

Principal Moderator's Report

Summer 2016

Pearson Edexcel GCE in Design &
Technology: Product Design, Graphic
Products (6GR04)

Unit 4: Commercial Design

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2016

Publications Code 6GR04_01_1606_ER

All the material in this publication is copyright

© Pearson Education Ltd 2016

It is pleasing to note that the vast majority of centres understand the needs in terms of submission requirements when presenting work for this part of the course. Obviously, in the case of a small number of new centres, there was the occasional misinterpretation but these were specifically reported to centres in the E9 reports from the moderators. There was probably a slight reduction in the number of centres who failed to include the design, development and manufacture of a 2D element, and I'm again pleased to report that we saw less products submitted that were more appropriate to Resistant Materials and not selected from the given pathways in the specification. Any product outcome that is feasibly made by a student at A2 level in its final form, such as furniture, lighting or jewellery, is unlikely to be appropriate as a Graphic Products entry, even if modelled.

It is a requirement of this submission that centres should select a pathway through which the design, development and manufacture will be evidenced. Part of the requirements of this submission is also to evidence the design, development and manufacture of a 2D, as well as a 3D element within this pathway (as defined on page 111 of the specification). It is essential then, that centres recognise the need to submit work that meets these criteria. To assist in the correct interpretation of a graphic product, we offer the following interpretation.

A suitable product for a graphics student would necessitate them to model the outcome, because it is too big to be made in its final form (architecture, garden, vehicle, etc.), or require too expensive a mould or moulds for its mass production (plastic moulding, blow moulding, die cutting, printing). Hence, it would be expected that a prototype model be made. The only exception to this rule might be a fully working Point-of-Sale display, which would be accepted as a submission as it is particularly mentioned in the specification. To simply make a model of a product (chair, table, etc.) is not going to meet the requirement of a graphic product as these outcomes could be reasonably made in final form by an A level student. As a guide, iPod docking stations, storage, furniture and lighting products are not likely to meet the criteria of a graphic product outcome as it is reasonable to expect an A-level student to make them in their final form through a Resistant Materials pathway. The vast majority of centres have recognised this and the work submitted on the whole was entirely appropriate. Where candidates have chosen to submit design work that is not included on the list of products on page 111, then significant changes may be seen in the expected mark outcomes for this section. Specifically, if evidence of 2D or 3D design work was missing, it would not be able to achieve in the highest marks available in designing, developing or making. It should also be noted that paying lip service to the completion of a very simplistic 2D outcome is not likely to enhance the credit gathered in the designing or manufacturing sections. We saw a number of very basic 2D outcomes, from simple bi-fold leaflets to posters or even logos that consisted of straight forward font changed names.

Coursework assessment booklets (CABs) were generally well completed. However, there were a number of issues that related to administration and the completion of the CABs that moderators were consistently reporting. Addition errors are always reported to the centre's Examination Officer so that the centre can change the initial mark entered on the system. This must be done by the centre as it is locked to moderators. Failure to do this could result in the adjustment of work unnecessarily in some cases, as the centre accuracy will be measured against the marks inputted by the centre and those allocated by the moderator.

It is also a requirement that centres include photographs of both the 2D and 3D elements within the CABs; however, the 2D element is still being consistently left out, particularly if it is an additional item to the main end product. It would appear that centres continue to have a varied view of the 2D element; some centres being vigilant in giving it an appropriately high profile, others ignoring it altogether. It is not an aspect that can be ignored if a centre is seeking marks at the highest level, and in some projects, it can be as demanding as the 3D element. However it is viewed, a photograph of the final 2D element is required in the CAB whether it is stand alone or as an inherent part of the 3D element.

Centres are also requested to add annotations to the CAB in support of the marks requested by the centre. Most annotations are detailed and direct the reader to where the evidence for marks can be found, others simply repeat the assessment criteria. Obviously, there is no need to simply reproduce the assessment criteria statements as the application of the mark directs the moderator. It is much more useful for the centre to explain where the evidence is for the marks allocated. In making, it is even more important to explain the rationale behind the marks requested. Offering information pertaining to the processes used and why they are assessed at the level requested would be much more helpful.

