



General Certificate of Education

Design and Technology; Product Design 5551/6551

Report on the Examination

2006 examination – June series

- 5551 AQA Advanced Subsidiary GCE
- 6551 AQA Advanced GCE

Further copies of this Report on the Examination are available to download from the AQA Website:
www.aqa.org.uk

Copyright © 2006 AQA and its licensors. All rights reserved.

COPYRIGHT

AQA retains the copyright on all its publications. However, registered centres for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to centres to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales 3644723 and a registered charity number 1073334. Registered address AQA, Devas Street, Manchester. M15 6EX.
Dr Michael Cresswell Director General.

Contents

AS Units

PD1D	(3D Design) Materials and Components	6
PD1T	(Textiles) Materials and Components.....	10
PDN2	Coursework.....	14
PD3D	(3D Design) Design and Market Influences	15
PD3T	(Textiles) Design and Market Influences.....	17

A2 Units

PDN4	Product Study.....	19
PDN5	Coursework.....	22
PD6D	(3D Design) Written Paper.....	24
PD6T	(Textiles) Written Paper	26

Mark Ranges and Award of Grades	29
---------------------------------------	----

PD1D Materials and Components

General Comments

This summer's PD1D examination has produced responses similar to that of previous examination series.

In general, candidate's knowledge of materials and components is very good. Responses to questions dealing with plastics, woods or metals were particularly good. In contrast, the smart materials question was not popular with candidates and was poorly answered.

A large number of candidates made rubric infringements by answering all four questions. Where this occurred question two achieved the lowest mark in most cases and these marks were not carried forward. In these cases candidates wasted much time which could have been better spent ensuring good answers were given for Question 1 plus two of the optional questions.

A significant number of centres did not issue candidates with the unlined answer book (7024). Instead, many candidates used lined answer booklets with plain paper added for drawings. Some centres even used plain A3 paper attached to a lined booklet or supplementary lined sheets. This often resulted in disorganised answers that were difficult to mark.

Quality of written communication was generally good, if not slightly better than in previous examinations. Candidates mostly wrote in fuller sentences and took care with spelling.

Question 1

On the whole, this question was fairly well answered with the majority of candidates gaining at least half marks.

- (a) (i) Most candidates gave correct answers for two of the three products as required.
 - (ii) Best answers linked the properties of each material to the manufacture or function of the products. Only three properties with a justification for each were required to gain the six marks. Many candidates gained maximum marks. Weak answers gave lists of generic properties, some being irrelevant e.g. "polypropylene doesn't conduct electricity".
 - (iii) Candidates gave excellent answers for the manufacture of the polymer food packaging- describing either injection moulding or vacuum forming. Diagrams were often text book quality. Answers for the manufacture of the drinks can were equally as good with many candidates describing the manufacture of all parts. The manufacture of the playhouse was less well answered. Candidates generally had only a basic understanding of the fabrication of the frame, sometimes describing inappropriate joining methods such as dovetails. Candidates often went into details of the conversion of timber from the raw material.
- (b) This was quite testing for some candidates. Instead of explaining why blow moulding is used to make bottles, many candidates described the blow moulding process, often wasting time, drawing the process in some detail.

Question 2

Only a relatively small number of candidates chose to answer this question. The vast majority of answers were poor.

- (a) Very few candidates were able to correctly define the term ‘smart material’. Most gave vague answers and often used the materials given in part (b) to illustrate their basic definition. Quite often, it was very clear that the candidates simply didn’t know and were guessing.
- (b) (i) Many candidates described window frames being made from shape memory alloys, stating that they won’t be affected by changes in temperature. Only a minority of candidates described the correct use of shape memory alloys in this application.
 - (ii) Answers for this part were mostly limited to the obvious such as the pigments being bright and that they glow.
- (c) Answers for this part were much better. Popular answers were the use of thermochromic pigments in saucepans to indicate the correct cooking temperature. Alternatively, thermochromic pigments used in feeding bottles to ensure safe temperature of the contents, etc. Most candidates gained at least half marks for this part.

Question 3

Responses to this question were quite mixed. In order to achieve four marks per material, candidates should have given two relevant properties plus justification or explanation as to why these properties were relevant to the product. Where candidates did this, high marks were achieved for a relatively small amount of writing. Unfortunately, quite often, candidates simply gave generic lists of properties, sometimes quite detailed lists. Such answers typically gained less than half of the marks available.

