Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2023

Pearson Edexcel GCE
In Design & Technology (1DT0)
1A: Metals

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Introduction
This is the third full cohort of candidates has taken the reformed (9-1) GCSE Design Technology given the disruptions to learning because of COVID.

There are six different material specialist papers on offer, each with a common core in Section A which was worth 40 marks and a Section B worth 60 marks based on one of the six material areas; Metals, Papers and Boards, Polymers, Systems, textiles and Timbers.

Question 1 (a)(i) A generally well answered question, with a good number of candidates offering a correct response, mostly related to the material being an electrical insulator, appropriate within the context of the question.

It is important to stress here that these opening four small questions are about the properties of materials in the context of the product or component given in the table and therefore generic properties will not be accepted. Waterproof is an example of the more generic type of response seen but in the context of a PCB, being waterproof is not appropriate given the circuit would fail before the PCB is potentially damaged by the water. Candidates often stated characteristics of materials or products instead of properties. A clearer understanding of the difference between these is needed.

Question 1 (a)(ii) This question was generally well answered with light/lightweight being the most popular correct response. In respect of the comments made above about characteristics rather than properties, an example here for the balsa wood toy plane would be ‘easily cut’ which is a characteristic of the material and not a property.

Question 1 (a)(iii) Most candidates answered this question correctly with hard or resistance to corrosion being the most popular answers seen. Many candidates made reference to the scissors being sharp.

Question 1 (a)(iv) Many candidates were not able to recall a relevant property of the solid white board book cover. When correct responses were observed, they were mostly related to the materials rigidity or printability.

Question 1 (b)(i) A generally well answered question, with many candidates scoring at least 1 mark for recognising that the company could be much more flexible in how they run and control their business and business decisions. Lots of reference to being able to keep profits within the company but lots of misconceptions related to not having to pay tax or stick to the rules.

Question 1 (b)(ii) The first of the maths based questions where very many candidates were able to correctly work out the mass the investment would be £45,000. Many responses were seen whereby candidates had simply multiplied the £150,000 by 1.3 to get an answer of £195,000. Had they then taken away the original sum of money they would have had a correct answer of £45,000 for the full 2 marks.

Question 2 (a) This question was overwhelmingly poorly answered with isometric being offered most frequently.

Question 2 (b) This was answered reasonably well with the most common answers being responses related to the concrete being fireproof or related to the concrete being heavy and therefore stable.

Question 2 (c) This was answered reasonably well with the most common answers being responses related to the availability of the candles and users likely to have some at home already given they were of a standardised size.

Question 2 (d) This maths question provided some challenge, especially at the point at which unit conversion took place making the numbers manageable for candidates. It is important to note here that candidates should always be encouraged to show their full working out for all maths questions. In this instance if a candidate had an answer of 163 or a factor of 10 of 163 then it may still have been possible to be able to award 3 of the 4 marks due to error carried forward (ECF) with the issue being related to the conversion of units. It was encouraging to see more candidates showing a logical sequence to their work in how they laid their responses out, giving a note to explain what they were doing, such as volume of cuboid and volume of cylinder for example. This approach is to be encouraged as much as possible.

Question 3 (a) A good number of candidates were correctly able to identify a softwood with pine or cedar being the most frequently seen correct responses.

Question 3 (b) A mixed set of responses from candidates with a good number scoring at least 1 mark, most commonly for softwoods growing faster or softwoods being cheaper. On many occasions, responses were observed offering softwoods grow fast and are cheaper. This type of response can only be awarded 1 mark because the question is an 'Explain' type question which requires a linked justification. The example cited above is essentially two give responses.

Question 3 (c) Nearly all candidates attempted this question with a reasonable proportion getting the correct answer of $1/10^{th}$ or a version of that such as 10/100ths or $30/300^{th}$ for example. The most commonly observed incorrect response was a calculation to show how much timber had been used i.e. $9/10^{th}$.

Question 3 (d) This appeared to be a very well answered question with candidates most commonly coming up with a response relating to the fact that the mild steel fixing would corrode for 1 mark. Fewer linked responses were observed but when seen, appropriate reference to the frame coming apart or the joint failing were in evidence.

Question 3 (e) A mixed set of responses but a good number of correct responses seen for the full 4 marks, most often due to the material being impact resistant and then either being lightweight or its ability to be recycled, with fully linked justifications.

Question 4 (a) Generally answered well with a reasonable proportion of candidates demonstrating some knowledge of polyester, with waterproof being the most frequently observed correct response with the linked justification of protecting the laptop inside from liquids and rain.

Question 4 (b) A maths question with a very large proportion of candidates being awarded full marks for a correct answer of 128g that had been calculated using a range of methods.

Question 4 (c) Many candidates offered a definition of a LCA as opposed to an explanation of an outcome of a LCA that could help reduce the environmental impact of the laptop bag.

