

Examiners' Report Summer 2008

GCE

GCE Design and Technology - Product Design (8108/9108)

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Summer 2008

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Contents

1.	Unit 6141/01 - Product Design	1
2.	Unit 6142/01 - Knowledge and Understanding of Product Design	6
3.	Unit 6143/01 - Further Study of Product Design	11
4.	Unit 6144/01 - Commercial Product Development	14
5.	Statistics	20

Principal Moderator's Report summer 2008
GCE AS Design & Technology: Product Design
Resistant Materials Technology unit 6141/01

Coursework selection

It is once again pleasing to note that more candidates achieved a pass grade in this part of the examination than last year. There were increased numbers of candidates achieving an grade A and a similar increase in the number of students gaining an E grade. In all this reflects what we feel, is a more accessible mark scheme, following the rewrite of the assessment criteria two years ago.

The submission for resistant materials was largely appropriate for this level and work submitted tended to be succinct and focused to the requirements of the mark scheme. Centres appear to be much better at directing the candidates work so that it fulfils the assessment criteria satisfactory. This has possibly (and understandably) led to more centres opting for 'safe' class controlled projects. Centres should be cautious in the selection of these projects, as they could result in products of a low demand, therefore limiting access to the full range of marks. Centres who continue to offer class set projects at AS need to be aware that this may concentrate the acquisition of marks in the middle band. Where very able candidates have been entered as part of a class set project they sometimes fail to meet the assessment criteria for some of the very top marks due to a lack of ownership of the problem and real understanding of what is required in the problem.

This lack of ownership is commonly seen in the candidates that 'want to make a coffee table', rather than solve a specific problem relating to its use. Class projects also encourage formulaic research which similarly discourages candidates from fully exploring the central issues of the problem.

This year there were far less electronic submissions than we have seen in previously years. It should be remembered that electronic submissions to this specification are permissible but a 1/3 electronic, 2/3 resistant materials rule should be applied when evidencing the designing and making elements. There was a general reduction in the number of inappropriate projects submitted this year, with far fewer centres offering graphic product outcomes on the resistant material option.

For the vast majority of candidates, the choices of project were appropriate to the AS standard, allowing them access to the full range of marks. There has been continued improvement in the choice of project work undertaken by students in this section of the examination. There was far less evidence of students being allowed to undertake projects of a highly complex nature. Projects offered were, in the main, appropriate for a course one year on from GCSE.

Administration

It was obvious that some centres had read the Edexcel guidance and support documentation, or had attended INSET events, as many design folders were well organised and presented in ordered sections relating to the assessment criteria. However, there was a significant problem this year in the timing of the arrival of samples with Edexcel. Many centres failed to send the coursework until they had been contacted individually by Edexcel. Centres also failed in some instances to provide the correct sample. Clear instructions are provided for this to each centre via the examination officer, but centres should submit the asterisked candidates on the mark sheet, and then add to this sample the required candidates to make up the correct sample number, including the top and bottom marked candidates if not already selected.

It is also essential that time be given to the careful packaging of this work and the labelling of individual sheets, especially if the work is not bound securely in some way.

The moderators are still experiencing difficulties with centres completing the wrong CABs for this submission.

The correct CABs are available from the publications department at Edexcel free of charge (code US018531 for resubmissions next summer). Alternatively, it can be downloaded from the main Edexcel website.

Attention must also be given to the correct completion of the CABs. Some are labelled incorrectly, or simply incomplete. Upon arrival with the moderator, the CABs are separated from the work, so **it is vital that the portfolio is independently labelled**. It is also enormously helpful if the candidates' work is not submitted in very heavy leather bound zip portfolios.

Exploring problems and clarifying tasks

There was a further increase this year in the undertaking of class set projects, which in itself is not a problem; in fact, it can be a useful management tool for some schools. It is recommended, however, that students are asked to add their own twist to the set project; if not, the centre runs the danger of the candidates failing to take ownership of their projects and therefore not getting to the hearts of the issues. This was a notable feature of some formulaic research sections, with the pointless addition of research for the sake of filling the folder. In this situation candidates do not fully understand the reasons or importance of the various researches being completed. It is important that candidates take the problem and analyse the issues, then tackle the research to answer the questions raised in the analysis section. This then feeds into the decisions that influence the key issues that make up the specification, which will be justified, rather than unfocused focus statements such as 'it must be attractive'. Measurable points are useful and will help students in completing their evaluations.

