

# Examiners' Report June 2022

GCSE Design and Technology 1DT0 1E



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#### 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.

### Question 1 (a)(i)

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.

#### Question 1 (a)(ii)

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

#### Question 1 (a)(iii)

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.

#### Question 1 (a)(iv)

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.

#### Question 1 (b)

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.

#### Question 1 (c)

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.

### Question 2 (a)

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.

#### Question 2 (b)

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.

### Question 2 (c)

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.

### Question 2 (d)

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.

#### Question 3 (a)

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.

### Question 3 (b)

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.

## Question 3 (c)

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.

### Question 3 (d)

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.

## Question 3 (e)

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.

#### Question 4 (a)

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.

#### Question 4 (b)

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.

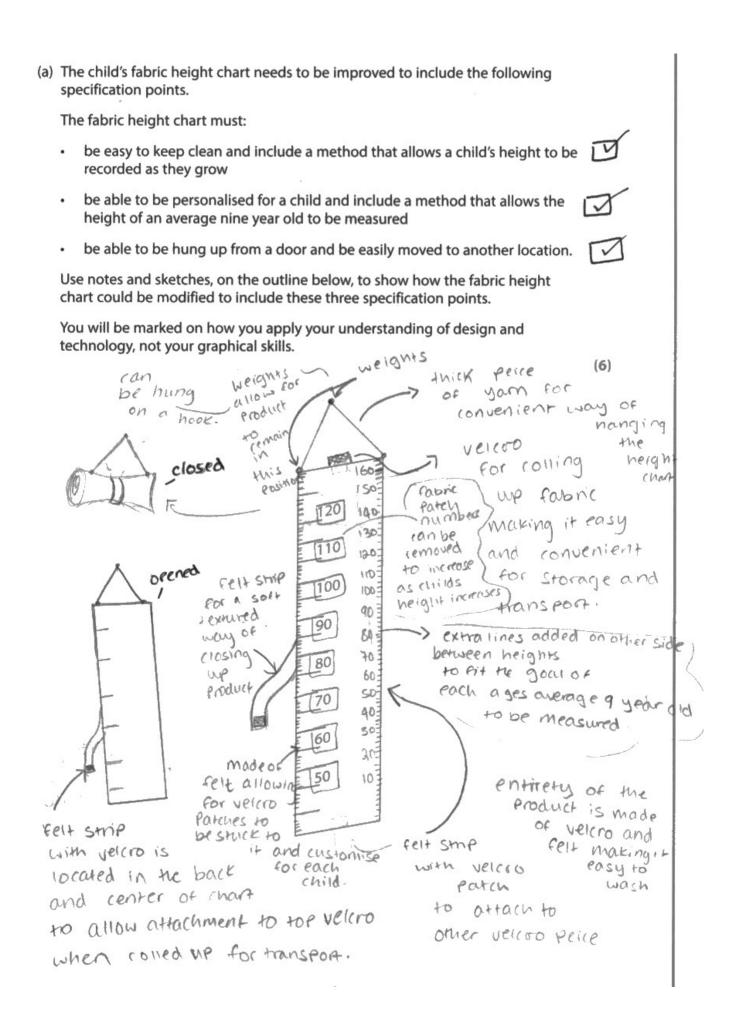
### Question 4 (c)

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.

#### Question 5 (a)

A good range of creative responses were produced by candidates when completing Q05(a). Many candidates were able to access at least half marks here by clearly identifying how their design ideas had met the specification points by using notes and annotations. Some of the marks here were more accessible and therefore more candidates achieved them e.g. being personalised and being able to be hung up. Some of the more difficult specification points where many candidates tended to loose marks included the need to record the height of an average 9 year old child and the need for the product to be easily moved to another location. To access the mark for the 9 year old child's height candidates needed to use the additional information on the previous page and identify that the height chart needed extending in some way. Many candidates just wrote that the chart was 'easily moveable' but didn't say how. The example response included shows that the candidate thought that the height chart could be rolled up and therefore that made it easier to move, this would have achieved the mark for that specification point.

