

Mark Scheme (Results)

Summer 2012

GCSE Design and Technology  
Graphic Products (5GR02)

Paper 01 Knowledge and  
Understanding of Graphic Products

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Summer 2012

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Question Number	Answer	Mark
<b>1</b>	D	(1)
Question Number	Answer	Mark
<b>2</b>	B	(1)
Question Number	Answer	Mark
<b>3</b>	C	(1)
Question Number	Answer	Mark
<b>4</b>	D	(1)
Question Number	Answer	Mark
<b>5</b>	C	(1)
Question Number	Answer	Mark
<b>6</b>	C	(1)
Question Number	Answer	Mark
<b>7</b>	D	(1)
Question Number	Answer	Mark
<b>8</b>	C	(1)
Question Number	Answer	Mark
<b>9</b>	A	(1)
Question Number	Answer	Mark
<b>10</b>	B	(1)

Question Number	Answer	Mark										
<b>11. (a)</b>	<table border="1"> <thead> <tr> <th>Name</th> <th>Use</th> </tr> </thead> <tbody> <tr> <td>Compass</td> <td>Drawing circles/arcs/technical drawing/marketing/measuring (1)</td> </tr> <tr> <td>Ellipse template (1) (Only answer)</td> <td>For drawing circles in isometric</td> </tr> <tr> <td>Set square (1) 30/60 degree set square (1)</td> <td>For drawing in isometric and planometric</td> </tr> <tr> <td>Photocopier</td> <td>For reproducing/printing/copying/scanning/enlarging/reducing/documents/images/drawings (1)  Do not accept 'Copy paper'</td> </tr> </tbody> </table>	Name	Use	Compass	Drawing circles/arcs/technical drawing/marketing/measuring (1)	Ellipse template (1) (Only answer)	For drawing circles in isometric	Set square (1) 30/60 degree set square (1)	For drawing in isometric and planometric	Photocopier	For reproducing/printing/copying/scanning/enlarging/reducing/documents/images/drawings (1)  Do not accept 'Copy paper'	(4)
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Question Number	Answer	Mark
<b>11.(b)(i)</b>	<p><b>One</b> property from:</p> <ul style="list-style-type: none"> <li>• Lightweight (1)</li> <li>• Soft/malleable (1)</li> <li>• Durable/ability to withstand weathering/corrosion/will not rust (1)</li> </ul> <p><i>[Do not accept 'strong']</i></p>	(1)
	1 x1	

Question Number	Answer	Mark
<b>11.(b)(ii)</b>	<p><b>One</b> reason explained from:</p> <ul style="list-style-type: none"> <li>• Ferrous metal/contains iron (1) therefore it will corrode/rust outdoors (1)</li> <li>• It will rust (1) without a protective finish/make it difficult to read sign/paint peeling/will need replacing more often (1)</li> <li>• Will need to have a surface finish applied (1) before it can be printed on (1)</li> </ul> <p style="text-align: right;">2 x1</p>	(2)

Question Number	Answer	Mark
<b>11.(b)(iii)</b>	<p><b>One</b> reason explained from:</p> <ul style="list-style-type: none"> <li>• Does not use a specific language/easier to understand/recognise (1) to communicate to people from different countries (1)</li> <li>• Standard international symbols/pictograms (1) recognised the world/country over (1)</li> <li>• Some people cannot read (1) but will still be able to identify / recognise/ understand symbols/logos (1)</li> <li>• Is easy to identify (1) from a distance/larger than words (1)</li> </ul> <p style="text-align: right;">2 x1</p>	(2)

Question Number	Answer	Mark
<b>11.(c)(i)</b>	<p><b>One property</b> given and linked <b>reason</b> from:</p> <ul style="list-style-type: none"> <li>• <b>Property:</b> Can be heated and reshaped/reformed/moulded (1)</li> <li>• <b>Reason:</b> Can be bent into shape easily using a line bender (1)</li> <li>• <b>Property:</b> Durable (1)</li> <li>• <b>Reason:</b> Will last a long time/resists long-term stresses/wear and tear (1)</li> <li>• <b>Property:</b> Self-finishing (1)</li> <li>• <b>Reason:</b> No surface finish required/excellent visual impact (1)</li> <li>• <b>Property:</b> Good impact strength (1) <b>Reason:</b> Will crack but not break into pieces if dropped (1)</li> </ul> <p><i>[Do not accept 'Strong/any reference to transparency']</i></p> <p style="text-align: right;">(2 x1)</p>	(2)

