

Design and Technology: Product Design

General Certificate of Secondary Education **J305**

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

OCR Report to Centres

June 2013

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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CONTENTS

General Certificate of Secondary Education

Design and Technology: Product Design (J305)

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OCR REPORT TO CENTRES

Content	Page
Overview	1
A551 Developing and Applying Design Skills	3
A552 Design and Making Innovation Challenge	6
A553 Making, Testing & Marketing Products	10
A554 Designing Influences	12

Overview

It is pleasing to see that OCR Product Design remains a popular GCSE qualification and it was a pleasure to see work from a number of centres new to the specification this series. Examiners and Moderators enjoy working on this qualification and candidates very often impress us with their creative and innovative approach to the design and manufacturing tasks that form the basis of the qualification. Candidates continue to work with a wide variety of materials and often combine materials from 'traditional' design and technology subjects to create their optimum solution.

Linear Assessment

Centres are reminded that to comply with Ofqual requirements this specification will only be assessed in June from 2014 onwards due to the move to linear delivery of all GCSE specifications. This will also mean that all units will be terminally assessed, ie all units have to be taken in the June series in which candidates are certificating in the qualification.

A number of centres have made late candidates withdrawals this series due to misunderstanding the linear approach to assessment.

An updated version of the subject specification is available on the OCR website.

Centre Support

INSET has been offered for both controlled assessment units at venues across the country this year. A number of 'on-line' resources are being developed by OCR to support the teaching of this qualification. Information relating to training resources can be found on the OCR website.

Centres should be aware of the textbook written in support of this specification which is available from Hodder Education ISBN 978 0340 98200 6. Additionally there is a DVD teacher resource ISBN 978-0-340-99123-7.

Administration – Controlled Assessment Units A551 and A553

In general, centre administration was effective and moderators received the required documentation and sample candidate materials on time. However, centres are reminded that forms CCS160, CCS/A551 and form MS1 (or electronic equivalent) must be fully completed and submitted to the moderator. Form A551/CSF is an optional form for use by centres. If submitted to the moderator this form can aid the moderation process. Centres should note that forms CCS/A551 and CCS/A553 will be removed from projects and retained with the other centre administration documents as part of the moderation process. It is essential that each portfolio is identified on the first sheet with candidate name and number and centre name and number. Do not rely on the CCS/A551 or CCS/A553 to identify an A3 paper portfolio.

It is important that centres check the addition of candidate marks carefully. The transcription of the candidate mark to the MS1 should also be checked. Correcting arithmetical errors causes delay to the moderating process. Centres are reminded that a 'spread sheet' based version of A551/CSF or A553/CSF is available on the OCR website. This form will automatically total the candidates' marks, thus reducing the risk of error.

Centres must take care to use the correct entry codes for this unit. The entry codes are A551/01 or A553/01 for entries using the OCR Repository and A551/02 or A553/02 for either paper or electronic folios submitted by postal moderation.

When submitting electronic folios, centres should ensure that the work of each candidate is presented in 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. If file sizes exceed this limit 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. A number of folios submitted to moderators failed to 'open'. This causes delays in the moderating process as moderators have to request additional copies. It would be of benefit to check that all work sent to a moderator is complete, functions as intended and contains all files for sound and video. Centres should note that moderators are instructed not to open links to external sources within candidate's folios.

Centres are reminded that they must submit candidate work using one of the formats detailed in the OCR Specification for this subject.

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. 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.

In centres where more than one member of staff is teaching candidates, it is essential that internal standardisation is completed in order to ensure that standards are consistent across teaching groups within the whole cohort and that the correct overall rank order is arrived at.

Administration – Examined Units A552 and A554

To avoid delays and unnecessary 'missing script' investigation work for both OCR and the centre it is important that examination scripts/workbooks are posted as soon as the examination has been completed using the labels provided by OCR. Exams officers must ensure that the exam register is fully completed and that a copy of the register is sent with the examination scripts to the examiner.

Examination scripts must be posted using approved secure postage. Examiners have reported that some centres are posting scripts using ordinary postal services which are untraceable in the event of a parcel not being received.

Centres are reminded of the requirement to submit details of the dates of the A552 Innovation Challenge to OCR using the VAF form. A number of centres failed to submit this form before the given deadline this series. Copies of the form are available on the OCR website – www.ocr.org.uk.

