic science knowledge and understanding was often lacking. The specification includes recall of examples of science applied in everyday life, and where questions required candidates to produce their own example, many were unable to do so.

The specification also requires recall of specified items of information. There was a marked contrast between those scripts which showed little or no recall of these particular facts, resulting in low scores on several questions, and those where factual recall was generally successful, leading to good marks.

### **Comments on Individual Questions**

- Q 1 In part (a) almost all candidates could link pine with wood, and most linked steel with alloy, but only the more able linked glass with ceramic. The most common error was to link it to polymer. Some responses linked properties that were not relevant to the application. A significant number of responses included more than one line drawn from each box and lost the mark for that link.  
The scores in part (b) differentiated well, with only the most able scoring 4 marks and the weakest scoring 0 or 1.
- Q 2 Almost all candidates correctly circled plastic foam.  
Almost all candidates correctly gave aluminium but a few wrote the number 24 instead. As they had named the material the mark could not be given.  
The great majority of candidates correctly gave steel and concrete.  
A small minority indicated 'increase in length' and 'increase in temperature' although most responses included one of these. The most common wrong answer was 'time for which sample is heated'.
- Q 3 Part (a): Almost all candidates made sensible suggestions, but some of these did not answer the question and were unable to gain a mark. Many answers correctly considered the ease of dismantling the equipment and there were plenty of thoughtful responses which considered the hazard screws could pose to young children.  
Part (b): Although many candidates identified the main advantage as being less heavy and therefore easier to handle, very many answers revealed misconceptions about tubes. The most common error was to state that a tube is stronger, more rigid or harder than a solid cylinder of the same size and material. A large number of candidates stated that tubes were safer.  
Some responses, generally from weaker candidates, related the choice of tube to the joining method in part (a). Some suggested that the lighter weight would cause less injury should the playframe collapse. These suggestions were not awarded the mark.  
Others wrongly inferred that tubes are not made of plastic.  
In part (c) almost all candidates correctly ticked 'to hold it firmly in place'. The most common wrong answer was 'to make it look attractive'.



In (d)(i) the great majority of answers scored at least on mark, and that mark was usually awarded for highlighting safety as the main reason. Many of these gained a second mark either by identifying its purpose for children, or for identifying the need for strength. Some candidates based an answer on economic competition which could not be credited, because the question asked the reason for requiring a product standard. There were a few responses which appeared to confuse design standards with product standards, and some candidates wrongly implied that a product standard would guard against faulty goods on sale.

In part (d)(ii and iii) the majority of answers were partially correct, indicating some awareness of these roles, but the proportion of fully correct answers was disappointing. These questions required the recall of examples listed in the specification.

Most candidates attempted to answer part (iv), although there were a significant number who did not. A large minority gave a correct example of an artefact with a safety margin, but many responses described safety features or safety instructions.

- Q 4 Almost all candidates correctly identified the shape of the diverging lens in part (a). In part (b)(i) only a tiny minority correctly measured the focal length of the lens; some gave answers to the nearest centimetre and so failed to score. In (ii) a small majority correctly indicated that the power of a lens depends on its focal length. In (iii) a similar small majority correctly indicated that the power of a lens is measured in dioptres.
- Q 5 A good proportion of the more able candidates indicated in part (a) that the band practice was twice as loud as a normal conversation, but very few weaker candidates answered correctly. In part (b)(i) the majority of responses correctly identified the loudness as 90 dB. A small minority of candidates in (ii) could both supply and spell the word 'tinnitus' and very many others struggled to spell the word correctly; unfortunately, some unrecognisable spelling attempts could not be credited. However, a significant number of candidates made no attempt to answer this question. In part (c) the specification requires candidates to recall their own examples of using materials for soundproofing and the quality of response to this question varied considerably, with some excellent, fully detailed answers and others which appeared to be guesswork. There was some confusion with radiation protection as a number of candidates suggested lining the walls with lead. Others confused the situation with thermal insulation and a large number of weak answers took the suggestion of plastic foam from Q2a. The most common error was to describe acoustically hard materials in order to reflect sound.
- Q 6 In part (a)(i) most candidates correctly ticked the box for 'to decrease the force of impact' but only the more able ticked 'to increase the time it takes to slow down'. The most common answer that could not gain credit was 'so other vehicles are not damaged in a collision'. In (ii) the specification states that candidates should be able to explain how  $Ft = \text{change in momentum}$  applies to crumple zones, seat belts and helmets; and that they should be able to recall two examples of materials used in road safety, describing how their mechanical properties are important. However, very few answers suggested that this knowledge had been learned successfully and very few candidates scored both marks. There were many answers which failed to include the mechanical properties of a device and so could score neither for describing those properties nor for how they help to improve safety. In part (b) a minority of responses included the correct quantities and of these, very few used the term 'velocity'. 'Speed' was the usual response. Although many candidates scored one mark, very many answers showed no understanding of momentum and a significant proportion of candidates listed devices, such as a speedometer, instead of giving the quantities required to calculate momentum.

## A336/02 – Additional Applied Science A – Materials & Performance – Higher Tier

### General Comments

This was the first major entry for this specification and the responses suggested that Centres were still unclear on the preparation for the examination. The specification requires candidates to recall and describe several examples of their own in order to illustrate scientific principles in everyday life, but where questions asked for this, the responses were often lacking in detail. Many entrants achieved low marks and the nature of their responses indicated that their needs would have been better met by entry for the Foundation Tier.

Some of the candidates who scored reasonably on more demanding questions did not perform well on those of standard demand; those entering for the Higher Tier paper should ensure that their revision covers the full specification.