Generating ideas

Despite last year's improvements, the moderators sadly reported the fall in emphasis that centres are apparently placing on this section. Candidates all too often settle upon a known solution far too early in their explorations and fail to explore real alternatives. The use of design strategies is increasing but many do not use them to explore creative solutions to the problem. Where candidates use design strategies in a meaningful way, they often evidence more creative and imaginative solutions to their work, ultimately producing successful design outcomes. The application of research tended to be overlooked by too many candidates. The two sections, design and investigation, should not be seen as separate, but should feed into each other, ultimately using the specification to evaluate the design solutions effectively.

Developing and communicating design proposals

This assessment section was again generally weak although this year there were many more candidates taking their designs forward and developing the product further. A significant number of candidates presented 'modelling', both physical and virtual, of a selected design. In the best work, this was then amended and changed to adapt towards a working solution. Technical information was often well used in this section; the theoretical knowledge demonstrated by many candidates was indeed high.

However, we still see many candidates offering unchanged designs from the ideas section as the main feature of this assessment criterion and then proceeding to describe the tasks involved in manufacturing their product with no further consideration of true development, which should include improvements, refinement and final detailing. Some centres placed importance on the step-by-step description of product construction, confusing this with development. As in previous years this section was often over-marked in comparison to other areas. It is important to teach candidates that this section is expected to have alternative and exploratory sketches to demonstrate that other methods of manufacture have been considered before settling on the final solution. This will then be drawn as a proposed solution in the most appropriate way.

Planning manufacture

A feature of this year's submission was the inclusion of the Gantt chart as a planning tool. This tends to be lacking in detail as a generic one-week time allocation is often added to the product manufacture activities. Greater detail is required at this level about the application of time and the steps involved in the intended manufacture. Risk assessments should take place with tools and equipment specified in detail.

A feature of this year's submission was the fall in standard of the working drawing, a general guide should be; the submission of a working drawing that will enable a third party to manufacture the product, including associated jigs or moulds, without additional assistance or information. Exploded views should also be encouraged in this section as they assist in the explanation of how a product is assembled without complex written explanations. As previously, up to 4 marks credit was given to candidates who had completed high quality, practical items, despite offering no written plans. The assumption is made in that a degree of planning has to take place in order that complex items, such as those that are submitted, are completed to a high standard.

Product manufacture

The quality of making displayed by many candidates was again very good and many scored very high marks in this section. It was obvious from the quality of work presented that candidates enjoyed this aspect of the course and took pride in what they produced. It is very important in this section that the centre provides additional information in the form of annotation on the CAB. Some centres are failing to offer useful annotation and simply repeat the words provided in the assessment criteria. Here, we need specific information, especially about unseen construction detail, or hidden aspects of the manufacturing process.

A continuing feature of product outcomes was the use of CAD/CAM equipment, especially laser cutters, but increasingly CNC routers. Where this equipment was used appropriately, products were enhanced and appeared as precise and cleanly finished items. Unfortunately, where candidates have only drawn their products on a software system, then 'pressed go' on the laser cutter/router, and then glued the component parts together, their making marks are reduced drastically. In order for candidates to achieve the highest marks it is essential that teachers guide their students in producing products with a variety of manufacturing processes. CD racks, acrylic clocks and modular lamps are not always appropriate to AS level work, but continue to appear regularly, usually cut out by CNC machinery and assembled by candidates who had no further opportunity to fulfil the criteria requirements for high marks by demonstrating a range of high level making skills that show precision and attention to detail.

Almost all centres are now well aware of the importance of good quality, informative photographs and supplied a range of appropriate images. This essential practice was valuable and assisted accurate moderation. Please ensure that the evidence of manufacture is documented in both CAB and portfolio. Centres are often taking the opportunity to present a practical diary; this is to be encouraged, as it is likely to add to the evidence of the candidates' making marks and often shows a moderator processes that have been overlooked in the final photograph.

Centres have a duty to ensure that all practical work is completed under supervision of staff in schools and colleges to ensure that they are able to validate the work as the candidates' own. It is not appropriate for centres to allow candidates to complete practical work outside of the school environment.