Yet again some very good work was seen and many centres have coped well with the A2 coursework. That said, many candidates do not appear to have been encouraged to delve into the appropriate depth of the problems being investigated, often skimming the surface of issues and decisions being made with little or no justification. It would appear that in many cases problems being tackled were clearly leading to known outcomes before the candidate had started investigating the problem. Similar to last year, the design work was often disappointing with for example candidates focusing on a body styling exercise and not looking into the detailed sub-systems of the working solution. This lack of depth prevents candidates from accessing the highest marks at A2 as they often do not get the chance to exhibit the knowledge they need for this level. There was some evidence of formulaic presentations, with a few centres offering class-set projects at this level. This is deemed inappropriate as candidates are expected to explore and analyse the problem being tackled individually, and the sharing of work is likely to lead to compliance issues at this

level. At this, the pinnacle of the candidates' KS5 based designing and problem solving, we seek much more demanding original work than the usual, formulaic, linear design presentation seen at GCSE. Candidates should be much more intuitive and the product solution should develop and grow as the process evolves. The client input throughout is essential in delivering this. We still see on page 1 of designing, an almost perfect replica of the final product. The work presented in these cases lacks authenticity, integrity and does not convince the moderator that the candidate understands the design process at the level expected for the higher mark ranges.

Where centres marked leniently, the significant differences tended to occur where centres failed to submit 2D elements or the product manufactured was simplistic and lacking in the demand required for this level. Some centres have not taken on board the need to encourage candidates to design with a commercial methodology in mind; indeed, some centres pay only lip service to this and then fail to produce the evidence required for the very highest marks in the assessment criteria. At other times, centres credited work that was too simplistic for this level. Designing a leaflet or simple folded menu offers less scope for range of technical processes than does the design of a more complex product. Thus the simple products may be well designed or well made, but they are not difficult to get right and hence they are unlikely to access the full mark ranges.

Almost all students identified a client/user group at the beginning of their work, but as in previous submissions, many failed to mention them again until the final summative evaluation. Students are required to employ a commercial methodology to their work at this level and act as a commercial designer might when working for a client/user group, which means the consultation between designer and client should take place at key points in the design/make process and contribute to almost all assessment sections. Where this designer/client relationship was well developed, the whole design and make process was enhanced and justified. Unfortunately, candidates still continue to pay only cursory attention to this relationship seeing it as a necessary inconvenience to be addressed in order to comply with the assessment criteria. There was again a proliferation of coloured inserted notes stating 'client' opinion, with no other evidence that a client had been involved at all, leading to a very unconvincing impression of commercial design methodology. It would be far better to evidence meetings with clients by photographs, email or tweets. That said, moderators did notice an increase in the evidencing of the use of clients through the design work. It would appear that this is finally being recognised as a process that we seek to evidence for higher performing candidates. Where client involvement is more genuine, the work flows with greater realism and the decisions taken feed into the design and development work.

Section A: Research and Analysis

The Quality of the Analysis of the problem varied across candidates and centres with some candidates really understanding the issues and possible opportunities, and others producing simplistic and obvious pathways of research. It was often seen that a mind-map would reveal areas of possible research that could have been illuminating but were never pursued. Here, the use of questioning would help to focus research. The intention is that the analysis should raise the questions being answered by the research, and the answers be presented through the specification. It is often the case that candidates who had completed a thorough analysis, often produced focused and relevant research, and this tended to be accurately assessed by the centre. Where candidates failed to evidence clear communication with the client or user group, they were less clear about the specific research required and tended to produce generalised research. This was often very well presented but not linked directly to the task, such as pages of information about materials where the designer has no idea whether they will be needed or not. The lack of sizing information was less problematic this year, although we still saw buildings being designed on sites that had 'no limits', or that the view/layout/geographic position of the site had been completely ignored. This kind of lack of focus is a direct result of the client not being realistically involved.

Research was often presented without conclusions or seemed generic and not specific to the problem. The linkage to the analysis seems to have worsened this year. Candidates were driven by the need to 'jump through hoops' presented by the centre as sections that need to be included in the research instead of the research emerging organically from the questions raised in the analysis. The research itself often lacked depth and product analysis often focused on a series of internet pictures with comments telling the viewer what they were looking at – not why the outcome was as it was. Sustainability was often poorly researched with little focus on the application of materials and processes. Given many candidates chose to produce an architectural solution, there was a distinct lack of research into building regulations, planning laws or construction processes. Research for a 2D element solution was occasionally included.

Some centres approached the research section more effectively and there was a clear attempt to demonstrate how research was appropriate and selective. These centres usually went on to link their research explicitly to design constraints established within their specifications. Others used summative 'research analysis' pages which concluded their findings. However centres prefer to present the work, it is essential that the work submitted is appropriate to the problem being addressed.

