



Pearson  
Edexcel

# Examiners' Report Principal Moderator Feedback

Summer 2019

Pearson Edexcel GCSE  
In Design & Technology  
(1DT02)

## **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](http://www.edexcel.com) or [www.btec.co.uk](http://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](http://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](http://www.pearson.com/uk)

## **Grade Boundaries**

Grade boundaries for all papers can be found on the website at:

<https://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html>

Summer 2019

Publications Code 8MU0\_02\_1906\_ER

All the material in this publication is copyright

© Pearson Education Ltd 2019

In this first year of submission, the work seen is generally marked inconsistently as centres learn the national standard. The moderators have seen a significant number of projects submitted, across the three themes and six contexts.

## **Administration**

This year we have seen a lot of errors in the administration of candidates marks. Transcription errors were a common theme for this series. Centres made mistakes totalling the marks across the Candidate Mark Book and transposing these onto the back page. There were also some problems with entering a different mark on Edexcel Online. It is important these marks correlate. Now that moderation has moved in-house, under one roof as opposed to postal, it has been a lot easier to keep on top of such issues.

There were a very few centres who failed to adhere to the Edexcel selection requirements, regarding the sample of students selected from centres which, if the highest and lowest candidates were not pre-selected by way of an asterisk, should be sent as well as the rest of the sample.

The majority of centres produced work that was in a format that was accessible, mainly A3 folders, however there were some USB and CD/DVDs. In some cases centres zipped these files and then placed them on the CD which meant that the computer took an image of the zipped folder, not the files within it which made it impossible to access these files. It should be remembered that candidates should include basic information like candidate name, candidate number, centre name, centre number, specification code and page number, to help moderators locate work and validate it is the candidate's work.

Most Candidate Assessment Booklets (CAB) were completed well with page numbers and annotation. Centres who failed to add page numbers and annotation made it hard for moderators to follow the flow of the work. Teacher annotation, where it was included in depth was key to being able to endorse centre assessments. Where centres failed to add photos to the CABs meant that the work could not be moderated and centres had to be contacted to make moderation credible. Where photographic evidence in the CAB was poor, it meant that it was difficult to adequately judge the level of accuracy candidates had achieved. There were many issues related to addition errors on the back page of the CAB and incorrect transposition of marks from the assessment award pages in the CAB to the back page. In some cases the incorrect mark was uploaded to the EDI exchange on Edexcel Online and this mark did not match the mark in the CAB or the back page. We then had to contact centres to change the mark.

In a few cases, the top and bottom candidate was not sent, in others the full sample was not sent. There were some centres who printed out folders but did not check the contents and had stated that work was on a certain page but was missing. In most cases CABs were in the right order with the top and the bottom candidate and the folders followed in the same order which helps the

moderators massively.

We did see some copying and plagiarism from several centres where candidates included the same work as a peer or had used templates produced by the centre assessors. In two cases we saw a template used with teacher guidance telling them what to put it what box. In a few instances we saw teacher's post it notes with feedback. The JCQ states that the centre must not *“give detailed feedback to individual students about how to improve work to meet the assessment criteria. The guidance provided before final submission should enable students only to take the initiative in making amendments, rather than detailing what amendments should be made. This means that teachers must not provide templates and model answers for the work of specific students”*.

## **Contextual Challenges**

Most centres responded to the contextual challenges well and really entered into the spirit of the new style methodology of working producing some well-made projects and prototypes. There were some instances where centres had not responded to the Contextual Challenges set by Edexcel, and another instance where a centre had not responded to a contextual challenge, let alone one by Edexcel. It was observed that some centres did not consider the range of contextual challenges which is a ruling by the JCQ. JCQ states that centres must not *“give students a choice of titles or tasks to choose from”*. All candidates should be given the full range of contextual challenges and they should be open to respond to these in their own way without being led or coerced into choosing a context.

