

Moderator's Report

Principal Moderator Feedback

Summer 2018

Pearson Edexcel GCE Advanced Level
In D&T: Graphic Products (6GR04)

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 2018

Publications Code 6GR04_01_1806_ER

All the material in this publication is copyright

© Pearson Education Ltd 2018

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.

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 requirement 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 criterion. To assist in the correct interpretation of a graphic product we offer the following interpretation.

A suitable product for a graphics candidate would necessitate them in modelling 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 candidate. As a guide; iPod docking station, 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 candidate 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 from page 111, then divergence may be seen between the centre assessment and the moderation marks. 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. 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.

Centre coursework assessment booklets were generally well completed. However there were a number of issues that related to administration and the completion of the booklets that moderators were consistently reporting. Addition errors are always reported to the centre examination officer, this is so that the centre can change the initial mark entered on the system.

It is also a requirement that centres add photographs of both, the 2D and the 3D elements, within the coursework assessment booklet (CAB), the 2D element is still being consistently left out, particularly if it is an additional item to the main 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 to get right. 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 annotation to the CAB in support of the marks requested by the centre. Most annotation is detailed and directs the reader to pages where the evidence can be found in the folders, at other times it simply repeats the assessment criterion. Obviously there is no need to simply reproduce the assessment criterion statements as the application of the mark to that criterion directs the moderator to the words anyhow. 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 appertaining to the processes used and why they are assessed at the level requested would be much more helpful.

Some very good work was seen, and many centres have coped well with the A2 coursework. This said, a lot of candidates appear not to have been encouraged to delve to 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 leading obviously towards known outcomes before the candidate had starting investigating the problem. Similarly to last year the design work in particular was often disappointing, 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 to for this level. There was an increase in evidence of the submission of more formulaic presentations. At this level it is expected that the candidates should be making decisions about their next steps, in discussion with their clients or users, the use of pre-printed, structured sheets (provided by the centre) do not give the impression of individual work and leads us to believe the candidates do not really understand what they are doing or why. 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 and integrity and, therefore, 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 onboard the need to encourage candidates to design with a commercial methodology in mind. Indeed, some centres allude insubstantially to this, and do not produce sufficient supporting evidence required in the assessment criteria for the very highest marks. 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 do not provide sufficient challenge to candidates at this level, hence they are unlikely to access the full mark ranges.

Almost all candidates 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 evaluation summary. Candidates 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. This requires that consultation between designer and client should take place at key points in the design/make process, which amount 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 component that needed to be addressed to comply with the assessment criteria, rather than considering it to be central to the whole process. There was again a proliferation of coloured inserted notes stating 'client' opinion. With no other evidence that a client has been involved at all, leading to a very unconvincing impression of commercial design methodology; far better to evidence the meeting with the client with photographs, email or tweets. This said it has been recorded by moderators that there was an increase in the evidencing of the use of clients through the design work. It would appear that this is now being recognised as a process that we seek to evidence for candidates, especially when high level marks are at issue. Where client involvement is more genuine the work flows with greater realism and the decisions taken feed into the design and development work realistically giving a better flow to the 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 opportunities that may be possible, 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 some questioning would help to focus the research. It is intended that the analysis should raise the questions being answered in the research, and then the answers be presented through the specification. It is often the case that candidates who had completed a thorough analysis often produced focussed and relevant research, and this tended to be accurately assessed by the centre. Where candidates didn't sufficiently 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:

pages of information about materials – about which 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. Instead, candidates were driven by a procedural progression of sections that need to be included in the research; as opposed to the research emerging organically from the questions raised in the analysis. The research itself often lacked sufficient depth and product analysis at times focused on a series of internet pictures (the candidates not having been anywhere near the product) with comments telling the viewer what they were looking at – not why said outcome was as it was. Sustainability was often insufficiently researched, with little focus on the application of materials and processes. Given that many candidates choose 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. It is essential that the work submitted is appropriate to the problem being tackled.

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 of each point and testing/measuring of each point scored better than the simple headings of form function etc. Candidates that presented in this form tended to achieve a higher mark for this section as they clearly presented more focussed 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 3 separate specifications. Many candidates justified their specification points, and measurability was often evident, the moderators reporting in fact 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 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 will test during the construction of their specification. Sustainability remains under considered, with many candidates providing on cursory engagement. Where sustainability was realistically covered, it was often through the connection of sustainability to the problem at the outset, or candidates kept a focused eye on re-use, recycle and reduce as a designing mantra.

Section C1: Designing.

The work in the designing section is still an area that centres have more room for improvement. The work in this section, more often than not, 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 will take.

The best candidates produced beautifully presented, intricate, and detailed work; however, often the work was simplistic, body styled work, which was not at the required level for GCE. It is not sufficient to 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' category in the top assessment criteria. Although there was an improvement on the detail in many submissions of interior design work, an area often found difficult by candidates.

