CAMBRIDGE
International Education

Cambridge IGCSE™

DESIGN AND TECHNOLOGY **0445/13**

Paper 1 Product Design **May/June 2025**

MARK SCHEME

Maximum Mark: 50

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the May/June 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

This document consists of **12** printed pages.

PUBLISHED

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standard isation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	Incorrect point
	Indicates that the point has been noted, but no credit has been given
	Correct point
Numbers	Indicating the mark allocated for the response

Performance description tables

Each question contains some marks which are awarded using the following performance description tables.

Communication of ideas

Part (c)	Mark	Performance description
	5–6	Ideas are communicated with precision and clarity through the use of sketches/accurate drawings and reasoned annotations linked to most of the requirements.
	3–4	Ideas are displayed with some clarity through sketches/clear drawings supported by annotations referring to some of the requirements.
	1–2	Simple sketches/drawings and limited annotations show little understanding of the requirements.
	0	No creditable response.

Suitable designs

Part (c)	Mark	Performance description
	5–6	Creative solutions which fully meet the requirements. Designs showing most aspects of construction detail.
	3–4	Sensible solutions that mostly meet the requirements. Designs with moderate construction detail.
	1–2	Solutions do not meet many of the requirements. Simplistic designs with little construction detail.
	0	No creditable response

Quality of drawing

Part (e)	Mark	Performance description
	4	High standard of line quality, use of colour and proportions. Appropriate techniques used that show clearly all detail.
	2–3	Good line quality, use of colour and proportions. Most of the detail presented.
	1	Poor line quality and proportions. Little detail presented.
	0	No creditable response.

Construction details

Part (e)	Mark	Performance Description
	5–6	All construction detail clear with good annotations and/or additional detail drawings as necessary.
	3–4	Most construction may be obvious from overall views or with some annotation.
	1–2	A simplistic design; little or no detail of construction used.
	0	No creditable response.

Guidance on using the performance description tables

Marking should be positive, rewarding achievement where possible but clearly differentiating across the whole range of marks available.

In approaching the assessment process, examiners should look at the work and then make a 'best fit' judgement as to which level statement it fits. In practice the work does not always match one level statement precisely so a judgement may need to be made between two or more level statements.
Once a 'best fit' level statement has been identified the following guide should be used to decide on a specific mark:

- Where the candidate's work **convincingly** meets the level statement, the highest mark should be awarded
- Where the candidate's work **adequately** meets the level statement, the most appropriate mark in the middle of the range should be awarded
- Where the candidate's work **just** meets the level statement, the lowest mark should be awarded

Candidates answer **one** question, **either** 1 **or** 2 **or** 3.

Question	Answer	Marks	Guidance
1(a)	Accept any **four** additional specification points – does not damage the water bottle or pram/push chair, holds it securely in place in use / prevent bottles falling out, easy to pick out of the holder with one hand / easy to access bottles, can be attached and removed from the push chair easily, colour neutral, easy to clean, drains if the bottle leaks, water resistant / waterproof, adjustable for different sized bottles / prams / tubes etc [1 x 4]	**4**	Each specification point – 1 mark No repeats from question: attach to the frame, hold different sized bottles Only accept unqualified answers (even if only **one** word) if relevant to this specific design problem e.g. lightweight **not** generic answers such as safe, aesthetic, strong, nice, cheap, durable, recyclable / environmentally friendly / sustainable Any other valid response
1(b)	Accept drawings of any **two** methods of temporary attaching items to a round tube: cam clamp, cupping the tube between two clamps which are screwed together, leaver locks, velcro straps, ratchet straps, cable ties, jubilee clips, carabiner, tape [1 x 4]	**4**	Maximum of 2 marks for each drawing: Appropriate method named / described – 1 mark Method sketched – 1 mark Any other valid response
1(c)	Any **three** suitable ideas. Award up to **6 marks for communication of ideas** using the 'Communication of ideas' table. Award up to **6 marks for suitable designs** using the 'Suitable designs' table.	**12**	At least **three different** ideas for maximum marks. Pro rata if fewer.

