OCR
Oxford Cambridge and RSA

# GCSE

# Design and Technology: Product Design

General Certificate of Secondary Education **J305**

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

# OCR Report to Centres June 2017

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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

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

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

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# A551 Developing and Applying Design Skills

## Centre Administration

In general, Centre administration was effective and moderators received the required documentation and sample candidate materials on time. However, moderators have reported that a number of centres provided incomplete paperwork resulting in delays in the moderation process. Centres are reminded that forms CCS/A551 and the electronic equivalent of form MS1 must be fully completed and submitted to the moderator. Form A551/CSF is an optional form for use by centres however if it is submitted to the moderator the form can aid the moderation process. Where candidate work is submitted on the OCR repository the centre must ensure that they upload the centre administration documents as well as the candidate folios.

Centres must take care to use the correct entry codes for this unit. The entry codes are A551/01 for entries using the OCR Repository and A551/02 for either paper or electronic portfolios (either on CD or Memory stick) submitted by postal moderation.

When using electronic portfolios centres should ensure that the work of all the candidates is presented in only one cohesive format. Producing individual documents for each page of a candidate folio is not an acceptable format. Centres using the OCR Repository should be aware of the file size limit of 20MB. It is possible to load separate files for an individual candidate but these should be clearly labelled. Each individual file should not exceed 20MB. Electronic portfolios may be submitted to the moderator on a single CD or USB Memory Stick. These devices must be clearly labelled with a 'permanent marker' to show the Centre name and Centre number.

The majority of entries were A551/02 postal with many centres using the option of producing e-portfolios in a PowerPoint format. This enabled candidates to use sound and video within their portfolios. Centres are reminded that they must submit candidate work using one of the formats detailed in the OCR Specification for this subject. The Centre must check to ensure that all videos are ***correctly embedded*** when sending work to moderators. Moderators ***will not open*** external links in folders.

Where work is submitted on paper it should be presented in a logical sequence and suitably bound to enable the moderator to complete the moderation process effectively. The use of "Treasury Tags" tightly tied is not a suitable binding method. Folders should not include teaching materials and classroom project work.

Where centres have 15 or fewer candidates entered sending all the portfolios to the moderator without waiting for notification of the selected sample will aid the speed of the moderation process.

Centres must ensure that the work of each candidate work is easily identifiable with their candidate name, candidate number and centre number being clearly stated.

## Internal Assessment Objective 1

In general, candidates undertook design activities which were manageable and appropriate. Occasionally centres allowed candidates to undertake problems which were too challenging within the 20 hour controlled assessment limit.

It is vitally important that all candidates identify a clear problem to solve with a specific user or user group and summarise the direction of their design activity at the start of their portfolio. This

enables them to identify and access appropriate research opportunities and also allows the creation of designs which reflect the needs of their identified user group.

Moderators reported that candidate's performance was higher when they were presented with a variety of 'situations' which they were able to explore in order to identify their own 'design problems' as opposed to simply being presented with a 'stock' teacher generated problem that the whole teaching group followed. Candidate performance in A551 is often better where Candidates undertake design activities involving the 'real' needs of an elderly person, a young child, a brother or sister, a friend at school, a parent or a whole family: essentially someone who is known to the candidate.

It is essential that Candidates keep an open mind whilst undertaking the design activity. It is clear that some candidates approach the task with a pre-conceived idea from the outset. This limits their ability to produce a range of creative design solutions to the initial design problem. Candidates need to present evidence of the user or user group. An interview, a profile, likes, dislikes, lifestyle, etc. can all contribute to the first layer of understanding for the subsequent design activity. Consideration ofsituations where the user is able to experiences the need, will add context to the design problem.

As a consequence of focussing on a specific user with a specific need in a specific situation, a candidate should be able to compile a brief statement to explain what that they are going to design to satisfy the need of the user (design brief). In the case of some candidates this final design brief was not stated.

**Internal Assessment Objective 2**

The main area of work within IAO2 is a research activity, where the candidate investigates, collects and analyses information. The purpose of this research activity is to ensure that the candidate has obtained relevant facts, data, measurements and opinions to be able to formulate a viable specification for the development of a solution to the design need. There should be two aspects to the research activity undertaken by candidates. These are: product analysis of similar or associated products (strand 1) and "other research" such as user requirements, ergonomic considerations and location (strand 2).

