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# Principal Examiner Feedback

Summer 2022

Pearson Edexcel GCSE  
In Design & Technology  
1DT0/1A

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## Paper Introduction

This is only the second time that a 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.

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### 1DT0\_1A\_Q01ai

A generally well answered question, with a good number of candidates offering a correct response, mostly related to the aluminium being resistant to rust or corrosion, all 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. Candidates often stated characteristics of materials instead of properties. A clearer understanding of the difference between these is needed.

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### 1DT0\_1A\_Q01aii

This question was not well answered well by many candidates with most incorrect answers relating to the hat keeping the sun off your face.

Correct answers referred to softness or insulator of heat.

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### 1DT0\_1A\_Q01aiii

Most candidates answered this question correctly with transparent being the most popular answer seen. Some candidates made reference to what the tracing paper was used for, being able to place over a drawing to copy, which is not a property but an application.

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### 1DT0\_1A\_Q01aiv

The most common responses related to the plywood being flexible or capable of being bent. Fewer references were seen in relation to it having good compressive strength.

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### 1DT0\_1A\_Q01b

A generally well answered question, with many candidates scoring at least 1 mark. Most responses referred to urea formaldehyde being a thermosetting polymer / plastic with some being able to go onto link how this makes it difficult to recycle for example. Many other responses were about the material being brittle.

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### 1DT0\_1A\_Q01c

The first of the maths based questions where very many candidates were able to correctly work out the mass of 32.5 kg using some form of ratio calculation.

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### 1DT0\_1A\_Q02a

This question was overwhelmingly well answered with oak being the most popular response by some margin. Occasionally candidates suggested materials such as plywood or had given mahogany as an answer, which of course was given in the question.

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### 1DT0\_1A\_Q02b

This was answered reasonably well with the most common answers being responses related to toughness and responses related to hardness. It is important to recognise here that any linked justification of that working property must be correct in relation to the property initially stated in the response.

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### 1DT0\_1A\_Q02c

This question worked well being the first question on the paper that could be considered a significant discriminator of candidate ability. The focus on the manufacturer should have provided a focus to the response and in many instances, it proved to be the case where candidates made reference to the product being unique allowing the manufacturer to charge more.

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### 1DT0\_1A\_Q02d

This was a mathematics question that provided slightly more challenge, especially at the point at which unit conversion took place making the numbers manageable for candidates.

The part of the question that was most challenging for candidates was the conversion of units within the context of a cross sectional area rather than conversion on a linear measure, hence the large proportion of almost correct answers 6, 60, 600, 6000 etc.

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 has an answer of £6 it was still 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.

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### 1DT0\_1A\_Q03a

A good number of candidates were correctly able to identify the circuit symbol as an LED or Light Dependent Resistor. Some candidates had responded with LDR or simply that it was a diode.

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### 1DT0\_1A\_Q03b

A mixed set of responses from candidates. The most common correct answer seen related to the increase or decrease of rotary speed. A small but significant number realised that a reduction in speed would increase the level of torque. The most common incorrect response related to increase in power.

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### 1DT0\_1A\_Q03c

Nearly all candidates attempted this question with a reasonable proportion getting the correct answer of 1600 or the 1 mark special case response of 800 due to them only calculating one of the two increases rather than a compound increase. The most common incorrect response was 200rpm. Almost all candidates appeared to have some grasp of the concept of gear ratios and their impact on output speed even when they calculated a reduction rather than an increase in speed.

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### 1DT0\_1A\_Q03d

This appeared to be a very well answered question with candidates most commonly coming up with a response alluding to portability and not needing to be near an electrical outlet or responses related to no power lead resulting in improved safety due to no trailing cables.

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### 1DT0\_1A\_Q03e

A mixed set of responses providing further discrimination between grades.

The most common correct responses related to the lightweight nature of carbon fibre allowing the user to work for longer because it is less tiring.

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### 1DT0\_1A\_Q04a

Generally answered well with a reasonable proportion of candidates demonstrating knowledge of agro-textiles especially in relation to protecting crops from pests eating them and how they are used to protect against adverse weather conditions. There were misconceptions about the use of agro-textiles being used to make clothes for farmers and farm workers.

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### 1DT0\_1A\_Q04b

A mathematics question with a very large proportion of candidates being awarded full marks for a correct answer of 7 that had been calculated using a range of methods.

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### 1DT0\_1A\_Q04c

This question worked very well as a discriminator at the end of section A. The question performed well by providing a range of responses about fair trade across the whole range of marks available.

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### 1DT0\_1A\_Q05a

This is the first question in Section B of the examination. The question follows a similar style to that used in each of the previous series, with an existing design being presented that candidates needed to improve to meet further specification requirements.

Candidates found some of the specification points challenging to address, such as relocating the bird feeder from one location to another. Many candidates identified how the bird feeder could be hung on a hook, but not how it could be easily moved elsewhere. Similarly candidates did not always explain how the peanut butter jar could be kept secure but also replaced when needed.