All materials relating to examinations sent from OCR to centres will be despatched to the examinations officer. It is important that teaching colleagues check with the examinations officer that they have received all relevant and most up to date information prior to starting the A552 Innovation Challenge activity.

A551 Developing and Applying Design Skills

General Comments

When completing this unit, candidates should be 'designing to satisfy a need'. The process candidates follow should be completely joined up. Every step is conditional on the previous step and influential on the next step.

There are no 'isolated activities' within this design process. The specification, for example, is not a stand-alone activity; it is derived from an analysis of the research into user needs and the data revealed from the analysis of existing products. The specification should then go on to both drive and control the generation of ideas and the development of a design solution.

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 folio. 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.

Work such as planning and "what I will do and where I will look for evidence" should not be submitted in the folios as this does not attract marks against the assessment criteria.

Moderators reported that candidate's performance tended to be 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. Fictitious users, such as 'celebrities', should be avoided. Consideration of the situation where the user experiences the need, will add context to the design problem.

As a consequence of focussing on a 'real' 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).

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. Some centres used a writing frame approach for the product analysis activity. It should be noted that this approach, or the use of pre-determined headings, can be restrictive for higher achieving candidates. It can also constitute malpractice if too much prompting or supporting information is provided in the writing frame. Each product has its own intrinsic set of features that may not neatly fit into a predetermined list or set of headings. Product analysis is not the same as a consumer survey about a product. Neither is it about ‘what I like and what I dislike about this product’.

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 gain very little information that will aid the design of the product. Moderators report 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. This list can form the foundation of the specification.

Candidate specifications were often found to contain vague or generic points which could apply to almost any product, while some candidates fall into the trap of compiling a specification based on their own preferences. 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. This type of specification can only attract limited marks.

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 and data and information; it should not be based on just the candidate’s thoughts and preferences.

Internal Assessment Objective 3

There were examples of some excellent design activity, with some very creative thinking evidenced.

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. Centres should note that a model of the final proposal is not required as modelling is seen as a design development tool rather than a presentation tool.

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 a more analytical approach to the 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. Moderators have reported problems in viewing candidate's work where poor quality, low resolution scanning has been used.

Moderators have 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 folio. 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 should 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 2013 theme 'Seaside Visits' is accessible to all candidates and work has been seen for each of the four set challenges. Candidates clearly enjoy the work they have carried out during the 'challenge' with many reflecting positively on their experience.

It is important that candidates read the design challenge carefully. The "minimising waste" brief was often answered as a pure waste bin design rather than considering the compacting of the waste. Some candidates choosing the "Beach Barbeque" did not supply any information regarding the food element of the barbeque pack.

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 in which the individual candidate's designing and modelling capability is being assessed.

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. 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. 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.

Photographs should be produced in colour. Poor quality, black and white or greyscale images do not show sufficient clarity to allow examiners to reward high marks for quality of modelling/use of materials.

Completion of the workbook

Despite previous comments 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 formal English. 'Text messaging' abbreviations are not acceptable. Centres should encourage eligible candidates to use 'scribes' to complete workbooks.

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 produce a range of initial concept ideas and think creatively about the challenge that they have selected. The production of a thought shower is not sufficient to justify the reward of higher marks. Occasionally candidates produce ideas for all four challenges despite indicating their selected challenge on the front of the workbook.

Briefs

Candidates often gain little or no reward for Initial Briefs or the Design Brief. These briefs are 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.

Users/Clients

The majority of candidates identified appropriate user groups for their products. 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 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. 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 get confused 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.

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 reported a lack of material knowledge amongst candidates. The majority of candidates did not identify specific materials or techniques for product manufacture.

Communicating information through sketches, writing and photographs

The standard of design communication was satisfactory overall but examiners report that the standard of drawing techniques has declined, with many candidates producing only 2D drawings. 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 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.

Written communication is generally good but many candidates miss the opportunity to use technical vocabulary when this is appropriate.

Materials, Components, Processes, Techniques and Industrial Practice

Examiners have reported that the majority of centres have 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. These materials included foam, foam board, card, balsa, clay, modelling clay, mechanism kits and polymorph.