When undertaking analysis of existing products, 'primary' research was clearly seen to provide greater depth of information than the use of 'secondary' research methods. Undertaking primary product analysis should be one of the underpinning activities of the GCSE Product Design Course. The research of two or three products 'in depth' should be sufficient to inform the future design activity and satisfy the assessment criteria for the award of full marks.

Ideally, candidates should start their analysis of a product by identifying and possibly sketching the key features of the product. An explanation of the purpose of these features will provide the candidate with the information required to both inform the writing of their design specification and aid the formulation of design ideas.

When researching the user requirements for the product to be designed, many candidates use either questionnaires or interviews. The design of these methods of obtaining 'User' data requires careful consideration. Often, the questions asked are either irrelevant or gain very little information that will aid the design of the product. Moderators have again reported that some centres are awarding high marks to questionnaires that often do little more than present evidence of the existence of the design problem (more suited to Assessment Objective 1). In order to achieve high marks the questionnaire or interview should illicit key information about the features or functions of the product to be designed and be fully analysed. Specific ergonomic data and other size information should also be researched and presented by candidates.

An analysis of all the information collected from and about the user, as well as the information about the features of existing products, should produce a list of key features for the solution to the need.

Candidate specifications were often found to contain vague or generic points which could apply to almost any product. Superficial specification points such as 'it must look good', it must be colourful', 'must not be too heavy', 'must be suitable for the user', 'must be ergonomic', 'must be inexpensive' or 'it must be safe', should be avoided. These types of specification points should not be rewarded highly.

The specification should be the foundation to the design activity of IAO3 and it should be 'visible' when Candidates are generating and developing ideas. Weak specifications often lead to poor design activity.

Candidates who produced a summary of the research findings were able to identify the key features of the product to be designed and were able to produce a series of justified specification points. The specification should be derived from facts, data and information; it should not be based on just the candidate's thoughts and preferences.

**Internal Assessment Objective 3**

There were some examples of excellent design activity along with evidence of some very creative thinking.

Development was limited in some of the work seen and candidates need to understand that development means improving and moving forwards, rather than just redrawing what has already been generated. Modelling should be used to test the feasibility of aspects of the design work. This modelling activity will then contribute to design development.

The evaluation of design ideas against the design specification is an area where candidate performance could be improved. Moderators report that candidates often produce little more than a tick box grid with limited meaningful analysis. To be awarded high marks in strand 3 of IOA3, candidates need to show an analytical evaluation of their design ideas.

Communication skills varied widely between candidates. More successful candidates presented their ideas in a 'free flowing' format, using sketching to show different views or parts of their product. They used annotation to communicate their design thinking and used modelling and enhancement techniques, such as rendering, to fully communicate their ideas. Design annotation should make reference to the user, aesthetics, ergonomics, function or other design influences.

When producing electronic portfolios, candidate's performance is seen to be higher when all the design work, including annotation, is completed on paper. The whole design page is then scanned into the folio. Centres should avoid scanning 'thumbnails' as these often show little detail and restrict free flowing design activity.

Moderators have again reported that a number of centres are awarding marks for the use of CAD or Other Computer Applications (OCA) where no evidence exists within the portfolio. The mark for the 'use of CAD or Other Computer Applications (OCA)' is rewarded for work in **IAO3 only**. To be rewarded with higher marks, CAD must be used as a design tool rather than just to produce an image of the final design.

# A552 Design and Making Innovation Challenge

## General Comments

The 2017 theme 'Cleverclogs Pre–School Nursery' was accessible to all candidates and work has been seen for each of the four set challenges. Candidates continue to enjoy the work they undertake during the 'challenge' with many reflecting positively on their experience.

## Running the Challenge

As this is an external examination an invigilator must be present.

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 and manufacture of their prototype product or cut materials to the 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.

When candidates have approval for the use of a scribe the appropriate JCQ forms should be attached and completed by the scribe in all instances.

## Photographs

The quality and size of photographs supplied by most centres is appropriate for this examination. 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 on the work book. Examiners have reported that whilst most centres provided clear colour photos of an appropriate size, some papers had very small or poor quality images that do not show sufficient clarity to allow examiners to reward the higher marks for quality of modelling or use of materials.

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. Close-up views to demonstrate quality would be particularly beneficial.

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.

## Completion of the workbook

Examiners have again reported difficulty in understanding candidate's work. Handwriting on many papers was almost illegible on some papers which made reading the work very difficult in some instances.

