Pearson
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Examiners' Report
Principal Examiner Feedback

Summer 2024

Pearson Edexcel GCE
In Design & Technology (1DT0)
1B: Papers & Boards

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Introduction
This is the fourth full cohort of candidates that has taken the reformed (9-1) GCSE Design Technology.

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) The most common answer was soft alongside absorbent with some candidates not understanding what a property is and writing dries quickly or used the words water repellent. The occasional answer of "insulator" on its own was observed but was not acceptable since it was not qualified as being a thermal insulator.

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. 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 not particularly well answered with a large proportion of candidates referring to the material being lightweight, decorative or easy to mould. It was clear many did not understand resin as a material. The most common correct answer was hard, with many generic answers such as durable and malleable also seen.

Question 1 (a)(iii) Generally well answered, however, confusions between 'opaque' and 'transparent' were observed. Most candidates responded with 'printability', 'absorbent' and 'flexible'. A lot of incorrect answers saying 'lightweight', 'thin', and 'soft'.

Question 1 (a)(iv) Overall candidates answered this well with most saying 'hard', 'tough', 'heat resistant'. Most incorrect answers consisting of 'durable', 'waterproof', 'light', 'lightweight', 'dense' and 'doesn't splinter'.

Question 1 (b)(i) A generally well answered question with most 2 mark responses being awarded for discussing thermal conductivity and the ability to cook food. Quite a few candidates referred to a high melting point but then incorrectly justified this by saying the pan would not melt. Many candidates answered that the pan would not rust or corrode in water or that food would not stick to the pan.

Question 1 (b)(ii) The first of the maths based questions. Many candidates were able to convert kg into grams and understood how to find a percentage. When answered incorrectly it was because there was a misconception that 3kg was 300g rather than 3000g.

Question 2 (a) The majority of candidates were able to state wool / sheep's wool however, some candidates misunderstood the word fibre and just wrote the animal – sheep or they mistook it for plant fibre – cotton / cotton wool or they wrote the word fur or sheep fur which was also seen.

Question 2 (b) Biofuels being renewable and not running out was a frequently seen answer – quite a few candidates understood it was sustainable but justified the sustainable by saying it meant 'no pollution', being 'environmentally friendly' or 'giving off less greenhouse gasses. Candidates also thought it meant the vehicles would be 'faster / cheaper' and very few could explain carbon neutral successfully.

Question 2 (c) Most correct candidates were responding either about adding ‘render / colours’, ‘3D views of the designs’, and ‘outputting the designs to CNC machines’. Very commonly candidates identified the CAD could be used in edited/modified designs but many candidates seemed to confuse CAD with CAM and talked about cutting out multiple sheep or the speed and accuracy. Many candidates also confused CAD with AI and discussed it involving no human error as the computer does it for you.

Question 2 (d) (i) Those candidates who understood the question were able to work out the calculation and were awarded 2 marks. The candidates needed to understand how to work out a percentage and it was evident that some did not have this knowledge. Overall answered well, most common incorrect answer was 30 for both amounts.

Question 2 d (ii) The vast majority of candidates demonstrated that they knew what bar graphs were and how to draw them accurately, but some candidates drew the bar graphs for the raw number of votes they had worked out in the previous question, rather than the percentages. Where it was incorrect candidates had often transferred the 45 and 15 from the previous question.

Question 3 (a) This question presented much more of a challenge than it should have and very few candidates were correctly able to identify the pulley as a v belt.

Question 3 (b) Most candidates were able to identify that aluminium wouldn’t rust, some were able to gain the extra mark because they understood that it was a non-ferrous metal /did not contain iron. Lightweight and not weighing down the boat was also a common correct answer.

Question 3 (c) Overall answered well by most candidates. Answers were very dependent on whether candidates were able to rearrange a formula. Some used the triangle method successfully and also understood how to use the ratio. A common mistake resulted in the answer 12000, or 333 as an ECF where candidates had not transposed the formula correctly.

Question 3 (d) A generally well answered question, with most referring to the need for sunlight and the impact on the boat of clouds / darkness. Those who only received one mark, usually didn’t provide a justification linked to the model boat.

Question 3 (e) Candidates generally performed well on this question, particularly when discussing balsa wood's lightweight nature and its ability to float or not sink. Many candidates earned marks by focusing on these points. Some candidates also correctly identified that balsa wood is soft and easy to cut, although there were misconceptions with some stating it is strong and durable. Confusion arose when some mistook the model boat for a real one, attributing characteristics like strength, robustness, seaworthiness, and durability.

Question 4 (a) This question was largely unsuccessfully attempted, many candidates did not know what a conductive ink is; many confusing it with thermochromic dyes or inks. The most common correct answer related to being used to draw circuits, whether with a pen or via a printer. The better answers stated that conductive inks can be used to replace wires and could be used in restricted spaces. Some candidates made reference to how this question links to the previous question and wrote about how the inks could be used on the balsa wood boat. Candidates very commonly offered inks for aesthetic reasons on packaging and on the external surfaces of products.

