

GCE 2003
June Series



Report on the Examination

Design and Technology: Product Design

- Advanced Subsidiary
- Advanced

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Design and Technology: Product Design

Unit PD1D: Materials and Components

General Comments

The quality of responses in this examination were slightly better than in previous Unit 1 examinations. This was perhaps due to the increased choice candidates had within Question 1. However, the positive effect of this was reduced by the poor responses to Question 3. Most candidates seem to have avoided Question 3 and those who attempted it, did not do particularly well.

As in previous examinations, most questions asked candidates to justify why a specific material was suitable for a particular product. Candidates were therefore expected to relate the properties of the material to the product. Simple bullet point lists of generic properties such as ‘ductility’, ‘malleability’, etc. therefore gained low marks. Candidates needed to explain how those properties were useful in the product.

Many candidates still used generic or vague terminology such as ‘easy to work’, ‘strong’, ‘cheap’, etc. without explaining what they mean. It also seems to appear to candidates that almost all materials are malleable and durable.

Rubric and related issues

There were fewer rubric infringements in this examination than were evident in the January paper of this year. However, there were still a significant number of candidates who attempted all four questions. This would have put them at a significant time disadvantage.

Many candidates seemed to complete their answers in a haphazard, disjointed manner with questions two-thirds completed in one part of the booklet and the remainder were found elsewhere. Candidates frequently started their answers two pages into the booklet which then led to the use of supplementary sheets. There seemed to be more incidences of candidates using red or green ink in their answers instead of blue or black, and very few candidates ruled off at the end of a question. Such issues made the marking process difficult.

Question 1

- (a) (i) Candidates were generally able to name a suitable specific material for two of the four products listed and illustrated on the Insert Sheet. A number of candidates gave incorrect answers such as manufactured boards for the chopping board and acrylic as a suitable material for the soap dispenser.
- (ii) Where candidates gave an incorrect material for part (a), but explained why the properties would be useful in the product (and these were correct), credit was given.

Again, candidates often produced generic lists of properties with many being not applicable or relevant to the product e.g. ‘electric insulator’ for HDPE used in the washing bowl.

- (iii) This was generally well answered with some very good diagrams of injection moulding, blow moulding, press forming or spinning and laminating strips of timber etc. However, quite a number of candidates believed the washing up bowl was vacuum formed and the bread bin was cast.
- (b) This was not particularly well answered. In many cases, candidates simply sketched the product and described what materials they used without justifying their selection.

Question 2

- (a) This question was well answered in the majority of cases. Many candidates were familiar with KD fittings such as block connectors, barrel nut and bolts, corner plates and so on, and produced some excellent diagrams supported with notes. However, quite a significant proportion of candidates used joining methods such as dowel, mortice and tenon, comb joints, etc. These are not KD fittings but if candidates did not show the use of adhesive, they were given some credit in the lower mark range.
- (b) (i) & (ii) Most candidates gave good answers being able to explain the benefits of using KD fittings to the manufacturer and the consumer.

Question 3

This question was not popular with candidates and did not stimulate good answers. Knowledge of compliant materials appears to be limited.

- (a) (i) Layout paper- Most candidates were able to give a credible answer such as design sheets, architectural drawing, etc.
- (ii) Acrylic sheet- Most candidates used ‘shed windows’ etc. for an appropriate application
- (iii) Self adhesive vinyl- very few candidates gave a correct answer for this.
- (iv) Corrugated polypropylene board (Correx)- most candidates, incorrectly stated it could be used for conservatory roofing.
- (b) This was not well answered. Very few were able to give much more information than they had already given in part (a).

Question 4

- (a) This was a popular question and generally, candidates did fairly well. This was particularly so where candidates explained the relevance of a particular material property to the product.
 - (i) ABS : Vacuum Cleaners. Most candidates made reference to impact resistance, self coloured, electrical insulator. Better candidates explained how these properties were useful in a vacuum cleaner.
 - (ii) Hardwood: Window frames. Most candidates gave a good justification for using hardwood in windows, this being quite well answered.

- (iii) Polycarbonate: Mobile phone screens. Again, this was well answered with candidates clearly using their own knowledge of such products to good effect.
- (b)
- (i) Most candidates used window frames and UPVC as the alternative material. (Although many stated PVC). Other popular choices were Acrylic as an alternative to ABS in vacuum cleaners or in mobile phone screens.
 - (ii) Again, providing candidates linked the material property to the product, they generally did well with this section.
 - (iii) This was not well answered with most candidates simply listing personal, protective clothing items such as goggles, lab coats, masks etc. Very few candidates referred to industrial practice such as ensuring guards are fitted to machines or regular safety checking of machines, training and so on.

Unit PD1T: Materials and Components

General Comments

The majority of scripts were clearly presented and most candidates made a fair attempt at the paper. This was the second examination giving candidates a choice of question but there were still a significant number who attempted all four questions, although fewer than in the January examination; often it appeared to be the weaker candidates who ignored the rubric.

Question 1

- (a) The majority of candidates described the jacket, but marks were not as high as expected because few considered the effects of the way in which fabric and components had been used on the style. Detail was lacking in many answers; most referred to the zip and hooks and eyes but few mentioned the colour of the denim and the way in which it had been faded and frayed to give a worn/distressed look. Zipped pockets seem to have been a feature in many answers and this distracted candidates' thinking about the impact of the zips.

