

Design & Technology (Resistant Materials)

General Certificate of Secondary Education **GCSE J306**

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

Report on the Units

June 2010

J306/J046/R/10

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 2010

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

CONTENTS

General Certificate of Secondary Education Resistant Materials (J306)

General Certificate of Secondary Education (Short Course) Resistant Materials (J046)

REPORTS ON THE UNITS

Unit/Content	Page
Chief Examiner's Report	1
A561 Introduction To Designing and Making	5
A562 Sustainable design	10
A563 Making Quality Products	14
A564 Technical aspects of design and making	17

Chief Examiner's Report

This report provides an overview of the work seen in the written examination Units 2 and 4 and the Controlled Assessment Units 1 and 3, for candidates who took the examination during this series. It precedes a more detailed report to centres from each subject area within the Innovator Suite and highlights general issues that have occurred across the suite of specifications.

This report has been prepared by the Chief Examiner, Assistant Chief Examiners, Principal Examiners and Principal Moderators and covers all specifications within the Innovator Suite. It should be read in conjunction with the examination papers, the mark schemes, and the marking criteria for assessment given in the specification booklets.

This is the second examination series in the first year for the new Innovator Suite.

An important point for teachers to remember about the Terminal Rule in relation to this suite of specifications and re-sits:

The terminal rule is a QCDA requirement. Candidates must be entered for at least two units out of the four (full course) at the time that they certificate. i.e. the end of the course.

Please be aware that the QCDA rule states that marks scored for terminal units will be the marks used in the calculation of candidate grades. Therefore, if one of the candidate's terminal units is a re-sit and the mark is poorer than the original mark, the poorer mark will be used to calculate the final grade for that candidate.

Obviously, the terminal unit marks are then added to the highest marks scored in the other units making up the certificate.

Teachers are reminded that it is also a requirement of QCDA that candidates are now credited for their accurate use of spelling, punctuation and grammar across all four units.

It is pleasing to see that centres and candidates have responded well to the new style of examination approach, especially when the nature of the work between subject areas within the suite is so varied. Centres are to be commended for this.

WRITTEN EXAMINATION – UNITS 2 AND 4

Unit 2 – For this examination series of the new GCSE Innovator suite entries were seen from all six subject specialisms:

A512 Electronic and Systems Control
A522 Food Technology
A532 Graphics
A542 Industrial Technology
A562 Resistant Materials
A572 Textile Technology

The overall performance and range of results for Unit 2 varied considerably. Many of the candidates demonstrated a general awareness of the main points and issues linked to sustainable design, but often failed to answer in sufficient depth to gain high marks.

In **Unit 2 – Section A** of the papers most candidates across the suite attempted to answer some of the questions, some candidates however did give ‘no response’ (NR) answers. Candidates need to be encouraged to give an answer for the multiple choice style of questions even if they are uncertain that they are correct.

With reference to Section A of the paper it was noticeable that;

- At times, candidates had not read the instructions correctly and centres would benefit from explaining the correct examination procedures and requirements to the candidates.
- Candidates need to be able to identify signs and symbols in particular giving information about materials, products and safety issues in relation to environmental and design issues.
- Candidates must take greater care when circling their answers in Section A. They should not circle more than one answer and completely clear incorrect circles to eradicate confusion in marking.

Unit 2 – Section B of the papers showed more varied responses and teachers need to ensure that they read the subject specific reports for further detailed feedback on specific issues and individual question performance. Many candidates did manage to use subject specific ‘terms’ in their answers, but at times these lacked sufficient depth and tended to be generally weak. Occasionally candidate answers were merely taken from the question itself and care needs to be taken here. For example, where two reasons or an explanation was required the same point was made twice with slight word variation.

Candidates need to be made aware of the importance of the wording for each question and have struggled to answer specific questions in regards to ‘explain’ or ‘describe’. Many candidates did not score marks on these questions, because they gave a list of unrelated points instead of developing one of these.

The questions marked with an asterisk * provided candidates with an opportunity to give a detailed written answer combining good subject knowledge with an ability to produce a structured response. The range of responses varied considerably in the specific subject areas and it is advisable that guidance is sought from the subject report within this document.

Hand writing, at times, was difficult to decipher and candidates need to be prepared to make an effort with their hand writing, particularly on the banded mark question * and questions requiring a detailed explanation or discussion of points.

