

Design and Technology: Resistant Materials

General Certificate of Secondary Education **J306**

General Certificate of Secondary Education (Short Course) **J046**

OCR Report to Centres

January 2013

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

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

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A561 Introduction To Designing and Making

Introduction

Entries for this unit were again lower in number than those in the summer which seems to support the suggestion that the majority of centres still prefer to see this qualification as a linear assessment rather than using the modular system to the candidate's advantage. However, from next year this option will no longer be available to centres and all assessment for this unit will now be completed at the end of the course.

In this cohort of entry the majority of centres again showed a clear understanding of the regulations relating to "controlled assessment" however there still remains evidence that some of the work presented for moderation did not comply with the levels of control stated for this unit of work in the specification. In particular the identification of the problem from the themes in the specification still remains a very confusing aspect in some candidates work, especially as it is a stated high level control requirement.

Further to this, some centres are also completing work that can only be described as "Teacher led" and our advice has always been that the use of writing frames, which creates a very formulaic approach to the work, should be limited in their use. They can be seen to be very helpful for SEN and EAL candidates, but they need to be used with caution for high achievers as 'filling in boxes' can limit their thinking and creativity."

It is suggested that some centres may wish to revise their internal procedures for teaching this unit in relation to the control methods that should be employed when completing project work in this specification.

Administration

Centres again used the full range of options available in this specification to produce candidates work, and portfolios were presented for moderation as "traditional" paper folders, e- portfolios or through the repository where the use of "PowerPoint" presentations were seen as being the most popular method employed by the candidates.

Where there were difficulties in administration they were focused upon the fact that some centres did not supply individual Controlled Assessment Cover Sheets for every candidate or a CSF form with the sample of work that had been requested. It is worth noting that in order to complete the moderation process moderators require this information both to check on the standard of marking and to provide the feedback required to centres on how their candidates performed.

Centres are reminded that there is a full range of documentation, including downloadable forms and other subject specific support materials on OCR's website: www.ocr.org.uk.

Performance of Candidates

There was a wide variety of responses seen during this moderation period which provided a range of marks across the whole of the assessment criteria. The more successful candidates work tended to reflect the mark allocations given for the four headings in the controlled assessment marking *criteria* for A561. Centres are therefore advised to use these mark allocations in guidance that they may give to candidates as to the amount of time that they should spend on each of the Creativity, Designing, Making and Evaluation elements of this unit.

Disappointingly, even though we have highlighted them before, some of the more common issues which affected candidate's achievement included –

- A “range” of existing products being shown in the creativity section of the portfolio without the candidates concluding what trends or design features they had identified from their analysis. Presenting examples of these products with just a basic description taken in many cases from a commercial catalogue is not what is required in this assessment strand.
- Candidate's not editing research information and providing summary conclusions as to what they had learned from producing these materials.
- Limited evidence of modelling techniques being employed to support the development of the design ideas.
- The lack of a written commentary to support the marks awarded on how they overcame technical problems in the making.
- Limited photographic evidence in the record of the key stages in making the prototype.
- The evaluation being focused upon the product rather than the process of designing the prototype.

Creativity

In starting this assessment strand, candidates are required to select a theme taken from those provided by OCR in the specification for this subject, which is a “high level” part of the control guidance given for the unit. In a number of cases this requirement has been ignored by some centres where all the candidates have been expected to work from the same brief which has caused issues in the moderation process.

Once the theme has been selected, the candidate will then need to identify a specific product or starting point that is associated with the theme to complete a product analysis. For example, if the chosen theme is ‘Travel’ a candidate may decide to design and model a prototype hand held game which can be used ‘on the move’.

The use of the word “creativity” as an assessment heading has possibly caused some confusion in centres. It is intended that the word creativity, as used in this assessment strand, should be related to how the candidate shows this ability through the work they present in identifying trends or design features from their research work. It therefore should be specific to the selected theme and focused upon conclusions that will support the candidate in developing their design ideas. It should not be seen as a process to be completed solely to address the requirements of the mark scheme.

In this way candidates should identify any design features (trends) or technical knowledge gained from analysing a range of similar or existing products. They should be able to provide conclusions as to what they have learned from this information and how it will help develop their design thinking.

In the final part of this assessment strand the candidates will then be expected to use this information to write a design brief which will improve, modify or develop the product studied.