Question Number	Answer	Mark
<b>11.(c)(ii)</b>	<p><b>Two</b> advantages explained from:</p> <ul style="list-style-type: none"> <li>• Lack of physical contact with the material (1) produces a clean/neat edge (1)</li> <li>• Produces a quality polished edge (1) which requires no further finishing (1) i.e. filing and sanding</li> <li>• Precision/accuracy (1) as there is no wear on the laser/it is computer controlled/minimises human error (1)</li> <li>• Reduced chance of warping the material that is being cut (1) as laser systems have a small heat affected zone (1)</li> <li>• Flexibility of some materials/features (1) are very difficult or impossible to cut by more traditional means (1)</li> <li>• It is quicker/faster (1) which means it can cut in the same time (1)</li> <li>• They will all be identical (1) if more than one is made/batch/mass produced (1)</li> <li>• Cost effective/reduced labour costs (1) for producing one offs/small batches (1)</li> </ul> <p style="text-align: right;">(2 x1) (2 x1)</p>	(4)

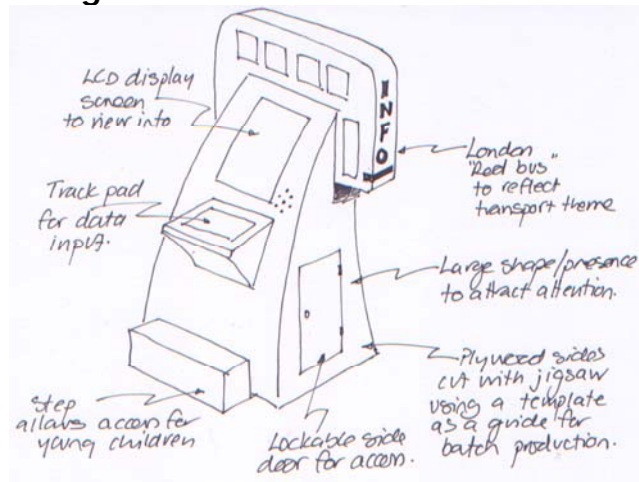
Question Number	Answer	Mark
<p><b>11.(d)</b></p>	<p><b>Two</b> advantages explained from:</p> <ul style="list-style-type: none"> <li>• It can be viewed from anywhere (1) therefore meaning a bigger potential market (1)</li> <li>• Customer data / profiling can be gathered (1) which means future marketing can be more accurate / focused (1)</li> <li>• Different media can be used such as film / animations (1) making the whole site more dynamic / appealing/interactive (1)</li> <li>• Less expensive/cheaper than traditional media (1) which means budgets go further (1)</li> <li>• Site visitors can leave details / fill out forms/reviews/download info (1) so they can be contacted about later events (1)</li> <li>• An online shop can be set up (1) so that merchandise can be sold/tickets purchased (1)</li> <li>• Updates/changes are easily made (1) and can be immediate (1)</li> <li>• Saves papers/printing (1) meaning it does not waste materials/more sustainable (1)</li> <li>• Much more information can be made available/searched (1) than that on a leaflet (1)</li> <li>• Different languages (1) can be displayed at a click of a button (1)</li> <li>• It is quick and simple to use (1) on many mobile devices (1)</li> <li>• Links to and from websites (1) makes it more accessible (1)</li> </ul> <p><i>[Do not accept anything related to 'Fast/speed of connection']</i></p> <p style="text-align: right;">(2 x 1) (2 x 1)</p>	<p style="text-align: right;">(4)</p>

Question Number	Answer	Mark
12.	<p><b>Design idea 1</b></p> <p>Candidates may answer any specification point in either graphical form or by annotation.</p> <p><b>No marks are awarded for the quality of graphical communication.</b></p> <ul style="list-style-type: none"> <li>• allow for information to be input (1) e.g. keyboard / voice / mouse / track pad / joystick / buttons/ USB stick pen / internet link / touch screen / interactive whiteboard</li> <li>• allow for information to be accessed (1) e.g. LCD / speaker / maps / lights / TV monitor / HD screen / e-paper / LED screen / touch screen / interactive whiteboard</li> <li>• reflect the theme of transport (1) e.g. trains / buses / airplanes / bikes / cars</li> <li>• be easily recognised from a distance within the museum (1) e.g. shapes / lights / profile / signage / use of colour /</li> <li>• be suitable for both children and adults to use (1) e.g. size / split levels / adjustable seat / step up / table</li> <li>• allow access to the inside of the information kiosk for maintenance (1) e.g. door / slide screen / access panel</li> <li>• use appropriate materials available in the school workshop (1) e.g. specific named material (do not accept <i>'wood/metal/plastic/card'</i>)</li> <li>• use manufacturing processes suitable for batch production (1) e.g. specific named process for batch production</li> </ul>	



