

**Additional Science B**

Gateway Science Suite

General Certificate of Secondary Education **J641**

**Examiners' Reports**

---

**January 2011**

**J641/R/11J**

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

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

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

OCR will not enter into any discussion or correspondence in connection with this report.

© OCR 2011

Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org.uk](mailto:publications@ocr.org.uk)

## CONTENTS

### General Certificate of Secondary Education

### Additional Science B (Gateway) (J641)

#### EXAMINERS' REPORTS

<b>Content</b>	<b>Page</b>
Chief Examiner's Report	1
B623/01 Foundation Tier	2
B623/02 Higher Tier	5
B624/01 Foundation Tier	9
B624/02 Higher Tier	12

## **Chief Examiner's Report**

This session's examination papers followed a similar entry pattern to previous January sessions, with B623 attracting the higher number of entries. Entry numbers for B623 have fallen since last year but interestingly entries for B624 doubled, both at higher and foundation tier.

The papers all produced a good spread of marks and when distributions were plotted they formed bell shaped graphs. The mean marks on the two foundation papers were fairly similar to last January but the two higher tier papers showed a decrease. It may be that a number of candidates have been entered for higher tier when they would have been better served by a foundation tier entry.

The Principal Examiner reports which follow will indicate weaknesses and strengths on particular questions and part questions. It is worth noting the following general comments:

- Increased care was shown by candidates when writing symbol equations. There was less confusion between superscript and subscript numbers and between lower and upper case letters.
- Many of the numerical questions were well answered.
- Some areas of the specification were still poorly understood by candidates. Knowledge was particularly weak in the topics of nanochemistry, longitudinal waves and the nitrogen cycle.

## B623/01 Foundation Tier

### General Comments

The paper discriminated well. A number of candidates scored in excess of 50 marks and only a few candidates scored less than 10 out of over 15000 candidates.

Three questions, in the Biology section were often unanswered.. In question 2(b)(i) some candidates failed to name auxin, in question 3(a) some failed to name the alveoli and in response to question 4(d) some failed to name the aorta.

It was disappointing to see some blatantly incorrect answers to question 5 in the Chemistry section. The candidates obviously did not use any common sense otherwise why conclude that iron is a gas. A moments thought may have yielded a correct response.

It was pleasing to see that there did not appear to be an issue with calculators. The majority of candidates were able to complete the calculation Question13(a)(i) successfully.

Candidates in general found the paper accessible. Most attempted all questions; there were few blank responses. Answers were usually well expressed, legible and pertinent. There was, however, a significant amount of poor spelling, particularly of words like auxin and alveoli.

In Physics the concepts of braking distance and thinking distance were poorly understood.

### Comments on Individual Questions

- 1(a) Part (i) was generally well answered but brain/brain cells was a frequent wrong answer. About half of the candidates knew that DNA was the chemical that genetic material is made of for part (ii). Chromosome and protein were common wrong answers.
- 1(b) A number of candidates correctly identified Dolly or sheep as the first cloned mammal. Mouse was the most common wrong answer.
- 1(c) About half of the candidates answered this question correctly.
- 2(a) Most candidates able to score a mark for sun/light. A number of candidates did gain a second mark for gravity or water but many candidates gave food/nutrient as their wrong answer.
- 2(b) In part (i) few candidates were able to identify auxin as a growth hormone. The spelling of this word defeated a number of candidates. Many candidates omitted to answer this question. Part (ii) was reasonably answered.
- 2(c) Few scored 2 marks. Some idea of reproduction was the usual answer. Many candidates gave growth as their response despite it being in the stem of the question.
- 2(d) Many candidates scored one mark for cell wall and some for vacuole. Few scored two marks; a common error being cell membrane.
- 2(e) This question rarely scored even on high scoring papers. Some had the correct idea but poor language meant they did not score. Most thought that genetic engineering was mutation, the concept of transferring genes was totally misunderstood.

