GCSE

Science B J640

Gateway Science Suite

General Certificate of Secondary Education

Report on the Units

June 2009

J640/MS/R/09

Oxford Cambridge and RSA Examinations

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General Certificate of Secondary Education

Gateway Science B (J640)

REPORT ON THE UNITS

Chief Examiner's Report

Ofqual produced a public report on GCSE Sciences in March 2009: 'Findings from the Monitoring of the new GCSE Science Specifications: 2007 and 2008'. This report (page 25) makes reference to an agreement between Ofqual and the Awarding Bodies 'to ensure that grade boundaries are set appropriately'. Part of this agreement required all the awarding committees to work towards a new national standard for this summer's series. This has had an impact on both the examined units and the coursework components awarded this summer, and has resulted in higher thresholds than might have been expected for a number of the key grade boundaries, across the Gateway Science and 21st Century Science suites of specifications.

Examinations have been set covering units 1 and 2 of the course since January 2007. There is clear evidence that centres are making effective use of past papers to better prepare candidates for the written examinations. For example ideas concerning thermal decomposition and the meaning of the term 'species' are now better understood by a significantly higher proportion of candidates.

A number of candidates have lost marks through the careless writing of chemical formulae. Centres could usefully underline the importance of subscripts and care with the use of upper and lower case letters when writing chemical formulae. Calculations continue to be well answered. Candidates can select the appropriate formula and perform the arithmetic accurately, although a number would have benefitted from the use of a calculator. This year, a number of two stage calculations have been included and these have discriminated well at the higher grades.

There is clear evidence that centres have come to grips with the coursework demands and there has been a pleasing improvement in performance. Can-Do tasks are motivating for students and Science in the News discriminates well across the ability range.

The reports from the principal examiners which follow indicate

- areas of good quality performance
- areas of weakness
- common errors and misconceptions.

B621/01 Foundation Tier

General Comments

The paper differentiated well across the ability range. Assistant Examiners and Team Leaders felt that the level of difficulty of the paper was appropriate. The mean mark was 24.7. Candidates tended to score slightly better on the chemistry and physics sections of the paper. Question 4 proved challenging even for the better candidates. There was no evidence of lack of time.

31 marks were required to gain grade C and 13 for grade F.

Most centres have their entry pattern about right with only a small number of candidates who may have been better served by entry to the higher tier paper.

Comments on Individual Questions

SECTION A – MODULE B1

Question 1

Part (a) was generally well answered. The most common incorrect response was 'mitochondrion'.

Most candidates correctly identified the 'nucleus' in part (b).

In part (c), fertilisation was the most common response. Answers referring to just 'reproduction', 'conception' or 'sexual intercourse' were insufficient to score.

Question 2

In part (a) relatively few candidates understood the characteristics of this reflex, usually describing in some detail what happened to the size of the pupils and how they varied in different lighting conditions. For 1 mark, candidates tended most often to refer to the speed of response. The mark scheme required recognition that reflexes are automatic (1), fast (1) or for protection (1).

Part (b) was very poorly answered even by the best candidates. Few referred to electrical impulses but answers such as 'light' or 'along the nerves' were common.

In contrast, part (c) was extremely well known by candidates of all abilities.

In part (d) disappointingly few candidates really understood what 'short term' meant. Frequently they would speak about the speed at which the alcohol had its effect rather than how long it lasted. Others went into some detail about long term effects, without saying why sleepiness was a short term effect.

Question 3

Part (a) was generally well answered, though too many candidates are still drawing the line dot-to-dot or are unable apparently to draw a single, coherent, smooth line. Weakest candidates did not know how to construct the plots. Almost two thirds of candidates scored three marks.

In part (b) most marks gained were for responses about the 'heart beating faster' or 'more blood being pumped around the body' for one mark. Better candidates understood that 'more oxygen' was required or that blood was being pumped to the muscles. Some lost marks by writing about 'increasing breathing rate'.

Question 4

This question was very poorly answered overall. A total of one or two marks out of six was the norm.

Part (a)(i) was not well answered generally. The most common mark was for 'fainting or dizziness'. Most simply reiterated the question by writing that 'the body heated up'. A few scored by mentioning cell damage and several others gained no marks for referring to organ damage or organ failure.

Part (a)(ii) was also poorly answered by all candidates. The concept of cooling by evaporation was rarely mentioned. Some candidates thought that the sweat 'washed the heat off the body'.

Homeostasis was not understood in part (a)(iii) with less than 10% of candidates scoring the mark.

Part (b) was generally well answered with most candidates correctly identifying aspirin as a pain killer. 'Temazepan' was the most frequent incorrect answer.

Part (c) was poorly answered. Incorrect responses shared equally between antibiotics helping to kill viruses and the body just having to kill off the viruses on its own, perhaps with the production of antibodies, no doubt gleaned from the following question. Few gave the required response of 'antibiotics only work against bacteria'.

Part (d) was again disappointing. A majority of candidates incorrectly referred to 'antibody' rather than 'antigen'.

SECTION B – MODULE C1

Question 5

Parts (a) and (b) were generally well answered with the correct responses of 'antioxidant' and 'emulsifier' respectively.

In part (b) 'mayonnaise' was the most common correct answer. A large range of answers was allowed.

Part (c) was moderately well answered. Many were able to describe the effect of a flavour enhancer, though several understood MSG to give the different commercial flavours available for crisps.

Question 6

Part (a) was less well answered than expected. 'Petrol' was a common incorrect answer.

Half of all candidates correctly answered part (b)(i), placing the cross above the dotted line at the top of the fractionating column and also part (b)(ii) where the most common correct answer was 'petrol'. A small number of candidates simply repeated fractions given in the question and failed to score.

In part (c) the first part was poorly answered, with many candidates suggesting that large molecules broken up enabled easier storage i.e. they were smaller and more compact. Several said 'it gave more fuel', but failed to mention petrol. Many simply reiterated the question – 'large molecules become small'.
More realised that cracking required 'heat' in the second part.

Question 7
Most candidates scored either one or two marks in part (a). Most realised the meaning of insoluble.

Part (b) was well answered with over 90% of candidates referring to some aspect of safety.

Question 8

Relatively few achieved 2 marks in part (a). 'Availability' and 'storage' were the most common correct responses, with some scoring with issues of 'safety' and 'toxicity'. Far too many were simply talking about the need to insulate the house or 'how much fuel was needed'.

About 40% of candidates scored the mark for carbon dioxide in part (b). Answers such as 'methoxide' were common. Complete and incomplete combustion remain areas of weakness for a significant number of candidates.