Example of candidate response:

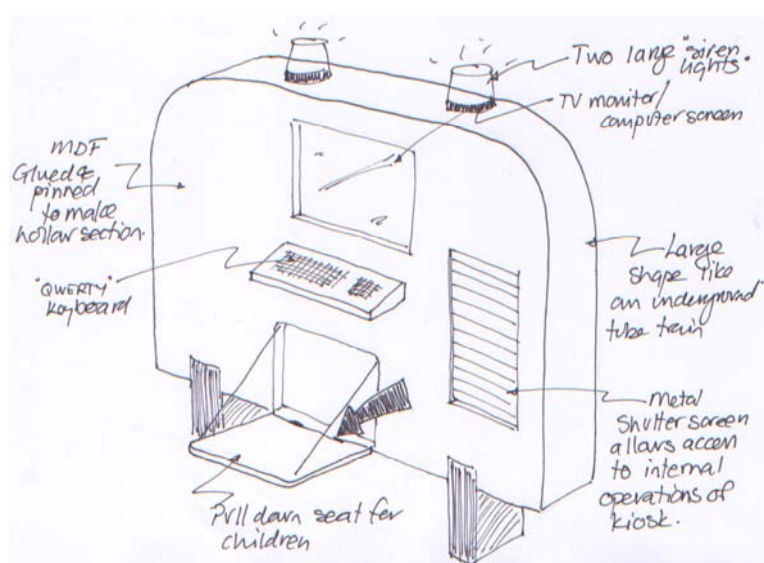
### Design idea 1



### Design idea 2

Marks for design idea 2 can only be awarded where specification points are resolved differently than in design idea 1.

Example of candidate response:



(8)

(8)

Question Number	Answer	Mark
<b>13.(a)</b>	<p><b>Two</b> properties given and linked justification from:</p> <ul style="list-style-type: none"> <li>• Property: Good impact resistance/tough (1)</li> <li>• Justification: protection of components inside (1)</li>   <li>• Property: Plasticity (1)</li> <li>• Justification: can be easily injection moulded/formed (1)</li>   <li>• Property: Lightweight (1)</li> <li>• Justification: making product portable/easy to carry around/user friendly (1)</li>   <li>• Property: Low water absorption (1)</li> <li>• Justification: does not allow moisture to come into contact with electrical components inside (1)</li>   <li>• Property: Electrical insulator (1)</li> <li>• Justification: Protects from shock (1)</li> </ul> <p>Do not accept 'strong/hard/cheap/durable'</p> <p style="text-align: right;">(2 x1) (2 x1)</p>	(4)

Question Number	Answer	Mark
<b>13(b)</b>	<p><b>One</b> reason explained from:</p> <ul style="list-style-type: none"> <li>• Good reproduction quality (1) giving a high quality sleeve (1)</li> <li>• Relatively inexpensive printing process (1) keeps unit costs low/cost effective (1)</li> <li>• Able to print on a wide range of papers (1) which gives a quality finish without need for lamination (1)</li> <li>• High printing speeds/relatively fast (1) shortens turnaround of job (1)</li> <li>• Widely available (1) therefore many printers able to carry out job – home and abroad (1)</li> </ul> <p>Do not accept 'fast/quick/cheap unless qualified'</p> <p style="text-align: right;">(2 x1)</p>	(2)

Question Number	Answer	Mark
13. (c) (i)	<p><b>One</b> explanation from:</p> <ul style="list-style-type: none"> <li>• There is a large textured button/switch (1) which is easy to move / slide (1)</li> <li>• It is ergonomically placed (1) so that your finger fits over it when holding it to take a picture (1)</li> </ul> <p>Do not award mark for repeat of question 'easy to turn on and off'</p> <p style="text-align: right;">(2 x1)</p>	(2)

