



General Certificate of Education

# Design and Technology: Product Design

## Examiners' Report

*2005 examination - June series*

- Advanced Subsidiary (5551)
- Advanced (6551)

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Set and published by the Assessment and Qualifications Alliance.

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*Dr Michael Cresswell Director General.*

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## PD1D

### *General Comments*

The established layout and style of this paper seemed to enable all candidates to access it and produced a wide distribution of marks. The standard of responses was similar to that of previous years with the exception of generic terms such as 'wood', 'plastic', 'strong' and 'cheap' becoming much less common. Unfortunately, these terms are being replaced by phrases such as 'high strength to weight ratio' or 'easy to manufacture'. Where candidates are asked to explain why materials are suitable for a product, answers are still not fully explained. For example, "plastic is used because it comes in different colours" without explaining why this is relevant to the product pictured.

Candidates supported written answers with, on the whole, good quality drawings. In some cases these were of text book quality with clear step by step descriptions of the process concerned.

This year, most candidates attempted the questions and sub-questions in a logical sequence which greatly assisted marking. A small number of centres issued candidates with supplementary drawing sheets which candidates used to sketch the manufacturing processes. This made marking of such centres a difficult, time consuming exercise as answers were disjointed.

Significant numbers of candidates seem to be making rubric infringements and, where this does occur, it is often a whole centre problem. Where candidates attempt all four questions, they rarely have the time to answer at least three in detail and, therefore, will be at a disadvantage.

There is also an increase in the alteration by some candidates of the question set. For example, in question 2, a number of candidates decided to describe the use of nuts and bolts to attach the wheel assembly to the skateboard, not the manufacture of the trucks themselves. Similarly, in question 1, candidates often described the manufacture of the bottle top presumably because they knew more about injection moulding than blow moulding.

### *Question 1*

- (a) (i) This was generally well answered. Centres had clearly prepared their candidates well to answer questions on polymers. Most candidates described suitable polymers for the mini disk player or bottle, or a suitable metal for a pencil case.
- (ii) In general, candidates linked the properties of the material to the function or manufacture of the products pictured. Some poor answers consisted of simple lists of generic properties that were not clearly linked to the product.
- (iii) There were some excellent diagrams and descriptions of injection moulding for the mini disk player and blow moulding for the bottle. Some candidates believed the pencil case was manufactured by compression moulding (with the aluminium in a paste form) whilst casting was another popular method given for making this product. Both were incorrect.
- (b) Many candidates described specific polymers and parts of cars where they might be used, rather than explaining why polymers are used.

### ***Question 2***

This was a very popular question with candidates and generated a wide range of responses.

- (a) (i) Most candidates gave the generic term 'plywood' in answer to this part. Only a small number made reference to it needing to be laminated.
- (ii) Generally, this was well answered with candidates making reference to the material needing to be flexible to withstand impacts when performing tricks, etc. Reference was also made to resistance to moisture and ability to use mechanical fixings to fit the wheel assembly.
- (iii) The majority of candidates gave good descriptions of the laminating process. Some candidates had clearly been taught about or experienced wood deforming methods in coursework with good descriptions of using a bag press and Styrofoam former, etc.
- (b) (i) Most candidates gave a sensible answer such as aluminium for the trucks or wheel assembly. However, a number gave inappropriate materials such as 'iron'.
- (ii) Many candidates ignored the arrows in the photographs and described the materials and manufacturing of the wheels, or the attachment of the wheels to the board rather than the wheel assembly itself. Where candidates described the wheel assembly or trucks, there were some excellent descriptions of sand casting or die casting.

### ***Question 3***

- (a) Many candidates simply described what they could see in the photographs on the insert sheet and focused on the physical aspects of the two lamps. Most concentrated on aesthetic points or the function of the lights rather than analysis of the materials and manufacturing processes used in each. Only the better answers truly compared and contrasted the two lamps in terms of the materials and processes and fully addressed the question.
- (b) There were some very good descriptions of powder coating paint technology or descriptions of chrome plating. However, many candidates generally described 'painting' with very little detail and rarely using specific paints as exemplars.

### ***Question 4***

This was a very popular question. Candidates were able to choose their own product for the given materials and so the familiarity with products led to good answers. Where descriptions linked the material to product function or manufacture, candidates gained high marks.

In weak answers, candidates simply listed generic properties that had some relevance to the material and product but this was often poorly explained.

- (a) In parts (i) to (iv) almost all candidates gave sensible applications for each of the materials listed with the exception of Urea Formaldehyde. This caused a few problems with some candidates being unfamiliar with it. A very small number of candidates described adhesives or finishes that would be suitable for use with each of the materials and, therefore, did not score well.

- (b) Most candidates linked the properties of the material to the products they had given but, in many cases, answers lacked clarity or detail. Often answers had one or two points explained with the remaining text being generic terms not linked to the product.

***Quality of written communication***

In general, this seems to be getting a little better with candidates giving fuller answers and taking care with spelling and punctuation. Candidates are also making more use of appropriate technical terminology.

## PD1T

### *General Comments*

The overall pattern of responses was very similar to that of previous examinations. Most candidates attempted three questions but a small minority ignored the rubric and answered all four questions; thus failing to answer any in the detail required for high marks. Scripts were generally well presented and legible although a small minority of candidates wrote with very pale blue or black ink which can be difficult to read, especially when handwriting is small.

As in previous examinations, many answers suffered from a lack of precise detail and many showed a lack of understanding of the most basic textile terms and processes.

There was, however, some evidence that candidates had used previous papers as part of their revision, and that comments from previous reports on the examination had been implemented in many instances.