Some candidates whose design work was of a good standard were limited by the materials supplied by their centres. Inappropriate or limited modelling materials impose restrictions upon candidate's use of materials and can have an adverse impact upon the quality of modelling. 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/or impact upon the candidates design work. Where these materials were used, the candidates' work was often incomplete because candidates were trying to manufacture 'final outcomes' rather than 'prototype products'. Some candidates highlight the availability of materials as a problem within the evaluation activity.

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.

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 did not record the feedback or planning for this activity.

Development of ideas

Design development was generally satisfactory. 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 are developing their design towards an optimum solution that satisfies the design brief, specification and needs of the user.

Some candidates either produce a model of the initial idea or simply redraw 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.

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 are asked within evaluation to reflect upon the future of the product. Many candidates do not give sufficient detail within this section of work, with generic comments such as 'it will be made bigger using wood' being given.

Reflection

To score highly candidates should focus on the product design rather than the modelling activity that has taken place. 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. Written comments on this element are often too brief to attract the best marks.

A553 Making, Testing & Marketing Products

Internal assessment Objective 4

This assessment objective relates to the creation of a single, functioning, quality product. Portfolio evidence should be based upon the use of photographs with supporting detailed annotation. The final outcome should be a working product, not a model.

A good range of products were presented for moderation. The nature of products varied considerably in size and complexity. If all candidates within a centre are making similar products it is important that candidates show individual ownership of the work. The photographic evidence within the folio should show the individuals approach to the product and its manufacture and be commented on accordingly.

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

The production diary should consist of a range of photographs showing the skills, materials and equipment used. Candidates should show ownership of the product and production process through their confident explanation of how they completed the product. Areas generally requiring greater focus within the production diary are:

- evidence of how candidates demonstrate economic use of materials
- evidence of how candidates obtain precision in the making of the product.

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

The quantity and quality of photographs enclosed in the portfolio is important; centres should ensure sufficient good quality photographic evidence is available to justify the awarded marks. Portfolios tend not to include close ups showing the quality and precision of the work undertaken.

Internal assessment Objective 5

This objective is all about taking the product forward and does not need to contain reference to the making process.

Evaluations were usually well written with reference to the specification and appropriate photographic evidence of realistic user testing. Video evidence of testing and user views is a strength of this unit.

Modifications and improvements to the product should be seen as a product development opportunity, and 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 way. This element of the objective tends to be over-rewarded by centres as it often focusses on what could have been done during the making rather than being based upon the product design and improvements to the product.

Quantity production continues to be an area where candidates/centres could improve marks. Candidates should research how their product could be made in a 'real world situation'. This research should then be applied to parts of the candidate's product, providing the necessary evidence to generate marks.

The marketing presentation/sales pitch should be the fun element of this unit. Unfortunately many candidates seem to be playing safe and creating an advert on a bus/bus shelter or inserting an image into a web based shopping site. Centres need to encourage candidates to explain the reasoning behind the selection of type of marketing presentation undertaken. 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

The Examination Paper provided a wide range of opportunities for candidates to reveal both their breadth of knowledge of Product Design and their ability to apply it.

The paper proved to be both rewarding to those who were well prepared for the task and discriminating across the whole ability range.

Question 1: The Lunchbox

Almost all candidates were well able to identify features of the lunchbox, such as the handle, the hinges, the compartments and the clips.

With this kind of question, candidates need to firstly look carefully at the illustration, get an overall impression, think about similar products that they have seen, and then visually check through all of the **features** of the illustration, considering their specific purpose, ease of use, safety, function and ergonomic implications. This will help to set the illustration in context before considering the questions.

Attempting to answer the question **before** spending sufficient time looking at and analysing the illustration, can often lead candidates to ill-considered responses. Candidates who score highly on later questions often give inaccurate responses to this first one, possibly because they mistakenly see the question as too easy, or they are in a rush to get started on the paper. The three marks 'missed' through haste may be harder to earn on later parts of the paper.

The names of three features were all that was required to attract full marks. Some candidates spent longer than needed giving full descriptions or explanations.

This question represents the first, fundamental activity for any effective product analysis exercise. Examining a product and being able to identify and list a range of its features is the basis of all of the product analysis activities required across each unit of this qualification.