Question 4 (b) Generally well answered with many candidates offering 3.6g without any working out shown but some different versions of calculations also seen, still arriving at the correct answer. Some conversion errors were seen, reducing marks awarded.

Question 4 (c) Candidates frequently talked about recycling or reusing parts and materials to save landfill. Some referenced a life cycle assessment along with references to carbon footprint. However, the term "new and emerging technologies" confused some candidates, leading them to discuss CAD/CAM and prototyping as ways to minimise material impact. Many candidates were repetitive in the points that they made and effectively reworded their answer given numerous times. Most candidates gained some credit for their responses.

Question 5 (a) Candidates generally answered this question well, with many achieving higher marks by including details such as three extra craft knives, solutions to prevent movement of the knives, user protection from the blades, and the ability to hang the unit. A significant number of responses included detailed notes and sketches that addressed these specification points, often warranting full marks. Where candidates had produced a back to back solution more able candidates were able to fully interpret where appropriate fixings could be placed and providing a good range of answers. Communication of ideas in the drawings was sometime poor but notes overall were clear and explained the design features well.

Question 5 (b) Candidates generally struggled with the question when comparing responses to the mark scheme. A number of candidates focused on the material and its suitability for use with young children, misunderstanding the direction of the question. Very few candidates linked the fruit and veg cut inside / cut through to the whole view and many seemed unclear as to what the imagery was showing.

Question 6 (a) Candidates that performed well in this question had a basic understanding of embossing, however it is clear from the responses that many could not recall the process. Frequently candidates made vague references to “aesthetically pleasing”, or “visually pleasing to a wider audience” which did not reach the criteria on the impact of the process on the material enabling a higher retail price.

Question 6 (b) This question focused on how the insert for the insert for the battery powered tealight would be made. This was answered generally well overall where candidates only seeming to be awarded two or three marks for the use of a cutting mat, safety ruler and a craft knife.

Question 6 (c) The question asked for an explanation of a physical characteristic of folding box board. This was answered reasonably well with the majority of candidates giving answers that explained folding box board in relation to being ‘foldable’ or ‘easily folded’ but only a small handful expanded on this to gain the marking point by mentioning the quality of the fold. Similarly, many candidates reference ‘printability’, however failed to mention the image quality element to enable them to gain the second mark.

Question 6 (d) This was again poorly answered. Incorrect responses centred around naming particular tools used for cutting such as a scissors or a craft knife rather than stating a method of manufacture such as cutting or laser cutting. The question clearly asked for methods that could be used to remove the waste material.

Question 7 (a) A large number of candidates answered this question correctly, identifying lamination or laminating as the heat treatment process.

Question 7 (b) Candidates appeared to demonstrate a reasonable understanding of the material's compressive strength. Many incorrect responses confused definitions, or identified properties associated with metals such as malleability or ductility.

Question 7 (c) Most candidates engaged with this question, resulting in a large number of full mark answers. In many instances where the question was answered incorrectly, candidates were still able to secure 1 or 2 marks for showing correct working out. Where they did not get full marks, candidates generally picked up marks for identifying that 244 cm × 122 cm = 29768cm. Fewer candidates managed to calculate the length of the semi-circle as 28.278 cm and the total length of the part required as 60.278 cm. Many students who gained fewer marks confused the circumference and area often adding an area to a length. Some did not halve the circumference and others did not multiply the result by 30 to find the area of the curved section.

Question 7 (d) Many candidates did not appear to have a full understanding of the joint described and could not articulate advantages well. The most commonly seen answers referred to not needing adhesive and ease of disassembly, although many wrote about this with an environmental slant.

Question 8 (a) Numerous candidates provided explanations and / or justifications linked to solid box board being 'strong' and 'durable' instead of 'rigid'. Many linked this to solid white board being able to 'hold its shape'. Numerous candidates mentioned 'printabilty' but all failed to link this to 'smooth surface'.

Question 8 (b) Candidates that performed well in this question had a basic understanding of the term stock weight material, however many made references to bulk buying justifying economies of scale. Candidates struggled to answer this question, with many referencing the weight of the material e.g. 'stock weight material is lightweight and can be transported easily'. Most candidates who answered correctly gained the marks by referencing stock weight being 'readily available'.

Question 8 (c) Candidates that performed well in this question identified lay planning/nesting/tessellation as methods to reduce material waste. Some candidates identified lean/batch/JIT production as methods to reduce the global heading "waste". Many candidates referenced 'recycling' or 'reusing' material in relation to reducing waste. Many others also referenced 'lean manufacturing' or 'JIT' and / or discussed the use of CNC to reduce human error.

Question 8 (d) Many candidates did not fully discuss cost factors and went down the route of environmental issues. As often happens with this question, candidates appear to use the facts in figure 18 too much and repeat them, limiting their argument to discuss the real cost factors. Those who were awarded a mark or two mainly gained them from referring to the need to be tested to certain standards or that batch production would give a cheaper product.

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.