### **1.1 Investigate**

Candidates entered into the investigation well looking at a range of problems related to the contextual challenge they had chosen. Most centres had given their candidates the opportunity to choose the contextual challenge that fitted their interests best. Candidates produced a range of types of research and generally looked fluid rather than quite stayed and formalised. Their work showed diversity and different candidates work was different to each other from centre to centre which was pleasing to see. Most candidates were looking into their context and produced contextual research about their contextual challenge rather than leaping into the generic headings which was good to see. Where candidates did not always consider the contextual challenge in enough detail, led to superficial research. Many candidates decided on the prototype that they intended to develop, too early on in the design process, making little reference to the contextual challenge and then identifying a range of possibilities that fulfilled it. Some centres had included more lengthy legacy style research into materials or joining methods; this research usually did not link to the contextual challenge in any meaningful way and was felt to be better placed in the 'development' section with reference to the refinement of the

prototype.

A large number of candidates had included user specifications that were limited in the content or repetitious to their client profile. Questionnaires sometimes contained a range of closed questions and sometimes asked questions that would not have informed the design ideas or specification, for example “where do you go on holiday?” instead of “when travelling what items do you take with you?” or “what items do you need to store when travelling?” Some centres had used screen shots of social media surveys to ask a ‘real life’ target market about the problems experienced at festivals, which made for excellent, relevant research that demonstrated a clear link to the contextual challenge. Candidates who did not attain higher marks in this section failed to justify their research and did not link their research to the contextual challenge.

Some centres had guided candidates to investigate a range of contexts before deciding on a direction of travel which only hampered candidates by spending more time choosing a context rather than making a decision and using the time more productively. This was not assessed and was not worthy of credit.

## **1.2 Specification**

Candidates responded to the specification well as this was nothing new, but we found it was easier to access the higher bands as this was not a huge difference to the legacy specification. Candidates generally placed the Design Brief in this section or in the research section just before the specification. Candidates produced a good range of specification points with realistic points and higher level students added measurable points with the more able candidates writing technical points. Most candidates wrote specification points which were justified. We did see many generic terms such as small, lightweight and cheap without including quantities which would enable candidates to make points measurable. There was also a lack of meaningful justification of points that linked back to contextual challenge. Better candidates were able to explicitly state where the specification points came from, linking it back to research. The criteria refers to justification of the performance requirements however this was often the weakest section in the specification rather than focussing on it.

## **2.1 Design Ideas**

This section was very broad and wide ranging in what we saw. Due to the nature of the new specification, we saw narrow electronic systems projects, graphic-based projects, product design based projects and textiles projects. There were a few pockets of centres who were using textiles with electronics, product design with textiles, product design with electronics and systems and graphics based product design projects. Most centres kept to a wide range of 3 or 4 ideas but there was the odd centre who produced 6 detailed design ideas or ten

less detailed designs ideas which was too much. Candidates from most centres offered too broad a range of design ideas and would have benefitted from the inclusion of fewer in more depth. Most candidates scored well in the Level 2 and Level 3 boxes. Where candidates' ideas were extremely similar in form and function, were unable to gain higher than a Level 1. Where candidates had lost sight of the contextual challenge and the expectations of the course, by determining their design from too early on in their portfolio, failed to gain higher level marks.

Most centres produced some good sketches, however, they would have benefited from more annotation to highlight specific materials, processes and techniques. In some centres, very few sketches were seen; candidates tended to produce one or two sketches and then write about the design. Centres tended to show a wide range of ideas, but in limited depth which prevented access to the higher marks available. Annotations were generally appropriate in relation to candidates ability and final mark. A minority of candidates had failed to make appropriate comments about materials.

A general observation was that only a few centres directed candidates to focus more on design strategies like user centred design, collaboration, systems thinking from a sub-systems strategy or from an input-process-output system and the use of external stimulus to trigger design work. There was also a lack of more focused annotation linking the designs back to the investigation and the user wants and needs which tended to be implicit but not always apparent.