- 3(a) Few candidates correctly identified alveoli as the air sacs in the lungs. The spelling of this word caused difficulties to candidates.
- 3(b) About half the candidates managed to gain a mark for this difficult question.
- 3(c) Some candidates scored with the answers 'not specialised' or 'undifferentiated'. The use of stem cells was beyond the understanding of most of the candidates for this paper. Commonly many candidates thought the stem cells acted as a support to the windpipe.
- 4(a) Generally well answered.
- 4(b) Generally well answered.
- 4(c) The calculation was not well done and quite a few candidates did not attempt a response.
- 4(d) Very few candidates correctly named the aorta as the other artery.
- 5 Some candidates answered this reasonably well. However, a large number of candidates did not identify oxygen in part (b), and hydrogen in part (c). Given this is taught to year 7 students, the lack of knowledge is surprising. There were also a lot of guessed answers which included candidates not identifying a metal in part (d) or a gas in part (e). Gold was sometimes described as the orange liquid at room temperature.
- 6(a) A very easy mark. Few failed to score but those who did not score described a property not a use for iron eg 'conducts electricity'.
- 6(b) Very well answered. Candidates who did not score merely stated that copper is a good conductor, omitting the word electricity.
- 6(c) Very well answered.
- 6(d) Well answered. The best way to score two was with a good diagram but many described the structure well.
- 7(a) This question was well answered; a common wrong answer was 6.
- 7(b) Not very well done. Lots of answers identifying element or number of electrons. Numbers of protons and neutrons were also commonly referred to. Few understood what a period is.
- 7(c) Well answered.
- 7(d) Most candidates able to assign the correct charge to an electron but few able to assign a mass to the neutron.
- 8(a) Good to see about half of the candidates scoring a mark here for understanding that alkali metals react with air and water.
- 8(b) Many candidates failed to give a simple response 'potassium is more reactive than lithium'. Candidates confused going down the group in the Periodic Table with the reactivity series. Other candidates repeated the stem of the question.
- 8(c) About a third of the candidates understood that an electron is lost when lithium becomes a positive ion.
- 9(a) Generally well answered. Most scored at least one. A common wrong answer was micrometer in place of tape measure.

- 9(b) Reasonably answered.
- 9(c) Very well answered although a common wrong answer was 'Mercedes'.
- 10 Almost every candidate got this question correct.
- 11 Both parts (a) and (b) were poorly answered. Marks were often lost because of poor English as well as poor Science. A large number of candidates started their answer with 'It is the time...' For both parts, distance was required for a possible mark. In part (a) the concept of a reaction was lost on most candidates as they concentrated on thinking in their response.
- 11(c) Some candidates calculated the stopping distance as 36 but a number left the question blank or carried out some other mathematical operation such as subtraction.
- 12(a) The majority of candidates scored 2 marks for diesel and petrol in part (i). Fuel consumption was poorly understood by candidates but quite a few scored usually by saying 'most km per litre'.
- 12(b) Generally well answered with most scoring from the response battery.
- 13(a) It was very pleasing to see most candidates gaining two marks from the calculation in part (i). 20 000 J was the answer. Part (ii) was not so well answered, with many candidates giving 500J as their incorrect response.
- 13(b) Many candidates correctly responded with the answers gravitational or potential with some very interesting spellings of potential.
- 13(c) Many candidates were able to score one mark for increases or doubles but many gave speed related answers.

## B623/02 Higher Tier

### General Comments

In general the paper was balanced and accessible to all candidates. Candidates performed reasonably well and marks ranging from the low twenties to near maximum were seen.

Very few candidates failed to complete the paper. Answers were appropriate to the questions and there was less evidence than in previous scripts of guessing taking place.

No artistic embellishments were observed indicating that the candidates were 'on task' throughout the session although a higher proportion of no responses were seen than on previous scripts.

Most questions were interpreted correctly. A few candidates ticked more than one box in question 3. Several candidates failed to realise that two reasons were needed for question 4(c)(ii).

Weaker candidates were able to recall knowledge of the terms "phototropism" and "auxin" and understand factors affecting thinking distance and fuel consumption when driving. Stronger candidates were able to describe the cloning process and had an understanding of the structure of metals affects the melting point.

Candidates need to be more aware of making comparisons to avoid losing marks.