Question 4 (d) This question worked very well as a discriminator at the end of Section A. Many candidates failed to read this question carefully enough before starting their response. Many talked solely about remote working with its pros and cons but did not relate that to the features of a laptop. Some even purely discussed laptop bags. Many candidates failed to expand their answers to enable marks to be awarded e.g. "They are portable" rather than "they are more lightweight and compact which means they are easily portable". Many candidates discussed Apps and software rather than the laptop itself which was not always creditable. Many candidates wrote a page describing the features of ‘Teams’ or ‘Zoom’. The question performed well by providing a range of responses about fair trade across the whole range of marks available.

1A – Section B report

5a
Candidates found some of the specification points challenging to address, such being able to add space for a further three boxes and for the tops to be displayed. Many indicated how prices could be changed but did not specify how they could be displayed. Many candidates were able to suggest ways to stop the boxes from falling off such as putting a lip or rails around the edges. Drawing standards were variable however it was often easy to interpret solutions. Three or four marks would typically be achieved by many candidates.

5b
The maze game allowed candidates of all levels to provide some analysis of the good/poor aspects of the design. They tended to identify factors linked to the transparent screen and the ability to see the metal balls and thus be able to see where they needed to be moved to. Other common answers made reference to the lack of a start/finish and the number of balls causing confusion and making the game more challenging. A lot of responses made reference to the weight of the metal, sharp corners or similar which did not gain credit. Very few candidates gave two justified answers.

6a
The focus of the question was on the characteristics of aluminium that made it suitable for the handle of the fishing rod. A large number of candidates did not achieve marks as they tended to focus on a real fishing rod as opposed to a toy version.
Where candidates responded appropriately to the question answers such as lightweight or corrosion resistant were common. Justifications were however uncommon and only a small proportion of candidates scored two or more marks.

6b
Many candidates were able to identify some relevant stages for cutting out the fish from the sheet of metal. These answers tended to focus on the need to clamp the workpiece in a vice and use a hacksaw or similar. Only a limited number of answers were developed beyond this. A small number of candidates suggested the use of tin snips rather than saws which was a valid alternative approach. A large proportion of candidates made reference to finishing techniques such as using a file which did not achieve any marks as this is not part of the cutting out process. Most candidates used notes and sketches even if the answers only covered one or two valid stages. Centres are reminded that when a question asks for notes and sketches both must be present to access full marks.

6c
Candidates gave a range of answers, with many achieving one mark for reference to the inappropriate use of text, language or colour as part of the design. A small proportion of candidates provided an appropriate expansion, with many achieving one mark.

6d
Candidates who achieved marks tended to give methods such as turning or filing, although in many cases these were not developed beyond stating these methods. Very few candidates gave answers which explained the reason for using their identified method.
Many of the processes stated were inappropriate such as casting, forging, bending, rolling etc. These would not be appropriate methods for making the handle from a square section.

7a
A significant proportion of candidates however achieve one mark for nut or hex nut. A lot of candidates stated locknut or nut and bolt. Neither of these answers achieved a mark.

7b
Candidates were often able to give a benefit of the use of CAM such as being able to produce smooth circles or that the wheels would be identical. There was quite a lot of confusion between CAD and CAM with candidates referencing drawing to precision rather than accuracy of the outcomes. Some candidates gave linked responses which made refence to perfectly round wheels and running smoothly but these were in the minority.

7c
Many candidates found this question to be more challenging than it should have been. Although a large proportion of candidates achieved full marks, marks were often dropped for not drawing the correct width of the top, the cut out only being 5 triangles not 6 from each edge or the thickness being incorrect.

7d
Candidates found it difficult to give two three-mark responses. They often identified that templates could become damaged or that they may be mislocated and the effects of these issues such as inaccurate marking out, parts not fitting together or waste being produced. It was typical of many candidates that there was not expansion of the response beyond an initial identification. Centres are reminded that for three mark explain questions answers need to have further justification in order to achieve full marks.

8a
Candidates recognized the benefits of titanium for the bicycle frame, for example it being corrosion resistant, however this was not generally linked back to the context with few candidates saying why or how these properties were beneficial for the manufacture of the bicycle frame.

8b
Many candidates gave generic responses that stated titanium was expensive which achieved no marks. Where candidates did score marks they tended to make reference to the source of the material. Common errors included making reference to the end user of the bike and not the manufacturer, for example stating it would be expensive to buy the bike.

8c
Where candidates achieved marks they tended to make some reference to checks for scratches and damage to the frame or checking the welds. A proportion of candidates explained functional tests of the complete bike rather than just the frame such as checking the brakes work or that it can carry the weight of an adult. These types of response achieved no marks.

8d
Candidates responded with varied success with some not attempting the question at all, which could be a result of running out of time during the examination.
Some candidates considered sustainability which did not really answer the question but where linked to the context did get some reward. Others tended to focus on the user groups and none of the other factors. A small number of candidates linked the three factors in the question, however it was typical for the majority of candidates to achieve a mark in band one or band two.