Successful candidates clearly showed how they had selected their own problem area from the list of controlled assessment themes stated in the specification. They carried out a thorough analysis of one existing product and then by editing information from other similar research they were able to identify what were good design features and explained the significance of any trends in these existing products. By using notes, sketches and photographs they were also able to give examples of intended users and their likely needs when using the product. From this, candidates were then able to analyse the information that they had gathered before using this to generate a concise design brief that clearly identified the product and users.

Designing

Candidates should start this assessment by analysing their design brief and the conclusions that they made from their previous research before producing a detailed specification for their own prototype product. A good design specification should provide the candidates with an essential checklist that will support them when developing the product required in this unit of work.

For this cohort of entry the design specifications produced by candidates varied in content and detail, with some candidates producing simple lists that were so generic and prescribed they could well have applied to any design product.

Most of the candidates used freehand sketching to illustrate their initial design ideas with basic annotation, which in some cases provided little in terms of detail or explanation. The use of CAM in the making element was not always supported by evidence of CAD being used in this assessment as part of the developing and modelling process.

Modelling was then used by a number of candidates to develop their design ideas but this was, in many cases, felt to be limited and just completed because it was a necessary requirement of the unit assessment. It is essential that candidates include evidence of modelling work to show how the product has developed from their earlier designs and to make informed decisions about materials and construction techniques in order to gain full credit for their work.

Centres are reminded that modelling is a necessary requirement of this unit and it is essential that candidates include evidence of modelling work in order to gain full credit for their design work in this assessment strand. Please refer to specification content 3.1 (page 9) which states –

- “They develop their design and use modelling before making and testing their prototype”
- “Use appropriate modelling techniques to aid product development.”

Most candidates identified a chosen idea but few fully justified their final choice or provided sufficient detail of the product that they wished to make.

Successful candidates having analysed their brief and the conclusions that they had reached from the research were then able to produce a clearly structured design specification which related to the product that they intended to design. Design ideas were presented using a range of graphic techniques, including the use of CAD, which were supported by detailed annotation. Modelling helped them to develop the final solution where they were then able to give details of sizes, possible materials, likely construction methods and processes. Reference to the specifications then helped them to give reasons for the choice of the prototype product that they intended to make.

Making

The majority of the candidates were able to complete a product within the allocated time for this unit; however, in some cases moderator’s have questioned the time that would be required to make the final design and if it was truly a “prototype” as stated in the specification. Centres are therefore reminded of the time limits suggested for this unit of work and although the practical work has become more “realistic” since the introduction of this specification some of the work presented for moderation is still felt to reflect the requirements of the previous “legacy” specification.

In this moderation period there was also evidence in many portfolios that candidates had attempted to plan the stages of making their product before starting to make the prototype, although the quality of this work varied between centres. The assessment of this work should be taken into account when deciding upon the overall mark to award for the making process as candidates cannot be awarded the highest marks if this work is not evident in the portfolio. The work presented to record the key stages of making was in many cases limited and was usually just a few written notes. Photographic evidence is also required to support this process and where this was evident and detailed many of the candidates were able to achieve full marks for this assessment.

Although not as evident in the work this series some centres are still awarding marks for how the candidates overcame any technical difficulties without there being any formal evidence recorded by the candidate. Again this resulted in a number of adjustments having to be recommended during the moderation process

Unfortunately, we again had a number of issues related to the standard of photographs supplied by centres showing the quality of the prototype products produced by the candidates. It must be remembered that it is the centres responsibility to ensure that at least two clear, reasonably sized photographs of the end prototype are contained in the candidate's portfolios if they wish to do justice to the candidates work.

Successful candidates made appropriate choices of materials, tools and equipment and worked skilfully and safely to produce a high quality prototype product suitable for the intended user. They showed evidence of having used a variety of making processes in producing the product and where CAM had been used as one of these techniques they provided supporting evidence in the form of screen shots which indicated understanding and ownership of the manufacturing system. Planning the stages of manufacture had clearly been produced before they started the practical work and they were then able to demonstrate their ability to solve any technical problems in the record they made of the key stages in creating the prototype through comprehensive notes and visual evidence.