A large number of candidates mis-spelt 'denim' - 'denium' being the commonest misspelling, suggesting that they had not referred back to the question when formulating a response.

Many answers concentrated on denim, including other uses of it, but gave insufficient thought to the impact of the jacket as a whole - this was the biggest area of weakness.

- (b) There were many lengthy descriptions of the properties of denim but few gave reasons to support their claims. Most of the points were related to the cotton content with little consideration given to the twill weave construction. Many candidates were very knowledgeable about the use of blends and popular finishes, such as stonewashing, which gained them some credit.
- (c) (i) This part of the question, surprisingly, did not always earn high marks as many obviously knowledgeable candidates failed to distinguish between interfacings and linings. There were some very detailed responses with separate sections for linings and interfacings which scored high marks. There was agreement that the collar would need to be interfaced in order for it to stand up and there were many references to the need to strengthen the front and cuff areas.

Many candidates were convinced the jacket had to be lined as the zips would rub on the wearer. Very few considered that the jacket is clearly exclusive designer wear and that the target market would, therefore, expect a garment of this type to be lined.

- (ii) Many candidates referred to Vilene and knew that it could be iron-on or sew-in but few related it to denim, with little consideration of an appropriate colour or weight.

Reference to fabrics suitable for linings was often confused with many candidates suggesting 'cotton' or a lighter weight denim. The best answers came from

candidates who used separate paragraphs to distinguish between linings and interfacings.

Question 2

This was a very popular choice with almost all candidates attempting to answer it. Overall there were some good answers worthy of high marks.

- (a) Many candidates picked up ten marks in this part of the question; equally some did not read the question and failed to answer all parts.

Some confusion about the difference between fibre and yarn was the usual reason why marks were lost in (i) and (ii).

- (b) This part of the question was not well answered as candidates did not answer fully enough. Many did not seem to realise that the question was about yarn type and instead compared the different properties of natural and synthetic fibres.

- (c) (i) Many clearly knowledgeable candidates lost marks because they wrote about the warp ‘going up and down’ and the weft ‘going from side to side’ without reference to the selvage or yarns fixed in the loom. Those who used a diagram tended to fare better as they automatically showed the interlacing of the warp and weft.

- (ii) This was answered better than (i) with many clear diagrams. Plain, twill and satin were the most popular choices. A number of candidates confused weaving and knitting which unfortunately did not gain them any marks.

Question 3

A popular question answered reasonably well.

- (a) (i) Candidates either knew this or they did not, in which case they offered some very garbled explanations.

- (ii) Many candidates did not make clear distinctions between the three fibres which led to some confused answers. Those who put the three fibres in correct order of absorbency usually received full marks. Many were convinced that polyester is more absorbent than wool.

- (b) (i) The majority of candidates were aware that absorbent fibres are usually comfortable to wear because they absorb perspiration and some explained that highly absorbent fibres would be uncomfortable in wet weather because they would become very heavy. Few referred to the wicking properties of modern fibres or the fact that dry fibres can become charged with static electricity which causes discomfort to the wearer.

There were many superficial responses to this question.

- (ii) There was widespread confusion with many references to ‘dry’ fibres needing to be tumbled dry whilst absorbent ones would be easier to iron because of their

moisture content. A good many candidates thought that wool shrinks when it becomes wet; there appeared to be little understanding of the important contribution made by the scales on the fibre. Few considered that absorbent fibres are likely to hold stains which might make them more difficult to clean effectively.

Question 4

This was the least popular question and probably the least well answered.

- (a) (i) There were very poor responses to this part of the question.
- (ii) This was quite well answered as many candidates were able to relate to the stretch and recovery properties associated with elastomeric fibres. Many qualities were listed but few were able to expand on their relevance.
- (b) (i) Most knew that elastomeric fibres can not be used on their own but were uncertain as to why with unclear explanations.
- (ii) This was an easy question but not always well answered as candidates did not always respond to all points of the question. Many candidates named fibres which are commonly blended with Lycra but did not always give realistic uses for both or clear explanations for using the blend in a particular application.
- (c) Most candidates were aware that Lycra should not be subjected to high temperatures but reasons such as ‘it will melt’ or ‘lose its strength’ were questionable. Few explained that chlorine bleach should not be used on Lycra.

Units PDN2 and PDN5 : Coursework

General Comments

The Principal Moderator, on behalf of AQA and the team of Moderators would like to express his gratitude for the way in which the staff at centres played their part in helping to ensure that the annual moderation procedure was conducted in a spirit of co-operation and is pleased to report that, in the main, everything went smoothly again this year. It should be appreciated that the procedure for postal and visiting moderation is a time consuming and complex one that relies upon all concerned working together to facilitate the operation of assessment and moderation to the appropriate standard.

Many teachers had attended the Autumn Teachers’ Meetings, and this factor, together with the *Notes and Guidance Update booklets for Units 2 & 5*, and Coursework CD Rom produced by AQA, has contributed to the steady improvement of standards and delivery of the important element of coursework assessment. Coursework advisers have been appointed and all centres will have been sent details of how to make contact with the adviser assigned to their centre. Coursework advisers have reported on the initial success of this system of support and welcome approaches made to them by centres, particularly those new to the specification.

It was found that in the majority of cases the work submitted was both appropriate to the course and that the initial assessment of candidates' work this year was often within or close to an acceptable level of tolerance. Moderators reported an improvement overall in the annotation provided by staff on the assessment of their candidates' work in order to draw the attention of the moderator to why they have awarded marks for a specific section and where they consider students to have performed particularly well.

