

# **Design & Technology (Product Design)**

General Certificate of Secondary Education **GCSE J305**

General Certificate of Secondary Education (Short Course) **GCSE J045**

## **Mark Schemes for the Units**

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**January 2010**

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## CONTENTS

General Certificate of Secondary Education Product Design (J305)

General Certificate of Secondary Education (Short Course) Product Design (J045)

### MARK SCHEMES FOR THE UNITS

<b>Unit/Content</b>	<b>Page</b>
A552	1
A554 Designing Influences	4
Grade Thresholds	17

# A552

Development of Design Evolution through making	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 ways of thinking	1	0 1 2 3 4 5
	Brief	Possible briefs are narrow	1	Final design brief has scope for creativity	1					6 7
	Use/clients/users	Intended user(s) and/or client(s) is considered	1	User requirements are positively reflected within design work	1					8 9 10 11
	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			12 13 14 15
	Ideas	Very limited / predictable idea/s	1	Range of ideas that respond to the brief/specification	1	Ideas show detail	1	Ideas fully explained	1	16 17
		Some evidence of creative thinking	1	Creative thinking expands ideas	1	Ideas are innovative (inventive, original, novel)	1	Details of construction or materials given	1	18 19 20
	Response to Design Problem	Limited consideration or response to given design problem	1	Design problem considered/addressed	1	Design problem fully considered/addressed	1			21 22

Communicating information through sketches, writing and photographs	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	Uses a variety of techniques to enhance design communication eg rendering, swatch	1	0 1 2 3 4
		Written communication (clarity of message) is limited	1	Written communication is satisfactory	1	Written communication is good	1	Written communication is clear and succinct. Technical vocabulary is used	1	5 6 7 8
Materials, Components, Processes, Techniques, and Industrial practice	Material Selection	Choice of materials and components limited	1	Considered choice of materials and components	1	Appropriate joining methods identified/detailed	1			0 1 2 3
		Use of Material	1	Some adept use of materials but with inconsistencies.	1	Adept use of materials	1	Creative use of Materials	1	4 5 6 7
	Making Skills	Product modelling attempted – may be incomplete	1	Model mainly complete with reasonable standard of making skills evidenced	1	Model complete with good standard of making skills demonstrating accuracy	1	Model(s) complete with a high standard of making skills	1	8 9 10 11 12
		Model accurately reflects design	1	Reviews manufacturing progress, producing clear plans for next stage of making	1	Making skills demonstrate a range of techniques/ complexity	1			13 14

Analysis of ideas, models and prototypes	Analysis and Evaluation	Analysis and evaluation limited	1	Analysis and evaluation satisfactory. Evident throughout design work and in box 17 and 18	1	Analysis and evaluation good. Some justification given. Clear information given about future product.	1	Detailed analysis and evaluation with justification. Suggested Improvements/Use of technical terminology	1	0
	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					1
	Development of ideas	Shows some development of ideas from 'initial thoughts'	1	Shows clear development. <b>Initial thoughts</b> have been expanded.	1	Shows clear discrimination between good and poor ideas	1	Explains rejection of ideas in favour of ones that are worthy of further development	1	10
						Clear evidence of development of ideas	1	Fully develops ideas. No outstanding design issues	1	11
										12
Reflection	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
				Alterations/refinements to the 'design' are specified/suggested			1			1
										2
										3
										4

## A554 Designing Influences

Expected Answer		Mark
1 (a) (i)	Buttons, Modern design, attractive, easy to use, easy to hold, lightweight, looks sophisticated, good surface finish, hardwearing/durable/last long time, well spaced buttons, comfortable material to hold, tactile grip, appropriate size for multiple users, navigation stick, wireless/no wires, on off button,	[3]
(b) (i)	Between 18 and 20	[1]
(ii)	The maximum size would be 20 because this matches the 5% women's' thumbs. Any larger than this and it would be too big for them to use. Any smaller than 18 and it would be too small, especially for men.	[1]
(iii)	Too large(1) to be comfortable used by most women(1).	[2]
(c)	Answers should refer to: Look, feel/texture Line, shape, colour, form, composition, line, balance, proportion, symmetry, rhythm The principles and elements of design. 1 mark for each point (up to 2) plus 1 mark for explanation.	[3]
	<b>Total</b>	<b>[10]</b>

Expected Answer		Mark
2 (a) (i)	Energy/electricity saving – lower carbon footprint - good for the environment, cheaper to run/cost savings, last longer, unusual designs, government pressure, filament bulb not available, does not hurt your eyes, may not fit all lights	[3]
(a) (ii)	Initial cost can be higher, lower wattage, cannot be used with variable resistor (ie dimmer), cannot be used as spotlights, delayed lighting up, not very bright, can cause skin allergy, can contain mercury/difficult to recycle	[2]
(b)	Any acceptable produce eg renewable energy sources – such as wind-up, rechargeable batteries, solar, wind, wave, tidal' hydroelectric, bio-mass, geothermal etc Wood (managed forest)	[2]
(c)	Answers should refer to: Need to evaluate energy use at every stage of the design process in order to find ways of reducing energy. 1 mark for reference to energy saving or reduction(1), inventory(1), break down stages of production(1). 1 mark any of the above each plus 0-2 marks for detailed explanation. <b>OR</b> 1 mark for up to two of the above plus 1 for explanation	[3]
	<b>Total</b>	<b>[10]</b>