Evaluation

It is still disappointing to note the number of candidates who based their evaluation on the prototype product and how it functioned, which resulted in the modifications proposed by candidates being focused upon improvements to the completed product and not the process of designing.

Centres are therefore again reminded that the specification for Unit A561 clearly states the evaluation should be of the complete designing and making process and not how well the final product functions. Furthermore that any modifications proposed by the candidate should be of ways to improve the designing and making process that the candidate has produced in completing this unit of work only.

It is worth noting that with the amount of marks available for the evaluation process it may have a significant affect on the candidate's achievement if an adjustment is recommended by the moderator due to a lack of understanding from the centre.

Successful candidates critically evaluated the processes involved in designing and making the prototype in this unit of work as opposed to the product itself (as in unit A563). With reference to their initial planning and the record they produced of the stages in making their prototype product, they were then able to reflect and suggest modifications to improve the design, modelling and prototyping processes using specialist terms with a clear emphasis on the correct use of spelling, punctuation and grammar.

A562 Sustainable design

It is pleasing to note that many candidates appeared to have been well prepared for the examination by centres and that they had a sufficient knowledge base to answer the questions. It is greatly encouraging to note that a few candidates have been able to achieve full marks.

In Section A of the paper (Questions 1-15) most candidates attempted to answer all questions, with few candidates giving no response (NR) answers. It is still noticeable, however, that at times candidates had not read the instructions correctly and centres would benefit from explaining the correct examination requirements to the candidates. The identification of the correct option is often casually crossed out, duplicated, scribbled or generally unreadable. Candidates must ensure that they read the question carefully, consider the options and give themselves enough time to think through the suitability of each one. Determining the correct answer to a multiple-choice question may require much more time than it takes to just circle a letter. Able candidates, keen to get on to what they see as the more challenging longer questions often lose accessible marks on this early part of the paper through carelessness.

Scribbling, crossing out, and multiple over-writing indicate that many candidates are too ready to choose any option before giving careful consideration to all of them.

Centres are reminded that questions 1-15 cover the grade range from A* to U.

Important: Centres need to be aware that where a candidate has provided multiple answers to a single response question, no marks will be awarded.

Section B of the paper showed a greater mixture of responses and teachers need to ensure they read previous examination reports for further detailed feedback on specific issues and individual question performance.

Important: Candidates need to be careful that they do not repeat the question in their answer or write the same answer for several questions. Similarly, candidates should not use certain terms as obvious 'stock' answers without clear qualification; such answers include:

- 'Environmentally friendly' and 'better for the environment' or 'damages the environment';
- To 'recycle' and 'recycling is good for the environment';
- 'Cheaper', 'lighter', 'better' and 'stronger'.

The 'banded' question marked with an asterisk (*) (Quality of Written Response) provided candidates with an opportunity to give a detailed written answer combining good subject knowledge with an ability to write a structured response. Many of the responses in this session did not contain sufficient technical information or were unstructured in their format. Too many candidates used bullet points which do not constitute a discussion, or discussed advantages as well as disadvantages but a few candidates managed to obtain full marks. Candidates would benefit from centres preparing them for this type of question technically, structurally and grammatically.

It is also important to note that candidates need to ensure that they write legibly and within the areas set out on the papers.

Important: Candidates need to:

- Read through the complete question before attempting to answer. The examination includes sufficient reading time for candidates to focus on the key points to address in their answers. It was pleasing to see that some candidates produced a ‘plan of action’ before giving their answer to the questions with a high mark allocation.
- Look carefully at the mark allocation and available space for their answers and be aware that there is a relationship between the space available and the length and quality of the expected answer, and thus the mark allocated.
- Have a better understanding of the different command words used throughout the exam paper in order to respond appropriately to the questions. Across the scripts there were many answers that lacked detail and clarity. Terms such as ‘cheaper’, ‘quicker’ and ‘easier’ are often used and mean very little without qualification or justification.
- Become familiar with the Quality of Written Communication question marked with an asterisk*. These questions provide candidates with the opportunity to give detailed written answers combining good subject knowledge with an ability to produce structured, coherent responses and accurate spelling. Simply repeating the same point several times will not lead to the award of marks. A list of bullet points does not represent an adequate answer and will compromise the higher marks. Practice of this type of question which carries six marks is strongly recommended.