### *Question 1*

(a) Many answers were more concise than in previous examinations. Some candidates misunderstood the question and either described fabric properties or wrote about the manufacture of the garments. Many concentrated on Style A pyjamas at the expense of describing Style B. Marks were often high for this part of the question.

(b) As in previous years, there was confusion about the differences between woven and knitted fabrics. This question was about basic fabric construction and it was expected that candidates would be able to describe the weft knit and plain weave structures in accurate detail. Those who did know the differences responded well and diagrams of weft knit and plain weave greatly helped their descriptions.

In part (ii), many who were able to describe the woven structure accurately omitted to explain how the stripes would be achieved or how the brushed finish would raise the fibres. Those who repeated information given in the question, i.e. the fabric is woven and brushed, were not given credit. Many candidates showed understanding that trapped air, both in the looped structure of the knit and the raised pile of the woven fabric, is an insulator. Some candidates appeared unaware of this basic fact and considered that 'a tight weave prevents hot air escaping'. Some candidates did not read the question thoroughly and wrote in detail about the garment styles rather than the fabric properties.

(c) Very few candidates answered this question well and 'thread' and 'cotton' appeared to be interchangeable. Common answers included 'cotton thread' and 'Lycra thread', neither of which was acceptable. Candidates should be aware of the legislation relating to the manufacture of nightwear and the use of polyester thread in industrial manufacture. Those who did understand were usually able to give some accurate reasons for its use. However, very few candidates scored well on this question.

(d)(i) Many candidates appeared not to have looked at the mark for this section and gave only a brief answer relating to laundering in general. Care instructions seem to prove a problem for some and many answers lacked a common sense approach, suggesting that the pyjamas would need hand washing or even dry cleaning. Many were very confused about wash and iron temperatures, especially in relation to the brushed cotton, but most were able to score at least half of the marks available.

(ii) Despite a similar question on flammability last year, many candidates appear unaware of legislation relating to nightwear. Few understood the differences in the ways cotton and polyester react to burning and the added effect of the brushed finish. There were some very elaborate

accounts of the need to know whether or not to remove nightwear in the event of fire, and the perceived dangers of drying pyjamas on radiators or even sleeping near to radiators.

### **Question 2**

- (a) This was a popular question which resulted in some good marks, particularly from those who were familiar with a range of fastenings from coursework. Although not very detailed, many accounts were well reasoned but a lack of appropriate examples meant that some candidates did not access the highest marks.
- (b) The compare and contrast element of this part of the question was tackled well by many; if marks were lost it was usually because of an inability to make effective comparisons. Some candidates did not know what petersham is, with many describing an elastic/drawstring style of waist finish as found on tracksuit pants.

Part (iv) was the weakest answered since many described, rather than compared, the two edgings. Better candidates referred to the flat finish of the binding, enclosing all raw edges, and the potentially more expensive process of applying the lace in industrial manufacture.

### **Question 3**

This was not the most popular question and the one which was the least well answered.

- (a) Definitions of fibre blends and mixtures were good by those who understood the differences, but many omitted to refer to the yarn or fabric which is the crux of the definition. Laminates were commonly confused with coatings and finishes, and this continued through to part (b)(ii).
- (b)(i) This scored highly when clear reasons for blending were illustrated by a range of examples, not just polyester/cotton blends. Responses tended to be generalised with little reference to the merits and drawbacks of individual fibres within a blend. Some candidates were able to refer to the achieving of novelty and colour effects as well as fibre properties.
- (ii) This was not well answered. Most candidates erroneously thought that a laminate is a PVC coating, and many were mixed up with other finishing processes. High scoring answers described fabrics such as Gore-Tex and Sympatex, but these were few in number.

### **Question 4**

This was a reasonably popular question and answered well by many.

- (a) Very few candidates knew the definition of standard moisture regain (SMR).
- (b) Most candidates interpreted the graph to good effect and were able to give reasonable explanations in each of the three situations presented to them. Marks were lost because answers lacked detail and, in some cases, did not go beyond the basic information provided in the graph. Viscose as a cheap, biodegradable and renewable source was understood by many candidates. The fact that polyester is virtually non-absorbent and would thus keep dry was noted by most. Although most used the graph to work out that synthetic fibres have low SMR, there were few answers showing a clear understanding of how static electricity builds up in these fibres.
- (c) The wool/cotton towel situation was discussed well by most candidates. Most could have acquired more marks had they given more detail, suggesting that it was perhaps not lack of knowledge but failure to register the mark allocation for this part of the question. Some

candidates discussed and compared fibres other than wool and cotton which was not asked for in the question. Many showed lack of knowledge by stating that 'because wool is knitted it will stretch out of shape', or 'fluff from the wool will attach itself to a wet body'. Others provided responses about sheep being rare, or the perceived difficulties of obtaining wool 'out of season'.

## PDN2

### *General Comments*

Overall the moderation process this year was satisfactory. Centres are increasingly familiar with the complex procedures necessary to conduct moderation and all played their part in ensuring that the operation was effective. Unfortunately a small number of centres continue to use an out of date mark scheme, but it is hoped that this will diminish as centres make reference to revised specifications on the AQA website.

In general, assessments carried out in centres were quite accurate and often very close to the AQA standard, teachers showing fairness in their marking with familiarity and understanding of the assessment descriptions as set out in the specification.

There is still some evidence to indicate that, where more than one teacher is responsible for the assessments, ineffective internal standardisation has led to difficulties in accepting a centres overall marking. This is particularly so when textiles and 3D candidates are in different teaching groups.

