

Design and Technology: Resistant Materials

General Certificate of Secondary Education **J306**

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

OCR Report to Centres

June 2012

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates 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.

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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.

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

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Overview

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 third year for the new Innovator Suite.

A reminder: An important point for teachers to note about the Terminal Rule in relation to this suite of specifications and re-sits: The terminal rule is an Ofqual requirement. Candidates must be entered for at least two units out of the four (full course) at the time that they certificate. ie the end of the course.

Please be aware that the Ofqual 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.

Centres are reminded that it is also a requirement of Ofqual 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 continued to respond well to the new style of examination approach. Centres are to be commended for this.

It is obvious that Centres have benefitted from previous reports and training sessions available for the qualifications.

Written Examination – Units 2 and 4

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

The overall performance and range of results for Unit 2 was generally the same as seen in the last examination session – January 2012. It was pleasing to see that many candidates had been well prepared for the examination by Centres and clearly had a sufficient knowledge base to answer the questions. It has been encouraging to see that candidates have been able to access the higher marks.

In **Unit 2 – Section A** of the papers most candidates across the suite attempted to answer all questions, with few candidates giving no response (NR) answers. It was noticeable that, at times, candidates had not read the instructions correctly and centres would benefit from explaining the correct examination requirements to the candidates. Candidates need to be encouraged to give an answer for the multiple choice style questions even if they are uncertain that they are correct. Centres are reminded that questions 1–15 cover the grade range from A* to U.

There was less duplication of circling answers seen during this examination session.

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

Unit 2 – Section B of the papers showed a greater mixture of responses and teachers need to ensure they read the subject specific 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 must not use certain terms as ‘stock’ answers. Such answers included:

- ‘Environmentally friendly’ and ‘better for the environment’ or ‘damages the environment’.
- To ‘recycle’ and ‘recycling is good for the environment’.
- ‘Cheaper’, ‘better’ and ‘stronger’.

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. There has been a significant improvement in the written response style question this session, with candidates giving detailed answers combining good subject knowledge with a clear, structured response.

It was noticeable this session, that where extra paper was required to continue a question response, many candidates failed to reference the question number thus compromising marks. It is important therefore, that centres teach candidates how to highlight where they are continuing an answer on a different page in the examination document.

Centres are reminded that candidates are assessed on spelling, punctuation and grammar on the banded mark scheme question.

It is also important to note 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 Innovator suite entries were seen from all six subject specialisms.

It was encouraging to see improvements in candidate performance across the Innovator suite this session. The following improvements were noted:

- Candidates appeared to be better prepared to ‘tackle’ the questions than in previous sessions.
- Candidates managed their time effectively, most attempted all of the questions and there were fewer No Response (NR) answers recorded.
- A better standard of response to the Quality of Written Communication questions was seen.
- More candidates demonstrated high levels of knowledge and understanding and were able to access the higher marks.

It was encouraging to see however, that most candidates demonstrated a good understanding of the technical aspects of designing and making across the specifications.

Important Note: 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.** Candidates need to 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 suite there were many answers that lacked detail and clarity. Terms such as 'cheaper', 'quicker' and 'easier' were often used and meant very little without qualification or justification.
- **Become familiar with the quality of written communication questions 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 [6] marks is strongly recommended.
- **Respond to specification and/or bullet points accurately.** In design type questions this is important if the candidate is to achieve the maximum marks available.
- **Make sketches large and clear enough to convey meaning.** It is equally important that notes should be clearly written and reinforce what appears in the sketches.
- **Make their answers clear and technically accurate.** In questions that require candidates to produce sketches and notes, it is essential that answers are made as clear and technically accurate as possible. Marks may be compromised through illegible handwriting and poor quality sketches.

Controlled Assessment – Units 1 and 3

This examination series has seen portfolios for all subject specialisms being submitted for Unit 1 and Unit 3 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. **It is important that Centres return the request for portfolios within three days.**

Centres are reminded to forward form CCS160 in particular to moderators. It is helpful if centres also include a record of the marks allocated to each candidate, for each of the marking criteria sections.

Important Note: Candidates producing paper portfolios should be entered for postal (02) moderation. Candidates producing their portfolio on a CD or memory stick should also be entered for postal (02) moderation.

Centres must ensure that if candidates are entered through the repository (01), the portfolios must be uploaded via Interchange and **NOT** sent through to the moderator on a disc. The preferred format of files presented for this type of moderation needs to be PowerPoint, PDF or Word, with work saved in ONE file only and numbered, not as individual sheets saved in different files.

In general, Centres have been successful in applying the marking criteria for both Units 1 and 3. Centres are reminded to apply the mark scheme on a ‘best fit’ basis which may mean allocating marks across the assessment grid. Marks should be positive, rewarding achievement rather than penalising failure or omissions.

It was still evident that a significant number of portfolios, particularly for Unit 1, resembled the legacy format, especially in terms of the excessive research and inappropriate critical evaluation.

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.

Important: Centres are also reminded to ensure that the OCR cover sheet is included with each portfolio of work, **outlining the theme and the starting point chosen by the candidate.**

JCQ documentation on Controlled Assessment (September 2011 – August 2012) clearly states that any guidance given to candidates must be clearly recorded. *4.5.2 When marking the work, teachers/assessors **must not** give credit in regard to any additional assistance given to candidates beyond that which is described in the specification and **must** give details of any additional assistance on the appropriate record form(s). **This includes providing writing frames specific to the task.** (eg outlines, paragraph headings or section headings).*

In light of the information given above, Centres need to take care when using writing frames in the controlled assessment portfolios.

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.** *5.3.2 Definitions of the Controls* section in the specification states: “*The teacher must be able to authenticate the work and insist on acknowledgement and referencing of any sources used*”.

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.*

Resits – Centres must remember that the theme, starting point and research aspects of the portfolio can be maintained. However, the remaining portfolio and final prototype should be redeveloped for submission.

It is a requirement in the Making criteria that candidates “*demonstrate an understanding and ability in solving technical problems*”. **Centres must therefore ensure that problems encountered are written into the record of making, for the higher marks.**

4.1 ‘Schemes of Assessment’ clearly states that “*A Minimum of two digital images/photographs of the final product showing front and back views*” should be evident in the candidate portfolio. **It is the centre’s responsibility to ensure that photographs are evident, are of a good quality and are of the candidate’s own work.**

A561 Introduction To Designing and Making

Introduction

Candidate numbers have again been positive for this unit and it is interesting to see the increase in centres that are either using the repository or other forms of electronic storage to enter candidates work. However, paper portfolios still remain the most common medium and as a result moderators were able to see a wide variety of work which showed a good range of presentation techniques.