### Comments on Individual Questions

#### SECTION A – Module B3

- 1(a) Most knew alveoli; though incorrect spellings were common; "aveoli" was the most frequent misspelling. Common errors were villi and bronchioles. It was surprising the number who left this very first question blank.
- 1(b) Most candidates scored with large surface area and thin walls. Adaptations were well known. Some failed to score because they just stated thin or thin cell wall.
- 1(c) Most able groups tended to score here. The nature of stem cells was generally well known, but a lot think they have a repair function rather than replacement function. Clearly the word 'differentiation' is regularly taught although occasional confusion with "plant stem cells" was observed.
- 2(a) The function of the capillaries was not well known or described in part (i). More able candidates scored for exchange or diffusion, but it was common to lose the mark for stating it was diffusion of blood. Many gave the impression it was the carrying of blood that was most important or that oxygen was carried, but failed to explain the idea of them being sites for exchange. Many gave answers in terms of transportation of blood constituents. In part (ii) only the most able candidates scored full marks. Adaptation was well done, simply reading off the table, but many forgot to use comparative terms in answers. Very few candidate scored two marks for the idea of a small diameter and 'forming a network of capillaries' was seen only rarely.



- 2(b) The calculation of percentage of blood in arteries, in part (i), was done well by more able candidates. A common error was to answer 35%, failing to take into account the 12% mentioned in the question, but not seen in the table. Several variations of aorta were seen in part (ii), but this was generally well done. Many said it was the vena cava. Others attempted some variation of pulmonary artery.
- 3(a) Only a few candidates scored two marks. Some scored for bases; a few with ATGC. Genes, DNA and chromosomes were seen often on the two answer lines. 'Amino acids' was a wrong alternative seen for 'protein'.
- 3(b) A good number of candidates scored 2 or 3 marks for very detailed answers. A few did not make clear that an egg cell was involved so lost a mark. Many discussed DNA and transplanting genes so failed to score. The idea of using a surrogate was given by many instead of the idea of implanting in the womb/uterus, which was rarely seen. Few mentioned electrical stimulation to start cell division. Weak candidates described some form of regular fertilisation or in vitro fertilisation. Many candidates wanted to use sperm and egg cells, some were writing about fertilisation, whilst others seemed to get the concept, but gave only vague descriptions which were not worthy of marks.
- 3(c) Well understood and answered.
- 4(a) Only 50% got this correct. Many simply said in the roots or shoots; the omission of the tips from shoots being the most common error. There were also references to stems and leaves.
- 4(b) Part (i) was quite well answered, usually with 'positive phototropism'. Several candidates made reference to geotropism. Part (ii) was reasonably well answered.
- 4(c) A few more than 50% got part (i) correct. Quite often candidates ignored the herbicide in the question and answered in terms of better plants, more reliability, desired characteristics, and higher yields. In part (ii) most of the scoring answers were for the example of rice/vitamin A. Many failed to see the question in terms of LEDC. Only a few scored for religious beliefs or health issues. Responses regularly revealed prejudices and misconceptions about the countryside and urban areas. Contrasts in terms of economic issues, such as more profit, were also seen quite often. A clear reference to the need for increased food production was not seen much. Reasons against were often written in terms of "they are rich and can grow enough food".

### **SECTION B – Module C3**

- 5(a) A fair number of correct answers. Fluorine was the most frequent wrong answer given.
- 5(b) Often correct.
- 5(c) Rarely correct. Sulfur was a frequent wrong answer.
- 5(d) Rarely correct.
- 6(a) The most common inaccurate response was in terms of high melting point or just malleable. Many high scoring candidates used the term ductile. Other candidates scored for easy to bend or flexible.
- 6(b) In part (i) better candidates scored with free electrons or other alternatives on the m/s, whilst many answered with references to 'electricity' or the gaps between the positive ions letting electricity flow. Only the very best candidates scored two marks in part (ii) for

identifying metallic bonds. Many candidates were not credited for incorrectly stating they were intermolecular forces. Those scoring one mark did so for the need for lots of energy to break the bonds. Again many did not gain the mark for stating it needs a higher temperature.

- 7(a) Most scored, but some added the number of electrons or gave an ambivalent response by mentioning all 3 atomic particles. Others identified the element as carbon.
- 7(b) In the main a well answered question but occasionally the incorrect response “because of two electrons in first energy level” was given.
- 7(c) A significant number of students mix up electrons and neutrons.
- 7(d) Many candidates scored full marks, but some candidates only completed the first box for the electron or gave the relative mass of the neutron as 0.9995.
- 7(e) Many candidates correctly answered this in terms of electrons and protons, but some failed to score with unassigned positive and negative charges or by mentioning neutrons and protons.
- 8(a) Most scored with ‘(one) electron’.
- 8(b) More able candidates scored two marks. Often candidates used F1 for fluorine or failed to identify fluorine as F<sub>2</sub>.
- 8(c) Only the most able candidates scored. Many failed to state either shielding shells or when answering failed to include the idea of outer electrons in the answer. Others wanted fluorine and chlorine to lose electrons!
- 8(d) Many candidates scored two marks. Only a few students showed electron transfer rather than sharing or charges on the atoms.