It is good practise here for a candidate to tick off the specification points in the question once they have included them in their designs. Some candidates also number the specification points (1-6) and then label their annotations with these numbers which is very clear and helpful to the examiner.





(a) The child's fabric height chart needs to be improved to include the following specification points.

The fabric height chart must:

- be easy to keep clean and include a method that allows a child's height to be recorded as they grow
- be able to be personalised for a child and include a method that allows the height of an average nine year old to be measured
- be able to be hung up from a door and be easily moved to another location.

Use notes and sketches, on the outline below, to show how the fabric height chart could be modified to include these three specification points.

You will be marked on how you apply your understanding of design and technology, not your graphical skills.

(6) Strap nang dod acherole .Thin plastic cover & extra to protect fabric Piece for from getting dirty 120 04 Magnet 9 year olds as plastic can easily 110 23 be cleaned 100 ·Zipper added to easily 90  $\sim$ take fabric at This Can 80 easily Magnet installed behind 70 5 fabric so rolled (Back) 60 that . small and non 50 atachable magnet figures can be placed prat front, these here a magnets the back are used to close height childs Buttor as they these magnets can Strap personalised for children as they come in different sha



#### Question 5 (b)

Many candidates here scored at least 2 out of the 4 marks. Although most candidates did write two answers for this question many were incorrect talking about how the child would like the tea cup shape or discussing how it could double up as a soft toy as the product was made from foam. A higher ability candidate often identified the see-through screens, the difficulty in getting money out and how a child would not be interested in a tea-cup shape. As well as identifying two good points those candidates that did achieve full marks justified their points really well as can be seen in the sample response. (b) Figure 7 shows a fabric covered soft foam money box in the shape of a tea cup.

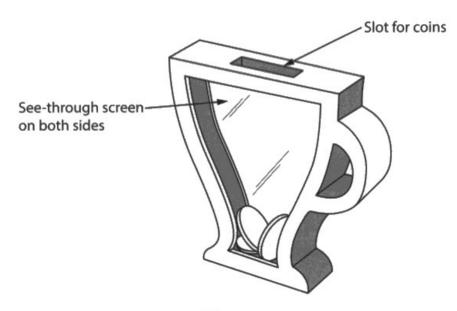


Figure 7

(4)

Explain **two** ways that the fabric covered soft foam money box meets, or fails to meet, the criteria of providing a method to encourage young children to save money.

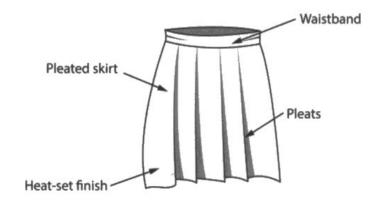
1. If meets the Criteria by having a see-through screen sochildren can easily see the money saved. This means & that, they can easily get Praited as they see their collection of money grow over time - As a result, kids will feel encouraged to save money as it feels like an experience 2 TA meets the critea by having a Slot for coins. This means that, more is easy for kids to put in but difficult for them to get out. As a result, ticls are more likely to save the money as they don't want to have to even figure out how to get movey out untill its necessary-



#### Question 6 (a)

There were mainly weak responses to this question. If a candidate did achieve any marks it was because of reducing costs or reducing wastage although it was very rare for the advantages of these points to be explained fully. Many candidates thought that the skirt was a standard size, not the fabric that it was made out of.

6 Figure 8 shows a pleated skirt manufactured from a woven polyester fabric.



#### Figure 8

The skirt pieces are manufactured from a standard sized width of fabric.

(a) Explain **two** advantages for the manufacturer of using a standard sized width of fabric for the skirt pieces.

1 If makes the maturial easy to source. This means that, the manufactorer is able to make large volumes (batches of the skirt. As a result, the manufactorers are able to sell to a wide market which will increase their sales. 2 It is cheaper to order pre-made widths of fabric than customade willths or fubric. This means that, the fubric will be cheaper for the manufactoriers to buy. As a result, the manufactoriers are able to keep manufactoring costs low and profits high.