The majority of centres now make use of suitable “soft bound” folders, making postal interchange and packaging more straightforward. A very small but increasing number of centres are making use of *electronic* design folders, these being submitted on disc, mostly making use of PowerPoint presentations with web hyperlinks and scanned in images / freehand sketching as well as digital photography. You should inform AQA at Manchester if you wish to do this.

Few candidates rely upon a single project to demonstrate their best work at each of the assessment criteria, however it was disappointing where two or more individual projects had been submitted to find that there was often little to differentiate between them. There is little value in seeing identical sets of research, communication, evaluation etc from the same candidate. In the case of textiles, fashion garments were produced along with furnishing outcomes and/or a fashion accessory. This resulted in a balanced range of evidence of both designing along with practical skills.

The intended portfolio approach is where candidates, with teacher guidance, can select the best examples of their work from a number of different project., Each example of work can address the needs of each of the five criteria and can be put together into a single folder. This should be coherent? and will require suitably detailed annotation by the teacher to show where marks have been awarded. Some candidates have simply handed in three separate folders whereupon staff have marked them all individually and submitted three mark sheets.

*Comments on the individual assessment criteria at both PDN2 and PDN5 can be found on pages 19 and 20.*

## PD3D

### *General Comments*

Centres are to be congratulated for preparing very well for this examination. It is clear from the standard of responses that candidates made good use of the theme paper issued in the spring term and researched products such as computer workstations, task lighting and desk tidies in readiness for the examination.

The style of the paper and general mark allocation for each section is now embedded and centres are clearly preparing candidates by using past papers and their own practice papers based on the theme so that candidates are familiar with how to access the top mark band in each section. The net result is that candidates are producing better responses and the mean mark continues to be high.

### *Question 1*

Generally candidates did reasonably well with this question with most gaining over half marks. However, a significant number of candidates clearly did not take note of the mark allocation for each question and wrote much more than required. This would have resulted in a reduction in the time available to answer question 2.

- (a) Responses to this question were very mixed. Some candidates gave almost a text book definition of ergonomics, whilst others either did not know what the term was or gave a very vague definition. In many cases ergonomics was confused with anthropometrics.
- (b) The majority of candidates understood that anthropometrics is the use of body measurements. However, a significant number didn't know what the term meant or confused it with ergonomics.
- (c) Candidates gained significant marks in this section with good descriptions of the ergonomic and anthropometric factors in a workstation. However, quite a number simply listed human body measurements without relating them to the workstation.
- (d) This was not well answered. The majority gave basic descriptions of the designer making a prototype which could be tested. Very few candidates described the use of computer models, user trips or consumer focus groups in pre-production testing.

### *Question 2*

- (a) The majority of candidates produced several design ideas (on average 4). In many cases these would be a variation of one or two ideas. Sadly, some candidates ignored the specification listed in the question and did not include a desk tidy within the task lamps they designed or gave it very little thought in their ideas or final design. This led to reduced marks in part (vii).
- (b) (i) Quality of communication in many cases was excellent. Candidates are generally using appropriate 2D and 3D drawings with sufficient use of colour, texture or tone and annotation to communicate their designs. Most candidates scored well in this section.
  - (ii) This continues to be an area of difficulty for some candidates. Many candidates simply designed standard anglepoise lamps with 'bolt on' desk tides that are very familiar sights in high street stores and catalogues. However, in the majority of cases, candidates were able to show some original or innovative features within designs or innovative use of materials. For example, the

use of thermochromic pigment in the shade to indicate it was hot, or built in features such as electronic hole punches or sharpeners, etc. In the best examples candidates produced some superb designs, using influences from nature or architecture to inspire ideas, going beyond the norm but still being feasible and suitable for a modern office interior.

- (iii) The responses for this section were very mixed. Many candidates randomly labelled up parts of drawings with the same materials repeated over and over throughout their designs and final drawing. Many were not entirely appropriate. A significant minority used poor terminology such as 'wood', 'plastic', and 'metal'. Better answers included sketches of some of the components and give brief justification for the use of specific, relevant materials.
- (iv) Again, for methods of construction, responses were mixed. Many candidates simply labelled drawings with phrases such as 'welded', 'injection moulded' and so on. Better answers included sketches of two or three parts showing assembly details or in the case of injection moulding/press forming, drawing some of the process and describing it with brief notes.
- (vi) 'Suitability of finish' is often ignored by candidates and therefore five marks are easily lost. The majority of candidates only give a specific finish without describing its application or justifying its use and so can only access the low mark range for this part.
- (vii) Most candidates met the specification criteria in their designs or final drawing and therefore gained full marks for this part. Some lost marks if they did not include a desk tidy or show how the height/angle could be adjusted. The majority included some method of shading the light bulb.

### ***Quality of Written Communication***

This was generally good with question 1 giving plenty of opportunity to show good use of spelling and punctuation. Candidates generally made good use of technical terminology.

## **PD3T**

### ***General Comments***

The overall level of responses were not quite as good as last year although Question 1 was better answered on the whole. It appeared that candidates had managed their time better in that most attempted both questions. The quality of written communication was good on the whole with many candidates using technical terms fluently and appropriately.

### ***Question 1***

- (a) Very many candidates misunderstood the question to be about recycling, the development of design ideas, or the length of time a product was likely to last before becoming unusable. Those who were aware of product life cycle responded well although, as with other questions, marks were lost because of a lack of examples. The use of graphs to show the rise and fall in popularity of fashions helped some explanations. Many candidates offered strange examples to illustrate points made, e.g. mobile phones, fizzy drinks and cars.
- (b) Here again, there was much confusion with many referring to the development of designs and advertising to the public rather than presentations to the client. Some detailed responses described catwalk shows, graduate and trade fairs as well as PowerPoint presentations and virtual catwalks.