It is essential that candidates fully complete the front of the workbook with their name and candidate number. Centres should encourage eligible candidates to use 'scribes' to complete workbooks.

Additional spaces were used copiously, but in many cases it was unclear what the extra work was a continuation from. Centres must instruct candidates to label/head this extra work, as it was often impossible to allocate it to a mark strand.

**Additional pages**

Many scripts contained extra pages which were stapled, taped, glued and treasury tagged into work booklets. In the majority of cases these were entirely unnecessary as the additional space provided in the workbook itself had not been used. This caused problems with opening the book and created unnecessary extra work for many examiners. Some centres had not used the allotted space in the workbook at all for some sections, and had used additional sheets to answer the questions. In some cases, candidates had added up to ten additional sheets into workbooks which could have been avoided had they used up the additional space. Centres are strongly urged to use the allotted spaces in the book before any extra sheets are added. If extra sheets do need to be added these should not be excessive. Any additional pages that are used must also be on a recognised JCQ paper.

**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 mixture of text and drawings to explore the selected challenge. The majority of candidates produce a range of initial concept ideas and thought creatively about the challenge that they have selected. Few candidates were awarded four marks for initial thoughts as most learners tended to focus on existing solutions and copy existing ideas.

The production of a thought shower is not sufficient to justify the reward of higher marks.

**Briefs**

Candidates often gain little or no reward for Initial Briefs or the Design Brief. Several candidates failed to provide three possible initial briefs instead giving descriptions of their ideas. The briefs in box 3 were often too prescriptive with many candidates confusing the design brief with the specification.

Candidates should be encouraged to write clear and precise design briefs that offer scope for creativity. The brief should be a short statement of intent.

**User/Clients**

The majority of candidates identified an appropriate user group for their products. The nature of this year's challenge made this easier than usual. However, many candidates failed to identify

the user age range given in the challenge and specified children older than 5 years. Higher performing candidates gave clear consideration of their user group whilst undertaking the design activity making clear reference to the target user and user needs.

**Specifications**

Examiners have again raised concerns that 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' will not attract high marks. Many candidates in this session were able to write more detailed briefs that showed specific relevance to the user group and scored at least two of the three marks available. Presenting the specification in a bullet pointed format rather than in an essay style would be of benefit to candidates. Re-wording the points outlined in the exam question is not enough to gain high marks for the specification.

It is clear that some candidates do not understand the difference between a design brief and a specification.

**Ideas**

The majority of candidates used a mix of drawings, text, annotation and occasionally modelling/photographs to show their ideas. Candidate's designs were creative, and the majority created a range of suitable ideas. However, many candidates failed to achieve higher marks for details of construction or specific materials in 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 and the final design was well detailed making it clear how it would look and function. Designs were on occasion 'rendered' to enhance communication and a small number of candidates included swatches of materials.

Lower scoring candidates reproduced the initial thoughts from box 1 of the challenge activity or only produced a single design idea. Many candidates produced design ideas that did not meet the main objectives of the product set out in the design challenge. Very often these candidates disregarded both the design brief and specification from boxes 3 and 4. Centres are encouraged to remind candidates to constantly refer to the brief, specification and challenge task at regular intervals during their designing to ensure they are on track.

Some candidates produced ideas based upon production using modelling materials. The design ideas should be based around the future manufacture of the product. Appropriate materials and construction methods should be indicated.

**Communicating information through sketches, writing and photographs**

The standard of design communication was satisfactory overall. Candidates presented their ideas using annotated drawings and text. Higher performing candidates gave different views of objects or parts of objects and clearly communicated their design thinking through the use of annotation.

The overall standard of sketches has improved this year. Examiners noted more use of rendering, along with orthographic sketches and thick and thin line techniques to enhance communication. However, the work of many candidates could have been enhanced with the use of 3D drawing techniques and rendering. Centres should encourage and support candidates to

be more adventurous in their forms of communication. Time spent developing graphical communication skills would be of benefit to all units within this qualification.

In the communicating information section it was evident that many candidates were more comfortable writing than drawing and some candidates had additional pages full of written descriptions where a simple sketch would have been a better form of communicating this information. It was noticeable that few candidates used technical terminology and failed to gain marks here.

**Materials, Components, Processes, Techniques and Industrial Practice**

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

Some candidates whose design work was of a good standard were limited by the materials supplied by their centres. The majority of models were completed, however some candidates had chosen 'flat' two dimensional designs such as a jigsaw puzzle which made it hard for them to demonstrate a high level of making skills. The majority of models reflected the designs but candidate's final outcomes from some centres were extremely similar and many of the candidates from some centres appeared to have made almost identical products.