Question	Answer	Marks	Guidance
1(d)	Award up to **6 marks for evaluation** of the ideas: Evaluation [2 × 3] e.g. Advantage + disadvantage explained for each idea Selection [1] Justification - **not** single words, or generic terms such as the best, meets the specification or most suitable [1]	**8**	Simple descriptions or repeats of same points for each idea not rewarded. Specific not generic justification. Award maximum marks if only either advantage or disadvantage given for each as long as includes sophisticated reasoning.
1(e)	Award up to **4 marks for quality of drawing** using the 'Quality of drawing' table. Award up to **2 marks for dimensions:** 2 or 3 overall dimensions only – **1 mark** Additional detail dimensions – **1 mark** Award up to **6 marks for construction detail** using the 'Construction details' table.	**12**	Additional detail dimensions might show thickness of materials, diameters, etc.
1(f)	Accept any **two** suitable **specific** materials. [1 × 2] Accept any **appropriate** reason for choice of **each** material [1 × 2]	**4**	Each suitable specific material – 1 mark Generic terms such as wood, metal, plastic **not** accepted. Appropriate reason for each material – 1 mark Materials must be appropriate for the design shown in **(e)**
1(g)	Accept any suitable manufacturing process. [1 × 1]	**1**	Process must be appropriate for design in **(e)**.
	Award up to **3 marks for description of process**.	**3**	Detailed description for 3 marks
	Award up to **2 marks for names of tools, equipment or machines used**.	**2**	Basic marking out tools, such as pencil or rule, or just drawings of tools / equipment = 1 mark only

Question	Answer	Marks	Guidance
OR			
2(a)	Accept any **four** additional specification points – keeps bottles separate (individual compartments), stops bottles moving around, handle suitable for different sized hands, comfortable handle, locking system to hold the shape once unfolded, easy / able to be refolded for reuse, instructions for assembly clearly shown on the side of the unit, suitable for a range of bottles, strong enough to hold 6 heavier bottles without falling apart, recyclable due to short lifespan etc. [1 × 4]	**4**	Each specification point – 1 mark No repeats from question: hold six bottles, made from graphic materials, fold flat, carried in one hand Only accept unqualified answers (even if only one word) if relevant to this specific design problem eg. **not** generic answers such as safe, lightweight, portable, strong, durable / sturdy, recyclable / sustainable / re-useable / environmentally friendly, aesthetic / appealing, nice, waterproof. Any other valid response
2(b)	Accept drawings of any **two** methods that allow sheet material to securely attach to itself: fold over and interlocking flaps, tuck flaps, lock rudder flaps, crash locks, arrow tabs, staples, split pins, paper clips, clic rivets, etc. [1 × 4]	**4**	Maximum of 2 marks for each drawing: Method named / described – 1 mark Sketch – 1 mark Any other valid response
2(c)	Any **three** suitable ideas. Award up to **6 marks for communication of ideas** using the 'Communication of ideas' table. Award up to **6 marks for suitable designs** using the 'Suitable designs' table.	**12**	At least **three different** ideas for maximum marks. Pro rata if fewer.

