

# Mark Scheme (Results)

## Summer 2010

GCSE

GCSE Design and Technology:  
Graphics Product (1972)  
Paper 2H  
Higher Written Paper.

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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1(a)(i)	<p><b>Quality</b>  <b>Point:</b> The case should be free from damage  <b>Reason:</b> Consumer satisfaction / maintain sales</p> <p><b>Point:</b> The case should hold the contents in place  <b>Reason:</b> Consumer satisfaction / aesthetic appearance</p> <p><b>Point:</b> Any text should be easy to read / clearly printed  <b>Reason:</b> Consumer satisfaction / brand reputation</p> <p><b>Point:</b> The materials the game is made from should be durable /reliable  <b>Reason:</b> Consumer satisfaction / brand reputation</p> <p><b>Point:</b> The set should comply with relevant legal standards  <b>Reason:</b> Moral and legal obligation</p> <p style="text-align: right;">(2x1)</p>	(2)
1 (a)(ii)	<p><b>Environment</b>  <b>Point:</b> Minimum materials used  <b>Reason:</b> Resource conservation</p> <p><b>Point:</b> Made from recycled materials / Possible to be recycled  <b>Reason:</b> Resource conservation / waste minimisation</p> <p><b>Point:</b> The manufacture of the case should not cause pollution  <b>Reason:</b> Protection of the environment</p> <p><b>Point:</b> The case should display a recycle symbol  <b>Reason:</b> Consumer awareness</p> <p style="text-align: right;">(2x1)</p>	(2)
1 (a)(iii)	<p><b>Safety</b>  <b>Point:</b> There should be no sharp edges  <b>Reason:</b> To prevent cuts / harm</p> <p><b>Point:</b> No parts should be toxic  <b>Reason:</b> To prevent poisoning</p> <p><b>Point:</b> The case should display suitable age range  <b>Reason:</b> To prevent young children using it</p> <p><b>Point:</b> The case should be tested to Standards  <b>Reason:</b> legal and moral / increased sales</p> <p style="text-align: right;">(2x1)</p>	(2)

1 (b)	<ul style="list-style-type: none"> <li>• It is rigid (1)</li> <li>• It is non-toxic / safe (1)</li> <li>• It is cost effective / cheap (1)</li> <li>• It can be the shaped / finished (1)</li> <li>• Lightweight (1)</li> <li>• Warm to hold (1)</li> <li>• labels stamps can be glued to it (1)</li> <li>• Pine is a renewable resource (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
1 (c)	<ul style="list-style-type: none"> <li>• Cost effective (1)</li> <li>• Low set up costs (1)</li> <li>• High quality prints (1)</li> <li>• Common Process (1)</li> <li>• Large choice of suppliers (1)</li> <li>• Fast process (1)</li> <li>• It is a full colour process (1)</li> <li>• It prints on paper / card (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
1 (d)	<ul style="list-style-type: none"> <li>• The label will be <b>durable</b> because varnish <b>protects</b> it.</li> <li>• The label will <b>look good</b> because varnish gives a <b>gloss finish</b>.</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
1 (e)	<p>Any two of the following:</p> <p><b>Point:</b> Acrylic is transparent (1) <b>Reason:</b> This allows the contents to be seen (1)</p> <p><b>Point:</b> Acrylic is rigid (1) <b>Reason:</b> This protects the contents / allows the case to maintain its shape (1)</p> <p><b>Point:</b> Acrylic is tough / strong (1) <b>Reason:</b> Makes the case durable (1)</p> <p><b>Point:</b> Acrylic is non toxic (1) <b>Reason:</b> Prevents harming the user (1)</p> <p><b>Point:</b> Acrylic is waterproof / easy to clean (1) <b>Reason:</b> Allows the user to maintain appearance (1)</p> <p><b>Point:</b> Acrylic can be coloured / tinted (1) <b>Reason:</b> Improves appearance /reduces the need for finishing (1)</p> <p><b>Point:</b> Acrylic is a thermoplastic (1) <b>Reason:</b> Allows it to be moulded (1)</p>	(4)

	<p>Point: Acrylic has a smooth surface finish (1) Reason: Allows it be cleaned (1)</p> <p>Point: Acrylic can be fabricated (1) Reason: Makes manufacture quicker / cheaper / easier (1)</p> <p>(2x1) (2x1)</p>	
1 (f)	<p>The case will be tested to ensure it meets its specification therefore maintaining quality of the product / prevent spoilage</p> <p>(2x1)</p>	(2)
1 (g)	<p>(i) Protect the contents</p> <ul style="list-style-type: none"> <li>• The lid will be secure / will not fall off. This will prevent contents becoming lost.</li> <li>• Acrylic is rigid/ tough. This will prevent damage through impacts.</li> <li>• The contents all fit inside the package. This prevents loss.</li> </ul> <p>(ii) Allow the retailer to easily monitor sales of the stamping set</p> <ul style="list-style-type: none"> <li>• There is a bar code printed on the side of the package. This enables EPOS.</li> </ul> <p>(2x1) (2x1)</p>	(4)
<b>Total for question 1</b>		<b>22 Marks</b>