It would be most helpful if candidates could provide photographic evidence of both developmental modelling and the manufactured solution as it is being considered at the final stage of evaluation. A number of cases were reported where it was not possible to establish without or prior to a visit exactly what was manufactured as the final outcome.

Internal standardisation must be carried out when groups of candidates within a centre have been assessed by more than one teacher. This is especially important where Textiles and 3D candidates are entered from the same centre.

Unit PDN2

There was a wide range of approaches to this AS coursework unit with some centres preferring to continue with a single coursework project whilst many candidates submitted their work using a portfolio of work to address each of the five assessment criteria. Both methods are equally acceptable, however, the multi project approach allows candidates the freedom to experiment and take risks, with novel approaches to designing. They then have the opportunity to select and submit from the whole of their two terms work the “best fit” selection of the most appropriate evidence to satisfy each assessment criteria.

It was unfortunate that there was some confusion resulting from the revised mark allowance for the criteria of both communication and manufacture. This was introduced to more appropriately reflect the relevance and importance of these specific areas. No candidates were penalised if centres had applied the old scheme but centres should be aware that the revised marks for criteria 3 and 4 will apply to both Unit 2 **and** Unit 5 next year.

Centres need to make good use of the year 12 coursework unit in order to help to prepare candidates for the written examination Units 1 and Unit 3. It is important that work includes modelling and a range of good communication skills. Centres where time had been specifically given over to teaching and developing good graphic techniques, ensured that their candidates acquired skills which proved to be particularly beneficial when designing at Unit 3 in the AS year.

There remains the important issue with respect to models, which deserves clarification. The submission of products which are produced in model form, be this full size or to a reduced / enlarged scale is acceptable, providing that these demonstrate the candidates' ability to manufacture using materials, components and media appropriately and accurately. This may be summed up as modelling a design, which is not the same as designing a model. An increase in the incidence of re-styling of CD/DVD/ Mini-disc players and their like is welcomed, but for these to merit higher grades they should be more than simply a re-shaping exercise. Perhaps they might include, as a number of more able students did, functioning / modelled switch gear, battery access panels, and graphic presentation to show how electronic / mechanical workings might be incorporated possibly by display alongside an existing “donor” product.

The range and variety of projects continues to be broad with some exciting and innovative work as well as those which utilised a tried and tested approach which nevertheless, gave an opportunity for individual candidates to provide suitable and original design work.

Unit PD3D: Design and Market Influences

General Comments

The quality of responses this year have been much better than in previous Unit 3 examinations. Centres are to be congratulated for preparing candidates well, clearly making good use of the pre-release material and the support materials distributed at the Autumn Teachers' Meetings. Generally, candidates appear to have studied the design and market issues of street furniture and applied this knowledge with some success in the examination.

Rubric issues

The vast majority of candidates correctly used the answer booklet to answer Question 1, and the two A3 sheets for Question 2. A small number answered Question 1 on the question paper itself or on the lined guide sheet. Some had answered Question 2 in the answer booklet.

Question 1

- (a) Many candidates made excellent use of simple sketches to describe how key anthropometric data is used when designing bench seating. These included using simple ergonomic sketches or drawings of benches with the relevant dimensions on, supported with statements describing the relevance of the dimension. Some candidates appeared not to understand what is meant by the term 'anthropometric data'.

Candidates who linked the anthropometric data to design features on the bench gained high marks.

- (b) Most candidates scored well in this question. Candidates demonstrated a good understanding of how a telephone box can be designed to meet the needs of the disabled. Again, candidates often used simple sketches to support their answers. Candidates who linked design changes to specific disabilities gained high marks.

Question 2

Quality of Communication

Candidates did much better in this section this year. Most use a variety of 2D and 3D sketching methods, colour, use of texture, etc. to enhance drawings. Candidates generally presented their work using an appropriate layout.

Range of ideas

Most candidates scored well on this section, with the majority presenting 4-5 different design ideas.

Originality and innovation

Candidates produced some extremely innovative designs including: built in lighting, motion activated voice recordings, recycling features, and a variety of interesting mechanisms to compress the litter, etc. Many candidates produced some very pleasing designs with original styling features appropriate to the theme. Some students also presented a range of innovative ways to combat vandalism. Quite a number of candidates seemed to ignore the theme of a ‘modern city centre environment’ and designed bins that were more suitable for theme parks e.g. in the shape of animals or characters. Candidates were not penalised for this.

Only a relatively small number of candidates produced designs that were simply a re-draw of existing products.

Appropriateness of materials and components

This was still a problematic area for many candidates who used vague terms such as ‘wood’, ‘plastic’, metal and so on. However this year, generally more candidates referred to specific materials with most being appropriate for a bin to be used in a city centre environment. Candidates who were able to state several different specific materials or components, gained high marks.

Methods of construction

This was one of the weakest sections with only a very small number of candidates using exploded drawings to show construction or assembly methods. Some candidates used diagrams to show the process of manufacture where they had designed a press formed, blow moulded or injection moulded product. This was given full credit. The majority of candidates produced simple labels stating the manufacturing process or joining method e.g. ‘cast’ or ‘welded’. Whilst this is credit worthy, it is harder for candidates to access full marks as they would have to state five different appropriate methods of construction.