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### 1DT0\_1A\_Q05b

Candidates tended to respond well when answering this question.

The tea-cup shaped money box allowed candidates of all levels to provide some analysis of the good or poor aspects of the design. They tended to identify factors such as the transparent screen to see the money and encourage further saving. As is often the case where two explanations are required, some candidates gave repeated points which limited the marks they were awarded.

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### 1DT0\_1A\_Q06a

#### Question Introduction

The focus of the question was on the use of standard sized sheets of aluminium for a painting surface on an easel. A large number of candidates did not achieve marks as they focussed on the material (aluminium) and its suitability for a painting surface.

Where candidates responded appropriately, answers such as less waste, no need for cutting and responses related to availability were common answers from candidates.

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### 1DT0\_1A\_Q06b

Many candidates were able to identify some relevant stages for cutting the required angle on the box section. They tended to focus on the need to clamp in a vice and use a hacksaw. Few answers were developed beyond this, however some candidates achieved full marks, perhaps from first-hand experience of such tasks.

Most candidates used notes and sketches even if the answers lacked completeness.

When a question asks for notes and sketches both of these must be included to be able to access the full range of marks.

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### 1DT0\_1A\_Q06c

Candidates gave a range of answers, with many achieving one mark for reference to allowing the legs/supports to be cleaned if they got paint on them. Linked responses were also relatively common with this being an area of content that was included in the advanced information to candidates.

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### 1DT0\_1A\_Q06d

Candidates who achieved marks tended to give two methods for joining the bottom rail to the upright, although in many cases these were not developed beyond stating methods such as welding or the use of named fixings such as nuts and bolts. Explanations were however often limited and did not give reasons why the process stated was appropriate for the type of joint or materials.

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### 1DT0\_1A\_Q07a

Candidates responded to this question with mixed success, which asked them to state the type of force in the top part of the lamp. A significant proportion of candidates did state compression or compressive force as an answer, although typical incorrect responses included gravity or tension.

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### 1DT0\_1A\_Q07b

Candidates were able to give appropriate working properties of brass, generally malleability and/or hardness, and link this to the context of the question. Some candidates linked this back to the scenario better than others, for example considering the compressive strength within the context of the lamp. Expansions were however often omitted or limited.

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### 1DT0\_1A\_Q07c

As with other mathematical questions on the examination, there were a number of common reasons why candidates did not achieve full marks when answering this particular question.

Conversions and rounding errors were generally the main reason, however a significant number of candidates calculated the area of a circle as opposed to a semi-circle.

Many candidates correctly determined the area of the rectangle/cuboid section even if they did not progress further and achieved some marks as a result.

When completing calculations, it is good practice for candidates to:

- show all working
  - convert units at the start of the calculation
  - avoid rounding until the final step of the calculation
  - write the final answer on the answer line.
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### 1DT0\_1A\_Q07d

Few candidates at any level of attainment were able to provide two three-mark responses. They often identified that off cuts could be used, or that there is less need for machining. It was typical of many candidates that there was not expansion of the response beyond an initial identification.

Only a limited number of candidates were able to provide two three-mark responses, however candidates often identified reasons and justified these with a short linked response. Typical answers included explanations that off-cuts could be used, or that waste is reduced.

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### 1DT0\_1A\_Q08a

Candidates recognised the benefits of stainless steel for the salt and pepper pot holders that was included in the scenario. Typical responses include stainless steel being corrosion resistant or hard, however this was not generally linked back to the context saying why or how these properties were beneficial for the tray.

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### 1DT0\_1A\_Q08b

In this question candidates were asked to explain one advantage of carrying out a quality control check on the salt and pepper pot holders during manufacture.

Many candidates gave generic responses that simply stated 'check for errors' which achieved no marks. Where candidates did score marks they referenced being able to dimensions or being able to correct tooling. Candidates found providing a contextual answer to be a challenge with only a limited number of linked responses being provided.

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### 1DT0\_1A\_Q08c

Where candidates achieved marks they tended to make some consideration of the different types of milling cutters that could be used to produce the different features when manufacturing the holders using a milling machine. This was a content area in the advanced information, and it was disappointing that most candidates failed to achieve more than one

mark and most candidates struggled to provide a further expansion of their explanation for the third mark.

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## 1DT0\_1A\_Q08d

This was the final question on the exam paper in which candidates were provided with some information about the materials used in the salt and pepper pot holder, the target market and scales of production.

The question asked candidates to evaluate the plant carrier with reference to social and availability factors including:

- use for different social groups
- use of stock materials
- use of specialist materials

Candidates responded with varied success with a small minority of candidates not attempting the question at all, which could be a result of lack of exam practice or running out of time.

Some candidates considered sustainability generically and thus achieved band one marks. Where candidates drew together a range of factors such as transportation from source to manufacturing, changes in demand and the use of stock materials from various suppliers they tended to move into bands two and three of the levels based mark scheme.

## 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.