Question Number	Answer	Mark								
2(a)	<table border="1"> <thead> <tr> <th>Material</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td></td> <td>Barrier to air / liquid / contamination / improves appearance</td> </tr> <tr> <td>Aluminium / foil</td> <td></td> </tr> <tr> <td></td> <td>Provides a surface for graphics / physical strength</td> </tr> </tbody> </table> <p style="text-align: right;">(1x1) (1x1) (1x1)</p>	Material	Function		Barrier to air / liquid / contamination / improves appearance	Aluminium / foil			Provides a surface for graphics / physical strength	(3)
Material	Function									
	Barrier to air / liquid / contamination / improves appearance									
Aluminium / foil										
	Provides a surface for graphics / physical strength									
2(b)(i)	<div style="border: 1px solid black; padding: 5px; text-align: center;">  </div> <ul style="list-style-type: none"> <li>• Inner corrugation (1)</li> <li>• At least one outer layer (1)</li> </ul> <p style="text-align: right;">(1x1) (1x1)</p>	(2)								
2(b)(ii)	<p>Any two from:</p> <ul style="list-style-type: none"> <li>• Rigid (1)</li> <li>• Heat insulator (1)</li> <li>• Non Toxic (1)</li> <li>• Can be printed on (1)</li> <li>• Can be folded (1)</li> <li>• Absorbs impacts (1)</li> <li>• Flexible along corrugation (1)</li> <li>• Easy to cut shape (1)</li> </ul> <p style="text-align: right;">(1x1) (1x1)</p>	(2)								

2(c)	<p>Any two from:</p> <ul style="list-style-type: none"> <li>• Protects the surface (1)</li> <li>• Keeps the scalpel sharp (1)</li> <li>• Provides a non slip surface (1)</li> <li>• Provides a grid as a guide (1)</li> <li>• Supports cutting in straight line (1)</li> </ul> <p style="text-align: right;">(1x1) (1x1)</p>	(2)
2(d)	<p>Any two from:</p> <ul style="list-style-type: none"> <li>• Costs are reduced (1)</li> <li>• Consistent brand image is achieved (1)</li> <li>• Manufacturing parameters are already known (1)</li> <li>• Performance has already been proven (1)</li> <li>• Previous tests results can be reused (1)</li> </ul> <p style="text-align: right;">(1x1) (1x1)</p>	(2)



2(e)	<p>One-off</p> <ul style="list-style-type: none"> <li>• Flexible (1)</li> <li>• Can be tailored to meet individual requirements (1)</li> <li>• Limited need for specialised equipment (1)</li> </ul> <p>Batch</p> <ul style="list-style-type: none"> <li>• Set-up costs &amp; time shared between several products (1)</li> <li>• Experiences gained during manufacture simplifies production (1)</li> <li>• Items produced faster than one-off (1)</li> <li>• Size of batch / frequency of production can be adjusted to suit demand (1)</li> </ul> <p>High Volume</p> <ul style="list-style-type: none"> <li>• Economies of scale for material purchase (1)</li> <li>• Opportunities for viable automatic production systems (1)</li> <li>• Limited intervention needed (1)</li> </ul> <p style="text-align: right;">(3x1)</p>	(3)
2(f)	<p>Any two from:</p> <ul style="list-style-type: none"> <li>• CAM (1)</li> <li>• Communication (1)</li> <li>• Finance (1)</li> <li>• Logistics (1)</li> <li>• Testing (1)</li> <li>• Automatic stock movement (robots) (1)</li> <li>• Stock control (1)</li> <li>• Just in time (JIT) (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
2(g)	<p>Any two from:</p> <ul style="list-style-type: none"> <li>• Less waste produced (1)</li> <li>• Less materials used (1)</li> <li>• Faster production (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)

