

Design and Technology: Resistant Materials

General Certificate of Secondary Education **J306**

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

Examiners' Reports

June 2011

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

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

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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 second 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. i.e. 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:

A512 Electronics and Control Systems
A522 Food Technology
A532 Graphics
A542 Industrial Technology
A562 Resistant Materials
A572 Textiles Technology

The overall performance and range of results for Unit 2 was similar to the last examination session – January 2011. 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. Performance however, across the subject specialisms is still varied.

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

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 G.

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.

Candidates need to be made aware of the importance of the wording of each question and they need to understand the difference between terms like 'name', 'discuss' and 'explain'. Many candidates did not score full marks on the 6 mark extended response or discuss questions, because they gave a list of unrelated points instead of developing one of these.

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. Few candidates were able to do this really well, but most candidates did score two or more marks from the six available for this question.

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 the following subject specialisms:

A514 Electronics and Control Systems
A524 Food Technology
A534 Graphics
A544 Industrial Technology
A564 Resistant Materials
A574 Textiles Technology

Candidates responded well to the Unit 4 examination papers across the Innovator Suite. The papers were accessible to the majority of candidates, although there was still a small minority of candidates who did not attempt any of the questions at all.

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

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. Practice of previous questions is extremely valuable to help candidates become more confident.
- **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 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

Unit 1 – For this examination series of the Innovator suite entries were seen from the following subject specialisms:

A511 Electronics and Control Systems
A521 Food Technology
A531 Graphics
A541 Industrial Technology
A561 Resistant Materials
A571 Textiles Technology

Unit 3 – For this examination series of the Innovator suite entries were seen from the following subject specialisms:

A513 Electronics and Control Systems
A523 Food Technology
A533 Graphics
A543 Industrial Technology
A563 Resistant Materials
A573 Textiles Technology

This examination series has seen portfolios for all subject specialisms 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. It is important that centres forward form CCS160 in particular to moderators.

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

In general, centres have been successful in applying the marking criteria for both Units 1 and 3. However, it is still 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 which may mean allocating marks across the assessment grid. For each of the marking strands, one of the descriptors provided in the assessment 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 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.**

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'.

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 individuality, flair and creativity, and therefore achieve the higher marks. Centres should avoid over-reliance on writing frames for candidate's work which, while assisting struggling candidates, clearly will affect the ability of able candidates to show their skills and thus gain high marks.

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 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 need to ensure that all research work undertaken for units 1 and 3 is related to the chosen theme/starting point.

Centres need to be more vigilant when awarding marks for SPAG in the Critical Evaluation and allocate the available 8 marks accordingly.

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 each unit – 20 hours.

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.

Unit 1 – specific areas of importance

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

It was evident this session that candidates are producing either too little research or too much research as an appropriate response to a brief. Care needs to be taken here.

Centres are to be commended on the quality of the work seen in this unit and the balance candidates have been able to achieve between the designing and making criteria.

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 product.

A561 Introduction To Designing and Making

Introduction

This summer has seen a high number of entries for this unit with candidates having been entered from both year ten and eleven. This is encouraging to see as quite a number of centres are now taking advantage of the structure offered by this specification in having the alternative of two assessment periods to enter the work of their candidates.

As result of this moderators were able to see a wide variety of work, from a number of different centres, with some of the work at the higher end of the assessment levels showing excellent standards of presentation and creativity.

However, 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 centres 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 for Design Technology Resistant Materials.

Centres are also reminded that one of the main requirements of this unit is to design and make a prototype product primarily constructed using 'Resistant Materials'. In this way it was never intended to be a continuation of the projects previously produced for the legacy specification but an opportunity for the candidates to show some creativity in their work. In some centres these expectations have not been addressed.

Administration

Centres presented the candidates portfolios for moderation as 'traditional' paper folders, e-portfolios or through the repository. It was also noted that in this cohort of entry a greater proportion of candidates work seen was as e-portfolios either sent on CD's, memory sticks or on the repository.

Where there were difficulties in administration they were focused upon the fact that some centres did not supply sufficient photographic evidence of the completed prototype product. Centres are reminded that it is their responsibility to provide at least two clear photographs of the end product in the candidate's folders. 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.

It is also worth noting that the assessment statements are now used as 'best fit' descriptors when applied to the candidates work and marking should be applied positively. 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.

