OCR
RECOGNISING ACHIEVEMENT

GCSE

Design & Technology (Product Design)

General Certificate of Secondary Education **GCSE J901**

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

Mark Scheme for the Components

January 2008

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

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.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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General Certificate of Secondary Education Product Design (J901)

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

MARK SCHEMES FOR THE UNITS

Mark Scheme B802 Designing and Making Innovation Challenge

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	Initial thoughts are creative showing unexpected and/or challenging ways of thinking	1	0 1 2 3 4 5 6 7 8 9 10 11 12 13 1415 16 17 18 19 20 21 22
	Brief	Possible briefs are narrow	1	Final design brief has scope for creativity	1					
	Use/ clients/ users	Consideration of intended use and clients is limited	1	User requirements are positively reflected within design work	1					
	Specification	Specification is vague/generic. Points based upon 'given' information.	1	Specification gives some detailed requirements for product	1	Specification is detailed key features of the product are identified.	1			
	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	
						Creative thinking expands ideas	1	Ideas are innovative and creatively sustained	1	
	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	
								Innovation and creativity demonstrated	1	

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	0 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 (swatches, rendering, overlays, etc)	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 basic	1	Considered choice of materials and components	1					0 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/ complexity	1	

Analysis of ideas, models and prototypes 12 Marks	Analysis and Evaluation	Analysis and evaluation limited	1	Analysis and evaluation satisfactory. Evident throughout design work and in box 18, 19 20	1	Analysis and evaluation good. Justification given. 'Fast forward' gives clear information about future product.	1	Detailed analysis and evaluation with justification. Suggested Improvements/Use of technical terminology	1	0 1 2 3 4 5 6 7 8 9 10 11 12
	Peer Evaluation	Limited Plan and recording of feedback for reflect & record activity	1	Clear plan for reflect and record. Records peer feedback and possible modifications	1					
	Development of ideas	Shows some development of ideas from **'initial thoughts'**	1	Shows clear development. **Initial thoughts** have been expanded.	1	Shows clear discrimination between good and poor ideas	1	Justifies rejection of ideas in favour of ones that are worthy of further development	1	
						Clear evidence of development of ideas	1	Fully develops ideas. No outstanding design issues	1	
Reflection 4 Marks	Reflection	Basic comments / observations. May relate to 'model' only	1	Reflection focuses on 'design issues' specific strengths and weaknesses identified			1	Quality analysis/creative design improvements suggested	1	0 1 2 3 4
				Alterations/refinements to the 'design' are specified/suggested			1			

	Development	Communication	Materials	Analysis of ideas	Reflection	**Total Mark**
Marks						/60

Centre Number	Candidate Name	Candidate Number

Mark Scheme B804 Designing Influences

Question	Mark Scheme	Additional Information
1(a)(i) [2]	Heels / high heels, strap / ankle strap, lightweight, modern looking, easy to clean, fashionable, colourful, repairable, appearance, design of sole, allows roll, proportion, adjustable buckle, makes the person taller, heels support, sole grip, exposed toes 1 mark for each.	Accept single word answers – see overarching comments - such as heels, straps If misinterpretation of ankle bracelets rather than there being straps do not reward. **Do not accept:** "platform" this is given in the stem of the question reference to materials health and safety comfortable moulded to shape of foot reference to anthropometrics / ergonomics
(ii) [2]	Wearer may fall/trip, affects posture, back problems, exposed toes, twisted ankle/foot, damage to structure of foot, weaken ankles, lack of stability of user 1 mark for each.	**Do not accept:** standing on others toes unless related to lack of stability discomfort heels may snap
(b) [3]	Any three from: • waterproof / water resistant / impermeable • hardwearing / durable / toughness / strong / robust / sturdy • breathable • elastic / flexible / malleable / soft • lightweight • easy shaped/formed/manufactured • easy to keep clean / polish • abilty to be stained/coloured 1 mark for each.	**Do not accept:** light comfortable smooth

(c)

Leather	Crocodile skin	Canvas
Rubber / latex	Cork	Hessian
Hide	Wood	Jute
Pig skin	Cotton	Wool
Suede	Silk	Snake skin
Fur		

1mark for any **one** natural material

Answers should relate to a natural material (eg animal skins) and its environmental / social / health / cultural / ethical / sustainability / endangered species related implications.

Exemplar issues:

- leather is made from animal skin (1 mark), animals are killed as part of the process (1 mark)
- silk worms produce silk (1 mark) but are killed during processes (1 mark),
- cotton fields / latex– crop is labour intensive (1 mark) exploitation of workers (1 mark).