Question	Answer	Marks	Guidance
2(d)	Award up to **6 marks for evaluation** of the ideas: Evaluation [2 × 3] e.g. Advantage + disadvantage explained for each idea Selection [1] Justification - **not** single words, or generic terms such as the best, meets the specification or most suitable [1]	**8**	Simple descriptions or repeats of same points for each idea not rewarded. Specific not generic justification. Award maximum marks if only either advantage or disadvantage given for each as long as includes sophisticated reasoning.
2(e)	Award up to **4 marks for quality of drawing** using the 'Quality of drawing' table. Award up to **2 marks for dimensions:** 2 or 3 overall dimensions only – **1 mark** Additional detail dimensions – **1 mark** Award up to **6 marks for construction detail** using the 'Construction details' table.	**12**	Additional detail dimensions might show thickness of materials, diameters, etc.
2(f)	Accept any **two** suitable **specific** materials. [1 × 2] Accept any **appropriate** reason for choice of **each** material [1 × 2]	**4**	Each suitable specific material – 1 mark Generic terms such as wood, metal, plastic **not** accepted. Appropriate reason for each material – 1 mark Materials must be appropriate for the design shown in **(e)**
2(g)	Accept any suitable manufacturing process. [1 × 1]	**1**	Process must be appropriate for design in **(e)**.
	Award up to **3 marks for description of process**.	**3**	Detailed description for 3 marks
	Award up to **2 marks for names of tools, equipment or machines used**.	**2**	Basic marking out tools, such as pencil or rule, or just drawings of tools / equipment = 1 mark only

Question	Answer	Marks	Guidance
OR			
3(a)	Accept any **four** additional specification points – boxes held securely on the platform, easy to move about / steer, ease of operating the lifting mechanism, compact / takes up little space, resilient to cope with years of use in the shop environment, be able to lift the weight of a box of bottles, height adjustable for different sized shop assistants, easy to restock with multipacks, easy to store when not in use, safe to operate etc. [1 × 4]	**4**	Each specification point – 1 mark No repeats from question: Allow movement around shop, allow to be lifted 400 mm Only accept unqualified answers (even if only word) if relevant to this specific design problem e.g. durable, stable, **not** generic answers such as waterproof, safe, lightweight, strong, nice, aesthetic, sturdy, recyclable / environmentally friendly / sustainable Any other valid response
3(b)	Accept drawings of any two **mechanical** methods for lifting a weight: eccentric mechanism, screw thread, rack and pinion, pulley system, levers and linkages etc. [2 × 2]	**4**	Maximum of 2 marks for each drawing: Method named / described – 1 mark Clear sketch 1 mark Must be a **mechanical** method (not handles, straps etc) Any other valid response
3(c)	Any **three** suitable ideas. Award up to **6 marks for communication of ideas** using the 'Communication of ideas' table. Award up to **6 marks for suitable designs** using the 'Suitable designs' table.	**12**	At least **three different** ideas for maximum marks. Pro rata if fewer.

Question	Answer	Marks	Guidance
3(d)	Award up to **6 marks for evaluation** of the ideas: Evaluation [2 × 3] e.g. Advantage + disadvantage explained for each idea Selection [1] Justification - **not** single words, or generic terms such as the best, meets the specification or most suitable [1]	**8**	Simple descriptions or repeats of same points for each idea not rewarded. Specific not generic justification. Award maximum marks if only either advantage or disadvantage given for each as long as includes sophisticated reasoning.
3(e)	Award up to **4 marks for quality of drawing** using the 'Quality of drawing' table. Award up to **2 marks for dimensions:** 2 or 3 overall dimensions only – **1 mark** Additional detail dimensions – **1 mark** Award up to **6 marks for construction detail** using the 'Construction details' table.	**12**	Additional detail dimensions might show thickness of materials, diameters, etc.
3(f)	Accept any **two** suitable **specific** materials. [1 x 2] Accept any **appropriate** reason for choice of **each** material [1 × 2]	**4**	Each suitable specific material – 1 mark Generic terms such as wood, metal, plastic **not** accepted. Appropriate reason for each material – 1 mark Materials must be appropriate for the design shown in **(e)**
3(g)	Accept any suitable manufacturing process. [1 × 1]	**1**	Process must be appropriate for design in **(e)**.
	Award up to **3 marks for description of process**.	**3**	Detailed description for 3 marks
	Award up to **2 marks for names of tools, equipment or machines used**.	**2**	Basic marking out tools, such as pencil or rule, or just drawings of tools/equipment = 1 mark only