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 –

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** from their analysis. Presenting examples of these products with just a basic description taken in many cases from a commercial catalogue is not what is required in this assessment strand.
- Candidates **not editing research information** and providing summary conclusions as to what they had learned from producing these materials.

Designing

- 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 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

Centres are again advised to prepare candidates prior to starting the controlled assessment on how to present the work required for the creativity section of this unit. 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.

This assessment strand has therefore presented a variety of concerns to the moderators as a number of centre's have still not fully understood the requirements of this section of the portfolio and they are almost teaching what they think should be included and then trying to adapt the mark scheme to their interpretation of the content. This has resulted in a number of scaling recommendations as the candidates have seemingly just been made to go 'through the motions' rather than focusing on what the specification requires and being taught how to edit information to show how they have identified trends or design features from their research work. 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.

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 in this assessment strand should be able to analyse their design brief and the conclusions that they made from their previous research before producing a detailed specification for their own prototype product. Centres are reminded to be aware of the instructions relating to controlled assessment when providing 'prompt sheets' to aid the production of specifications.

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. However, in some portfolios there was no list of specifications or the candidate had included a lot of very generic or vague statements that could have applied to any product rather than specifically to the design that candidates wished to produce.

Most candidates used freehand sketching to illustrate their initial design ideas with basic annotation, which sometimes provided little in terms of detail or explanation. In other cases candidates had combined a variety of presentation techniques to develop their design ideas towards a working prototype product. In these folders the quality of the work produced was a delight to see and moderators were very encouraged by the standards of work being produced in a number of centres which have encouraged the candidates to show some creativity in their design thinking.

Modelling was also used by a number of candidates to make informed decisions about materials and construction techniques and to show how the product had been developed from their earlier designs. However, some centres seem to ignore this requirement completely or the standard of the work that was produced was of such a low quality it could not, in all honesty, have supported this process and the high marks awarded for this aspect of the work. Centres are again reminded that modelling is necessary requirement of this assessment strand and it is essential that candidates include evidence of modelling work in order to gain full credit for their design work.

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 focus of this unit should be based upon an introduction to designing and making and therefore it remains a concern that in some centres the details given in the specification have clearly not been understood due to the size and complexity of the projects presented for moderation. Expecting candidates to complete large coffee tables or side cupboards is unreasonable in the 20hrs allowed for this unit but it appears that these centres still appear to view the controlled assessment units in the Innovator suite as being two similar units of work. Can we please state again that it has never been the intention of the examination board in this specification to expect candidates to complete two 'coursework' type projects for controlled assessment?

Candidates are also expected to show a variety of construction techniques in the making of the prototype product. Where candidates then use CAM to complete the product centres should be aware by now that there also needs to be evidence of other processes used in conjunction with this in order to comply with the requirements of the assessment criteria. The use of screen shots or CAD drawings to show 'ownership' of this process should be encouraged as in some cases the final solution seemed to 'appear' without any supporting evidence given by the candidate in the folder work.

The majority of candidates had planned the stages of making their product to some degree or other before starting to make the prototype. Centres are reminded that the assessment of this work should be taken into account when deciding upon the overall mark to award for the making process as candidates cannot be awarded the highest marks if this work is not evident in the portfolio.

The work presented to record the key stages of making was in many cases limited and was usually just a few written notes. Photographic evidence is also required to support this process and where this was evident and detailed many of the candidates were able to achieve full marks for this assessment.

Centres are also awarding marks for how the candidates overcame any technical difficulties without there being any formal evidence recorded by the candidate. This resulted in a number of adjustments having to be recommended during the moderation process and our 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

Although there was evidence that a lot more centres have now focused their work to reflect the specification requirements for this assessment strand it is still disappointing to see candidates who have based their evaluation on their prototype product and how it functioned rather than modifications to improve the designing and making process.

It should be noted that with the grade boundaries much closer together than in the previous legacy specifications a candidate's performance in this assessment strand can have a significant effect on their achievement especially if an adjustment is recommended by the moderator.

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

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). 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

Introduction

Overall, the paper was clearly accessible for the candidates with the majority of the candidates able to attempt and gain marks in all questions.

The spread of marks achieved was consistent with previous examination series. Some candidates scored well over 50 marks (out of a possible 60) and very few scored less than 5. Over one third of candidates scored half marks (30).