### ***Question 2***

Candidates did not respond well to the set theme. Some candidates were aware of the dichotomy between designing original products and those appropriate for a mass market, and responded by using logos, colour and cut in novel ways. Most, however, were content to reproduce very basic designs which are commonplace in any sports shop.

Most candidates used the two A3 pages as stated in the rubric, showing a range of initial thoughts on one and a final design on the second. A minority of candidates did not follow instructions to show a final solution for one product, instead they showed a further range which made it difficult for examiners to award marks. Many others spent so much time on initial ideas that they had insufficient time to do justice to the final design. It is important that candidates look at the breakdown of marks for the two sections of this question; 61% is for the final presentation against 15% for initial ideas. A reproduction of one of the initial ideas is unlikely to allow them to access high marks.

Quality of communication was varied although there were few very poor presentations. Candidates are awarded marks for clear annotation of ideas as well as for their graphical skills. When assessing initial ideas examiners look for annotated pencil sketches showing a varied range of thoughts including originality of thinking. This could be for different products or a range of similar products. Many candidates showed limited ideas at this early stage and some spent too long on very detailed notes – in some instances the annotation took up more of the page than the sketches.

Lack of originality was a serious weakness in the work of the majority of candidates. Ideas, especially the final idea, lacked the innovation and complexity required at this level. Candidates should consider whether presenting a simple sweatband, basic cargo style pants, drawstring bag or simple gym top is sufficient to earn them a high mark. Many did not indicate which sport or leisure activity their product was intended for and, whilst it was nearly always obvious, there were a few cases where it was not clear. Examiners accepted a wide interpretation of the theme, especially where the candidate had clearly justified their choice of product.

Many candidates had clearly researched smart and modern fabrics and were anxious to share their knowledge. Whilst this led to a number of slightly more innovative products, many candidates referred to various fabrics, fibres and finishes, showing little understanding of the nature of these modern and smart materials. There were many instances of the use of materials not having been thought through, for example, the use of Gore-Tex for a swimsuit or panels in a gym top, polar fleece to line a gym vest, use of leather for holdalls intended for wet sports, 100% Lycra for tops and swimwear. Other candidates were unable to venture beyond simple fibre names, e.g. cotton, nylon, polyester/cotton and Lycra. The more thoughtful responses included detail of the fabric structure, e.g. knitted, mesh, micro-encapsulated, ribbed.

Information about product construction was improved this year with many referring to seam and hem finishes, and showing the pattern templates to be used. Some who selected pants had problems with the pattern shape. Many candidates continue to lose marks in this section because they ignore the request to show construction details or think it refers to fabric construction or decorative techniques.

## PDN4

### *General Comments*

This was the second year in which the new assessment criteria were used and the overwhelming view of the senior moderators is that candidates who produce the most insightful and considered studies are being fairly, and rightly, rewarded. There was little evidence to suggest that centres have not now fully grasped the concept of the Product Study, but the attention of teachers is drawn to the statements made in the 2005 Specification, p49, which reads;

*“The study must be based on a proposition that can be explored and from which conclusions can be drawn and evaluated. **The study is not to be seen simply as a historical survey or an account of all the material gathered, but as a demanding intellectual investigation that allows a candidate to develop their critical analytical faculties ... ..**”*  
*[emphasis added]*

As in previous years centres are, once again, advised to ensure that the appropriate guidance is given to their students when preparing for this piece of coursework. As the Specification (p49) states:

*“Candidates should select areas of study which are of interest and value to them, in consultation with their teachers ... .. the work should be school-based ... ..”*

In the weaker studies it often becomes clear that the candidates may not have received the necessary guidance and they have been allowed to develop the study as they think best. To achieve the very best results the candidates need clear guidance on both the structure and content of their study in order to ensure that it will meet the requirements of the assessment criteria. In a number of cases clearly able candidates have produced a lot of work that is well presented and well written but fails to meet the assessment criteria, and these pupils are clearly being disadvantaged by a lack of guidance and advice. Over the years AQA has produced comprehensive guidance notes on preparing students for the product study and all teachers are strongly advised to refer to these, and to keep them close to hand during the time spent on this piece of coursework.

However, that said, we are now seeing some excellent studies that are incisive and well written as well as being interesting and instructive to the reader. For the first time this year we have also seen a significant number of studies scoring 45 or more and a number are now achieving full marks. One final general observation of note, from being the most popular study topic the Dyson has now given way to the Barbie Doll!

***Product Study Objectives and Context – 5 marks***

Although only worth 5 marks, the choice of topic of the product study and the subsequent decision as to which issues of design and manufacture they will focus on is a major issue. This year the vast majority of candidates focused on an appropriate topic, but often their choice of issues caused them some problems. For whatever reason too many candidates still continue to try and address far too many issues, the result being that, given the advisory 2000 word limit, results in a study lacking depth and analysis. Consider this example of a study that looked at the Canon digital camera and proposed to look at the following issues:

Design issues The history of Canon The history of Canon digital cameras How technology has changed the digital camera How the camera is designed so that it is easy to use for the user How the size of the Canon digital cameras has changed How the design process has changed	Manufacturing issues How technology has changed the way that the cameras are manufactured How the materials have changed How the quality of the product has changed What kind of materials are used for this camera
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Consider now another two examples seen this year. The study that challenged Jonathan Ive's view that the iPod has already reached iconic status, this student set out to define iconic status and then applied this definition to the iPod. Another based on Birkenstock sandals wanted to investigate their claim that they are good for your feet, after searching out the information they found five criteria for a good, supportive shoe and then applied these to the sandals. On the manufacturing side candidates are setting out to find how and why products and their components are manufactured in the way they are.