- (a) Teak – most candidates answered this well, describing the aesthetic qualities and durable nature of the material. In doing so, a significant number of candidates stated that teak does not corrode rather than using the correct term-‘decay’.
- (b) Foam board – answers for this part tended to be rather generic and vague. However, most candidates mentioned that it can be cut and shaped easily.
- (c) Polycarbonate – this was well answered with candidates showing some insight into the function and manufacture of a CD case.
- (d) Low Density Polyethylene – quite a number of candidates described LDPE as being strong. This was not credited with marks unless qualified, i.e. strength required to withstand the load from shopping contents. Best answers described properties such as ‘tensile strength’, ‘waterproof’ and ‘thermoplastic’, and then explained their relevance to the product.
- (e) Laminated card – this was well answered with reference to the material being lightweight (reducing transport costs) and waterproof (to contain the liquid drink). Many candidates incorrectly stated that laminated card is easy to recycle.
- (f) Silver – answers for this part were poor. Many described silver as being easy to weld. Several stated that it was lightweight but did not make a comparison to other metals or explain why this might be relevant to jewellery.
- (g) Aluminium answers to this part were fairly good. Most gave the lightweight nature of aluminium and linked this to the weight of the vehicle and therefore performance. Best answers described the good casting or machining properties of aluminium necessary for the manufacture of engines.

Question 4

In general, this question was not as well answered as expected, particularly so when candidates had made rubric infringements. This often appears to have led to question four being rushed.

- (a) Answers by the majority were good. However, quite a number described the material for the legs as being “steel” as opposed to mild steel or stainless steel.
- (b) Most candidates correctly explained that the material had to be able to be bent (malleability) and it had to withstand wear and tear from use.
- (c) Very few candidates could correctly name a specific paint finish. A very large number described instead- various plating processes or dip coating with polymers. However, many gave very good descriptions of the powder coating process (with generic paints) and so picked up marks.
- (d) Answers for this part were variable. At a very basic level, candidates described the use of screws and or “glue” to fix the top on the legs of the frame. Good answers described the welding of the legs together to make a frame, the use of moulded screw posts or moulded in parts that the legs are pressed into, and so on.
- (e) As in question 1 part (b), many candidates simply described the stages of the injection moulding process and even used good quality diagrams to do so. Quite often, answers were basic, simply stating that, “injection moulding is quick”.

PD1T Materials and Components

General Comments

This paper was generally much better answered than the 2006 paper with some very high marks awarded. The overall pattern of responses was very similar to that of last year and there are now very few who ignore the rubric and answer all four questions. Scripts were generally well presented and legible although a small minority of candidates write with very pale blue or black ink which can be difficult to read, especially when handwriting is small.

The majority of candidates do not indicate which questions they have attempted in the boxes on the front cover of their answer booklet; this omission leads to wasted time for markers. Some even fail to indicate the number of the question to which their response corresponds inside the booklet. A small number of candidates also fail to indicate that they have continued their response in a different part of the booklet from the main answer; again this wastes examiners' time.

As in previous examinations, many answers suffered from a lack of precise detail and many show ignorance of the most basic textile terms and processes. There was, however, good evidence of exam technique being practised in some centres with candidates using previous papers as part of their revision, and that comments from previous reports on the examination had been implemented.

Question 1

(a) This question was answered much better than it has been in the past with many candidates giving consideration to how a designer might use various fabrics and components to create interest. The better candidates (of which there were many) managed to introduce more feeling in to their answers rather than just providing a description of what they saw. Their knowledge of techniques was more obvious and many gave a detailed description of the fabrics and components used on both sides of the bag.

(b) (i) This was generally well answered. There was good all round knowledge of both the fabric construction and fibre content, but some candidates are still falling into the trap of not applying the appropriate knowledge by considering the bag; there were many points about washing the bag at high temperatures in a machine and cotton's absorbency being useful in the rain

Many candidates had difficulties in distinguishing between the properties of the plain weave and those of cotton.

(ii) A lot of candidates had learnt how to draw a diagram of the plain weave and they tended to achieve full marks. Surprisingly, there are still many who cannot describe/draw this basic weave structure.

(c) Use of components was well understood and revised and, in most cases, knowledge was applied to the bag in question. It was clear many had practised on previous exam questions and thus gained an advantage here.

(d) Again, there were many good answers here. Those candidates who aimed to give a range of reasons for using a lining were able to gain maximum marks.

Question 2

This was a popular question but not one which many found easy and there were few awarded high marks.

- (a) Most candidates picked up two marks, although there are a significant number of candidates who think that swimming costumes need to be waterproof.
- (b) (i) There was much difficulty with the experiment and in interpreting the results, with only superficial knowledge shown. The experiment was a simple one and candidates who tried to over complicate their answers did not get extra marks. Too many described tests for water absorption rather than water resistance.
Those who had conducted simple experiments relating to fibre /fabric properties either as part of coursework or classwork were at an advantage here.
- (ii) Interpretation of results led to much confusion with few explaining that the spray pattern would be a good indicator of the water repellency; most simply stated that high water absorption meant that the fabric was not water repellent.
- (c) Descriptions of a modern fabric were either excellent or poor and many appeared not to have read the part of the question which said "extreme conditions".

Few candidates realised that (i) called for a clear description of the fabric structure and fibre type, instead making detailed references to the qualities and use of the fabric selected which was asked for in (ii). Many erroneously thought that polyester, nylon and Lycra are modern fabrics. Descriptions of Goretex were usually good but a considerable number of candidates mixed up Stomatex, Gortex and Polartec, producing answers that were descriptions of hybrid fabrics. Credit was given where due but confusion was obvious. Smart fabrics needs to be taught simply and clearly as the majority of candidates are very ignorant of the basic facts.