Testing and evaluation

This section is improving markedly from previous years. Higher performing candidates can be relied upon to demonstrate their tests and link them to the specification. However, with low to medium performing candidates, these are not always realistic tests. Evaluation then builds on the results of these tests and feeds into the modifications offered. We are seeing less and less evaluative comments relating to the overall portfolio, although there is some evidence in the annotation that teachers have erroneously been considering the evaluation in the designing section when allocating these marks. Photographic evidence to demonstrate the tests undertaken should be encouraged, as this often gives the opportunity to justify making marks.

Appropriate project

As stated previously there were fewer inappropriate projects submitted this year, but some centres remain confused over the word 'specification' as it appears in Edexcel's assessment grid and some centres awarded interim marks in this section which is not permitted. Only marks of 0, 5 or 10 should be allocated.

QWC (Quality Written Communication)

Most centres awarded marks fairly appropriately in this section, but leaned towards slight generosity. This was due in the main to a lack of technical and demanding enough terminology. It is not just enough to spell correctly, but also to communicate to the reader at the appropriate level. The use of appropriate technical language was a feature that was often well used in the RMT coursework submission this year and candidates were rewarded here because of it.

A number of centres submitted marks on the wrong CABs and had to have marks added for QWC by moderators.

General Comments

Candidates should learn to structure their answers according to the mark allocations. Many candidates misread or misunderstand questions and give inappropriate answers, having not perceived the thrust of the question. The various command words used are published in the available support material. Understanding the command words will help candidates to structure their answers appropriately.

Question 1(a)

Most candidates scored well, naming appropriate materials and properties. A significant number of candidates gave the vague response 'easily shaped' as a property for the plastic shop sign. A more specific reference to 'easily shaped using CNC equipment' would have gained the mark.

Question 1(b)

On the whole, a well answered question. Some candidates lost marks because they did not state whether their response referred to hardwoods or softwoods.

Question 1(c)

Generally well answered with the vast majority clearly understanding the mortise and tenon joint, although quality of sketching was very questionable at times. A small minority of candidates failed to score high marks because they only presented a 2D sketch which did not communicate sufficient understanding of the joint.

Question 2(a)

A very straightforward question which elicited a wide range of responses with the vast majority gaining full marks. A minority of candidates failed to understand the question fully and identified hazards and control measures on two different machines, or stated a control measure that was not relevant to the hazard identified.

Question 2(b)

The majority of candidates scored full marks, clearly understanding the different responsibilities of the employers and employees. Having said this, a significant minority did not understand these terms and effectively gave the same response twice.

Question 2(c)

A number of good responses, showing a clear understanding of the role of the HSE, although this proved a challenging area for many. Some candidates confused this with the role of the BSI and described the testing of products for safety.

Question 3(a)

It was pleasing to see the vast majority of candidates' responses contained references to 'containing iron' rather than 'will not rust'. This shows an understanding of the more accurate answer although either would have been accepted here. A small minority stated the converse.

Question 3(b)

Almost all candidates gave the correct response to this question.

Question 3(c)

Again, a straightforward question with most candidates correctly identifying the symbol, although a significant number identified it as the Kite mark.

Question 3(d)

Few candidates scored well in their responses to this question. Many candidates picked up a single mark for identifying the use of a drill on the lathe, but identifying use of a centre drill or mention of the tailstock was rare. An alarming number of responses referred to use of the pillar drill or milling machine, indicating that they had not fully understood the question.

Even fewer candidates were able to describe how the shape would be produced by setting the compound slide at an angle. Most responses referred to chiselling or scraping the shape by applying more pressure at one end. All candidates should have used this basic workshop machine during their course, enabling them to describe its use effectively. Several more answers stated that it would be moulded.

Question 3(e)

A well answered question, with the majority of candidates scoring 3 or more of the 4 marks. Common mistakes included repeated answers or single word / phrase answers such as 'cheaper'. Some candidates would then go on to later identify that they require less labour costs, gaining the mark.

Question 4(a)

Candidates responded with a wide range of answers covering the whole range of the mark scheme. Most candidates were able to pick up 1 or more marks by identifying the need for and use of a rivet gun, with a minority clearly showing the fitted rivet correctly. Other candidates confused this process with solid riveting and scored no marks.

Question 4(bi)

Well answered with many candidates picking up both marks.

