Moderator's Report
Principal Moderator Feedback

Summer 2017

Pearson Edexcel GCE
In Design & Technology (6RM01)
Product Design
Paper 01: Creative Skills Port Folio

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As a reminder of requirements in the 6RM01 course, candidates must produce a port folio of creative skills which is divided into three distinct sections: Product Investigation, Product Design and Product Manufacture.

In Product Investigation, candidates must select a product that contains at least two different materials and is manufactured using more than one process. They are required to investigate the selected product under the headings performance analysis, materials and components, manufacture, and quality. Candidates, under teacher guidance have complete choice in selecting appropriate products for investigation. Work can be presented in either A4 or A3 format.

In Product Design, candidates are required to submit at least one design task appropriate to AS levels of response that demonstrates their design competencies. They are encouraged to be as creative as possible and to support this there is no requirement for the designed product to be manufactured, which means there are no constraints placed on designs through the limitations of resources found in centres. Candidates have the option in Product Manufacture of making what they design.

In the course of designing, candidates are expected to produce a range of initial design ideas accompanied by technical annotation, a review of design ideas based on product specification requirements and development of designs into a final design proposal that includes enough detail to allow a skilled third party to manufacture the intended product.

Candidates, under teacher guidance have complete choice in selecting appropriate design briefs.

In Product Manufacture candidates are required to plan, make and test one or more products that match the manufacturing criteria of the task. If a single product is made, it must be manufactured using more than one material and process and if more than one product is produced, the collective group must contain more than a single material and process. In this section of the portfolio, it is strongly recommended that teachers set the manufacturing tasks in order to ensure that candidates improve competencies and learn new skills in preparation for A2 tasks. It is a rule that where CAM is used, it must not exceed 50% of product manufacture. Where more than one product is made, planning and testing should only be evidenced once.

It is a requirement that clear photographic evidence is submitted that shows the quality and complexity of challenge relating to all manufacturing tasks. It is expected that the complete Portfolio of Creative Skills will be presented using 25 – 30 sheets of A3 paper. There is no penalty for exceeding these guidelines.

Assessment criterion (a)

In this criterion, most candidates were able to score good marks, where appropriate comparisons of similar products were completed by many, with

the majority of centres teaching this in a structured way, using the specification points given in the assessment criterion.

Unfortunately, a recurring problem was the choice of 'similar' product, with significant numbers of candidates selecting those that were almost identical, greatly limiting opportunities for comparing and contrasting. The choice of 'similar product' is important in enabling candidates to make effective comparisons under specification headings, but if the similarity is too great, inevitably, form, function, user requirements, performance requirements etc will be the same or very close for each product.

A product pairing of two portable electric drills offers few opportunities to identify and discuss differences, whereas selecting a portable electric drill and a pedestal drill would be more appropriate as form, user requirements, performance requirements etc. are different in each product.

A significant number of centres approached this unit in a formulaic way, guiding the whole cohort to analyse the same product. Where this was the case, information was often teacher led and comments from candidate to candidate were similar and sometimes identical.

Some centres were recognizable by the products used, as they were the same as those investigated in previous years.

Many candidates simply described products instead of justifying why specification points were relevant and the important areas of user requirements and performance requirements were often dealt with cursorily.
The object of this section is to assist teachers in their teaching by encouraging a group of candidates to look at different products individually so that the information gathered through several analyses can be used in relevant and cohesive teaching, avoiding dry theory lessons.

Assessment criterion (b)

In this section candidates are required to investigate two materials used in the manufacture of the product under investigation and suggest one appropriate alternative for each.
Almost all candidates were able to identify two appropriate materials and suggest viable alternatives. However, where plastics or steel were involved, most suggestions were just another closely related plastic or steel material. A lot of candidates simply listed properties and cut and pasted generic information about materials without evaluating and justifying their suitability in meeting the design needs of the product. Some saw this as an opportunity to list everything they knew about materials without any selectivity.
In centres where the same product was investigated by the whole group, many statements were identical or had the same information re-jigged. Suggestions for alternative materials were usually the same and where inaccurate information was recorded by one candidate, this was often repeated by several. It was obvious in some cases that this and other sections were teacher led.