Dimensions and dimensioning

Again, candidates did better in this section than in previous examinations. Many candidates dimensioned the usual length, width and depth but also dimensioned the sub-components.

Dimensions were also usually appropriate for a bin, with some candidates referring to relevant anthropometric data.

Appropriate graphic image

This was a relatively easy section for candidates with most using the ideogram used on a wide range of commercial packaging and commercial bins. This was appropriate and if drawn clearly, would have gained full marks. Many candidates also used a variety of appropriate recycling logos, slogans and so on.

Suitability of finish

Many candidates failed to give any details of suitable specific finishes, or in the case of using stainless steel, concrete or polymers, justify why a finish is not required. In this section, there were vague references to ‘paint,’ ‘varnish’ and ‘polish’.

Unit PD3T: Design and Market Influences

The majority of scripts were clearly presented and most candidates made sensible use of the two A3 sheets provided. Most appeared to be using the published breakdown of marks to check that they had answered all sections of the design question. It would appear that a number of candidates started with Question 2 but, unfortunately, did not plan their time effectively and were unable to attempt Question 1 in any depth.

Candidates had made sensible use of their research time for this paper and were clearly aware of current trends and styles in fashion and furnishings. This information was, on the whole, used to good effect in the examination. When researching, candidates should be aware that it is not just fashions which should be considered but also influences and origins of a particular style. This would have helped them respond to Question 1 in more detail.

Question 1

- (a) Candidates had clear knowledge of current fashions and streetwear but had some difficulty in discussing the origins and influences of urban style. Influences were often restricted to one aspect, e.g. military or music, but there was usually insufficient information to gain high marks. Links between current styles and past events were uncommon and many answers were confused and disjointed. There were some rare excellent responses from candidates who were clearly aware of influences on fashions and who used their knowledge and understanding intelligently.
- (b) On the whole, this question was not done well. Techniques suggested were limited and market research invariably revolved round questionnaires and use of the Internet. There were few examples to illustrate knowledge and understanding. Suggestions of trend forecasting, observation of what celebrities wear, impact of film or world events and direction of other designers’ work were rarely considered. Few candidates scored highly on this question.

Question 2

There were some excellent designs for fashion clothing but interior products were, on the whole, mundane and uninspired. The set theme was used effectively by virtually all candidates.

Initial ideas are an important starting point for quality designs and are best presented as pencil sketches with annotation to explain thinking and possible development. Many candidates showed only a limited range of products or different ideas for the same product and the range was often a development of previous thoughts rather than a collection of truly alternative designs.

Whilst many designs were innovative and interesting a lot were copies of current high street fashions with little or no modification. Examiners were looking for original and wearable

garments which might not appeal to a very large market but which would be capable of being manufactured in limited or even large quantities.

The range of fabrics and components was generally suitable and some had attempted to use materials in very innovative ways. A few candidates felt the need to include as many fabrics and components as possible rather than select what was appropriate. Many showed a lack of knowledge by the labelling of fabrics, e.g. ‘polyester/cotton’ without naming a particular fabric or providing a supporting description of appearance/properties.

Smart materials and technical components, such as electronic sensors, were in evidence in many scripts, sometimes to the detriment of the design as they were either impractical or made the manufacture difficult to explain. Candidates should be advised that examiners are looking for realistic designs which are suitable for mass manufacture.

Candidates were poor at describing construction methods for the products they had designed although there was some improvement in showing sizes and proportions. There was little evidence of knowledge of industrial construction, but those who did understand generally gave detailed information. Detailed accounts of how to put together every section of the product were not asked for but candidates should have been able to give an outline of the main areas, e.g. ‘the logo will be produced using computerised embroidery’, ‘the main seams will be overlapped on the inside’.

The presentation drawing was, surprisingly, a weakness in the work of many candidates, often a direct copy of one of the initial ideas shown on the previous page or a very rough sketch. It is expected that time and trouble will be taken to show a design which has been developed from pencil sketches and will be of quality. Where possible, colour should be used and a back view indicated. Those who studied the printed breakdown of marks will have realised that sixteen marks were allowed for this and therefore something better than a rough pencil sketch was required.

Unit PDN4: Product Study

General Comments

It was pleasing to note that the many centres took onboard the advice of last year’s report together with the support given at the Autumn Teachers’ Meetings. All Moderators reported a greater consistency in quality in the Product Studies seen, although there remain some centres that have yet to fully appreciate the requirements of the assessment criteria.

The advice issued at the Teachers’ Meetings, that the topic of the study should be thoroughly researched before the candidate considers what issues of design and manufacture they will focus on, again proved its worth. The highest scoring studies benefited from an excellent understanding of their topic by the candidate who was then able to demonstrate this throughout all sections of the study.

In a number of cases problems arose through the choice of inappropriate study topics which failed to allow the candidate to complete a piece of work that was able to address the assessment criteria. The title of this coursework is the Product Study and yet a number of moderators saw work that had no reference to a product at all. Examples included a study topic that looked upon the effect of marketing on a particular business, another considered the

development of the G3 mobile phone technology without reference to a phone of any kind, and a further example was a study of the scheduling of satellite TV stations. Teachers have an important role to play in ensuring that their candidates are not disadvantaged through the choice of inappropriate topics. Clearly the most successful studies had at the core a single product, either considered as a one-off or as part of a product range of a piece of work by a named designer.