## **2.2 Review of Initial Ideas**

The majority of centres did this well, evaluating ideas against specification. Most candidates carried out a review in a tabular format and were able to score well, with many achieving Level 2 or Level 3 mark. The higher scoring candidates utilised user group feedback to highlight good design and areas it was lacking in. There was a reduced amount of copying and pasting analysis but where this took place candidates achieved lower marks. Where candidates' comments were simplistic, this scored lower than the detailed well-thought out evaluative comments. Where candidates had reviewed their design ideas against the specification using red-amber-green (RAG) colour coding, to identify where problems were and changes needed to be addressed, they were well prepared to approach the development section. A minority of candidates had used scaled evaluations from 1 to 10 which were felt to be insufficient in detail for qualifications at this level therefore no credit was available to candidates as a result. A number of candidates had not identified areas of refinement or had copy and pasted responses in their review which was reflective of a lower level response.

Many centres did not review designs specifically on a discrete page, with design annotation across the design pages. Candidates who did not

produce a discrete page did find it difficult to score highly in this criterion as their analytical comments across the design ideas did not reference each of the design ideas against each other, but in isolation.

### **2.3 Development of Design Ideas into a Chosen Design**

Most candidates entered into the true spirit of the iterative development section by carrying out further research, developing the design over several iterations, including modelling to test the functionality culminating in a chosen design with details for a third party to manufacture it. The variation of work presented by centres in this area was however, extremely varied.

Many centres had included a large quantity of research that they had not used to inform their design ideas, as seen in the legacy specification, with very few centres using research appropriately.

Where centres had completed development well, there were a huge number of strategies used from developing logos and fonts, body styling and developing colourways, making structural changes, tracings and overlays, altering electronic circuits and flowcharts and producing PCB track patterns. The use of traditional modelling approaches were observed alongside 3D drawing work which was a big change from the legacy specification.

It was great to see candidates using and experimenting with card, cardboard, styrofoam, templates, producing pattern pieces and toiles, modelling joints or samples, modelling system components like gear systems, PCB track patterns and breadboarding. Better candidates then went on to test these card board mock ups in relation to contents. Some centres had encouraged pupils to create miniature cardboard models that didn't really offer any insight into refinements or link to the specification. What would be more useful would be to see a second and a third model that changed and improved as part of the iterative journey. Where the user is able to feedback will trigger a change and springboard onto a new model or a different iteration. Many candidates had placed cardboard modelling into their diary of manufacture or toile diary, when it would have been better placed in this section. Some centres used commercial patterns and clearly evidenced changes they had made to these patterns, through the use of sketches and photographs which helped clarify the marks awarded.

The inclusion of CAD was present for a good number of centres utilising 2D, 3D and graphic development and this dovetailed nicely in the iterative design process by carrying out some light CAD work in the earlier stages and some more detailed CAD work later once the designs had been firmed up. Sadly, many centres failed to test their CAD models and produced it as an aesthetic exercise.

Most candidates were able to make improvements based on reviews from the previous section and this tended to drive the development section

which was good to see. There was a number of centres who failed to fully develop an idea, but instead focusing on general issues such as shape and body styling.

This section also includes the Chosen Design which should include the details needed for third party manufacture. Here candidates produced working engineering drawings in third angle orthographic, cutting lists, bought in components, assembly drawings, exploded diagrams, final CAD renders, vector drawings of CAD/CAM CNC files, circuit schematics, PCB track patterns, bill of materials, wiring diagrams, coding and programming, patterns, line drawings and lay plans, design for print and graphic DTP images.

Generally this was an area that was weakest in most centres and with the raised percentage weighting of marks from the legacy, centres should focus efforts here to reinforce the marks awarded.

## **2.4 Communication of Design Ideas**

It is in this section that we can credit the communication that is used to design and develop the ideas. In too many cases we saw that centres had written 'throughout' in the CAB and this should be refrained from. Communication is only assessed through 2.1 Design Ideas and 2.2 Review, 2.3 Development of a Chosen Design and 2.5 Review of a Chosen Design. This criterion assessed the use of graphical communication, written communication and the use of computer aided design.

Graphical work was well assessed by centres and saw candidates using a wide range of graphic techniques including 2D, isometric, perspective and orthographic. Written work was also appropriate to the design work and candidates were able to annotate in some detail.