Both aspects of Part (b) of this question represent the next stage in any product analysis activity: an appraisal and explanation of the importance of some of the design features of a product. Most candidates were well able to explain the significance of using well-known characters to decorate products and the importance of colour for a child's product.

Candidates involved in Product Design must fully understand the impact of consumer law on the design of products. They must be particularly cognisant of copyrights, trademarks and patents and how these can protect both consumer and designer.

This last part of question 1 was concerned essentially with the legal protection preventing the use of well-known images without permission or payment.

Most candidates identified a term such as copyright, trademark, registered, or licensed and then went on to explain the term and how it protects against illegal copying.

Question 2: The Box of Pies

The familiar context of a family pack of fruit pies was used to test knowledge and understanding of the influence of sustainable technology on the design of products. This example of a very common product used for analysis to explore various aspects of the design influences, serves to highlight that many ordinary household items are worth considering for this kind of activity.

The first part of the question was a simple test of knowledge and understanding of the term 'renewable resources'. These are resources that will never run out, or can be easily replaced by re-growing or re-planting.

Clearly some candidates incorrectly saw aluminium and plastic as renewable because they are materials that can be recycled. Sustainable technologies and sustainable design are key influences in Product Design. It may be particularly appropriate when undertaking product analysis exercises to consider the sustainability of the materials involved in the item as one of the concerns along with function, form, user requirements, aesthetics and ergonomics.

Many candidates were awarded full marks for their answer to this question, and a significant number of candidates scored 2 of the available marks.

The second part of this question required more specific knowledge of one principle of sustainable technology. This could have been related to design for the recycling of materials, design for the repair of a product, biodegradability, design for the extended life of a product, or re-thinking of lifestyle to reduce home energy usage. Most candidates chose to focus their answer on the recycling of a product in order to either reduce the need to exploit finite resources or to avoid the need to send it to landfill.

Clearly, the impact of sustainable technology on the design of products will become increasingly important to future generations. Candidates will ultimately become the buyers of products, and it will be important that experiences from this qualification will help them become well-informed consumers for the decisions and choices that they will face.

The final part of this question is essentially about the benefits to a manufacturer for creating products that have reduced environmental impact.

In terms of the future, perhaps this is the most significant question on the whole paper, for only when manufacturers can be persuaded to create products with minimal environmental impact, can there be hope for the next generation to be able to enjoy a more sustainable future. Clearly, the drive for products with minimal environmental impact comes mainly from the buying inclinations of the consumer, and many manufacturers only respond to consumer pressure.

The primary benefit to a manufacturer of marketing products with reduced environmental impact is that they will enjoy a positive reputation that may help increase their sales. However, it may be possible for a manufacturer to reduce costs and conserve energy by using recycled supplies and renewable power sources. Manufacturers could also benefit, financially and in terms of reputation, if their products are more easily disposed of or create less harmful waste.

Most candidates were able to explain the importance of consumer buying power when a manufacturer is seen as environmentally friendly.

Question 3: The Modern Digital Radio

This was very well attempted, showing an impressive understanding of the features of the modern digital radio. However, candidates have to be careful not to see this as just a '*spot the difference*' task. The illustration of the 1940's radio was provided for context, but this question is **only** about the modern radio. Any references to the disadvantages of the 1940's attracted no credit.

As with Q1 (a), candidates need to first visually analyse the illustration of the modern radio, identify **features**, think about modern radios that they have seen, and consider function, ease of use, and ergonomics. Then it would be appropriate to read the question and consider the answers. Without this initial analysis of the product, the questions do not easily slip into context, so candidates then give answers such as, *the radio from the 1940's is harder to clean, or the modern radio is easier to manufacture.*

The question was asking for **features** of the modern radio so only one or two words are required for each feature. Explanation and justification of the feature attract no credit in (a) and should be 'saved' for answering part (b). For example the word '*aerial*' is sufficient to attract a mark.

'*Aerial for better reception*' will also attract only **one** mark and it may then make it more difficult for the candidate to expand their answer for part (b).

Explanations of **why** the identified features make the modern radio successful were generally well attempted with most candidates scoring 3 or 4 marks. So, for example, *the buttons make it easier to change stations without having to search for a radio frequency*. And as another example, *being lightweight and slim makes it easier to carry and use in different places such as a bathroom or a garden*.

