



*Rewarding Learning*

**General Certificate of Secondary Education  
2025**

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## **Technology and Design**

Unit 2:  
Option C: Product Design

**[GTY23]**

**WEDNESDAY 11 JUNE, MORNING**

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# **MARK SCHEME**

## **General Marking Instructions**

### ***Introduction***

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses. The mark schemes should be read in conjunction with these general marking instructions..

### ***Assessment objectives***

Below are the assessment objectives for GCSE Technology and Design.

Candidates must:

- AO1** Recall, select and communicate their knowledge and understanding of Technology and Design in a range of contexts;
- AO2** Apply skills knowledge and understanding, including quality standards in a variety of design contexts. Plan and carry out investigations and making tasks involving an appropriate range of tools, equipment, materials and processes; and
- AO3** Analyse and evaluate evidence, design proposals and outcomes, make reasoned judgements and present conclusions and recommendations.

### ***Quality of candidates' responses***

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

### ***Flexibility in marking***

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of an unanticipated answer, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

### ***Positive Marking***

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 16-year-old GCSE candidate..

### ***Awarding zero marks***

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

### ***Types of mark schemes***

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

### ***Levels of response***

Tasks and questions requiring candidates to respond in extended writing are marked in terms of levels of response. In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement. The following guidance is provided to assist examiners.

Level 1: Response which merits inclusion in the band and should be awarded the lower mark.  
Level 2: Response which merits inclusion in the band and should be awarded the higher mark.

### ***Marking calculations***

In marking answers involving calculations, examiners should apply the “own figure rule” so that candidates are not penalised more than once for a computational error.

### ***Quality of written communication***

Quality of written communication is taken into account in assessing candidates’ responses to all tasks and questions that require them to respond in written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

- Band 1: Quality of written communication is basic.
- Band 2: Quality of written communication is limited.
- Band 3: Quality of written communication is satisfactory.
- Band 4: Quality of written communication is good.
- Band 5: Quality of written communication is excellent.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided in the relevant question in the mark scheme.

			AVAILABLE MARKS	
1	(a)	(i) CNC Lathe [1] Laser cutter [1] 3D printer [1]	[3]	10
		(ii) Any <b>three</b> from: Lower costs [1] Accuracy/higher quality/less human error [1] Speed of manufacture [1] Can produce 24/7 [1] Repeatability [1] (3 × [1])	[3]	
	<b>All relevant, valid responses will be given credit</b>			
	(b)	(i) Maximum 110.02 – Minimum 109.98	[2]	
	(ii) Maximum 30.9 – Minimum 29.1	[2]		
2	(a)	Any <b>two</b> from: Interchangeability – can use common part across a range Manufacturing in larger quantities reduces costs/economies of scale [1] Reduces inventory range [1] (2 × [1])	[2]	10
		<b>All relevant, valid responses will be given credit.</b>		
	(b)	Any <b>two</b> from: Identical components produced in medium sized production runs [1] Minor changes between batches if required [1] Skilled workers required [1] (2 × [1])	[2]	
	<b>All relevant, valid responses will be given credit.</b>			
	(c)	(i) Any <b>two</b> from: Lightweight [1] Suitable to mould/injection mould [1] Electrical insulator [1] (2 × [1])	[2]	
	<b>All relevant, valid responses will be given credit.</b>			
	(ii)	Injection moulding	[1]	
	(d)	(i) British standards	[1]	
	(ii)	A product has been independently tested [1] and meets an approved quality standard [1]	[2]	

- 3 (a) Any **two** from:  
 Has four wheels [1]  
 Hard case [1]  
 Extendable/retractable handle [1]  
 (2 × [1]) [2]

**All relevant, valid responses will be given credit.**

- (b) (i) Aesthetics is our perception of a product based upon its appearance [1]

- (ii) Any **two** from:  
 Yellow and black contrasting colours  
 Ribbed surface  
 Rounded corners  
 (2 × [1]) [2]

**All relevant, valid responses will be given credit.**

- (iii) Anthropometrics is the study of body measurements [1]

- (iv) Any **two** from:  
 Grip of handle [1] is influenced by length of fingers [1]  
 The length of handle [1] is influenced by the width of hand [1]  
 Height of handle [1] to suit the height of the user when pulling [1]  
 (2 × [2]) [4]

**All relevant, valid responses will be given credit.**

- 4 (a) (i) Function follows form [1]

- (ii) Fruit juicer [1]

- (iii) Any **two** from:  
 Sleek  
 Modern  
 Elegant curves  
 Tear-drop shape  
 (2 × [1]) [2]

**All relevant, valid responses will be given credit.**

- (b) Any **one** from:  
 • The juicer is a unique design  
 • It is made of an expensive metal  
 • It is an exhibition piece  
 • Function is not the primary driver  
 (1 × [1]) [1]

