



General Certificate of Secondary Education (Short Course)
June 2011

Design and Technology: Short Course **45751**

(Specification 4575)

Unit 1: Written Paper

Pre-Standardisation

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

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Question	Part	Sub Part	Marking Guidance	Mark	Comment										
1	(a)		<table border="1"> <thead> <tr> <th>Material</th> <th>Property</th> </tr> </thead> <tbody> <tr> <td>Polyester</td> <td>Crease resistant</td> </tr> <tr> <td>Margarine</td> <td>Shortening</td> </tr> <tr> <td>Copper</td> <td>Ductile</td> </tr> <tr> <td>Acrylic</td> <td>Brittle</td> </tr> </tbody> </table>	Material	Property	Polyester	Crease resistant	Margarine	Shortening	Copper	Ductile	Acrylic	Brittle		x 1 mark for each correct answer Max 4 marks
Material	Property														
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1	(b)	(ii)	<p>Response demonstrates an understanding of the property term, therefore the explanation about why the property is useful is specific e.g.</p> <p>Ductility - Ductile materials can be bent or stretched whilst cold without breaking or fracturing. This is useful in jewellery making where a lot of items are formed using cold processes.</p> <p>Shortening – Fat coats flour to prevent water developing the gluten in flour. This gives pastry a crumbly “short” texture.</p> <p>Crease resistance – Polyester is an elastic fibre which is often blended with other fibres such as cotton to provide crease resistance. This means that clothes are easier to iron and lower temperatures can be used.</p> <p>Brittleness – Brittle materials will not withstand shocks or bending without fracture. Fire alarm covers are made from brittle materials as they are designed to be easy to break.</p> <p>Response suggests that the candidate has some understanding, but the response is a little vague</p> <p>Explanation does not relate to the properties listed</p>		Max 2 Marks 1 0										

1	(c)	Product chosen has been enhanced by the addition of a thermo chromic pigment. i.e. improves / increases range of product functions E.g. feedback on whether temperature is OK. E.g. baby bath/ teapot	2	Max 3 marks
		Product chosen could incorporate thermo chromic inks, but this may improve the aesthetics only. e.g. t-shirt which changes colour because of changes in body temperature	1	
		Product chosen does not have any functions relating to temperature and therefore the addition of a thermo chromic ink does not improve the product	0	
		Additional mark for good quality communication through sketches or written explanation of the idea	1	

Question	Part	Sub Part	Marking Guidance	Mark	Comment
2	(a)		<p><i>Mark scheme to be exemplified with examples for each mark range</i></p> <p>Effective pattern drawn which meets criteria i.e. only two colours, geometric. Interesting design achieved by using a variety of geometric shapes/ rotation of a pattern</p> <p>Simple design achieved which meets the criteria. May be a direct copy of a pattern from the stimulus provided</p> <p>An attempt at a pattern using geometric shapes. May be very simplistic e.g. checkerboard. May have ignored some of the criteria e.g. number of colours.</p> <p>Drawing not made from geometric shapes</p>	3 2 1 0	Max 3 marks
2	(b)		<p>Product accurately redrawn from the sketch. Repeat pattern applied in an appropriate scale. Design thought given to how much of the design should be covered by the pattern, so design is effective</p> <p>Product accurately redrawn from the sketch. Repeat pattern applied in a sensible manner, design is effective</p> <p>Reasonable drawing with design applied</p> <p>Recognisable drawing of product. Pattern applied, but not terribly effective</p>	4 3 2 1	Max 4 marks
2	(c)	(i)	<p>Any specific CAD package named e.g. Corel draw, 2D design, Adobe Illustrator, Adobe Photoshop, Corel Photopaint, Pro Desktop</p>	1	<p>Max 1 mark</p> <p>No marks for programs such as word, power point etc</p>

2 (c) (ii) Advantages of using CAD – responses may include: Max 2 marks

- Designs can be saved and used again
- Easy and quick to make changes to a design
- Possible to use software to make a virtual prototype for evaluation – this saves time and money
- 3D software allows designs can be viewed from different angles and designs can be rendered to look like a real material
- Designs can be shared with others through email
- Designs can be sent directly to a CAM output for manufacture

Simplistic point made 1

2 separate points or one point with further qualification/ explanation 2

2 (d) An appropriate process to apply a surface pattern decoration named e.g. Max 1 mark

Food	Textiles	Resistant Materials
Roll out icing Piping Printing using edible ink	Block printing Iron on vinyl Sublimation printing Applique Machine embroidery	Vinyl cutting Etching (laser) Inlay Sublimation printing

2	(e)	Mark scheme to be exemplified with examples for each mark range and for a variety of likely responses (above)	Max 9 marks
		A lot of detail provided, demonstrating a high level of feasibility, very little information missing (6+ pieces of information included in the response), possible to apply the decoration from the info provided. Clear to follow plan through sequencing (flowchart) or tabular form presentation	7 – 9
		Planning in a lot of detail (5-6 pieces of information), however there may be one or two errors or omissions but overall the response shows that the candidate has a clear idea about how the design would be applied. With some minor adjustments this is feasible. Clear to follow plan.	5 – 6
		Plan describes a process which idea is feasible, but may not be the best way of applying the decoration to the product, or a process has been accurately described but it is inappropriate for the selected product. Sufficient labelling to explain in simple terms how the decoration would be applied (3 – 4 pieces of information can be gleaned from the response)	3 – 4
		Insufficient detail to ascertain whether the process is feasible. Some tools named but description of the process is missing.	1 – 2
		Description of how the product is to be made rather than how pattern decoration is to be applied.	0

