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Moderators' Report/ Principal Moderator Feedback

June 2011

GCSE Manufacturing

5MN01 Paper 01

Designing Products for Manufacture

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Unit 5MN01
Designing Products for Manufacture

This was the first submission of the new specification, which includes the controlled assessment (CA) and quality of written communications (QWC) requirements of most internally assessed elements of current qualifications. An extra assessment criterion was introduced (f) – make a prototype – to reflect and enhance the practical nature of the subject. Since many centres had already been doing this for the old specification, the candidates' prototyping skills now attract marks.

The maximum score for Unit 5MN01 is now 50, and this unit carries 30% of the overall assessment weighting for the double award GCSE Manufacturing.

Administration

All aspects of administration, in the majority of cases, were addressed with some thoroughness for this unit. It is noted that a small proportion of centres made several mistakes when completing the forms to submit their candidates' centre assessed marks.

A small number of centres had continued to submit old specification materials, with questionable control over the assessment processes. Each case was investigated and the way ahead resolved on an individual basis by the qualifications team at Edexcel.

The great majority of centres sent the required samples for moderation in accordance with the agreed submission date.

A variety of A4 and A3 sheets of paper and card were submitted with many different types of binder being used. Centres should encourage candidates to use A4 sheets, preferably in portrait mode, with each portfolio fastened together using a single treasury tag through the top left hand corner. Folders, buckle clips, comb-binding, plastic sleeves and many other form of binding impede the processes of moderation and awarding.

In most cases samples were well organised and a Controlled Assessment Record Sheet had been completed for each candidate, giving a list of marks and a Controlled Assessment Tracking Sheet had been completed, providing the page number and comments of annotation which proved helpful to a moderator. The most difficult portfolios to work with are those that included no contents list, no page numbers, or no assessor comments. All candidates should be encouraged to provide a contents list together with page numbers. At least one centre had allowed the use of pencil for written work. This is to be discouraged, by

candidates and assessors because work completed in pencil can be changed at any time after the work has been marked and moderated. The use of pencil for drawing and any graphs is acceptable, but ink, and preferably word processing, should be used as much as possible.

A small number of EDI (cohort score printouts) were not signed and dated by the centre. In a small number of centres, the forms had been incorrectly completed. It is strongly recommended that all portfolios are internally moderated to demonstrate centre quality standards and that paperwork is checked before being sent to the moderator.

Assessment

QWC was hardly, if ever, mentioned or referred to by centre assessors.

There was very little evidence of internal standardisation or second marking/quality control of assessment materials or assessment decisions in all the portfolios sampled at moderation.

Many centres made effective use of the bullet point lists given in the contents of the specification and assessed these accordingly within the assessment, but several centres appear not to have read or fully understood the requirements of the 2009 specification, more details are provided below.

Witness statements were used effectively by some centres, but others made ineffective use of them, if at all. Assessment grids contain ‘with limited guidance’, ‘with guidance’, or ‘worked independently’, etc, and require an essential teacher witness statement and/or comments to help a remote moderator agree the score awarded, or not. Depending on what is being assessed it is important that witness statements or observation reports are completed by teachers to authenticate candidate work and provide evidence that candidates have achieved the level of performance required in the assessment grid. In some cases good use was made of such documents.

In many cases good use was made of pictures and photographs. This and other similar types of media are to be encouraged together with much more use of ICT. Word processing of portfolios, with import of images, is to be encouraged – preferably with the page orientation set to portrait mode, as is normal for written work.

In a number of cases the students must be shown how to interpret the evidence requirements more carefully for each mark band and at times it was difficult to find a real progression of the ‘design for manufacture’ processes across the mark ranges.

Criteria (a)

Analysing the brief - Centres are encouraged to include a copy of the given design brief with the moderation samples. This would allow moderators to provide feedback about how fit for purpose they are – ideally being neither too brief nor too complicated for the GCSE requirements.

The candidates who seemed to score higher marks had clearly outlined client needs and key features of the product, as identified on page 11 of the specification where 11 bullet points are provided for consideration. Several client briefs that were seen did need some attention. Many centres are encouraging a 'design & make' or 'product design' solution and not a 'Design for Manufacturing' solution. Candidates need to be encouraged to consider the manufacturing options and details for their design solutions.

Criteria (b) and (c)

Some centres did not separate 'design specifications' from 'manufacturing specifications', and the detail of the given client brief is key to candidates' performance, here, but many were lacking sufficient detail. The manufacturing specification should reflect the manufacturing details needed to realise the product in response to the given client brief.