- (ii) Much repetition of information given in (i) occurred here and many did not apply knowledge of a modern fabric to extreme conditions, e.g. swimwear made from 'Fastskin' was not a good choice.
- (iii) This part was poorly answered; many candidates find it difficult to deal with questions which require them to make straightforward comparisons.
There were some clear answers where candidates chose an old fabric and compared it with more modern alternatives, adding in some innovative technology for good measure.
Candidates should be advised to look carefully at mark allocation on these questions in order to maximise their chances of earning high marks.

Question 3

This was another popular question producing a reasonable spread of marks.

- (a) Many showed clear understanding of the usefulness of elastanes in sportswear. To achieve higher marks they needed to consider a broader range of advantages other than just improved fit. Many do not appear to understand that the properties of the fabric depend largely on the qualities of the other fibres present in the blend and that Lycra is not absorbent.

Few, however, managed to show understanding of how the fibre has changed the nature of sportswear, which was obviously the crux of the question, and there were hardly any references to older style garments.

- (b) (i) Candidates should be aware that elastanes have excellent stretch and recovery properties too; many just think that elastanes are very stretchy and have no structure. Many candidates thought that elastanes are not used alone because they are weak fibres.
- (ii) Those who knew the ways in which elastane is combined with other fibres answered really well. Others described the cutting of elastane into staple form and spinning with another fibre.
- (iii) This was a very straightforward question and many managed to score very high marks. The percentages were on the whole realistic and so were the blends and chosen garments. Many marks were lost because the fibre content was repeated, or the percentage of elastane was unrealistic; 80% in some applications. Candidates should also learn that denim is a fabric and not a fibre.

In questions of this type, taking care to have a range of fibres, percentages and applications will ensure high marks.

- (c) Many were much clearer about washing, drying and ironing, recommending accurate temperatures rather than vague and unspecific statements such as ‘not too hot’.

Question 4

This was not the most popular question but those who attempted it tended to score well.

- (a) (i) There were some good answers here with clear knowledge of how felt is produced; it was evident that candidates had experienced the making of felt in some centres.
 - (ii) This was very poorly answered as many had not read the question properly and seemed to think that they were answering last year's question about interfacing. Understanding of the reasons why interfacings are made from non-wovens was lacking in many responses.
 - (iii) This was another occasion on which responses should have been tailored to the number of marks allocated to the question. Some clearly knowledgeable candidates did not score as highly as they might have done had they presented more detailed information. Some thought that disposable products are recycled and used again – this was often down to incorrect use of terms rather than lack of knowledge.
- (b) This part of the question about flammability produced a mix of both very good and very weak answers. The good ones considered fibre content, fabric construction and, perhaps, finishes and gave clear and accurate information. The weaker ones became very confused with attempts to explain legislation and the labelling of textile products. It is worrying that some candidates have such ignorance of an important area of textile safety.

PDN2 Coursework

General Comments

Overall the moderation process this year was processed smoothly. Centres are increasingly familiar with the complex procedures necessary to conduct moderation and all played their part in ensuring that the operation was effective.

Staff at the majority of centres are now familiar with the specification requirements for the coursework units and work of an appropriate nature is being produced. However, there are a small number who are over generous with their assessments leaving the moderators to make appropriate reductions. It is hoped that, when required to do so, teachers will attend one of the teachers' meetings scheduled for the autumn term and accuracy of marking will improve. Advice with regard to the suitability of specific projects can be gained by centres contacting their appointed *coursework adviser*. AQA will have sent details of how they can be contacted when centres initially register their students with AQA.

Many centres have now adopted a *portfolio* approach to AS coursework and although this is not the only way to generate appropriate design and make evidence it does often provide a more varied experience for students in the first year of the course. This is where candidates, with staff guidance, can select the best example of their work which addresses the needs of each of the five criteria and then put these together in a single folder. This should be cohesive and will require suitably detailed annotation by the teacher so that how and where marks have been awarded can be seen. Some students have simply handed in separate folders which lack annotation and cohesion. Often there is little difference between the work in each project rather than select work which best addresses a specific element of the design/make process.

There is still some evidence that where there are a number of teaching groups and different teachers are responsible for assessing them there is a need for effective standardising across all groups as the board require a single entry mark submission.

This is even more important when the groups focus upon 3D and textiles as separate subject specialities. The number of candidates submitting folders electronically on CD and using presentations such as PowerPoint is increasing dramatically and with excellent effect. The best of these demonstrate very good use of ICT with digital imagery, ProDesktop CAD and web hyperlinks etc.

Comments on the individual assessment criteria are common to AS PDN2 and A2 PDN5 and can be found on pages 22 and 23.

PD3D Design and Market Influences

General Comments

This year's PD3D paper has generated responses similar to that of previous years but not quite as good as expected. The full spectrum of marks has been achieved by candidates but certain sections have not been addressed as well as they have in previous years.

