Pearson
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Examiners' Report
Principal Examiner Feedback

Summer 2024

Pearson Edexcel GCE
In Design & Technology (1DT0)
1F: Timbers

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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 chisels, solutions to prevent chisel movement, user protection from the sharp ends, 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. However, fewer candidates successfully identified a suitable finish to make the units easier to clean or provided a solution to enhance the base's stability, which was a common area where marks were lost. Drawing at times was very poor but notes overall were clear and explained the design features well.

Question 5 (b) The vast majority of candidates discussed the product showing fruit – some were able to clarify why this was beneficial often repeating the question in the answer. There were a large number of the same incorrect answers about the fruit being able to be cleaned, danger of being swallowed or bitten into as it was wood or that the Velcro allowed the toy to be reused which did not answer the ‘encourage healthy eating part’. Many candidates thought that giving a child a knife would lead them to violence also or that they would cut themselves.

Question 6 (a) Showing the grain and making it shiny to reflect the light were common answers but often lacked the explanation. Most common incorrect answers included making it waterproof, stronger, easier to clean and to prevent splinters. It is important that candidates understand the context of the product and the accompanying information since many assumed the candle was a real one and even then when on to explain how shellac would protect the wooden block from burning.

Question 6 (b) Many responses were awarded 2-3 for this question. Most put that it needed to go into a vice or cited a bench hook or clamp and then cutting but the detail was lacking with the technique of how to cut; for example, safety cuts first or keeping the saw straight. Many candidates described how to mark out but the question was clear and was only about the cutting to length, therefore no marks were awarded for any marking out or finishing processes.

Question 6 (c) In general this was not answered very well. Candidates were often able to show understanding of what birch was by discussing the colour/grain for one mark but then didn’t give a justification linked to the toy house. Some candidates seemed to overlook the context and referenced a real property.

Question 6 (d) While there was a wide variety of responses, some candidates could name one method to remove waste material but few provided sufficient explanation to earn additional marks. Planning, routing and sanding were frequently observed common answers with many stating bandsaw, laser cutter and chiseling incorrectly.

Question 7 (a) A large number of candidates did not answer this question correctly with many simply suggesting bending as opposed to laminating.

Question 7 (b) Candidate responses seemed to indicate that plywood was a commonly used material in the workshop and seemed to have had more experience using it but responses often lacked the linked justification. Many correct answers referred to ply being able to be bent into shape, some used flexible as the first part of the answer but many used suggested plywood was malleable.

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 considered aesthetics rather than the constructional qualities of the joint with frequent reference to the ease of making the joint. There was little reference to the connection enabling the axle to turn. Some candidates were able to recognise that the mortise and tenon joint created a larger gluing area. Some picked up marks for stating that there was a tight fit and had a physical connection which meant that the upright would turn the handlebars.

Question 8 (a) Most candidates attempted this question, and most marks were awarded for discussing the sustainability and MDF being a manufactured board. Many candidates referenced the weight as light therefore the door will open and close. Some candidates mentioned the cost that had already been identified in the question. There were very few candidates that really understood the MDF was smooth but would require a finish.

Question 8 (b) Overall, this question posed problems for most candidates. Generic answers e.g. easy/quick to manufacture, cheap/saves money without a good explanation were frequently observed. Readily available was the only really common response seen for 1 mark.

Question 8 (c) It was clear the vast majority of candidates did not understand what a jig was. Common mistakes included confusing a jig for a jigsaw or a type of fitting. Those who had a basic understanding referred to a template or were able to access one mark by saying ‘reducing need to mark out’, ‘speed up production’. Some could identify holding the frame or increasing the strength. A large number of responses were either left blank or a complete guess often refencing the hinge opening and closing better or increasing durability of the cupboard, ease of installation for the fitter.

Question 8 (d) Candidates in general tended to ignore the question which clearly states ‘cost factors’ and instead explained the table shown at the start of the question more generally. Candidates that were more successful with this question recalled many of the properties of MDF and referenced these to cost factors. This included mention of the use of surface finishes, being easy to cut and not warping.

The large majority of responses were about where the MDF had come from and the fact that this would be harmful to the environment in terms of pollution generated due to transportation, not looking at the value of the material in terms of what was required of it and its properties. Bulk buying was common as were import taxes and shipping costs.

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.