

Cambridge IGCSE™

DESIGN & TECHNOLOGY**0445/31**

Paper 3 Resistant Materials

October/November 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 October/November 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level 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.

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 standardisation 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
	Unclear
	Benefit of the doubt
	Incorrect point
	Error carried forward
N/A	Highlighting areas of text
	No benefit of doubt given
N/A	Off-page comment – allows comments to be entered off the page
	Repeat
	Indicates that the point has been noted, but no credit has been given
	Indicates that the point has been noted, but no credit has been given (big)

Annotation	Meaning
	Correct point
	Too vague
	Relevant detail

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Question	Answer	Marks	Guidance
1(a)	Quicker, meet customer demands, less prone to warping, temperature controlled	1	Do not accept more environmentally friendly
1(b)	More evenly dried, better quality timber, cheaper, cost effective, low maintenance, uses less electricity, larger scale	1	

Question	Answer	Marks	Guidance
2	Strips shown on one end [1] Strip shown along the length of one side [1]	2	Award 1 mark for 'strips' shown on one side

Question	Answer	Marks	Guidance
3(a)	Dividers	1	
3(b)	Make indentation [1] Use of centre or dot punch [1]	2	

Question	Answer	Marks	Guidance
4(a)	Polypropylene, PP	1	
4(b)	HDPE, PET, polyethelene	1	Do not accept polythene, LDPE

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Question	Answer	Marks	Guidance
5(a)	Cutting gauge	1	
5(b)	Mortise gauge	1	

Question	Answer	Marks	Guidance
6	Sitting height, shoulder height, lower leg length, hips width, elbow height, buttock seat depth], buttock-knee length [3 × 1]	3	Reference to parts of the chair must be accompanied with reference to human body

Question	Answer	Marks	Guidance
7	Saw/cut made: hacksaws, tin snips, piercing saw [1] Secure sheet vice, cramps, folding bars [1] Method of force: hammer, mallet, pliers [1] 3 Correctly named tools/equipment [1]	4	

Question	Answer	Marks	Guidance
8	Benefit: the baby will not burn their tongue or mouth [1] Because the spoon will change colour [1]	2	
9	2 'slots' in right hand piece [1] 2 'slots' in left hand piece [1] 1 biscuit shown [1]	3	Biscuit should 'match' size of slot Reward biscuit shown in slot

Question	Answer	Marks	Guidance
10(a)	Pop rivet gun, rivet gun, pop rivet	1	Do not accept 'rivet'

Question	Answer	Marks	Guidance
10(b)	Soldering, brazing, welding	1	

Question	Answer	Marks	Guidance
11(a)	3 specification points: safe in use, no sharp edges, finger traps, non-toxic finish, well-built to withstand misuse, sturdy, durable, easy to move around, attractive, aesthetically pleasing [3 × 1]	3	Accept any valid specification points Do not accept weather resistant, lightweight
11(b)	(Twist) drill [1] used to drill holes for saw blade [1] Coping saw [1] blade inserted through hole and refitted to remove shape [1] File [1] used to make sawn edges flat/smooth [1]	6	Description of use MUST relate to the window otherwise 0 If tool is incorrect, description of use can be marked as correct
11(c)	Ends of dowel tapered to assist entry [1] Saw-cuts along the length of dowel or across the ends [1]	2	
11(d)	Hardwood held securely while sawn [1] 12mm thickness can be sawn without need for marking out [1] Suitable material for jig [1] 2 sizes [2 × 1]	5	Ignore saw blade and material thicknesses
11(e)	Axle fitted to wheels [1] Axle through side of bus or supported under bus [1] Free rotation: washer, bearing, larger diameter hole [1] Dimension [1]	4	If wheel rotates on axle, method of retention must be shown for 1 mark If axle is rotates through side of bus, hole must be larger to gain mark for 'Free rotation' Award maximum 2 marks for 'stub' axle, or screws that are fitted to ONE side of bus only

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Question	Answer	Marks	Guidance
11(f)	Practical modification [1] Fitted to front of bus [1] Additional notes [1]	3	Reward modification and additional notes only if shown on back of bus
11(g)	Reason for wood-based toys: hardwearing, durable, 'solid' [1] Reason for plastic toys: appealing colours, more details possible, waterproof, can be cleaned and washed, lightweight [1]	2	Accept any valid reasons for both types of toy Do not accept wooden toys are 'non-toxic' and plastic toys are 'cheap' Only accept wooden toys are attractive if reference is made to 'grain features'

Question	Answer	Marks	Guidance
12(a)	Ability of thermoplastics to be reheated and reshaped	1	
12(b)	Retain paper/plastic backing sheet. Apply a separate backing sheet.	1	
12(c)	A material that has a surface prepared for final appearance [1] Needing no further treatment [1]	2	
12(d)(i)	Scriber produces a permanent mark that cannot be erased whereas a chinagraph pencil can be erased	1	
12(d)(i)	Sawing process: Name of saw [1] Method of holding work piece [1] Sketch showing process [1] Edge finishing process: Edge filed [1] Method of holding work piece [1] Use of 'wet and dry paper' and/or polishing mop [1]	6	Appropriate saws: Hegner, scroll, coping, tenon Reward 'holding securely' when using Hegner type saws without reference Do not accept jig saw

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Question	Answer	Marks	Guidance
12(e)	Method of heating: strip heater, line bender, hot air gun [1] Some type of former to enable acrylic to be bent to shape [1] Method of retention [1] Accuracy of technical details [1]	4	Do not accept oven
12(f)	Stages: transfer/download data to CNC machine, place MDF on bed of machine, set tool parameters, computer 'print', 'run' [4 × 1]	4	Accept any valid stages
12(g)	Generally cheaper than pre-assembled products, personal satisfaction, can be taken apart to repair or for storage, less space when stored, can be assembled by non-expert [2 × 1]	2	Do not accept 'faster'
12(h)	MDF is made from waste materials which has little or no impact on existing resources, biodegradable [0 – 2] Acrylic is made from oil which is a finite resource, non-biodegradable [0 – 2]	4	Accept any valid issues

Question	Answer	Marks	Guidance
13(a)	3 specification points: menu card dimensions, method of changing menu card, exact location, size of table surface, café décor/style, stable in use, attractive, aesthetically pleasing, durable, easy to manufacture [3 × 1]	3	Accept any valid specification points Do not accept references to writing on menu, lightweight
13(b)	Template with holes drilled [1] + 1 side [1] + 1 edge located [1] Suitable material for jig named [1]	4	Template with holes drilled = 1 Template with holes drilled + 1 side = 2
13(c)(i)	Block, jack, smoothing planes	1	

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Question	Answer	Marks	Guidance
13(c)(ii)	Methods: Wood held secure in vice or with cramps Wood could be held in a vice between its sides or held between its edges	3	Award 0–2 dependent on technical accuracy [0 – 2] Additional notes [1]
13(d)(i)	Metals that do not contain iron	1	
13(d)(ii)	Annealing	1	
13(e)	Jig design: EITHER a flat board with locating pegs/pins OR bent around a shaped former held in a vice or held with cramps [0 – 2] Held securely in place [1] Method of force [1]	4	
13(f)(i)	White/French polish, Danish/Teak oil, wax, olive oil	1	Do not accept varnish, oil [on its own]
13(f)(ii)	Lacquer	1	
13(g)	2 parts of epoxy resin: resin + hardener [1] Equal parts mixed together [1]	2	
13(h)	Menu stand A is the more economical to produce [1] Reasons to support choice should expand on fewer materials, types of construction and processes involved to batch produce Supportive reasons [3 × 1]	4	Reward any valid justified points