Question 4(bii)

A little more challenging for many candidates, with most scoring 2 or 3 of the 4 marks available. Virtual modelling as a topic is now clearly understood within the subject but many candidates failed to grasp that the direction of the question was concerned with aiding the design process rather than advantages of virtual modelling in general. As a result, answers that focussed on the economic factors of saving the business money due to less material usage or less labour did not gain marks.

Question 5(a)

A reasonable proportion of candidates were able to respond correctly here with chromium being the most popular response, although all the answers in the mark scheme were covered. Many candidates also gave inappropriate answers with the most common ones being zinc, iron and carbon.

Question 5(b)

The vast majority of responses gained the mark for a reference to corrosion or rust resistance, although a significant number of candidates confused this with a different aspect of the product and focussed on increased heat insulation.

Question 5(c)

Again, most candidates responded well and gained both marks for a correct description. Unfortunately a significant minority failed to understand the direction of the question and explained the reasons for alloying rather than how the process is carried out, which failed to gain marks.

Question 5(d)

Generally a well understood process. It is evident that the vast majority of students have practical experience of this process as most of the responses scored 3 or more marks. Diagrams were usually clear and features were easily identified. General misconceptions from candidates showed heaters below the mould or confusion with the blow moulding process.

Question 5(e)

There was a range of answers here, with many candidates scoring 2 or 3 marks, although this area was not as well understood by the candidates as other parts of the specification. Many answers were superficial with references to single molecules joining into long chains and the necessity of heat. A significant number gave more technical answers and made reference to monomers and the splitting of the double bonds, which was pleasing to see. Unfortunately there were also a number of candidates that presented inappropriate answers referring to the refining or cracking of crude oil into its separate components.

Question 6(a)

There were some reasonable attempts at this question although many failed to understand the direction required and gave spurious responses. 'Easily update/modify' was by far the most popular response but few candidates went on to explain this advantage for the second mark. Many candidates missed the thrust of the question and focussed on the advantages of ICT systems for designing or manufacturing rather than production planning.

Question 6(b)

Clearly this part of the specification and its related content had not been taught in the vast majority of centres. The published cross-referencing document between the legacy specification and this revised specification directed centres to the old A2 CAD/CAM content from which the question and content of the mark scheme was drawn. A significant number of candidates were able to pick up single marks for descriptions of strategies but very few specifically named any. In general, responses focused on Gantt charts, flow charts and JIT systems, with a number describing one off, batch and mass production systems, none of which gained marks.

Question 7(a)

Relatively few candidates picked up both marks here for a clear description of smart materials. The majority of candidates could name one, and many described what a specific smart material did (which was awarded a mark), but few gave the broader picture of the nature of smart materials. A significant number of responses went in an inappropriate direction and described recyclable or environmentally friendly materials.

Question 7(b)

This was appropriately answered, with most candidates picking up 2 or 3 marks for answers that concentrated on selecting recyclable materials and bio-degradable materials. Responses then commonly drifted into long explanations of the implications of these changes and their effect on global warming. A minority of candidates kept their answers focussed and went on to outline further eco-design decisions and scored higher marks. Students need to take note of the marks available and tailor their answers accordingly.

Question 8(a)

The majority of candidates accessed this question well and gained high marks with the most common responses being increased portability, increased functionality and increased appeal due to smaller size.

Question 8(b)

Most candidates could access this question but few were able to remain focussed in their discussions. Superficial answers often identified that mass production increased the volume of products available and made them cheaper. It was not uncommon after this for candidates to repeat these same themes over and over again in extended amounts of text. Many candidates quickly moved away from the question and gave long descriptions of the development of mass production, the range of benefits to the manufacturer and the implications on employment. Too often, candidates that did stay with the theme lambasted mass production as the cause of falling quality and the death of individual choice. Having said this, it was pleasing to see the more able candidates staying focussed, analysing the effects appropriately, and then identifying a wide range of both positive and negative points resulting in higher marks.

Principal Examiner's Report summer 2008
GCE A2 Design & Technology: Further Study of Product Design
Resistant Materials Technology unit 6143/01

General information

Candidates generally followed procedure more effectively this year with fewer answers being written 'out of clip'. If candidates need more space or need to rewrite their answers then a separate sheet (**not the margins around the paper**) should be used and clearly labelled.

Candidates should not enclose any separate sheets which just contain their 'jottings'!!