Criteria (b) - 'product criteria and material constraints'

For the product criteria candidates need to consider: product performance, intended markets, maintenance, aspects of design and function which make the product suitable. For the material constraints students need to consider: selection and availability of material, stock sizes, properties, characteristics and performance, cost, handling, storage and aspects of safety and hygiene. Several considered most of these, but many considered only a limited amount.

Criteria (c) - 'production requirements and quality standards'

Many candidates did not give a clear list of production requirements. In order to meet the higher mark ranges, candidates need to describe or explain these details, including some consideration of the most cost effective and efficient way to manufacture the product.
Much more information is needed about real quality standards, which can be addressed by including reference to meaningful tolerances, material specification, standard of finish, performance and whether or not the product would eventually be 'fit for purpose'. Centres may need to work with their candidates to ensure they understand the technical vocabulary – even words such as 'tolerance' appear to have been misunderstood by some candidates.

Criteria (d) – 'Ideas and design solutions'

Evidence here was rather limited to basic and simplistic evaluative comments on the design idea alone, generally the aesthetics. Candidates need training on how to carry out objective testing ideas against the constraints of the given brief. Most candidates produced a range of ideas, without much reference to the client's real needs and the specifications which they had developed.
In order to fully meet the requirements of this criterion each design idea should include information about how the processes of manufacture can be used to realise the product. Centre staff and candidates need to remember that this unit is about 'design for manufacture', not 'product design'.

Criteria (e) – 'Testing and selecting the final solution'

Many candidates tended to use a scoring system to 'score' ideas against personal, or classmates' own feelings – and mostly associated with aesthetics - not for their addressing the client's needs or the specification. Had effective constraints been given at the outset, then this criterion would have been much more straightforward for a larger number of candidates.
The final design solution should be tested against the client's design brief and the design specification, using a range of testing including comparative testing and testing of 'mock-ups' and models, which some centres did. This should lead to the justification of the final chosen design solution by evaluating the strengths and weaknesses of each solution, and/or provide comparisons of the design ideas which were rejected. In most cases there was limited evidence to meet either aspect of this criterion and in some cases there was little justifying evidence. In many centres the only form of testing was by the use of a questionnaire. Non-destructive testing and destructive testing were generally not considered by most candidates.

Criteria (f) – 'Prototype'

The quality of the prototypes covered a wide range. Some produced card models, and unnecessarily included them in the portfolio, while others produced working prototypes. Annotated photos were used by most to good effect, but ICT use was limited to printing a photo, then stapling it to a hand written description, instead of word processing and importing and re-sizing the images. Few included any form of manufacturing records, making any credit for production quite difficult to justify. Candidates should be encouraged to take this opportunity to explain the manufacturing processes and any issues, throughout the whole process, showing how their final design solution idea addresses the client's brief as well as pointing out the most suitable manufacturing method to the client.

In the manufacture of the prototype, in many cases, it was difficult to find a manufacturing plan as mentioned on page 13 of the specification. The plan

should include details of materials, parts and components to be used, processes to be used, tools, equipment and machinery required, timescales, aspects of health and safety, avoidance of hazards, etc. Good use was made of photographs showing evidence of how materials, tools and equipment were used in order to produce their prototype. More detail could have been provided about the evaluation of and the justification for their final design solution.

Prototypes tended to be assessed leniently, mostly due to the lack of witness statements or real evidence of making and the emphasis on 'product design', not 'design for manufacture'.

Criteria (g) – 'Presentation techniques'

Most candidates presented their ideas using 'PowerPoint' and some included photographs, models, posters, etc. Several candidates appear to have received little, or no feedback. Feedback was generally limited to the candidate's presentations, not about their product or design solution, making responses to criterion (h) limited and assessment was lenient and inaccurate in several cases. In most cases some evidence was provided that candidates had selected a presentation technique and had made a presentation. In a number of cases much more detail would have been helpful, particularly dealing with the chosen final solution.

Criteria (h) – 'Final review'

A significant number of candidates produced evaluation details, but due to the lack of effective and appropriate feedback from their client/audience, few went on to develop modifications to further develop their design solution, as is required here.
The candidates evaluated the feedback for the suitability of the final design proposal and described the modifications required to the design and manufacture of the product. In a number of cases much more evidence was needed to satisfy this criterion. More attention needs to be given to how the final design solution meets the client's design brief and the specification.

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