Section A

Q1

Virtually all candidates recognised that the appropriate answer is Hydro-electricity.

Q2

A majority of candidates chose the correct ‘making donations of items to a charity shop’ but too many candidates chose an alternative response indicating that primary, secondary and tertiary recycling are still not properly understood. Q3. Almost all candidates were able to pick ‘reduce’ as the correct response.

Q4

A good majority of candidates were able to pick the correct Forest Stewardship Council. Too many, however, picked the made-up ‘Footprint of Sustainability Choices’ which seems to indicate a poor understanding of the work of the various controlling bodies within the sustainable design sphere.

Q5

Encouragingly, the majority of candidates chose the correct ‘half-full paint tins’ with card packaging being the favoured incorrect choice.

Q6-10

The questions were generally poorly answered, only Q6 and Q10 eliciting correct responses from the majority of candidates.

Q6

Many candidates recognised this as the Tidyman or Keep Britain Tidy symbol, although other – equally acceptable – responses were seen. Examiners were anticipating responses that implied the disposal of general rubbish in a responsible way (“throw rubbish in bin” was the most favoured) rather than just “throw away” or “bin it”. “Recycle it” was not an accepted response as the symbol shown is not a recognisable recycling symbol such as the Möbius loop.

Q7

The expected response here was thermochromic (pigments). A small number of candidates correctly responded to this question with many other unacceptable alternatives being proposed; smart materials (typical), variants on thermosetting, thermic or thermometer.

Q8

A significant number of candidates correctly gave the correct answer to this question.

Q9

A significant number of candidates were able to correctly give the answer of ‘ergonomics’ with a popular incorrect answer of ‘interactive’ being given by some candidates.

Q10

The majority were able to answer this question correctly (Reforestation), although ‘deforestation’ was a popular suggestion followed by ‘afforestation’ and ‘replace’.

Q11-15

A substantial majority were able to pick the correct answer in these five questions (True, False, True, False, and True) which was encouraging.

Section B

Q16

This question focused upon flat-packed products with a toy castle serving as the focus.

Q16 (a)

This question asked candidates to ‘Explain’ three environmental benefits of flat-packed products. The term ‘explain’ is fundamental here and some candidates did not recognise its significance. A few candidates did not understand the question, but too many gave simple statements about flat-packed products gaining three marks at most. The word ‘environmental’ does not mean ‘economical’ so discussions relating to cost are not worthy of a mark. Too many vague statements were made like “it can be recycled” or “it’s made of recycled materials”. Does “it” refer to the product or its packaging? Answers such as “less materials used” (there must be the same materials used whether the end product is sold made-up or flat-packed) were also not credited.

Q16 (b)

Candidates are asked to give three benefits of using low volatile organic compound (LVOC) paints. The focus of the question is that LVOC paints (typically water-based) are far less harmful to the user, the environment in which they are used and the environment generally.

The point being that LVOC paints do not contain strong volatile solvents such as white spirit, acetone, toluene or other hydrocarbons. Again, however, vague statements such as ‘environmentally friendly’ are, as usual, not acceptable, and comments such as, “organic, so does not affect the environment” show a poor understanding of LVOC paints as well as simply repeating part of the question. Many candidates, therefore, did not achieve a mark for this question and centres should ensure that their candidates are fully conversant with specialist terms that occur within the Resistant Materials specification.

Q16 (c)*

This question tests candidates’ knowledge as well as their quality of written communication and is highlighted by an asterisk. This type of question has been posed in every question paper since the inception of the Innovator suite but still candidates present their facts as a series of bullet points or in one large paragraph with six or more correct points, but without any expansion upon the points given, neither of which can be deemed to be a discussion. This is reflected in the marks awarded where many candidates gained only two marks (Level 1) due to their answer being in the form of a list. However it was pleasing to note that there were some candidates who were able to present the facts in a structured way using transitional words (“in addition”, “however”, “equally” for example) and who focused upon the question which was to discuss the disadvantages of flat-packed items.

Q17

This question focused upon school furniture, specifically a combined desk/chair.

Q17 (a)

Part A asked candidates to identify groups of people who might find this combination difficult to use. The stem of the question specifically noted that the desk/chair is designed for a school. The majority of candidates took this description on board but there were a few who either misunderstood the question or simply did not read it properly, as they discussed groups of adults or of very young children (babies). Most, however, were able to identify such groups as tall, short, obese and disabled students and were then able to discuss their individual problems and the difficulties that the desk/chair pose.