**All relevant, valid responses will be given credit.**

AVAILABLE  
MARKS

10

(c)	He was born in Cardiff, Wales.	
	He studied at the École Nissim de Camondo, Paris.	×
	He held the position of Design Director in Habitat and this gave him a unique insight into global retail.	
	He became his country's Ambassador of Creativity and Innovation in 2009.	×
	He was widely acclaimed for his work collaborating with the skilled Venetian glassblowers.	
	He designed the London 2012 Olympic Torch.	
	He designed the Ghost dining chair for Kartell.	×
	His vision for design is products that improve people's lives which were often sold at affordable prices such as the optical mouse for Microsoft.	×
	His love for and curiosity about the arts has resulted in extensive travel in India, Asia, the Middle East, Northern Africa and South America to research other cultures.	

[4]

AVAILABLE  
MARKS

9

5 (a) Any **two** from:

A chuck key left in a chuck of a pillar drill

A broken tool/piece of equipment not reported/decommissioned

A machine left unguarded

(2 × [1])

[2]

**All relevant, valid responses will be given credit.**

(b) (i) Personal protective equipment

[1]

(ii) Any **one** from:

Apron

Visor/goggles

(1 × [1])

[1]





**All relevant, valid responses will be given credit.**

(c) (i) Mandatory

[1]

(ii) Prohibition

[1]

(d)		Hazardous to the environment
		Corrosive
		Health hazard. Hazardous to the ozone layer
		Acute toxicity

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[4]

10

6 (a) (i) Cost per wet floor sign – £6.25

$$1\% = 0.0625 \text{ [1]}$$

$$18\% = 0.0625 \times 18$$

$$= £1.125 \text{ [1]}$$

$$\text{Profit} = £1.125 \times 3000$$

$$= £3375 \text{ [1]}$$

[3]

(ii)  $1\% = 0.0625 \text{ [1]}$

$$5.75\% = 0.0625 \times 5.75 = 0.359375 \text{ [1]}$$

$$\text{Selling price} = 6.25 + 0.359375 \text{ [1]}$$

$$= £ 6.61 \text{ [1]}$$

[3]

(b)

Material/component	Sizes	No. needed	Price/unit	Cost £
Yellow injection moulding plastic pellets	250g pellets	1	£12 per 1 Kg bag of pellets	<b>3.00</b>
Black injection moulding pellets	100g pellets	1	£12 per 1 Kg bag of pellets	1.20
Black vinyl stickers	600 mm × 300 mm	2	£10 per m <sup>2</sup>	<b>3.60</b>
Castor wheels	Ø 40 mm	4	£8 per 80 castor wheels	<b>0.40</b>
Nut	M5	8	10p each	0.80
Extruded tube for mop handle	1.4 m	1	£4.00 per metre length	<b>5.60</b>
Mop head	100 mm × 300 mm	1	78p each	0.78

[4]

(c) The bucket has a lip to keep the sides of the bucket rigid and strong [1]  
it also gives a safe, smooth edge. [1]

(2 × [1])

[2]

**All relevant, valid responses will be given credit.**

(d)

AVAILABLE  
MARKS

Response Band	Description	Mark
When a response is not worthy of credit, a [0] mark should be awarded		
Basic [1]–[2]	The candidate attempts to produce a method to attach the wet floor sign. The quality of sketch(es) is basic. Annotation is basic and lacking in technical vocabulary and specialist terms.	[1]
	The candidate produces a basic wet floor sign attachment. The design attempts to consider a design feature. The quality of sketch(es) is basic. Annotation is basic and lacks the use of technical vocabulary and specialist terms.	[2]
Limited [3]–[4]	The candidate produces a limited method to attach the wet floor sign. The design considers at least 1 of the design features. The quality of sketch(es) is limited. Annotation is limited and lacks the use of technical vocabulary and specialist terms.	[3]
	The candidate produces a limited method to attach the wet floor sign. The design considers the design features. The quality of sketch(es) is limited. Annotation is limited but uses some technical vocabulary and specialist terms.	[4]
Satisfactory [5]–[6]	The candidate produces a satisfactory method to attach the wet floor sign. The design considers the design features. The quality of sketch(es) is satisfactory. Annotation is satisfactory and uses some technical vocabulary and specialist terms.	[5]
	The candidate produces a satisfactory method to attach the wet floor sign. The design incorporates the design features. The quality of sketch(es) is satisfactory. Annotation is satisfactory and generally uses technical vocabulary and specialist terms.	[6]
Good [7]–[8]	The candidate produces a good method to attach the wet floor sign. The design incorporates the design features. Good clear sketch(es) linked to good annotation, generally using technical vocabulary and specialist terms.	[7]
	The candidate produces a very good method to attach the wet floor sign. The design incorporates the design features with some detail. Very good clear sketches linked to good annotation, generally using technical vocabulary and specialist terms.	[8]
Excellent [9]–[10]	The candidate produces an excellent method to attach the wet floor sign. The design fully incorporates all the design features. Excellent clear sketch(es) and annotation using technical vocabulary and specialist terms.	[9]
	The candidate produces an excellent method to attach the wet floor sign. The design fully incorporates all the design features showing excellent detail and clarity. Excellent clear sketch(es) with excellent annotation which makes full use of technical vocabulary and specialist terms.	[10]