(4)

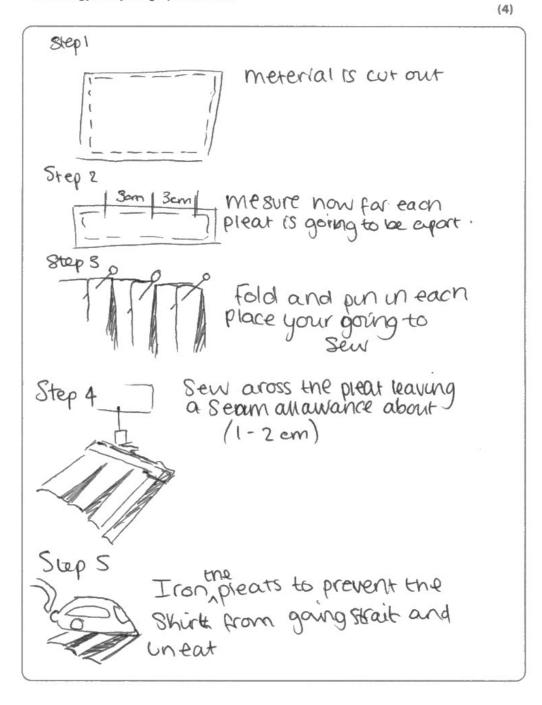
#### Question 6 (b)

Q06(b) was a very well answered question by many candidates. It was common for a candidate to use notes and sketches in their answers. It should be noted here that if a candidate does not use notes and sketches as required then they can only achieve a maximum of 3 out of the 4 marks, even if their explanation is compeletly correct. Higher scoring candiates produced a clear and logical set of annotated diagrams which fitted the mark scheme points really well as can be seen in the sample response.

(b) The skirt is pleated from the waistband.

Use notes and sketches, in the space below, to show how to form a pleat.

You will be marked on how you apply your understanding of design and technology, not your graphical skills.





#### Question 6 (c)

This was generally answered well by most candidates with the pleat being permanently set into position being the most common answer seen. Some candidates did miss the second mark as they did not go on to give a linked justification for their answer eg. this will keep the pleats looking pristine in wear.

The skirt pleats are heat-set.

(c) Explain one reason for heat-setting the pleats.

So that the folds of the pleat
can be preserved on which also
looks more aesthetically pleasing.

(2)



#### Question 6 (d)

A wide range of answers were given for Q06(d) and a wide range of marks were achieved for this question by candidates. Where there was some confusion a candidate did not understand what was meant by a finishing technique (see Specification 6.7.3c). When a candidate lost marks they did not use the correct names for the finishing techniques. 'Hemming' was a popular answer which was accepted although it is not a named finishing technique in the specification. A candidate scoring 3-4 marks could identify an appropriate technique and could briefly justify why that techniques was suitable. It was very rare for a candidate to achieve 5 or 6 marks here and when they did it was because the could fully justify the advantages of the finishing techniques chosen.

(d) Give **two** different methods of finishing the raw edge at the bottom of the skirt.

For each method, explain **one** advantage of using that method to finish the raw edge at the bottom of the skirt.

Method 1 averloared edge Explanation The quickest method for finishing an edging of a simply running it through an overlacter cuts off seals the edges making it the fashest approach Method 2 Explanation Se Folding the pabric over twice and then sewing on the to stop it wavalling. It hides now edges and adds stigeness to the bottom of The skirt allowing its drope botter (Total for Question 6 = 16 marks)



(6)

(d) Give two different methods of finishing the raw edge at the bottom of the skirt.

For each method, explain **one** advantage of using that method to finish the raw edge at the bottom of the skirt.