Candidates seem to be clearer about the meaning of the 'key' words in the question and therefore targeting their answers more carefully.

Candidates should try and explain their answers in detail, using accurate technological language.

Question 1a

This question was quite well answered and showed many candidates to have a good knowledge of waste minimisation. However, candidates must justify their answer in order to access the full mark allocation

E.g. '*Use less material*' will score only **one** mark. '*Redesign products so that they require less material to manufacture*' will score **two** marks

Question 1b

This question was generally well answered. More candidates were able to justifying their answers which enabled them to access the full mark.

Question 2a

Candidates either scored well or very poorly on this question. All four options were used in roughly equal amount suggesting that **more** centres are now covering the whole specification in their teaching.

Question 2b

This question was poorly answered by many candidates, with very few having an in depth knowledge of the topic. Many candidates seemed to concentrate their answers on an electronic 'point of sale display' and not a method of capturing sales data electronically

Question 3a

Many candidates scored some marks on this question, usually with comments about strength/ease of bending, but only the more able candidates clearly knew the differences between constructing the legs using lamination and forming them from solid timber and were therefore able to explain the advantages of one over the other.

Question 3b

Many candidates wrote about veneering or applying a surface laminate to the leg which only allowed them to score half marks.

Far too many candidates used the manufacture of plywood to explain their answer rather than focussing on the construction of the leg as in the stem of the question.

Question 4a

This question was not answered well with most candidates having little more knowledge that '*the speed of data transfer*'.

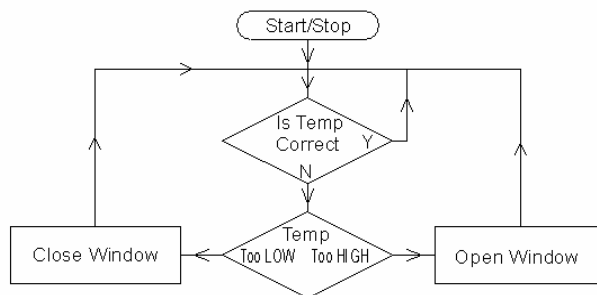
Question 4b

Many candidates had good knowledge of AI (Artificial Intelligent) and its general applications and scored well on this question

Question 5a

The range of ways candidates tried to present their answer to this question was vast. The question asked for the following and was worth 4 marks

- Input
- Process
- Output
- Feedback



Many candidates appeared not to plan their answer in full before putting it down on paper, preferring to 'add bits' to the diagram as they went along. This resulted in a lot of correct information being 'hidden' by the candidate's response.

Question 5b

Very well answered question regarding to the Shape Memory Alloy (SMA)

Question 5c

A large number of candidates accessed the full range of marks available on this question by using a simple diagrammatic representation, with a few simple annotations. The use of 3D drawings enhanced some answers, but all too often the ability to sketch in this way resulted in answers which were difficult to understand

Question 5d

This question was generally well answered with many candidates' access full marks

Question 6a

Candidates generally knew and understood the properties of carbon fibre but made their answers unnecessarily complicated by putting all they knew about it into the first answer

E.g. *'Carbon fibre has a good strength to weight ratio, making it strong, light and easy to wear'*

It is important for candidates to learn to separate out key points and explain each one in order to access the marks more easily

E.g. *'Carbon fibre is very strong in comparison to other materials (1) therefore affecting a greater protection for the wearer (1)*

The increased strength to weight ratio of carbon fibre (1) means the body armour is significantly lighter and easier to wear (1)

Question 6b

Many candidates scored well on this question, but again far too many did not justify their points so only accessed half the marks available. Also the question was focussed on the production of 'electricity' for 'domestic' use. Candidates should therefore restrict their answers to these points and not include the production of hot water or their industrial use.

Question 7

This question was poorly answered by many candidates. Simple comments about recycling/reusing/reducing power required/extended life were quite common and many candidates scored up to 4/8. Only the more able candidates were able to **explain** more fully about 'how companies might reduce the environmental impact' scored more marks.

Only a small number of candidates really approached the question as written i.e. how companies manufacture their products so the 'use of' and the 'recycle/disposal' have minimal environmental impact.