### Comments on Individual Questions

- Q 1 In part (a) a minority of candidates recalled that increasing sound intensity by 10dB in corresponds to doubling it, but the majority wrongly selected 'slightly louder', suggesting that they were unaware of the nonlinear nature of the dB scale.  
In part (b)(i) most candidates correctly chose 90dB. In (ii) many candidates gave a recognisable spelling of the word 'tinnitus'.  
In part (c) the great majority of candidates correctly selected 'low frequency sounds penetrate building structures'.  
In part (d) many candidates correctly suggested an acoustically soft material applied to the walls, and some explained that this would absorb sound, gaining full credit. However there was confusion with using acoustically hard materials to reflect sound.
- Q 2 In (a)(i) most answers correctly included 'to decrease force of impact' and a reasonable proportion also included, 'to increase the time it takes to slow down'. In (ii) this question asked candidates to describe another example of how mechanical properties are used to improve road safety. Two parts of the specification, list examples which could have been used to provide acceptable answers but these were rarely seen. Some candidates gave examples without giving any mechanical properties and thus failed to answer the question.  
In part (b) few responses included 'velocity' although the majority included 'speed'. Relatively few entrants listed mass and some stated 'weight', which was not accepted.  
In part (c) The great majority correctly stated that the momentum was double.  
In part (d)(i) a tiny minority stated that the area under the graph represented 'momentum', and still fewer gave 'change in momentum' as their answer. The word 'impulse' was not seen. In (ii) few candidates evaluated the expression correctly as many of them did not obtain the value of the force acting, but instead calculated the product of the numbers written on the page. In (iii) very few candidates attempted the correct method of obtaining their answer, namely to divide by 0.3kg and many used it to multiply instead. A significant number did not use their answer to part (ii) despite the instruction to do so, but a large minority did use their own value, even if incorrect and thus could score both marks.

*Report on the Units taken in January 2008*

Q 3 Part (a)(i): Almost all candidates circled the correct outlier. In (ii) almost all candidates drew an acceptable line of best fit, but some lines were spoilt by being too short or drawn freehand.

Part (b): A minority of candidates, who knew how to use the equation  $F=kx$ , earned both marks; but many were unable to relate the equation to the graph. Those who could, had no difficulty in scoring the second mark as well as the first.

Part (c): Many candidates used the fact that the stored energy was linked to the product of force and extension but very few included the factor 0.5 in their calculation. Even fewer remembered to convert from centimetres to meters. Very little working out was set down and a more methodical approach might have led to greater success.

Q 4 In part (a) the responses to this question reflected a poor understanding of how mechanical properties are affected by temperature, despite the prompt words. Almost all candidates chose mechanical properties but very few scored both marks.

In part (b) some excellent responses showed good preparation for the examination, but in many cases the answers appeared to be guesswork. Some candidates incorrectly chose to base their answer on complementary, rather than matching, properties. Other candidates omitted a diagram, despite the instruction to use one, and many omitted to name the materials.

Q 5 Most candidates correctly selected refraction in part (a).

In part (b) few candidates recalled that the refractive index influences the amount of refraction by a material, and even fewer stated that a higher refractive index is required to produce a thinner lens.

In part (c) (i) almost all responses indicated that the image would become larger, but very few candidates understood that its position would alter. There were many references to its becoming blurred or out of focus, suggesting that candidates were unaware that a sharp image still existed but in a different position. In (ii) a small minority of responses suggested that the camera lens should move forwards or backwards, but scarcely any made the required direction clear.

In part (d) many responses discussed aspects of how the eye functions, but very few correctly described the thickening of the eye lens. Many described the pupil widening to allow in more light and others discussed the image as being inverted.

# Grade Thresholds

General Certificate of Secondary Education  
Science A (Specification Code J632)  
January 2008 Examination Series

## Unit Threshold Marks

Unit		Maximum Mark	A*	A	B	C	D	E	F	G	U
A324/01	Raw	36	n/a	n/a	n/a	24	20	17	14	11	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A324/02	Raw	36	27	23	19	16	13	11	n/a	n/a	n/a
	UMS	50	45	40	35	30	25	23	n/a	n/a	n/a
A325/01	Raw	36	n/a	n/a	n/a	25	21	17	14	11	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A325/02	Raw	36	32	28	24	20	14	11	n/a	n/a	n/a
	UMS	50	45	40	35	30	25	23	n/a	n/a	n/a
A326/01	Raw	36	n/a	n/a	n/a	20	17	14	12	10	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A326/02	Raw	36	29	24	19	15	12	10	n/a	n/a	n/a
	UMS	50	45	40	35	30	25	23	n/a	n/a	n/a
A334/01	Raw	36	n/a	n/a	n/a	21	17	14	11	8	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A334/02	Raw	36	27	22	17	13	10	8	n/a	n/a	n/a
	UMS	50	45	40	35	30	25	23	n/a	n/a	n/a
A335/01	Raw	36	n/a	n/a	n/a	21	17	14	11	8	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A335/02	Raw	36	30	24	18	13	10	8	n/a	n/a	n/a
	UMS	50	45	40	35	30	25	23	n/a	n/a	n/a
A336/01	Raw	36	n/a	n/a	n/a	23	20	17	15	13	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A336/02	Raw	36	28	23	18	13	10	8	n/a	n/a	n/a
	UMS	50	45	40	35	30	25	23	n/a	n/a	n/a

## Specification Aggregation Results

Overall threshold marks in UMS (ie after conversion of raw marks to uniform marks)

	Maximum Mark	A*	A	B	C	D	E	F	G	U
J632	<b>Not Aggregating in January 2008</b>									

For a description of how UMS marks are calculated see:  
[http://www.ocr.org.uk/learners/ums\\_results.html](http://www.ocr.org.uk/learners/ums_results.html)

Statistics are correct at the time of publication.

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