GCSE

Design and Technology: Product Design

General Certificate of Secondary Education **J305**

General Certificate of Secondary Education (Short Course) **J045**

Examiners' Reports

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J305/J045/R/11

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EXAMINERS' REPORTS

Chief Examiner's Report

General Comments

Work presented in the controlled assessment units (A551 and A553) generally followed the requirements of the specification closely and some good practice was seen in portfolios presented for moderation. The Assessment Criteria for these units was applied appropriately in the majority of cases, but there were some instances where insufficient evidence had been provided to support the marks awarded.

Candidate responses in the examinations for Units A552 and A554 indicated that the specification content for these units had been generally well covered by most centres.

This unit continues to go from strength to strength, with this series providing the largest entry so far. The marking criteria is more explicit and Centres are, generally, marking accurately against the standards set by OCR.

A551 Developing and Applying Design Skills

There were fewer problems than in January with centres entering candidates for A551/1 the OCR repository.

Centres should be aware of the need to break files down to manageable size prior to uploading to the repository which can be problematic for marking and moderation. Video evidence occasionally failed to function and so affected the moderation process.

Many centres have embraced the Controlled Assessment Cover Sheet and made really helpful comments to assist the moderation process. It was also most helpful where centres also supplied a copy of the CSF which is available via the OCR website.

The majority of entries were A551/2 Postal with over 60% of centres using the PowerPoint format which enables more adventurous candidates to use sound and video within their folios. Centres are reminded they can provide one CD with the sample candidate's folios. Centres should note that evidence for A551 and A553 should be presented separately.

Where centres have 12 or fewer candidates entered for either unit, they can send the folios to the moderator before notification of the selected sample.

A551 is about designing, candidates do not have to make what they design. Equally A553 is all about the making, candidates are not expected nor rewarded for design work associated with that unit. At in-service training events (see OCR training Website for next autumn's schedule) separating the two units is actively encouraged as this allows a more varied approach for candidates. Evidence for A551 and A553 demonstrates more candidate success by undertaking separate activities.

Most candidates undertook the designing activities which were manageable and appropriate. Fewer impractical problems such as designing a new airport or a hybrid motorcycle was evident this series. It is important that candidates identify a clear problem to solve with a specific user or user group and summarise the direction of their design activity. Where candidates do not have a good foundation, the work sometimes lacks direction.

Work such as planning and "what I will do and where I will look for evidence" should not be submitted and will not achieve marks.

Research was generally well done with better performing centres providing evidence for the two aspects to the research; product analysis of similar or associated products and "other research" such as user requirements, ergonomic considerations, location and increasingly inspirational investigations.

Primary research is usually more beneficial than secondary research and reflected on the quality of specifications presented for assessment. The use of acronyms for product analysis and specification writing proved restrictive for candidates. This practise is discouraged for all ability levels.

Candidates need to have access to specification requirements in all units to ensure all criteria is accessed.

There was excellent design activity with evidence of creative thinking. Centres should be aware that "creative thinking and risk taking" is not an expectation for marks in the high strands of AO3 (marks 14 – 19). This is provided by a sufficient range of ideas, detail, and evidence of development of an appropriate quality are presented.

Development was limited in some cases. Centres should understand that development is improving and not redrawing what has been generated. Modelling can be used to test the feasibility of aspects of the design work which contribute to the development. Centres should also note that a model of the final proposal is not required, being seen as a design tool rather than a presentation tool.

An area some centres need to develop is an analytical evaluation of design ideas with factual details. Comments such as "it meets specification point 1" will not gain credit.

Communication skills were varied, ranging from outstanding to poor. Graphical communication skills are important to A551 and require candidates to suggest modifications to their made product. Modifications should be undertaken by the use of sketches and notes.

The use of CAD or Other Computer Applications (OCA) is rewarded for work in AO3. There was some evidence of centres rewarding ICT from AO1 and AO2 when there was none present in AO3. CAD is also seen as a design tool and limited marks will be awarded to candidates who just produce an image of their final design.

A552 Design and Making Innovation Challenge

General Comments

The 2011 theme 'Theme Parks' was accessible to all candidates.