Part (c) was poorly answered. Few understood incomplete combustion and thought the house or water would be inadequately heated or 'it was a waste of the money paid for the gas'.

Question 9

Part (a) was correctly answered by about 40% of candidates. Unacceptable answers included just 'H' and 'C' or 'hydro' and 'carbon'. 'Carbon dioxide' also featured regularly along with 'hydrogen'.

Only about a quarter of candidates recognised propane as an alkane in part (b).

Part (c) was better answered.

In part (d) most candidates managed to score with the molecular formula of methanol, although subscripts need to be taught much more clearly and though allowed, many candidates were giving numbers for the carbon and oxygen atoms.

SECTION C – MODULE P1

Question 10

Few candidates scored 3 marks in part (a). Candidates either tended to score 2 marks with 'ice cream', 'drink' and 'meal' correct or 1 mark with just 'meal' correct. Too many clearly failed to be able to process the question fully and many put objects in the opposite column; i.e. were simply listing what they thought was 'hotter' than the room and putting it in the 'gained heat' column.

Only the most able gave correct units for heat as joules in part (b). Interestingly the vast majority of incorrect responses were ‘Fahrenheit’ in an astonishing variety of spellings.

Question 11

Part (a) was a question common to the higher tier paper. Few understood the insulating role of foam. Most often responses were suggesting the idea of the foam trapping the heat from going further. Most common correct answers mentioned the air in the foam.

In part (b) more candidates understood that the shiny foil reflected heat and scored the mark. ‘Heat bounces off the foil’ was a common answer which failed to score.

Question 12

About a third of candidates failed to score any marks on question 12. In part (a) the best candidates scored with ‘water’. Several wrote ‘antioxidant’ and failed to score.
Over 90% of candidates failed to score in part (b). Most candidates that attempted the question confused infra-red with microwaves.
Parts (c)(i) and (ii) were better answered with ‘T.V. remote’ or ‘mobile phone’ being common acceptable answers in part (i).

Question 13

Part (a) was generally well answered, although many wrote about ‘curtains left open’ or ‘TV on standby’ and failed to score.

Part (b) was well answered only by the best candidates, who correctly calculated 0.075 or 7.5%.

Question 14

The vast majority of candidates scored at least one mark on this question with significant numbers scoring both.

In part (b) over two thirds of candidates scored one or two marks with over a third of candidates scoring both marks. There was little evidence of the large numbers involved causing candidates problems.

Part (c) was surprisingly poorly answered with only the best candidates realising that all electromagnetic waves travel at the same speed. ‘They are all fast’ was the most common unacceptable answer.

B621/02 Higher Tier

General comments

Overall the performance of the candidates was good to satisfactory. The performance of the candidates was consistent across the three sections. Many candidates made a poor start in the Biology section but redeemed themselves in the rest of Section A. The main areas of regular weakness were

- SECTION A: Weak understanding of homeostasis and antibiotics.
  Lack of understanding of alleles.
  Poor knowledge of how the eye-lens adjusts.
- SECTION B: Poor skills in equation balancing.
  An inability to recall the term, 'fractionating column'.
  Weak grasp of intermolecular forces.
- SECTION C: A low level of knowledge about the methods of heat loss in a wall cavity.
  The idea of heat **particles** is a worrying trend and was seen too regularly.
  Very poor understanding of microwave cooking.
  Weak grasp of how the ionosphere reflects radio waves.

However it should also be noted that many candidates displayed sound levels of knowledge and understanding across the specification. The levels of knowledge and understanding exhibited were spread equally across biology, chemistry and physics. The level of mathematical ability in the relevant questions was high although Centres should continue to stress to candidates the importance of showing the working. There was no evidence that candidates struggled to complete the examination paper in the allotted time, nor did there appear to be any misunderstanding of the rubric. Few scripts contained a high number of no – responses although too many candidates had clearly been entered for the wrong tier.
The standard of handwriting has deteriorated further this session.

Comments on Individual Questions

SECTION A - MODULE B1

Question 1

(a) Despite all parts of the first question being overlap with the Foundation paper apart from 1(b) the question produced good differentiation.

(i) A good start for the majority of candidates although some candidates answered in terms of burning, sickness/vomiting or raised blood pressure and failed to gain the mark. Some answers referred to stopping organs working.

(ii) A fairly large number of answers that merely contained ideas of water or moisture on the skin or the pores releasing water then failed to mention **evaporation**. Weak answers merely elaborated on the information in the question and described it was how the body cooled down. There was a much lower success rate than the first part of the question.

(iii) The concept of homeostasis was not well understood by more than half of the candidates and many candidates struggled to express their ideas on the topic. Failure to put the idea of **internal** control or vague references to things staying the same weakened many answers.

(b) Aspirin chosen correctly by the vast majority with a small number choosing anabolic steroid or temazepan.

(c) The better candidates gained the mark with well constructed answers around antibiotics only working against bacteria. There were many answers that were not of such high quality but still gained the mark for the idea that antibiotics do not work against viruses. A lot of candidates answered in terms of white blood cells or the immune system should be left to 'deal with' the illness and failed to gain the mark. When candidates answered 'yes' they followed up with references to the body or white blood cells being unable to fight the virus alone. The idea of preventing secondary infection following a 'yes' answer was not seen.

(d) Approximately half of the answers given were correct but a significant number of answers identified 'antibody', a strong distracter. A smaller number answered vector or toxin.

Question 2

(a) (i) Surprisingly this was poorly answered even though it tested material from the standard demand column of the specification. Many candidates gave 19 as the answer but 76 and other multiples of 19 were fairly common with no mathematical pattern to other numbers given as an answer.

(ii) A marginally better success rate even when the first part was answered incorrectly. Candidates often recognised that the sperm cell had half the number of chromosomes. Again, there was no discernable pattern to incorrect answers although it was sometimes half of the first answer.

(b) (i) Alleles was very poorly understood (a very low rate of gaining the mark); different genes and recessive **or** dominant being the preferred wrong answers. Reference to giving features or characteristics were frequent answers that did not score.

(ii) Only the better candidates drew a correct diagram and correctly identified the black panther cub. These candidates did not indicate what '*dd* ' actually represented. Incorrect diagrams did not start with the correct alleles (eg only D and d, or D and D) whilst too many good diagrams did not identify or label the black cub. Punnet diagrams tended to be better than a line or a string diagram. A higher level question that differentiated well as approximately 2/5ths of the candidates failed to score; stretch and challenge evidenced here.