Question 8

Many candidates wrote a huge amount for this question, but all too often it lacked planning and tended to jump from one topic to another and then back, repeating points in different words and often exceeding the space allotted for the answer. Whilst candidates will **not** be penalised for exceeding the space allotted, careful planning has gone into the amount of space provided and candidates should be able to score full marks within the given space

This type of 'stretch and challenge', essay type answer requires candidates to plan before starting. There were four categories under which they needed to put their answer. Those candidates who put a heading for each tended to score better marks because they made sure they scored the two marks available for each heading before moving onto the next point.

Principal Moderator's Report summer 2008
GCE A2 Design & Technology: Commercial Product Development
Resistant Materials Technology unit 6144/01

This is the first year of assessment with the new A2 assessment criteria. The demands made upon the candidates have in no way changed; the assessment criteria have simply been revised in such a way as to clarify the allocation of marks to the candidates. The majority of centres adapted quite well to the changes in the assessment criteria and we found the coursework to be more accurately marked than in previous years. There was, however, a significant number of centres that failed to recognise these changes.

Where the changes in the mark scheme were not recognised by centres, it caused a number of issues at moderation. Centres that had not realised that the mark scheme had changed for A2 were more likely to submit work on the wrong coursework assessment booklet (CAB). If centres failed to submit the correct booklet, they had been using an out of date mark scheme to assess the candidates work, which meant that no QWC mark had been added. Using the incorrect set of assessment criteria would also have given those candidates less chance to access the mark scheme as easily as other candidates. Moderators also reported an increase in incomplete or inaccurate administration from centres. Among the issues were no signatures from teachers to verify the work being entirely the candidate's, no AS and A2 summary statements completed by the candidate, addition errors and incorrect transfer of marks onto the OPTEMS. Some centres still fail to submit annotation in support of the assessment criteria.

In general, the A2 coursework for resistant materials focussed around a wide variety of projects, some being demanding problems with great possibilities at this level. A good range of materials were used in product outcomes, which indicates a widening variety of skills and technical knowledge as one would expect at A2. As in previous years there was a noticeable increase in the use of CAD/CAM. However, most centres have recognised the need to be careful not to restrict candidates marks by over-dependency on a single computer generated manufacturing process and are using the CAM manufacturing process along with other processes to enhance the range of making skills.

Most projects were appropriate to the ethos of resistant materials, although there was still some evidence of inappropriate projects, usually resulting in modelled outcomes or outcomes that were non-working prototypes. However, such inappropriate projects were significantly reduced in number compared to previous years.

The vast majority of design work was submitted on A3 paper and the use of bulky and difficult-to-handle portfolios was kept to a minimum. Most candidates tried to keep the size of their portfolios to the suggested limit of 26-30 pages and were well organised, with 'padding' kept to a minimum. However, there was still a small number of candidates offering work that stretched to hundreds of pages. An important aspect of the assessment is to be able to be succinct in the presentation of relevant information. Where candidates are not able to be so, it leads to a conclusion that the candidate does not have a clear understanding of what is required of them within the design process and demonstrates a lack of ability to sort the useful from the irrelevant.

Where candidates presented work of a very structured nature, such as set projects by teachers, it was often difficult to work within a client-based commercial approach, and there was little offered in the way of original and relevant research. Whilst 'set' projects are acceptable at AS we do expect students to establish their own specific problems and briefs at A2. It was pleasing to note the use of set projects was reduced from previous years, but still significantly evident. One or two group projects were submitted and tended to fare less well due to the difficulty of candidates demonstrating their own individual skills in all assessment criteria.

Some centres failed to send the top and bottom marked candidates. Where the random sampling failed to pick these candidates out, such centres had to be contacted and the work sent through before moderation could take place. It is vital that the centre sends the indicated sample on the OPTEMS and any additional candidates to make up the required number in the sample. If the top and bottom marked candidates are not among those indicated on the OPTEMS they should be included in addition.

Annotation was helpful where it was detailed and informative. Only a few centres failed to supply any annotation at all. It can be particularly informative in the justification of practical marks. However, centres are encouraged to add annotation that directs the moderator to the relevant pages (with numbers) and explain why the marks have been given, rather than simply copying out the assessment criteria verbatim.

It was clear from the moderation procedure that the centres attending INSET, or those following the guidance materials carefully, generally achieved at a higher level than others.