Section A

Questions 1-5

These questions require candidates to select the correct answer from 4 possible answers. One mark was available for each question. Some candidates let themselves down by ringing more than one answer or by not clearly deleting one ring when a change of mind occurred. Candidates should be made aware of the necessity for clearly defining their answers.

Q1

This question was well answered with almost 100% of candidates achieving one mark. Products are safe and fit for purpose is one of the aims of the BSI resource listed as the correct answer.

Q2

This question was equally well answered with a majority of candidates achieving one mark. The impact of human activities on the environment was the only correct answer.

Q3

Few candidates found this question challenging, with almost 100% achieving the one mark available. To be as environmentally friendly as possible is the purpose of eco-design.

Q4

This question showed that most candidates had seen the CE mark, but probably only on electrical equipment, as many of the answers related to (d) – can be connected to an electricity supply. Meets a safety standard was the correct answer.

Q5

Surprisingly at this stage, candidates are still not recognising non-renewable energy sources. Many candidates suggested answers other than Gas, the correct response.

Questions 6-10

These questions require candidates to respond with written answers of a single word or short sentence. One mark is available for each question.

Q6

The large majority of candidates were able to provide synonyms to the given 'repaired', most going for some form of 'fix', 'fix it' or 'fixed'. A few related their answer to non-resistant materials, which were not credited; nor was any answer that suggested an improvement or an upgrade to the original.

Q7

Many candidates answered this question correctly, but there were an equal number who judged that the question related to the manufacturer profiting from forward planning and not understanding the concept of obsolescence.

Q8

Although this question was attempted by all candidates it was clear that this symbol has not been encountered by many candidates. Most candidates went for the obvious 'magnetic'. Only Recyclable steel was accepted as the appropriate answer.

Q9

Many candidates are now aware of the nature of biodegradable materials and their effect upon the environment.

Q10

Many more candidates are now able to differentiate between environmental harm and specific damage to the ozone (O₃) layer – although some still went for the vague 'harms the environment' style of answer.

Questions 11-15

These questions required candidates to choose between a 'True' or 'False' response to a given statement. Many candidates lost marks by unclear ticking of the correct box, or in some cases, ticking both boxes on the same line. Centres should advise candidates to read the questions carefully before committing an answer to paper.

Q11

There still seems to be a lack of knowledge relating to primary, secondary and tertiary recycling, despite the definitions being well documented in the supporting textbook.

Q12

COSHH regulations appear to be familiar to many candidates. The majority were able to identify particulate pollution as being a hazard falling under the COSHH umbrella.

Q13

Most candidates have clearly studied life cycle analysis/assessment and they recognised the context of this complex statement.

Q14

The preponderance of 'bio-products' on the market ensured that the majority of candidates gave the correct answer

Q15

The majority of candidates recognised that this statement is true.

Section B

These questions enable candidates to draw upon their knowledge base and present their answers in a more open format than Section A allows. The candidates are also advised to spend three times as long on this section than on Section A. Centres are advised to remind their candidates that they should spend as much time as possible on this section; too many candidate scripts were seen where the last three or four question parts were unanswered.

Q16 (a)

A great majority of candidates managed at least one mark, but there were too many references to the strength of the electrical fitting or the flex attaching the fitting to the ceiling, neither of which is within the powers of the manufacturer to control. The shade is lightweight in construction, so falling off the fitting and harming a person under it were also not acceptable.

Q16 (b)

Candidates are familiar with flat-pack items on a day-to-day basis, so gaining some marks in this question was a relatively simple exercise; gaining all four was less straightforward, however. Candidates failed to recognise that the question is worth 4 marks and thus did not provide the degree of explanation necessary

Q16 (c)

Appropriate responses were given (and a few imaginative ones) in terms of promotional literature, special offers and incentives as well as dire warnings if the product were not recycled. Most acceptable responses revolved around the manufacturer giving recycling/reusing information as well as the simplistic 'print recycling symbol' somewhere on the product.