A significant number of candidates again 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 this and previous years, many moderators have found it difficult to justify centre 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 (for example through photographs/email) 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 as a generic

input. It is noticeable that some candidates do not pay sufficient attention to the development of design strategies, simple sketches are offered that were holistic considerations, offering little detail and few considerations of 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 now 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 the candidates to be discussing the building of the 'real' product and not the model that will be later produced. The design and development of the final product will be amended and justified more realistically if the real construction materials and processes 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, 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 regarded to lack objectivity, and comments are preferred.

Here we should also see use of the client; we did see this in a number of cases but this was not always so. It should be pointed out that whilst we seek realistic client or user group input, we do not expect the candidate to undertake a 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 raises some concern, especially given the importance placed upon it within the new GCSE and GCE specifications. The work in this section was one of the sections most commonly displaying divergence between the centre and moderator assessment. The number of candidates providing insufficient (or non-existent) evidence of the development of a 2D design component has continued to grow this year. Often the development focused entirely on the 3D element, at times at the expense of 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 by centres were still lenient. Lenient marking was evident where work featured too little testing of components, modelling aspects of the design, or gaining and using feedback from users or clients. This is an important aspect of supporting iterative design and development work.

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 ever increasingly used effectively within interior design/architectural projects to explore alternative spatial arrangements, and gaining in popularity for concept modelling. There was an increase in the use of CAD and traditional modelling this year, but again not being used as a design tool, simply as a practice or presentation piece for the final design. CAD is an ideal way to present the designs to the client and gain feedback from them, it offers enormous opportunities for making minor changes and presenting these considerations, although this potential usage is often overlooked.

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 in this area we saw candidates modelling products and allowing third parties to test them and 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 was significantly different to previous design ideas. Final Design proposals again at times did not include technical details of materials and/or components, processes and techniques; where they did, they focused too much on how the chosen design would be made, rather than exploring alternatives, in this 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 the 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. Regarding this centres were again 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, 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 of 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 would be to offer 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 accurately marked, by the vast majority of centres.

Many candidates draft Tables/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 upon reading the detail they rely upon broad statements, like 'build vacuum form mould' and 'make 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 the 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 appropriately due to the experience gained. 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 the processes utilised are of an undemanding nature.

Candidates were 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 or similar, at a more advanced level. Candidates who submitted a simple single technique model (possibly with no 2D element) found it difficult to justify high marks being allocated against their work.

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 ½ of the manufacture should be CAM and the rest balanced by more traditional manufacturing methods. However, we have seen some submissions that have wholly relied upon 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 HIP's 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 that candidates are expected to work in essentially two areas:

Conceptual Design

Built Environment

As mentioned previously; Tables, benches, lamps, ipod docks and storage items are real products (RM focused) and so 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 previous comments in the 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 process 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 under-estimated, they are vital for the award of the manufacturing

marks, as is the teacher annotation. However, in a number of centres the diaries submitted by candidates showed little in the way of detailed photographs of making to show the candidates' 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 for the marks assigned.

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 the most popular, but concept modelling has gained in popularity again this year, showing a high degree of finish in the best examples. Styrofoam modelling and various finishing techniques appeared to be used to assist in the shaping of amorphous concept models to a lesser degree than previously, with 3D printed components to add to the processes used growing from previous submissions. Lathe and other more traditional machining are still seen regularly, along with some casting and machining work and some very demanding net constructions, often in conjunction with extensive Photoshop (or similar graphic manipulation packages) 2D graphic applications. In contrast we are still seeing candidates presenting models, without a 2D element, which required little more than a craft knife, safety rule and cutting mat. The absence of a 2D outcome limited assessments for candidates here, as they couldn't benefit from the additional process, which may have been used. Over reliance of 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 fallen short of the highest standards in terms of them being items 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. This 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.

Section E3: Complexity/Level of Demand.

There is still evidence that some centres have not guided candidates towards the production of a complex enough product at the final outcome. It is not enough just to design a suitable answer to the design problem, but as teachers we must ensure that our candidates have enough demand in their final proposals to gather 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 have understood the requirements and have submitted appropriate products, then the marking tended to be 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.); in these instances, 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 though. A range of additional modelling techniques of a more demanding nature were 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 are just some examples of techniques seen and credited. Where candidates submitted nets of a simplistic nature with straight forward flaps and locking mechanisms, they will 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 would be the 2D outcome, here we see a lot of very simple outcomes, failing to utilise the more demanding graphic skills in the production of what appear to be tangential items. Greater utilisation of graphic manipulation packages or conversion into signage (with possible use of electronic components here) or similar 3D outcomes would be welcomed. 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 third party feedback was evidenced, and testing took place. However, client responses were not always analysed in sufficient 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 also evidence the involvement of the client or user group too. Evaluations generally referenced the specification and addressed both 2D and 3D elements, but could utilise 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 would feature strongly in this section. In the best cases tests had been 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 of 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.