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. Models must be an appropriate size for the candidate to be able to successfully manipulate materials and demonstrate the features of the product. Solid block models limit the candidate's ability to test, analyse and develop their design.

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. The standard of skills such as cutting out neatly, folding and assembling components accurately was not evident when studying the work from many candidates.

**Analysis of ideas, models and prototypes**

**Peer Evaluation**

The majority of candidates planned for the presentation and recorded the outcome. Clear evidence was seen 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 satisfactory and slightly improved compared to previous sessions. Higher achieving candidates show clear development of their ideas between box 1 'initial thoughts' and box 5 'initial ideas'. They also show 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 are developing their design towards an optimum solution that satisfies the design brief, specification and needs of the user. It should be clear how the design has been 'moved on' from box 5 for them to show this.

Some candidates either produce a model of the initial idea or simply redraw a neater or larger version of the initial idea again. This does not show development of the design and therefore will gain no marks for design development. Candidates should consider the construction and operation of their design during design development and try to provide specific information such as dimensions and constructional techniques.

**Evaluation**

Many candidates produced detailed evaluations of their prototype product. However, many candidates appeared to find this logical examination of their work difficult and many made valid statements, but failed to justify them. 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 are asked within evaluation to reflect upon the future of the product. Many candidates fail to give sufficient detail within this section of work with generic comments being given such as “it will be made from plastic” or “it will be spray painted”. Candidates should consider how the product might be mass produced or developed further to gain marks in this section.

**Reflection**

The quality of responses in this section has improved with many candidates breaking up their answers into ‘strengths’, ‘weaknesses’ and ‘improvements’ to ensure they gain the appropriate marks. Candidates should focus on the product design rather than the modelling activity that has taken place order to achieve high marks. Many candidates provided limited notes on how their products could be improved or showed only basic improvements such as adding a handle to improve carrying or adding a speaker with sound effects. Candidates who achieved full marks in this section were able to show creative design improvements and communicate these effectively through notes and diagrams. It is essential that candidates use the 30 minutes available to read through their workbook and reflect upon the product design. When design alterations are proposed these should be sketched and clearly communicated. Cursory written comments will not attract high marks.

# A553 Making, Testing & Marketing Products

**General Comments:**

I was pleased to see how most centres are applying the assessment criteria and the accuracy of marking continues to improve.

Centres should ensure that files are packaged properly within the presentation to give candidates full credit for their efforts. Moderators have experienced difficulties when accessing files that have not been correctly uploaded.

The use of PDF files with hyperlinks to you tube or similar web based programmes is also working well and giving centres a range of options. OCR repository lends itself well to this unit.

It is the centres responsibility to ensure sufficient photographic evidence is available to support the marks for the practical outcome.

In centres where there are more than one staff teaching candidates, it is essential that internal standardisation is completed in order to ensure that standards are maintained and the correct rank order is applied. All work should be carried out in the presence of a teacher at the Centre. To save delays in the moderation process, form CCS160 (which needs to be signed by all staff teaching the specification), should be enclosed with the selected sample of work sent to the moderator (paper or electronic format).

Candidates are free to present the work in any appropriate medium, both on paper format or in electronic format on CD or USB stick, but preferably not a combination of the two. CD seems to be the favoured format for this unit and the use of photographs, sound and video is becoming popular. The use of the OCR repository has worked very well where Centres have uploaded work to the system.

Centres should be aware that electronic folders are not returned, so ensure a copy is kept at the Centre.

**Comments on Individual Objectives:**

**Internal assessment Objective 4**

This is all about creating a single, functioning, quality product. All evidence in the portfolio should be through photographs and annotation and the final outcome should be a working product **not a model**.

A good range of products were presented for moderation varying considerably in size and complexity. If centres are making similar products with all candidates it is important that candidates show ownership of the work and folio - photographs should show the individuals approach to the product and be commented on accordingly.

The submitted evidence should be a diary explaining what has been achieved and how problems have been solved and must include evidence of how candidates have used economy in their approach, how they have worked safely and how they have worked with precision. A plan, time lines or similar are not required.

The best candidates are presenting detailed and well thought out evidence of how the product was made. The production log should be a range of ‘doing’ photographs showing a range of

skills, materials and equipment used and candidates showing ownership in a confident manner showing they know how to make the product. Areas to focus on include evidence of how candidates demonstrate economic use of materials and how they obtain precision in the making of the product.