Centres are reminded that candidates are marked on spelling, punctuation and grammar on the banded mark scheme question. It is also important to note here that candidates need to ensure that they write legibly and within the areas set out on the papers.

Unit 4 – For this examination series of the new GCSE Innovator suite entries were seen from the following subject specialisms:

A514 Electronic and Systems Control
A524 Food Technology
A534 Graphics
A544 Industrial Technology
A564 Resistant Materials

On the whole candidates responded well to this Unit across the suite of subjects, with very few questions showing ‘no response’ (NR), which was encouraging. Candidates should be reminded that it is always better to attempt an answer, rather than leave a blank space with a guaranteed zero.

Report on the Units taken in June 2010

It is still apparent this series that candidates need to be practiced in examination technique; reading the questions carefully, responding to the instructions given in the questions and having an awareness of the full range of question formats.

All candidates seemed to have sufficient time to complete the paper and were able to access most parts of all the questions, which is encouraging.

Centres are to be reminded that 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. This type of question format still requires practice, although candidate performance was much improved this series.

CONTROLLED ASSESSMENT – Units 1 and 3

This series has seen portfolios for all subject areas being submitted both through postal and repository pathways. Most centres have been prompt in the dispatch of documentation to OCR and moderators, which is to be commended.

In general, centres have been successful in applying the marking criteria for both Units 1 and 3. However, it was noticeable that some candidates were being awarded full marks for work that lacked rigour and depth of analysis. Words highlighted on the marking criteria grids such as 'appropriate', 'fully evaluated', 'detailed' and 'critical', which appear in the top mark band, were not always adhered to.

Centres are reminded to apply the mark scheme on a 'best fit' basis. For each of the marking criteria, one of the descriptors provided in the marking grid, that most closely describes the quality of the work being marked, should be selected. Marks should be positive, rewarding achievement rather than penalising failure or omissions.

It was noticeable this series that a significant proportion of portfolios, particularly for Unit 1, resembled the legacy format. Care must be taken here to ensure that the marking criteria and format for the Innovator Suite is not confused with the legacy approach.

It is important that centres encourage candidates to organise the portfolio according to the different marking criteria strands as it enables the candidates to produce work that clearly shows an understanding of the controlled assessment requirements. Portfolios should be clearly labelled with the Candidate and Centre name and number, with the Unit code and title also evident. (*Specification - 5.3.5 Presentation of work.*) This is particularly important when the Centre submits work via the OCR Repository, where individual files are used to store portfolio work. Centres need to ensure that candidates clearly label each file using the marking criteria section headings; this facilitates a more effective completion of the moderation process.

Centres are also reminded to ensure that the OCR cover sheet is evident on each portfolio of work, outlining the theme and the starting point chosen by the candidate.

Many candidates included a bibliography or referenced their research sources, which was pleasing to see. It is good practice to ensure that candidates acknowledge sources of information used for the development of their portfolio work.

There was still some evidence this series of strong teacher guidance influencing candidate portfolios. Where this was evident it greatly hampered the candidate's ability to show flair and creativity, and therefore achieve the higher marks. Centres should avoid the over-reliance on writing frames for candidates work. It is essential that candidates have the opportunity to show flair and creativity in the way they approach the various aspects of these units.

Report on the Units taken in June 2010

Centres are to be reminded that the '*controlled assessment task must NOT be used as practice material and then as the actual live assessment material. Centres should devise their own practice material using the OCR specimen controlled assessment task as guidance.*'
Specification - Section 5.2.2 Using Controlled Assessment Tasks.

It was noticeable this series that some candidate's failed to provide any visual evidence of practical work within their portfolio. Centres are reminded to ensure that candidates provide clear photographic images in both portfolios for Units 1 and 3, particularly within the making and evaluation sections.

It was noticeable that where candidates had scored the high marks, they had used specialist terms appropriately and correctly and had presented their portfolio using a structured format.

Centres are to be commended on the amount of work produced for the portfolios in Units 1 and 3, which has been realistic in terms of the amount produced and the time allocated to this unit – 20 hours.

Unit 1 – specific areas of importance

Centres are to be reminded that Themes for Unit 1 are based around environmental awareness and sustainable resources/processes. Therefore, it is considered good practice for teachers to encourage candidates to consider Eco-design and sustainability when making decisions and combining skills with knowledge and understanding, in order to design and make a prototype product. This knowledge base also acts as a 'spring board' to active learning for Unit 2.