### SECTION C – Module P3

- 9(a) Most candidates scored 2 marks in part (i). Others often had the working mark and had incorrect number of 0's on answer line. Most candidates scored in part (ii).
- 9(b) GPE and potential were well known by many.
- 9(c) Most scored one mark for increases or doubles. A few candidates quoted  $KE = \frac{1}{2}mv^2$  and that the energy quadrupled. These were not always the high scoring candidates.
- 10(a) Part (i) was an easy two marks for most with drugs and alcohol the most common answers, along with mobile phones. Many also said tiredness. There were many multiple answers on one line. Those who failed to score discussed the speed. A significant number of candidates did not score in part (ii) because they discussed road or weather conditions without stating exactly what they were. The idea of load was often given but candidates failed to score because they did not say increased load.
- 10(b) The calculation was not well understood as being just the area of the triangle. Many gave 192m, by calculating the whole area under the graph and not recognising the importance of ‘braking’ being in bold.
- 11(a) Most scored in this calculation.

- 11(b) Candidates looked for the obvious answer of number of passengers carried being higher so less pollution. Only a few managed to answer this question in terms of less fuel per passenger. Candidates ignored the instruction to use the information in the table or at least they only used passenger numbers and quite often thought the bus was more economical because it did 3km per litre ie it was a smaller number than for the motorbike! Many answers were just general statements that "buses carry more people".
- 11(c) Another two marks that most candidates scored. Many actually stated 'different driving styles' and 'different road conditions'. Only those who did not make clear 'it was extra load' failed to score or those who discussed engine size or different fuels.
- 12 Some candidates scored three marks without writing long accounts and were clearly guided well by the 'use ideas about' instruction or well drilled into mentioning time, acceleration and distance. Candidates failed to explain that the energy was used to change the shape of the metal or the car. Many simply re-stated what was in the stem about energy being absorbed by the crumple zone. Some had distance and time decreasing instead of increasing.
- 13 Better candidates scored for the idea of a larger area. Many understood that drag increases or made reference to aerodynamics, but this was insufficient to gain credit here. Very few managed to understand the idea of forces balancing at a lower speed. Most went for responses to do with increased weight slowing the car down.

## B624/01 Foundation Tier

### General Comments

The paper proved accessible for the majority of candidates and performed in a similar fashion to that of last January.

Few candidates scored above 50 or below 10, showing that schools had targeted pupils correctly for this component.

Despite a ruler being in the list of required equipment on the front of the paper it was disappointing to note that candidates regularly failed to follow the instruction of drawing straight lines in questions 4b and 11. This led to some candidates combining all the lines in the middle and making it difficult for the examiner to decide the correct route for each line.

### Comments on Individual Questions

- 1(a) The majority of candidates correctly identified dead leaves and grass cuttings as the two materials that decay most easily in part (i). In part (ii) approximately half the candidates correctly identified bacteria or fungi as the agents for decomposition; a significant number of candidates gave the answer earthworms or woodlice. Several candidates gave the answer warmth, obviously not reading the question.
- 1(b) Part (i) proved straight forward for the majority of candidates who chose the correct answer "growth boost". In part (ii) approximately half the candidates gave a correct reason for mixing the fertilizer with water and in part (iii) most candidates identified roots or root hairs as the part of the plant where minerals are absorbed.
- 2(a) Examiners were looking for the answer "to grow" in part (i) and about 75% of candidates gave this or a higher correct answer such as making glucose. In part (ii) a similar number of candidates correctly identified the chloroplast as absorbing light.
- 2(b) Most candidates gave leaf as a correct answer although higher correct answers were accepted.
- 2(c) Few candidates answered this part correctly with about 30% offering no response of the remainder about 25% gave the correct answer hydroponics (or a close approximation to the spelling) the majority clearly not having come across the word.
- 2(d) Biological control was not known by the majority of candidates in part (i) but the other two parts of the question were answer correctly by the majority of candidates,
- 3(a) About 30% of candidates managed to answer each part of this question correctly. In part (a) fossil fuel was the most common answer.
- 3(b) In this question it proved quite difficult for candidates to link the information in the question to the answer that eucalyptus leaves contained little energy.
- 3(c) Most candidates scored some marks, usually for water entering through the root. To score further marks they needed to mention xylem and evaporation from the leaves. Quite often the phrase "by transpiration" appeared which did not gain credit as it was part of the question. Osmosis on its own was not enough to score marks and more detail was needed.