The reasons why the design of electronic products change over time are essentially a result of changes in fashion, development of new technology, consumer demands, product updating, product replacement and obsolescence. Many candidates were able to relate this last part of Q3 to their own experiences with modern phones, cameras and iPods.

However, with a mark value of 3, and the provision of 8 answer lines, the question was looking for reference to at least one specific influence for change together with a comprehensive explanation.

Question 4: Trendsetter and Iconic product.

Philippe Starck, Laura Ashley, and Linda McCartney had been well researched and were well represented in many of the answers to this question. Sir Clive Sinclair and Alan Fletcher were equally well researched but less popular.

In preparing for this question, candidates need to be very clear that marks will be awarded in 4(a) for information about the Trendsetter and that marks will be awarded in 4(b) for information about their Iconic Product. Knowledge about the Juicy Salif Lemon squeezer, Floral fabrics, and Vegetarian sausages gain credit in 4(b). Knowledge of the important influences (other than the given Iconic product) and the long-term legacy of the Trendsetter have to be explained in 4(a).

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 4(a) that focuses on the Trendsetter rather than their Iconic Product.

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**.

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.

Question 5: Design.

Specification

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: even if this is seen as an end in itself, without necessarily moving on to generate and develop possible design solutions.

Candidates have to be able to analyse a design situation and identify the key issues that will ensure the solution to a design need fully meets the requirements of the user.

Analysing the successful features of existing products, and specifying the required features of a new design need, are just two sides of the same intellectual activity.

Within the whole of Product Design, students should be encouraged to be concerned with the analysis of successful design solutions and proposals for new design opportunities.

Specification points that merely re-phrase the design need give no direction to a viable solution. Specification points that identify features that a solution must **not** have (*no sharp edges, not too heavy*) are more of a distraction than help. Specification points about selling price or cost can be too arbitrary to be of help to the designing activity at this level.

Generic specification points such as *must look good or bright bold colours or in the style of*, are too subjective and preferential to be able to be used to inform the design activity.

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 be well rehearsed in compiling 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).

Design ideas

Without a viable specification, candidates often deviate to inappropriate design solutions.

In this strand, 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.

Sketching and annotation for examination answers are skills that may have to be taught and practiced in a similar, time-pressured context. Within the confines of the examination, candidates have to effectively fill up an A4 sheet with a range of ideas in no more than about 10 minutes. This is a situation that requires very thorough preparation. Candidates may need plenty of practice with a sheet of A4, a list of four specification points, some basic pencils and crayons. This could be an activity used to start off a lesson, finish a lesson, or as a mid-lesson break. The A4 sheets of ideas could be displayed and commented on, and all of the sheets that look like they would score 4 or 5 marks (range of ideas, with notes, that address at least two specification points) identified as exemplars for a future activity.

Development

At KS3 level, the development of an idea is often seen as a larger, neater or more colourful drawing of one of the initial design ideas; this is not sufficient for GCSE.

Development at this level requires the competent application of D&T 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 evidence the developmental activity being sought.

Final idea and Evaluation

This is where the final idea needs to be presented along with some appropriate technical detail. Then there should be **four sets of notes** drawing attention to particular features on the drawing and explaining **how** these features satisfy the requirements of the original four specification points from 5(a).

Notes that merely state that “*the feature satisfies spec point 2*” without explaining **how** the spec point is satisfied, are not sufficient to gain marks.

Where a specification point refers to comfort and ease of use, the evaluation comment must explain **how** the feature makes the final idea comfortable and easy to use. This is very much a Product Analysis activity, typical of what is expected in the A551 Unit.

In order to prepare candidates for successfully completing this part of Question 5, they may need to have practice in comparing a product with four specification points, identifying the features of the product that help meet the four points and then explain **how** the features contribute to the success of the product. An A4 sheet with a small illustration of a product in the centre of the sheet and four specification points presented in each corner of the sheet could be the starting point for a class activity to link the specification points to features on the illustration and give written explanations of **how** the features contribute to satisfying the points.

Use of additional sheets or lined answer booklets

Particularly with questions 4a and 5d, candidates often use additional sheets in order to complete their answers. It is important that candidates clearly identify the additional writing or sketches with the correct question number so that examiners can apply the appropriate part of the mark scheme to the additional work.

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