It was evident through the portfolio that candidates struggled with the critical evaluation section of the marking criteria. Unit 1 requires that the candidate evaluates the processes and subsequent modifications involved in the designing and making of the final prototype ONLY. Too many references were made to the performance of the prototype against the specification, which meant that candidates' marks were compromised. (Not applicable to Food Technology)

Unit 3 – specific areas of importance

Due to the low number of entries for this Unit specific guidance is limited. However, centres need to ensure that candidates complete a quality product for Unit 3. The weighting of marks available for the making section therefore, must be reflected in the time available for the candidates to complete a quality outcome.

A561 Introduction To Designing and Making

Introduction

The number of entries during this assessment period has been very positive and it is also encouraging to note the centres who have applied the information that was provided during OCR training for this specification or who have acted upon the previous examiners report produced in January.

It is now the second time that candidates work will have been completed under “controlled assessment” procedures for this unit and centres are still advised to ensure that they apply the correct levels of control to the production of the candidates work as described in the specification. There was again evidence of teacher guidance and the use of writing frames in some centres which were clearly influencing the content of candidate’s folders and our advice would be to take great care when making the distinction between guidance and prescription during these periods. It is essential that candidates have the opportunity to show individuality in the way they approach the various aspects of this unit.

It also remains a concern that some centres are approaching the controlled assessment units for this specification in a similar way to the work that was produced for the legacy specification 1956. Candidates must be taught the skills of how to edit research materials that they have collected and only then to explain what exactly they have learned from this process in the portfolios.

Centres are also again reminded that it is therefore a requirement of this unit to produce a prototype, as opposed to a product as in A563. It needs to be seen as an opportunity for candidates to show some freedom for creativity in their design work and it is for that reason that although the prototype should primarily be produced using the more traditional materials and process that we connect with “Resistant Materials” we will also be accepting prototypes where parts of the prototype may be made in other materials which would then demonstrate an understanding of how the “real” product might be made, have most of the function of the “real” product but not be so demanding in time to produce.

Administration

The majority of centres appear to have found the move to postal moderation a reasonably straight forward exercise and it is encouraging to report that most of the assessment material reached the moderators in plenty of time. It was also interesting to see that centres used the full range of options with regards to producing this evidence and candidates work was presented as “traditional” paper folders, e- portfolios or through the repository.

Where there were difficulties 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.

Content

Candidate's folders were generally presented in a logical manner that reflected the four main assessment strands of the innovator specification. However it was also apparent that some centres had not fully understood the requirements of producing the work for this unit under the "controlled conditions" guidance provided in the specification. In one instance all the candidates from one centre had written on the front of their folders that the written work for this unit was to be completed after school as homework for that term. This clearly raises concerns about how the candidates from this centre were supervised.

Centres are therefore reminded that Unit A561 is a controlled assessment which should be completed in 20 hours and their attention is again drawn to the relevant control measures which are clearly stated in the specification.

Performance of Candidates

The more successful candidates work tended to reflect the assessment strands written in the specification and they provided evidence across all of these areas to support the marks awarded by the centre. 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.
- Candidate's not editing research information and providing summary conclusions as to what they had learned from producing these materials.
- Little evidence of modelling techniques being employed to support the development of the design ideas.
- The lack of formal detail to support the marks awarded on how they overcame technical problems in the making.
- Limited photographic evidence in the record they needed to produce of the key stages in making the prototype.
- The evaluation being focused upon the product rather than the process of designing the prototype.

Centres should also please note that the assessment statements are now used as "best fit" descriptors when they are applied to the candidates work and marking should be positive. In order to support this there are no longer separate marks given for any of the individual elements of the assessment objective, only an overall numerical value taking into account the quality of all the work produced by the candidate against the related criteria. This is a fundamental difference between the marking in the legacy specification, where there are in a number of cases twelve marks and twelve statements, and the Innovator exam.

Centres are therefore advised to look at the three main levels of response – Basic ability column, demonstrate ability column and works competently column as a first indication to use when assessing candidates work.

Creativity

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.

As part of the control guidance for this unit candidates are required to select a theme set by OCR in the specification and to state this theme as the starting point for their work in this unit. This theme can, however, be contextualised in order to best suit centre-specific circumstances.

It was therefore a concern that some centres were still presenting the same content of work for this assessment strand as they had done previously for the legacy specification. If centres follow this approach then they will have difficulty in completing the entire unit in the 20hrs required for controlled assessment.

Centres are therefore advised to prepare candidates prior to starting the controlled assessment on how to **edit** and present this information to the best effect. We are not expecting work that is not relevant, informative or focused upon the theme selected by the candidates. In this way research work such as a questionnaire produced to find out the user needs can still be completed but within the “controlled” environment it is the results or conclusions only that we would expect to see in the portfolio.

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

This section of the portfolio should be started with the candidates producing a detailed specification for their own prototype product. A number of candidates were seen to be clearly successful in completing this requirement but again there was a great variation in the content and detail produced for some projects and they were so prescribed that they could have applied to any product the candidates were likely to produce. A good design specification should provide the candidates with an essential checklist that will support them when developing the prototype required for this unit of work.

Design ideas produced by the candidates were evident in nearly all of the portfolios and were usually seen as a combination of freehand sketching with basic annotation which in some cases was of a poor quality. Where centres had produced these and then uploaded this evidence into Power point presentations the better quality images proved to be those which were scanned into the presentation rather those which had been photographed as there proved to be a lack of clarity and definition to the work.

Centres are also reminded that there should be evidence of candidates using CAD to develop the design solution if the higher marks are to be awarded in this assessment strand.

Modelling appears to remain an issue in a number of centres as when it was used well the candidates were able to use this information to support the decisions they were making about materials and construction methods and therefore production of the final prototype. However, in a number of centres candidates had not produced any evidence in their portfolios of having used any modelling techniques. In some cases the quality of work that was presented was seen to be of such a low quality that it would be difficult to see how this supported the candidates design thinking.

Finally most candidates were able to identify a final chosen idea but few then 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

There was a great variation in the range and type of products that were produced for this unit. Centres are reminded that the focus remains on this being an introduction to designing and making and as such candidates should be developing a prototype product. It was a worry this year that some candidates had produced very large items of furniture which are obviously not the expected outcome for this unit if the detail given in the specification is followed correctly.

The concern with this approach is that some centres still appear to view the controlled assessment units in the Innovator suite as being two similar units of work. It is worth stating again that this has never been the intention of the examination board with the introduction to the unitised approach to assessment in this specification.

Centres are also asked to be aware that where CAM is used in the production of the final prototype it needs to be used in conjunction with other manufacturing processes. The final solution of some candidates that had used this method of construction also seemed to “appear” without any supporting evidence being provided in their folder work. Centres are therefore advised to provide screen shots or CAD drawings as evidence of “ownership” if this process is being used as one of the construction techniques by a candidate.

The majority of candidates had planned the stages of making their product before starting to make the prototype, although there was felt to be evidence of teacher input in some centres as the candidates work was very similar in content and presentation.

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 required to support this process and where this was evident many of the candidates were able to achieve full marks for this assessment strand.

Centres also appear to have awarded marks for how the candidates overcame any technical difficulties without there being any formal evidence recorded by the candidate. Our advice in this instance would be to highlight this information in the record of the key stages mentioned above.

There should be also at least two photographs supplied of the end prototype by all candidates. These photographs are an important element of the postal moderation process and Centres are requested to ensure that they supply photographs which are of a sufficient size and clarity to provide full details of the prototype product that the candidate has produced.

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. 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. Candidates 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

Quite a number of the candidates based their evaluation on their prototype product and how it functioned. As a result of this all the modifications proposed by candidates were focused upon improvements to the completed prototype product which then resulted in the moderators having to apply adjustments to the final marks.

Centres are therefore reminded that the Specification for Unit A561 clearly states that 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.

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 A 563). This included reference to their initial planning and the record they produced of the stages in making their prototype product. Candidates were then able to reflect and suggest modifications to improve the design, modelling and prototyping processes.

A562 Sustainable design

Introduction

Overall, the paper provided a suitable challenge to the students. Nearly all candidates found the paper fully accessible and were able to attempt nearly every question.

The spread of marks achieved was very wide, with a few candidates scoring over 50 marks and a few scoring less than 5. The highest number of candidates scored exactly half marks (30).

Section A. These questions were almost always attempted and were generally well answered, with most candidates achieving at least 10 marks.

Section B. These questions provided plenty of opportunities for candidates to gain marks. There were no questions that were avoided by large numbers of candidates and there were no questions that did not attract full marks by at least a few of the candidates.

The * question (which rewards candidates for the quality of their writing) was marked with a banded mark scheme. This question differentiated between candidates well with around 10% of candidates scoring 0 but about 10% also scored 5 or 6 marks. There was a fairly even spread of candidates scoring 1 to 4 marks.

Section A

Questions 1-5.

These questions required candidates to select the correct answer from 4 possible answers. One mark was available for each question.

Question 1.

This question was well answered with more than 80% of candidates achieving one mark. Metal was the only non-renewable resource listed as a possible answer.

Question 2.

This question was fairly well answered with more than 60% of candidates achieving one mark. Product disassembly was the only correct answer.

Question 3.

Candidates found this question much more challenging with slightly less than half of candidates achieving the one mark available. Planned obsolescence was the only correct answer.

Question 4.

This question was well answered with more than 70% of candidates achieving one mark. The symbol shown was the European Eco symbol.

Question 5.

This question was well answered with more than 80% of candidates achieving one mark. Create innovative environmentally friendly designs being the only correct answer.

Questions 6-10

These questions required candidates to respond with very short answers of a single word or sentence. One mark was available for each question.

Question 6.

This question was well answered with around 70% of candidates achieving one mark. Biodegradable was the only correct answer.

Question 7.

This question was well answered with more than 80% of candidates achieving one mark. A simple statement that eco design is a design that is environmentally friendly was all that was required to **Question 8.**

Candidates found this question much more challenging with only around a quarter of candidates achieving the one mark available. The Ethical Trading Initiative was the only correct answer.

Question 9.

This question was well answered with more than 80% of candidates achieving one mark. Plastic or any named plastic gained the mark.

Question 10.

This question was well answered with more than 80% of candidates achieving one mark. Allowing plastics to be sorted into different types for recycling was the correct answer but many candidates incorrectly answered that the number was the number of times the product could be recycled.

Questions 11-15

These questions required candidates to respond with true or false. One mark was available for each question.

Question 11.

This question was well answered with more than 70% of candidates achieving the mark. It is false that manufactures do not have to follow government guidelines when disposing of waste materials.

Question 12.

This question was well answered with more than 70% of candidates achieving the mark. It is false that energy from the sun is an example of a fossil fuel.

Question 13.

This question was well answered with more than 80% of candidates achieving the mark. It is true that disposal is the final stage of a life-cycle analysis of a product.

Question 14.

This question was well answered with more than 80% of candidates achieving the mark. It is true that wood is biodegradable.

Question 15.

This question was well answered with more than 70% of candidates achieving the mark. It is true that carbon offsetting allows companies to compensate for unavoidable carbon emissions.

Section B

Questions 16-18

These questions required candidates to respond with more extended writing, drawings or notes. 15 marks were available for each full question.

Question 16a(i).

Few answers showed a good understanding of sustainability. Candidates often confusing it with long lasting, durability, not rotting or not breaking.

Few candidates made reference to the two plant containers. A simple statement that plastic is not sustainable but wood is, was all that was required for the 2nd and 3rd mark. Candidates must be encouraged to remember that the stem of the question provides a framework for their thinking and that the mark scheme will reward answers that refer to the given illustrations and text. Candidates should also be encouraged to remember that the number of lines provided for an answer gives a good indication of the detail required for full marks to be awarded.

Question 16a(ii).

Candidates did show a better understanding of recycling but few candidates referred to how the two plant containers could be recycled at the end of their useful life.

Question 16a(iii).

Many candidates showed a good understanding of biodegradable and some went on to say that the wooden container was biodegradable but the plastic one was not. These candidates gained all 3 of the marks available.

Question 16b.

This question did result in some very good answerers with candidates referring to possible damage to plants or the source of synthetic finishes. Candidates should be encouraged to consider sustainability in terms of finishes as well as other materials and energy sources.

Question 16c

This question was poorly answered with few candidates referring to giving consumers information on which to make a decision about which product to buy or information about possible dangers of organic compounds being released into the air.

Question 16d.

Globalisation was often referred to as “all over the world” without reference to manufacture, distribution or selling of products. Few candidates referred to components for a product being made in different areas of the world or products being recognised across wide areas of the world.

Question 17a.

The advantages of an old car tyre were generally well communicated and many candidates gained all 3 marks available. Candidates should be reminded that if two or more examples are needed they must avoid repeating the same answer using different language as such repeats will not gain further marks.

Question 17b.

This question was generally well answered with many candidates gaining all 3 marks available. The quality of drawing was often poor and this limited candidate’s ability to communicate their answers. Some candidates simply suggested ways of making the seat stronger, for example by making the wood thicker. These responses did not gain credit.

Question 17c(i).

There was considerable confusion between ergonomics and anthropometrics. The question clearly asked for a response with reference to the seat of a child’s swing. Many candidates failed to respond in this way. Simple statements relating a measurement of a child to a size of the swing were all that were required for marks to be awarded. An understanding of the key terms given in the specification is important for all candidates. Candidates are likely to be asked to explain these key terms in future examinations.

Question 17c(ii).

Few candidates understood that ergonomics is how products interact with people. Again simple statements about the comfort of the seat or the feel of the ropes or chains in the child's hand were all that were required. Some candidates also confused ergonomics with economics.

Question 17d.

This question was well answered with most candidates responding with landfill. A few candidates responded with disposal at sea which was rewarded.

Question 17e.

Most candidates gained at least 1 mark. Answers relating CO₂ to global warming, releasing harmful gasses into the air were common. A few candidates also considered the environmental effect of the use of the fuel used in the incineration process, this was rewarded.

Question 18a*

This question required candidates to respond with an extended piece of writing. Candidates should be encouraged to respond to the question marked with a * using about 3 paragraphs of writing. The response should use specialist terms and accurate spelling, punctuation and grammar. Candidates should be encouraged to make about 3 main points explaining each as fully as possible. Candidates should also write a simple conclusion to their work. Most candidates referred to the fact that Mahogany is slow to grow, the environmental effect of cutting down trees and that metal and acrylic are from non-renewable sources.

Question 18b

Consideration of a more environmentally friendly material than Mahogany produced answers of Pine, chipboard, MDF and Plywood. All of these answers were rewarded. Some candidate gave good reasons for these materials being more environmentally friendly. Pine being fast growing and the use of recycled materials being common

Question 18c(i).

This question was well answered with the availability of low cost labour enabling the company to make more money being the most common answer to gain full marks.

Question 18c(ii).

This question was well answered with the availability of jobs enabling people to earn money to give a better standard of living being the most common answer to gain full marks. Some candidates also considered the advantages to the local people in the area from which the company had moved. These were also rewarded.

A563 Making Quality Products

Introduction

This summer has seen the first entry of students for this unit in the new Innovator specification and entries were at this stage understandably lower than those which were moderated for A561.

There were also no centres that had used the repository system of entry or e- portfolios for this cohort of candidates.

With this being the first time that candidates had been entered for A563 it was interesting to note that the concerns which were expressed with regard to “controlled assessment” procedures in unit A561 also applied here. Centres are again advised to ensure that they apply the correct levels of control to the production of the candidates work as described in the specification and our advice would be to take great care when making the distinction between guidance and prescription during these periods.

The focus of this unit should be on the making of a quality product and therefore within the 20hrs of controlled time allocated for this unit. The majority of this period should be used by the candidate to produce the product rather than portfolio of design work.

Centres are required to ensure that candidates do not pursue the same ‘theme’ for their work as submitted or intended for submission in Unit A561.

Administration

It is encouraging to report that most of the assessment material reached the moderators in plenty of time for them to complete the moderation process. Where there were difficulties they were focused upon the fact that some centres did not supply individual Controlled Assessment Cover Sheets for each candidate or a CSF form with the sample of work that had been requested. It should be worth noting that the minimum we require from centres are copies of the cover sheets for each candidate requested in the sample for moderation. A CSF form is useful for both the centre and the moderator to see in one glance how the candidates have performed across each of the assessment strands.

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

Generally there was a very mixed response from the centres that had entered candidates for this unit. Folders still tended to reflect the content that we had seen previously in the legacy specifications and therefore it was felt that candidate’s time was not being focused sufficiently upon the production of a quality product. Some of the more common issues which affected candidate’s achievement included –

- A limited range of design ideas where the quality of presentation was also felt to be of a disappointing standard.
- Little evidence of modelling techniques being employed to support the development of the design ideas.

Report on the Units taken in June 2010

- The lack of formal detail to support the marks awarded on how they overcame technical problems in the making.
- Limited photographic evidence in the record produced of the key stages in making the prototype.

Designing

Candidates are required to select a theme set by OCR in the specification for this subject as part of the control guidance for the unit from which they will then select their own problem or starting point for the project taking into account any constraints relating to resources and time available for completion of the task.

Having selected the problem area candidates should then be able to produce a design brief and specification, with some evidence of how they responded to these as part of the initial assessment strand. Centres are advised to look carefully at the allocation of marks in this section of the portfolio for an indication of the amount of work that should be produced by the candidates. The advice that we would offer candidates would be to show this response in about two sheets of work.

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. In this cohort of entry there was no evidence in the portfolios of CAD being used to support the development of the final design. The modelling was felt to lack quality and was often produced just as very basic models in corrugated card.

As in A561 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.

Successful candidates Clearly showed how they had selected their own problem area from the list of controlled assessment themes stated in the specification. They were then able to produce a design brief for their intended product together with some supporting evidence to show what conclusions they had reached from any related research that they had previously conducted. A clearly structured specification resulted from this which was specific to the product that they intended to design. Design ideas were then presented using a range of graphic techniques, including the use of CAD, and 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 product that they intended to make.

Making

The quality of work seen by moderators varied considerably and it was clear that in some cases the candidates had attempted to produce some very ambitious projects which did not always result in a successful outcome.

It should also be worth noting that where candidates use CNC techniques to produce the final product they should be used in conjunction with other construction methods. In some cases this year the resulting product just seemed to “appear” without any previous evidence in the portfolio of CAD drawings. Candidates are therefore advised to provide screen shots or a CAD drawing in their portfolio’s if this process is used as one of the construction techniques.

The planning that was seen in the portfolios varied considerably in content and detail with some candidates presenting no work at all and yet centres had given very high marks for the quality of the making assessment. It is worth noting that although there are no specific marks given for planning in this specification it is a requirement in all three response levels of the assessment criteria that planning is evident to support the production of the product.

Recording the key stages of making is an aspect of this specification which was not previously seen in the legacy coursework unit and on the evidence seen in this cohort of entry it would be fair to say that centres have not yet developed this evidence sufficiently for the marks that were awarded before moderation. The better examples that were seen incorporated notes and photographic evidence produced by the candidate as the product was being made. They were then also able to highlight any technical difficulties and problems they had encountered in construction and how they had overcome them.

Successful candidates made appropriate choices of materials, tools and equipment and worked skilfully and safely to produce a high quality product suitable for the intended user. They showed evidence of having used a variety of making processes in producing the product. Where CAM had been used as one of these techniques candidates 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 candidates 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 product through comprehensive notes and visual evidence.

Evaluation

The requirement here is to evaluate the function of the product as opposed to the design processes as in A561. Maybe because of this all of the candidates based their evaluation on the product they had produced and how it functioned which resulted in fewer alterations to the centre marking being applied by the moderators.

Candidates should be able to show that they have tested the completed product and used this information to evaluate the function of the product against the design specifications.

Successful candidates Showed evidence of having tested their completed product in use and compared this to their list of specifications. From this they were then able suggest improvements to their product using a series of notes and sketches. Throughout this assessment strand they also showed evidence of the correct use of specialist terms and showed accurate use of spelling, punctuation and grammar.

A564 Technical aspects of design and making

General comments

It is encouraging to report that many candidates did demonstrate a good understanding of the technical aspects of designing and making in most of the specifications within the suite. However, there are some issues that candidates need to address in order to improve their performance.

- The structure of the exam paper is different from the legacy specifications.
- Within the legacy GCSE specifications there was an incline of difficulty throughout the whole paper; i.e. Question 1 was the most accessible and Question 5 the most difficult. The Innovator exam questions have an incline of difficulty within each individual question. This does mean that candidates do need to read the whole paper carefully before answering since they may be able to attempt questions throughout the paper.
- The 1 hour 15 minutes duration for each paper is designed to give candidates a good opportunity to attempt all questions. Therefore it is important that candidates do not feel that they need to 'rush' their responses.
- It is important that candidates understand the command words in order to respond appropriately to the questions. Practice of questions from previous sessions is extremely valuable.
- In those questions that require candidates to produce sketches and notes, it is essential that answers are made as clear and technically accurate as possible. There were many instances where examiners were unable to decipher illegible handwriting and poor quality sketches.

Comments on specific questions

Candidates' knowledge and understanding of this area of the specification was very poor. In particular, their 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 excellent 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.

Section A

Question 1

This question tested candidates' practical knowledge of working with acrylic. Generally, the results were poor.

- (a)** Very few candidates were able to name the basic tools and equipment needed when working with acrylic.
- (b)** Many candidates recognised the need for a strip heater or line bender but failed to provide sufficient details about the former or mould and the method of retention while the acrylic cooled.
- (c)** Many candidates understood why the acrylic would be drilled before it was bent.
- (d)** Very few candidates were able to give two reasons why it is important to clamp acrylic securely while drilling. The best answers referred to it spinning or resulting in breaking. Vague answers relating to personal injury did not receive any credit.

Question 2

This question tested candidates' practical knowledge of working with a manufactured board and methods of construction. Good quality sketches were essential in order to answer parts (c) and (d).

- (a)**
 - (i)** There were some good answers relating to availability, size, stability and environmental issues of manufactured boards.
 - (ii)** There were some good answers relating to the generally unattractive appearance of manufactured boards, but many candidates gave incorrect answers about the boards being weaker than solid wood.
- (b)** The best safety precautions when using a jig saw referred to the need for secure clamping, no trailing leads, clear room below the saw cut and references to specific items of personal protection.
- (c)** This question required a knowledge and understanding of K-D fittings to join the sides and the rails of the table. The question stated that the method must allow them to be taken apart, yet many candidates glued them in place. In addition to recognised K-D fittings there were some innovative blocks and brackets that were fully rewarded.
- (d)** The most popular correct methods of fitting the top to the sides and rails of the table involved the use of grooves and applied beads. Unfortunately, the quality of sketches was often so poor that it was extremely difficult to understand what candidates were trying to communicate.
- (e)** There were many good advantages of spray painting over brush painting given. Few candidates achieved the maximum two marks. Popular misconceptions included that spray painting was easier, faster and cheaper.

Question 3

This question tested candidates' practical knowledge of working with beech and an understanding of CAM.

- (a) The most popular performance characteristics of beech were its toughness, hardness and durability. There were often references to its close grain being less likely to splinter than other woods. Most candidates achieved one of these.
- (b) The mortise and tenon joint was the most common correct answer with dowel also popular. Some candidates drew an appropriate joint but gave the incorrect name.
- (c) This question tested candidates' knowledge of basic tools and equipment used when working with solid wood. Generally, the results were very poor. Many were able to name a marking out tool but could not name a specific drill or bit used to drill the slot. Some candidates named correctly use of a mortising machine. Using a chisel to remove the waste was also a correct answer, as was the use of a file or glasspaper to clean up the mortise to allow the block to move freely.
- (d) Only a few candidates named a lathe as the woodworking machine that could be used to make the discs.
- (e) It was encouraging to read some answers that referred to the transfer of CAD designs to a CAM machine and the correct name of machines such as a vinyl cutter and engraver.

Section B

Question 4

This question tested candidates' knowledge and understanding of flat-pack, self-assembly furniture and their ability to design a modification to the DVD storage unit shown in the question.

- (a) There were very good reasons given for the unit being supplied without a finish; the most common being that it would be cheaper for the manufacturer and consumer preference.
- (b) There were a few excellent innovative devices for keeping the DVDs upright. However, few candidates achieved maximum marks. The bullet points are designed to help candidates focus on the key elements required and for which, marks are available. Many candidates did not include any details of materials and fittings used. Often, sketches were so unclear that it was impossible to understand or interpret the candidate's intention.
- (c*) This question required candidates to produce answers in a coherent and structured manner. A list of bullet points does not satisfy this format. This question tests the candidates' Quality of Written Communication [4.7 of the specification].

Many candidates appeared to read only the first five words of the question: "Evaluate the DVD storage unit..." then set about their answer. What they missed was that the question required them to examine the ways that the designer had specifically made the storage unit as a flat-pack, self-assembled product. Often answers were completely irrelevant with candidates giving advantages of this type of furniture or providing a final evaluation of the product. Few candidates achieved higher than Level 1, 0-2 marks, for this question.

Question 5

This question tested candidates' knowledge and understanding of anthropometrics and the use of mild steel and MDF in the design of a computer desk.

- (a)** Candidates' knowledge and understanding of anthropometrics was generally poor. The best answers referred to dimensions relating to the human body or how parts of the desk had been designed with these considered.
- (b)** Many candidates provided a brace or triangular plate to strengthen the joint. Many also incorrectly showed additional back legs. Often the method of fitting the brace or triangular plate was inappropriate.
- (c*)** There were a few good answers explaining how the designer had considered sustainability in the design of the desk. Some candidates relied sensibly on their knowledge and understanding of the 6Rs and applied some of these effectively. In addition, there were specific references to the 'good' use of a limited amount of materials and their durability extending their use over time.

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

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