Question 3

(a) (i)(ii) and (iii) Taken together the three parts were very poorly answered (less than 20% success rate overall). Perhaps not surprising as these are higher level concepts in the specification. The way the eye-lens changes shape and the role played by the ciliary muscles and suspensory ligaments was understood by **very** few candidates. Many candidates answered 'contract' rather than 'relaxes' or reversed the correct answers to parts (ii) and (iii). Some gave two answers that contradicted each other.

(b) This higher demand question was answered much better. Weaker answers only gained one mark, for 'more oxygen' or 'lactic acid production'/'build up or the removal of lactic acid'. Oxygen debt was fairly well known. Responses that did not gain a single mark usually were about rapid breathing needed to pump blood or oxygen/air needed by the heart and/or lungs. The very best answers often gave four or five creditable points. This was a very good differentiating question with a high level of stretch and challenge.

(c) **(i)** Over half the candidates gained two marks rather than one for this question. A large number failed to follow the instructions in the question by only drawing two lines, often resulting in no score. Very few did not correctly identify the amino acid link but too many connected glycerol to carbohydrate.

(ii) With a variety of acceptable responses, there were a high number of correct answers. Nutrients into the body or getting the nutrients out were often given as unacceptable answers. The need to digest before egesting was another common error.

SECTION B - MODULE C1

Question 4

(a) The vast majority of candidates gained this mark for 'mayonnaise' which is the example in the specification. Some candidates correctly gave other foods that contained an emulsifier but some gave 'oil' as an incorrect answer.

(b) By a simple re-word of 'flavour enhancer' a large majority of candidates were successful whilst many others gave 'improves the flavour or to taste nicer' to gain the mark. Those that did not gain a mark often wrote about changing to a different flavour.

(c) **(i)** The test and result for carbon dioxide were both well known with a large majority gaining both marks. Very few only gained one mark whilst a small number failed to score. The 'pop' test was a frequent wrong test and therefore responses tended to be 2 marks or 0.

(ii) Most answers contained the correct symbols in the right place in the equation. Fewer candidates were able to balance the equation (approximately 40% were awarded both marks). The ones that failed to score any marks often started the equation with Na_2CO_3 sometimes with the 'correct' balancing numbers. Other answers were spoilt by putting the wrong sized letters or numbers. This was a simple but effective differentiating question.

Question 5

(a) The term 'fractionating tower' (or column) was the most poorly recalled piece of knowledge on the entire question paper with less than 1 in 5 correct answers. 'Distillator' was the most popular incorrect response whilst 'boiler', or 'tank' were less frequent. Petrol, catalyst and less often, diesel were strange responses in this question, presumably because candidates thought that the top product omitted from the diagram was required.

(b) Whilst the majority successfully placed the 'x' in the correct portion of the fractionating column a lot placed it in the second or bottom portion of the column.

(c) The question structure facilitated the response of the candidates with this difficult concept. The number of maximum mark answers (only 1/3rd of the entry) were infrequent, one mark usually being gained for the idea of 'larger molecules having higher boiling points'. The relevance of higher intermolecular forces was poorly understood or, at the very least, poorly expressed. A good stretch and challenge question.

Question 6

(a) A high number of two mark answers, to be expected as this was a common question. A number of candidates gave 'alkenes' as the first response, whilst a small number reversed the correct choices and could not be awarded any marks. More candidates gained the 'alcohol' mark than the 'water' mark.

(b) The majority of candidates found this to be a difficult two-part question. Consequently there were few two-mark responses, many candidates failing to recognise the strong force of attraction between water molecules and so failing to secure the first mark. Indeed too many thought that this force was weak. More candidates did gain the second mark for the forces between water molecules and nail varnish molecules being weak(er). A lot of candidates focused on the attraction of the varnish to **the nail** or answered only in terms of attraction between nail varnish molecules. This gave good differentiation as there was real stretch and challenge in the question. A small number wrote about 'hydrophilic' and 'hydrophobic' in their answers.

Question 7

(a) This question was an overlap question with the Foundation level paper and many candidates gained both marks. However, it did differentiate even with the more able candidates. Failure to gain a single mark was rare but when errors were made it was due to related, but not worthy of credit responses such as; efficiency, how much is needed or unqualified pollution. Reference to payback time, insulation or if the fuel was environmentally friendly were other answers not worthy of credit.

(b) This question was well answered with a variety of acceptable answers. Poor responses just stated 'more demand for them', 'more demand for fuel' or 'people use more'.

Question 8

(a) This was also well answered. Poly(chloroethene) and, to a lesser extent ethene were the frequent incorrect choice.

(b) A much higher number of candidates were awarded this mark, as should be the case on the Higher paper with an overlap question.

(c) The displayed formula question was more problematic. Errors included; brackets with 'n' after them, bond lines drawn from the carbon atoms and attempts to write the displayed formula from the previous part. The most frequent error was, however, to miss the double bond between the carbon atoms. The question provided sound differentiation.

SECTION C - MODULE P1

Question 9

(a) **(i) & (ii)** A variety of acceptable answers that allowed the vast majority (about 4/5ths) of candidates to get off to a good start in the physics section.

(b) More than half gained both marks but too many reversed the correct choices and did not score any mark. Other non-scoring answers gave 'coldness' for the temperature part and 'capacity' for the heat measurement. Approximately 20% of the candidates failed to register any score.

Question 10

(a) Some good answers although often not mentioning **trapped** air. Poor answers referred to the air moving in and **then** being trapped or hot air being trapped. Despite this being an overlap question with the Foundation paper, less than half of the candidates were awarded both marks available. Answers in terms of heat **particles** were seen too often.

(b) This was more difficult and many candidates failed to score. Candidates seemed to have little or no knowledge of heat loss through an uninsulated cavity wall. Often candidates answered in terms of warm air escaping through holes in the brick. In their second answer there was often a description of the air being hot and moving **across** the cavity with no mention of the processes of convection or radiation. Attempts to describe conduction or convection were muddled and rarely gained any marks. The question certainly proved challenging to the candidates. Again, answers in terms of heat **particles** were too common.