In order to achieve the higher (4-5) marks the issues of design and manufacture must be clearly expressed and explained within the context of undertaking the study.

***The Plan of Action and its Execution – 5 marks***

Of all the sections this continues to be the most disappointing, despite the fact that the guidance given at the teacher meetings has clearly explained what is expected, too many centres are awarding 4 and 5 marks for lower quality work.

Most studies include a simple time plan but too many continue to address this section as a plan of intention and rarely record the success of their plan. In order to achieve the higher (4-5) marks it is expected that some comment as to the usefulness of the data collated will be made, this is explained in greater detail in the most recent teacher meeting support material.

A number of centres continue to award the highest marks even when candidates have only used minimal sources, usually just one or two Internet sites, the objectivity of a study is quickly lost when only the manufacturers Internet site is used as the source of data. The use of the Internet is being used by some candidates as a short cut to undertaking a full and thorough investigation of the topic issues. At this level it is expected that the Internet will be just one source of data and that this will be supported by other, more traditional, sources as well. It should also be noted that search engines such as Google and MSN are not considered to be data sources.

### ***Analysis and Synthesis – 20 marks***

Since increasing the number of marks available to this section it is pleasing to report that the quality of work seen has shown a steady improvement since last year. The key to this section, as already highlighted, lies in the careful selection of the design and manufacturing issues in Section 1. Candidates still seem unclear as to the full meaning of the requirement for *analysis*. Over the years the teachers meetings have promoted the need for the candidates to be expressing their own views and opinions, using the data collated, about their chosen design and manufacturing issues. The best way of reporting back on this section is to suggest a series of do's and don'ts based upon what we have seen this year.

Do ... ..

- make sure that the writing meets the stated design and manufacturing issues;
- make sure that the majority of this section is the original writing of the candidate;
- feel free to offer personal views and opinion, so long as these are based on fact and are realistic;
- include annotated pictures and images, especially if they have been taken by the candidate;
- make regular reference to the collated data;
- make sure that an appropriate standard of terminology is used.

Don't ... ..

- just copy the writing of others;
- just cut and paste from the Internet, this applies to both text and images;
- make sweeping generalisations;
- just write about anything.

Finally, whatever happens, don't let your candidates turn the study into a product history, we are still seeing a significant number of studies that focus too much on the irrelevant history of the product at the expense of incisive writing that has the stated issues of the study as its central focus.

### ***Conclusions, Evaluation, Recommendations – 15 marks***

The teacher guidance has always suggested that this section be presented under the separate headings, and those that do continue to present the highest quality work. This year too many candidates have presented work that appears to be rushed or even an afterthought after the analysis and synthesis section. At another level it could be suggested that a lot of candidates do not really understand what is required of them in this section, yet further evidence of the need to ensure that this is a taught, school based piece of coursework.

For information the three headings need to address the following:

- Conclusions – the focus here should be on what the candidate has learned from completing the study. This needs to be linked to the original design and manufacturing issues.
- Evaluation – here the candidate needs to be looking at the overall completion of the study, the ease (or not) with which they were able to collect data, their use of time, the overall quality of the study they have presented.
- Recommendations – candidates need to be advised that they are not expected to suggest how the product could be improved, although many continue to do so, instead they should be writing on how they could extend/develop the study.

***Presentation – 5 marks***

The overwhelming majority of studies are now very well presented. Teachers and Centres do need to remember that this is expected to be a formal study and that there is no need to try and present their work in a more novel manner.

***Assessment and administration***

As always the moderating team is grateful for the work of the Centres in ensuring that work is completed and dispatched by the deadline dates. This year, however, a significant number of Centres did not annotate the Candidate Mark Sheets, they are reminded that at GCE this is a requirement.

Centres are also reminded to check that all the necessary documentation is enclosed and signed.

## **PDN5**

### ***General Comments***

As stated earlier, a small number of centres are still using the incorrect assessment forms. Centres can either request the correct form from AQA or download the form from the AQA website.

As was the case in previous years, Centres exhibited work which encompassed a very broad range of problems. The overall impression was that in the majority of cases the projects submitted were entirely appropriate to the specification, being holistic projects, the better ones having been “commissioned” by a named client who could help in setting out their needs for the specification and again with appraisal of ideas and evaluation of the final outcome.

*The majority of the following comments can also be applied to the AS unit, PDN2.*

### ***Investigation and Clarification of Problems – 10 marks ( AS – 7 marks)***

There is often a lack of focus to this section with candidates producing many pages of generalised, cut and paste catalogue based research and multi copied questionnaires which lack real impact upon the design process which follows. Best practice was found amongst those candidates who made use of digital cameras and carried primary research of the design situation and followed this with detailed analysis of this and relevant analogous products. In many centres the section is appearing to be somewhat formulaic. Mood and image boards were frequently provided but often lacked any analysis or explanation of their relevance to the specific brief for the design to follow.

It is vital to the development of successful product design through evaluation of ideas and the final outcome that a detailed and focused design specification is presented through analysis of the initial brief and after due consideration of the research.