Q16 (d)*

This question allows the candidates to show the quality of their written communication skills while responding with appropriate technical information. Few candidates, however, took the opportunity of the full page to provide convincing discussion on the impact of landfill disposal or incineration. A number of responses talked about the decomposition of plastics causing the evolution of gases, thus negating their previous point relating to the fact that plastics do not usually bio-degrade. Many candidates' responses rapidly degenerated to discussion of recycling, which was not the focus of the question. It was pleasing to see that fewer candidates than last session provided bullet point responses – which, while possibly showing the range of knowledge, do not allow candidates to reach above Level 1 of the banded mark scheme (max. 2 marks). Other candidates let themselves down by intrusive poor spelling, grammar or punctuation, never rising above Level 2 (max. 4 marks). However, there were candidates for whom the six marks available were easy to award, and their responses showed evidence of a great deal of verbal skill.

Q17 (a)

It was clear that many candidates had not considered the evolution of products from their origins to the present day (Specification: Design Issues – examine the way that designers respond to ... changing technological advances ...). Most candidates were able to identify the basic design differences between the two barrows, but were unable to draw out the historical reasons which underpin these changes.

Q17 (b)

As in 17a above, candidates used the same tactic of identifying similar features but not justifying them.

Having stated the above for 17a and 17b, the majority of candidates were able to achieve at least one mark, and nearly half the candidates managed half marks in each part.

Q 17 (c)

Approximately one third of the candidates achieved full marks, indicating that their understanding of ergonomics has improved from previous sessions. There were, however, references to economic – rather than ergonomic – issues; centres need to instruct candidates in the difference between the two, possibly by the use of practical, hands-on examples.

Q17 (d)

Those answers that showed that the candidate understood the point were well written and indicated that candidates are aware of the differences between – say – oak or beech and mahogany or teak, and the manner in which they are grown and harvested.

Q17 (e)

Little understanding of injection moulding was evident, many of the answers pointing to cost, pollution, energy saving or moulding size.

Q17 (f) (i), (ii)

Many candidates did not recognise that a reference to a relevant human *measurement* is required for marks. Mention of hand, arm, and height was not enough.

Q18 (a)

The majority of candidates achieved at least one mark here, but it was disappointing that few gained full marks. There were many vague references to the design being 'tribal' or 'cultural' without explanation. Few were able to relate a cultural influence (religion, art, and people's beliefs) to a design or product.

Q18 (b)

An understanding of aesthetics is quite clearly improving, although many responses referred to size, or the material from which a product may be made. As the question is specifically focused upon the pendant, such senses as smell, taste and hearing were inappropriate.

Q18 (c)

This was exceptionally well answered, with over $\frac{3}{4}$ of candidates gaining at least one mark. Understanding of the requirements of ETI was very evident, even at the lowest level of response.

Q18 (d)

Many candidates did not take notice of the wording, 'State *the* two key components of risk assessment.' and simply noted *any* two risk-associated actions

Q18 (e) (i)

Few recognised the European Eco-label; (EU Eco-label; European Eco-logo; EU Eco-logo also acceptable)

Q18 (e) (ii)

Candidates were able to determine the significance of the symbol – albeit vaguely. A number gave CE, Fairtrade and FSC definitions, or talked about European standards, or discussed manufacture in Europe, none of which was awarded.

General Conclusions

Section A

These questions were almost always attempted and generally well answered.

Section B

Some answers showed that the question was not considered carefully enough.

It was clear that many centres have carried out little work in relation to *evolution* of design or cultural *influences* upon design, and candidates are not able to evaluate products except to state the obvious points (size, colour, material); This is fundamental D&T process : identifying particular design features of the product and considering how successfully they meet the needs of the user. Comparing a new product with its predecessor can be a simple, quick and exciting

classroom activity in D&T, with different products and different presenters, as a way of developing product analysis skills.

Many of the technical terms and environmental references that could be woven into an answer for Q16d* are scattered throughout the specification, and must have been covered in a classroom activity at some time. Too many responses degenerated into notes relating to recycling (not required) and degradation of – and toxic effluent from – non-degradable plastic. For this kind of extended writing task, candidates could be encouraged to write three paragraphs for their answer: within each paragraph identify one specific issue, and use specialist terms, accurate spelling, punctuation and grammar to analyse and exemplify the issue as a balanced argument with some form of simple conclusion. In any event, reading the question and then reading their answer **MUST** be rigorously emphasised in 'mock' exams and classroom activities.

Q18 was generally well answered overall, with the exception of 18a. Insufficient knowledge/experience of cultural influences is evident – surprising in today's multi-cultural society. It should be possible to use of cultural artefacts, carrying out the same product analysis as would be imposed upon a toaster or mp3 player.