Candidates clearly enjoy the work they have carried out during the 'challenge' with many reflecting positively on their experience.

Administration

Examiners have reported few problems due to centre administration errors in this session. It is, however, important that teachers make examination officers aware that the examination takes place in three separate stages and that workbooks should not be sent to examiners until all of the three stages are complete. To avoid delays and unnecessary 'missing script' investigation work for both OCR and the Examination Centre, it is important that examination workbooks are posted to examiners as soon as the 'Time to Reflect' activity has been completed.

Examination scripts must be posted to examiners using approved secure postage. A number of centres posted scripts this session using ordinary first class post.

Centres are reminded of the requirement to submit details of the dates of the Innovation Challenge to OCR using the VAF form. A number of centres failed to submit this form before the given deadline this session. Copies of the form are available on the OCR website – www.ocr.org.uk.

The Innovation Challenge is designed to take place within a time window of the 1st May to the 23rd June. Centres are not allowed to run the Challenge outside of this window.

All materials relating to examinations sent from OCR to centres will be despatched to the examinations officer. It is important that colleagues check with the examinations officer that they have received all relevant and most up to date information prior to starting the Innovation Challenge activity. It is very important that centres use only the workbook and teacher script provided for Unit A552.

Examination notices must be displayed in the area where the examination is to take place and an invigilator should be present. Candidates should work in silence unless otherwise instructed by the teacher script.

Running the Challenge

Centres are reminded that the role of the teaching colleague is that of a facilitator and not that of a normal classroom teacher. They are there to provide access to materials, monitor health and safety issues and read the teacher script to candidates, elaborating and explaining where this is indicated within the script.

Teaching colleagues and support staff must not give advice to candidates about the design/manufacture of their prototype product or cut materials to correct shape or size. It must be made clear to all candidates that this is an examination and we are assessing the individual candidate's designing and modelling capability.

Photographs

The quality and size of photographs supplied by most centres is appropriate for this examination. However, examiners have again reported concerns about the quality of photographs from some centres. Problems include: photos being printed at low resolution, photos being printed on printers that are low on ink, photos that do not clearly focus on the model and poor quality black and white images.

Photographs form an essential part of the assessment process. Photographs must be good quality colour images that are of an appropriate size to fit into the space provided.

By providing poor quality images centres are disadvantaging their candidates as the examiner will be base their judgements about the quality of the prototype on the photographs provided. Centres should refrain from inserting large images that are folded to fit the available space in the workbook. This can make the assessment task more difficult for examiners.

The addition of a card with the candidates name within the photo aids the return of photos to candidates. Centres are reminded that four "teacher" photographs is the minimum required. Additional photos can be added to the workbook. This is particularly important if it is necessary to show other parts or views of an artefact to fully illustrate the final outcome.

It is recommended that if candidates wish to annotate photographs that a second print is produced and stuck into either the appropriate section of the workbook or into the 'additional space' and clearly labelled and then annotated. Where overlay paper is used on the four 'scripted' photographs examiners have reported difficulty in viewing the photos due to the application of excessive glue.

Candidates should be encouraged to stick photos into the workbook as they are printed.

Completion of the Workbook

Examiners have again reported difficulty in understanding candidate's work where blunt pencil, highlight pens or gel pens have been used for written work. Please advise candidates of the need for all of their work to be legible. Work should be completed in English. 'Text messaging' abbreviations are not acceptable.

Security of Workbooks

Centres are reminded of the importance of appropriate security of all workbooks between the three sessions of the Innovation Challenge. Workbooks must be returned to the examinations officer and should be stored in secure conditions.

Development of Design. Evolution Through Making.

Initial Thoughts

Candidates used a mix of text and drawings to explore the selected challenge. The majority of candidates produced a range of initial concept ideas and thought creatively about the challenge that they selected.

Candidates should be encouraged to take risks and think creatively about the design task.

Briefs

Candidate Design Briefs have improved this session. Most candidates produced clear and precise design briefs that offered scope for creativity.

Design Briefs are sometimes too prescriptive with candidates confusing the design brief with the specification.