Question 11

(a) Candidates found this a difficult question to gain more than one mark on, either for increased energy of (unspecified) particles or conduction (occasionally convection) of heat to the centre of the food. There was little appreciation of **water** (or fat) molecules **absorbing** the microwaves or the increased **kinetic** energy that would result from this absorption. Considering this is exactly what is stated in the specification it does give cause for concern. There were also a number of candidates that expressed the view that microwaves cook **from the inside**. Vague references to microwaves heating the food, cooking it quicker or 'making heat' were other typically poor responses. Points such as; 'reflecting off shiny sides' or 'just penetrate the food/heat the first few cm' whilst relevant to microwave cooking failed to answer the question. Heat **particles** moving to the centre was a response seen too frequently. Centres need to review their approach to teaching this topic and make strenuous efforts to dispel the popular myths relating to microwave cooking. There was a high level of stretch and challenge in this question which had even the best candidates struggling to gain 2 or 3 marks.

(b) The relationship between frequency and (micro)wave energy was well know by the majority of candidates but some answers were spoilt by referring to a change of speed. Weaker answers only related to 'cooking quicker' or 'more heat' being made.

Question 12

(a) The majority gained both marks and few answers scored zero. Some candidates tried to work in percentage but failed to put % beside their answer whilst others answered 0.075 with 'J' as a unit. This error was not penalised. Other mistakes at the start of the calculation were 15 ÷ 185 and 200 ÷ 15.

(b) A very well answered question in the calculation of payback time.

Question 13

(a) **(i)** There was a range of unacceptable answers here that included

- 'bouncing' off
- reflecting off a satellite, the ozone layer or clouds
- incorrect reference to refraction.

Most candidates failed to gain this mark. Some very good candidates gave TIR as the answer.

(ii) Often this mark was gained even when the answer given in (i) was incorrect (although the spelling of 'ionosphere' was often poor). Lithosphere or ozone layer were often the wrong responses to this part.

(b) Most candidates comfortably gained two marks in the final question. Some multiplied incorrectly and answered 30 000 000 to gain one mark while others divided by 0.1 and scored zero.

B622/01 Foundation Tier

General Comments

Generally candidates performed well on this paper. Few questions were not attempted, the exception being question 13 where the majority of candidates demonstrated little understanding.

Areas of the specification that were clearly understood included:
- Predators and prey.
- Ideas about endangered and extinct animals.
- The uses of different paints.
- Objects in Space.

Areas of the specification that were clearly not understood included:
- Speciation.
- Sulfur dioxide pollution.
- Ideas about nuclear radiation.

Comments on Individual Questions

SECTION A – MODULE B2

Question 1

(a) The majority of candidates could identify at least one example of variation. However, when asked to describe differences candidates should be encouraged to use more than one word. For example an answer of 'males' should be extended to 'There are males and females'.

(b) The majority of candidates understood that lions were predators.

(c) The candidates that did badly in this section tended to write just one word, e.g. teeth or claws. They should be encouraged to show that they understand that the teeth need to be sharp in order to kill their prey.

Question 2

Most candidates gained at least one mark for the correct answer of water in the second sentence. A large number could not name a type of food made, common errors included chlorophyll or minerals.

Question 3

(a) Candidates performed well on this question with the majority scoring at least one mark.

(b) The majority of candidates could clearly explain the difference between endangered and extinct. Those that lost marks gave vague answers such as 'they are dead' and 'they are dying'. Some candidates believe that endangered means they are dangerous.

(c) Most candidates correctly realised that an increase in population would lead to more hunting.

Question 4

(a) Candidates performed well on this section with the majority making some reference to light.

(b) Few candidates were able to successfully carry out the calculation in part (i) and only the more able understood that the pale moths were better camouflaged. A common error in part (ii) was to think that the pale moths stood out so more could be counted. In part (iii) the majority of candidates incorrectly thought the characteristics of the two moths could simply be compared. Very few realised they needed to breed the moths or compare DNA.

SECTION B – MODULE C2

Question 5

(a) Few candidates could recall the chemical name for limestone and marble. Using the Periodic Table resulted in a number of candidates giving calcium cobalt as their answer.

(b) The majority of candidates correctly answered this section.

(c) It tended to be the more able candidates that identified the gas as carbon dioxide in part (i) and only the minority understood that thermal decomposition involved breaking down a substance using heat.

(d) Those candidates that got this question wrong normally gave granite as their answer.

Question 6

(a) Very few candidates identified the missing gas as nitrogen; the majority thought it was carbon dioxide.

(b) Only the minority of candidates understood how sulfur dioxide causes air pollution. The majority of candidates confused acid rain with global warming or ozone depletion.

(c) Candidates could not recall the name catalytic converter.

Question 7

(a) Most candidates knew that paint is used for decoration or protection.

(b) Those candidates that got this wrong tended to give binding medium as their answer.

(c) The majority of candidates were able to give a correct example of the use of thermochromic pigments.

Question 8

(a) Candidates made mistakes in this question because they did not use all the space available to them. They need to be encouraged to write in the space provided when writing out long word equations.

(b) Most candidates successfully identified the mass in part (i) but they struggled to determine how long the reaction took to finish in part (ii), 175 seconds being the most common error.

(c) Very few candidates realised the reaction had finished because all the acid had been used up. There was clear evidence that they did not read the information telling them that there was some calcium carbonate left.

(d) Many candidates incorrectly thought smaller pieces meant fewer particles. Only the minority of candidates referred to surface area or the number of collisions.

Question 9

Candidates were more successful at identifying a formula with three oxygen atoms than they were are at identifying one with six atoms.

SECTION C – MODULE P2

Question 10

The majority of candidates showed a clear understanding of objects found in space.

Question 11

(a) Candidates could identify fossil fuels burnt in power stations but struggled to understand what 'renewable' fuels were. Many candidates chose oil or nuclear as a renewable fuel.

(b) Very few candidates understood the role of a transformer. The common mistake in part (ii) was to think an electrical device was a consumer. Those that got part (iii) incorrect tended to do so because they just said 'pylons' instead of referring to the power lines or wires.

Question 12

(a) Candidates should be discouraged from writing one word answers; vague comments such as weather, could not score marks. Instead they should be encouraged to say that 'satellites are used to look at the weather'.

(b) Most candidates scored at least two marks in this section. Many forgot about either water or oxygen.

Question 13

(a) Very few candidates could recall a use for the three different types of radiation. Some candidates mixed them up or simply answered mobile phones. A large number just missed out the question completely.

(b) There were a large number of alternatives for this question yet very candidates knew a source of background radiation.

(c) Very few candidates could answer this question with a large number just leaving it blank.

B622/02 Higher Tier

General Comments

The paper produced the full range of marks and the mean mark was 33.3. The paper gave candidates the opportunity to show what they know, understand and can do and there was real stretch and challenge at grades A and A*. The standard deviation was 10.1 underlining a wide distribution of marks. Assistant examiners and team leaders felt the level of difficulty of the paper was appropriate. Most candidates could access the paper with very few questions omitted. There was no evidence of lack of time.