(6)

Method 1 Explanation me a. onn exc 00 0 DIIC below Method 2 Las Explanation Spearo 92. e on 0 one (Total for Question 6 = 16 marks)



#### Question 7 (b)

It was suprisingly very rare for a candidate to score 3 or 4 marks on Q07(b). Many candidates did not list properties of the nylon fibres but instead discussed subjective characteristics such as it being inexpensive. Many candidates also listed properties but not correct ones eg. nylon is a breathable fibre. Where a candidate did achieve highly it was because they could list two correct properties eg. crease resistance and non-absorbancy and could clearly justify those properties, clearly linking them to the fact that they were discussing a fancy dress costume.

(b) Explain **two** properties of nylon that make it an ideal fibre for the fancy dress costume.

1 it is crease resistant so will have an aesthetically
preasing loole so the esser looles nice while wearing
it because it is a janey dress costume so needs to
be aenterically pleasing
2 it is non-absorbent (mouter proof) so if something is spilt
de un it, it can be easily cleaned off which is good fer or
janey dress costume as it needs to iccle aemetically
preasing.



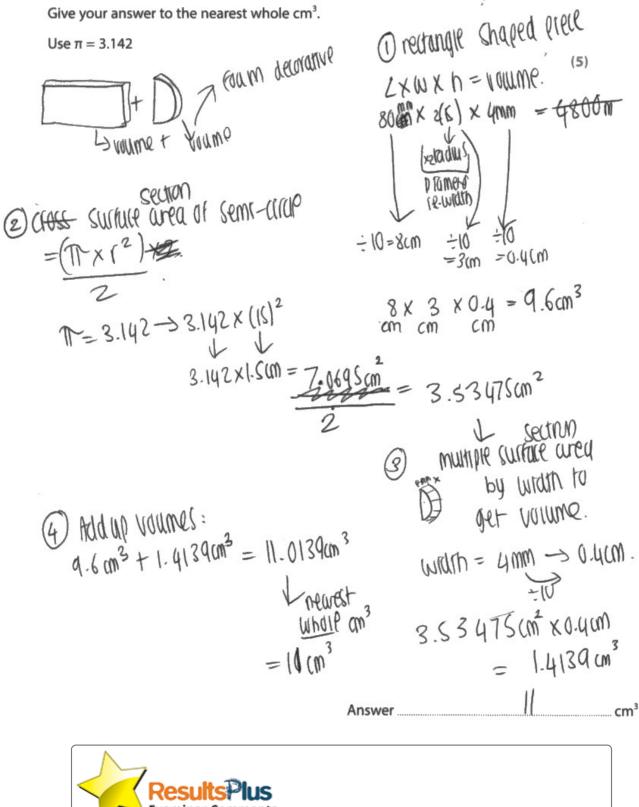
(4)

#### Question 7 (c)

Many candidates who answered this question performed well using range of mathematical methods recognised in the mark scheme. There were some full mark answers awarded with a small number of candidates having a correct answer with little or no clear working out. Some candidates went completely way off in their calculations but could be credited for sections of their answer that were relevant. Many candidates showed some understanding of the question.

(c) Calculate the volume of material needed to produce one of the foam padded decorative details.

Give your answer to the nearest whole cm<sup>3</sup>.



This is a good example of a candidate response.

# (c) Calculate the volume of material needed to produce one of the foam padded decorative details.

Give your answer to the nearest whole cm<sup>3</sup>.

Use 
$$\pi = 3.142$$
  
 $2 \pi r^2$   
 $2 \pi$ 

This is a good example of a candidate response.

#### Question 7 (d)

This question proved to be a good discriminator and a good range of marks were awarded. Many candidates were able to briefly describe how using seperate pieces of nylon could reduce waste or cost. It was rare for a candidate to develop their answers fully however like that in the sample response shown.

It is worth noting here that often 'cheaper' is not considered to be enough of a response to gain credit – it is important that a candidate can justify this answer.

The different parts of the fancy dress costume are cut out from separate pieces of blue nylon rather than from a single roll.

(d) Explain **two** reasons for cutting the different parts of the fancy dress costume from separate pieces of blue nylon rather than from a single roll.