Q17 (b)

This question required candidates to sketch modifications to the desk/chair that would make it more suitable for all students and to add notes to expand upon their sketched details. Virtually any suitable modification was acceptable but some candidates simply drew a separate desk and chair which the examiners considered to be too great a leap to take from the original concept. It was pleasing to see that very few candidates just drew a sketch or just wrote notes (maximum two marks for either), indicating that this form of question is being recognised more and more by centres. The examiners did not award notes/sketches that strengthened the structure (for obese students), on the assumption that the original design would already cater for all expected weights; making the chair more comfortable was not an accepted modification. Many awardable responses involved hinged or rotating desk tops, adjustable connector(s) between desk and chair, adjustable legs to raise or lower the combination and shaped edges of the desk to allow better access to the seat. Answers relating to left-handed students were also rewarded.

Q17 (c)

This question required candidates to recognise the steps needed to recycle the multi-material combination, essentially involving disassembly, sorting into groups of like materials and a suitable recycling method (three marks). Most candidates gained two marks (disassembly and sorting) but failed to gain the final mark by not specifying a recycling method (melt, shred, mould, etc.); ‘recycle’ was not acceptable as it was already seen in the question.

Q17(d)

This question asked candidates to consider the environmental implications of transporting the completed desk/chair from an overseas manufacturer to the UK. The majority of candidates were able immediately to recognise the problems of transporting large volumes of constructed goods, of which the greatest proportion of the volume is air and where extra protection is required to prevent damage to vulnerable edges. The effect upon the environment due to burning of (fossil) fuels was also pointed out by many candidates as was the emission of CO₂/greenhouse gases.

Q18

The final question focused upon an acrylic CD rack.

Q18 (a)

This question required candidates to complete a table of the 6Rs, where three of the six were given already. Half the candidates gained full marks here and very few gained zero marks (usually due to a lack of any response at all). It was encouraging to see many candidates planning their response by writing all six 'Rs' in the margin and eliminating those given.

Q18 (b)

The three parts to this question required the candidates to define a term by referring to an aspect of the CD rack.

Q18 (b) (i)

This question refers to 'non-biodegradable' and the large majority of candidates defined this well. However, they did not make specific reference to the acrylic structure of the CD rack and its non-biodegradability and lost the second mark in this part.

Q18 (b) (ii)

This question refers to planned obsolescence and again candidates explained the term reasonably well but failed to make reference to the acrylic structure of the rack.

Q18 (b) (iii)

This question refers to 'eco-design' but many candidates did not manage to state a recognisable definition OR refer to the CD rack.

Q18 (c)

This question required candidates to complete the three missing stages in a table showing the 'Life Cycle Analysis'.

Many candidates missed the first (substituting 'design' as a possible alternative) and writing a form of disposal/recycling in the final blank space. Examiners did not penalise candidates for getting the order incorrect and the vast majority of candidates achieved at least one mark.

Q18 (d)

This question required a definition of 'carbon footprint' in relation to LCA. Most candidates recognised that the term 'carbon footprint' is associated with a measurement of 'something' and credit was given for "how much", "the amount of" and similar phrases. Thus, most candidates were credited with at least one mark.

A564 Technical aspects of design and making

General comments

Candidates' knowledge of basic techniques when working with wood, metal and plastic was very weak.

Candidates need to make their sketches large and clear and provide meaningful written notes that **add** to the information given in their sketches.

Often, illegible handwriting and inaccurate spelling meant that answers were extremely difficult to understand.

Questions marked with an asterisk* provide candidates with the opportunity to give detailed written answers combining good subject knowledge with an ability to produce structured, coherent responses. While there were some good individual points expressed in both questions, candidates failed to gain maximum marks.

In addition, candidates should improve their examination technique by reading the questions carefully and responding to the instructions given in the questions.