### ***Development of a Design Proposal – 30 marks ( AS – 23 marks )***

This section clearly represents one of the most important sections and one which most frequently leads to over generous marking. There is all too often less evidence of time given to this section than that given to the previous section. Students should be encouraged to enjoy a little risk taking in the initial stages of designing with less reliance upon retrospective ideas. It is important in this first stage of generating ideas that students discuss and share their ideas with others. Fellow students, staff, parents, friends and the important client or intended user could assist in the review and selection of ideas. Weaker candidates presented a small range of ideas, all too quickly homing in on one to take further into manufacture. This was then simply redrawn with only one type of construction/material shown. The best candidates refined the shape/appearance of the initial design, giving detailed consideration to alternative methods of manufacture and different material combinations. It is here that a number of possible ideas could be presented in model form. These may be produced in materials ranging from 3D hard modelling in Styrofoam / balsa / jelutong / MDF/ to card / clay / or, in the case of textiles, calico toiles. It is advisable to take photographic evidence of these to both aid their use in developing and evolving the best solution and keeping evidence for assessment purposes. Innovation and experimentation is to be encouraged as, not only does it lead to better design solutions but it helps expand the students overall knowledge of materials, processes etc.

### ***Communication and Modelling – 15 marks ( AS – 11 marks )***

This section produced quite varied results but included some excellent work with pro-desktop and some very exciting and creative folders exploiting a wide range of graphic media and superb CAD to produce both 3D artistic impressions and 2D working drawings. Sadly the increase in use of computer generated design is often at the expense of quality free-hand sketching and the demonstration of students “thinking” out a design on paper. Textiles focused folders generally set a very high standard for both sketching and

modelling and excellent use is often made of materials testing and calico toiles. (*please do not send these to the moderator*). Alternatively some quite poor attempts at 3D modelling of non-working, solid block MDF / acrylic styling projects were submitted. In some cases this work was the only and final practical manufactured outcome produced and yet quite high marks had been awarded within the next – Making / Manufacture criteria section.

***Making/Manufacturing – 30 marks ( AS – 23 marks )***

Weaker candidates continue to submit work which is often very simplistic, sometimes incomplete/unfinished and resembling more of a rough prototype or mock-up than a marketable product. However, moderators are also delighted to report that there is some truly excellent work in evidence, ranging from contemporary furniture, jewellery, fashion garments and exercises in genuine product design styling. All of these produced in a range of appropriate materials. Many more candidates this year produced at least a basic manufacturing plan, flow charts etc. Best practice showed through the production of detailed plans that included quality control checks, risk assessments and in built review of progress. Again, textiles project work scored highly when these included links to industrial manufacture and flow chart production mapping. It should be noted that although a small number of the available marks are allocated to the folder based evidence of planning and modification of the product design the majority of the marks at this criteria are reserved for the actual manufactured outcome. It is the quality and complexity of this which must be considered when deciding upon the marks to be awarded.

***Evaluation and Testing – 15 marks ( AS – 11 marks )***

Staff annotation which simply stated “evaluation evident throughout the folder” is not sufficient to demonstrate why marks have been credited. This section is often seen to be a rushed “add-on” section and suffers from a lack of time allocated to it, particularly when moderators report that quite high marks are frequently given. Weaker candidates simply provide a description or photograph of the final product with no reference back to the original specification. There is often no contribution from a third party other than the very basic “ I think it’s great ” comments from friends/parents etc nor evidence of genuine “field trial” testing to expose design faults and the need to suggest re-design modifications. This is not a sign of weakness or fault and will not affect the award of marks given for the finished product. It is not necessary to re-paint or protect products against the effect of testing if this is the result of genuine testing of a final product. Photographic evidence of this would be very much appreciated, and would assist moderation considerably.

## PD6D

### *General Comments*

This was the fourth Unit 6 examination for Product Design :3D and examiners are pleased to report that they perceived a distinct improvement in candidates' overall performance. It was stated in last years report that preparation for this, synoptic examination should be an integral and ongoing part of the Product Design course from the very beginning of the course in year 12. This, together with more centres making use of past papers and the availability of course specific text books has improved the responses received for all questions.

There was no obvious preference for any particular question and nothing to suggest that candidates were short of time to make their responses. Sketches were included and although sometimes limited in value they provided support for answers. As in previous years some candidates filled out the front of answer books incorrectly and some answers were disjointed with additional pages handed in untitled and out of order. In a small number of cases poor handwriting rendered the script almost illegible.

### *Section A : Materials and Components*

#### *Question 1*

This was a popular question with part (a) being reasonably well answered although some candidates spent an unnecessary amount of time describing the process of injection moulding whilst others incorrectly stated that the flask would have been blow moulded. It was frequently stated that the metal flask would have been cast. Despite the use of italics to emphasise the different wording of the two parts (a) and (b), most candidates did not concentrate upon an explanation of *why* stainless steel had been used to manufacture the second flask. Some suggested that being a good conductor of heat was a beneficial reason for using stainless steel to manufacture the flask.

#### *Question 2*

- (a) The question was again reasonably well answered but too many candidates again ignored the italicised instruction to name *different* composites and wrote about GRP (usually stated to be “glass fibre”) and carbon fibre. Often the candidates themselves stated that the two were very similar. Inevitably, almost identical characteristics were written for the constituent materials and, therefore, few marks could be awarded. Knowledge of materials properties was, in general quite poor with limited understanding of how different materials contribute useful properties to a composite. Concrete, MDF and plywood were other popular composites.
- (b) Carbon fibre as applied to the manufacture of canoes, tennis rackets, racing cars and racing cycles and MDF furniture were popular products stated to contain composites in their manufacture and explanations, although lacking in detail, were generally acceptable.

