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**DESIGN AND TECHNOLOGY**

**0445/13**

Paper 1 Product Design

**October/November 2019**

MARK SCHEME

Maximum Mark: 50

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**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 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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This document consists of **4** printed pages.

**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 descriptors 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.

Question	Answer	Marks
1(a)	Accept any <b>four</b> additional suitable points – non-toxic, safe shape, pulling string, low friction, realistic appearance, bright colour, appeal to young child, AOVR $1 \times 4$ No repeats of question	<b>4</b>
1(b)	Accept drawings of any <b>two</b> methods of linking – hook and eye, fixed pins and chain, hooks and chain, slotting mechanism, AOVR $2 \times 2$	<b>4</b>

Question	Answer	Marks
2(a)	Accept any <b>four</b> additional suitable points – lightweight, stable in use, attracts attention, realistic appearance, includes surrounding area, transparent windows, AOVR $1 \times 4$ No repeats of question	<b>4</b>
2(b)	Accept drawings of any <b>two</b> building material representations – paper lay on, lines/grooves cut into surface, plastic sheet, stencil painting, 'built up blocks/bricks', balsa strips, AOVR $2 \times 2$	<b>4</b>

Question	Answer	Marks
3(a)	Accept any <b>four</b> additional suitable points – safe power source, hidden mechanism, operated as train approaches, firm fixing to track or board, barriers linked together, AOVR $1 \times 4$ No repeats of question	<b>4</b>
3(b)	Accept drawings of any <b>two</b> mechanisms – belt and pulley, chain and sprocket, worm and wheel, gear system, resistor, AOVR $2 \times 2$	<b>4</b>

Question	Answer	Marks
1, 2 and 3(c)	Any suitable ideas. At least <b>three different</b> ideas for maximum marks. Pro rata if fewer.  <b>Communication</b> Simple drawings displaying a low standard or limited range of techniques. 0–2 Clear drawings displaying a good standard and a range of techniques – shading, colour, annotation. 3–4 High quality drawings using a wide range of techniques with clear annotation and detail. 5–6	<b>6</b>
	<b>Suitability</b> Simplistic designs showing outlines only. 0–2 Rather more detail, sensible solutions that could work. 3–4 Accurate solutions, good fitness for purpose, construction detail. 5–6	<b>6</b>

Question	Answer	Marks
1, 2 and 3(d)	Evaluation of each of the ideas. At least 3 evaluations up to 2 marks each.	6
	Selection and justification.	1 + 1 2
1, 2 and 3(e)	<b>Quality of drawing</b> Poor line quality, proportions, little detail Good line work, use of colour, proportions, some detail. High standard throughout with a range of techniques that show clearly all detail.	1 2–3 4 4
	<b>Dimensions</b> 2 or 3 overall dimensions only Additional detail dimensions	1 1 2
	<b>Construction detail</b> A simplistic approach showing little or no detail of construction to be used. Most construction detail may be obvious from overall views or from some annotation. All construction detail will be clear with good annotation and additional detail drawings as necessary.	0–2 3–4 5–6 6
1, 2 and 3(f)	Suitable <b>specific</b> materials stated.	1+1 4
	Appropriate reasons for choice.	1+1
1, 2 and 3(g)	Suitable method described.	1 6
	Good detailed description of: processes tools	0–3 0–2