The use of CAD/CAM should be encouraged; however this is just one skill. Centres must ensure candidates have used a range of skills in producing the practical work to achieve the higher marks. If CAD/CAM is used, candidates should produce evidence they understand the process by using screen shots and appropriate annotation.

The quantity and quality of photographs enclosed in the portfolio is important, centres should ensure sufficient photographic evidence of a good quality is available to justify the awarded marks. Candidates tend not to include close-ups showing the quality and precision of their work. A good tip for centres is to mark the word from the evidence presented in the portfolio and not the actual practical work.

**Internal assessment Objective 5**

This objective is all about taking the product forward and needs to contain no reference to the making process.

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 is now a real strength of this unit.

Modifications and improvements to the product should be seen as a product development opportunity, candidates should sketch possible improvements that could be made to their product with appropriate annotation. Candidates may wish to alter or draw on original images of the finished product or use overlays in an innovative design way. This element of the objective tended to be over marked by centres as it was not design based and improving the product, but often focused on what could have been done during the making. Sadly still too many centres are relying on written description.

Quantity production continues to be an area where candidates/centres could improve marks. Candidates researching how their product could be made in a ‘Real World’ situation and then applying the knowledge gained to parts of the candidate’s product, providing the necessary evidence to generate additional marks.

This element should be the fun element of the course and becoming disappointing as candidates seem to be playing safe and creating an advert on a bus or shelter with an insert into a web based shopping site seems to be the norm. Centres need to encourage candidates to explain the reasoning behind the type of marketing presentation used. If the product was to be taken to full production, where and how would the candidate want to advertise/promote the product in order to maximize its market potential? In answering this question candidates will hopefully produce a much more meaningful and pertinent marketing presentation.

# A554 Designing Influences

**General Comments:**

The Examination Paper gave candidates the opportunity to reveal their knowledge and creative abilities in Product Design.

Candidates found the paper accessible and were able to attempt all questions. The paper proved successful in discriminating across the whole ability range.

**Comments on Individual Questions:**

**Question No.1a**

Identifying three design requirements of a vegetable peeler was required to gain full marks and most candidates were able to do this. In this question, candidates need to look carefully at the illustration of the vegetable peeler and then identify three design requirements. The most answers related to grip, sharpness of blade and comfort, this acted as a confidence booster at the start of the exam. Some candidate's listed that the vegetable peeler *must be able to peel vegetables*; care must be taken not to answer with information given in the question.

**Question No.1b**

An explanation of why string is added to the wooden handle of the vegetable peeler was expected and most candidates gained full marks. Good answers referenced the string creating friction or giving good grip and the hand being stopped from slipping. Other adequate responses given: usable when wet hands, improved control and stops cuts to hand. No credit was given to any references to: Cost, cheapness of the string, looks, aesthetics, colour and appeal of the string.

**Question No.1c**

Giving two examples of how labelling is used to protect the consumer was required to gain full marks and most candidates were able to do this. Responses were varied, including information about use, safety and age appropriate. This gave good access for candidates to answer from their different areas of Product Design, gaining them full marks.

**Question No.1d**

Explanation of how the British Standards Institute helps designers create products that are safe and fit for purpose was required to gain full marks. The understanding that BSI was involved in something to do with safety of products was well understood, but candidates failed to explain the specific details of how their work helps designers. Candidates did not fully understand the work of the BSI and rarely gaining more than 1 or 2 marks. The good answers included the setting up of standards of quality, references to laws and regulations, tests and compliance.

**Question No.2a**

Giving three aesthetic requirements for the toy clock to ensure it appeals to young children is required to gain the full marks. Understanding of aesthetics is well known giving candidates little problem with giving three good answers. Responses which stated look, smell and feel regularly gained 3 marks. References to Large or big on its own, gained no marks unless qualified. No marks for coloured plastic numbers/hands which is given in question.

**Question No.2b (i) / Question No.2b (ii)**

Post-series update: As a result of an investigation into these questions and mark schemes, all candidates were awarded full marks.

**Question No.2c**

Candidates were required to explain how the educational toy clock could be modified to allow the numbers to be removed and replaced more easily. Candidates are required to explain how the modification allows removal and replacing the numbers more easily. When the use of magnets and Velcro were used, the explanation of no recess and a clock face must be mentioned to gain full marks.