The paper differentiated well with 23 marks being required for grade C, 39 for grade A and 47 for A*. Centres' entry patterns are for the most part accurate with only a few hundred candidates scoring less than 15 marks.

Comments on Individual Questions

SECTION A - MODULE B2

Question 1
The vast majority of candidates scored 1 mark in part (a) for stating that there would be less light below the trees. A small number of candidates made reference to competition for nutrients or water.

In part (b)(i) about three quarters of candidates could correctly perform the calculation to estimate the number of pale peppered moths.

Part (b)(ii) was well answered. Most candidates referred to camouflage or lighter coloured trees.

Part (c) tended to score 2 marks or 0. The question discriminated well at the higher grades with the mark scheme requiring the idea that if the moths breed together (1), they will produce fertile offspring (1). The most common wrong answers related to the observation of physical characteristics and/or behaviour to show that the moths belong to the same species.

Question 2

Most candidates scored the mark for feathers in part (a)(i), although many mentioned wings as well. The most common wrong answer was wings alone.

In part (a)(ii) most candidates again scored the mark for scales, although lack of a beak was also frequently mentioned.

In part (b) candidates tended to score 3, 1 or 0 marks. Those scoring 1 mark usually wrote a general answer that did not specifically refer to feathers. The number of very good quality responses that scored 3 marks was pleasing.

Question 3

The majority of candidates scored 1 mark, in part (a), for long roots to absorb more water. Many wrote about spines for protection from predators, which is not specifically a desert adaptation, and so failed to score the second mark. Other acceptable responses were 'rounded shape to reduce water loss' and 'small surface area to reduce transpiration'. The majority of candidates scored at least 1 mark on this question.

In part (b) the equation for photosynthesis was well known and most candidates scored 3 marks. The majority of candidates scored the mark in part (c), correctly stating glucose although starch, oil or cellulose were also commonly seen. The most common incorrect answers were chlorophyll, water and sand.

Question 4

In part (a) only a handful of candidates scored the mark. Most wrote about the population increasing rapidly or out of control. The mark scheme required the idea of 'increasing at an ever increasing rate' or 'the gradient of the curve is getting steeper'. The best answers sketched an exponential curve.

In part (b) many candidates scored 1 mark for the idea of using renewable energy sources or a named renewable source (wind, tidal, solar etc), but only the best candidates scored the second mark for mentioning that finite resources won't be used up or pollution won't be caused. Weaker candidates wrote about what sustainability means or about quotas/limits on how much energy people should be allowed to use.

SECTION B – MODULE C2

Question 5

Unlike previous years, the meaning of thermal decomposition was generally well known in part (a). Common misconceptions included melting, dissolving, release of a gas and simply causing a reaction.

Most candidates correctly selected clay in part (b). The most common incorrect response was granite.

In part (c) it was pleasing that fewer candidates made basic errors with chemical formulae this year (e.g. $CaCo_3$, CO2, CO^2 etc) and many candidates scored this mark. The most common errors were '$CaCO_3$ + heat' or incorrect balancing.

Many candidates correctly stated metamorphic in part (d)(i), with incorrect responses including igneous and hard.

More candidates knew that limestone is a sedimentary rock in part (d)(ii).

Question 6

In part (a) many candidates correctly stated the percentage of oxygen in the air as 20 or 21%. 22% was a common error. Candidates who did not know the answer appeared to try to work it out from the pie chart, with varying degrees of success.

More able candidates knew that sulfur dioxide is produced by burning fossil fuels in part (b), although weaker candidates simply wrote ‘from factories’, ‘from cars’ or ‘from burning sulfur’ and failed to score.

Carbon dioxide was well known in part (c). Common misconceptions were oxygen and nitrogen.

Question 7

In part (a) many candidates correctly described that emulsion paints dry due to evaporation of the solvent/water. Some gave stock answers referring to oil paints suggesting perhaps that either water based paints had not been covered or that candidates had not read the question.

In part (b) three quarters of candidates correctly gave a use of thermochromic pigments – usually warning on cups/mugs or kettles.

In part (c) only the most able candidates scored 2 marks. Those that scored 1 mark usually correctly identified that ‘solid particles are mixed with particles of a liquid but are not dissolved’ but failed to recognise that ‘the solid particles will not separate out because they are very small and do not sink to the bottom’.

Question 8

In part (a), despite the large space to write this word equation, most candidates still tried (and failed!) to fit it on the line. However, the majority scored the mark. A very common error was writing carbon dioxide over the arrow.

In part (b) the majority of candidates correctly identified how long it took for the reaction to finish (usually 180 or 200s), although 175 was a common error.

In parts (c) and (d), despite the fact that questions of this type appear every year, many candidates remain confused or unclear about collision theory. Parts (c) & (d) differentiated well with only the best candidates gaining 3 or 4 marks.

In part (c) many knew that smaller pieces have a larger surface area, but then failed to gain the second mark because they simply referred to ‘more collisions’ or ‘more successful collisions’ rather than collision frequency. ‘Faster collisions’ also remains a common misconception.

In part (d) many candidates simply picked up the catch mark for ‘more collisions’ as the idea of more crowded particles was not at all well known. Many candidates still think that increasing the concentration gives the particles more energy.

Question 9

In part (a), oxidation was well known. The most common incorrect answer was decomposition.

Part (b) was generally well answered, with many candidates correctly describing the protective layer of aluminium oxide. Weaker candidates often stated that ‘aluminium does not react with water or oxygen because there is no iron in aluminium’.

SECTION C - MODULE P2

Question 10

Despite the fact that this entire question was targeted at grades C & D, it was badly answered by the vast majority of candidates. Only a tiny percentage of the very best candidates scored well and the omit rate was very high. A quarter of all candidates failed to score any marks on the whole question.

There were a range of incorrect answers for the uses of alpha, beta and gamma radiation in parts (a)(i), (ii) and (iii) ranging from X-rays to cooking, sun beds, microwaves and mobile phones.

The source of background radiation in part (b) was probably marginally more well known, although the Sun was a frequent misconception.

In part (c)(i) many candidates stated that plutonium is produced when uranium is burnt in nuclear power stations and in part (c)(ii) there were many vague references to 'bombs'/'weapons' or 'for energy' which failed to score.

