

# Cambridge IGCSE™

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**DESIGN & TECHNOLOGY****0445/01**

Paper 1 Product Design

**For examination from 2028**

MARK SCHEME

Maximum Mark: 50

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**Specimen**

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This document has **8** pages.

**Generic Marking Principles**

All examiners must apply these general marking principles when marking candidate responses. Examiners must apply them alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme must 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 descriptions for the question
- the specific skills defined in the mark scheme or in the generic level descriptions 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 descriptions.

**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:**

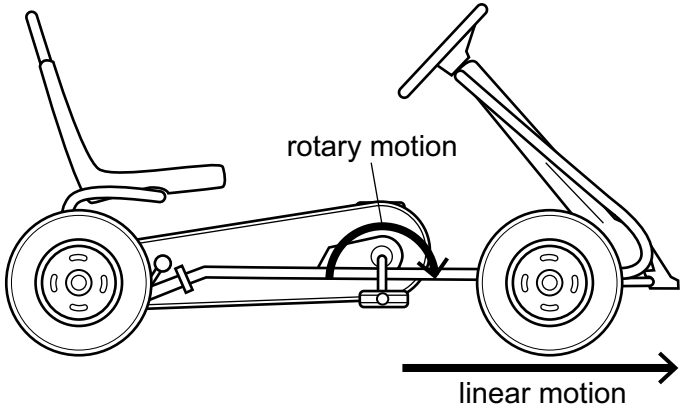
Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptions in mind.

Question	Answer	Marks	Guidance
1(a)(i)	<b>aesthetics</b> The lamp shade could be made in a range of colours [1] allowing customers to select a colour that matches the decoration of their room. [1]	<b>2</b>	Award one mark for demonstrating an understanding of the influence and one mark for explaining how that might apply to the adjustable desk lamp. Any other valid response
1(a)(ii)	<b>sustainability</b> Base is made from a softwood [1] as this material is a renewable resource. [1]	<b>2</b>	Award one mark for demonstrating an understanding of the influence and one mark for explaining how that might apply to the adjustable desk lamp. Any other valid response
1(a)(iii)	<b>where the product will be used</b> The product will be used indoors / The product will be used on a flat surface [1] so the materials do not need to be weather resistant / so the base must provide a stable platform to hold the light securely. [1]	<b>2</b>	Award one mark for demonstrating an understanding of the influence and one mark for explaining how that might apply to the adjustable desk lamp. Any other valid response

Question	Answer	Marks	Guidance
Mark parts 1(b) and 1(c) using the following performance description tables.			
<b>Communication of the idea</b>			
<b>Mark</b>	<b>Description</b>		
2	Idea is communicated with precision and clarity through the use of detailed sketches and reasoned annotations linked to most of the requirements.		
1	Idea is displayed through sketches supported by annotations referring to some of the requirements.		
0	No creditable response.		
<b>Suitability of the idea</b>			
<b>Mark</b>	<b>Description</b>		
3–4	Creative solution which fully meets the stated requirements. Design shows most aspects of construction detail.		
1–2	Simple solution that meets some of the stated requirements. Some construction details are shown.		
0	No creditable response.		
1(b)	Responses are likely to focus on clamping the lamp to a desk surface. (G-clamp, magnets, suction cups)	<b>6</b>	Acceptable answers may be a redesign or a modification to the existing design
1(c)	Responses are likely to focus on screw mechanisms.	<b>6</b>	
1(d)	1 To check if the mechanism works [1] 2 To see how the design looks in three dimensions (3D) [1]	<b>2</b>	Any other valid response
1(e)	Replace the switch with a touch sensor [1] activated by simply touching rather than physically moving a switch. [1]	<b>2</b>	Identify part of the lamp and the modification [1], how this modification meets the needs of the user [1] Any other valid response