[3]

+ 1 mark for explanation
+ 1 for some 'extra' detail reference explanation

Do not accept:
Plastics
Pvc
Glass
Metals

If the explanation does not relate to a natural material no marks but reward natural material.

If explanation is creditable but does not relate to the given natural material given in c reward up to two marks but not the mark for the material given.

If material is left blank possible reward of up to three marks if it referred to in the explanation.

If an incorrect natural material given it might be possible to gain three marks in explanation if one is given and appropriate explanation is given.

2(a)(i) [2]	Concerns for the environment, help contribute to reduction in global warming, becoming cheaper to buy, cheap to run, doesn't requires mains electricity, low maintenance, more available, no need to switch on/off, automatically comes on in the dark, moveable, does not require a battery (current stored internally), no wires, safer because low voltage, fashionable/trendy, like to see garden lit at night, ease of set up. 1 mark for each **different** reason.	**Do not accept:** Doesn't need electricity to run it Attractive Easy to use Re-charged by the sun
(ii) [2]	Only works efficiently in bright sunlight, usually more expensive than electric/battery powered, often dim during the winter months, become dimmer as stored charge runs down, environmental disposal, limited light output 1 mark for point plus 1 for the explanation.	**Exemplar responses:** Don't always come on = zero Don't produce much light = 1 If it isn't sunny they don't work as well = 1 If the garden does not have much sun in the day it will not light up at night or not be so bright. = 2
(b) [3]	Wave, hydro-electric / dams / wind, bio-mass / manure geothermal, wind up / manual, tidal / barrage, timber – if from a sustainable source (pine / softwood).	**Do not accept:** Heat / thermal kinetic potential nuclear water oil gas fossil fuels
(c) [3]	Explanation could include: cost, size of storage, availability, do not provide continuous electricity, (are designed for AC mains) do not provide enough electricity, power level, feeling of unreliability by consumers, sources are external generally lower power available, supply dictated by energy suppliers, time required to charge, consumer need / demands. Each point = 1 mark up to 2 marks plus 1 mark for justification One point = 1 mark plus justification = 1 mark	Answer should look for reasons why there are not more domestic products like the solar powered lights.

3(a) [3]	Better looking, cheaper to run, more attractive, easier to use / manoeuvre copes with different height carpets floor materials and surfaces, bagless system – more environmentally friendly – additional cost, self adjusts to floor surface, has hose connections, warning / indication when needs emptying, flatter angles for getting under furniture, air filtering / more attachments, / versatility, easier to empty, heppa filters, retractable cable. 1 mark for each **different** point	**Do not accept (spot the difference between the two graphic images):** Longer lead / position of lead Bigger wheels Reference to anthropometrics / ergonomics Shape unless justified Cubic capacity More robust More compact Lighter in weight Reference to suction / cyclone (given in 3b)
(b) [4]	**An** explanation of two different points that justify the choice above. One mark for a simple explanation, such as 'it is see-through', two marks for a detailed explanation such as 'the body of the vacuum cleaner is clear so you can see when it needs emptying'.	If point is incorrect but explanation is valid reward up to two marks for example. If bigger wheels given in part (a) i.e '0' mark given **BUT** explanation states bigger wheels then allow vacuum to be more easily moved around (1 mark) less tiring for the user (1 mark)
(c) [3]	Explanation should include: materials and production, improved design, more efficient motors, lighter weight, more functions, changes in the home – different material / lifestyles, health considerations, advances in ergonomic understanding, consumer demand, greater affluence has led to new markets / products fashion trends planned obsolescence, modern materials and moulding techniques. Look for 3 points for 1 mark each **or** 2 points (2 marks) with an explanation (1mark)	Do not reward the term "technological developments" (this is given in the example within the question) but reward the actual examples and explanations given.

Question 4 overarching comments:
Irrespective of what "tick" response candidates have done positively reward the content of 4 (a) and 4(b)
Question 4 (a) and 4(b) may be different era or trend setters
Trend setter / iconic product must be selected from the list given in question ie not trend setter iconic product of their own or from a previous OCR Product Design Theme.

4a	A clear explanation that identifies any two reasons that justify the importance of the trend setter- 1 mark for each reasons, (up to 2 marks) plus 1 mark for each explanation (up to 2 marks). (See below) [4]	Only <u>one</u> trend setter must be referred to. Reward content even if no or incorrect trend setter identified.
	Points	Legacy / impact
Charles Rennie - Mackintosh **Art Nouveau**	Related to art nouveau – Crossover from Arts and Crafts No boundaries to his designing New technology and materials World wide – design movements –	New art form / turning point from Victorian ornate to flowing lines more feminine, curves flowery. Greatly influenced Vienna Art School and the Art Nouveau movement. Streamlined Victorian style. Took design forward from arts and crafts movement who had started using machines to provide furniture for ordinary people as opposed to the wealthy. Jewellery, furniture, architecture, whole interiors, Relates to the use of designs in a range of materials - metal, glass, Wood and their combination –typically in jewellery and clocks. Work has been widely copied. Has influenced subsequent design movements, influence still seen today in modern products such as: jewellery and glass, and architecture such as the Glasgow School of Art

Raymond Loewy **30, - 60's**	Commercial product design, transport, industrial design. Domestic products Graphics: Simplification of designs for logos such as Shell / Pepsodent / Hoover logos	Became to be know as "streamlining". Designs look like aeroplanes, graphic designs were simplified and typography were spaced out to improve their visual impact (white space / no visual clutter). Era of air travel which influenced designs. Bull nosed fridges / The classic coke bottle. Designs not restricted to one discipline Taking 3D objects and breaking down into simplest forms, use of primary / bold / few colours eg shell logo / lucky strike. Now in purest from no need to change – they are at their optimum Modern, timeless Improved people's lives, better graphic recognition Brand identity for many products. Voted as most important American of the 20th century. Streaming has influenced by Loewy and his contemporises
Transistors **50's**	Semiconductor technology enabled smaller, lighter weight products. Use of semiconductors such as silicon Portable products and standalone, complex products manufactured cheaply –	Led to the development of Telephony, communication Led to greater efficiency such as energy and manufacturing Has enabled communications technology – social benefits such as medical, internet, travel communications Huge increase in technological obsolescence – Less power required so development of battery powered products followed.

Mary Quant **60's**	Led the sixties revolution – Clothing and accessories such as: Short skirts, hot pants, bold and flamboyant colour combinations Regarded as the mother of sixties fashion design, which made London the design capital of the world for a decade –	Challenged conventional design thinking and moral attitudes. Womens' rights, less formal, less conservative, justified freedom. She used the "Daisy" logo, bold colours- often black and white, the "A" line. Functional – running for the bus. Inspired other designers such as Christian Dior
Processed Food **70's**	Led the way for convenience foods and ready meals, (meaning easier, quick preparation, labour saving for consumer). Lifestyle changes, more women at work / televison New Technologies: • freeze drying • dehydration • use of additive • preservatives	Changed shopping habits. Less time at home for domestic eg cooking Has ultimately contributed to obesity, behavioural problems Enabled foods to be stored for longer periods and produced in desiccated / dried / and re-constituted

4b	3 different points clearly explained = 1 mark for each point + 1 mark for each justification (See grid below) [6]	Only one 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.
Iconic product	**Design**	**Impact the design has had on other designs and designers**
Macintosh Chair	Unique design Tall straight / flowing lines Incorporated motifs Oriental influence Decorative not to be used	Horizontal / vertical lines. Floral motifs and square holes. 1st seen in the 1890's when designs were still very ornate – the beginning of volume production. Functional but was a statement of "Form before function" for example the chair symbolic of a throne to be used at a ceremonial event. Still popular today, widely reproduced, also influences. Use of glass, japanning, use of silver colouring.
Shell logo	Simple design using primary colours Easy to remember – (instantly recognisable) Uncluttered Uncomplicated Symmetrical Can be photocopied and used in black and white Can be enlarged/reduced	Used throughout the world Design reduced to its perfect form – influenced other designs such as McDonald's logo. Has stood the test of time and has not been developed. When enlarged / reduced does not lose impact or identity.

Bush TR82 transistor radio	The first really portable radio Relatively low cost Iconic shape – appeals to young Modern looking Streamlined Available in different colours	Made radios accessible to many more people because prior to this radios were items of furniture. Younger generations beginning to have more money. The time of popular music culture – birth of rock and roll. No warm up time need compared to valve sets. Battery operated allowing freedom of use. Radio that followed were influenced by that design. Portable so used in cars which led to the development of in car entertainment systems. Coincided with the increased and so travelling more.
Mini Skirt	Daring design A statement about the freedom of women to express their sexuality	Icon of the generation – encapsulated whole ethos of the 1960's – sexual freedom – statement about femininity – ability receptivity whilst looking "attractive" Changed people's attitudes toward dress, changed convention. Moved from conservative to freedom to express themselves. More comfortable, more manoeuvrable Quote: Now women can run for buses.
Pot Noodle	Simple to prepare Quick / little effort Very tasty Same pot Starch / carbohydrate Brand image Staple diet of those with limited resources / time Low in fat 5%	 Bulking properties Formally "instant Noodle" Love / hate relationship "cult" status Ability to capitalise on population issues such as: part of breakaway movements "take away" Indian / Chinese / Italian, more overseas travel demanded newer "tastes" Social changes: more people living on own, more student's population, divorce therefore responding to consumer opportunities. Numerous similar products such as cup a soup, bean feast.

5a	1 mark for each key specification point – no marks awarded for points identified in the question [4] **Mackintosh**: material properties, aesthetics, ergonomics, production, motifs taken from Macintosh designs, straight and curved lines, **Loewry**: style, simplistic design, bold colours, material, target market, mechanism, **Transistor:** power supply, ease of use, target market, production, electrical safety, techniques, sensor(s), weather resistant / water proof, wall mounting, appearance, output type and intensity **Mary Quant:** user, properties, lightweight, ergonomics, comfort, maintenance care, style, materials, construction, sizes, strap arrangements, closures, function **Processed Food:** Appearance, bulking / filling, balance, quick to prepare, enjoyment, taste, texture, prepared and eaten in same container Textiles: [4]	If there is no "tick in the box" refer to parts 'b' – 'd' to identify candidate focus. Do not accept points lifted from design situation such as 'based on nutritionally balanced". Or generic points Eg aesthetically pleasing, cheap, durable, light, strong no sharp edges Accept one word points as long as they clearly relate to the design need such as stylish (as in the mackintosh jewellery).
5b	initial ideas 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]	For electronic responses reward according to mark scheme even if an electronic system not shown. Loewy responses reward according to mark scheme even if a Loewy design is not present. Where there are no specification points in 5a maximum marks available are 3 For Processed Food accept each course as a separate idea.

5c	development of ideas – must reflect the product focus One developed solution showing an idea from the initial ideas with some development - no notes [1] 1 developed idea with notes [2] Clear development of an idea with notes [3] Clear development with 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]	In this part candidates must address the requirements of the *"design need"* and draw upon specific subject material knowledge. Where there are no specification points in 5a maximum marks available are 3 For "transistor" responses a system must be shown and no marks to be awarded for aesthetic developments. To obtain full marks candidates must consider their own specification.
5d	final proposal A simple solution with limited detail/notes (1) A solution which meets the original design need with details of all components/materials needed for manufacture (0-2) Full details showing how the design meets their specification point 1 = 1 [1] Full details showing how the design meets their specification point 2 = 1 [1] Full details showing how the design meets their specification point 3 = 1 [1] Full details showing how the design meets their specification point 4 = 1 [1] [6]	Candidates should show relevant details for manufacture: • sizes / dimensions, • quantities, • method, • joining / mixing techniques • tools / equipment Evidence of detail may be taken from 5c and / or 5d. Accept justified points related to the candidates' own specification even if not rewarded in 5(a), and / or any points given to the candidates in the design need in the actual question. *Eg nutritionally balanced meal.*

Grade Thresholds

General Certificate of Secondary Education
Design & Technology: Product Design (Specification Code J900 and J901)
January 2008 Examination Series

Unit Threshold Marks

Unit		Maximum Mark	A*	A	B	C	D	E	F	G	U
B801	Raw	90	82	68	54	41	33	26	19	12	0
	UMS	120	108	96	84	72	60	48	36	24	
B802	Raw	60	47	41	35	29	25	22	19	16	0
	UMS	80	72	64	56	48	40	32	24	16	
B803	Raw	90	82	68	54	41	33	26	19	12	0
	UMS	120	108	96	84	72	60	48	36	24	
B804	Raw	60	48	41	34	27	22	17	12	7	0
	UMS	80	72	64	56	48	40	32	24	16	

Specification Aggregation Results

Overall threshold marks in UMS (ie 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	0	100	100	100	100	100	100	100	1
J901	0	0	0	0	100	100	100	100	100	2

For a description of how UMS marks are calculated see:
http://www.ocr.org.uk/learners/ums_results.html

Statistics are correct at the time of publication.

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