Candidates at A2 are expected to:

- Undertake projects that have a level of complexity suitable for A2
- Work as a real designer would when assigned to a commercial brief
- Be specific and focused about the investigations they undertake
- Take into account industrial practice that is relevant to the brief
- Manufacture high quality demanding outcomes
- Incorporate more advanced technical understanding and knowledge

This has not changed from previous years.

Moderators were instructed to look for the above criteria if candidates were to achieve at the highest levels in the individual sections of the mark scheme across all of the assessment criteria.

Criterion A: Investigation, research and specification

Almost all candidates used the 'client/designer' relationship in their work to varying degrees of success and some were able to record realistic feedback that influenced their thinking and decision making throughout the design process. However, there was, again, evidence of candidates starting with a client situation and taking it no further after the initial introduction. To be credited with marks in the top assessment criteria there has to be evidence of commercial working practice throughout. Research offered at this level should be focused on the problem. The need for a questionnaire, for example, should be determined by the information required. Product analysis is more focussed than in previous years, with less reliance on endless cut-outs of products from catalogues or, as is more often the case, from the Internet.

The products looked at tend to be used to indicate design trends or styles, rather than function or reason for construction and material use or processing. There was again evidence of a formulaic approach to the research, which tended to reduce the realism or effectiveness of the individuals work. Doing a questionnaire for the sake of it, rather than having a focussed idea as to what the designer needs to find out from the user group, was common this year. This generally demonstrates a lack of understanding on the designer's behalf.

The moderator is searching for a link to the problem. Candidates who do not understand the real issues raised in the analysis of their problem will complete this section without fully understanding the reasons why, and then fail to use it later. The formation of a specification is usually a direct result of the information gained in the collation of research. All too often the specification appears as though it could have been written before any research was undertaken. In the very best cases the specification showed a direct link back to the results of the research, formulating the way ahead for the designer.

Criterion B: Generating Ideas

As in previous years there is evidence of high quality design work taking place in some centres, with candidates offering a wide range of realistic ideas, communicated in an open and clear manner. However, this work was at times depressed due to the lack of input from a client/user's point of view. The general quality of evaluative comment varied according to the approach taken by the candidate. Where candidates were offering ideas in order to explore the best alternative, their comments were realistic and had greater maturity. Where a candidate had settled on a known solution before embarking on design work the associated annotation was far less convincing. Here, candidates would benefit if they were encouraged to employ design strategies to generate design ideas. At this level it was disappointing to see how few candidates were using inputs to assist the aspect of their design work. At this level we should be seeing realistic design work, where candidates have approached the work without preconceived notions of a solution. Ideas should show progression and not be isolated from each other. They should be evaluated formatively against the specification and in conjunction with client feedback and candidates should recognise the need for compromise where appropriate. Good quality sketching and presentation techniques are expected here, with high-level technical analysis. It was often disappointing to see how little real use of the specification candidates made at this stage. The specification was often 'evaluated' by the use of a tick box or coded table. Realistically, at this level we are expecting to see more explicit evaluative comments relating to the design progression and the matching of specification criteria. There was a real lack of the client/user group input at this stage; as a result, some candidates failed to access the highest assessment criteria.

Criterion C: Developing and communicating design proposals

Many centres still fail to acknowledge the need to move a design on from the initial stage. We are still seeing candidates re-drawing an initial idea that was previously drawn on an earlier page, and then explaining how each individual component part will be manufactured with only minor changes or none at all. At all levels candidates should be modelling and trialling ideas here, checking to see if a chosen approach will work, consulting with the user or client after modelling, and feeding these suggestions back into the designing. There should be evidence of a refinement of ideas into a workable proposal that meets a client's needs. In-depth and detailed technical knowledge and understanding should be appropriately demonstrated in modelling the final design proposal. It is essential to show change in the development of a final solution. The detail of minor components or accessories should be considered as well as the final decisions regarding the final overall proposal.

Materials, finish, and the chosen construction techniques should be justified and alternatives considered. Client or user group input at this stage is essential if access to the higher mark categories is to be achieved.

There are still too many candidates treating this section as a vehicle for explaining how their proposal will be constructed. The nature of the title should lead candidates to focus on communicating designs, not a solution alone. Only in a minority of cases did we see really good developmental work, where candidates were exploring ways of developing the initial ideas towards a final solution. Despite this, technical knowledge continues to demonstrate clear development from the AS, with candidates offering sound reasons for decisions. There was evidence of a deeper understanding of technical knowledge inherent within the work offered for assessment. A final proposal is expected at the end of the development process to give an impression of what the candidate is proposing to make.