**Question No.2d**

An explanation of why consumers want new products to be made from biodegradable materials rather than non-biodegradable materials was required to gain full mark. Candidates gave answers describing the ability of materials which decompose or those which do not and have to be disposed at landfill. There were some misconceptions also that biodegradable material are recycled and reformed into new products. Candidates generally gained one or two marks, not gaining the final mark for further explanation. General information about the environment and sustainability gain no credit, unless related to biodegradable materials.

**Question No.3 a**

The question required the candidate to give three benefits for the user of reading a book on a tablet. This worked well; the reason for this is due to tablets being familiar with candidates. Common correct answers included: Enlarging, zooming, brightness and large capacity to store books. Most candidates gained 3 marks easily, but with a minority of candidates marks were not gained due to including responses about the benefit to the environment and not the user. Answers relating to: less paper used, benefits to the environment, water damage, portable/carrying and easier to read gained no marks

**Question No.3b**

Candidates had to give two reasons why the size and weight of the battery have to be considered when designing mobile digital devices. The responses were mainly the need to make the battery smaller and lighter to make the devices more sleek and portable. Some candidates gained marks by giving battery life and short time between charges as reasons to consider weight and size of batteries. Full marks awarded mostly for aesthetic and usability of the device. Responses which stated that a larger battery would make the device heavier and vice versa gained no marks.

**Question No.3c**

Candidates had to give **two** reasons why manufacturers make products in a range of colours. Candidates have a very good understanding of manufacturers many ways to satisfy customers to increase sales of their products. Many good answers resulting in both marks being awarded, reasons included – target market, gender, greater choice, fashion/trends, etc.

**Question No.3d**

This question is asking for an explanation of new techniques of advertising and marketing on digital technologies using a specific example. Techniques used online by companies such as: potential customers are emailed with special offers, popup adverts spring up when browsing the internet, collection of customer details and preferences/lifestyles would gain good marks when explained well. Explanation of advertising and marketing of a new technology device such as a mobile phone gained no marks.

**Question No.4a**

This question gave plenty of opportunities for the candidates to reveal their knowledge and creative abilities.

Knowledge of the important influences and the long-term legacy of the Trendsetter have to be explained in 4(a), candidates need to be encouraged to write about **three** paragraphs for their answer; within each paragraph to identify **one specific issue**, and using specialist terms, accurate spelling, punctuation and grammar, and a balanced argument, to exemplify the issue explaining the **importance** of the trendsetter in the context of **modern design**.

**Typical connectives that may be used to link points of discussion:** so that, because, therefore, however, although, but, consequently, alternatively, whenever, besides, moreover, since, whereas, despite.

In preparing for this question, candidates need to be very clear that marks will be awarded in 4(a) for information about the Trendsetter. This can be a named person or a type of development which has being influential. In this year's paper they were influential trends in product designs.

This question was reasonably well answered, with fewer candidates finding it difficult to separate the product from the trendsetter. Folding tubular steel products was overwhelmingly the most popular to be chosen by candidates, with Laminated packaging materials, Programmable components, Trouser suit and Mediterranean diet rarely being attempted.

Most common answer referred to the Folding tubular steel products, candidates included a wide range of reasons that influenced design and products. Candidates, who answered this question focussing purely on the Maclaren B-01 buggy, were capped at 2 marks.

There were a few candidates who attempted the Laminated packaging materials, Programmable components, Trouser suit and Mediterranean diet option. For candidates that answered the question through these trendsetters, it was evident that candidates had not studied them in depth, with candidates not accessing the full range of marks as most of the responses were limited.

**Question 4b**

In preparing for this question, candidates need to be very clear that marks will be awarded in 4(b) for information about their Iconic product. Knowledge about the Maclaren B-01 buggy, PIC microcontroller, Ossie Clark trouser suits, Tetra Pak and Pizza in 4(b).

Candidates have to be especially careful to avoid repeating the same information in 4(a), and to ensure that they give information in 4(b) that focuses on the Iconic Product rather than their Trendsetter. In 4(b), candidates need to identify specific features of the Iconic Product, and explain the importance of the features, their legacy, and how they have influenced the design of other products.

The most common answer referred to Maclaren B-01 buggy and these were often very well done with full marks awarded. Responses which made reference to the Ossie Clark trouser suits, Tetra Pak, Pizza and the PIC microcontroller lacked any real knowledge about the iconic product gaining one or two marks only.