User/Clients

The majority of candidates identified appropriate user groups for their products. Higher performing candidates showed clear consideration of their user group whilst undertaking the design activity. These candidates made clear reference to the target user and user needs.

Specifications

Examiners have raised concerns that some candidates are producing vague, often generic specification points that could apply to any product. The specification must be 'specific' to the product that is being designed. Vague points such as 'it must be the right size', 'it must be ergonomic' and it 'must not cost too much' should be avoided. Presenting the specification in a bullet pointed format rather than in an essay style would be of benefit to candidates. Specifications should give additional information to that contained with the question paper. Ideas

The majority of candidates used a mix of drawings, text, annotation and occasionally modelling/photographs to show their ideas.

Higher performing candidates produced a range of creative ideas that clearly related to their design brief, specification and potential users. Drawings of both full designs and parts of designs were provided along with detailed annotation relating to materials and construction methods. Development of the design from the 'initial thoughts' was clearly evident. Designs were 'rendered' to enhance communication.

Lower scoring candidates reproduced the initial thoughts from box 1 of the challenge activity or only produced a single design idea. Very often these candidates disregarded both the design brief and specification from boxes 3 and 4.

Some candidates produced ideas based upon production using modelling materials. The design ideas should be based around the future manufacture of the product. Examiners have again reported a lack of material knowledge amongst candidates. The majority of candidates failed to identify specific materials for product manufacture.

Candidates should give justification for the selection/rejection of ideas for development in box 6.

Communicating information through sketches, writing and photographs

The standard of design communication was generally satisfactory. The majority of candidates drew 2D views of their design. The use of 3D techniques and exploded/component views would be of benefit to students.

Higher performing candidates gave different views of objects or parts of objects and clearly communicated their design thinking through the use of annotation. Examiners felt that the work of many candidates could have been enhanced with the use of rendering techniques and that centres should encourage candidates to be more adventurous in their forms of communication.

Written communication was generally good but many candidates fail to use technical vocabulary when appropriate.

Materials, Components, Processes, Techniques and Industrial Practice

Examiners have reported that the majority of centres prepared their candidates well for this part of the examination. Candidates from these centres clearly understood that they were making a prototype model rather than the 'final' product. Appropriate materials were supplied by these centres for candidates use. Materials included foam, foam board, card, balsa, clay, modelling clay, mechanism kits, polymorph, etc.

It is essential that during the product design course candidates undertake modelling activity in order to develop their manufacturing skills and knowledge of modelling materials.

Some candidates whose design work was of a good standard were limited by the materials supplied by their centres. Sheet materials such as MDF and Plywood are often unsuitable for modelling. These materials can limit the candidate's ability to model designs appropriately and impact upon the candidate's design work. Where these materials were used, the candidate's work was often incomplete because candidates were trying to manufacture 'final outcomes' rather than 'prototype products'. Some candidates highlighted the availability of materials as a problem within the evaluation activity.

Models must be an appropriate size for the candidate to be able to successfully manipulate materials and demonstrate the features of the product. Candidates should name specific tools and processes when undertaking the planning and review activity.

Higher achieving candidates considered the choice of materials and components available and identified the most appropriate materials for the manufacture of their product, demonstrating adept use of these materials. They completed their models to a high standard, showing all features of their design.

Analysis of Ideas, Models and Prototypes

Peer Evaluation

The majority of candidates planned for the presentation and recorded the outcome. There was evidence of candidates using the feedback to further develop ideas. Occasionally, candidates failed to record the feedback or planning for this activity.

Development of Ideas

Design development was generally good. Higher achieving candidates showed clear development of their ideas between box 1 'initial thoughts' and box 5 'initial ideas'. They also showed development between box 5 'initial ideas' and box 9 'developing your idea'.

It is important that candidates use notes or annotations to show how they develop their design towards an optimum solution that satisfies the design brief, specification and needs of the user.

Producing a model of the initial idea or redrawing the initial idea does not show development of the design and therefore will gain no marks for design development.

Evaluation

Many candidates produced detailed evaluations of their prototype product. Higher performing candidates clearly considered each element of the evaluation section of the workbook and also provided detailed analysis of their design in relation to the design specification. Candidates should give specific detail about the product when considering how it may look in the future if developed further.