It is very clear where candidates have used the theme paper and prepared for this examination from March to June- making good use of past paper questions and preparing answers for a variety of potential scenarios based on the theme. In such cases, sensible answers were offered for question 1 and in question 2, well organised answers scored well above half marks.

Question 1

- (a) (i) Answers for this part in the main described the generic advantages or uses of CAD instead of the specific application of CAD to the design of a point of sale display. Best answers described the use of CAD to make virtual models of the point of sale display which could be viewed in situ i.e. a digital image of a shop, or virtual testing of component parts e.g. shelf fittings to predict failure points.
- (ii) As for part (i), candidates often simply listed the generic advantages or uses of CAM without describing how specific equipment could be used to make parts of a point of sale display. Best answers described the use of CNC lasers to cut out acrylic to make up a point of sale stand, or the use of a plotter cutter to cut vinyl for the use of logos or text.
- (b) This section was not well answered. Many candidates simply listed things from nature such as birds, plants and so on, without really explaining how these might be used by the designer. References were made to the use of moodboards but the link to how these might influence the shape, colour scheme or graphics of the point of sale display was not made clear.
- (c) This straightforward question was well answered with most candidates gaining maximum marks.

Question 2

This year, the marks for originality and innovation were reduced from 15 to 10 marks, (a section where many candidates have difficulty achieving the top mark band). The marks for specification criteria met were increased from 5 to 10 marks, giving the specification a greater significance.

- (a) Range of annotated ideas

This was a good section for a large proportion of candidates. Typically between 3 and 5 different ideas were produced. The top mark band was awarded to candidates who produced entirely different ideas which were appropriately annotated.

- (b)(i) **Quality of communication-** Marks awarded for this section were generally high. Most candidates used a combination of 2D and 3D drawings, applied colour or texture or tone, and appropriate annotation to their drawings. Some candidates added evaluative comments to their drawings. This was not necessary. Quite a large number of candidates simply wrote too much on the two A3 sheets, spoiling the overall effectiveness and quality of the communication. Annotation was often repetitive.

- (ii) **Originality and innovation of product-** Marks awarded for this section were generally limited to crediting unusual shape to the designs, e.g. point of sale displays in the shape of animals, plant life or natural phenomena. Very few candidates made any innovative use of materials or components such as voice recordings triggered by motion sensors, etc.
- (iii) **Appropriateness of materials and components-** The specification given in the question required materials that would have a lifespan of a minimum of six months. Therefore, answers could have been from a wide range of compliant and resistance materials. Sadly, this year, many candidates seemed to only consider a very limited range of materials such as cardboard (carton board), foam board and laminated card.
- (iv) **Methods of construction-** This section was slightly better with some good descriptions of appropriate construction methods. Best answers gave 1-2 exploded views showing assembly details with notes or diagrams and notes of industrial manufacture. Many candidates struggled to describe how card point of sale displays would be manufactured.
- (v) **Dimensions and dimensioning –** In the lower mark band, candidates often omitted the dimensions or missed one or more of the critical length, width and depth. Top answers give these essential dimensions plus additional ones for component parts of the point of sale display.
- (vi) **Details of finish-** Again, in the lower mark band, candidates often omitted to give any details about finish or simply used generic terms such as “paint it or varnish it”, “laminates it” and so on. Only a small number would give specific appropriate finishes and explain their application or alternatively explain why a finish is not needed.
- (vii) **Specification criteria met-** On average candidates gained about half marks for this section as not all of the specification criteria were met. Typically, designs did not reflect the use of natural ingredients or perhaps were unsuitable in terms of being biased towards one gender or the other. Top mark band answers had clearly used the specification as a checklist when producing their initial ideas and final design proposal, ensuring each point had been addressed as they designed.

Quality of Written Communication- Questions 1 & 2 provided candidates ample opportunity to demonstrate this. On average, candidates were awarded 3 out of 4 marks.

PD3T Design and Market Influences

General Comments

The overall responses were slightly better than last year, especially in the answering of Question 1. It appeared that candidates had managed their time better since most attempted both questions and produced some detailed answers to Question 1. The quality of written communication was good on the whole with many candidates using technical terms fluently and appropriately.

Question 1

(a) (i) This was answered well by the majority of candidates with low cost and convenience being regularly discussed. Many also showed awareness that major supermarket chains are developing high quality textile products which follow the latest trends, and there were frequent references to the various ranges available.

Most responses scored at least four marks.

(ii) Answers invariably concentrated on the need for packaging to grab the consumer's attention; few went beyond this and wrote about the functions of protection and provision of consumer information.

Marks tended to be limited to two or three out of the five marks available.

(b) There were many detailed accounts identifying many differences between the two ranges, with reference to complexity of designs, type of fabric and components used, and range of embellishment techniques available to manufacturers. Better candidates also compared the use of linings, seam finishes, type of packaging and links to catwalk trends.

While most responses fell into the middle mark range, there were many good responses which moved into the top mark band.

Question 2

Candidates responded well to the set theme, using inspiration from nature to present appropriate ranges of textile products appropriate for a supermarket range.