‘Environmental impact’ was addressed well by many candidates who discussed extraction, processing, refining, transportation, reusing and recycling, but in a significant number of cases information was generic and limited to recycling without linking statements to the product under investigation..

Assessment criterion (c)

In this section candidates are required to identify and investigate two processes used in the manufacture of the product under investigation and to suggest one appropriate alternative for one of the identified processes.

This section contained the greatest discrepancies between centre marks and those of moderators, where inaccuracies were common and information was generic.

Most candidates were able to identify two appropriate manufacturing processes and suggest an alternative for one, but many simply described a process and produced a generic list of advantages and disadvantages and did not relate these to the product to say how or why they met its design/manufacturing needs.
Some suggestions for alternative processes were inappropriate, such as vacuum forming and blow moulding as substitutes for injection moulding. A few candidates suggested hand processes as alternatives, when what is required are suggestions for appropriate commercial processes.
Environmental impact was often limited to energy use, or recycling of the product, rather than a discussion of the effects of using a process.

Assessment criterion (d)

Most candidates were able to identify some appropriate quality control procedures, but quality assurance was very generic and not often related to the product. Information about quality standards tended to just define the terms and not show how they were related to the product under investigation or how the standards influenced the manufacture of the product.

Assessment criterion (e)

Since the beginning of this course, the design and development section has been the most problematic for candidates and this year has been no different.
In the best work, candidates showed flair and imagination, but were in the minority. Most candidates opted for the safety of designs that were simplistic and when offering a range of ideas these were often undetailed and seemed to be added to make up numbers. When developing an idea, most candidates used modelling to represent their final design proposal, but those that used modelling to test some aspects of designs were in the minority.
Many candidates annotated to describe design features or details, but failed to illustrate how they might work. Technical annotation was often weak and did not reflect a good knowledge and understanding of materials and

processes. Final evaluation against design criteria was often simplistic, especially when no measurable criteria had been set at the beginning of the design task.
Reference to design criteria was not often in evidence and in some instances candidates presented no design criteria, or it was so superficial as to be useless in reviewing designs as they progressed.

Design development was excellent in some cases, but in others it was often limited to presenting construction details without any further design input taking place. There should be evidence of further design input as part of development as a result of evaluation against design criteria.

Assessment criterion (f)

Some excellent standards of presentation were seen in this section, where almost all candidates are now expert users of 2D and 3D CAD. Many candidates still struggle with freehand sketching however, and this was weak in many cases.

Modelling varied from precisely scaled replicas of the intended product to very loose 3D representations that could not be used in any constructive way to test aspects of designs. Working drawings were included in almost all instances, but a large number were not detailed enough to enable 3rd party manufacture of the product.

Assessment criterion (g)

This section was reasonably well done, but many candidates did not provide a great deal of detail and merely listed a number of stages in manufacture of their intended product.
The best work incorporated Gantt charts, flow charts or tables and details of tools/processes and materials. Timings were sometimes given in lessons, weeks or dates, but these terms needed to be qualified to clarify how long each would be in real time.

Assessment criterion (h)

Some excellent work was seen where tasks were demanding and challenging but a minority of work did not reach moderate GCSE level. Many centres set the making task and where this was done well candidates were able to demonstrate their capabilities in a wide range of skills and processes. However, there were a lot of centre set tasks that did not offer the level of demand necessary to give candidates access to the full range of marks which is disappointing and limiting to capable candidates.
Some centres could be recognised by the same making task they have set and used over several years, which must be unexciting for candidates pressed into a formulaic routine.
CAM equipment was used appropriately and the vast majority of centres understand the correct balance of no more than 50% usage in a practical outcome.

A continuing problem is that many candidates failed to justify the choice of materials used in their making tasks which meant that they were unable to achieve full marks despite demonstrating skills worthy of this level. This requirement is stated clearly as part of the assessment criteria.

Assessment criterion (i)

As has been the case for several years, many products lacked detailed testing against measurable performance related manufacturing criteria, due often to limited criteria set at the beginning of manufacture, with some projects having no starting point.
Tests were not often carried out under realistic 'field trials' and third party testing often consisted of simplistic comments which did not evaluate the product and were not related to measurable performance criteria.
It is essential that three or four measurable performance criteria are set at the beginning of the making task, so that realistic and meaninful testing can be carried out on the finished product to test its fitness for purpose

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