Reflection

To score highly candidates should focus on the product design rather than the modelling activity. It is essential that candidates use the 30 minutes available to read through their workbook and reflect upon the product design. They should identify strengths and weaknesses in the design and suggest detailed alterations/improvements. Where design alterations are proposed these should be drawn and clearly communicated. Cursory written comments will not attract high marks.

A553 Making, Testing & Marketing Products

General Comments

Candidates can present work in both paper format or on CD but not a combination of the two. CD is the favoured format with the use of photographs, sound and video becoming popular. The use of the OCR repository has worked very well this series.

It is important that video and sound is checked prior to submitting as evidence. A guide of how to do this can be found in the new OCR Product Design for GCSE text book. Some electronic portfolios had video or sound that did not work effectively, causing concerns with moderation.

Centres are required to authenticate that the work is that of the candidate. A signed CCS160 must be supplied in the sample selected for moderation. All work should be carried out in the presence of a teacher at the centre and photographic evidence should reflect this.

It is important that the centre rank order is correct. Centres must ensure they give appropriate time to this task and avoid any large alterations to the marks. Internal standardisation must be carried out as part of the assessment process.

It is preferred that candidates' work is submitted on individual CDs. Centres should be aware that electronic folders are not returned and should keep a copy at the Centre.

CAD/CAM is only one skill and candidates need to combine others to achieve the higher marks. It is, however, important to show a candidate's understanding through annotated screen shots.

The centre sample is required as soon as the marks have been uploaded by the Centre and should check with OCR within 5 working days if no sample request has been received.

Coursework Summary

Objective 4 – This is all about creating a single, functioning, quality product. All evidence should be through photographs and annotation. Modelling is not acceptable in this unit. A model will achieve no marks for the quality outcome mark for this objective.

A good range of products were presented for moderation varying considerably in size and complexity. The majority of Centres have allowed the candidates to attempt a realistic product design within the time allowed. The quality of some of the Centres' work is outstanding and should be congratulated. Some Centres allow the pupils to attempt manufacture of a product which is either too complex or too large, usually resulting in a poor outcome. Some Centres are clearly spending far too much time on this aspect.

The recording of the manufacture is very important. There is a distinct difference emerging between Centres who submit candidates work on CD and those who still use paper. Candidates submitting work on paper generally include more photographic evidence and annotation leading to higher marks. The evidence provided should be in a diary format explaining what has been achieved and how problems have been solved. Little evidence of how candidates have used economy of approach; worked safely and with precision is still a problem and Centres must ensure candidates are addressing these points and showing evidence of these points in the production log.

Candidates producing only a written time plan with no photographic evidence will not receive marks.

The use of CAD/CAM is to be encouraged; however it is one skill. Centres should ensure candidatesdemonstrate a range of skills when producing the practical work to achieve the higher marks. If CAD/CAM is used, candidates must produce evidence they understand the process. The use of photography and screenshots with annotation is required.

Poor quality photos or no photographs impacted on moderation. Centres must ensure that candidates show a range of images of the final product. Centres should show images that justify the marks awarded to candidates. Centres should mark this element from evidence shown in the portfolio and ensure there is appropriate evidence in the folder to support the marks awarded. Marks are awarded based on the quality of the outcome and not how they have worked on the product.

Objective 5 – This objective is about taking the product forward. Reference to the making of the product will receive no marks for this objective.

Evaluations were well done with reference to the specification and appropriate photographic evidence of realistic user testing. Good video evidence of testing and user views was good in this unit.

Modifications and improvements is a product development opportunity and candidates should be sketching possible improvements that could be made to their product. Candidates may wish to alter or draw on original images of the finished product or use overlays in an innovative design way. Some candidates only produced a written summary which achieved low marks.

Quantity production is a weak area not being addressed in many centres. Some centres awarded marks for this section with no evidence in the portfolio of the candidate attempting a response. Centres should outline to candidates how their product could be manufactured in quantity. A significant number of responses were generic, based on theory notes or cut and paste information from the internet. Candidates need to find out how a similar product would be manufactured in a 'Real World' situation. It is then a case of applying the theory to parts of the candidate's product.