Question Number	Answer	Mark
13. (c) (ii)	<p><b>One</b> explanation from:</p> <ul style="list-style-type: none"> <li>• It has a separate carton/plain sleeve (1) which can be printed to suit/before being placed on camera (1)</li> <li>• The whole sleeve can be printed / coloured / themed/ icons added (1) to fit any company image (1)</li> </ul> <p>Do not award mark for repeating question 'branded for specific events'</p> <p style="text-align: right;">(2 x1)</p>	(2)

Question Number	Answer	Mark								
13. (d) QWC	<p>Evaluation to address the following sustainability issues: <b>Sustainability</b> How does the design take environmental considerations into account?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">A: Disposable camera</th> <th style="width: 50%;">B: Compact digital camera</th> </tr> </thead> <tbody> <tr> <td>Cardboard sleeve can be taken off to be recycled appropriately</td> <td>Aluminium can be recycled</td> </tr> <tr> <td>Polystyrene (PS) can be recycled</td> <td>Small compact size / shape reduces material consumption</td> </tr> <tr> <td>Built in obsolescence therefore has to be thrown away</td> <td>Can be recharged at the mains reducing the need for batteries</td> </tr> </tbody> </table>	A: Disposable camera	B: Compact digital camera	Cardboard sleeve can be taken off to be recycled appropriately	Aluminium can be recycled	Polystyrene (PS) can be recycled	Small compact size / shape reduces material consumption	Built in obsolescence therefore has to be thrown away	Can be recharged at the mains reducing the need for batteries	(6)
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Polystyrene (PS) can be recycled	Small compact size / shape reduces material consumption									
Built in obsolescence therefore has to be thrown away	Can be recharged at the mains reducing the need for batteries									

	<b>User requirements</b> What makes the product attractive to potential users?		
	<b>A: Disposable camera</b>	<b>B: Compact digital camera</b>	
	<p>The graphic packaging will be appealing</p> <p>It has an in-built automatic flash</p> <p>Can be used for a single event / trip and that alone</p> <p>You will get a developed set of photos printed out to keep</p>	<p>A more robust case makes it more durable</p> <p>It has a lens which will adjust focus to what you are photographing/zoom function</p> <p>It can take a video</p> <p>It can be adjusted for various settings such as fast sports</p> <p>Hundreds of photos can be stored on the memory card</p> <p>You can print only the photos you want</p> <p>Photos can be deleted if you do not want them</p>	

Level	Mark	Descriptor
	0	No rewardable material
Level 1	1-2	Candidate identifies the area(s) of comparison with no development OR identifies and develops one area. Shows limited understanding of the comparison. Writing communicates ideas using everyday language but the response lacks clarity and organisation. The candidate spells, punctuates and uses the rules of grammar with limited accuracy.
Level 2	3-4	Candidate identifies some areas of comparison with associated developments showing some understanding of the comparison. Writing communicates ideas using D&T terms accurately and showing some direction and control in the organising of material. The candidate uses some of the rules of grammar appropriately and spells and punctuates with some accuracy, although some spelling errors may still be found.
Level 3	5-6	Candidate identifies a range of areas of comparison with associated developments showing a detailed understanding of the comparison. Writing communicates ideas effectively, using a range of appropriately selected D&T terms and organising information clearly and coherently. The candidate spells, punctuates and uses the rules of grammar with considerable accuracy.

Question Number	Answer	Mark
<b>14. (a) (i)</b>	<p><b>One</b> metal from:</p> <ul style="list-style-type: none"> <li>• Aluminium (1)</li> <li>• Steel/mild steel/stainless steel (1)</li> <li>• Titanium/titanium alloy (1)</li> <li>• Magnesium/magnesium alloy (1)</li> </ul>	(1)

1x1

Question Number	Answer	Mark
<b>14. (a) (ii)</b>	<p><b>Two</b> reasons explained from:</p> <ul style="list-style-type: none"> <li>• Excellent strength to weight ratio (1) ideal for a professional/high performance bike (1)</li> <li>• Lightweight (1) therefore easier/less effort to move bike/able to travel faster (1)</li> <li>• Better tensile strength than steel alloys (1) distributes stresses efficiently (1)</li> <li>• Fabric can be placed in different directions (1) to provide strength in specific areas of the frame (1)</li> <li>• Can be formed into complex one-piece frames/monocoques (1) for increased aerodynamics (1)</li> <li>• It is weather resistant/durable (1) so will last a long time (1)</li> </ul> <p>Do not accept 'strong/anything relating to rust'</p>	(4)