Question 11

Part (a) discriminated well. Many candidates scored one mark for describing how radiation from the Sun enters the conservatory and more able candidates could describe how radiation was absorbed and emitted from surfaces. Few mentioned that the glass reflected infrared. Some candidates confused their explanation with that of a solar cell, describing electrons being knocked off silicon.

In part (b) most candidates scored 1 mark, usually for correctly stating one advantage and one disadvantage. Many mentioned cost and so failed to score.

Question 12

Part (a) was well answered correctly by over 90% of candidates. Almost all scored both marks.

Part (b) differentiated well with only the best candidates correctly calculating the energy wasted as 600 000J. A proportion scored 1 mark, usually for working out the useful electrical output of 350 000J.

Only more able candidates scored both marks in part (c). Weaker candidates wrote in general terms about energy losses, electricity travelling faster and about step up transformers.

Question 13

In part (a)(i) most candidates correctly selected 'between Mars and Jupiter'. The most common incorrect answer seemed to be 'between Earth and Venus'.

In part (a)(ii) the vast majority were aware of craters as evidence for asteroids having hit the Earth.

Ice was generally well known in part (b)(i), although usually seen in association with rock and dust.

Incorrect answers in part (b)(ii) either did not mention the increase in gravity or wrote about the heat from the Sun giving the comet more energy.

B625 Report on Gateway Science Skills Assessment

A General Comments

Although this is for some teachers and moderators the third year of this form of skills assessment, some centres are still making the mistakes common in the first two years. It is pleasing to report that there are many candidates who now produce good considerations of the topic in their Science in the News report, looking for and against and then using their research to come to a considered decision. Unfortunately there are still centres that seem to regard this aspect of the specification as irrelevant, consequently not preparing candidates with the necessary skills. Science in the News reports are then produced which do not embrace the importance of candidates researching arguments for and against. The reports are sometimes merely essays on the topic with scant regard for matching the Qualities.
For Science skills assessment, there are two components Can-Do tasks and Science in the News.

A total of 104087 candidates entered either for Science B625 or separate Biology (B635), Chemistry (B645) and Physics (B655).
The table summarises the number of candidates in each specification.

Specification	Subject	Number of candidates
B625	Science	81244
B635	Biology	9336
B645	Chemistry	6914
B655	Physics	6593

It is pleasing to report that there is an increase in the number of candidates doing separate Sciences.
It is possible that candidates use the same piece of Science in the News for more than one specification. However, each specification is moderated separately so if the same piece of work is used it must be photocopied each time it is used. Marks cannot be just transferred from one specification to another. Some centres continue to ignore this important point. Failure to do this makes the Moderator's job more difficult.
Centres are reminded that if a piece of work is resubmitted in a following year, the Science in the News report cannot be added too, but new Can-Do tasks can be attempted. If the Science in the News report is not considered to represent the true standard of the candidate a new and different Science in the News task should be attempted.

B Administration matters

General

Teachers are required to supply, for each of the candidates chosen in the sample, a breakdown of the marks awarded for the Can-Do tasks together with the marks awarded for each of the six Qualities in the Science in the News Task which had been chosen for assessment. Despite the column on the form, dates for the Can-Do tasks are not essential. There were still some arithmetical errors in Can-Do tasks. If moderators find any mistakes in the sample, the centre will be asked to check the arithmetic of the whole sample. Centres must use the Can-Do tasks listed in the specification and on the Skills Assessment Record. They cannot devise their own. For a separate science, e.g. Chemistry, all the Can-Do tasks must be from the Chemistry list.

Selecting tasks for Science in the News

One of the strengths of Gateway Skills Assessment is that all of the materials which are required for each of the Science in the News tasks are provided by OCR and are available on the secure Interchange website. Some centres have not realised that new tasks have been added each year. Some centres still use unapproved and unsuitable tasks. If they do not fully match the requirements of a task, candidate marks will suffer. If a centre has a good idea for a task, it must be approved by OCR in advance of its use (see Science Support Booklet p27).
A task set for P1, for example, cannot be used for Biology and a task from P5 or P6 cannot be used for Science. Centres still disregard this instruction. Although the task about mobile phones in P5 may seem suitable for P1 because mobile phones are mentioned in P1d, candidates will not have covered the additional theory in P5.

There were some problems where centres were attempting to double enter from Entry Level but this was less significant this year.

Supervision of Skills Assessment

One of the strengths of Gateway Skills Assessment is that the assessed work is under the direct control of the teacher.
All Science in the News reports are to be written under controlled conditions where the teacher can sign the Centre Authentication Form (CSS160) with confidence.
The teacher should give the candidates the OCR stimulus material for a task after the topic has been studied so that they are fully equipped with background knowledge. The teacher must not give any opinion on the question for the task. However, they may read through the stimulus material and explain any scientific words.

OCR provides a writing frame which should only be used with lower-attaining candidates. Centres are allowed to use their own writing frames providing they are generic i.e. not specific to the task and is applicable for all tasks. There are still a few centres trying to use non-generic writing frames which provided too much help to candidates.

There is considerable evidence that candidates do their best when they are given independence to study the topic and look at both sides of the argument. It is common, in some centres, for candidates to be provided with a list of suitable sources. Even if they are fully referenced this does not automatically give the candidates 4 marks for Quality A. Sources must be used and not just quoted. It is not unusual to see 10 or more sources listed. This is totally unnecessary as no candidate can use all of these adequately in the report. Telling them which are for and which are against the argument is giving too much help.

Research time

Each Topic requires the candidates to undertake some research for themselves in a period of approximately one week. This research could be carried out in school, either in the laboratory or a computer facility or it could be done at home. It is emphasised that the candidates do not need to be supervised during this preliminary research and they do not necessarily need to work on their own. If the preliminary research is done in school, teachers can provide a range of materials from which the candidates can select to get started with their task. However, it was felt that in some centres the candidates had been provided with a complete list of source material for use thus removing the necessary element of choice and selection on the part of the candidate for relevant aspects. The best reports came where students had the freedom to investigate the question set selecting their own sources.
Where there are a large number of candidates in the sample it is reasonable to expect

- a range of source materials used
- different processing to be done in Quality B, for example, not all candidates having the same bar chart
- candidates answering the question in different ways.

Supervised session

The Science in the News report is written up under controlled conditions following the completion of the preliminary research. A time of 1 hour is suggested but the centre may extend or reduce the time if required. If more than one lesson is needed, the work must be collected in from the candidates at the end of the first lesson and stored securely until the second session. During the supervised session, candidates are required to work independently.

A limit of 400-800 words is also suggested in the specification.