Many candidates are still not utilising CAD in their project work and there was a marked absence of this from previous years. Where candidates used CAD in a well-thought-out manner were able to achieve the higher mark band. Candidates that did utilise CAD had used 3D CAD software, circuit schematic software, circuit board software, electronic programming software, graphic design software for graphics and textiles drawings, photographic manipulation software and 2D CAD vector based drawing package. In several cases, we saw no CAD work utilised in centres. In a modern age, CAD should be used as a tool for design and with more and more types of CAD becoming cheaper and cheaper, there is no excuse for not including it in candidates project work. In a few cases we saw that CAD had been used by the candidates but not credited by the centre assessor in the CAB. Some students showed laser cutting in their manufacture diaries for instance, but had not included screenshots of the vector drawing package, that could have supported an increased mark in this area.



## **2.5 Review of Chosen Design**

This was a new section that has been included as part of the 2017 reform. What is expected is for candidates to look at the points taken forward from the Review of Initial Ideas and evaluate if these points have now been improved as opposed to looking at the points that had not been changed. The first bullet point in the criterion relates to the analytical points that review the design idea across the development section. The second bullet point relates to the evaluation of the chosen design against the specification points. Candidates generally produced a review on a separate sheet, which made it easy to see where the marks were awarded. There were incidents where centres were asking for marks when the student had evaluated their work in the previous section, which was difficult to agree as this was often double marked.

The Review of Chosen Design section was in a lot of cases omitted from folios. In most cases of work that had been seen, candidates had reviewed the chosen design against every point of the specification but was broad and lacked detail. A large number of candidates failed to complete this in any depth, instead they had marked this section using evidence from the annotation of the final idea which meant there was a lack of depth to the review.

Where candidates had described changes in their developments, but then not produced an evaluation that specified the refinements in relation to the specification, could not be awarded higher level marks. Where candidates had produced small summaries on each page with a more detailed final summary against the specification, were awarded marks in the highest mark band was easy to support.

## **3.1 Manufacture - Selection of Materials**

This is a new section compared to the legacy specification and relates to evidence that underpins and exemplifies reasons for choice and their fitness for purpose. This section was leniently assessed by a large number of centres as most centres had used appropriate materials but they had failed to explain and justify why they had chosen these materials in any depth. Centres generally awarded credit in this area where no explicit reference to materials was made anywhere other than in the diary of manufacture, which did not include properties and as a result credit was leniently awarded by the centre. Where candidates had included a separate area where different materials were identified and listed material properties, they did not analyse or justify these in relation to the final prototype. Some centres had included a discrete page included as investigation in the development section however marks could not be agreed if it is generic, general and signposted as investigation or further research as part of development

as this would have been credited as so. It must be remembered that teacher's annotation in the CAB cannot be credited marks.

### **3.2a Manufacture - Skills and Processes**

This section relates to the skills and processes used to manufacture the prototype and pertains to the competence or skill of the process. Despite training online and across the country, and a 'prototype' being exemplified in the delivery guide, there has still been some confusion. A prototype is defined by the DfE as *"...a functioning design outcome. A final prototype could be a highly finished product, made as proof of concept prior to manufacture, or a working scale model of a system where a full-sized product would be impractical"*. Obviously, the outcome also needs to be demanding to produce, to access the higher levels.

Candidates had produced an extremely wide range of final prototypes across all material specialisms and in some cases overlapping specialisms and it was good to see centres had allowed candidates to work in the vein of the new reformed course. We did see prototypes that were solely Timber, Metal, Polymer or a mixture of the three, Systems products that were encased in a range of materials; timbers, polymers and textiles, Textiles prototypes and Textile prototypes with electronics encased inside and Paper, Board, Timber and Polymer prototypes. We did see legacy style Electronic Products prototypes, Resistant Materials prototypes Graphic Products prototypes and Textiles Technology prototypes, but invariably we saw what we hope is a growing trend of candidates crossing over materials to produce a prototype. A number of centres took full advantage of the ability to now use mixed materials to create innovative prototypes. A lot of candidates were being safe by producing a box, which seemed to be a trend across the qualification.