Question	Answer	Marks	Guidance
2(a)	A suitable softwood e.g. pine [1]  A suitable property of a softwood e.g. A paint finish can be applied to provide an attractive finish. [1]  A suitable thermoplastic e.g. PVC [1]  A suitable property of corrugated cardboard e.g. Has a smooth surface that can have images and text printed on it. [1]	4	Any other valid response
2(b)	tri-square / rule / compass / marking gauge / marking knife [2 × 1 mark]	2	Any other valid response
2(c)	Handle: fret saw / laser cutter / coping saw / craft knife [1] Box: craft knife / scissors / cutter plotter [1]	2	Any other valid response
2(d)	paint / varnish [2 × 1 mark]	2	Any other valid response
2(e)	The plastic handle can easily be removed [1] from the cardboard box for recycling. [1]	2	Any other valid response
2(f)	Development (net) [1] To show the stages in making the box in the correct order. [1]	2	

Question	Answer	Marks	Guidance
3(a)(i)	The cover over the sprocket and chain drive is an example of a shell structure.	2	Award one mark for notes and one mark for the sketch. Any other valid response
3(a)(ii)	The child's weight compresses the seat.	2	Award one mark for notes and one mark for the sketch. Any other valid response

Question	Answer	Marks	Guidance
3(b)(i)	<p>The wheels will rotate at twice the speed of the pedals. [2] OR The pedals will rotate at half the speed of the wheels. [2]</p>	<b>2</b>	<p>Award one mark for an understanding that the wheels will rotate more/faster/quicker than the pedals.</p> <p>Second mark for the detailed answer showing how much the speed of the pedals will change.</p> <p>OR</p> <p>Award one mark for understanding of power reduction between the pedal sprocket and the wheel sprocket (less power).</p> <p>Second mark for details of the power reduction (half power).</p> <p>Any other valid response</p>
3(b)(ii)	<p>Rotary motion with correct arrow for the wheels/pedals [1] Linear motion and correct arrow for movement of the pedal toy [1].</p>  <p>The diagram shows a side view of a pedal toy. It has two wheels, a central axle, and a pedal arm. A curved arrow labeled 'rotary motion' points to the central axle. A straight arrow labeled 'linear motion' points to the right, indicating the direction of travel.</p>	<b>2</b>	<p>For each mark the arrow and correct name must be present.</p> <p>Any other valid response</p>

Question	Answer	Marks	Guidance																						
3(c)	<p>Mark using the following performance description tables:</p> <table><tr><th colspan="2">Modification</th></tr><tr><th>Mark</th><th>Description</th></tr><tr><td>4</td><td>The modification is appropriate and would increase the appeal of the toy. The circuit is accurately described in terms of input, process and output and would work.</td></tr><tr><td>2 - 3</td><td>The modification is largely appropriate. The circuit is described, although some aspects of the input, process and output may be unclear or missing but may work.</td></tr><tr><td>1</td><td>The modification may not be appropriate. Some stages in the input, process and output are mentioned but the circuit would not work.</td></tr><tr><td>0</td><td>No creditable response.</td></tr></table> <table><tr><th colspan="2">Components</th></tr><tr><th>Mark</th><th>Description</th></tr><tr><td>2</td><td>Most components required to make the modification are accurately named and shown in the correct positions.</td></tr><tr><td>1</td><td>Some components required to make the modification are named.</td></tr><tr><td>0</td><td>No creditable response.</td></tr></table>	Modification		Mark	Description	4	The modification is appropriate and would increase the appeal of the toy. The circuit is accurately described in terms of input, process and output and would work.	2 - 3	The modification is largely appropriate. The circuit is described, although some aspects of the input, process and output may be unclear or missing but may work.	1	The modification may not be appropriate. Some stages in the input, process and output are mentioned but the circuit would not work.	0	No creditable response.	Components		Mark	Description	2	Most components required to make the modification are accurately named and shown in the correct positions.	1	Some components required to make the modification are named.	0	No creditable response.	6	<p>Examples: Lights, indicators, hooter, engine noise, powered drive for the pedal toy.</p> <p>The response to this question does not need to be a circuit diagram.</p> <p>Any other valid response</p>
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