High performing candidates produced videos or placed their product in a promotional context. Centres are beginning to introduce a marketing strategy explaining the reasoning behind the type of marketing presentation. Candidates should explain why they chose this type of marketing.

To achieve the higher marks, the outcome should be realistic and professional in appearance and an explanation for the idea of the marketing strategy given.

A554 Designing Influences

General Comments

The majority of candidates found the paper accessible and were able to attempt all questions. All Trend Setters and Iconic Products were chosen by candidates.

Candidates struggled with concepts of "Design Classics" in question 3c together with opportunities for designers and manufacturers 1(c) and the issues surrounding the wind turbines 2(c).

It was evident candidates had teaching of Design Eras, Trend Setters (Designers) and the Iconic Products. Some of the responses on William Morris showed a positive insight into his life and work. Marcel Breuer and Coco Chanel proved popular with candidates. Fewer candidates chose not to mix responses between 4(a), 4(b) and Question 5.

Centres should note that there is still a tendency amongst candidates to confuse the trend setter with the iconic product. For example, in question 4(a), the impact and legacy of the trend setter (such as Marcel Breuer), candidates often wrote about the iconic product rather than the wider work and impact of the Trend Setter.

Separating the Trend Setter from the Iconic Product is a differentiator in this examination.

The emphasis of question 4(a) changes every session and it is important candidates address the question and not regurgitate generic facts.

Design Qualification

The design section (question 5) was well answered. However, the poorest response of the design question was part (a), the four important specification points. Candidates repeated points given to them in the design need. For example, the design need to design a "Magazine rack in the style of the Wassily chair" gave specification points such as: "It should be in the style of the Wassily chair", or using the same materials as the Wassily chair".

It is important that specification points are expanded e.g. aesthetically pleasing or aimed at adults, into specific points that can be "designed against" and "evaluated".

When designing solutions, candidates should pay attention to the design need ensuring the solutions address the original need.

For the systems orientated design need, a systems diagram is required and for a food orientated question, a food product outcome is required and not a packaging design.

Candidates should be prepared for this paper by being encouraged to write legibly and thinking about their possible responses before starting and avoid basic repeats of information from the stem of the question.

Candidates should be able to product analyse and have a sound knowledge of their chosen trendsetter and iconic product.

Item Level Responses

Question 1 – The Child's Trainer Cup

(a) Where candidates had been well practiced in the skills of product analysis, the identification of three design features was straightforward, and the majority of answers correctly identified two or three of the design features of the Child's trainer cup. Two handles, sealable / non spill lid and the ergonomic spout were the most popular responses.

(b)(i) Thermochromic, thermosetting and thermoplastic were not fully understood. Candidates had some understanding that plastic changed colour and gained a mark and some extended information about it being a warning or the process reversed when the liquid cooled again, gained the second mark.

(b)(ii) The question included smart materials. Candidates who had knowledge failed to gain a mark by incorrectly responding with "a correct" material when the question asked for a "product". Memory framed glasses, children's bath toys and Gortex items of clothing were amongst the most popular responses.

(c) Candidates needed "an example" to gain marks in this part of the question.

For example, "miniaturisation of electronic components [1] has allowed designers to pack the electronics into much tighter arrangements [2nd mark] which produces smaller and more portable products [3rd mark]. There are numerous examples from the introduction of CAD CAM, to injection moulding, smart materials, freeze drying etc. but knowledge was limited.

Question 2 – Wind Powered Generator

(a) A new format for a question in this paper which seemed well received by candidates. The majority gained 3 to 4 marks for identifying the correct categories of source of energy.

(b) The question was about "efficiency" with regard to friction and loss of energy together with the unreliability of the wind and subsequent loss of energy production. Most responses were about the lack of wind and resultant lack of energy production.

Candidates added information to their answers, for example; there not being enough wind followed by "… and they lose energy though heat and sound loss" which was the focus of the question.

