

Cambridge IGCSE™

DESIGN AND TECHNOLOGY**0445/11**

Paper 1 Product Design

May/June 2024

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 2024 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

This document consists of **11** 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.

Performance description tables

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

Part (c)			
Communication of ideas		Suitable designs	
Mark	Performance description	Mark	Performance description
5–6	Ideas are communicated with precision and clarity through the use of accurate drawings and reasoned annotations linked to most of the requirements.	5–6	Creative solutions which fully meet the requirements. Designs showing most aspects of construction detail.
3–4	Ideas are displayed with some clarity through clear drawings supported by annotations referring to some of the requirements.	3–4	Sensible solutions that mostly meet the requirements. Designs with moderate construction detail.
1–2	Simple drawings and limited annotations show little understanding of the requirements.	1–2	Solutions do not meet many of the requirements. Simplistic designs with little construction detail.
0	No creditable response.	0	No creditable response

Part (e)			
Quality of drawing		Construction details	
Mark	Performance description	Mark	Performance Description
4	High standard of line quality, use of colour and proportions. Appropriate techniques used that show clearly all detail.	5–6	All construction detail clear with good annotations and/or additional detail drawings as necessary.
2–3	Good line quality, use of colour and proportions. Most of the detail presented.	3–4	Most construction may be obvious from overall views or with some annotation.
1	Poor line quality and proportions. Little detail presented.	1–2	A simplistic design; little or no detail of construction used.
0	No creditable response.	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. Suitable responses may include: Air holes to breath; soft surface to sit on; easy to clean interior; easy to carry/handles; door must secure closed; easy to get pet in/out [1×4]	4	Each specification point – 1 mark No repeats from question – to transport small household pets, keep the pet safe or only used for a short time. Only accept unqualified or one-word answers if relevant to this specific design problem - lightweight, easily cleanable, hygienic, durable, strong, accessible, comfortable (for the pet), lockable, air holes, weatherproof, waterproof, aesthetic, compact, etc. Do not accept one-word generic answers such as safe, nice, etc. Any other valid response
1(b)	Accept drawings of any two methods of hinges used on doors such as: butterfly hinges; butt hinge; barrel hinge; wooden handmade hinge; piano hinge; fabric hinge, grooves [2×2]	4	Maximum of 2 marks for each drawing: Notes/labels/arrows showing method – 1 mark Clear drawing – 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 [2x3] 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] Additional detail dimensions [1] 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 [1x2] Accept any appropriate reason for choice of each material [1x2]	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 method [1]	1	Process must be appropriate for design in (e) .
	Award up to 3 marks for description of method .	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. Suitable responses may include: product name must be displayed; recyclable packaging; brightly coloured; price tag; barcode; easy to open to remove contents; window to view contents [1×4]	4	Each specification point – 1 mark No repeats from question – hold and display a pet toy, toy must be visible or hung on a display rack. Only accept unqualified or one-word answers if relevant to this specific design problem - recyclable, lightweight, informative, attractive, aesthetic... Do not accept one-word generic answers such as strong, durable, safe, waterproof, water resistant... Any other valid response
2(b)	Accept drawings of any two methods of hanging packaging from a shop display rack such as: euro slot; metal hook; plastic hook; string loop; integrated card hook as part of packaging [2×2]	4	Maximum of 2 marks for each drawing: Notes/labels/arrows showing method – 1 mark Clear drawing – 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 [2x3] 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] Additional detail dimensions [1] 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 [1x2] Accept any appropriate reason for choice of each material [1x2]	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 method [1]	1	Process must be appropriate for design in (e) .
	Award up to 3 marks for description of method .	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. Suitable responses may include: store enough dry food; secure so pet cannot get to contents; variable time for dispensing; indicator screen to show dispensing times; easy to clean; battery powered/power access; easy access control panel to set timings [1×4]	4	Each specification point – 1 mark No repeats from question – feeds animals/pets, used when the owner is away, dispenses food automatically, dispenses a set portion or allows easy access to food Only accept unqualified or one-word answers if relevant to this specific design problem - safe, reliable, robust, programmable, operated by Wi-Fi, stable... Do not accept one-word generic answers such as aesthetic, nice... Any other valid response
3(b)	Accept drawings of any two methods which can be used to dispense a set amount of dry food such as: rotary compartments; automated door which can open; conveyor belt to deliver food through an opening; paddles which rotate to move food through an opening [2×2]	4	Maximum of 2 marks for each drawing: Notes/labels/arrows showing method – 1 mark Clear drawing – 1 mark 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 [2x3] 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] Additional detail dimensions [1] 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 [1x2] Accept any appropriate reason for choice of each material [1x2]	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 method [1]	1	Process must be appropriate for design in (e) .
	Award up to 3 marks for description of method .	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