Section B: Specification

Virtually all candidates presented a specification of some kind even if it was a generic list of points. Candidates who laid out the specification in a table with additional headings for the justification and testing/measuring of each point scored better than the simple headings of form and function etc. Candidates that presented in this form tended to achieve a higher mark for this section as they clearly presented more focused specifications that considered how they would be tested at the end of the folder. Centres were clearly advising candidates about how best to present their work. The most concise specifications considered the real proposal, the model and the 2D outcome as three separate specifications. Many candidates justified their specification points and measurability was often evident with the moderators reporting in that this section was often accurately marked and at higher levels. It is acknowledged that some of the focus of a graphics specification can be difficult to 'measure'. Aesthetics can be measured by questionnaires if they are constructed properly and this is an ideal way of connecting to the client or user group. Other techniques that can be used are the use of scale rules to determine scaled components sizes, or the use of other measuring devices to show angles or verticals. Components that interlock or fit together can be visually compared and physically tested. It may be useful for candidates to state how they intend to test during the construction of their specification. Sustainability remains a little superficially treated, with many candidates only paying it lip service. Where sustainability was realistically covered, it was often through the connection to a sustainability problem at the outset, or where candidates kept a focused eye on re-use, recycle and reduce as a designing mantra.

Section C1: Designing

The work in the designing section was considered one of the areas that centres have most room for improvement. The work in this section often fell within the middle box descriptor for most candidates perhaps as would be expected, with initial designs describing appearance and function with limited focus on the materials, processes and suitability for a particular aspect of the design. Sub-system detail was often limited or not evident and there was a clear preoccupation for styling across a number of centres. Too many centres had clearly directed candidates to produce three ideas and move on. At this level, we expect to see a more iterative approach with a number of ideas being explored and inputs from the client then affecting the direction the designs take.

Candidates at best produced beautifully presented intricate and detailed work, but too often the work was simplistic body-styled work, which was representative of an average performance at GCSE. It is not enough to simply present a shaped outcome such as a hand-held electronic device, without considering how the key components would be positioned, used, accessed or

even charged with a power source. Buildings that have basic external shapes with no detail or alternatives for key structural elements will similarly fail to meet the needs of the 'workable and detailed' top assessment criteria.

A significant number of candidates designed the 3D element with the 2D outcome appearing as a 'bolt on' at the end of the project. This lack of focus on the 2D element has been noticeable in this and previous years, and many moderators have found it difficult to justify the centre's design marks because of it. Some candidates did not present a 2D outcome and would not have been able to access the marks at the highest end of the mark range. It is important that candidates evidence the design of 2D elements even where they are constituent parts of the whole product, as in applied graphics for the design of packaging.

Client feedback was often evidenced but was again limited in quality and seemed lacking in real connection. It would be much better for the candidates to show they have connected this stage with the client (photographs/email etc.) and show the feedback being given, as opposed to just recording a decision from the client. Analytical comments linking the specification and research to the design work was often evidenced but increasingly only as a generic input. It is a continuing disappointment to note the lack of design strategies adopted by some candidates. Simple sketches are commonly offered with holistic considerations, offering little detail on the sub-systems in the design work. Where the candidates accessed the full range of marks in this section, they offered work that suggested alternative ways of solving the key issues within the designs, thus allowing them to demonstrate knowledge and understanding of the subject, as well as applying research undertaken previously or as part of their design work.

At the highest end, the work was well presented and technically detailed, showing a clear understanding of the intimate sub-systems that make up the whole in the design being presented. Candidates will have explored possibilities for these sub-systems and dealt with them individually rather than just drawing a building and pointing out constituent parts. It should be noted at this level, we expect candidates to be discussing the building of the 'real' product and not the model that will be later. The design and development of the final product will be amended and justified more realistically if the real construction materials and presses are considered.

Section C2: Review

The review section was attempted by the majority of candidates. Generally this section is more often completed as a stand-alone task rather than reviewing as the designer progresses, although both were credited.

Review usually referred back to the specification and took into account its parameters and specific issues, although the results of this specification review rarely turned into real changes in the development section later. We rarely see numerical scoring systems as part of the review section; indeed, these are generally seen to be lacking in objectivity and comments are preferred.

Here, we should also see use of the client, which did appear in a number of cases but not always. It should be pointed out that whilst we seek realistic client or user group input, we do not expect the candidate to undertake any route suggested by a client that will jeopardise the end product in terms of its level of demand or range of manufacturing outputs.