1 It reduces wastage, which means less Materials are thrown away Theretore \* 1835 provertation nyton is ending up in landhin nylon is made of plastic which means it takes a long time to break down. Soit is a more environmentally Hiendly way 2 It is cheaper soit reduces costs of Manateration Manufacture and SO MEANS CANSTALLISETS DLO Maybe a Onit neod to pay a lot. Also it moans the manufacturer saving money, because (olls will cost more 10 and Mere would would be waste



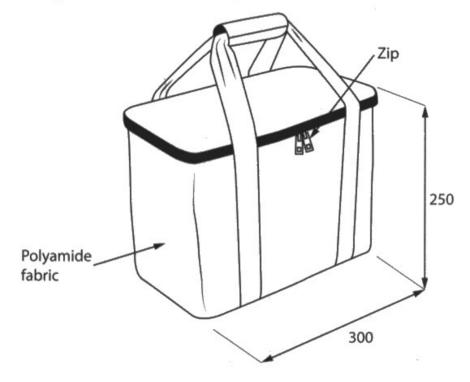
(6)

#### Question 8 (a)

It was rare on Q08(a) for a candidate to be awarded full marks. Often the responses given were not properties of polyamide fibres. For example a candidate might have written that is it 'easy to clean', this is not a property in itself but more a justification of the fact that polyamide is hydrophobic and therefore does not stain easily.

It is important to note here that 'strong' is a rarely accepted answer. As the mark scheme states the fibre has 'high tensile strength' as it puts the property more in context of the product being discussed.

Figure 11 shows a family picnic bag manufactured from a polyamide fabric.
 The family picnic bag is lined with an insulating reflective fabric.



All dimensions in mm

Diagram not to scale

Figure 11

(a) Explain **one** benefit of manufacturing the family picnic bag from a polyamide fabric.

(2)ISING proof to rain noin 10



#### Question 8 (b)

This question was very poorly answered by the majority of candidates who tended to write generic statements about carrying out quality control checks. As the mark scheme states the examiner is looking here for specific quality control checks that would be carried out on the product in question eg. 'the breakage strength of the seams would be tested' – this would be important in the context of a picnic bag as it would be required to carry a lot of heavy food.

The picnic bags are subjected to quality control checks during manufacture.

(b) Explain **one** advantage of carrying out a quality control check on the family picnic bags during manufacture.

Sure the fits they are no taulto malees defects in the Fabric 000 Costment from is the barg and preven hum

(3)



#### Question 8 (c)

This question was a good differentiator and a good spread of marks were achieved by candidates. Most could access some marks discussing the accuracy or speed of the laser cutter. Higher marks were also achieved where candidates could provide a linked justification of those points.

me (c) Explain two reasons for using a laser cutter to cut out the pieces for the family picnic bags. Vai w GN G wate 01 Man Mac Finon



#### Question 8 (d)

The final question was a good differentiator and a good spread of marks were achieved by candidates. Those that scored a Level one response may have repeated information out of the question or discussed a lot of generic information about the environment. Those that achieved a higher level response managed to include information about all social and availability factors listed in the question and discussed their thoughts logically with a good level of written English.

Many of the candidates who score well on this final question use the space around the question to plan what they are going to write before they start as you can see from the example responses included.

(d) The family picnic bag is manufactured from polyamide fabric and is lined with an insulating reflective fabric.

Figure 12 shows some additional information ab	bout the family picnic bag.
--	-----------------------------

Source of oil for polyamide fabric	Saudi Arabia / UAE
Picnic bag fabric	137 cm wide woven polyamide
Potential market	Families, walkers, day trippers
Scale of production	Batch _ can be made
Fig	jure 12 & More libely to be shortages. higher qual that
Analyse the information in Figure 12.	Nigher qual that.
Evaluate the family picnic bag with refere factors including:	nce to focial and availability
<ul> <li>use for different social groups</li> </ul>	
use of stock materials	
<ul> <li>use of specialist materials.</li> </ul>	(9)
The materials for this prec	luct should be readily available
	t is made based on the stock
measurement of 137cm wh	ich is an Enternationally
recognised Stock Rom for Rat	one Therefore it should be easy
	icialist measurements / wielth are
required. The use of stock	materials will also be useful
to the manufacturer as ma	chinery will not need to be
adjusted / bought to accom	
	secialist materials like polyanide
fabrics and insulating refle	crue fabric can cause availability
visues because they are not	as common as other synthetics
like polyester or Nylon w	high makes the source pool
smaller and disruptions to b	he supply chain are more