Encouragingly we have also seen fewer examples of candidates producing large items of practical work for assessment, as this unit is intended to provide an introduction to designing and making where the practical outcome is a prototype product.

However, there was evidence that some centres had encouraged their candidates to produce their prototypes entirely out of compliant materials such as modelling foam, foam board etc. It should be remembered that although alternative materials can be used in the construction, in order to encourage candidates to show some creativity in their work, the prototype product should primarily be constructed using the “Resistant Materials” detailed in the specification.

Whilst the majority of centres have a clear understanding of the regulations relating to “controlled assessment” 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. Teacher guidance and the use of writing frames create a very formulaic approach to the work and as a result, candidates are restricted from showing the individuality which is expected in this unit. Our advice would be to take great care when making the distinction between guidance and prescription during these periods and centre’s should be aware of the guidance offered in the document “**Guide to controlled assessment in Design Technology**” which can be downloaded from the OCR website.

Administration

Moderators were able to accept candidates portfolios for moderation as “traditional” paper folders, e-portfolios or through the repository which allowed them to see a good range and variety of work. However, centres should be aware that the methods they employ for uploading some of the design work resulted in very unclear images of hand drawn ideas. Our advice would be ensure that the images are scanned into the presentation as accurately as possible and to avoid the use of photographing the pages as this does not allow the clarity of the candidates work to be fully appreciated during the moderation process.

A number of difficulties were experienced in the administration of this unit and for future reference centres attention should be drawn to the following –

- The method of entering candidates for this exam has obviously caused confusion in some centres as a number of the repository entries that we were expecting eventually reached the moderator as paper portfolios. Please note that the 01 prefix is the repository entry and not postal.
- Most centres included CWS forms and/or coversheets to indicate the marks awarded for each of the assessment strands and this is to be commended. However, not all centres provided at least one of these forms and without them moderation cannot take place and feedback provided to the centre on their assessment of the candidates work.

- There needs to be sufficient photographic evidence of the completed prototype product shown in all portfolios which is separate to any that is shown in the candidate's record of the practical work. Centres are reminded that it is their responsibility, and not the candidates, to provide at least two clear photographs of the end product in each of the folders.
- When presenting paper portfolios candidates should be reminded not to enclose folios in separate plastic wallets or binders.

Assessment

In a few cases, it has become evident this year, that although centres understand the concept behind the use of "best fit" descriptors to assess the work, they did not use the full range of marks available in each of the response categories. Where this method was then applied across a number of the assessment strands it resulted in a recommendation being made by the moderator for the centre's marks to be adjusted in order to reflect the standard of work seen in the candidate's portfolio.

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

The more successful candidates work was clearly focused upon the requirements of the assessment criteria which indicated the preparation candidates had received before starting the controlled elements of this unit of work.

Moderators this year were also asked to ensure that the centre's attention was drawn to the contents of this report as there were still a number of misconceptions that were not being addressed in aspects of the work. Again some of the more common issues which affected candidate's achievement included –

Creativity

- 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**
- Questionnaires and charts are still appearing with no summary or analysis of the findings which should be seen as the main reason for producing them.
- There is still little mention of the users' needs, only superficial reference to colour/material/cost preference.
- Candidate's **not editing research information** and providing summary conclusions as to what they had learned from producing these materials.

Designing

- Design ideas which did not show the variety of techniques and quality of presentation described in the assessment criteria.
- Limited **evidence of modelling techniques** being employed to support the development of the design ideas.

Making

- The lack of a **written commentary** to support the marks awarded on how they overcame technical problems in the making. Far too often centres are rewarding the candidates in this assessment strand purely on what they have observed rather than evidence provided by the candidate.
- Limited photographic and written evidence in the record they needed to produce of the key stages in making the prototype.

Evaluation

- The evaluation being focused upon the product rather than the process of designing the prototype.

Creativity

It is intended that the word creativity, as used in this assessment, 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.

Centre's need to be aware that the emphasis in this part of the portfolio has altered considerably from the legacy specifications and candidates are advised to provide a detailed commentary to explain what they have **learned** by analysing the work of others rather than going through a "check list" of requirements.

Therefore, there still remains some confusion regarding the focus and content of the work in this section of the candidate's portfolios with what, at times, seems to be some centres apparently trying to adapt the assessment criteria to what they think should be included rather than the requirements of the specification. This has resulted in a number of scaling recommendations as the candidates have just been made to go "through the motions" of gathering research materials, rather than being taught how to edit information to show how they have identified trends or design features from their research work.

Centres should be aware that in order to award marks in the "works competently" category for this assessment strand then the candidates need to show the evidence that they have successfully edited their research materials with clear summaries of what they intend to take into their own designing. In this way research work such as a questionnaire produced to find out the needs of the user 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

Candidates should begin this assessment strand with a detailed list of specifications for their own prototype product that they have identified in the previous section of their project work. They should be encouraged to use the information that they have identified from analysing the needs of the user, design features and technological trends in developing their design ideas through to a final proposal for the practical work.

Our advice would be to produce this list of specifications as a series of bullet points that are relevant to the product being produced and which reflect the information presented in the creativity section of the portfolio. Far too often candidates had included a lot of very generic or vague statements in response to a pre-determined list of headings that could have applied to any product rather than specifically to the design that candidates wish to produce.

The vast majority of candidates used freehand sketching to illustrate their initial design ideas with basic annotation, which sometimes provided little in terms of detail or explanation. The quality of presentation also varied both within centres and across the whole cohort, with some candidates being awarded very high marks for what was a range of limited design ideas. In other cases candidates had combined a variety of presentation techniques to develop their design ideas towards a working prototype product. Where this was evident it also encouraged the candidates to show some creativity in their design thinking which resulted in a quality prototype being produced in the making sections of this unit of work.

An increase in the use of both 2D and 3D modelling was also noted in this cohort. Some centres still need to be reminded that it is a stated requirement in the specification, and therefore the assessment criteria, that candidates show evidence of these techniques in developing their design solutions.

Reference specification content 3.1 (page 9)

“They develop their design and use modelling before making and testing their prototype”.