Section C3: Develop

The development section remains a growing concern. It is apparent that many centres do not understand the need for change, exploration, testing or modelling. The work in this section was one of the sections most commonly over-marked. The number of candidates failing to evidence the development of a 2D design component has continued to grow this year. Often the development tended to focus entirely on the 3D element and at times ignored, or only paid lip service to the 2D element.

To attract marks at the highest end of the range we must see client feedback and designer evaluation being used as part of the final modification stage. While there was evidence of good practice, the application of the assessment criteria was still lenient, with work that had too little testing of components, modelling aspects of the design, or gaining and using feedback from users or clients.

Candidates achieving high marks in this section clearly attempted to move on their ideas and there was some excellent use of CAD and traditional modelling to explore modifications. Sketch Up/Photoshop and other CAD packages are increasingly used effectively within interior design/architectural projects to explore alternative spatial arrangements, and gaining popularity in concept modelling. There was an increase in the use of CAD and traditional modelling this year, but again not as a design tool, but simply as a practice or presentation piece for the final design. CAD is an ideal way to present designs to the client and gain feedback. It offers enormous opportunities for making minor changes and presenting these considerations, all too often however, it was not used for this.

We consider development to mean 'change' or at least to consider it. This should be shown in students' work through their ability to use the results of design review to bring together the best or most appropriate features of their design ideas into a coherent and refined final design proposal that meets all the requirements of the product specification, and matches the client/user group

needs. It is not acceptable to simply take an initial idea and make superficial or cosmetic changes to it, and then present it as a final developed proposal. Some 3D modelling was purposeful, but often failed to lead to significant changes in design thinking. It appears to be used more often as a presentational tool to show what the final product will look like, rather than as a tool to make minor yet realistic changes to a proposal to elicit the final outcome. This year, most candidates managed to make improvements to their chosen design idea through the development stage. However, candidates rarely fully refined and extended their ideas through the development tasks, often making only cosmetic changes. The best candidates reviewed their developmental work with their end user/client.

The input of technical information and even additional research is usual here where candidates are demonstrating a commercial design methodology. Input from the client or user group would be essential at this point too. Few clients would be happy to set a designer a brief, and then have no input with the way the product is being developed until it is finished! At the higher level, we saw candidates modelling products and allowing third parties to test them and provide feedback. This use of models to develop designs would immediately attract a higher level of assessment.

Candidates who failed to address both 2D and 3D elements within their designs were restricted in their mark acquisition. In these cases, developments were not used to produce a final design proposal that were significantly different to previous design ideas. Final design proposals again sometimes failed to include technical details of materials and/or components, processes and techniques. They often focused too much on how the chosen design will be made, rather than exploring alternatives. We advise the individual exploration of alternatives for the sub-systems in the design.

A necessary aspect of the development section is a design proposal; this is often well presented. As has been pointed out in previous years the final proposal is often improved with the submission of not only a presentation drawing, but an exploded view as well. This can be utilised as a tool in justifying the choice of manufacturing processes and materials, which will be later credited in the manufacturing section.

Section C4: Communication

One of the key aspects on the mark scheme is that candidates at the highest level offer a range of communication techniques and media including ICT and CAD. There were occasions where candidates failed to offer this variety and simply presented sketching/word processing as the main presentation medium. The work must also be presented with precision and accuracy. In this section, centres were usually accurate in their assessment and candidate marks reflected

these requirements. At the very highest level, the moderators saw work of superb quality, utilising a wide variety of ICT skills and an increasingly comprehensive range of CAD packages used with considerable skills and accuracy. The application of the assessment criteria by centres tended to be accurate in many cases but it was difficult for candidates to access the highest marks. This was because communication techniques generally lacked sufficient precision and accuracy to convey detailed and comprehensive information to enable a third party to manufacture the final design proposal. The inclusion of a cutting list would be an obvious starting point here. The use of dimensions on a working drawing or exploded view, with additional component drawings or electrical wiring diagrams as appropriate would be expected.

Enough information should be provided through the final proposal or working drawings for a product to be made by a third party. The most effective way to complete the proposal aspect seems to be offering a presentation drawing with justification of materials choices with a working or exploded drawing with relevant sizes applied to it.

Section D: Planning

This section was generally well completed and well-marked by the vast majority of centres.