### *Section B: Design and Market Influences*

#### *Question 3*

A very popular and quite well answered question. It was clear that many candidates were familiar with these methods of communication and use them in their own project work.

- Prototype – many explained how this could be used for establishing the 3D qualities of a paper design. The uses were; non/ destructive testing, customer / client feedback and

planning for manufacture. Rapid Prototyping methods were often included as was a reference to the number of prototypes Dyson used in developing their products.

- Rendering – Pro Desktop would appear to be well used within many Centres with candidates listing its capability for rendering colour texture and pattern alongside the less sophisticated use of marker and pencil.
- Flow chart – it was generally understood that a flow chart is used for planning manufacture and presenting the sequence with quality checks highlighted.
- Orthographic projection – a mixed response with some confusion between this and isometric drawing. Few discussed or used terms like – plan, elevation, first/ third angle, but most recognised that it is here that measurements are recorded.
- Isometric drawing – generally understood but few thought to present a sketched example. This was the case with all of the above.
- Mood board – often mistaken to be a collection of design ideas for final presentation to the client, rather than a collage of pictures to present as influences to guide initial design thinking.

#### ***Question 4***

- (a) The question was popular and reasonably well answered with more able candidates making reference to BSI and CE testing legislation whilst others simply listed possible safety issues with little reasoning to support their answer.
- (b) Understanding of the function and importance of a product specification was often simplistic with many suggesting that the specification could change throughout the design process. This is no doubt due to the fact that many candidates produce their own brief rather than work to client's needs and make only passing reference to the specification when carrying out evaluations. Any changes which were made so becoming of little consequence.

#### ***Section C : Processes and Manufacture***

#### ***Question 5***

- (a) There were some successful answers, where candidates show a good knowledge of JIT, flexible manufacture, cell and sub-assembly, detailed application of CAD/CAM , robotics and the use of templates, jigs etc. Better answers came from those who had first hand knowledge of modern manufacture possibly as a result of a factory visit
- (b) This part of the question was generally quite poorly answered with many choosing to ignore the first part of the introductory sentence and going on to describe the position of a designer within the design and manufacture process. Few, sensibly made reference to a specific area and described how the designer/maker can respond to a commission for a bespoke / tailor-made product, and of the close relationship between the client and the designer/maker, the ability to select materials and one-off production methods and hence costs involved.

#### ***Question 6***

Although popular and in many cases a well answered question there were many who again failed to read the question and wrote at length describing the earliest form of products such as irons and kettles heated over open fires. Better answers focused upon mobile phones and forms of personal music – cassette / mini disc / CD and MP3 players, where candidates had a direct knowledge of the product, although it is disappointing how little knowledge candidates have of the developments in technology (i.e. analogue to digital, sound compression and electronic compared to mechanical, data storage, power supply etc. Design knowledge remains fairly superficial with limited debate regarding style / fashion developments.

## **PD6T**

### ***General Comments***

This was the fourth Unit 6 examination for Product Design Textiles. Overall the performance by candidates was a little lower than last year although there were still many candidates achieving high marks. A number of candidates had prepared well for this examination judging by the responses produced. There were, however, many examples of poor basic knowledge and a lack of understanding of the specification content, particularly in section A and section C question 6 part (a). There were a number of candidates who produced very limited and superficial responses with little relevant detail. This lack of basic knowledge of materials is an area that must be addressed in future. It is important that sufficient time is spent on preparation for Unit 6 and that this is balanced by the time spent on the coursework units.

All questions were answered in reasonable numbers. Although in section B question 4 on marketing was the most popular. Candidates did not always read the questions properly and in some cases provided answers from previous examinations. When sketches or diagrams were used these were often relevant and helped to support answers. The quality of written communication was generally good although there were many basic spelling errors.

### ***Section A: Materials and Components***

#### ***Question 1***

Both questions in this section were answered in equal numbers. The overall performance on question one was quite poor and the main problem appeared to be that candidates did not read the question carefully. This question required knowledge of pattern through construction. Candidates were required to describe four different fabrics where pattern had been created through construction but many candidates gave printed and dyeing methods in their responses which meant that no marks could be awarded. The question quite clearly stated construction rather than printing or finishing techniques. Many answers illustrated a lack of basic knowledge of the manufacture of fabrics. There were however a number of candidates who were able to provide excellent answers supported by detailed diagrams of the interlacing of threads and different counts of yarn.

#### ***Question 2***

This question required knowledge of recent textile developments that have imitated nature. This was a popular choice of question for this section. Many candidates gave at least one relevant response and many gave three accurate answers. Speedo Fastskin, Stomatex and colour changing dyes were the most popular answers often supported by detailed explanations and diagrams. However, many answers given described natural products rather than biomimetic products created to mimic nature. There were many responses which discussed textile products that had no links with nature, and in some cases were not recent developments. Unfortunately few marks could be awarded in these cases. Many candidates seemed unable to describe textile products accurately and more practice at describing products would be beneficial to future candidates.

## ***Section B: Design and Market Influences***

### ***Question 3***

There have been a number of previous questions requiring knowledge of key historical textile products and this question regarding design icons should have allowed candidates to illustrate their knowledge of this aspect of the specification, and could also have allowed some candidates to make reference to their product studies. The choice of categories was broad and candidates were asked to identify a product from two categories and explain why each product is regarded as an icon of design and how it reflects the time in which it was created. Most candidates who selected this question did give appropriate examples of design icons, the Mary Quant Mini skirt being by far the most popular example. Candidates often lost marks by not giving enough detail about their chosen products, for example material, shape, colour and pattern and also the contribution that this product has made to textile design. There were some examples given that were not textile products, for example rubber wristbands and wooden furniture or very vague answers, for example handbags. Furnishings as a category was rather poorly answered considering the number of candidates that have made products inspired by Art Deco or Art Nouveau for example. Many responses illustrated a continued lack of factual knowledge and there were still incorrect historical dates given as in previous years.