2(h)	<ul style="list-style-type: none"> <li>• Registration / checking alignment of separations (accept drawings of registration marks ) (1)</li> <li>• Colour bar / grey scale bars / optical measurement of ink density /densitometer (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
2(i)	<ul style="list-style-type: none"> <li>• Virtual models do not use real materials (1) therefore reducing production costs. (1)</li> <li>• Virtual models can be transmitted electronically (1) therefore increasing access / reducing logistics / reducing costs (1)</li> <li>• Parametric designs (1) are possible therefore reducing development times. (1)</li> <li>• Models can edited / adapted (1) therefore reducing costs / development time / expanding creative experimentation. (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
Total for question 2		22 Marks

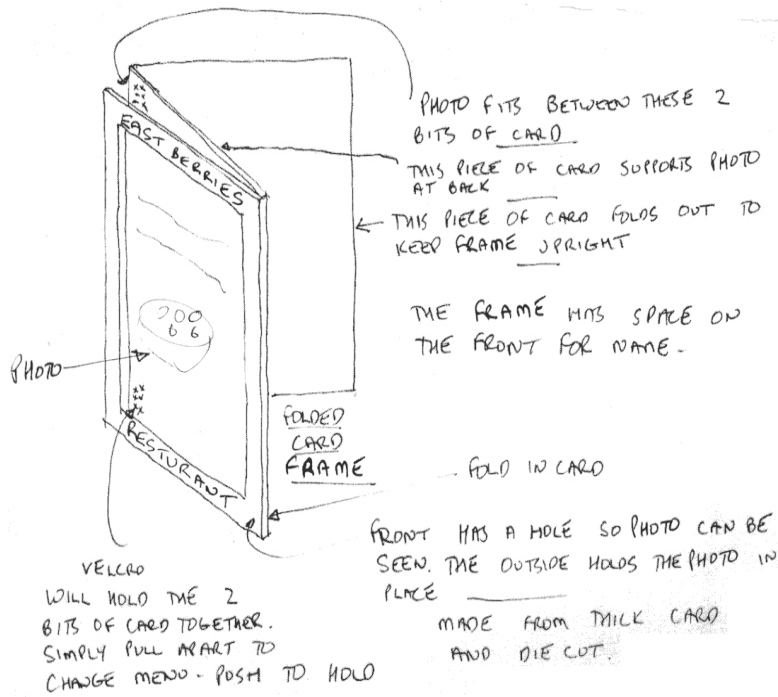
Question Number	Answer	Mark
3	<p>East Berries Restaurant requires photograph frames to display images of its dishes, such as the one shown below. The photograph frames will be placed on tables.</p> <p>The specification for each photograph frame is that it must:</p> <ul style="list-style-type: none"> <li>• display one photograph in an upright position and stand without additional support</li> <li>• allow the photograph to be removed and replaced easily with a different one</li> <li>• have space to display the photograph and the restaurant's name</li> <li>• be made using materials and processes suitable for batch production.</li> </ul>	
	<p><b>Design idea 1</b> Each point of specification has two marking points.</p> <p>1 mark should be awarded for evidence of each point of specification resolved in the design</p> <p>For each point with both elements viably satisfied 2 marks For each point with only one element viably satisfied 1 mark Where the answer does not viably answer a specification point 0 marks</p> <p>Candidates may answer any specification point in either graphical form or by annotation.</p> <p><b>No marks are awarded for quality of communication.</b></p>	

	Design idea 1	
	<p><b>Display one photograph in an upright position and stand without additional support.</b></p> <ul style="list-style-type: none"> <li>• The photograph is displayed upright (over 45 degrees) <i>E.g. the menu slopes slightly backwards to prevent it falling over.</i></li> <li>• The frame is will stand without additional support <i>E.g. the frame has a wide base.</i></li> </ul> <p><b>Allow the photograph to be removed and replaced easily with a different one.</b></p> <ul style="list-style-type: none"> <li>• There is an indication of how the photograph can be removed. <i>E.g. Two side of the holder can be pulled apart</i></li> <li>• There is an indication of how the device will hold the photograph <i>E.g. Two sides of the holder are Velcroed together.</i></li> </ul> <p><b>Have space to display the photograph and the restaurant's name.</b></p> <ul style="list-style-type: none"> <li>• The is evidence of an area where the photograph will be seen. <i>E.g. There is a window in the middle of the frame.</i></li> <li>• There is an indication of where the restaurant's name will be placed. <i>E.g. An arrow and note shows where the name will go.</i></li> </ul> <p><b>Be made using materials and processes suitable for batch production.</b></p> <ul style="list-style-type: none"> <li>• A material suitable for batch production is indicated. <i>E.g The drawing is annotated to indicate it is made from acrylic.</i></li> <li>• A process suitable for batch production is indicated <i>E.g. The drawing is annotated to indicate the material is shaped using a jig.</i></li> </ul>	
	(8x1)	(8)