Develop Designing Skills –

“Use appropriate modelling techniques to aid product development”.

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

In this unit candidates should be developing a prototype product which enables the candidates to show some creativity in their work. The emphasis should be on the candidates experiencing an introduction to designing and making within the 20 hours of controlled assessment.

It is for this reason, that along with evidence of the more traditional materials and process that we connect with “Resistant Materials” we also accept prototypes where **parts of the prototype** may be made in foam, balsa, jelutong instead of a more durable timber, aluminium instead of steel or silver, plastozote instead of acrylic etc. This 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 spent on production or finish.

However, centres should also be aware whilst expecting candidates to complete large coffee tables or side cupboards is clearly unreasonable in the time allowed for this unit, candidates must provide enough evidence of the use of “Resistant Materials”, and not just complainant materials, in the production of their prototype product.

Candidates are also expected to show a variety of construction techniques in the making of the prototype product and centres are reminded to reflect this within their assessment of the work. Where candidates then use CAM, as the manufacturing process to complete the product, they should be made aware that there also needs to be evidence of other techniques used in conjunction with this in order to comply with the requirements of the assessment criteria. The higher mark range should not be applied to these products, however well-assembled, unless a variety of processes are used in the construction of the prototype.

The use of screen shots or CAD drawings to show “ownership” of this process should also be expected as in some cases the final solution seemed to “appear” without any supporting evidence given by the candidate in the folder work. Without this supporting work moderators are left with concerns regarding the involvement of the candidate in the making process.

Whilst the majority of candidates had planned the stages of making their product to some degree or other before starting to make the prototype, there were also portfolios where no pre-planning was evident and yet centres had awarded marks well into the “works competently” assessment responses. Therefore, centres are reminded that when assessing the making of the prototype product, the planning provided by the candidate should be taken into account when deciding upon the overall mark to award.

The work presented to record the key stages of making is showing clear signs of improvement as centres start to develop processes during the making of the prototype product to record this element of the work. With the variety of responses now being seen by the moderators it is becoming a differentiating factor in assessing the candidates performance

Unfortunately, even after stating this in all the reports on this unit, centres are still awarding marks for how the candidates overcame any technical difficulties **without** there being any formal evidence recorded by the candidate. This has resulted in the highest number of recommended adjustments again, for any of the assessment strands in this unit. The advice in this instance would be to highlight this information in the record of the key stages mentioned above or to produce a separate sheet in the portfolio.

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 see the number of candidates who have based their evaluation on their prototype product and how it functioned rather than modifications to improve the designing and making process as stated in the assessment criteria.

Centres need to make their candidates far more aware of the focus that is placed upon the evaluation of the process rather than the product in this unit of work. Moderators feel that in a number of cases they have to adjust the marks not because of the candidate but due to a lack of understanding by the centre on the criteria used for assessment.

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 they have completed in developing the final prototype product.

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

Many of the candidates demonstrated a general awareness of the main points and issues linked to sustainable design and the 6Rs.

In Section A of the papers most candidates across the suite attempted to answer all questions, with few candidates giving no response (NR) answers. It was noticeable 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 and re-done, or scribbled. Candidates must ensure that they read the question carefully, consider the options, and give themselves plenty of 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 easy 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.

The question 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 response to the banded marked question this session tended to either not contain sufficient technical information, or be unstructured in its format. Candidates would benefit from centres preparing them for this type of question, both technically 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.

Section A

Q1 Virtually all candidates recognised that the appropriate answer is **(a) Carbon footprint**.

Q2 A majority of candidates chose answers other than the correct one. This shows that although candidates are recognising the term recycling, few are aware of the differences between primary (answer b), secondary (answers a & d) and tertiary **(c) Changing plastic bottles into fleece fibres**.

Q3 Most chose the correct answer **(b) Natural gas**, but there were a number of candidates who chose one of the other options, all of which are renewable energy sources.

Q4 The clue to this answer is in the word “measurement”, normally applied to the term, “Carbon footprint”. Thus, **(a) Eco-footprint** is the logical response to this question, and the majority of candidates picked up this hint.

Q5 Shape-memory alloys are cold-forged into the shape the designer requires for everyday use. The application of heat will cause the shaped alloy to revert to the pre-deformed shape. Response **(d) Heat** was chosen by the large majority of candidates. Interestingly, quite a few candidates chose (b) Impact as an alternative response – possibly their knowledge of work-hardening may have influenced this.

Q6 Very many recognised this as the **Fairtrade** symbol. There were very few alternative answers given, a “no response” being the most common of these.

Q7 An almost equal split between the correct and any alternative answers was seen here. **Carbon** offsetting is now quite well-known in schools, but we saw many answers which proposed fair-trade, eco-friendly and oil-seed rape, and “No response” was common at the lower end of the mark scale.

Q8 This question was not well answered. The use of the term “design” in the question may have thrown some candidates, as the correct answer; **eco-design** uses the same word. We accepted “sustainable design” and “eco-friendly” as student-friendly possibilities, but could not stretch to eco-awareness or eco-footprint.

Q9 A minority gave the correct **Anthropometric data**, or **Anthropometrics** (and recognisable mis-spellings). Proposals ranged from “ergonomics”, through “economics” to the common “bar graph” and “chart”. It was disappointing that, despite the consideration that this question was a relatively easy one to answer, many candidates were unable to provide an acceptable response.

Q10 The majority were able to answer this question correctly (**Repair**), although some proposed alternatives that did not start with the requisite letter; fix or mend might have been acceptable in other circumstances, but they are not one of the 6Rs.

Q11–15 A substantial majority were able to pick the correct alternative in these five questions (**False, False, False, True, False**), which was encouraging. Surprisingly, Q15 was by far and away the best answered, and clearly the matter of risk assessment is well known by candidates. By contrast, only a small majority managed to answer Q12 correctly, and many seemed unaware that thermoplastics are generally recycled on a regular basis.

Section B

This section comprises three multi-part questions, including one part where the quality of written communication is also assessed.

Q16 focused upon the relative merits of two kettles, one plastic and one metal. Aspects such as aesthetics, disassembly and energy usage are tested in this question.