- 3(d) In part (d) candidates had to link an adaptation to an explanation. Examiners were looking for 2 of the 3 following adaptations, large surface area to allow sunlight to be absorbed (long was not enough for this mark), thin to allow sunlight to reach all layers or for easy gas exchange, and many veins to allow easy transport.
- 4(a)&(b) These questions were answered well with the majority of candidates scoring full marks.
- 4(c) Approximately half the candidates correctly answered the question but a significant number of candidates thought that steam was involved and others thought that the dry related to the drying process.
- 5(a) The majority of candidates were able to give a correct reason for applying fertilizers to fields. The answer 'to help them grow' was not accepted as it was too vague. Examiners were looking for increased yield or increased speed of growth.
- 5(b) Most candidates knew that the fertilizer was neutral.
- 5(c) Few candidates were able to correctly answer part (c) and did not know the test for sulfate ions.
- 5(d) About 40% of candidates correctly calculated percentage yield, of the remaining many did not attempt the calculation and several put the figures in the expression the wrong way round. Surprisingly only a quarter of candidates were able to correctly calculate relative formula mass.
- 6(a) It was surprising that several candidates did not attempt part (a) and of those who did only a third were able to give a correct industrial use for water. The answer cleaning or washing was not credited unless qualified eg washing surplus dye from cloth.
- 6(b) Lead compounds was the most popular answer.
- 6(c) Most candidates were able to explain why clean water was important in developing countries.
- 7(a) The majority of candidates gave diamond as the correct answer, although several candidates gave lead as an answer.
- 7(b) Few candidates were able to answer correctly.
- 7(c) Few candidates gave the answer strong despite the help given in the use described.
- 8 This question was answered well with the majority of candidates scoring on all three parts.
- 9(a) Approximately half the candidates correctly identified the colours in a mains plug.
- 9(b) Most attempted this question but had difficulty in explaining why the lamp did not light. Common errors were that the lamp was not connected to the battery or that the circuit was not complete.
- 9(c) Surprisingly only half the candidates gave a correct answer as there was a wide range of suitable components that they could use.
- 9(d) Candidates were able to perform this calculation without problem.
- 10(a) Most candidates correctly identified the charges as positive and negative.

- 10(b) Most candidates scored at least one mark but few scored all three. The question has three bullet points and candidates should be advised to address all three points if they wish to score full marks. The most common mark was for charging by friction, several did not identify the material as an insulator or named fabric, and even fewer explained that she got a shock because she was earthed or charge moved through her.
- 10(c) Defibrillator was the most common correct answer.
- 11(a) Most candidates correctly linked the features to their descriptions.
- 11(b) 28000 was the most common answer although there appeared to be several careless mistakes in writing 2800 as an answer whilst marking a different answer in the list.
- 12(a) Candidates correctly identified the nucleus as the part of an atom emitting alpha particles in part (i) but were unable to explain why it could not be used as a tracer in hospitals in part (ii). Examiners were looking for the idea that it could not pass through skin. In part (iii) the majority of candidates thought that the radioactivity died out. Examiners only accepted decreases or gets less as correct answers to this part.
- 12(b) Most candidates knew that alpha sources are used in smoke alarms.
- 13 This question proved difficult for a large proportion of the candidates with 30% making no attempt at one or more parts of the question. Approximately 20% of candidates gave the correct answer fission to part (a) and the same proportion were able to correctly explain background radiation but only 3% of candidates knew that neutrons were absorbed in a reactor to make metals radioactive.

## B624/02 Higher Tier

### General Comments

The entry for this unit has increased significantly in this session and the resulting performance by candidates produced a wide spread of marks. It may have been that a few candidates would have been better served by a delayed or a foundation tier entry. At the other end of the distribution, there were some excellent scripts.

Candidates are making improvements in some areas. Numerical questions were very well answered and more care is being taken over the writing of symbol equations.

The nitrogen cycle still proves to be a difficult topic for most candidates and the nature of the longitudinal wave was also poorly understood. What provided the most difficulties, for nearly all candidates, were some of the new areas of carbon chemistry and the dating of rocks.