Whilst there were some inspired and original products there were also many very basic products which would not deserve a second look in any retail outlet. It is worthy of note that candidates presenting design ideas for interiors and furnishings tended not to achieve high marks, often because the range was limited or they were unable to move beyond the most basic of product ideas.

Candidates are now well aware of the way in which the two A3 pages are to be used, showing a range of initial thoughts on one and a final design on the second. The balance of time between initial and final ideas seemed better this year with most leaving sufficient time to do justice to the final design. Candidates are seemingly aware of the balance of marks within the paper and of the need to put effort into presentation of an original final design.

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 many candidates. Ideas, especially the final idea, lacked the innovation and complexity required at this level. Many produced a simple variant of a popular product shape with a nod towards the theme of nature, usually a simple embellishment involving flowers and/or leaves. Equally there were many highly original and marketable products which would prove very popular in a supermarket's summer range; these products showed novelty in the product shape, were in line with current trends and had developed the concept of nature in a modern and exciting manner. Examiners accepted a wide interpretation of the theme, especially where the candidate had clearly justified their choice.

Many candidates appeared to have forgotten that natural fabrics and colours were to be employed in the designs and, whilst most colours can be found in nature, excessive use of man-made fibres tended to lose marks. A high proportion of candidates are still unable to go beyond simple fibre names, e.g. cotton, nylon, polyester/cotton and Lycra, but many more are beginning to describe fabric types such as knitted, mesh, micro-encapsulated, ribbed. 100% Lycra is used by a significant number of candidates, despite comments about this inappropriateness in previous reports.

Information about product construction was slightly 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 significant marks in this section because they ignore the request to show construction details or think it refers to fabric construction or decorative techniques.

PDN4 Coursework

General comments

This year saw a slightly worrying return to the number of candidates submitting studies that failed to properly address a number of issues that the support material and previous reports have sought to highlight. The result of this was that a number of Centres will have seen their marks adjusted. On a more positive note the overwhelming majority of studies seen have made full use of the extensive guidance that has been made available and teachers are clearly sharing this information with their students.

As always Centres are encouraged to ensure that the Product Study is an essential part of the examination and as such requires teaching. Candidates should not be left to work on the study just in their own time, or as homework. To be successful they need careful guidance to ensure that they approach the study in the right manner and that they properly address each section.

Product Study Objectives and Context – 5 marks

Over the years of the Product Study it has become clear that a successful piece of work can often hinge on this section. This section should provide an introduction to the study, setting the context and clearly outlining the design and manufacturing issues that the study will address.

Despite reminders through these reports and guidance in the teacher support material many Centres fail to give candidates adequate guidance for this section. This generally results in marks of 3/5 being achieved rather than accessing the higher marks often being awarded by the Centres themselves. The three key elements of this section that moderators are looking for to achieve the higher marks are:

- The context of the study – what has motivated the candidate to choose this particular product, this may include a brief history of the product as well.
- Clearly stated design and manufacturing issues. Again it is brought to your attention that one stated issue for each is sufficient. This information needs to be made clear to the Candidates, and supervising teachers should be working with their students to focus their attentions on editing down a number of initial issues to a smaller number upon which the study will focus.
- Finally, throughout this section it is expected that Candidates will be making reference to the research data that they have collated prior to starting to write their study.

The Plan of Action and its Execution – 5 marks

Disappointingly the comments made in last years Report continue to stand for this year. Candidates ought to be achieving full marks for this section, but without guidance from supervising teachers they will fail to do so if they do not fully understand the purpose of this section.

Candidates often choose products with which they have a particular interest in, or experience of. The problem is that they often think that they know everything about their product, or they have accessed the products own website and take everything that is presented without question. Candidates need to be directed to extend their investigation into their chosen product far and wide, one piece of information should lead to another search for information. Students at A-level are often encouraged to ‘read around’ a subject as part of their work, with reference to the Product Study candidates should be encouraged to ‘research around’ their chosen product including areas that are not only product specific.

For further clarification an edited version of the comments made last year are included below.

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

As already stated the quality of this section will often be dictated by the clarity with which the candidate has identified the specific issues of design and manufacturing that they have stated in Section 1. In the best studies seen this allowed the candidates to analyse the issue(s) and present their own views and opinions on these supporting their findings with carefully selected research data take from Section 2.

In mid-range studies candidates tend to miss the point and allow themselves to become distracted from the focus of the study. They present the section in a more generalised manner, but do show some evidence of the use of research data to back up what they write.

As in previous years the weakest studies were nothing more than product descriptions without any reference to stated design and manufacturing issues at all. Although it is pleasing to report that the number of these studies seen continues to show a downward trend.

Conclusions, Evaluation, Recommendations – 15 marks

Over the years of this specification the gradual trend for this section has been upward as teachers and candidates have fully grasped the expectations and purpose of this section. Without out doubt the higher mark studies succeed because they closely reference their comment to the originally stated design and manufacturing issues. This brings full circle the comments relating to the importance of setting off the study with meaningful and worthwhile design and manufacturing issues.