Product Study Objectives and Context – 10 marks

Many candidates produced clear explanations as to why they chose their particular study topic and applied some of their research in this section. In a number of cases it was clear that candidates were struggling to achieve the 2000 word advisory limit, and it is in this section that this matter might be addressed. Many candidates are still far too ambitious in the issues of design and manufacture that they set out to consider and discuss. There is no need to have an extensive list when just one or two issues, worthy of consideration, will suffice. For example, the claim is made that a football boot is anatomically designed, - this would be a design issue clearly worthy of further investigation and consideration, and would be sufficient to be considered as the *only* design issue.

There was some evidence of higher-level marks being awarded for lesser quality work. The assessment criteria clearly states that it expects the candidate to show ***“the value of the study with regard to both design and manufacture”***. It is expected that these will be listed and a brief explanation for their choice given if the highest marks are to be awarded.

The Plan of Action and its Execution – 10 marks

The vast majority of studies did not, as advised last year, include all of their research data. There are, however, a number of issues that still need to be resolved.

Although research data does not need to be included, it is expected that a candidate will include such details as where a piece of data was obtained from, what information was gained and how useful that information might be in the completion of the study. This is best presented in a table format and centres are advised to look at the exemplar studies issued at last year’s Teachers’ Meetings for guidance.

Given that the Product Study is an A2 piece of work, there are some concerns as to the narrowness of the research often being carried out. As useful as the Internet is, it is not the only place of information, although some candidates used this as their only data source. In order to access the highest marks it is expected that a wide range of information sources will be used. It is disappointing to report that the number of candidates making reference to books and journals was depressingly small. On a more positive note, however, many candidates undertook personal visits and conducted interviews, a trend which is to be encouraged.

Most studies displayed some consideration of a working schedule.

Analysis and Synthesis - 10 marks

Although there was a clear improvement upon the previous year, this section continues to cause problems for a lot of candidates with very few scoring in the higher-level. The assessment criteria asks for the candidates to “*display good analytical skills and has selected information that is mostly relevant and shown some flair and discrimination, regarding both designing and manufacturing*”, for the 4-6 mark range. Once again this seems to have been interpreted as simply describing, making great use of slightly edited information drawn from the Internet.

In order to access marks at both this and the higher-level it is expected that there will be clear evidence of *original* writing and thinking being shown by the candidate. In the best cases this was done by an assumption and/or opinion being made by the candidate and then backed up, or further explained by the use of a piece of research information. For example, a candidate considering whether or not the Nokia 3210 phone is ergonomic, conducts a series of users’ tests and checks this against published anthropometrical and ergonomic data before making a statement as to their opinion.

This section must also clearly relate to the design and manufacturing issues stated in the study’s Objectives and Context. Too often candidates side-tracked themselves by writing about the product in a descriptive way and failed to cover the issues that they had said would be the focus of their attention.

There was, however, enough evidence to suggest that the demands of this section are being more clearly understood, by candidate and centres alike.

Conclusions, Evaluation, Recommendations – 10 marks

The opening statements from last year’s report, regrettably, needs to be restated *many studies failed to achieve higher level marks because they lacked the content that is required by the assessment criteria, “the candidate provides a critical analysis of the results of the study” and “displaying an excellent understanding of the ways in which the study could be extended”*.

The single biggest issue is that candidates continue to adopt a summative approach to this section in much the same way as they have approached their evaluation for Unit 5. Often a study is based on a highly successful product and yet candidates suggest that it is in need of full scale re-design because of the many faults they perceive it to have.

Best practice studies continue to show remarkable insight by the candidate into the topic they had focused on, offering their opinions on further developments based on technological advancements. As indicated at the Teachers’ Meetings the use of a SWOT (strengths, weaknesses, opportunities and threats) analysis gave the necessary scope for the candidate to express their own views.

Presentation – 10 marks

Credit must be given to the candidates for the very high quality presentations of their Product Studies. The very best examples employed a wide range of ICT based techniques to very good effect.

Assessment and administration

The moderating team is grateful to those centres who annotated the work of their candidates. The comments were always helpful. This year there was an increase in the number of centres submitting work some days after the deadline date set by the Board. The moderation period is very short and any delay can cause a moderator problems, centres' assistance in this matter would be appreciated.

Despite the statement in the specification and in this report last year, not all centres presented their work in the correct A4 format. Studies this year ranged from postcard size through to A3, for further details and guidance please refer to the specification.

Centres are reminded that the weighting of the assessment criteria will be changed, as advised at last year's Teachers' Meetings. Full details are published in the most up to date version of the specification, available on the AQA website: www.aqa.org.uk

Unit PDN5: Coursework

This was the second year of submission of A2 coursework and it is pleasing to report that, in the majority of cases the work submitted was entirely appropriate to the specification. Product Design is, by nature a very broad area and so it offers candidates an opportunity to submit work from disparate areas, ranging from jewellery to textiles, engineering focused work to the intrinsically artistic, concept modelling to fully operational, tried and tested, furniture etc. All of these examples were to be found with a varied range of support folders, which told the story of how the design had evolved through to the final manufactured solution.

Investigation and Clarification of Problems

As stated in the Specification the project at A2 must be a single, holistic piece and it is clearly beneficial if the candidate is able to work to the requirements of an independent client. This may not always be possible but even so the candidate may represent themselves or family / friends to be a third party or the commissioner of the product.

Some candidates felt it necessary to include details of how they came to decide upon a specific task from amongst a wide range of options – this simply delays getting to grips with the actual problem and is not required.