Question	Part	Sub part	Marking Guidance	Mark	Comment
3	(a)		Hand span Finger width	2 x 1	Max 2 marks
3	(b)	(i)	Colour Bright primary colours are attractive to children White phone gives a good contrast to buttons so they stand out		Max 2 marks
			1 mark for identification of feature e.g. primary colours used	1 mark	
			Additional mark for explanation/ evaluative comment relating to children	1 mark	
3	(b)	(ii)	Shape / form No sharp edges for safety Tapered in the middle to make it easier to grip Appropriate size for small children, big buttons so easier to press even with poor manual dexterity. Large so not a choking hazard		Max 2 marks
			1 mark for identification of feature e.g. big buttons	1 mark	
			Additional mark for explanation/ evaluative comment relating to children	1 mark	
3	(b)	(iii)	Educational features Designed to look like a phone, so good for role play – encourages children to talk into the phone and develop speech Learn to recognise numbers and count Develop motor skills in pressing buttons, Rewarded for doing this through the use of sound		Max 2 marks
			1 mark for identification of feature e.g. role play	1 mark	
			Additional mark for explanation/ evaluative comment relating to children	1 mark	

3	(c)	CE mark – Conforms to European standards. Legal requirement for mark to be on all toys sold in the UK.	2 x 2 marks Max 4 marks
		Lion Mark – Mark from the toy and hobby association. Helps consumers to see that a toy has been deemed safe for children. Those displaying the mark are members of the association and have to adhere to codes of practice.	2 x 1 mark
		Identification of symbol	
		Explanation of what the symbol means	2 x 1 mark

3	(d)	<p>Opportunity for crediting written communication through extended writing. Look to credit points made with qualification/ examples either specific to the toy phone at the start of the question or any toys aimed at a very young age group</p> <p>Possible responses may include:</p> <ul style="list-style-type: none">• Battery compartment secure, cannot be opened by young children• Weight – not too heavy so unlikely to drop and cause injury• Size – not a choking hazard, no small parts that are easy to break off• Non toxic materials in case it goes in the mouth, moisture resistant casing• Possible to clean with a damp cloth to maintain hygiene• Shape – No sharp edges, curved at corners <p>3+ separate points made qualified with examples Response well structured with good use of appropriate design and technology and showing a good grasp of grammar, punctuation and spelling.</p> <p>2+ points made with some explanation Response reasonably well structured with some use of design and technology terminology with some errors in grammar, punctuation and spelling.</p> <p>simplistic response e.g. possible danger identified such as choking hazards, but little further explanation Response poorly structured with little or no use of design and technology terminology and with numerous errors in grammar, punctuation and spelling.</p>	<p>Max 6 marks</p> <p>5 – 6</p> <p>3 – 4</p> <p>1 – 2</p>
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Question	Part	Sub part	Marking Guidance	Mark	Comment								
4	(a)		<p>Paper pattern</p> <ul style="list-style-type: none"> • Pin the paper pattern to the fabric • Draw around the pattern with tailors chalk and transfer any pattern markings to the fabric • Cut around the pattern with fabric scissors <p>Weighing scales</p> <ul style="list-style-type: none"> • Put the pan onto the weighing scale • Make sure the dial is set to zero • Weigh dry ingredients first before ingredients such as margarine so that it doesn't stick to the pan • Always stand directly in front of the scale to make sure an accurate reading is achieved <p>Tri Square</p> <ul style="list-style-type: none"> • Measure and mark with a pencil • Place the try square against the wood so that it is flush so the lines marked are at 90 degrees/parallel • Transfer the markings all the way around the wood. Shade in the waste wood to avoid cutting the wrong side of the material <p>1 mark for each stage/step described in using chosen tool to mark out as detailed above</p>	3 x 1 mark	Max 3 marks								
4	(b)		Any appropriate tool named e.g. measuring tape, measuring cups/spoons, marking gauge, vernier gauge, jug	2 x 1	Max 2 marks								
4	(c)	Units of measurement correctly identified.	<table border="1"> <thead> <tr> <th>Material or ingredient</th> <th>Unit of measurement</th> </tr> </thead> <tbody> <tr> <td>Timber</td> <td>mm/m</td> </tr> <tr> <td>Fruit</td> <td>g/kg</td> </tr> <tr> <td>Milk</td> <td>ml/l</td> </tr> </tbody> </table>	Material or ingredient	Unit of measurement	Timber	mm/m	Fruit	g/kg	Milk	ml/l	1 x each correct mark	Do not award marks for imperial units. Max 3 marks
Material or ingredient	Unit of measurement												
Timber	mm/m												
Fruit	g/kg												
Milk	ml/l												

4

(d) (i)

Max 2 marks

Food processor	Laser cutter	Pillar drill
Lid must be locked in place otherwise the food processor will not work	Extraction of fumes	Drill has a guard to protect fingers
Plunger to push food onto grater attachment so less likely to cut fingers	Automatic cut off if the lid is opened	Emergency stops located so that the machine can be turned off quickly in an emergency

1 mark for each feature identified to a maximum of 2
e.g. emergency stop

2 x 1
mark

Or

1 safety feature identified and explanation provided

2
marks

4

(d) (ii)

Max 2 marks

Food processor	Laser cutter	Pillar drill
Do not leave attachments in the sink to avoid cutting fingers	Correct set up of machine for the material to be used to avoid a risk of fire	Always clamp work, do not hold with fingers
Do not operate with wet hands to avoid electrocution	Do not leave the machine unattended when in use	Wear goggles to avoid pieces going into eyes
		Long hair tied back/loose clothing tucked in to avoid getting caught in the drill

Safety rule stated e.g. wear goggles
Identification of how this protects user

1 mark
1 mark

Total 120 marks