### ***Question 4***

The first part of this question was about the marketing function when planning a range of products. This was a popular choice of question and in many cases was answered reasonably well. The overall understanding of the marketing function was rather limited and many answers were from the designer's point of view. Due to candidates' knowledge of product development, analysis of target market and product functionality, enough information was included in many responses for marks to be awarded. More focus on the point of sale, the product, the people involved, the process of purchasing and the product image would have been appropriate. All candidates who answered this question achieved some marks and there were some excellent and balanced responses.

The second part of the question referred to the constraints which might affect buying decisions. Many candidates included reference to the cost and quality of the product but only some responses included reference to other constraints which could have included environmental, production capacity, moral and ethical, availability of materials and components and retail location.

## ***Section C: Processes and Manufacture***

### ***Question 5***

This was a popular question and required reference to modern production facilities and manufacturing systems which enable textile manufacturers to respond quickly to change. These are clearly defined aspects of Section C of the specification. All candidates who answered this question achieved some marks. Key to achieving marks in the higher mark band was by ensuring that enough depth and explanation was included in the responses given. Candidates were expected to make reference to the use of ICT through CAD/ CAM, EDI and EPOS for example and to fast and flexible production systems like UPS, QRM and JIT and to explain how new technology is linked to these systems. Many candidates made reference to a range of examples but they lacked detail in their explanations. Some candidates made references to only batch or mass production and their responses were very similar to those expected at GCSE level. Alternatively the focus was only on production systems or the use of CAD/ CAM and not the use of both or the bigger integration of computer technology.

### ***Question 6***

The first part of this question was very poorly answered in general. It was clear which candidates were familiar with the specification content for both AS and A2 on this topic. Candidates were expected to make reference to three different methods of dyeing of yarn and/or fabric. Many answers were very superficial with little detail given. Many candidates made reference to garment dyeing which was not asked for in the question. A common mistake made by many candidates was to describe methods of printing fabric which again was not asked for in the question and, therefore, no marks were awarded.

The second part of the question requiring an explanation of the practices a dye house could implement when addressing environmental issues was in general reasonably well answered. Most candidates were able to explain colour fastness and make reference to care and maintenance information. Marks were lost by many candidates who omitted to state the specific label requirements to prevent colour loss.

## Mark Range and Award of Grades

Unit/Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
PD1D	100	100	41.1	14.9
PD1T	100	100	37.6	11.7
PDN2	80	80	52.6	15.5
PD3D	100	100	54.2	13.9
PD3T	100	100	38.0	9.8
PDN4	50	50	32.8	9.1
PDN5	105	105	68.4	20.1
PD6D	100	100	48.2	12.8
PD6T	100	100	44.7	14.3

For units which contain only one component, scaled marks are the same as raw marks.

### PD1D (6398 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	58	53	48	43	38
Uniform Boundary Mark	90	72	63	54	45	36

### PD1T (1773 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	52	47	42	37	32
Uniform Boundary Mark	90	72	63	54	45	36

### Unit PDN2 (7962 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	80	64	55	47	39	31
Uniform Boundary Mark	120	96	84	72	60	48

### Unit PD3D (7183 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	69	62	56	50	44
Uniform Boundary Mark	90	72	63	54	45	36

### Unit PD3T (1984 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	51	45	39	33	28
Uniform Boundary Mark	90	72	63	54	45	36

### Unit PDN4 (4580 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	50	38	33	28	23	19
Uniform Boundary Mark	90	72	63	54	45	36

### Unit PDN5 (4567 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	105	79	68	57	47	37
Uniform Boundary Mark	90	72	63	54	45	36

### Unit PD6D (3627 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	66	60	54	49	44
Uniform Boundary Mark	120	96	84	72	60	48

### Unit PD6T (982 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	57	51	45	39	33
Uniform Boundary Mark	120	96	84	72	60	48

## Advanced Subsidiary award

Provisional statistics for the award (6586 candidates)

	A	B	C	D	E
Cumulative %	11.7	26.2	47.4	68.8	86.1

## Advanced award

Provisional statistics for the award (4626 candidates)

	A	B	C	D	E
Cumulative %	15.9	38.6	64.5	85.8	96.7

## Definitions

**Boundary Mark:** the minimum (scaled) mark required by a candidate to qualify for a given grade.

**Mean Mark:** is the sum of all candidates' marks divided by the number of candidates. In order to compare mean marks for different components, the mean mark (scaled) should be expressed as a percentage of the maximum mark (scaled).

**Standard Deviation:** a measure of the spread of candidates' marks. In most components, approximately two-thirds of all candidates lie in a range of plus or minus one standard deviation from the mean, and approximately 95% of all candidates lie in a range of plus or minus two standard deviations from the mean. In order to compare the standard deviations for different components, the standard deviation (scaled) should be expressed as a percentage of the maximum mark (scaled).

**Uniform Mark:** a score on a standard scale which indicates a candidate's performance. The lowest uniform mark for grade A is always 80% of the maximum uniform mark for the unit, similarly grade B is 70%, grade C is 60%, grade D is 50% and grade E is 40%. A candidate's total scaled mark for each unit is converted to a uniform mark and the uniform marks for the units which count towards the AS or A-level qualification are added in order to determine the candidate's overall grade.