There were many instances of limited primary research, with evidence of only superficial consideration of existing products using cut and paste from high street catalogues, many of which had limited application to the specific needs of the problem being addressed. Many candidates felt it necessary to include a questionnaire, even when the problem was a very personal one and the general questions used were almost irrelevant to the design solution. There was increasing evidence of the use of the internet for secondary research and good use of CD Rom information found on readily available software. This should be analysed and evaluated and not simply printed out to be included in the folder. Some candidates found it particularly difficult to analyse a problem and then produce a specification relevant to their problem alone, and not, as was often seen, generic specifications, which could apply to a number of unrelated problems. Disassembly and an in-depth analysis of the materials and manufacture / construction methods used with existing products, which have a genuine

application to the problem can lead to a better understanding of design approaches. When applied well, this proved to be useful and inspired good design solutions. Although the proportion of marks for this section is relatively small, (7 at AS and 10 at A2), many candidates submitted an excessive amount of work, the bulk of which often had limited benefit to the actual process of design creation.

Development of a Design Proposal

This should really be the most important section of all, however, it is disappointing to report that this was often the weakest part of the folder. For the award of the highest level of marks candidates are required to present a comprehensive and imaginative range of ideas, which show flair and ingenuity. These should then be developed through a consideration of materials and methods of construction. All too often the section was simply a selection of basic ideas with one developed through to final manufacture without the use of modelling, or reference back to the original specification to explain the form presented. On the other hand, the more able candidates made excellent use of programmes such as Pro-Desk Top to produce computer generated 3D modelling as well as very useful scale models, which were photographed and analysed to assist in the development of a chosen solution. The absence of photographic evidence of what is actually manufactured can pose problems for moderation, as it is not always evident what is actually being manufactured. Planning is an important element of design development, but many candidates still consider that a retrospective diary of construction is an acceptable substitute for estimating what will be required in terms of time and resources in order to produce a solution. Plans can happily be revisited and refined, as can ideas as they progress and evolve into a final product. Remember, evaluation is appropriate at all stages of the design process and not simply examined as a final afterthought.

Communication and Modelling

There was an increased use of very good ICT software such as Pro-Desktop, 2D Design as well as some excellent examples of high level graphic skills where these have obviously been an integral part of teaching design technique basics.

Communication skills seen in folders should include both 2D and 3D sketching, colour rendering as well as exploded views. Candidates should be able to draw and understand the requirements of working drawings, cutting lists etc. Models of proposed design ideas prove to be invaluable when selecting and developing solutions even when relatively basic.

Making / Manufacturing

It is pleasing to report that the majority of centres allowed candidates to embark upon a major piece of work and to take pride in Product Design outcomes by mounting exhibitions or public displays.

There was inevitably a wide variety of work at both AS and A2 with some centres failing to recognise that A2 projects do not need to be large and complex in order to achieve high marks and that AS projects need to be more demanding than styling exercises of small artefacts such as bottle openers with no consideration of function, selection of manufacture and materials etc. Although there was an increase in the submission of CD storage, Memphis tables and their like, these remain successful when developed through an appropriate design

and make process. Some excellent, original textiles based design work manufactured to a very high standard was evident from an increasing number of centres, often now taught within a 3D course and not always from a focused, specialist textiles department.

At the A2 level there remains the ever popular use of furniture projects, computer workstations, desks, chairs etc using a range of materials, whilst at AS level it is becoming standard practice to submit variations on the teacher led themes of clocks, lighting, point of sale display, CD storage, 3D block-model styling exercises of mobile phones / hair dryers etc. All of these are perfectly acceptable and capable of being rewarded with high marks providing that they meet the assessment criteria at that level. Candidates who do not plan their use of time effectively and work right up to the final submission deadline often leave too little time for final evaluation and many put themselves under unnecessary pressure by attempting to manufacture overly complex and demanding products. Some very good use of electronic kits like the TEP radio kit provided realism and functionality to styling prototypes. However, many candidates missed an opportunity to be rewarded for showing the marketing possibilities of such products. The use of computer aided manufacture through CNC equipment is increasing and is welcomed providing that candidates are directly involved in this work and there is an opportunity for them to show their manufacture capability. The assessment criteria published in the specification for this section includes reference to planning, in-built quality assurance checks etc, however, it is predominantly the quality of manufacture which is being considered when awarding these marks. Centres are reminded once again of the revision to marks to this assessment criteria, for the 2004 examination.

Evaluation and Testing

It is of some concern that a number of centre assessments had awarded quite high marks for what was no more than a couple of sheets of work at the end of the folder. Despite being the final criteria for assessment, this section should not be left until the very end where it will often not be given the time that effective evaluation deserves. Marks are allocated for evaluative comments throughout the folder and should not merely rely upon the views of the candidate and/or their friends or parents. The consideration of industrial and/or commercial practice is expected to be found in this section and will often simply be a record of how the candidate and hopefully a third party believes that the prototype would perform within a commercial application. The more able candidates included details of the modifications to materials and construction techniques needed to facilitate various volumes of production. Digital cameras and economic printing methods are increasingly made use of so that candidates can display and evaluate their products in appropriate situations. Testing can then be fully documented alongside the original specifications and modifications suggested.

Unit PD6D : Written Paper

General Comments

The vast majority of candidates followed the rubric correctly although, as last year, a small number mistakenly answered all questions on the paper. It would be helpful if candidates completed the box on the front of the answer booklet accurately in order to identify which questions they had answered. Any extra sheets should be attached in the correct sequence using treasury tags, loose sheets, not identified make marking scripts quite difficult and time consuming.

Although this was the second sitting of this synoptic paper it is disappointing to report that there has been very little improvement in the quality of responses with the majority of questions on the 2003 paper. There is evidence to suggest that, in the main, candidates had been ill prepared for this examination unit and were not able to answer questions at a level commensurate with Advanced Level. Feedback on the 2002 examination had been provided at Teachers' Meetings through the Notes and Guidance Update and the *Report on the Examination*.

Despite a specific instruction on the front of the paper to include illustrations and / or diagrams, many candidates chose not to. Where annotated sketches had been included they inevitably helped to get across candidates' knowledge and enabled marks to be awarded.

Section A: Materials and Components

Question 1

- (a) This question was, without doubt, the most popular question and was reasonably well answered. Most candidates were able to correctly identify three different polymers and provide an appropriate application, however, many simply stated that wood or a metal was the original material, which the plastic had replaced.
- (b) Sensible reasons for the preferential use of each specific plastic were given and received reward. The most frequent, basic errors occurred when candidates wrongly stated that specific plastics were from the thermosetting group but were then injection moulded. Often the relationship between properties, manufacture processes and cost although clearly explained was at a quite basic level.

Question 2

The answers to this question were, in general, quite poor, with candidates failing to identify the actual point of the question; that products are increasingly manufactured to order rather than stock piling mass produced items, without the guarantee of a sales market. The more able candidates were familiar with J.I.T and the attendant risks and benefits involved. A need for a sophisticated communication system and the infrastructure to supply both materials and components were generally specified. The weaker answers simply provided a description of manufacture methods, which relied upon a computer to do all of the work and take over from humans in order to be efficient.

Section B: Design and Market Influences

Question 1

- (a) A comparison of the two photographs of chairs was usually good, providing that the candidates did not simply describe the two chairs. Reference to "form follows function" was common and many appreciated the broad principles associated with the two design schools. However, in a number of cases the knowledge was quite superficial with appreciation of the ideology and philosophy of post modern design less well covered.
- (b) Although part (b) gave students an opportunity to discuss their own coursework the answers were disappointing with many providing quite poor descriptions of what they had made; few were able to address the important points relating to exactly how materials and form had been employed to suit function and appearance. A simple description of making processes was not sufficient to be awarded marks, although some

candidates provided quite good sketches of their work, there was a lack explanation/annotation. The question specifically asks for sketches to be used but quite a number of candidates provided no sketches, making it almost impossible to award marks.

Question 2

This proved not to be a popular question. Despite the fact that nature has for many years been recognised as providing an excellent inspiration for the design of a wide range of products, candidates clearly had a limited experience of academic study of design influences. Knowledge once again rarely went deeper than the superficial, predictably the most popular reference being birds and flight, fish / birds and the aerodynamics of cars. Some candidates considered that if a product was manufactured from a natural material then the craftsperson responsible had been inspired by nature. There was rarely any reference to mechanics, structure and aesthetics and no differentiation between form and principles found in nature.

Section C: Processes and Manufacture

Question 1

The popularity of this question was not matched by the quality of answers. Far too many responses included only a passing reference to energy, the main thrust of the question. Quite a number of candidates wrote at length to provide the developments made in recycling products and the re-use of materials, but few accepted the lead given in the question to include reference to use of raw materials, product manufacture or function. Cars, kettles and irons were featured but changes dated back to very early developments, made in some cases hundreds of years before. Henry Ford – Model T production, cast iron kettles and irons - heated on a fire / stove were typical examples. Those candidates who referred to domestic buildings generally had a better understanding of how design and manufacture features had focused upon energy saving, through insulation, building situation, energy source etc.

Question 2

Candidates did not have to make reference to the photographs provided and very few did, preferring to write in quite general terms about how important packaging is and how plastics are now frequently used. The inclusion of this statement then led many candidates to include a sketch of an injection moulding process with little to link it to packaging. Once again the statement that computers have taken over the design and manufacture of packaging to make it easier, quicker, better, cheaper, more accurate, etc. was all the detail that many candidates were able to include. However, better candidates did make an effort to consider packaging from the point of view of manufacturer, retailer and consumer, with the different needs of each stated.

Unit PD6T: Written Paper

General Comments

This was the second Unit 6 examination for Product Design Textiles candidates. Overall, the performance by candidates was not as good as last year, although there were still many candidates who performed very well. Section A in particular was rather poorly answered by a substantial number of candidates. Centres must be reminded that this is a synoptic paper

and is a test of two years of advanced level study. It is important that candidates are properly prepared for this examination.

As with last year's paper there was no obvious preference for any particular question, each of the six questions being answered by a similar number of candidates. There were however too many examples of basic factual errors given in answers. Some candidates had attempted to convey all their knowledge in their answers, rather than considering the questions being asked. Most candidates completed the four questions within the allocated time. Most of the diagrams or sketches used within answers were relevant and helpful. The quality of written communication was generally good.

Section A: Materials and Components

Question 1

Many candidates scored very low marks for this question. This was because they did not have a good understanding of the classification of inorganic fibres. This classification is clearly given on page 38 of the Specification for Product Design. In many cases long detailed answers made no reference to any inorganic materials. There were a number of examples of regenerated fibres and even cotton being classed as inorganic. Often reference to microfibrils and new developments were given in answers which would have been more suited to Question 2.

Many candidates did have a good understanding of inorganic materials, in particular of glass, metal and carbon, and were able to explain a number of applications.

Question 2

This question required candidates to explain advances in fibre and yarn formation and methods of fabric construction. Many candidates did give comprehensive answers and included references to microfibrils, micro encapsulation and new materials. Examples of yarn and fibre formation included Lyocell. Most candidates did make reference to four distinct examples; some candidates gave more than the required number of examples and therefore could not be awarded additional marks. Unfortunately many candidates described fabrics, for example a plain or satin weave fabric (which have been made for several thousand years), with no reference to how weaving has advanced with developments in textile technology. It is very important that candidates read the questions thoroughly.

Section B: Design and Market Influences

Question 1

- (a) Most candidates had a good understanding of product life cycles and were able to describe a given example in detail. Graphs were used successfully to reinforce answers.

Most candidates focused on the core issues of product introduction, growth, maturity and decline. Some candidates focused on the development of products within a factory, and they were awarded some marks for this, but if no reference was made to the retail stage and the commercial decline of products, they were unable to access the full mark range.

- (b) This section required candidates to compare several different life cycles, depending on product classification. Most candidates answered this section reasonably well and again supported answers with the use of graphs. Some answers related to scale of production, batch or mass, which was not what was required.
- (c) Candidates were required to outline clearly the objectives of an advertising campaign. Most candidates were able to give several relevant objectives. These objectives included an increase in market share, the introduction of new products, to reassure customers and to create brand awareness. Some candidates focused on methods of advertising, for example to use television or magazines, which are not objectives.

Question 2

- (a) Most candidates were able to define the term “brand awareness”. Good explanations were given in relation to the textile industry, including reference to brand recognition, identification of a particular image, reference to quality and value for money. Some candidates also made reference to copyright law in relation to brand protection. Generally answers for this part were good.
- (b) Candidates were required to select a designer of their choice and describe how their style and image is reflected in advertising and promotional campaigns. Although many candidates selected designers, a number wrote about branded products for example Levis or Wonderbra with no reference to the heads of design of these large companies. Some candidates were confused over dates and when particular designers worked and advertised their merchandise. Generally there was insufficient detail given about textile products produced by designers and too much emphasis on perfume advertising.

Section C: Processes and Manufacture

Question 1

This question required candidates to explain the meaning of **quality assurance**. Candidates were required to outline the advantages of a quality assurance system and the difficulties of its implementation. All candidates that attempted this question were able to access some marks. Many candidates responded in depth, including reference to quality assurance systems being a whole company issue and total quality management being part of this. Relevant references to quality checks before and during manufacture were made along with appropriate mention of BSI standards and the need for training and monitoring staff. Some of the answers given lacked appropriate depth and were predominantly focused on quality checks with a very limited mention of wider issues. They bore a resemblance to GCSE style answers.

Question 2

Overall this question was answered well and candidates were able to access marks in each part. However there were a number of candidates who were unable to describe two commercial methods of printing. This is basic knowledge and candidates should have been able to answer this with a certain degree of accuracy having studied the subject for Advanced Level. Most of the diagrams used within answers were helpful.

- (a) Most candidates gave two printing methods although in some cases the methods given were examples of classroom practice rather than necessarily being commercial

methods. Some technical errors were made when describing methods. Some students were able to access the higher mark range by including reference to speed, efficiency and cost.

- (b) Most examples of products given in this answer were appropriate although some of the justification for choice of method were not very relevant or accurate.
- (c) Overall the additional finishing methods that could be applied to printed fabrics to increase their end uses were answered well. Many candidates gave a number of finishes and indicated clearly the additional end uses that would apply.

Mark Ranges and Award of Grades

Unit/Component	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
PD1D	100	100	40.0	14.0
PD1T	100	100	42.6	13.7
PDN2	80	80	51.5	15.5
PD3D	100	100	57.2	12.4
PD3T	100	100	50.6	13.9
PDN4	50	50	30.3	9.0
PDN5	105	105	65.8	20.2
PD6D	100	100	35.2	12.3
PD6T	100	100	48.0	13.7

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

Unit PD1D (5525 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	56	51	46	41	36
Uniform Boundary Mark	90	72	63	54	45	36

Unit PD1T (1045 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	58	52	46	41	36
Uniform Boundary Mark	90	72	63	54	45	36

Unit PDN2 (6585 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 (6117 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	69	64	59	54	49
Uniform Boundary Mark	90	72	63	54	45	36

Unit PD3T (1200 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	65	57	49	41	34
Uniform Boundary Mark	90	72	63	54	45	36

Unit PDN4 (3833 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 (3828 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 (3271 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	53	49	45	41	38
Uniform Boundary Mark	120	96	84	72	60	48

Unit PD6T (578 candidates)

Grade	Max. mark	A	B	C	D	E
Scaled Boundary Mark	100	59	52	45	38	31
Uniform Boundary Mark	120	96	84	72	60	48

Advanced Subsidiary award

Provisional statistics for the award (4573 candidates)

	A	B	C	D	E
Cumulative %	12.8	28.5	49.1	70.9	88.4

Advanced award

Provisional statistics for the award (2838 candidates)

	A	B	C	D	E
Cumulative %	12.0	32.2	57.2	82.1	96.1

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.