### Comments on Individual Questions

- 1(a) This was well answered, with 'little energy' the most common answer.
- 1(b) In part (i) many candidates scored a mark for entry via the roots, followed by the xylem mark next. The term 'osmosis' was used indiscriminately by many candidates without specifically referring to the uptake by the roots. Part (ii) was well answered, with options split evenly between cooling, photosynthesis and minerals.
- 1(c) Many candidates simply referred to the leaves as 'long' but then made up for with a reference to the surface area in their explanation. A number lost marks for simply referring to 'better photosynthesis' which was in the question.
- 2(a) Answers to part (i) were reasonable but quite a number simply said just 'minerals taken in'. In part (ii) a number of candidates lost marks by referring to chloroplasts rather than chlorophyll. There were a number of correct definitions of intensive farming in part (iii) but some simply quoted examples of intensive farming techniques.
- 2(b) Part (i) was well answered, with 'ladybirds might fly away' the most common answer. Part (ii) was also well answered. Most correct answers referred to respiration in part (iii) but many candidates just said that energy is lost along chain. In part (iv), only the better candidates appreciated the idea of bioaccumulation and many confused immunity with resistance.
- 3(a) Part (i) was poorly answered, most candidates simply said that nitrogen was not being used or even was poisonous. Most correct answers referred to amino acids in part (ii).
- 3(b) A surprising number of candidates did not score here.
- 3(c) About half the candidates chose correctly, with a sprinkling of answers including nitrogen-fixing, fungi and detritivores.
- 3(d) Very poorly answered with many linking the increase to the rain rather than the lightning.
- 4(a) Very well answered.

- 4(b) Nearly all answers were correct in part (i). Only a few candidates failed to score in part (ii) by referring to numbers scored or 'all temperatures'.
- 5(a) Reasonably attempted with probably over half of the candidates getting the correct figure.
- 5(b) Very few candidates could describe a titration and if they scored a mark, it was for reactants. A number suggested or described the Haber process.
- 5(c) Well answered.
- 6(a) About half of the candidates could link the boxes in (i) and a similar number could order the processes in (ii).
- 6(b) This was well answered with many references to cholera.
- 6(c) Purification was probably as popular a choice as precipitation here.
- 6(d) Candidates are taking more care with writing symbol equations but many lost the marks by writing  $\text{Na}_2\text{Cl}_2$ .
- 7(a) A number of candidates just wrote marking/rubbing but many correctly referred to weak forces between layers.
- 7(b) There were some impressive descriptions of the bonding resulting in free electrons.
- 7(c) Many candidates left this blank and seemed not to have studied this.
- 7(d) Many just described a catalyst but there were some correct references to the surface area.
- 8(a) Most candidates were able to answer this question correctly.
- 8(b) Very few candidates could explain compressions in ultrasound waves in terms of the movement of the particles in part (i). Again, in part (ii), very few candidates could describe amplitude in longitudinal waves.
- 9(a) Still a number of candidates refer to positive electrons and electrons passing in the wrong direction.
- 9(b) Many candidates could explain that the paint is charged and so attracted to the boat. Fewer could explain the reasons behind the fine spray and even fewer could explain how the paint is charged.
- 9(c) This was correct in most cases but there were references to some explosions causing a nuisance.
- 10(a)&(b) Both of these numerical questions were very well answered.
- 11(a) The unstable explanation was given by most candidates.
- 11(b) The better candidates referred to the lack of skin penetration whilst others just referred to being dangerous or not being able to penetrate paper.
- 11(c) Only the more able candidates could correctly describe the consequences of the release of an alpha particle.



*Examiners' Reports – January 2011*

11(d) This is obviously one part of the specification that candidates could not recall. There were very few correct answers even from the high scoring candidates.

12(a) Mostly candidates correctly stated fission with a few stating chain reactions.

12(b) A number of candidates wrote neutrons but answers included a whole array of other particles.

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

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

**Oxford Cambridge and RSA Examinations**  
**is a Company Limited by Guarantee**  
**Registered in England**  
**Registered Office; 1 Hills Road, Cambridge, CB1 2EU**  
**Registered Company Number: 3484466**  
**OCR is an exempt Charity**

**OCR (Oxford Cambridge and RSA Examinations)**  
**Head office**  
**Telephone: 01223 552552**  
**Facsimile: 01223 552553**

© OCR 2011