Criterion D: Planning manufacture

At its very best we saw work submitted here that was thorough, detailed and completed in advance of the manufacture. Where retrospective planning is offered it often shallow and lacking in detail. Moderators expect to see changes and errors in the planning work and candidates should be encouraged to document them. Most candidates included reference to time management, consideration of commercial methods of production including sequencing for batch/mass production if appropriate, and quality control. Health and safety issues are also often considered.

Formal working drawings (with measurements) or/and exploded views are considered part of the planning procedure that could take place. These have been simplistic and lacking in enough detail in recent years. There needs to be enough information on drawings (both component and assembly) for a third party to complete the manufacture. Templates and jigs should also be evidenced as part of the manufacturing planning.

Where no written planning documentation is offered, 2 marks are available if the candidate has completed a fully working version of the product, unless advised otherwise by the teacher's annotation.

Criterion E: Product manufacture

The majority of practical work offered for assessment at A2 was suitable for this course, in both level of depth and appropriateness. Candidates generally offered work in resistant materials, often producing products of a very demanding nature. Many candidates accumulated good marks in this section in comparison to other areas the coursework.

It was good to see some demanding making work that was well marked; there was not the over-reliance on CAM, as seen in previous years, but an attempt to balance this with other making skills.

It must be pointed out that there is still a gap between candidates achieving high marks and those not due to some centres allowing candidates to pursue very simplistic outcomes that do not allow the candidates to demonstrate a range of high level making skills commensurate with this level. To achieve at the highest level, candidates must demonstrate a range of higher order skills such as veneering, laminating, casting, welding, moulding, turning, machining, etc.

Photographic evidence of completed coursework was largely appropriate and centres were generally familiar with the requirements for producing evidence of product manufacture. However, a few centres still produced photographs of a digital nature on poor quality reprographic paper, which were grainy and unclear images. In the very worst cases we had to request further evidence from centres or indeed the products themselves. It is essential, considering the assessment value of product manufacture, that a range of photographs is presented in order that the full potential of the product is demonstrated. It should also be noted that it is not acceptable to simply direct the moderator to photographs in the folder whilst none are in the CAB. It is a requirement of this specification that centres submit photographic evidence in the CABs.

It should also be noted that centres are not meeting QCA guidelines if candidates are completing a significant amount of work outside the centres supervision. Projects completed at home cannot be verified as the candidates own work unless a member of the centre's teaching staff was there to supervise it.

Criterion F: Testing and evaluating

This section of the assessment criteria was generally marked accurately. There should be evidence of appropriate testing under typical user conditions. Tests should demonstrate clearly how they will relate to the client's specification, the client's views and inputs are vital. Centres should encourage candidates to conduct field trials and to use the product as intended. Changes suggested should be documented, possibly with sketches; this is possibly the weakest section of the assessment, with candidates rushing due to poor time management in other sections. It was evident that the candidates working in a sensible timescale had the time to test and evaluate carefully, some indeed amending practical work as a result of the evaluation. These candidates consistently performed well in this part of the coursework.

Criterion G: Appropriateness of project

The section of the assessment criteria is generally correctly marked. Teachers understand that the specification referred to in this statement is the subject specification, not the candidates' specification. Centres are reminded that only 0, 5 or 10 marks are allocated to this section. Intermediate marks are not allowed.

Criterion H: Quality of Written Communication

At A2 candidates demonstrated a good level of technical understanding in most cases. The presentation of the information was clear and often well marked by the centre. There was a significant number of centres however, that failed to add these marks as they had used an out of date assessment criteria. The marks were then had to be added by the moderator.

Statistics

			Grade Boundaries				
			A	B	C	D	E
Unit 6141	Raw marks	115	92	82	72	63	54
	UMS	150	120	105	90	75	60

			A	B	C	D	E
Unit 6142	Raw marks	80	48	44	40	36	32
	UMS	150	120	105	90	75	60

			A	B	C	D	E
Unit 6143	Raw marks	80	49	44	39	34	30
	UMS	150	120	105	90	75	60

			A	B	C	D	E
Unit 6144	Raw marks	115	92	82	72	63	54
	UMS	150	120	105	90	75	60

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