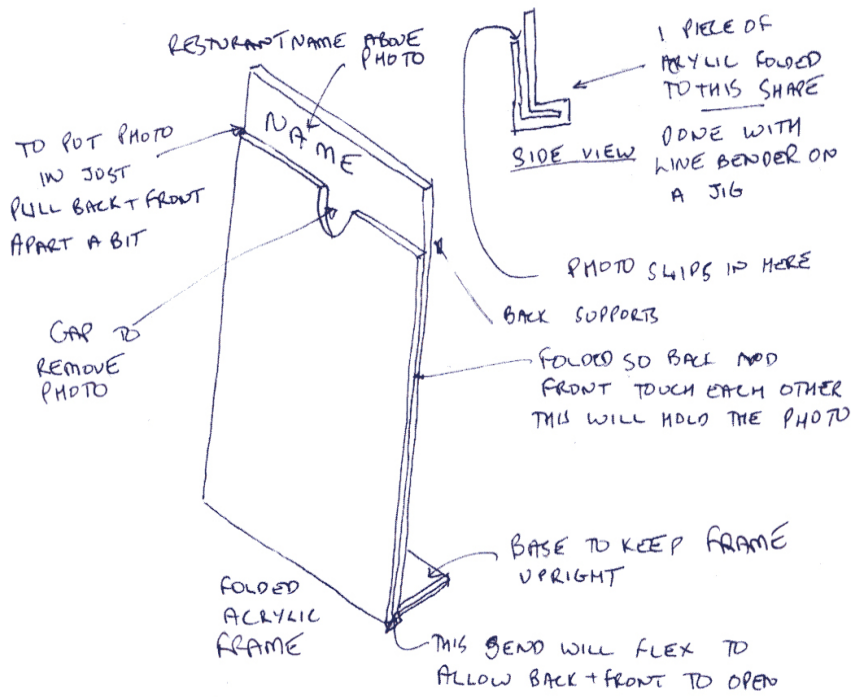
	<p><b>Design idea 2</b></p> <p>Specification points 1,2 and 4 must be fully resolved in the second idea using <b>technically or conceptually different</b> solutions that are significantly different, eg simply changing proportions would not be significantly different.</p> <p>Specification point 3 must be fully resolved again in design idea 2. Specification point 3 is <b>not</b> subject to the requirement to be different, eg if the graphics are placed top centre on design 1 and design 2 it will score in both designs.</p> <ul style="list-style-type: none"> <li>• There is an indication that the device will <b>display the photograph in a different method</b> to idea 1.</li> <li>• The photograph frame stands <b>in a different method</b> to idea 1.</li> <li>• The frame holds the photograph <b>in a different method</b> to idea 1.</li> <li>• The photograph can be <b>removed in a different method</b> to idea 1.</li> <li>• There is an area where the photograph can be seen in the frame.</li> <li>• There is an indication of where the restaurant's name will be placed.</li> <li>• A <b>different</b> material suitable for batch production is indicated.</li> <li>• A <b>different</b> process suitable for batch production is indicated.</li> </ul> <p style="text-align: right;">(4x1) (4x1)</p>	8
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Question Number	Answer	Mark
3(b)	<p>Each point clearly evaluated:</p> <p>If a candidate has indicated Design idea 1 (or 2) then evaluates Design 2 (or 1) for all or part (i), (ii) &amp; (iii) then the idea in greater evidence should be marked.</p> <p>The evaluation of the design must contain reference to either positive or negative qualities not simply a description of the design. The answers must contain new information from that credited in the design solutions.</p> <p>Repetition of original specification scores 0</p>	
3(b)(i)	<p>Evaluation of display the photograph in an upright position and stand without additional support</p> <ul style="list-style-type: none"> <li>• How the frame displays the photograph upright. <i>E.g. The frame <u>holds the picture on all its edges</u>.</i></li> <li>• How the frame stands without additional support. <i>E.g. The frame has a <u>wide base</u> so it won't fall over.</i></li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
3(b)(ii)	<p>Evaluation of allow the photographs to be removed and replaced easily.</p> <ul style="list-style-type: none"> <li>• How the photograph can be removed. <i>E.g. There is a <u>gap clearly visible</u> at the front to pull the photograph out</i></li> <li>• How the photograph can be replaced. <i>E.g. The photograph is <u>simply pushed</u> into the gap in the frame.</i></li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
3(b)(iii)	<p>Evaluation of: Be made using materials and processes suitable for batch production.</p> <ul style="list-style-type: none"> <li>• A material suitable for batch production is indicated. <i>E.g. Acrylic is a <u>constant colour</u> so all the holders will look the same.</i></li> <li>• A process suitable for batch production. <i>E.g. <u>Jigs</u> will make manufacture quicker and accurate.</i></li> </ul> <p style="text-align: right;">(2x1)</p>	(2)