It is empirically felt that this examination has shown that candidates have a greater understanding of the specification than before, and that centres are providing an environment where aspects other than the '6Rs' are being taught and learned. However, there still remains the fact that too many candidates let themselves down by incorrectly reading the question, or selectively responding to just some of it.

A563 Making Quality Products

Introduction

This summer has seen the third entry of students for this unit in the new Innovator specification and the number of candidates entered continues to rise in proportion to those for Unit A561. Many centres appeared to have entered their candidates at the more 'traditional' period at the end of year eleven and therefore appear to be viewing this unit as the second controlled assessment project even though they can be taken in any order to suit the requirements of the centre.

Centres may also wish to be reminded that they need to ensure that candidates do not pursue the same 'theme' for their work as submitted or intended for submission in Unit A561. Full lists of themes, which represent a high level of control, are provided in the main specification documents for this subject.

On a positive note it is good to report that there were no major issues with regards to controlled assessment reported for this unit and that the work seen by the moderators was generally felt to be of a good overall standard. This may be as a result of the focus of this unit being on producing a quality product which possibly reflects the more 'traditional' approach seen in the legacy specification.

Centres should be aware that 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 candidates to produce the product rather than the portfolio of design work.

Administration

Centres used the full range of options to present candidates work and portfolios were sent for moderation in paper, repository or e-portfolio formats, with 'PowerPoint' being the most common presentation method used in the e-portfolios. For postal entries it is worth noting that although the work produced by each individual candidate is expected to be in the same format throughout the design folder, centres may wish to use more than one method overall.

The moderation process was helped by centres supplying separate notes, if appropriate, to those on the Controlled Assessment Cover Sheets.

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 good response from the centres that had entered candidates for this unit although some of the work that was presented in the initial designing strand was either lacking in focus or content.

Projects are becoming far more realistic in terms of reflecting the time limit of 20hrs for this unit and it was generally felt that candidate's time was being focused sufficiently upon the production of a quality product. Centres seemed to have the 'balance' of the work more in the right proportion in this unit. However, some of the more common issues which affected candidate's achievement included –

Designing

- Producing **either too much work or too little** in the initial assessment strand for the four marks that are available. It needs to be **edited and focused** upon the theme chosen for this unit.
- The **presentation and annotation of the design ideas** was in some cases felt to be of a limited quality and this was not reflected in the marks awarded by the centres concerned.
- **Little evidence of suitable modelling techniques** being employed that would support the development of the design ideas.

Making

- The lack of **formal detail** (written notes) to support the marks awarded on how they overcame technical problems in the making. As in unit A561 centres are rewarding the candidates in this assessment strand purely on what they have observed rather than evidence provided by the candidate in the portfolio.
- Limited **written notes** to support the **photographic evidence** of the key stages in making the product.

Designing

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, in some cases the quantity of work that was presented had not been edited or focused sufficiently on the chosen theme for this unit. Centres should not be expecting candidates to present similar quantities of work in this initial assessment strand to those seen previously in the legacy specifications.

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 concise and focused work.

Most of the candidates used freehand sketching to illustrate their initial design ideas with some annotation which varied both in terms of content and quality. In this cohort of entry there was again evidence in the portfolios of CAD being used to support the development of the final design especially the use of 'sketch up' software which is available from the internet.

Some centres have not, however, understood the need for modelling to be included as part of the designing process. In some cases high marks had been awarded without there being any real evidence to support this.

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 in this cohort of entry was generally good across the full range of abilities. Centres are starting to become far more realistic in terms of their expectations due to the obvious time constraints in this unit of work although there were still some very ambitious projects being attempted. It is worth stating again that it is the quality of the project that should be assessed rather than its overall size.

Centres are, however, reminded again 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. Candidates should also provide some evidence of 'ownership' of this process in the portfolios as in some cases it was difficult to determine if they, or a technician, had made the product.

The planning that was seen in the portfolios varied considerably in content and detail with a few centres giving 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 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 again the one indicated by moderators as needing the greater number of adjustments. Our advice would be to ensure that candidates clearly record these issues in the record they make of producing the product.

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 noting that there were far fewer recommendations to adjust centre marks. Exceptions to this comment resulted in centres not reflecting the standards expected for the three levels of response as stated in the assessment criteria.