(c) A number of candidates repeated information about the generators not being 100% efficient. However, candidates correctly focused on other issues such as NIMBY"s, noise and visual pollution and the adverse effects on the wild life and ecosystems. For a challenging part (c) of a question this was often well answered.

Question 3 – The Tennis Rackets

(a) Most candidates were able to identify three successful features, with most answers referring to improved surface areas, stringing, handles comfort and durability of rackets.

(b) Explanations of why the identified features make the modern tennis racket more successful were attempted with most candidates scoring at least 2 or 3 of the marks available. Some candidates suggested improved aesthetics which were not rewarded.

(c) A lack of understanding about Design Classics hindered candidate's responses to this question. The London underground map, CoCo Chanel's "LBD" and the Wassily chair all gave candidates access to full marks. Some articulate suggestions such as a "ruler" with its basic functions analysed were positively rewarded.

Question 4 – Trendsetter and Iconic Product

(a) Marcel Breuer, Coco Chanel and William Morris were researched and well represented in many of the responses to this question.

The LED and Convenience foods were well researched but less popular.

4(a) is designed to assess candidates quality of written communication (QoWC). Candidates need to demonstrate an understanding of the required technical content and write fluently and convincingly. Candidates who write simple statements or a bulleted list will not achieve high marks.

In 4(a), candidates should identify one specific issue, and using specialist terms, accurate spelling, punctuation and grammar, and exemplify the issue explaining the importance of the Trendsetter.

(b) In preparing for this question, candidates should understand that marks are awarded in 4(a) for information about the Trendsetter and marks are awarded in 4(b) for information about the specific Iconic product.

Knowledge about the Wassily Chair, the "flapper" and Block printed wallpaper gained credit in 4(b). Knowledge of the important influences (other than the given Iconic product) and the long-term legacy of the Trendsetter need to be explained in 4(a). As mentioned in the introduction, candidates have to be especially careful to avoid repeating the same information in 4(a) and 4(b), and to ensure that they give information in 4a that focuses on the Trendsetter rather than their Iconic product.

Question 5 - Designing

(a) Many candidates scored less than two marks for not providing four specific points which have not already been given in the question, so references to the Trendsetter or the Iconic product do not gain credit. Additionally, references to the requirements outlined in the initial design need cannot gain credit. Candidates should use their knowledge of the Trendsetter and the Iconic product, together with their analysis of the requirements of the design need to formulate new specification points.

The specification point only applies to the one design need indicated / selected and cannot be applied to any of the others. If they do they are not specific and will not aid the design activity.

Some good examples:

The design must allow easy removal and replacement magazines
The title of the magazines must all be in full view
The shirt must have tassels for decoration
The blouse must have detachable arms to allow for different uses
The wrist watch must be adjustable for different sized wrists
The face must have repeated patterns similar to those used by Morris
The moisture sensor must have a warning signal when the battery is low
The electronic components must be sealed to avoid the ingress of liquids
The product must not contain any cereal ingredients whatsoever because wheat tolerance often extends to other cereals

The product must have a visual appeal using the colours of ingredients in a "organised" way

Generic points e.g. strong, bold, comfortable and generic negative points e.g. no sharp edges, not too heavy, no loose bits did not gain credit.

The purpose of the specification points is to help the candidate focus their thoughts on viable design ideas. Time spent „thinking before writing' the specification points will not only improve the mark score in section (a), but also help the candidate improve their performance in all of the other sections of this question.

(b) To score well for the design ideas part of the question, candidates must provide a range of different ideas, each with explanatory annotations (rather than just notes or labels), and with some indication that some aspects, of some of the ideas, address at least two of their specification points.

(c) In order to move beyond two marks in the development of ideas part of this question, candidates must provide evidence, in the form of sketches and notes, of developmental activity and decision-making rather than just a single drawing.

(d) The notes and explanations of how the final solution meets each of the specification points were not generally well attempted. For example, candidates will state their idea meets specification point 2.

It is necessary for the candidate to explain how the solution meets each particular specification point.

To achieve maximum marks for the final part of question 5, it is important for candidates to provide some details of their final solution possibly including some reference to specific materials, ingredients or components, sizes, dimensions or quantities, joining or mixing techniques, or an indication of possible manufacture