2 x1

2 x1

Question Number	Answer	Mark
<b>14. (a) (iii)</b>	<p><b>Two</b> explanations from:</p> <ul style="list-style-type: none"> <li>• CAD is accurate (1) allows for dimensions/measurements to be input (1)</li> <li>• Designs can be edited / altered (1) without having to redraw the whole image (1)</li> <li>• Standard components / parts (1) can be stored in a library (1)</li> <li>• 3D/virtual modelling (1) can be used to test design on screen (1)</li> <li>• Different colours can be tested (1) to gauge consumer feedback (1)</li> <li>• CAD files can be sent electronically (1) to a manufacturer for rapid prototyping / manufacturing</li> </ul>	(4)

	<p>(1)</p> <ul style="list-style-type: none"> <li>• No need for physical prototyping/to work out stress points on frame/wind tunnel testing (1) because it can all be done using software (1)</li> <li>• CAD files can be saved (1) which means they can be recalled/loaded when required (1)</li> <li>• Zoom/enlarging features (1) allows you to see the smallest of pieces (1)</li> </ul> <p>Do not accept 'faster/quicker/easier/cheaper'</p> <p>(2 x 1) (2 x 1)</p>	
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Question Number	Answer	Mark
<b>14. (b)</b>	<p><b>Two</b> reasons explained from:</p> <ul style="list-style-type: none"> <li>• Carbon fibre products not currently mass produced (1) due to complexity/skills required in manufacture (1)</li> <li>• Flexibility (1) can adapt production to another product quickly/fast response to market trends (1)</li> <li>• Identical batches of products produced (1) to the same high quality (1)</li> <li>• Efficient manufacturing systems can be employed/very good economies of scale in bulk buying of materials (1) resulting in lower unit costs/cheaper (1)</li> <li>• Level of consumer demand (1) is not sufficient warrant mass production (1)</li> <li>• Limited editions (1) can demand a higher retail prices/see if there is a demand (1)</li> </ul> <p>(2 x 1) (2 x 1)</p>	(4)

Question Number	Answer	Mark
<b>14. (c)</b> <b>QWC</b>	<p>Evaluation to address the following issues:</p> <p><b>Advantages for developed countries:</b></p> <ul style="list-style-type: none"> <li>• Financial benefits – it is cheaper to manufacture offshore than in a developed country.</li> <li>• No 'minimum wage' for workers therefore labour costs much lower.</li> <li>• Low cost of land and rent of premises.</li> <li>• Large 'willing' workforce.</li> <li>• Access to local markets for export of products.</li> <li>• Access to local raw materials which are sometimes scarce and/or more expensive in home market.</li> </ul>	(6)

	<p><b>Advantages for developing countries:</b></p> <ul style="list-style-type: none"> <li>• Economic regeneration of local areas through increased employment.</li> <li>• Improved living standards through potential for career development and multi-skilling of local workforce.</li> <li>• Physical regeneration of local area through development of road system, transportation and local amenities.</li> <li>• Widening of the country's economic base and enabling of foreign currency to be brought into the country.</li> <li>• Enables the transfer of new technology that would be impossible without the backing of multinationals.</li> </ul> <p><b>Disadvantages for developed countries:</b></p> <ul style="list-style-type: none"> <li>• Damaged reputation in home country as jobs are outsourced and not given to local workers.</li> </ul> <p><b>Disadvantages for developing countries:</b></p> <ul style="list-style-type: none"> <li>• Lower wages than workers in developed countries where a minimum wage operates.</li> <li>• Promotion restrictions as managerial roles are often occupied by workers from the multinational's home country.</li> <li>• No unions to protest against equal rights issues such as unfair dismissals.</li> <li>• Lower health and safety standards when using 'sweatshops'.</li> <li>• Devaluing of traditional craft skills and replacement by repetitive tasks.</li> <li>• Local communities can become dependent upon multinational leaving them devastated if the multinational leaves the area.</li> <li>• Increased pollution and waste production as a result of large-scale manufacturing activities.</li> <li>• Destruction of local environment to build factories, processing plants and roads etc.</li> </ul>	
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