Whilst the quality of this section is improving Centres do have a tendency to over mark the work of their candidates. To achieve marks of 10+ candidates must provide a comprehensive conclusions, evaluation and recommendations (CER) that cover all of the expected content. For clarification Centres are encouraged to take note of 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, and 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

Whilst the vast majority of candidates present their work in an appropriate manner for a formal Product Study there has been a significant number of studies, this year, that are moving away from this. These are usually common to a Centre so that it must be presumed that some teacher advice is been given as to how a study can be presented. It is also noted that in the majority of instances it did seem that these studies were textiles based products.

Centres are reminded that this is a formal piece of writing and that studies should be presented as such. Coloured paper, double mounting, detailed borders, etc are not necessary and not appropriate.

These Centres do their candidates no favours by encouraging a level of over presentation, often submitting studies of 25 pages plus for a content that could be perfectly well presented on 15 pages.

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 noticeable number of Centres still 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

Most centres made use of the correct CRF assessment forms. These are available on the AQA website or from AQA Manchester.

The accuracy of marking to AQA standards is improved overall as centres become familiar with the nature of appropriate project work.

The variety and range of work submitted for A2 coursework is vast with some very original work produced to an exceptionally high standard. It would facilitate moderation greatly if centres posted folders in their rank order and presented visiting moderators with the manufactured outcomes in a similar fashion.

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)

Unfortunately there is often a lack of focus to this section with a continuing reliance upon copied secondary research via the internet and catalogue cut and paste. More empirical research, with candidates being encouraged to investigate the environment for their intended product with camera, note book and discussions with a product client would improve the relevance of the section greatly. In many centres the section is appearing to be somewhat formulaic with excessive print outs of questionnaire results in a variety of bar and pie chart forms, generic anthropometric data and ergonomics which are not specific to the client / product area. Mood and image boards were frequently provided but often lacked any analysis or explanation of their relevance.

It is vital that a detailed and focused design specification is presented through analysis of the initial brief and after due consideration of the research. There is scope for further research and experimentation in the next section, when ideas are developed towards a final solution. A detailed and focused specification for designing should form the summative part of this section.

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

Candidates should be encouraged to begin with a blank canvass and generate as many feasible and imaginative ideas as possible, keeping a reference to the specification referred to in the last section. There is less evidence of time given to this section than that given to the previous section. On the whole ideas tend to swivel around one theme, a preconceived idea. Once ideas have been extinguished development is often poorly done. 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 may all assist in the review of ideas. Modelling is improving and is an important part of design development. This should be of a small number of ideas in order to evaluate shape and form and inform selection of materials and production methods. Photographic evidence as a record of such development is important.

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. Where CAD is featured it should not be at the

expense of freehand sketching which still demonstrates an important part of design generation. Textiles focused folders generally set a very high standard for modelling and excellent use is often made of calico toiles and materials testing. Digital photography is commonplace but provides a vital piece of evidence of manufacture which is most useful at summative evaluations.

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

Weaker candidates continue to submit work which is often very simplistic, sometimes incomplete and unfinished and resembling more of a rough prototype or mock-up than a marketable product. In some cases this was rewarded generously by centres who seem to reward candidates for effort rather than by outcome. 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. Many more candidates this year produced at least a basic manufacturing plan, with better ones producing detailed plans that included quality control checks, risk assessments and in built review of progress. Again textiles project work scored highly when they included links to industrial manufacture and flow chart production mapping. A photo diary of manufacture, although interesting, does not replace effective planning in advance of production.

Manufacture through CNC using laser machinery and rapid prototyping is increasing and is to be welcomed as an understanding of commercial / industrial practice is seen and the quality of manufacture is improved. However, details of the set-up and programming of the equipment should be presented as an integral part of this section. Reference to all of the assessment criteria in this section should be made by both students and the staff making assessments.

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

Staff annotation which simply stated “evaluation evident throughout the folder” is not sufficient to demonstrate where and why marks have been credited. As in the past this section is still seen to be an inconvenience and suffers from a lack of enthusiasm and insufficient time allocated to it. Weaker candidates simply provide a description of the final product with no reference to the original specification. There is often only lip service to the opinion of others. Evidence of real field trials testing and suggestions for improvements is an important part of this section. Where centres have established sensible deadlines for completing manufactured product there was time for some excellent evaluation with photographic evidence to support marks awarded. Evaluation of block model prototypes should include a realistic appraisal of how the completed product would be expected to perform. Commentary relating to commercial use of such models is vital as is a reference to the product specification generated early on in the course.

PD6D Written Paper

General Comments

There continues to be a year on year improvement in candidates responses to the questions set for this paper.

Students should be familiar with the specification sections so that they can see how the questions relate to the content of each.

There was no obvious preference for any particular question and nothing to suggest that candidates were running out of time. Sketches were often in short supply or in some cases, of limited value. A number of candidates do not complete the front of answer books correctly and there is an increase in the number where answers are disjointed with additional pages handed in untitled and out of correlation.

