

Design & Technology (Product Design)

General Certificate of Secondary Education **GCSE J901**

General Certificate of Secondary Education (Short Course) **GCSE J900**

Mark Schemes for the Components

June 2007

J900/J901/MS/R/07

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

The reports on the Examinations provide information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content, of the operation of the scheme of assessment and of the application of assessment criteria.

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CONTENTS

General Certificate of Secondary Education Product Design (J901)

General Certificate of Secondary Education (Short Course) Product Design (J900)

MARK SCHEMES FOR THE UNITS

Unit	Content	Page
B802	Designing and Making Innovation Challenge	1
B804	Designing Influences	5
*	Grade Thresholds	13

Mark Scheme B802
June 2007

Development of Design Evolution through making 22 Marks	Initial Thoughts	Work is predictable/non creative	1	Work shows potential/some elements of creativity	1	Creative thinking expands ideas which show potential but is not always fully realised	1	Responds with an open mind showing unexpected and/or challenging ways of thinking	1	1	
	Brief	Possible briefs are narrow	1	Final design brief has scope for creativity	1					2	
	Use/ clients/ users	Consideration of intended use and clients is limited	1	Work positively reflects client/user requirements	1					3	
	Specification	Specification is vague/generic points	1	Specification gives some basic requirements for product	1	Specification identifies key features of the product	1			4	
	Ideas	Very limited / predictable idea/s	1	Some evidence of creative thinking although elements are predictable	1	Ideas show detail	1	Ideas fully explained showing details of construction/materials	1		5
						Creative thinking expands ideas	1	Ideas are innovative and creatively sustained	1		6
	Supplementary Information	Some consideration of supplementary information	1	Positive response to supplementary information	1	Considered and reflected within design work	1	Fully incorporated into design work	1		7
								Innovation and creativity demonstrated	1		8
											9
											10
										11	
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Communicating information through sketches, writing and photographs 10 Marks	Quality of Communication Skills	Use of sketches/images is limited	1	Use of sketches/images is satisfactory	1	Use of sketches/images is good	1	Sketches/images are clear, confident, incisive and to the point	1	1 2 3 4 5 6 7 8 9 10
		Written communication (clarity of message) is limited	1	Written communication is satisfactory	1	Written communication is good	1	Written communication is of a high level, clear and succinct	1	
					Innovative and creative communication technique	1	Extensive use of innovative and creative communication techniques	1		
Materials, Components, Processes, Techniques, and Industrial practice 12 Marks	Material Selection	Choice of materials and components is basic	1	Considered choice of materials and components	1					1 2 3 4 5 6 7 8 9 10 11 12
	Use of Material	Use of materials restricted to basic constructions, structures or experiments	1	Some adept use of materials but with inconsistencies. Not always relevant to the task	1	Adept use of materials	1	Creative use of Materials	1	
	Making Skills	Poor quality making skills. Product may be incomplete	1	Model complete with reasonable standard of making skills evidenced	1	Model(s) complete with good standard of making skills demonstrating accuracy	1	Model(s) complete to a high standard	1	
Model accurately reflects design						1	Making skills demonstrate a range of techniques/and/or complexity	1		

Analysis of ideas, models and prototypes 16 Marks	Analysis and Evaluation	Analysis and evaluation limited and appears only on boxes 18, 19 & / or 20	1	Analysis and evaluation limited but evident within design work	1	Analysis and evaluation good	1	Detailed analysis and evaluation with some justification	1	1
	Peer Evaluation	Plans for reflect and record activity	1	Records peer feedback and possible modifications	1					2
	Development of ideas	Shows some development of ideas	1	Shows clear development of ideas	1	Shows discrimination between good and poor ideas	1	Justifies rejection of ideas in favour of ones that are worthy of further development	1	3
						Evidence of further development of ideas	1	Develops ideas to a logical conclusion	1	4
	Reflection	Basic comments / observations with no suggested refinements	1	Some specific strengths and weaknesses identified		1	Quality analysis/creative improvements suggested	1	1	5
Alterations/refinements are specified/suggested				1	6					

	AO2 Development	AO2 Communication	AO1 Materials	AO3 Analysis	Total Mark
Marks					/60