Candidates can bring into the supervised session charts/graphs that they have completed as well as a completed bibliography, thus reducing wasted time during the session. They may not bring in word processed or hand written reports.

Some candidates are using word processors to produce their reports.
Centres are reminded this is acceptable providing the centre can ensure:

- that no complete or largely complete report is brought into the supervised session in any electronic format
- no completed report is taken out or e-mailed to another person
- the candidate cannot access websites electronically either from storage devices or the Internet. The Internet should not be accessible during the writing up session.

If these conditions cannot be guaranteed, it is not possible for the teacher to sign the Centre Authentication Form, and hand-written reports should be submitted.

It was an increasing trend, this year, to see word processed reports where almost the whole report had been pasted in electronically from websites without any acknowledgement as if it was the writing of the candidate. Awarding Quality F marks is impossible.

Under no circumstances should any Science in the News tasks be drafted, marked and subsequently redrafted. What is produced at the end of the supervised writing session has to be submitted. If there are deficiencies, candidates should be told how to improve next time and given another task to do. There was still clear evidence that drafting and redrafting, or teachers advising candidates to make additions, went on in a small minority of Centres. This is totally unacceptable.
Evidence of drafting and redrafting of candidates' reports or too much coaching will lead to the work not being accepted for moderation and being reported to the Malpractices committee.

C Can-Do Tasks

Can-Do tasks are an important part of the Gateway Science specification. They are motivational for students at all attainment levels. These tasks ensure that practical Science is an important aspect of teaching for this specification. Some of the tasks can also ensure that ICT is used appropriately.

They are not expected to differentiate candidates at Grade C and above.

The tasks can be used throughout KS3 and KS4 and candidates at an earlier stage will clearly benefit from having their positive achievements rewarded. All the teacher needs to do is to record the tasks each candidate achieves. For a task to be credited it must be carried out as individual work. Groups of candidates cannot work collectively to complete a task. All aspects of a task must be completed before credit is given and it is not possible to award 1 or 2 marks for a 3 mark task.

Centres are not expected to provide any evidence for the moderator to support the awarding of marks for Can-Do tasks.

It is pleasing to see that candidates are taking these seriously and centres are reporting the benefits of motivation of candidates at all levels but especially with lower-attaining candidates.

D Science in the News

Approach

Since Can-Do tasks will not differentiate at Grade C and above, it is essential that the necessary differentiation between the levels of attainment of candidates is obtained using Science in the News.

From September 2008 there were some slight changes to the mark descriptors. The use of these new mark descriptors caused no problems this year.
The mark descriptors must be applied hierarchically. They can only be awarded when the whole statement is fully matched. There are still some centres trying to use a ‘best-fit’ principle.

It has always been OCR policy to encourage teachers to annotate coursework. As candidates may attempt several Science in the News tasks, this represents a burden on teachers when, in reality, very little of the work will be seen by a moderator. It is recommended that the emphasis should be given to reporting back to students on their early tasks so they can improve for the final one. When the sample is requested by the moderator, a little time should be spent annotating the maximum 20 reports that have to be sent. In particular annotation should concentrate on why intermediate marks (i.e. 1, 3 and 5) have been awarded. The aim of annotation is to provide evidence that the moderator is able to accept in support of the marks awarded by the centre.

It is important that internal standardisation is carried out and the moderator informed of the way in which it has been done. Several centres had clearly not internally standardised the marks and consequently the rank order was not valid. In such cases the sample had to be returned to the centre. This is not desirable for the teachers at centres, for moderators or for OCR, if work has to be returned at the beginning of June to be re-marked. It is possible that the marks of a centre could be reduced if one or two teachers have over-marked and internal standardisation has not taken place.

Quality A (Approach to the Task)

Candidates who do not undertake any research of their own cannot be awarded a mark in Quality A since the use of the OCR source material does not count for research purposes. However, candidates who do not do any research for themselves are able to gain marks in the other five Qualities.
For 2 marks candidates only need to use one source - from a book, newspaper, Internet etc. The source does not have to be referenced.

For 4 marks, however a candidate must use more than one source. Two sources are sufficient and it helps later in their report if one source is for and one source is against the question posed. It is essential that each of the sources is fully referenced so that it can be checked. It is also essential that the source is clearly identified where it has been used in the report.
Without detailed referencing it is very difficult to support a match to 4 marks. A long list of sources, even if fully referenced, does not mean the award of 4 marks unless they are used.

For an award of 6 marks it has to be clear that the sources have been used correctly to produce a structured and balanced report. The candidate is expected to have looked at both sides of the issue. Centres are reminded that 6 marks is awarded for the quality of the research and how it is used to produce a balanced report, rather than the quantity of research which has been carried out. Again it is important to say that little credit can be given where large amounts from a website have just been pasted in but not used even if the work is fully referenced.

It is recommended that candidates attach their preliminary research to the back of the report which has been produced during the supervised session. This will assist the teacher in marking the report since it will save having to go back to the sources to check the information. This preliminary work does not have to be sent to the moderator.

Quality B (Analysis of the data)

The award of marks for this quality is dependent on the candidates actually processing the information/data which they have collected from their sources or the OCR stimulus material.

For 2 marks the candidate needs to identify a simple trend or pattern e.g. *'….more women get skin cancer than men…*'. It is not sufficient to quote just a fact e.g. *'…7000 women in England get skin cancer…'*. The trends quoted must be correct. Trends can come from the OCR source material or from the candidate's research. There are always ample trends and/or patterns within the OCR stimulus material.

There are still many examples of candidates carrying out processing, even quite advanced processing, without identifying any trend. This cannot be awarded 2 marks as the mark descriptors are hierarchical.

For 4 marks there must be evidence of more than one trend, although which is the main trend may not be obvious, and some processing done by the candidate. Processing could be drawing a graph, pie chart or bar chart from the data, calculating averages or percentages, or extracting and using data from a graph etc. All processing must be correct. A poorly drawn graph with incorrect scales or incorrect average calculations will not gain credit. Teachers are reminded that, for the sort of data obtained, bar charts are often more appropriate than line graphs.

Still few candidates progressed beyond 4 marks. This is not surprising considering the hierarchical nature of the mark descriptors. It is not sufficient just to pick out an apparent anomaly in data. To secure above 4 marks the candidate must do some **further** processing to identify some new information or to identify anomalies. In a few cases it was apparent that a candidate was told to take a particular approach to get 6 marks, however, they did not fully understand what they were trying to do. This is an increasing and unwanted trend where teachers are giving far too much direction to candidates to undertake processing which they don't understand.