Candidates based their evaluation on the product they had produced and how it functioned having previously conducted a series of tests to see how it performed in use. They were then able to compare the product to the design specifications and suggest modifications through notes and sketches.

Centres are also reminded that as part of this assessment strand candidates should also be marked on their correct use of specialist terms and accurate use of spelling, punctuation and grammar.

Successful candidates Showed evidence of having tested their completed product in use and compared this to their specification. 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

There were more high quality exam performances in this session than in previous.

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.

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

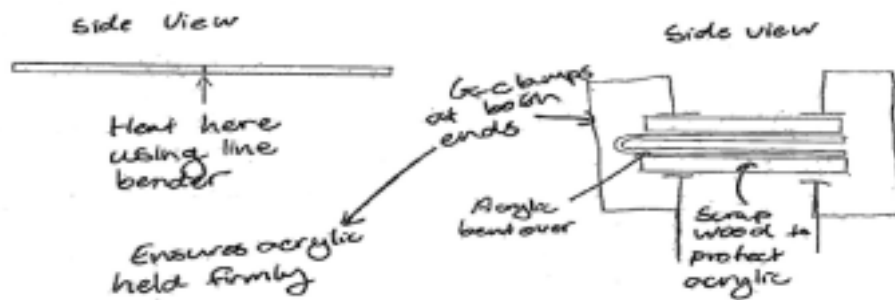
This question tested candidates' knowledge and understanding of some basic techniques using wood and acrylic.

- (a) Most candidates gained marks for naming tools that could be used for marking out, cutting and levelling a slot cut in wood.

Stage	Process	Tools
1	Mark out the slot	pencil, ruler, try square
2	Cut out the slot	tenon saw.
3	Make the bottom of the slot flat	chisel

[3]

- (b) For maximum marks answers needed to include the following: the method of softening the acrylic, the use of a former or jig and additional information about holding and retention. Many candidates achieved some marks but it was often the lack of detail that denied candidates maximum marks.



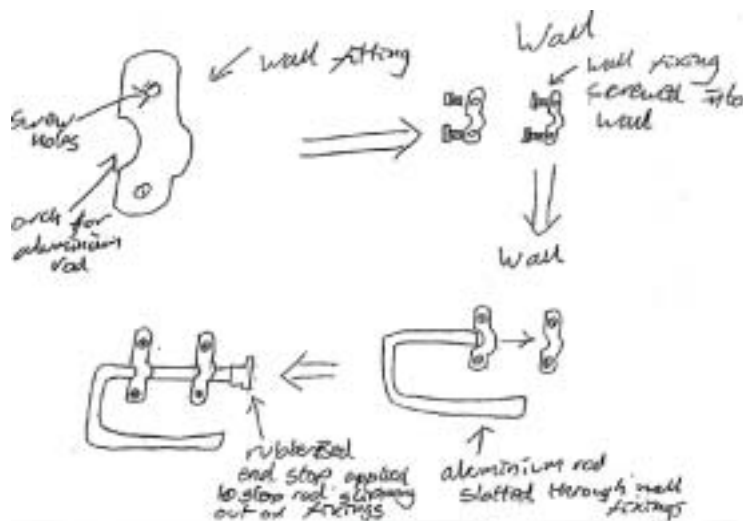
- (c) Many candidates were aware of the processes involved in finishing the edges of acrylic. The use of file, scraper, wet and dry (silicone carbide) paper, polishing mop and compound or polish were often included but there were many answers that included glass/sand paper which is inappropriate.
- (d) Many modifications to the photograph holder involved additional bends to make it freestanding. Candidates were rewarded for a potentially practical idea and then further marks for details of how it could be made. There were some excellent design modifications and details including a development (net) of the modified holder with sizes.

Question 2

This question tested candidates' knowledge and understanding of the properties of aluminium and stainless steel.

- (a) Some candidates correctly described that aluminium is 'self-finishing'. Most answers referred to aluminium not rusting which was accepted.
- (b) The majority of answers recognised the need for some kind of shape around which the rod could be bent. These included bending jigs and formers, use of an anvil and the edge of a vice. There were many answers that included the use of heat to soften the rod. This was not necessary and was not rewarded.
- (c) There were some excellent designs of wall-mounted kitchen roll holders. To achieve maximum marks answers needed to include some sort of back plate that could be attached to a wall, a method of preventing the rod from falling out and details about the materials and/or sizes involved.