Section A : Materials and Components

Question 1

In the main this was popular and reasonably well answered by the majority of candidates with quite high marks being the reward. Generic terms such as “strong”, “easy to use” etc. are too frequently used. Accurate detail of fig.3 the contemporary wood/metal chair was less well given than that of the two other examples.

Question 2

A good number of candidates answered the question well, showing adequate knowledge of both smart materials and alloys. However, some believed that a modern material such as “Goretex” was smart and that aluminium was automatically an alloy. Thermochromic pigments and brass were the materials of choice for many and were readily rewarded with marks.

Section B: Design and Market Influences

Question 3

Although popular the answers given were often superficial and not the source of many marks. Simply stating that larger dial / buttons would facilitate the ease of use of a telephone would earn low level marks where as details of the application of “Bluetooth” connectivity for phones and sensor responsive automatic doors would be the required response for better marks. A small number of candidates were quite imaginative and creative, providing solutions which applied a high level knowledge of the latest technology in their answers. These were rewarded accordingly. Few bothered to define ergonomics and/or anthropometrics in respect of a particular context but simply stated that they were important to get right.

Question 4

A very popular question where some of the answers given were detailed and full, covering all of the points referred to in the question. Some excellent marks were awarded. The products shown are popular in teenage culture but it is pleasing that many have shown an interest in the technologies involved. This level of interest should be encouraged across a wider spectrum of products.

Section C : Processes and Manufacture

Question 5

The motor vehicle was the most popular choice of product and some accurate and detailed answers given. Many focused on exhaust emissions with no reference to other issues. A significant number of candidates drifted away from the **use** of the product as required by the question and answered with reference to manufacture. Similarly in part (b) candidates brought up issues such as congestion charges, legislation and taxation or simply not using vehicles rather than improving the design of the product itself.

Question 6

- (a) Industrial visits and web site, video, text book observations have helped candidates to have a broad appreciation of the increasing use of computers in industrial manufacturing. However there are still too many advanced level students who appear to believe that computers do everything themselves and that the computer is all powerful. A knowledge of the more precise definitions of CIM, FMS, CAM and how they work to improve efficiency was limited in some cases.
- (b) Better candidates made good reference to products such as Dyson cleaners and Smart cars in their answers. The use of temporary fixings and even smart materials to aid disassembly were referred to in good answers. Weaker candidates were more confused by the question with some suggesting that single moulded products (Question1 Fig. 2) were no longer possible, having to be designed in separate parts so that they could be taken apart.

PD6T

General Comments

This was the fifth Unit 6 examination for Product Design Textiles students. Overall the performance by candidates was higher than last year and many candidates achieved success. There were a number of very good responses and a number of candidates achieved very high scores across all sections. There were however a number of candidates who appeared to have little grasp of basic fibre and fabric knowledge based on the poor quality of responses, particularly in section A. It would be expected that an understanding of basic fibre and fabric knowledge would be established during the AS programme and built on at A2. Centres are reminded that this is a synoptic testing of two years of study. It is important that candidates are kept informed of new developments in the industry. This will enable them to respond appropriately to questions regarding knowledge of new technological developments or modern processes.

All questions were answered by a reasonable number of candidates but both questions in section A, plus questions 4 and 5 from the remaining two questions, were the most popular. Overall performance in questions 1 and 3 was not as good as expected, while candidates selecting question 6 tended to perform reasonably well. The quality of written communication was generally good.

Section A: Materials and Components

Question 1

Both questions in this section were answered in reasonable numbers, with many candidates selecting both questions from section A. Performance in Question 1, however, was lower than expected. The first part of Question 1 required descriptions of two different fabrics that have been produced from woven, knitted or non woven methods. It was disappointing that many candidates were unable to describe construction of fabrics accurately, many confusing warp and weft knitted fabrics for example. There were candidates using fibre names only as fabric names, for example cotton fabric and there were a number of inaccuracies in woven and non woven descriptions.

Many candidates wasted valuable time describing fabrics in all sections rather than one. This was an infringement of the rubric and candidates could be awarded marks in one section only. Diagrams were often used to illustrate construction and, when accurate, these were of a good standard. Part b) required an explanation of the effect of new technology on one of the construction methods from section a). Again, there were responses which made little reference to technological developments.

Question 2

This question required knowledge of modern finishes. Although some responses given were not finishes or finishing processes that were not particularly modern, most candidates gave acceptable answers. Explanations of the advantages of each finish named were usually good, although descriptions of how the finishes are applied were often superficial or missing from responses and appropriate reference to care and maintenance was not always made. In order to gain full marks for each finish named, all aspects of the question had to be included in answers given. The emphasis for this question was on **modern** finishes. Responses which particularly met this requirement were thermochromic or photochromatic dyes, phase changing resins, micro encapsulation, performance and reflective coatings, thermoplastic pleating techniques and other more recent finishing techniques. References to laminates were awarded. The overall performance of candidates who selected this question was good.