[10]

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		AVAILABLE MARKS
7	(a) Deforming	[1]
	(b) Gantt chart	[1]
	(c) 5 minutes [1] – glue part A and B/press mould part C 10 minutes [1] – glue all parts/solder Total 15 minutes [1] (3 × [1])	[3]
	(d) Advantage: One-off production allows for customisation [1] appealing to a broader range of customers/allowing the company to change more [1] Disadvantage: The cost of an individual product is greater for one-off production [1] due to the increased time required/economies of scale [1] (2 × [2])	[4]
<b>All relevant, valid responses will be given credit.</b>		

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8 The design solution should show evidence of the following:

**Bands of response**

Tasks and questions requiring candidates to respond in extended writing are marked in terms of bands of response. In deciding which mark to award, examiners should look for the “best-fit”, bearing in mind that weakness in one area may be compensated for by strength in another.

In deciding which mark within a particular band to award to any response, examiners are expected to use their professional judgement. The following guidance is provided to assist examiners. For the following sections:

**Level 1:** Response which merits inclusion in the band and should be awarded one mark

**Level 2:** Response which satisfies the band description and should be awarded two marks

- Should be capable of allowing water to drain.
- Should be aesthetically pleasing.
- Should include three key dimensions.
- Identify and justify the choice and use of materials.

**Level 1:** Response which merits inclusion in the band and should be awarded one mark

**Level 2:** Response which satisfies the band description and should be awarded two marks

**Level 3:** Response which satisfies the band description and should be awarded three marks

**Level 4:** Response which satisfies the band description and should be awarded four marks

- Good quality annotated sketches giving consideration to line, shape, form and proportion. The annotated sketches should clearly convey your design thinking.
- The shower solution must be strong, stable and capable of holding at least three bottles as shown in the diagram in **Fig. 9**, in an easily accessible position for the average adult user.
- Identify and justify the main manufacturing techniques to be used in the design's construction.

Design features	Response band	Mark band description	Mark to award
When a response is not worthy of credit, a <b>[0]</b> mark should be awarded			
Good quality annotated sketches giving consideration to line, shape, form and proportion.	[0]–[4]	Basic sketch conveying little detail. Basic annotation.	[1]
		Limited sketch conveying some detail. Limited annotation using limited technical vocabulary and limited specialist terms.	[2]
		Satisfactory sketch conveying most information. Satisfactory annotation using some technical vocabulary and some specialist terms.	[3]
		Good sketch giving consideration to all of the information. Good annotation using technical vocabulary and specialist terms.	[4]
The shower solution must be strong, stable and capable of holding at least three bottles in an easily accessible position for the average adult user.	[0]–[4]	Basic solution that holds three bottles.	[1]
		Limited solution that is strong, stable and holds three bottles.	[2]
		Satisfactory solution that is strong, stable and holds three bottles in an accessible position for the adult user.	[3]
		Good solution that is strong, stable and holds three bottles in an easily accessible position for the adult user.	[4]
Capable of allowing water to drain.	[0]–[2]	Reference to solution preventing water build up.	[1]
		Reference to solution allowing water to drain.	[2]
Aesthetically pleasing.	[0]–[2]	Unrefined solution with little consideration given to aesthetics.	[1]
		Refined solution with consideration given to aesthetics.	[2]
Three key dimensions.	[0]–[2]	Reference to three key dimensions.	[1]
		Reference to three key dimensions which are appropriate/realistic.	[2]
Identify and justify the main manufacturing techniques used in the design's construction.	[0]–[4]	Basic detail of main manufacturing techniques shown/discussed. Basic annotation.	[1]
		Limited detail of main manufacturing techniques shown/discussed. Limited annotation using limited technical vocabulary and limited specialist terms.	[2]
		Satisfactory detail of main appropriate manufacturing techniques shown/discussed. Satisfactory annotation using some technical vocabulary and some specialist terms.	[3]
		Good detail of main appropriate manufacturing techniques shown/discussed. Good annotation using technical vocabulary and specialist terms.	[4]
Identify and justify the choice of materials.	[0]–[2]	Reference to choice of material with little consideration and justification given to selection of material/s used. Limited use of technical vocabulary and limited specialist terms.	[1]
		Reference to choice of appropriate materials with consideration and justification given to selection of material/s. Good use of technical vocabulary and specialist terms.	[2]

	AVAILABLE MARKS
[20]	20
<b>Total</b>	<b>100</b>