It is important that sketches and notes are clear and easily understood so that examiners are left in doubt as to how the holder is constructed and how it could be made wall-mounted.

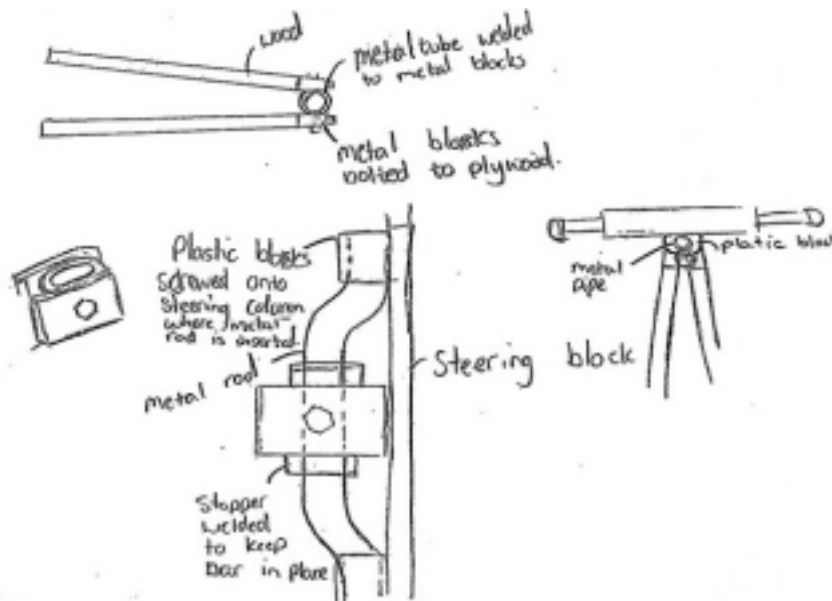


- (d) Stainless steel is more durable than aluminium which is softer. Many candidates simply stated that stainless steel would not rust.
- (e) There were many good reasons provided why consumers would prefer to purchase a wall-mounted kitchen roll holder rather than a freestanding version. Most correct answers referred to it saving space, not likely to get knocked over and easier to use.

Question 3

This question tested candidates' knowledge and understanding of plywood and how it could be joined and fixed as part of a design problem. In addition, a practical knowledge of CAD software was required to produce a set of assembly instructions.

- (a) While there were some good advantages stating that plywood was more stable, less likely to shrink, twist or warp, there was a popular misconception that plywood was 'lighter' than solid wood.
- (b) Only a minority of candidates achieved maximum marks for this question. Many answers showed how the steering column could be joined to the frames but did not allow for any movement at all. Methods included the use of dowel and screws which received limited credit. The best answers used some form of wooden or metal bracket fitted to the steering column and a connecting peg or bolt to allow the toy to be steered. Often a lack of clarity of sketches and technical accuracy of written notes prevented candidates from explaining their ideas effectively.



- (c*) This question required candidates to combine technical knowledge with an ability to present written information in a structured, coherent manner with a high level of spelling, punctuation and grammar.

If candidates present their information as a set of bullet points they can only achieve Level 1, maximum 2 marks. Many candidates simply provided information about types of drawing that could have been produced on a drawing board. Those candidates who referred to software and explained how it could be used to produce instructions gained more reward than those who didn't.

Section B

Question 4

This question tested candidates' knowledge and understanding of quality control, design modification and different manufacturing techniques associated with wood and plastic. Many candidates were unable to distinguish between quality control and the final evaluation of the product.

The question did state '...during the manufacture of bracket A'. However, candidates were not penalised if they could justify their answers across parts (i), (ii) and (iii).

- (a) (i) The best quality control checks related to checking size, squareness and quality of finish.

Those answers referring to testing to support a weight were accepted.

- (a) (ii) Candidates had to describe *how* the check would be carried out. In the case of size it could be simply by applying a rule to measure. A try square or template could be used to check for squareness and a visual check to see if there were any imperfections.