The moderator does expect to see different approaches to the same task from different candidates within the centre.

Quality C (Evaluation of the data)

The accuracy, reliability and validity of data are important aspects of Science National Criteria and they are assessed in Science through the Science in the News task. There are still some reports where these are totally ignored and so a mark of zero has to be awarded.

For 2 marks the candidate needs to make some comment about the quality of the sources used or the data within them. This can be a very simple statement.

For 4 marks the candidate must compare the reliability of different sources and explain why one source is likely to be more reliable than another. To award more than 4 marks the candidate's judgement about reliability of sources must be sensible and supported. They must also consider the validity of the sources.

Quality D (Relating Data to the issues)

Again social, economic and environmental aspects of the topic are an important part of Science National Criteria. Some centres did not develop these aspects sufficiently with their candidates during the teaching process.

Not all Science in the News tasks provide the same opportunities for consideration of social, economic and environmental aspects and it is difficult to link all three of them in some tasks. Teachers should remember that the 2, 4 and 6 mark descriptors are loosely linked to performance at F, C and A respectively. So when awarding 2 marks teachers should ask whether the response matches the expectation from an F grade candidate. Similarly, performance at C and A can be the evidence for awarding 4 and 6 marks. It is not necessary to cover all three aspects even at 6 marks providing the approach to these aspects is at a suitably high level.

Often these social, economic and environmental aspects were diffused throughout reports rather than in a separate section. This does not affect the mark awarded but makes it more difficult for both the teacher and the moderator.

Quality E (Justifying a conclusion)

All of the tasks are posed as questions and therefore an answer must be given. Most candidates now are giving an answer and a reason which allows the award of 2 marks.

To award 4 marks the candidate needs to show that they came to their answer using what they have found out. That is why it is essential to refer back to sources although full references are not needed.

For 6 marks a candidate needs to decide which source is more significant in helping them to come to their answer. Few candidates do this.

Quality F (Quality of written communication)

Centres were quite good at assessing this Quality. However, the use of a scribe to write the report for the candidate could limit the mark that can be awarded.
For 2 marks there could be many mistakes but it would still be possible to read the report.
For 4 marks there should start to be the correct use of scientific vocabulary.
For 6 marks there are few errors and a good use of scientific and technical vocabulary.

The assessment should be made of what the candidate has written and so a report which is largely pasted in from websites will not score well.

E Summary Comments

The moderator does everything to support the decisions of centres. Providing the average marking is within plus or minus 4 marks no change is made as the centre is deemed to be 'within tolerance'. Where the marks are outside tolerance and adjustments have to be made, the work is always considered by at least two moderators. To summarise, if a centre is within plus or minus 4 marks no change is made but if the average is, for example 5 marks, 5 marks would have to be deducted.

Moderators are encouraged to provide useful reports for Centres. The moderation was accomplished efficiently and effectively. The team of moderators, team leaders and senior team leaders worked hard and efficiently to complete the process in the limited time available.

The importance of Cluster group meetings, attendance at OCR INSET meetings and meetings arranged in-house, all provided centres with an appropriate awareness and understanding of the new framework. Centres should have copies of the revised Science Support booklet (which is also available on Interchange).

Many Centres continue to use the free OCR Coursework Consultancy service. Each year a Centre can submit good quality photocopies of three marked Science in the News reports to OCR. They will then receive a written report from a senior moderator on the quality of the marking. This means centres can use this as part of their internal moderation and then enter candidates for moderation with some confidence.

F 2009 Grade Thresholds for B625

The distribution of marks for Science in 2009 was very similar to the distribution of marks for 2008 with a small increase in the mean mark.

Grade boundaries for 2009

	Grade threshold							
	Max. mark	A*	**A**	B	**C**	D	E	**F**
Can-Do tasks and SinN	60	55	**51**	46	**42**	37	32	**27**

Grade boundaries for 2008

	Grade threshold							
	Max. mark	A*	**A**	B	**C**	D	E	**F**
Can-Do tasks and SinN	60	53	**49**	44	**40**	35	30	**25**

Grade boundaries for 2007

	Grade threshold							
	Max. mark	A*	**A**	B	**C**	D	E	**F**
Can-Do tasks and SinN	60	55	**50**	45	**40**	35	30	**25**

Marks in bold were determined by consideration of the Grade Descriptions listed in Appendix A of the Science Specification, and also by the quality of the work submitted when compared with the work from last year and with A 219 (21st Century Science Skills Assessment).

Since the same work can be submitted for Science in the News for Science and separate sciences the same boundaries apply for B635, B645 and B655. Approximately 68% of the Biology candidates entered for B635 rather than B636, 57% of the Physics candidates entered for B655 rather than B656 and 55% of the Chemistry candidates entered for B645 rather than B646.A great deal of care was taken to ensure that performance by the two routes was comparable in each case.

The grade thresholds have been decided on the basis of the work that was presented for award in June 2009. The threshold marks will not necessarily be the same in subsequent awards. Some adjustments may be expected as experience with the mark descriptors grows.

Grade Thresholds

General Certificate of Secondary Education
Science B (Specification Code J640)
June 2009 Examination Series

Unit Threshold Marks

Unit		Maximum Mark	A*	A	B	C	D	E	F	G	U
B621/01	Raw	60	-	-	-	31	25	19	13	7	0
	UMS	69	-	-	-	60	50	40	30	20	0
B621/02	Raw	60	46	37	28	19	13	10	-	-	0
	UMS	100	90	80	70	60	50	45	-	-	0
B622/01	Raw	60	-	-	-	35	29	23	17	11	0
	UMS	69	-	-	-	60	50	40	30	20	0
B622/02	Raw	60	47	39	31	23	15	11	-	-	0
	UMS	100	90	80	70	60	50	45	-	-	0
B625/01	Raw	60	55	51	46	42	37	32	27	22	0
	UMS	100	90	80	70	60	50	40	30	20	0

B625 – The grade thresholds have been decided on the basis of the work that was presented for award in June 2009. The threshold marks will not necessarily be the same in subsequent awards.

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
J640	300	270	240	210	180	150	120	90	60	0

The cumulative percentage of candidates awarded each grade was as follows:

	A*	A	B	C	D	E	F	G	U	Total No. of Cands
J640	4.2	15.6	35.4	63.0	79.2	90.0	96.1	98.7	100.0	78945

80042 candidates were entered for aggregation this series

For a description of how UMS marks are calculated see:
http://www.ocr.org.uk/learners/ums_results.html

Statistics are correct at the time of publication.

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