Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2023

Pearson Edexcel GCE
In Design & Technology (1DT0)
1C: Polymers

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Summer 2023
Publications Code 1DT0_1C_2306_ER

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with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom

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.

Question 5 (a) This appeared to be quite accessible to most candidates. There were a number of annotations produced by candidates which was supported with some reasonable sketching allowing candidates to access the majority of the marks for this question. Many of the candidates were able to score well on a method for holding and changing the pricing of the boxes of chocolates. Common mistakes included misreading the question and not providing space for three additional boxes, only the original three, and those that did allow for six boxes did not always ensure the additional three were fully visible, often cramming in the extra three boxes to the existing space. Candidates also frequently missed marks by not providing a method for transporting the display, although often they still showed a method of stopping the boxes from falling off.

Question 5 (b) A significant number incorrect responses related to the properties and features of the materials, for example the weight of the steel balls or not having any handles to hold to be able to move it. Most common correct responses related to the users being able to see the movement of the balls through the acrylic screen or the need to identify the start and finish to allow users to know where to move the balls.

Question 6 (a) was generally well answered by most candidates. Common correct responses referred to the rod being lightweight and easy to pick up or use. Also

reference to the rod being impact resistant. Incorrect responses often related to the rod breaking as a result of the child throwing the rod about.

Question 6 (b) This question was answered quite poorly overall with candidates only seeming to be awarded marks for either clamping the acrylic and for use of the coping saw. Many referred to the marking out and finishing with sandpaper. There were quite a few responses that focused on laser cutting but the question clearly stated the use of hand tools.

Question 6 (c) Many candidates seemed to just repeat the question, suggesting that the best way not to cause offense was not to use anything offensive. Many candidates made comments about using something other than a fish or to make the fish gender neutral. Many candidates scored a mark for reference to different colours or information provided in different languages.

Question 6 (d) Incorrect responses centred around mass production methods such injection moulding, extrusion and blow moulding. The question clearly asks for methods that could be used to manufacture the cylindrical HIPS fishing rod handle from a length of square section material. Use of the lathe or sanding seemed to be the most common responses seen but not very often.

Question 7 (a) This question generated very few correct responses. There were far too many responses of 'nut and bolt' which was incorrect given only one component was shown.

Question 7 (b) Candidates were 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 were some reasonable linked responses which made reference to perfectly round wheels and running smoothly but these were in the minority, as many of the candidates did not link their answer to the operation of the toy.

Question 7 (c) This question was answered quite well where candidates knew about or had used isometric grid paper previously. Line work was generally accurate and using the isometric paper to the correct scale. Common errors were the incorrect length of the whole product and the 5mm thickness.

Question 7 (d) For those candidates that understood the question they answered this reasonably well. Several discussed advantages rather than disadvantages such as time saved for example. The most popular responses were inaccuracy of the original template and correct location. Many responses referred to only being able to see the template in 2D.

Question 8 (a) This question seemed to be answered quite well with the main focus on the product being food safe or waterproof/water resistant. Incorrect responses centred around the cutlery being recyclable or biodegradable.

Question 8 (b) This question was answered quite poorly, with hardly any cost factor explanations. The focus of most responses was on the cost of the material

itself and how much was needed, polystyrene being cheaper to buy it in bulk, for example. There was quite a lot of responses which focussed on the environmental cost.

Question 8 (c) This question was attempted by most candidates with many discussing checks focussed on the size of the cutlery. Incorrect responses centred around strength testing or food safety testing.

Question 8 (d) Many candidates were fixated on the environmental sustainability rather than social aspects. As often happens with this question, candidates appear to repeat the facts in figure 16 too much, limiting their argument to discuss the social factors. Very limited conclusions that were often unbalanced.

Paper Summary
Overall the paper provided questions that gave candidates the opportunities to demonstrate their knowledge of Design and Technology via a range different context based questions, including several maths based questions but in a DT context. The paper offered a range of differentiated questions that candidates could answer in differing degrees and a full range of marks were observed across the whole cohort.