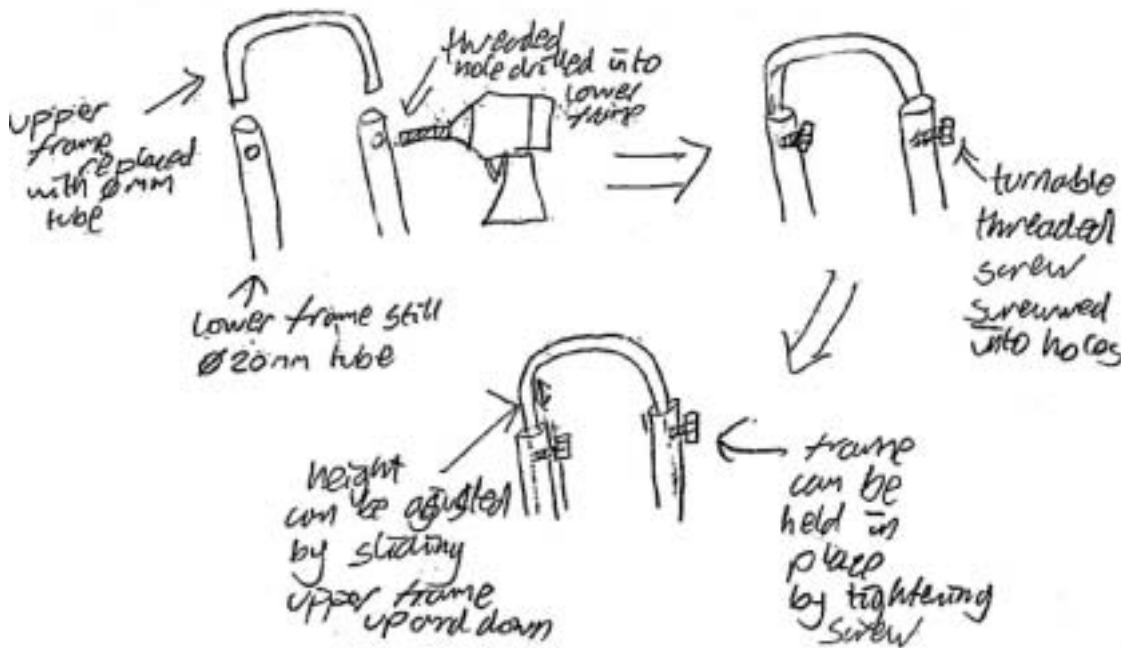
- (a) (iii) Candidates had to state *when* the check would be carried out. Many correct answers stated that the check would be carried out when the bracket was glued together or on completion.

- (b) Only a minority of candidates provided modifications to the bracket that would prevent the shelf from moving in three directions; i.e. side-to-side, back-to-front and up-and-down. Many candidates did achieve at least one mark for achieving one of these restrictions. Unfortunately, many candidates ignored the instruction '...without the use of pre-manufactured components' and added screws or other components.
- (c*) There were some excellent answers to this question. There was no right or wrong answer and candidates could argue a case for either bracket. Most candidates chose the moulded plastic bracket as the more efficient to produce in quantity. For maximum marks it was essential that candidates provided details of manufacture of both brackets. Excellent answers included accurate information about the wooden bracket comprising joints that would have to be constructed involving increased time and labour costs. The plastic bracket could be produced by injection moulding much quicker following the manufacture of the mould. Many candidates explained correctly that the initial set-up costs would be higher but that these would be recovered over time with high volume production.

Question 5

This question tested candidates' ability to apply a practical knowledge of materials and constructions to design modifications to a small table made from polypropylene and mild steel tube.

- (a) Many candidates stated that polypropylene was lighter in weight, self-finished, easier to keep clean and was easier to manufacture in quantity.
- (b) The most popular method of height adjustment involved the use of an inner and outer tube with pre-drilled holes and inserted pegs to lock at the required height. Some answers involved the use of a drilled slot up the length of tube and a welded or brazed nut on the outside, into which a bolt could be screwed. Many candidates failed to gain maximum marks because they failed to add the important details such as diameters of tube or materials and sizes for the peg or pin.



- (c)** There was a wide variety of solutions to the problem of locking the table top in a horizontal position while enabling it to be folded away. Unfortunately, many sketches lacked the clarity needed to explain to examiners how the device could work. Marks were awarded for some form of 'stay' to lock and 'hinge' to enable it to fold. Many candidates provided potential designs but could not incorporate the necessary level of clarity or important written details to achieve high marks.

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