Q16(a) This question asked candidates to recognise the energy usage of both kettles, but also to determine the effectiveness of the plastic kettle in terms of its energy efficiency. The majority of candidates managed to gain at least one mark, but few were awarded the full 4 marks. Many candidates gave ambiguous or ill-defined responses, such as stating that the plastic kettle ran off electricity and was therefore “better for the environment”, whereas the metal kettle ran off gas with no thought as to how the electricity were to be generated. Others majored on the ergonomics of either kettle, or that the electric kettle was efficient because it used less energy. (It takes the same amount of heat energy to heat a certain quantity of water, no matter what form the heat energy takes (gas, oil, electricity, solar power, etc). There may be a cost and/or time saving between one form and another, but this was not the question.) Good answers cited a property, elaborating upon this as a corollary: eg **easy to see water level (1) to prevent overfilling (1); the plastic body acts as a heat insulator (1), so less heat is lost to the environment in use (1)**.

Q16(b)(i) This question asked candidates to define aesthetics in relation to the kettles; general descriptions of aesthetics were not, therefore, fully awarded. Again, as in Q16a, candidates did not read the question carefully enough, and gave generalised and brief descriptions (“looks nice”) without qualification. Many gave repeated descriptions gaining no extra marks (“looks nice and pleasing”) and too many gave a stock “aesthetically pleasing” which gained no marks. The majority did, however, manage to gain at least one mark, and a good few achieved full 3 marks. A typical answer would be **“Aesthetics means how well the product looks (1), such as the plastic body is smooth and shiny (1) and the metal kettle looks short and chunky (1)**.

Q16(b)(ii) This part of Q16 asked candidates to define “Repair” in relation to the kettles. The majority found the definition easy enough – “Repair means to fix or mend the kettle so it works again” (1), but let themselves down by not making further reference to the kettles for the next two marks. A named part followed by a possible repair or replacement action, would have been enough, eg **“For example, the handle (1) of the metal kettle may need to be glued together if it splits” (1)**

Q16(c) This part focused on disassembly, and had to be implicit in any answer for full marks. The word “how” in the question was important, and many candidates missed this, preferring to give responses relating to recycling in general. It was required of candidates that they recognise that the kettles had several parts to their construction, and that the kettles had to be broken down into their component parts for recycling to take place. That said, only a small minority gained no marks, the large majority being awarded at least one mark. A typical response would be, **“The handle and knob (1) would be removed from the metal kettle, and the metal could then be melted down (1) and moulded. The plastic kettle could have most of the electrical parts removed (1), and it could then be used as a jug (1) in the garden.”**

Q16(d) Almost all candidates gained the mark available for this question. Technically, the plastic is an insulator, and prevents most of the heat being transferred from the metal of the kettle to the hand holding the plastic handle. The majority answer was that **“it stopped you burning your hand” (1)**, which was considered acceptable as the conclusion of the scientific explanation. Only answers that made no reference to heat/burning were not awarded, such as reference to ergonomics or cost.

Q17 This question focused upon wooden and plastic garden furniture, requiring comparisons to be made between each material.

Q17(a)* As has been noted above, this question tested the quality of written communication (QWC) as well as the depth of technical knowledge. The question was carefully worded, and the “how” was important, in that candidates were not asked about recycling of the chairs, nor about the energy requirements of making chairs in factories. Clearly, candidates must **determine the point** of a question and ensure they give an answer that will gain them some credit. The **“everything I know about recycling”** answer would only score 1 or 2 marks. Despite current trends towards more reuse of materials, many candidates seem to have little experience of reusing reclaimed timber to make new products. However, there were some very interesting references to the **use** of waste branches and logs to be found in woods and on the beach, but little in the way of **how** these could be cut and joined to make a chair.

Whilst it is appreciated that using new materials in D&T is substantially safer for students there should be some mention made of how the waste material left over from making should be put to use. It should also be remembered that the question tests QWC and the quality of response seen coupled with the technical content did not unfortunately attain the top end of Level 3 (6 marks). It is not possible to give definitive answers here but the mark scheme does give several points to look for when considering the technical and grammatical response level.

(a) Discuss how garden chairs could be manufactured from recycled or waste materials.

The plastic garden chair would be made from waste plastic bags, they would have been recycled and melted down and then the chair could be made formed by injection moulding.

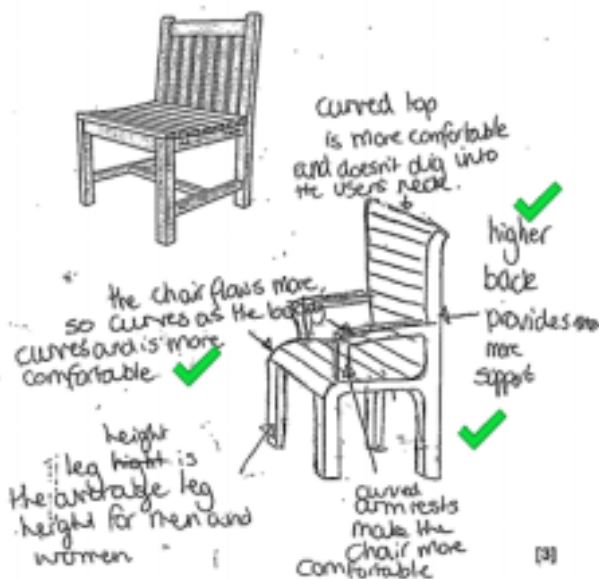
Waste plastic cups could also be melted down, and plastic child's toys could be ^{disassembled} ~~apart~~ and then melted to form a liquid plastic. A softwood chair could be made from old child's toys, (pine or cedar), surplus scrap wood, clocks etc. The woods would have to be reformed, and either cut or joined together to make appropriately sized pieces of wood and then ^{fastened} ~~joined~~ to make a chair by using waste or recycled ⁱⁿ dowel joints or epoxy resin.

+2 marks

In the example can be found the following terms: plastic bags, melted down, formed, injection moulding, cups, toys, disassembled, old child's toys, surplus scrap wood, reformed, cut, joined, fastened, dowel, epoxy resin. By themselves, each is trivial, but together they comprise reasonable evidence that the candidate is aware of the materials that could be recycled, or how scrap materials might be re-used, and the methods of manufacture. The writing is clear and legible, there are a couple of small mistakes but generally the paragraph provides an introduction to the subject.

This answer is Level 3, but was not given 6 marks as there was no evidence of proper structure: there are at least two sections mentioned here – plastic garden chair and wooden garden chair – but they have not been separated into paragraphs; the mistakes, while small, still intrude into the reading of the piece; the whole of the first “paragraph” is one sentence; the second “paragraph” is also only one sentence. Thus, 5 marks, not 6.