Evidence of the manufacturing of most centre's prototypes was good, with photographs illustrating the completion of the prototypes. Some centres did not give candidates access to a wide range of skills which restricted the quality of outcome.

Centres were seen to mark leniently when the product was seen to be simplistic and not demonstrating a range of skills and processes. Where prototypes were not complete or fully functioning and there was little evidence of the product in use it was difficult to support marks in the highest band. Work in the highest mark bands was supported where diaries included explicit reference to Health and Safety, quality was either highlighted or photographs of marking out and quality control were clear. Where work was incomplete it was difficult to support the highest mark bands. Some centres produced items that did not show a high quality finish, and were instead more akin to sketch models.

### **3.2b Manufacture - Quality and Accuracy**

Work in this section relates to the level of demand of the prototype and its ability to function as it was designed, meeting the specification and the accuracy of the make.

Some centres did not produce products that showed the right level of demand, producing simplistic products that were KS3 in nature. Where candidates failed to provide a range of final photographs which highlighted the quality of the prototype, presented a challenge for moderation. Prototypes that demonstrated functionality was seen to be encouraging and in keeping with this specification. Some centres used a quality and accuracy page to highlight and showcase the quality of finish. There was some misinterpretation by some centres about the level of finish required to gain full marks for this section, with some producing high quality finished outcomes and others producing less finished items. It was good to see that candidates had been directed to take close up photos of seams and the back side of the printed circuit board to show the quality and accuracy of the textiles prototypes and the PCB.

### **4.1 Testing and Evaluation**

We saw a wide range of different methods of completing this section which was refreshing. Here candidates should be analysing the prototype they have made in response to the contextual challenge and reference feedback from the target audience or even client if they used one and take into account the product specification. Candidates should also carry out some testing, preferably with the target audience, against the more measurable points. Candidates had tested their prototype against a wide range of specification points that were measurable and generally evaluated against the specification. Candidates that gained higher marks had included some user group feedback and produced a life cycle analysis.

Measurable tests should relate to the specification points that can be tested, for example, it must hold 8 dinner plates, or it must be portable, it must fit a size 8 model, it must be waterproof, it must work at 60 degrees, it must sound at over 80 decibels. Better practice included candidates writing the specification point, explaining the test, explaining what happened in the test and evaluating if it met the point or not, supported by photographic evidence. It is always great to see the prototypes candidates have been working on being tested in the environment they should be, for example at the zoo, at the festival or travelling. Where candidates had included photographs of testing taking place, marks were generally supported. Candidates had generally used appropriate tests to check the performance and quality

of their products helped by the use of measurable specification criteria. Many candidates had thoroughly tested their products, often with their real client or a member of their target audience. In many cases, when candidates could test their work, they tended to just write that it worked without any real evaluative comment. Some centres made good use of client and third party feedback to evaluate their outcomes.

Where specifications were not measurable, technical and specific, evaluations tended to be vague and meaningless. In many cases, we saw a copy and paste of the specification which was then RAG colour-coded or merely add a column to a table that said 'Yes/No' which was very basic and would have only scored points if there was a greater body of work to help support the criterion. Better practice saw candidates writing the specification point but then explaining if it did or did not meet the point and explain why, and RAG colour code the paragraph. Where candidates backed this up with feedback from the user group secured marks in the higher mark bands.

The Life Cycle Assessment was new to the NEA this year having sat in the legacy AS Level coursework for the last decade. A Life Cycle Analysis should discuss the sustainability of the prototype from cradle to grave through headings like Raw Materials, Materials Processing, Manufacture, Distribution, Use, Maintenance, Disposal. The Life Cycle Analysis was attempted and accomplished well in many cases, meaning that the higher band grades could be reached by many candidates, although many life cycle analysis' were based on a single material and did not refer to the prototype in its entirety. A number of centres failed to produce a life cycle analysis of any depth, where they were evident, they often included generic comments. There were many candidates who had failed to understand how to conduct a life cycle analysis effectively with many missing it out completely.

Pearson Education Limited. Registered company number 872828  
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom