CAMBRIDGE
International Education

Cambridge IGCSE™

DESIGN & TECHNOLOGY **0445/11**

Paper 1 Product Design **October/November 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 October/November 2024 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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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**	
Marks	**Performance description**		**Marks**	**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**	
Marks	**Performance description**		**Marks**	**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 – must allow plants to be watered but not spill out, allow access to plants, separate compartments for different vegetables/herbs, materials which do not rot when in contact with moisture, screw holes to fix to wall, bracket/shelf component to allow it to be fixed to a wall. [1 × 4] Acceptable one word and short answers: waterproof, sturdy, robust, durable, rustproof, support plants, fit into space, Any other valid response	**4**	Each specification point – 1 mark No repeats from question: for growing vegetables or herbs, used in a limited space, should allow three different vegetables or herbs to be grown and attached to a wall. Only accept unqualified answers if relevant to this specific design problem, **not** generic answers such as safe, lightweight, strong, nice, aesthetic. unless qualified.
1(b)	Accept drawings of any **two** methods of making woods/metals resistant to moisture: polyurethane varnish; yacht varnish; resin; polymer dip coating; metal paints; electro plating. [2 × 2] Award marks for the method, the material does **not** need to be named. If the material is incorrectly named, do **not** awarded the second mark. Two applications of the same method, for example paint on wood and paint on metal, award a maximum of three marks. Any other valid response	**4**	Maximum of 2 marks for each response: Appropriate method sketched – 1 mark Appropriate notes – 1 mark
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 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] Award up to **3 marks for description of process**. Award up to **2 marks for names of tools, equipment or machines used**.	**6**	Process must be appropriate for design in **(e)** and **not** just a stage in the making of a part of the solution. Detailed description for 3 marks 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 – use of bright colours to attract children; fun images, anthropomorphic features added to vegetables, clear slogans written on the display, wide base to it cannot topple over, images associated with vegetables being healthy and fun [1 × 4] Acceptable one word and short answers: visually attractive, colourful, use logos, cartoon characters, weatherproof, easy to clean, methods of attracting attention, informative of health benefits, nutritional values, easy to read. Any other valid response	**4**	Each specification point – 1 mark No repeats from question: encourages children to eat healthy foods, used in a shop, for display, made from lightweight materials, flat-packed and assembled by the shop workers. Only accept unqualified answers if relevant to this specific design problem, **not** generic answers such as safe, lightweight, strong, nice, easily assembled. unless qualified.
2(b)	Accept drawings of any **two** methods of temporarily joining thin materials: slot joints; plastic click rivets, Velcro tabs, male/female locking mechanisms, poppers, paper fasteners [2 × 2] The method must be temporary for the award marks. If not for thin materials, award only one mark. Two applications of the same method, for example Velcro on foamboard and Velcro on thin plastic sheet, award a maximum of three marks. Any other valid response	**4**	Maximum of 2 marks for each response: Appropriate method sketched – 1 mark Appropriate notes – 1 mark

Question	Answer	Marks	Guidance
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.
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 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)**

Question	Answer	Marks	Guidance
2(g)	Accept any suitable manufacturing process. [1 × 1] Award up to **3 marks for description of process**. Award up to **2 marks for names of tools, equipment or machines used**.	**6**	Process must be appropriate for design in **(e)** and **not** just a stage in the making of a part of the solution. Detailed description for 3 marks 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 – must remove only the skin of vegetable, easy to adjust to shape, simple mechanism which allows mechanical advantage, easy to clean, waterproof, must hold vegetable securely, must be comfortable to operate for different hand sizes [1 × 4] Acceptable one word and short answers: safe (for the user), secure, strong, hygienic, not damage worktop, can be dismantled, adjustable, aesthetically pleasing, operate efficiently/quickly, easy used, non-toxic finish. Any other valid response	**4**	Each specification point – 1 mark No repeats from question: used by people with limited strength/mobility, used to peel vegetables, hold different types/sizes of vegetables and able to be secured to a kitchen worktop. Only accept unqualified answers if relevant to this specific design problem, **not** generic answers such as lightweight, strong, nice.
3(b)	Accept drawings of any **two** methods which could remove the skin of a root vegetable: grating, cutting with a blade, abrasive panels, abrasive wheels, scraper. [2 × 2] Two applications of the same method, for example a knife used on a carrot and a knife used on a potato, award a maximum of three marks. Any other valid response	**4**	Maximum of 2 marks for each response: Appropriate method sketched – 1 mark Appropriate notes – 1 mark
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 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 × 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] Award up to **3 marks for description of process**. Award up to **2 marks for names of tools, equipment or machines used**.	**6**	Process must be appropriate for design in **(e)** and **not** just a stage in the making of a part of the solution. Detailed description for 3 marks Basic marking out tools, such as pencil or rule, or just drawings of tools/equipment = 1 mark only