Q17(b) This question required a written and drawn response, adapting a wooden garden chair to make it more ergonomic. Answers had to include both notes AND sketches for the full three marks. The requirement was to modify the chair, not just to add soft furnishing to the existing one – thus, cushions or back-rests were considered unacceptable. Few candidates gained no marks for this question (and the majority of these did not attempt the question at all – No Response), and a good few successfully gained three marks. There were quite a few responses that involved the reduction of materials from the chair (removal of slats being the most common), which indicates that ergonomic and economic are being used synonymously. There are many modifications that could be made (adjustable or curved back, curved seat, footrest and so on) and written notes relating to why the drawn modification would be ergonomic. Labels (“arm-rest”, “foot-rest”, “curved seat”) gained no marks, but a note (eg arm-rest so that the user can place their forearms in a more comfortable position) would be very acceptable.



The example is a good sketch, the notes expand upon what can be seen by the viewer (they are not just labels). There are more notes than there are available marks, so the best two can be chosen. Full 3 marks.

Q17(c) This question was not about preservative coatings, but about Low Volatile Organic Compounds and how they improve the environment. A small majority gave responses that showed little evidence of any understanding of LVOCs: “organic, so better for the environment” – too vague; picking out words from the question; stating that they prevent the wood from rotting – irrelevant (so do solvent-based preservatives). However, references to the “**naturalness**” of the materials, the fact they **do not use renewable resources**, that they **do not contain volatile solvents** (white spirit, toluene, etc) which could be injurious, were all awarded.

Q17(d) The question related to the plastic chair and how it benefits the user. The majority of candidates were able to access this question, although a few provided unqualified answers (light, strong, etc) which could not be awarded. Many went for **lightweight, so easy to move/carry**, or **moulded/shaped for comfort**.

Q17(e) This question related to the social benefits of manufacture of the wooden chair in a LEDC. Although some candidates gave stock answers such as cheap labour, cheap goods, more raw materials or easy to repair (zero marks), the majority recognised that the manufacture of hand-made chairs would provide **employment/jobs, better quality of life, learned skills, foreign investment** and so on, any of which would gain a mark.

Q18 This question focused upon a wooden child’s rocking horse, covering Life Cycle Analysis, product analysis, safety checks and planned obsolescence. Generally, this question was well answered, averaging 10 out of a possible 15 marks.

Q18(a) This question related to Life Cycle Analysis, and asked candidates to fill in blank boxes to complete the LCA table. This was well answered, with many candidates gaining full marks for the four expected responses. It is accepted that there are differing versions of a LCA, and it is possible that “Design” may be found in one of them, but this was not considered awardable here; suitable answers to our model were **raw materials/obtain raw materials; manufacture/assembly/process raw materials; distribution/warehousing/selling/buying; product use/product life**.

Q18(b) This question related to the features to be found on the rocking horse that the designer has incorporated to make the toy safe to use. This was answered very well, with only a small minority scoring zero (mostly No Response, or those who did not read the question at all). There were many features that could be identified, but for the full 4 marks the feature had to be coupled with a reason for the feature being incorporated. The mark scheme is quite clear in this regard, and below is an example of an excellent and typical 4 mark answer.

(b) Describe **two** ways that the designer of the rocking horse has considered safety of the user.

1 There is a back rest - to prevent the user ^{sliding} ~~sliding~~ back off of the ^{horse;} ~~chair~~ and hurting themselves.

2 There ^{are} ~~are~~ handles to hold onto to help keep me ^{on} ~~in~~ the horse, and provide grips to help rock me ^{with} ~~with~~.

[4]

Q18(c) This question related to safety checks which could be carried out on the rocking horse **during** manufacture. This form of question has arisen in previous papers, and candidates continue to answer this question as if the toy had been completed and was being tested/evaluated. Thus, descriptions of load-bearing tests, stability whilst being ridden and longevity were not deemed suitable for awarding. Some checks were thought acceptable, despite the fact that they could be considered to be evaluation checks, such as looking for loose components, no sharp edges, no splinters, etc, as these could equally be carried out during manufacture to safeguard the health of the employees. Good and unambiguous answers are, “**joints cut accurately, small parts are fixed firmly, the quality/strength of the materials are of a suitable quality.**”

Q18(d) This question related to limited product lifetime, and asked candidates to define the term. Many candidates managed good answers to this question, and a good proportion achieved full marks. A few responses made reference to a product becoming unfashionable, or being outgrown by the user, but these were not considered applicable to this term. A typical answer would be, “**Planned** (1) **obsolescence** (1) where a product would not last very long and a **replacement would have to be purchased** (1).

Conclusions

- knowledge of subject improving
- knowledge of some specific areas (outside the “main-stream” 6Rs) less evident
- analytical capability/ability to identify design features improved
- ability to “compare and contrast” two or more products/materials less sound
- writing quality poor
- clear understanding of written instructions not always evident

A563 Making Quality Products

Introduction

Numbers have remained very positive for this unit with most entries in the summer moderation period rather than in January. Whilst this specification clearly has advantages in having the option of two assessment periods for candidates, it is interesting to note that the majority of the centres still apparently prefer to see this examination as a linear assessment.

It can therefore be concluded that centres see this particular unit as the second controlled assessment project even though they can be taken in any order to suit the requirements of the candidates.

Centres should be aware that the focus of this unit should be on the making of a quality product and therefore within the 20 hours of controlled time, the majority of this period should be used by the candidates to produce the product rather than portfolio of design work.

In this unit of work candidates will be expected to further develop skills and abilities gained while undertaking Unit A561 in order to design and make a fully functioning quality product. Our advice would be to encourage candidates to consider their own needs/requirements or those of an identified user group, as well as the situation in which the product will be used when selecting a suitable theme for their project from those listed in the specification. It should be explained that the type of project selected needs to be challenging, but realistic in terms of the resources and time that is available.

Centres are also required to ensure that candidates do not pursue the same 'theme' for their work as submitted or intended for submission in Unit A561. A full list of themes for each unit of work can be found on the relevant pages of the specification.

Administration

There were a number of issues this year with centres taking longer than the time stated on the sample request forms to send back the work to the moderators. In some cases this delayed the moderation process and centres are reminded of the need to be as prompt as it is possible in sending off the work to the moderator.