**Question No.5a**

Writing specification points is a fundamental skill in all aspects of Product Design. This skill may require direct formal teaching and students should be given extensive opportunities to write specifications for a wide range of design needs.

Specification points that merely re-phrase the design, identify features that a solution must **not** have (*no sharp edges, not too heavy*), stipulate selling price or cost, suggest that it *must look good* or *bright bold colours* or *in the style of*, gain very few marks and should be avoided.

Specification points that name particular materials (must be made of aluminium) or stipulate precise measurements (must be 300 mm high) are rationally objective: they can become controls in the development of an idea. Specification points that list particular colours (*red, white and blue*), or describe particular features (*comfortably fit in the hand*, or *easy to open and close*), are definable and impartial enough to control the generation and the development of the design solution. To be successful in Question 5, candidates must compile four considered specification points that can be used to direct the design thinking in Part (b), refine the developments in Part (c) and evaluate the final proposal in Part (d).

Candidates struggled to write a good specification, they were generally only just sufficient for the designing to proceed. Most candidates took *a camping picnic table which is compact and easily transported* option. There were very few of the other design needs chosen.

Specifications generally remained far too generic and would have been of little or no value to the designer. Many candidates quoted directly from the question, offering no new specification points.

It would not have been possible to deduce what the product may have been by reading the specification. Most specifications were vague and did not address the fundamental design requirements of the product in sufficient detail. Common weak points were 'pleasing to the eye', 'strong enough to carry weight', 'reasonable size', 'fits the user, etc. Centre's need to get across to students that products are designed for a purpose and their specifications need to address this, being prefaced with 'it must be' and then expanding on the detail being focused on saying why it needs to be like this.

**Question No.5b**

In this part, candidates must provide a **range** of different ideas, each with explanatory notes (rather than just labels), and with indication that aspects of some of the ideas, address their specification points. Typically, candidates score 3 or 4 of the available marks for design ideas. Pictorial sketches with appropriate colour or shading should be encouraged, as they tend to communicate the thinking of the candidate more fully. There was very little use of colour, but those that did enhanced the communication of their designs making them stand out.

High quality responses with creativity were evident this year and some candidates gaining the sixth mark. Some detailed designs were produced for the camping picnic table; however most designs were of combined chair and table which folded into a carry case. Candidates generally produced at least two designs and notes, but design ideas were not normally of high quality and simplistic in nature. There were some excellent designs of trouser suit which showed a depth of thought and creativity, but these were infrequent. The general standard of sketching remains limited, candidates struggle to use drawing systems to demonstrate their ideas in pictorial view.

**Question No.5c**

Development at this level requires the competent application of subject knowledge to **move** a particular idea towards a solution that more successfully satisfies the requirements of the design need and meets the specification points. This requires analytical thinking and decision making about such influences as materials/ingredients, sizes/quantities, constructions and finishes, ergonomic considerations, ease of use, cleaning and hygiene, maintenance, durability and life expectancy. Through the use of **notes** and **sketches**, the candidate should show how they have considered and refined key aspects of their idea to make it more likely to satisfy the original design need. The presentation of just **one** well drawn idea, without evidence of any design thinking may qualify for only 1 or 2 marks as it is unlikely to show the developmental activity required.

There were a lot of well-developed picnic tables; this is due to the familiarity with this product they have seen. As a result, there were many good picnic table designs with added cup holders or draws included gaining 3/4 marks. Candidates which gained 1/2 marks, seemed unable to develop their chosen idea, with no indication of size, details of construction and materials, suggesting that they do not possess enough knowledge about materials or construction to confidently state them. Some developments were merely limited to redrawing of the original idea with a few additional notes about how it might meet one or two specification points.

**Question No.5d**

The candidate evaluates their final idea against the four design specification points identified in part **(a)**. A reasonable consideration of how their design satisfies their original specification enables full marks to be awarded. The format of the question directs candidates to carry out an audit of their specification, which enabled responses by candidates which had more focus. Candidates should write an evaluation of their ideas against the original specification. There was

a good range of responses, indicating that the question differentiated well. Candidates, who restated their specification and gave little further insight into their designs, were awarded the lowest marks. There were very few candidates who were awarded no marks for this question, since it was rare to see no responses to their specification and ideas. Candidates with a lowly marked specification in 5a commonly were awarded with a low mark in 5d. Conversely, a full mark specification commonly converted into full marks in the evaluation.

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