Comments on specific questions

Section A

Question 1

- (a) Most candidates were able to provide relevant issues that would be included in a specification. However, it was disappointing to read many one word answers such as 'height' or 'safety' without a relevant context.
- (b) Many candidates named a suitable joint for the corner of the desk but were unable to provide a clear sketch of it. Some candidates failed to provide any sketch at all.
- (c)(i) & (ii)
It was disappointing that many candidates could not choose the correct manufactured board or its thickness for the desk lid from the possible answers provided.
- (c)(iii) The majority of candidates gained marks for this question. The most popular method of fitting a lid was to use hinges. The best answers showed the hinges correctly spaced with details about their type, size or material from which they were made. There were some innovative lift-off lids and hinged lids using dowel that gained maximum marks.

Question 2

- (a) Most candidates were able to explain that weight was an important consideration. The majority of candidates recognised that if the car was too heavy the motor would find difficulty in moving it or that the battery would 'run down' quickly.
- (b) Most candidates were unable to select polystyrene from the list of three possible answers. It is expected that every student would have had practical experience of vacuum forming using polystyrene sheet.
- (c) Very few candidates understood why webbing can occur when vacuum forming.

- (d) Most correct answers referred to a glue gun being less messy or more accurate to apply and that the adhesive set more quickly than PVA. Vague answers such as 'quicker' and 'easier' were not rewarded.
- (e) Many candidates named injection moulding correctly but there were many incorrect answers such as 'vacuum forming' and vague references to 'CAM' that were unacceptable.
- (f) The best answers included details of sawing the manufactured board to shape, making it round using a sanding disc and drilling the hole for the axle. Other answers included the use of the ubiquitous 'laser cutter', 'CNC router' and a 'hole saw'. Maximum marks for these answers were awarded only if candidates provided sufficient detail to accompany their chosen method.
- (g) Marks were awarded for simply **naming** two fittings such as nut and bolt, screw, nail, dowel or star washer. Many candidates demonstrated poor exam technique and provided lengthy descriptions that were completely unnecessary and gained no marks.

Question 3

- (a) It was disappointing that many candidates could not state one advantage of a thermoplastic over a thermosetting plastic. This is basic knowledge and understanding that could be acquired through working with plastics.
- (b) (i) Many candidates were able to name one tool used to mark out the acrylic. The range of acceptable answers should have provided an accessible question for the majority of candidates. However, many candidates appeared to misread the question and suggested the use of a strip heater or line bender to mark out the acrylic.
- (b) (ii) There were many really good answers showing how the acrylic sheet could be bent. Many candidates achieved at least one mark for recognising the use of a strip heater or line bender. Many candidates provided good technical details relevant to the bending process.
- (c)* There was a range of answers explaining the advantages of CAD over traditional drawing methods.
As in previous sessions many candidates were unable to combine sound technical knowledge and understanding with an acceptable level of spelling, punctuation and grammar.

Section B

Question 4

- (a) Many candidates were able to choose the two correct properties from the possible answers provided.
- (b) Most candidates understood that mild steel would rust without some sort of finish.
- (c) Most candidates understood that the cooking bars would need to be removed for cleaning purposes or the need to replenish the charcoal.

- (d) (i)** There were many good answers to this question. The ‘ghosted’ drawing of the barbecue seemed to help candidates sketch their designs. Many candidates gained at least one mark for showing two handles drawn onto the ends of the barbecue. Many added wheels or castors that were deemed irrelevant to carrying the barbecue and gained no reward. The best modifications showed details of how the handles were constructed and fitted and named the materials. Those who recognised the need to insulate the handles from heat were rewarded with an additional mark.
- (d) (ii)** Many candidates gained at least one mark for providing some form of definition: ‘how the product and user interact’. The best answers expanded upon specific issues such as the need for comfort and safety.

Question 5

- (a)** The best answers referred to the fact that softwoods were more plentiful and because they grew faster, could be replenished faster. There were many vague answers such as ‘sustainable’ and ‘can be recycled’ that were not rewarded.
- (b)** Only a handful of candidates could name the two KD fittings. To answer ‘Where it will be used’, candidates only needed to refer to Fig. 8 and use the terms labelled to provide their answers. Very few candidates gained marks for this question.
- (c)*** Many candidates were aware of the problems associated with designing products for outdoor use. Most answers included information about weather with wood rotting and metal rusting. Sometimes suitable solutions were given by using alternative materials or the application of a finish. As in Question 3(c), many candidates were unable to combine sound technical knowledge and understanding with an acceptable level of spelling, punctuation and grammar.

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