Centres also used the full range of options to present candidates work and portfolios were sent for moderation in paper, repository or e-portfolio formats. It is worth noting however that although the work produced by each individual candidate is expected to be in the same format throughout centres may wish to use more than one method overall.

Many centres supplied separate notes to those on the Controlled Assessment Cover Sheets for each candidate along with a CSF form with the sample of work that had been requested which in all cases helped the moderation process.

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

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. Again some of the more common issues which affected candidate's achievement included.

- The presentation and annotation of the design ideas was of a more limited quality and this was not reflected in the marks awarded by a few centres.
- Little evidence of suitable modelling techniques being employed that would support the development of the design ideas.
- The lack of formal detail (written notes) to support the marks awarded on how they overcame technical problems in the making.

Designing

This assessment strand has three separate marks than can be awarded –

- *An appropriate and considered response to a brief and a detailed specification for a product produced as a result of analysis.*

The majority of candidates provided a suitable “response” in terms of the content of the work that they presented in this assessment strand having previously identified their own brief from those themes stated in the specification. However, there are still some candidates who provide far more information than is required to fulfil the assessment criteria as much of their work is lacking in the focus and direction expected.

Centres are advised to look carefully at the allocation of marks in this section of the portfolio as an indication of the amount of work that should be produced by the candidates. The advice that we would offer would be to show this response in about two sheets of work.

By editing the work evidence in support of a considered response could possibly include –

- Sizes of any items important to the design of the intended product.
- Relevant design features of other similar products.
- The needs of the intended user group.
- The nature of how and where the product is likely to be used

However, there has been a great variation in both the quality and content of the design specifications seen in the portfolios with a lot of very generic or vague statements being given that could apply to any product rather than specifically to the design that candidates wish to produce. The advice would be to produce this list of specifications as a series of bullet points that are relevant to the product being produced and which reflect the information presented in the creativity section of the portfolio.

- *The production of a range of creative design ideas using a variety of techniques.*

Freehand sketching is still the most popular method used by candidates to illustrate their initial design ideas with annotation which varied both in terms of content and quality. In this cohort of entry there was further evidence of CAD being used to support the development of the final design with Google “sketch up” proving to be the most popular software used by the candidates.

The standard of work seen where candidates had used this effectively was very encouraging as it provides a high standard of presentation and visual support in developing the candidates design ideas.

However, there are still some centres that have not understood the need for 2D and 3D modelling to be included as part of this process and are awarding high marks as part of the marking for this assessment strand without there being any real evidence in the portfolios to support this requirement.

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.

- *The use of detailed drawings and annotation to communicate these ideas.*

The final mark in this assessment strand should be used to indicate how well the candidate has communicated the details of the product they have chosen to produce for this unit. In some cases it was difficult to see any evidence of the final product as candidates moved straight from a series of design ideas onto the planning required for production. Higher achieving candidates were able to provide details of construction, sizes and materials at this stage of their portfolios which then helped them to produce a suitable plan for construction of the chosen product.

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

There are three main requirements in this assessment strand that the candidates need to address –

- *The planning and making of a Quality product.*

The planning that was seen in the portfolios varied considerably in content and detail with a few centres giving very high marks for the quality of the making assessment even though the planning provided by the candidates was felt to be very limited. 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.

Centres are also appearing to be more realistic in their expectations due to the obvious time constraints in this unit of work and although there were still some very ambitious projects attempted these were far fewer than in previous cohorts.

It should also be remembered that where candidates use CNC techniques to produce the final product they should be used in conjunction with other construction methods as stated in the specification guidance. Further reference to this issue is also made in the report for unit A561.

Centres need to be more aware of the importance of the marks in the following two assessment strands as the six marks that can be awarded for evidence of this work is equal to the current grade boundaries for this unit.

- *Recording the making of the product.*

Some centres appeared to assess this work without using any discretion towards the statements in the mark scheme when it came to judging the details provided by the candidates. The work presented to record the key stages of making was in many cases limited and was usually just a few written notes. Our advice would be to provide photographic evidence to support this process and where this was evident and detailed many of the candidates were able to achieve full marks for this assessment.

- *Details of how they overcame any technical problems in the making of the product.*

Centres attention is also drawn to the requirement that in order to achieve the marks that can be awarded for identifying how the candidates overcame technical problems they must provide evidence of this in their portfolios. Out of all the assessment strands in this unit this was the one indicated by moderators as needing the greater number of adjustments. Our advice would be to ensure that candidates clearly state these issues in the record they make of producing the product or on a separate sheet in their portfolios.

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

With the requirement here to evaluate the function of the product as opposed to the design processes as in A561 it was encouraging to note that there were far fewer recommendations to adjust centre marks.

By evaluating their products firstly against the specifications candidates were able to base their conclusions on the product and how it functioned having previously conducted a series of tests to see how it performed in use. From this they were then able to suggest modifications through notes and detailed sketches.

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

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. This is characterised by so many candidates who thought that mild steel did not rust and that acrylic was 'strong'.

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

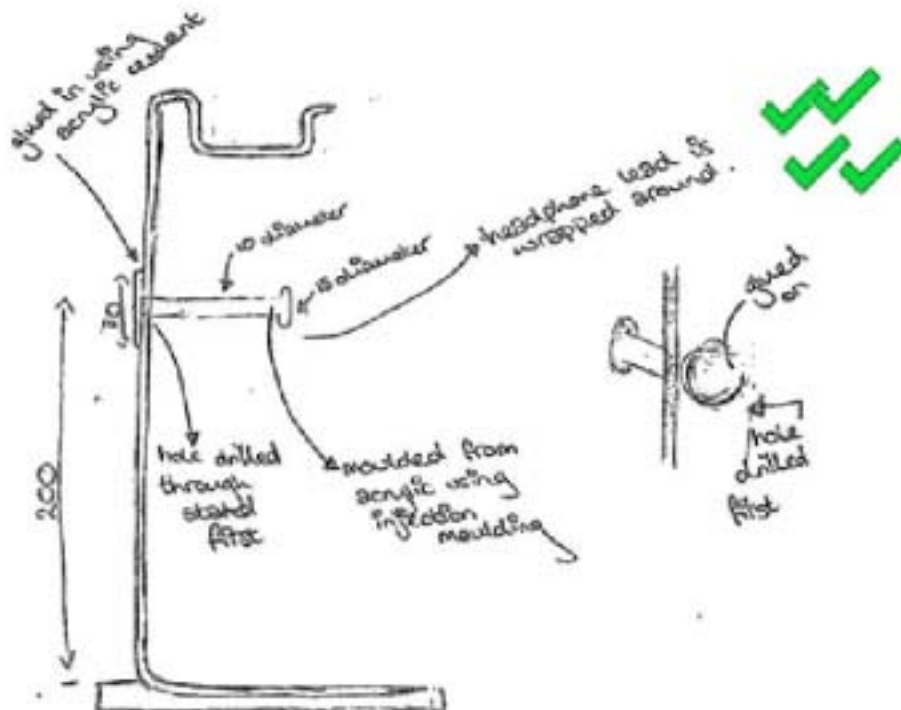
Question 1

This question tested candidates' practical knowledge of working with acrylic sheet.

