GCSE
Design and Technology: Electronic Products
45402
Report on the Examination

4540
Summer 2015

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Principal Moderator’s Report on the Controlled Assessment for GCSE Electronic Products (45402)

General

- Centres are becoming far more expert in correctly interpreting the criteria to the benefit of their candidates and the accuracy of assessment. This was matched by the considerable amount of time and effort in the presentation of the controlled assessment projects for moderation and was very much appreciated by the moderation team, making their task significantly easier. Congratulations to all the teaching staff for the determination shown to help their students achieve their potential.
- All of the twelve contexts and tasks proved popular and they allowed the candidates to respond with creative ideas. It is encouraging to see more projects involving textiles, which give a very wide scope for innovation and creativity. There were very few requests to contextualise the tasks and in all cases merely adapting the context could accommodate the brief suggested.
- Centres had the opportunity to offer all or just one design task to their candidates but in either case there were many opportunities to show creativity and individuality.
- Teacher Online Standardising (TOLS) exemplar work provided by AQA, accessed by using the e-AQA portal, is meant to assist assessment although centres that struggled to meet the AQA tolerance invariably had not used the support materials. The vast majority of centres however were within tolerance with their marks.
- Projects that receive full marks, or very close to the maximum, must meet all of the top band criteria. The criteria are precise and if they are not met in full, a maximum mark is not appropriate. There is a mark tolerance that is applied to moderation, but generous marking of all five assessment criterion will almost certainly lead to an adjustment of a centre’s marks.

Administration

- There have been an increasing number of centres submitting folders in electronic form each year, using Power Point or PDF files. Please do not use any other format; individual ‘Word’ files for each sheet of design work is extremely time consuming to moderate and the moderator may return the work to the centre to be placed in a PDF/Power Point file. There were many excellent design folios, which were concise in the relevant areas covered, not padded out, and photographic evidence was being used in virtually all instances.
- Annotation on CRF’s (candidate record forms) is important and is very helpful in aiding a moderator to support the centre’s judgement; teachers should use the CRF positively by explaining particular circumstances and considerations, which have arisen and affected the assessment of a candidate, and which would not be apparent to the moderator. If a centre decides not to annotate the CRF, the moderator can only work with the available evidence, the candidate’s design folder – which does not always tell the full story to support the awarded mark.
- Centres were prompt with the dispatch of marks and requested sample folders.
Applying the standard

Assessment Criterion 1: Investigating the Design Context

- This criterion is worth a maximum of eight marks but if used purposefully sets the agenda for a successful piece of project work.
- There were a significant number of candidates who had spent a disproportionate amount of time on this section in relation to the maximum marks available. Many had clearly worked unproductively by gathering unrelated research and completing time consuming tasks (e.g. Theory notes) which were unrewarded against the Marking Criteria (typically the marks moderated were in the 5-6 range because key assessment points were not evidenced); focussed research to support analysis was rarely seen by the moderators.
- Candidates who wrote down the selected controlled assessment task and context, and then investigated it tended to be more successful with their project as it gave them an opportunity to analyse and research with a more open mind, rather than stating what was going to be manufactured.
- Identifying the target market and user helped many candidates to put a structure to their project by producing a more rigorous specification and also offering the opportunity for ongoing feedback and evaluation.
- Candidates who investigated similar products, identified inputs and outputs, examined ‘case designs’ that fitted in with their design ideas, and did not have too many predetermined conclusions tended to generate imaginative and innovative ideas in Assessment Criterion 2.
- ‘Full marks’ can only be awarded if all top band criteria are met; for example, ‘relevant research that will promote originality in designing’ must be evident in a candidate’s folder. Too often a folder is too full of generic research which has no bearing on the development of the design proposals. Research should be an aid to design decision making, if not, it has no value.
- A significant number of candidates were awarded marks from the top band of Assessment Criterion 1 without the evidence to support teacher judgements.
- Common weaknesses were confusing design criteria with the specification, poor profiling of a target market/user and not ‘acquiring research that will promote originality in designing”
- An increasing number of candidates are writing a research plan before embarking on research, enabling some candidates to focus their work and achieve high marks in this section.
Assessment Criterion 2: Development of Design Proposals (including modelling)

Successful candidates:

- used the initial ‘specific design criteria’ to develop a specification with measurable factors (objective where possible rather than subjective)
- included reference to issues including social, moral, environmental and sustainability but with reference to their particular project. This area might also be successfully addressed in the testing and evaluation of a project.
- modelled ideas by both real world and virtual methods, whether it is hand drawn circuits or CAD, or bread board or CAD/CAM.
- had PCB’s which showed development; if auto-routed, the tracks were realigned, made thicker, pads were added, components identified.
- made the shape and size of the PCB fit the ‘case’.
- showed development of the ‘case’ through initial sketch ideas and 3-D modelling.
- for the manufacturing specification tried to provide enough information for a competent third party to be able to make the product, conveyed successfully through a formal drawing, sketch or CAD with measurements and a plan of making.
- ‘Full marks’ for the ‘Development of design proposals’ can only be awarded if imagination, innovation, creativity, flair and originality are evidenced in the folio.
- The use of PICs is now common, however; some centres need to be reminded that it is important for candidates to show their development work, particularly in designing/developing a circuit board (not using a PCB mask download or purchasing a ready made kit/PCB) – these comments apply equally to the development of programming.