Many candidates drafted tables and charts, which were also used to address H&S and QC. Quality control sometimes remains an issue, with candidates simply stating 'check for the right size' or 'make sure that it fits'; these comments need to be backed up with how they would do this, perhaps 'check size against the prepared template' or 'use ruler to compare door to scale'.

Although it was relatively simple to meet the requirements of the lower tier assessment criteria, planning sections, in general, lacked the detail necessary to justify centre assessments at higher levels. The charts quite often look impressively complex but often lack detail and contain broad sweeping statements, such as 'build vacuum form mould' and 'doors/windows'. There were very few instances where candidates planned to manufacture the 'real' product. Almost all made plans that related to the actual model being made. Naturally, candidates do not have to plan for the real products as they will not be making the real thing, so at this stage the model should now be planned for.

Making

This section has improved a great deal over the last few years, with centres marking work much more appropriately as experience of the expected submission is gained. Attendance to the feedback session and the

exemplification of practical has probably assisted here. We continue to see work of great complexity and high demand, but in equal measure we see work that is repetitive in its collation of skills/processes, or these processes are of a basic and undemanding nature.

Candidates were again disadvantaged across the making section if they selected a low level demand project or a project that didn't allow them to evidence a range of tools/materials/etc. Higher level candidates who submitted a simple single technique model (possibly with no 2D element) would often not justify high marks being allocated against their work.

An increased number of centres felt that they could submit a page from the folder as the 2D element; however, the drawing would already have been credited in another section. The final drawing in the folder is assessed as part of the development section; it is not then reassessed as the 2D element. The 2D element must be independent to the folder and either form part of the model itself or be a separate entity. A back-to-client presentation board with a representation of the product designed should be developed within the folder, and made as a stand-alone product which utilises largely different graphics than those shown in the folder.

We see less work that is over-reliant on the use of CAM, especially the laser cutter, but we continue to have increasing submissions of work from 3D printers. Many centres have clearly taken on board the requirements that only half of the manufacture should be CAM, and the rest balanced by more traditional manufacturing methods. However, we have seen some submissions that wholly rely on the use of a CAM output. We also see centres submitting work that contains a range of skills and processes; however, they are at times too simplistic a process to be recognised as an advanced level skill. Simply placing a mould in a vacuum former and vacuum forming HIPs is not as demanding as constructing a complex mould with drafted angles, vent holes and fillets.

In terms of products that are inappropriate for the specification, we did see a small number of these. The specification is clear in that candidates are expected to work in essentially two areas: conceptual design and built environment.

As mentioned previously, tables, benches, lamps, iPod docks and storage items are real products (Resistant Materials focused) and therefore would not be able to access the full mark range in the making section. The specification is clear that all Graphic Product candidates must select work from either of the two pathways (see introduction).

Section E1: Use of tools and equipment

In this section, we are looking for candidates to have demonstrated that they have used a range of tools and processes skilfully. This should not necessarily

be viewed as a holistic process at the end of making but a build-up of a collection of skills and processes as the product is completed. Individual processes can be evidenced for component manufacture through the use of photographs very easily.

Detailed making diaries with photographs were often submitted and clearly demonstrated the candidates making for the majority of centres. These diaries cannot be underestimated and are vital for the awarding of manufacturing marks, as is the teacher's annotation. However, in a number of centres the diaries submitted showed little in the way of detailed photographs which showed the students' making skills. Precision and accuracy were assessed primarily by the submitted final product photos and the quality of these photographs was on occasion poor. Many centres over awarded in this section as the photographic evidence contradicted the given marks, or the photographs did not provide the evidence.

Most centres attempted to use a range of processes and much of the photographic evidence submitted was entirely appropriate. Evidence of safety awareness was usually offered through documentation in the folder of risk assessments or in the planning documentation.

At the very highest levels of manufacture, we saw evidence of some high quality, demanding manufacturing processes. Architectural modelling was still popular, but concept modelling has gained in popularity this year showing a high degree of finish in the best examples. Styrofoam modelling and various finishing techniques were used to assist in the shaping of amorphous concept models to perhaps a lesser degree than previously, with 3D printed components adding to the processes developed from previous submissions. Lathe and other more traditional machining are still regularly seen along with some casting and machining work, and some very demanding net constructions often in conjunction with extensive work using Photoshop or similar graphic manipulation packages. In contrast, we are still seeing candidates presenting models without a 2D element, whose construction requires little more than a craft knife, safety rule and cutting mat. The absence of a 2D outcome limited assessments for candidates who failed to benefit from the additional process, which may have been used. Over reliance on the use of CAM, in particular the use of a laser cutter or 3D printer, will prevent access to the higher mark category due to the previously mentioned 50/50 guidelines. However, there was more of an attempt to justify the selection of tools and equipment and centres were clearly directing their candidates to employ an appropriate range of techniques when CAM was used.

Section E2: Quality

Yet again some of the work submitted was outstanding; however, it tended to be very much a 50/50 split. Most candidates produced a final outcome that matched their design proposal although it was noted that some candidates struggled to achieve the correct proportions of their final design drawing in their model.

Many submissions have again this year disappointed in terms of real quality, and again I have to report that often products lacked the level of sophistication required to gain access to the higher levels of the assessment criteria. That said, at the highest level we have seen some remarkable work that has a high quality of finish with a good range of advanced processes being evidenced.

In many cases, the materials selection was not always justified and working properties not clearly identified in relation to their use within the project. The justification of the choice of materials and processes is also required to be evidenced in the portfolio; where it was offered, this was usually completed satisfactorily by the candidates but occasionally lacked justification. The presentation of a work diary with photographic records of candidate production processes allowed the clear evidencing of the range of processes used. Some candidates generally failed to demonstrate an explicit and detailed understanding of the working properties of materials used in order to justify their selection.

It is apparent that more and more centres have access to CNC equipment and in some cases this led to an over-reliance upon CAM technologies. The increase in quality is often mirrored by a decline in demand in this situation. More judicious centres ensured that their candidates incorporated additional processes as the utilisation of CAM outputs requires little effort from the candidates to achieve a high level of finish.

Section E3: Complexity/Level of Demand

There is still evidence that some centres have failed to guide candidates towards the production of a complex enough product at the final outcome stage. It is not enough to design a suitable answer to the design problem. Teachers we must ensure that candidates have enough demand in their final proposals to gain the marks expected. There are hoops to jump through in order to comply with any demands of an assessment criterion, and we have to monitor candidates to ensure that they are ready for those hoops. Where centres understood the requirements and submitted appropriate products, marking tended to be more accurate. In this section, centres have a good idea of the level of demand on the whole. Where there is an over reliance of repeat or very similar simplistic techniques being used (use of a glue gun, laser cutter, etc.) then the level of demand mark would and should not be high. The use of specific jointing in construction of architectural models and the assembly of complex laser cut items

was credited however. A range of additional modelling techniques of a more demanding nature was also credited: clay modelling, graphic manipulation and printing, use of Polyfilla in finishing block models, electrical work, casting, sheet metal work, use of jigs, moulding and mould making were techniques seen and credited. Where candidates submitted nets of a simplistic nature with straight forward flaps and locking mechanisms, they did not achieve as highly as a product that has double folds or more unusual locking mechanisms or closures.

Again, an area of weakness in this section was be the 2D outcome. Here, we saw a lot of very simple outcomes, failing to utilise the more demanding graphic skills in the production of what appeared to be after thoughts to main item. Greater utilisation of graphic manipulation packages or conversion into signage (with possible use of electronic components here) or similar 3D outcomes would be welcome. However, complex packaging and more imaginative 2D outcomes can be demanding and will adequately support the complexity of a simple 3D element.

Section E3: Testing and Evaluating

The application of the assessment criteria by centres was quite often accurately applied. There was evidence of good practice from candidates where 3rd party feedback was evidenced and testing took place. However, client responses were not always analysed in any detail or used to inform evaluations and modifications and in some cases tests were neither explained, undertaken or had results applied to the evaluation process.

Candidates still need to justify the tests being undertaken. This important factor seems to be an area commonly overlooked this year. Indeed it would be beneficial for more candidates to evidence the tests though the use of photographs, this could include the involvement of the client or user group too. Evaluations generally referenced the specification and addressed both 2D and 3D elements, but could have utilised the tests results rather more. When candidates performed well in this section, they used a variety of techniques to test their products. Questionnaires and feedback from clients featured strongly in this section. In the best cases, tests were derived from the specification and justified.

Many more centres had encouraged a Life Cycle Assessment as part of this section. This factor only needs to be applied to a single part of the product if the product is of complicated nature. It would be quite onerous to apply a life cycle analysis to a whole building but the key elements could and should be considered, such as the use of reclaimed materials as part of a building or the design or a green roof in its construction. There was utilisation of some excellent website applications where the details of some of the materials could be processed automatically with carbon footprint costs being calculated.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>