Section B: Design and Market Influences

Question 3

It was hoped that this question would allow candidates to make reference to three products they would have studied while reviewing the history of design from the mid 19th and 20th centuries over the previous two years of study, particularly as nature has been the source of inspiration for many textile products. There were students who made accurate reference to William Morris nature motif prints, Manolo Blahnik floral shoes, Mary Quant stylized sixties flowers, organic inspired fashions by Paul Poiret and Laura Ashley prints for example. Often illustrations were included and these were generally of a good quality. Many of the descriptions given in the responses to this question were very superficial or were of general product descriptions, with no label, designer, company, brand or date linked to the product. Reference to how nature has been used was in many cases limited. There have been previous questions in section B requiring descriptions of historical products and it was hoped that students would be able to describe products more effectively.

A number of students, possibly inspired by last years question in Section A on development of biomimetic fabrics mimicking nature, made reference to Speedo Fastskin fabric and swimsuits, Stomatex fabric and phosphorescent colour changing materials. These responses were credited.

Question 4

This question required a discussion on moral, ethical, social and political influences and the constraints these issues have placed on designers when developing commercial textile products. It was encouraging to note the high calibre of responses to this question. Most candidates gave a very good account of these issues and gave a wide range of examples to support answers given. Reference to environmental issues including organic fibres, natural dyes and sustainable sources, the moral issues of using real fur, exploitation of workers and acceptable styles for different global markets were common examples given by candidates. Where candidates scored lower marks this was mainly due to the fact that they had not addressed the range of issues indicated in the question and gave only very limited answers. Also some candidates appeared not to understand what the word ‘constraint’ meant.

Section C: Processes and Manufacture

Question 5

This was a very popular question and generally performance was reasonably good. Part (a) required candidates to compare the different manufacturing processes used to produce a one-off garment and a garment made by mass manufacture. This was obviously a topic with which many candidates were familiar and most were able to explain a number of differences between the two manufacturing processes. There did tend to be a lack of specific detail regarding the exact processes involved for the garments selected. Reference was often made to one-offs being exclusive, made to fit an individual client, hand cut, often including handing embroidery or beading, made predominantly by one person compared to standard sizes, automatic cutting and manufactured in a line system. Responses did not always include more specific processes related to the specific garments named, for example sewing and finishing processes.

Part (b) required an explanation regarding the suitability of processes for each method of garment manufacture. A reasonable explanation was given by most candidates, although the explanations given were not always as detailed as would be required to be awarded the higher marks.

Question 6

The first part of this question required candidates to explain the purpose and advantages of using pre-manufactured components in the production of textiles products. The specific examples given in many cases indicated a lack of understanding. Many candidates made reference to zips, for example, rather than focusing on the zips being inserted into a product section and this being purchased as a pre-manufactured component. A number of candidates did make correct reference to pre manufactured garment sections and embroidery, for example. Most candidates did include accurate reasons for the use of these components, for example cost and time savings and the lack of specialist facilities.

The second section of this question was on the application of ICT to Production, Planning and Control. Many candidates proceeded to explain a wide range of CAD and CAM processes in textile design and manufacture, many listing a good range of examples for both CAD and CAM. Other examples of the wide use of ICT in textiles manufacture were given. Many candidates had not read the question and had not addressed the particular subject of Production, Planning and Control in particular. Where candidates had focused on the topic of planning and controlling production, they often gave detailed accounts, including mention of tracking orders, monitoring production and control points. Overall, the candidates selecting this question were successful in their responses.

Mark Range and Award of Grades

Unit	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
PD1D	100	100	47.9	14.7
PD1T	100	100	46.6	12.8
PDN2	80	80	53.4	15.7
PD3D	100	100	50.5	13.1
PD3T	100	100	50.8	12.0
PDN4	50	50	32.6	9.0
PDN5	105	105	68.7	20.3
PD6D	100	100	47.1	13.1
PD6T	100	100	50.7	14.0

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

Unit PD1D (6258 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	64	59	54	49	44
Uniform Boundary Mark	90	72	63	54	45	36

Unit PD1T (1935 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	60	55	50	45	41
Uniform Boundary Mark	90	72	63	54	45	36

Unit PDN2 (8061 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 (7222 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	65	59	53	48	43
Uniform Boundary Mark	90	72	63	54	45	36

Unit PD3T (2277 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	64	58	52	46	40
Uniform Boundary Mark	90	72	63	54	45	36

Unit PDN4 (4884 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 (4880 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 (3674 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	64	58	52	47	42
Uniform Boundary Mark	120	96	84	72	60	48

Unit PD6T (1210 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	63	57	51	45	39
Uniform Boundary Mark	120	96	84	72	60	48

Advanced Subsidiary award

Provisional statistics for the award (6752 candidates)

	A	B	C	D	E
Cumulative %	11.9	28.4	49.3	70.1	87.1

Advanced award

Provisional statistics for the award (4913 candidates)

	A	B	C	D	E
Cumulative %	17.1	40.2	66.4	86.4	97.1

Definitions

Boundary Mark: the minimum 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.