Assessment Criterion 3: Making

Candidates who achieved top band marks showed a high level of making / modelling / finishing skills and accuracy.

The lack of finesse demonstrated in some of the practical outcomes did not justify the marks awarded by some centres. For candidates to be awarded top band marks there should be evidence of a number of the following quality standards:

- PCB and battery secure in the case/package.
- circuit assembly and soldering completed to a high standard.
- PCB strain holes used to secure wires, preferably stranded wire.
- exposed wires insulated by use of heat sheathing
- external components appropriately fitted to case/package.
- case/package completed to a high standard with access to the circuit and battery; it must be fit for purpose – ergonomics/anthropometrics applied (size, shape, colour, texture).
- there is a limited time to complete Controlled Assessment projects and it is sensible to plan and best use the time available. The project is a prototype which should show its commercial viability, parts of it can be modelled to shows its intended final appearance; the time spent on making a case out of a resistant material is considerable, especially when the intended effect can be produced by using a modeling material such as thick card in a lot shorter time – or any other medium that is appropriate.
- ‘Full marks’ for ‘Making’ demands that an electronic product has commercial viability and suitability for the target market and must be complete, meaning that the customer/client can see how it would work and understands it’s commercial appeal. If this is not the situation with a piece of practical work, top marks cannot be awarded.
- There were a few instances were teachers awarded candidates high marks for an undemanding outcome; centres are reminded to mark students work against the
Assessment Criteria rather than allocating maximum marks to the 'best piece of work' and decreasing marks for remaining work irrespective of the evidenced outcomes.

**Assessment Criterion 4: Testing and Evaluation**

This section provided mixed evidence; some candidates were able to provide ample evidence to be awarded high marks. Unfortunately, there were a significant number of folders where there was little or no evidence of testing or evaluation, either in the main body of the folder or as a summative section. It would appear that where this section was underdeveloped, candidates had insufficient time to complete it - in some folders seen this might have been the result of devoting too much time to AC1.

Successful candidates:

- honestly appraised their work and told the moderator whether it worked or not, what they had found difficult and what was successful.
- would have referred back to their initial design criteria statements and specification, produced formative as well as summative evaluation and tested the practical work on a regular basis during its manufacture and at completion.
- might have considered commercial production.

'Full marks' cannot be awarded if the candidate has not used feedback from their client/target market to justify improvements to the product.

**Assessment Criterion 5: Communication**

Successful candidates:

- had a narrative, which explained and justified decisions and processes.
- had an organized, concise, focused and legible design folder including name, cover, contents, page numbers, page titles and acknowledgements.
- used technical language.
- had produced design work by hand and/or by use of ICT but the choice was appropriate – scanned hand drawings placed into e-folders normally enhance a candidate’s work.
- An increasing number of centres are submitting Controlled Assessment folios in an electronic format, either as PDF or PowerPoint presentations, frequently displaying a high standard of communication; occasionally candidates provide video evidence of a working outcome, which is a pleasure to see.

'Full marks' cannot be awarded if the folder is not concise or has excessive duplication - this lack of brevity is mainly found in the research section. There is also a temptation when producing electronic portfolios to add information that is of marginal relevance; folios in electronic form containing one hundred and fifty slides can surely be positively edited, for the benefit of both candidate and moderator!
A few reminders

- Please use your Controlled Assessment Adviser. They are appointed to help and guide you with your candidates’ choice of projects - especially if you are unsure about how to proceed and you need reassurance.
- Acknowledgement of sources of information is important. It was apparent this year that candidates were putting information into their design folders, particularly circuits and PCB designs that were taken from text books or downloaded but not acknowledged. As long as the information is acknowledged, it is perfectly acceptable to use it as a starting point for development.
- Photographs – as many as possible of 3-D modelling and the practical work, so that the moderator is in no doubt why marks have been awarded.
- If a moderator wishes to visit your centre, it would be appreciated if centres could provide batteries, screwdrivers to enable access to the internal layout and written instructions describing how the projects worked.
- Candidates are producing prototypes in a fixed time so be realistic about what can be achieved; please note that the Assessment Criterion 2 and 3 include the word ‘modelling’, which should be interpreted broadly – it is to be used to support and enhance the completion of the electronic product.
- All documentation is sent to your centre’s examination officer. Please check regularly for AQA correspondence which can also be found, in most cases, on the AQA website.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

UMS conversion calculator