- (a) Many candidates were able to state a performance characteristic for acrylic; the most common answer being its ability to be shaped.
- (b) Many candidates understood that a scribe would leave a permanent mark or that it could weaken the material. Answers that referred to it being easier to see were incorrect.
- (c) Many candidates understood that it would be more awkward to finish the edges after it was bent or that it could result in damage to the acrylic.
- (d) The majority of candidates gave good reasons for making a model of the headphones stand; the most common being to check the sizes, to check if the stand was stable and to save the expense of making a mistake when using acrylic.
- (e) Very few candidates gained maximum marks for this question about COSHH. Answers that included a reference to safety gained a mark while those who stated what the abbreviation meant also achieved a mark. The best answers, like the one below, included safety, a danger and a way of minimising it.

..... An understanding of COSHH allows the manufacturer to
understand and undertake the necessary safety requirements
when using acrylic cement, ~~to use~~ a toxic substance
for example, the manufacturer should wear gloves [3]

- (f) Many candidates gained marks for showing a modification to the headphones stand. Often, potentially good ideas lacked clarity or failed to include details of materials, sizes and constructions required in the question. An innovative design is shown below.



[4]

Question 2

This question tested candidates' practical knowledge of working with mild steel. Generally, candidates' knowledge and understanding of this resistant material is extremely limited.

- (a) Some candidates provided good reasons for mild steel being suitable for the guitar stand; the most common referring to is durability, ease of working, ability to be joined and that it could take a variety of finishes. However, it was disappointing to read answers stating that mild steel doesn't rust or that it was lightweight.
- (b) Most candidates were unable to provide two reasons for using a centre punch to mark the hole to be drilled. Many thought, incorrectly, that it would show the mark more clearly. The best answers referred to it providing a guide for the drill or that it would result in a more accurate hole being drilled.
- (c) It was evident that many candidates had no knowledge whatsoever of the brazing process. Those candidates who understood brazing were able to achieve the four marks for providing four main stages

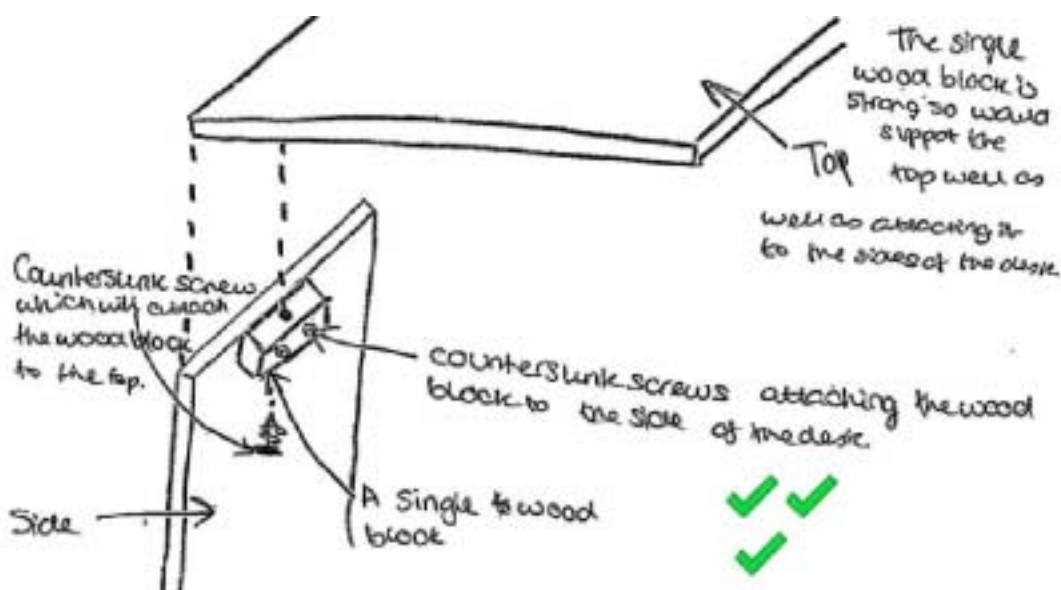
1. The legs and support needs to be cleaned with an emery cloth ✓
2. Flux needs to be applied ✓
3. They should both be heated to till glowing red ✓
4. A brazing rod with a lower melting point is used to join them. [4] ✓

- (d) Many candidates achieved marks for this question. The majority of answers involved the use of a nut and bolt as a pivot. To gain the maximum five marks tightening had to be carried out without the use of tools. The most innovative designs included a knurled surface or use of a wing nut. Questions requiring sketches demand a level of clarity so that examiners can understand what the candidate is trying to communicate.

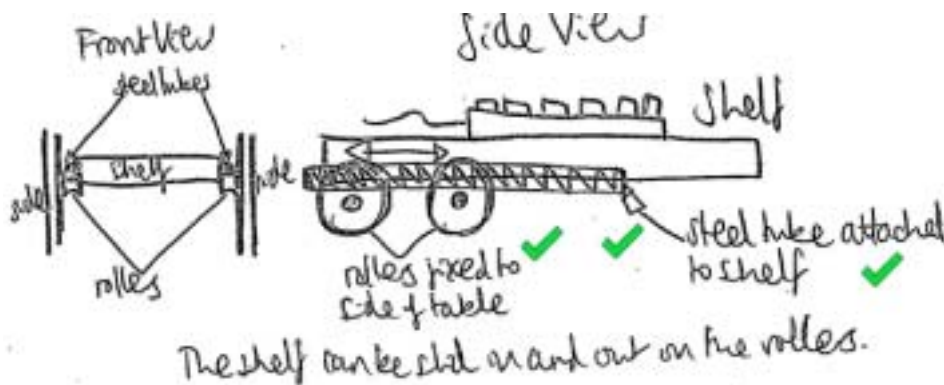
Question 3

This question tested candidates' practical knowledge of flat-pack furniture.

- (a) It was disappointing that many candidates were unable to show a suitable KD fitting for the computer table; the most common being some form of corner or modesty block. Many candidates drew a dowel joint which, although often used with flat-pack furniture, does not provide a complete KD joint. Only partial reward was given for this answer. There were also answers including the use of screws. These were not rewarded.



- (b) Many candidates attempted to show either a pre-manufactured set of 'runners' or grooves or applied beads in between which the shelf could slide in and out. The main reason why most candidates did not achieve maximum marks was due to the poor quality of sketching and/or clear annotation. The answer below shows excellent details.



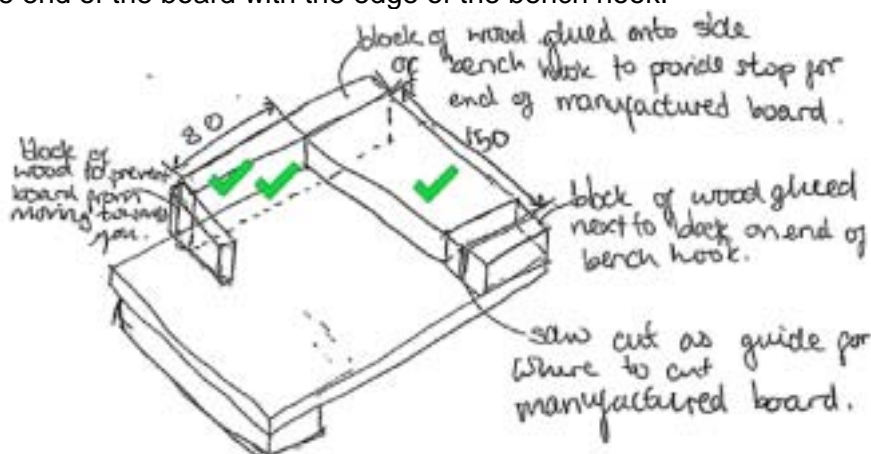
- (c)* Generally very poorly answered.

The most common issues explained for the computer table having a limited life involved the durability of the materials [manufactured board] and the methods of construction. Many candidates considered incorrectly that 25mm thick manufactured board would be weak. Candidates achieving Level 3 generally included more information about fashion and the fact that technological advances with laptops and ipads would render the computer table obsolete. This question does require candidates not only to demonstrate technical understanding but an ability to construct a structured response with a good level of grammar with accurate spelling. Very often untidy handwriting made it difficult to understand what was written.

Section B

Question 4

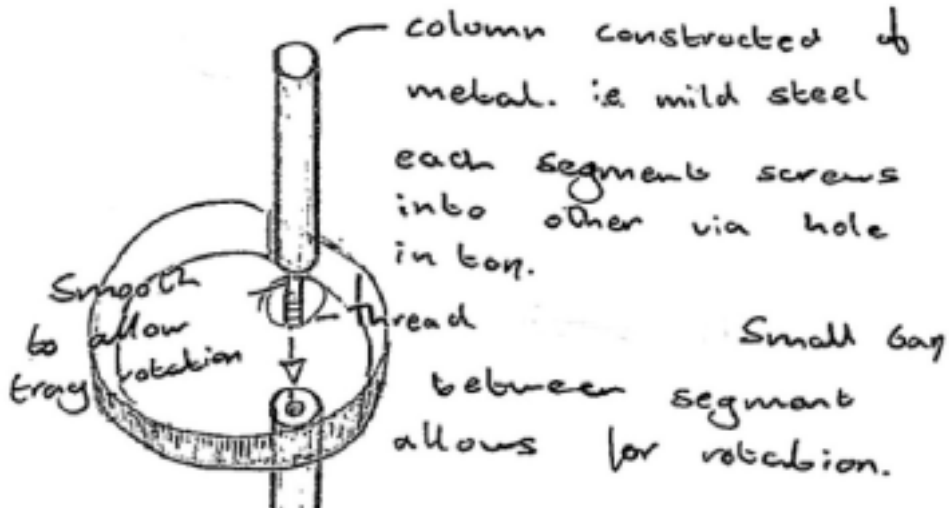
- (a) Very few candidates could provide two reasons for using manufactured board rather than hardwood. The most common correct answer being that it was cheaper. Many candidates thought, incorrectly, that manufactured board was lighter, easier to work or that it wouldn't hurt children if they were struck with it.
- (b) Many candidates were able to name and sketch a suitable corner joint. The name and the sketch did not always correspond. The most common joints included lap, mitre, dowel and finger [comb].
- (c) There were some excellent modifications drawn showing how the bench hook could be used as a jig. Many candidates realised that the 'hook' could be made to 150mm, the length of each domino. The best designs, like the one below, included the use of a 'stop' up against which the manufactured board could be positioned. Many candidates simply lined the end of the board with the edge of the bench hook.



- (d) This question tested the candidates' knowledge and understanding of CAM. Many answers started with the use of CAD to design the coloured dots, then to transfer the data to a CNC machine. Because the question asked candidates to explain how CAM could be used, only one mark was allocated to this preparatory stage. Many candidates named '2D Design' and a variety of CNC machines. Use of a laser cutter was popular but candidates are reminded that reference to this or any CNC machine must be supported by additional details of set up etc. Such details were rarely seen.

Question 5

- (a) The vast majority of candidates gained a mark for giving one benefit of reusing products.
- (b) The vast majority of candidates provided an example of where dimensional accuracy would need to be considered during manufacture of the desk tidy.
- (c) Answers to this were very disappointing. Candidates were given the opportunity to select a material of their own choice for the column and subsequent method of fixing. Many candidates noted that something was needed below the trays but generally did not show their idea clearly enough or provide written notes describing how it would be fixed to the column. The excellent solution below shows clearly what is being fixed and how.



- (d)* Marginally better than responses to Q.3(c)*. There were some very good structured answers explaining the benefits of moulding processes. However, these were in a small minority. The best answers included reference to specific processes, the most popular being vacuum forming and injection moulding. The benefits included speed of production, scale of production and repetitive accuracy. Some answers included the benefits of intricacy of shape and that moulding replaced fabrication. The same specific comments about Quality of Written Communication made to Question 3(c)* also apply this question.

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