Design idea 1 example



Design idea 2 example



Total for question 3

22 Marks

Question Number	Answer	Mark
4(a)(i)	Any two from: <ul style="list-style-type: none"> <li>• Can be folded / cut (1)</li> <li>• Can be glued (1)</li> <li>• Low cost (1)</li> <li>• Can be printed / written on (1)</li> <li>• Can be recycled (1)</li> <li>• Available in different colours (1)</li> <li>• Lightweight (1)</li> </ul> <p style="text-align: right;">(3x1)</p>	(3)
4(a)(ii)	Any two from: <ul style="list-style-type: none"> <li>• Transparent (1)</li> <li>• Waterproof (1)</li> <li>• Tougher / more durable / stronger (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
4(b)	<ul style="list-style-type: none"> <li>• Corriflute (1)</li> <li>• Corrugated plastic (1)</li> </ul> <p style="text-align: right;">(1x1)</p>	(2)
4(c)	<ul style="list-style-type: none"> <li>• The colour will be more consistent (1) because printed ink tends to be streaky. (1)</li> <li>• The colour will look better (1) because it will be more even. (1)</li> <li>• The label will be flatter (1) because printers tend to buckle the paper (1)</li> <li>• The label will be cheaper (1) because printing is expensive / less ink used (1)</li> <li>• It is quicker (1) because printing is a slow process. (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)



4(d)	<ul style="list-style-type: none"> <li>• The appearance would degrade (1) because the image would become pixelated / blocky / stepped (1)</li> <li>• The edges would become rough (1) because the sizes of the pixels would increase. (1)</li> <li>• Paint is a raster type programme (1) this would make the enlarged image not look good. (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
4(e)	<ul style="list-style-type: none"> <li>• The ink would not dry (1)</li> <li>• The ink would smudge (1)</li> <li>• The ink would come off (1)</li> </ul> <p style="text-align: right;">(1x1)</p>	(1)
4(f)(i)	<ul style="list-style-type: none"> <li>• Thermocolour film (1)</li> <li>• Temperature sensitive coating (1)</li> </ul> <p style="text-align: right;">(1x1)</p>	(1)
4(f)(ii)	<ul style="list-style-type: none"> <li>• To transmit light (1)</li> <li>• To transmit data (1)</li> <li>• To light up an object (1)</li> <li>• Stress detection (1)</li> </ul> <p style="text-align: right;">(1x1)</p>	(1)
4(f)(iii)	<ul style="list-style-type: none"> <li>• Lighter (1)</li> <li>• Stronger (1)</li> <li>• Improved performance / properties / qualities (1)</li> <li>• Higher perceived status (1)</li> </ul> <p style="text-align: right;">(1x1)</p>	(1)
4(g)	<p>Answers must relate to production not disposal / use</p> <p>Acid is produced. (1) This can damage the environment. (1)  Chlorine is used (1) this is toxic (1)  e.g. hydrochloric acid is formed (1) this causes acid rain. (1)  e.g. acid is generated (1) this can poison rivers/ground water (1)  e.g. corrosive products are formed / used (1) this can harm workers (1)</p> <p style="text-align: right;">(2x1)</p>	(2)

4(h)	<ul style="list-style-type: none"> <li>• Safe/safer (1)</li> <li>• Reliable (1)</li> <li>• High quality/better quality (1)</li> <li>• Accurate Information will be available (1)</li> <li>• Information about the product will be available / accurate (1)</li> <li>• Customer confidence (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)
4(i)	<ul style="list-style-type: none"> <li>• Emails may contain a virus. (1) This could damage user's data / system. (1)</li> <li>• Hardware / software / internet access are expensive. (1) This cost may compromise lifestyles. (1)</li> <li>• Email reduces face to face (1) communication. Relationships may be compromised. (1)</li> <li>• Pressure may be applied to use email (1) instead of other communication methods. This may cause the degradation of alternative methods. (1)</li> <li>• In order to function email requires hardware/ software / infrastructure (1) breakdown of any one part prevents communication (1)</li> <li>• User may suffer information overload (1) important information may not be noticed (1)</li> <li>• Email is not secure (1) this mean privacy could be compromised (1)</li> <li>• Medical problems could be caused (1) this mean pain, inability to work, possibly compensation (1)</li> <li>• Written communication skills is required (1) this limit access / compromises quality communication (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1)</p>	(4)
Total for question 4		22 Marks
Total for paper		88 Marks

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