Candidate Name	Centre Number	Candidate Number

Mark Scheme B804
June 2007

Question	Mark Scheme	Rationale
1a	Slim, compact, lightweight, modern looking (appearance features), easy to use, ergonomic design / comfortable grip, hygienic, easy to clean, blades protected, different speeds, consistent speed, one handed operation, electrically safe, cordless. [2]	Answers must relate to the electrically operated whisk. Do not accept cheap, expensive, durable unless qualified. Accept 1 word answers if correct point given. Do not accept light it needs to be lightweight, If two points in one feature award 2 marks
1b	Low cost, easy to use, doesn't require electricity, can be used anywhere, manual speed control, safer because slower, accept change of directions, (left handedness), visual check of blades, greater whisking area, quieter operation, can be totally immersed in water, sustainability issues / eco friendly. 3 x 1 mark for each [3]	Do not accept removal of whisks/blades,
1c	Any two from: Time saving (speed of operation), multi-function, lower cost, ease of use (less physical effort / no need to hold it), fashionable / desirable, advertising influences (cooking programmes), availability, cleaner in operation / contains mixture. [2]	Answer has to refer to a Food Processor. Multi-function = new food trends such as smoothies. Do not accept ease of cleaning.
1d	Technological obsolescence, technological / material advances (integrated circuits microchips, embedded systems), fashion, consumer choice. [3]	Explanation could refer to any electrical product ie does not have to refer to the food processor. Marks can be awarded even if a product is not cited. 1 mark for each point up to 2 points + 1 mark for explanation or 1 point with extended explanation for up to 2 marks If three points given award maximum of 2 marks

2a	Support the back, stability, comfort, lightweight, stackable, easy to store, hardwearing/strong, appropriate size for age (reference to anthropometrics/ergonomics), ability to be linked together, low cost, easier to clean. - 1 mark for each [3]	Do not accept reference to colour (this is an option not a requirement) Do not accept maintenance or reference to manufacture.
2b	Easier to manufacture (speed of production / productivity rate higher) less labour intensive, lower unit cost to produce, lighter weight only with regard to transport, ease of colouring could increase product range. - 1 mark for each [2]	Two reasons can be rewarded if found in one response. Answer must refer to <u>manufacturing</u> and not the user.
2c	For carrying, uses less material, makes it lighter, more comfortable for user (prevents sweating, allows air movements, allows ventilation), increased rigidity (folded edges). - 1 mark for each [2]	Do not accept: shape, ergonomics, aesthetics. Only one mark for answers related to comfort ie Don't reward the same thing twice.
2d	Labour costs are lower, availability of workforce, cost of raw materials may be lower, taxes/rates for factories may be lower, greater profits as unit costs are lower. 1 mark for each [3]	Answers must be linked to economic reasons or reasons of Fair Trade. If high unemployment abroad is stated, it is <u>not</u> a valid reason. Do not reward. 1 mark for each point up to 2 points + 1 mark for explanation or 1 point with extended explanation for 2 marks If three points given award maximum of 2 marks

3a	<p>Better looking, more modern, lighter, more fuel efficient, more aerodynamic, more comfortable, better road handling, wing mirrors, Advances commonly found in modern vehicles: Air con, electric windows, ABS breaks, airbags, power steering, Sat Nav, higher performance, crumple zones, long lasting – less corrosion, improved reliability, sensor operated devices, less pollution, reflective glass, quieter engines / soundproofing. [3]</p>	<p>Do not accept reference to number of doors, large headlights, bigger tyres, bumpers, not size of lens but of referenced to halogen bulbs or light intensity reward accordingly.</p> <p>Environmentally friendly / sustainability needs qualification.</p> <p>Safer must be qualified.</p> <p>Lighter in weight must be qualified with a specific detail.</p>
3b	<p>An explanation of two different points [2 x 2] that justify the feature identified. Simple explanation such external mirrors enable you to see behind = 1 Detailed would be external mirrors provide additional safety because driver can see rear on both sides of car = 2 [4]</p>	<p>New technology and/or new materials require specific details.</p> <p>If feature in part (a) incorrect or absent a correct explanation can be credited if explaining points (0-2).</p>
3c	<p>Specific technological developments such as improvement in materials and production, lighter weight, improved tyre design, aerodynamics, electronic ignition, improved power weight ratio – more compact power unit. [3]</p>	<p>Do not reward any references to fuel.</p> <p>Do not reward environmental issues.</p> <p>Do not accept “advances in technology means the engine runs more efficiently” (as this example has been given)</p> <p>1 mark for each point up to 2 points + 1 mark for explanation</p> <p>or 1 point with extended explanation for 2 marks</p> <p>If three points given award maximum of 2 marks</p>

4a	A clear explanation that identifies any two reasons - 1 mark for each point, 1 mark for each explanation. (See below) [4]			Only <u>one</u> trend setter must be referred to. Reward content even if no or incorrect trend setter identified.	
	Influence (legacy)	Innovation	Use of materials	Impact	
Bakelite	Birth of plastics, formed new shapes beyond the age	New technology, opened up the improvement of electrical safety in products	Created design opportunities	Lower cost products, more people to have products	
Harry Beck	Graphic information systems around the world based upon design principles	Simplification, user friendly	Primary colours, horizontal and vertical lines, consistent angles	People travel easier, design reproduced in many different media	
Microchips	Semiconductor technology enabled smaller, lighter products – social benefits such as medical, internet, travel communications	Telephony, communication use of semi-conductors such as silicon		Portable products and standalone, complex products manufactured cheaply – huge increase in technological obsolescence – led to greater efficiency	
Goretex	New product produced – leisure industry and clothing	Waterproof and Breathable – use of composites and laminated textiles	Clothing, footwear	High efficiency textiles, greater hygiene, lightweight clothing and products for leisure pursuits and sports	
Food	Rationing – ‘dig for victory’ (grow your own). campaigns, recipes provided, people to be responsible for health, basic nutritional guidelines	Creative use of a limited range of food	No waste, re-using of food materials for stock, broth etc.	Nations health good – (obesity), publicity to promote food preparation. Ensuring minimum quality and standard for everyone.	

4b	3 different points clearly explained = 1 mark for each point + 1 mark for each justification (See grid below)		Only <u>one</u> product must be referred to. Trend setter and iconic product can differ from 4a to 4b. Reward positively. Iconic Product can be different from 4a but answer must relate to Iconic product chosen. Marks must show the impact that the iconic product has had and not merely describe the product. Reward good justification even if the point is relevant but not worthy of credit.	
	Design	Innovation	Function	
Radio TV or other domestic product	Fashion/trends Desirability, smaller	Moulding methods that enabled new products and designs to be created. Modern designs including curves, rounded corners took products away from being a piece of furniture. Also more portable because of size.	Reference to function of Radio TV or other domestic product such as greater access to news entertainment social function – bringing family together were increased because of mass production.	
Underground map	Simple, easy to follow , representation rather than accuracy – user focused	Clear, equal spacing of stations, use of colour, sans serif typeface	Use of colours and symbols / easy to follow and use / has not required changes over time / can be used by any nationality / design copied world wide / has become the blueprint for transport systems.	
Mobile phone	Fashion/trends, use of colour/style, multiple use E.g. music, texting etc	Technology enables phones to be used for a variety of purposes,	Phones became part of the communication explosion. Additional functions such as camera, internet connection, sound recording, texting and/or video. Knock on effect affecting life style and independence, security.	
Sports clothing	Fashionable, lightweight, youth culture	Used in a range of different environments including extreme conditions,	Explanation of how Gore-Tex works as a composite/laminate to specifically improve the functionality of the sports clothing.	
War time rationing	It forced people to be innovative and self efficient, required them use initiative, focused upon nutrition, simple basic menus	Use of powdered ingredients for the mass market, use of preservatives	Reduced waste, improved nutrition, to ensure the health and well being of the nation, social implications – caring for one another.	

5a	<p>1 mark for each key specification point – no marks awarded for points identified in the question [4] Food: Appearance, nutrition, balance, ethical, enjoyment, taste, texture, speed of making Textiles: user, sport, properties, lightweight, ergonomics, comfort, maintenance / care, Graphics: material properties, target market, production techniques, location, 2D/3D, stable / sturdy Resistant Materials: stationary equipment, user, location, material properties, ergonomics, production, Electronics: electrical safety, power supply, ease of use, target market, production techniques [4]</p>	<p>If there is no “tick in the box” refer to parts ‘b’ – ‘d’ to identify candidate focus. No marks for criteria lifted from design situation such as ‘based on ‘30’s ‘40’s Bakelite products’’. Generic points Eg aesthetically pleasing, cheap, durable, light, strong are not accepted. Accept one word points as long as they clearly relate to the design need Such as Gortex – comfortable waterproof breathable or lightweight.</p>
5b	<p>initial ideas [1] Only design solution with no accompanying notes [1] 1 design solution with notes or more than 1 design with labels only [2] More than 1 design solution with notes [3] A range of design solutions that address at least two specification points [4] A creative approach to designing [5]</p>	<p>For electronic responses reward according to mark scheme even if an electronic system not shown. Where there are no specification points in 5a maximum marks available are 3 For food except each course as a separate idea.</p>
5c	<p>development of ideas – <u>must</u> reflect the product focus One developed solution showing an idea from the initial ideas with some development – no [1] 1 developed idea with notes [2] Clear development of an idea [3] Notes that link to at least two specification points [4] A range of developments with notes that link to at least 3 specification Points [5]</p>	<p>In this part candidates must address the requirements of the “<i>design need</i>” and draw upon specific subject material knowledge. Where there are no specification points in 5a maximum marks available are 3 For electronic responses a system must be shown. No marks to be awarded for aesthetic developments. To obtain full marks candidates must consider their own specification.</p>

5d	<p>final proposal</p> <p>A simple solution with limited detail/notes (1)</p> <p>A solution which meets the original design need with details of all components/parts (0-2)</p> <p>Full details showing how the design meets their specification point 1 = 1 [1]</p> <p>Full details showing how the design meets their specification point 2 = 1 [1]</p> <p>Full details showing how the design meets their specification point 3 = 1 [1]</p> <p>Full details showing how the design meets their specification point 4 = 1 [1] [6]</p>	<p>Evidence of detail may be taken 5c and/or 5d.</p> <p>For all areas accept justified points related to the candidates' specification and any points given to the candidates in the "design need". Eg <i>Bakelite Radio, 30's 40's</i></p>
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**General Certificate of Secondary Education
GCSE Product Design (Full and Short course)
June 2007 Assessment Series
Unit Threshold Marks**

<i>Unit</i>		Maximum Mark	a*	a	b	c	d	e	f	g	u
B801 (01)	Raw	90	77	62	47	33	27	21	15	9	0
	UMS	120	108	96	84	72	60	48	36	24	0
B801 (02)	Raw	90	77	62	47	33	27	21	15	9	0
	UMS	120	108	96	84	72	60	48	36	24	0
B802	Raw	60	50	43	36	30	26	23	20	17	0
	UMS	80	72	64	56	48	40	32	24	16	0
B803 (01)	Raw	90	73	60	47	35	28	21	15	9	0
	UMS	120	108	96	84	72	60	48	36	24	0
B803 (02)	Raw	90	73	60	47	35	28	21	15	9	0
	UMS	120	108	96	84	72	60	48	36	24	0
B804	Raw	60	47	40	33	26	21	16	12	8	0
	UMS	80	72	64	56	48	40	32	24	16	0

Specification Aggregation Results

Overall threshold marks in UMS (i.e. after conversion of raw marks to uniform marks)

	Maximum Mark	A*	A	B	C	D	E	F	G	U
J900	200	180	160	140	120	100	80	60	40	0

	Maximum Mark	A*	A	B	C	D	E	F	G	U
J901	400	360	320	280	240	200	160	120	80	0

The cumulative percentage of candidates awarded each grade was as follows:

	A*	A	B	C	D	E	F	G	U	Total No. of Cands
J900	0.7	4.9	17.6	40.0	58.9	77.7	88.9	95.9	100	752
J901	0.3	11.0	31.8	58.1	75.8	88.0	95.2	98.6	100	1751

J900 – 752 candidates were entered for aggregation this series

J901 – 1751 candidates were entered for aggregation this series

For a description of how UMS marks are calculated see;

www.ocr.org.uk/OCR/WebSite/docroot/understand/ums.jsp

Statistics are correct at the time of publication

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