likely to impact availability. The use of batch production means that the product can be made with more flexibility to demand especially as picnic bags may be considered seasonal as they are mainly used in the summer. This is economically viable but there could be delays in the summer months as the demand would be high but the production rate would be slower than mass production. The purie beg would appeal to active social groups that need to beep food cool over a period of time and this is reflected by the intended market. It would be suitable to families as it has a large volume to kit Road in for multiple people. The straps make it easy to earry so that it can be used by everyone including the elderly and children. It also doesn't have any patterns, slagans or colours that would make it stereotypically more attractive to one social group over another. Overall, considering social and availability factors, I believe that this product would be successfull in any market, especially in the summer and it will be readily available to manufacture and buy without ! too many delays or set up costs.



(d) The family picnic bag is manufactured from polyamide fabric and is lined with an insulating reflective fabric.

Source of oil for polyamide fabric	Saudi Arabia / UAE
Picnic bag fabric	137 cm wide woven polyamide
Potential market	Families, walkers, day trippers
Scale of production	Batch

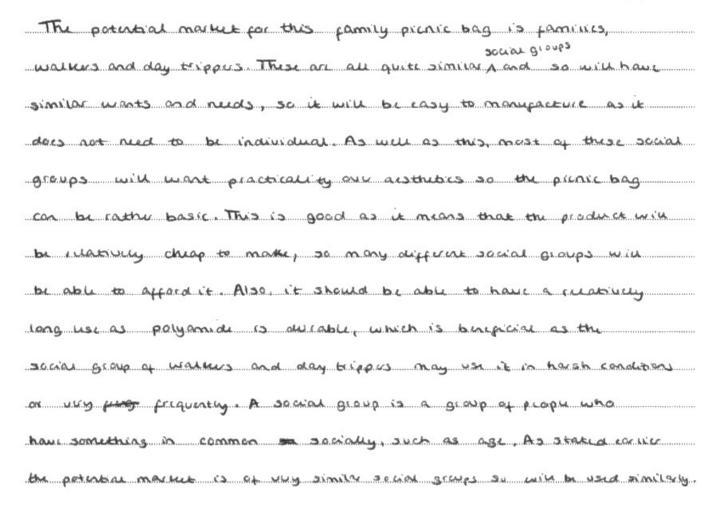
Figure 12 shows some additional information about the family picnic bag.



Analyse the information in Figure 12.

Evaluate the family picnic bag with reference to social and availability factors including:

use of stock materials.
use of specialist materials.



The picnic bag uses a 137cm wide ferbric. This is a standard
width in stack maturials. This means that it is cheopert and
easier to find as it is the standard. This is especially good for this
picnic bag as it is batch produced, which usually methods meching
The machiney will be used to this width of matucas, so it
will be much easily to many galour. As well as this, the picnic
by is 30 cm wide, so many will be able to be made promove
cour, thuryers matting is cost upticient.
cerr, thurger matting it cost yricient.
The primic bag is which an insulating synctice patrick
The priorie bag is lined with an insulating sylletic patric, which
The priorie bag is lined with an insulating public patrice, which is good allows pead in the bag to be kept in good condition, which is good

able to apported to spind lets of money on a prenic bag. Also, the use of pelyanical is noting as it is made from oil which is a finite concrete.

this may be seen as unethical and there may also be availability

protono is on public as it is a pinite resource.



#### **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.

#### **Grade boundaries**

Grade boundaries for this, and all other papers, can be found on the website on this link:

https://qualifications.pearson.com/en/support/support-topics/results-certification/gradeboundaries.html

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