Expected Answer	Mark
3 (a)	[3]
Ergonomically designed for comfort, and reach. Swivel/tilt chair makes it easier for the user to reach things without moving the chair. High/low back support. Adjustable height, comfortable, moveable, back shape to fit back, wheels, sloping arm rests for support, more padding, available in more colours, 5 wheels make the chair more stable	
(b)	[4]
An explanation of <b>two different</b> points that justify the choice in part (a) <b>One mark</b> for a simple explanation such as: easy to hold <b>Two marks for a detailed explanation</b> such as: wheels – the modern office chair has wheels making it moveable therefore the user can reach things more easily without getting out of his seat.	
(c)	[3]
The material is wood which is sustainable whereas the modern chair uses steel and plastic which although recyclable use large amounts of energy both in production and recycling 1 mark any of the above each plus 0-2 marks for detailed explanation. <b>OR</b> 1 mark for up to two of the above plus 1 for explanation	
<b>Total</b>	<b>[10]</b>

**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.


N.B. 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.

Avoid giving credit for information gleaned from the examination paper, eg Sir Alec Issagonis designed the mini cooper.

4 (a)	<p><b>Continuous prose – question marked for quality of written communication (6 marks)</b>  3 different points clearly explained = 1 mark for each point + 1 mark for each justification. <b>(See grid below)</b>  Iconic product must be ticked or written.  Iconic product can be different from 4a but answer must relate to iconic product chosen.  Marks must show the <b>impact</b> that the iconic product has had and <b>not</b> merely describe the product.  <u><b>If candidate accidentally describes iconic product instead of designer in 4a, award credit in 4b and vice versa (to a maximum of 4 marks). The additional two marks for 4a can be awarded if the candidate meets the criteria for top band QWC</b></u></p> <p><b>Level 1 (0-2 marks)</b>  Basic analysis showing some understanding of the meaning of influential in the context of the chosen iconic product. Can provide an explanation which makes some reference to design innovation and function.  There will be little or no use of specialist terms. Answers may be ambiguous or disorganised. Errors of grammar, punctuation and spelling may be intrusive.  One specific point is well made (2)  Just one general point made (1)</p> <p><b>Level 2 (3-4 marks)</b>  Adequate analysis, showing an understanding of the meaning of influential in the context of the chosen iconic product. Can provide an explanation which makes adequate reference to design, innovation and function.  There will some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There will be occasional errors in grammar, punctuation and spelling.  Two specific points well made (4)  Two general points made (3)</p> <p><b>Level 3 (5-6 marks)</b>  Thorough analysis, showing a clear understanding of the meaning of influential in the context of the chosen iconic product. Can provide a clear explanation which makes detailed reference to design, innovation and function.  Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of grammar, punctuation and spelling.  Three specific points well made (6)  Three general points made (5)</p> <p><b>[6]</b></p>
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	Points	Legacy / impact
<p>4 (b)</p> <p>Sir Alec Issagonis</p> 	<p>His greatest legacy was the mini which he designed during the late fifties. Innovative space saving designs including front wheel drive and transverse engine became the model for all small car designs of the future.</p>	<p>His work has been widely copied, and is always in demand. He has influenced subsequent design movements. His influence can still be seen today in modern products, such as jewellery, glass, furniture and architecture. Major influence towards Glasgow achieving status of European City of Culture.</p>
	<p>3 different points clearly explained: 1 mark for each point 1 mark for each justification. [6]</p>	<p>Only <u>one</u> product must be referred to. Trend setter and iconic product can differ from 4a to 4b. Iconic Product can be different from 4a but answer must relate to chosen product. Must explain <b>impact</b> of the iconic product, not merely describe the product. Reward good justification even if the point is relevant but not worthy of credit.</p>
<p>The Austin Mini</p> 		<p>Almost all small front-wheel-drive cars developed since have used a similar configuration The Mini was designed with sliding windows in the doors, thus allowing for storage pockets to be fitted in the space where a winding window mechanism would have been. Issigonis is said to have sized the resulting storage bins to take a bottle of his favourite Gordon's Gin</p> <p>The boot lid was designed with the hinges at the bottom so that the car could be driven with it open to increase luggage space. On early cars the number plate was hinged so it swung down to remain visible when the boot lid was open. Although it has to be mentioned that this design was later discontinued as it was discovered that exhaust gasses could leak into the cockpit while the boot was open.</p>

	Points	Legacy / impact
4 (b)		<p>The Mini was designed as a monocoque shell with welded seams that are visible on the outside of the car running down the A and C pillars, and between the body and the floor pan showing where the joins are. To further simplify construction, the car had external door and boot hinges.</p> <p>All of these novel and elegant technical innovations resulted in a car with minimum overall dimensions yet maximised space for both passengers and luggage.</p>
4 (b)	<p><b>Only <u>one</u> trend-setter must be referred to.</b> View parts (a) and parts (b) a whole and reward: Up to 3 marks for three different points plus 1 mark for explanation of one of the points <b>OR</b> 2 different points (0-2) both explained (0-2) [4] Reward content even if no trend-setter or incorrect trend-setter identified.</p>	

	Points	Legacy / impact
<p>4 (b) Andy Warhol</p> 	<p>In the sixties Warhol started painting daily objects of mass production like Campbell Soup cans and Coke bottles. Soon he became a famous figure in the New York art scene. From 1962 on he started making silkscreen prints of famous personalities like Marilyn Monroe or Elizabeth Taylor.</p>	<p><b>Andy Warhol art</b> was the first to remove the difference between <i>fine arts</i> and the <i>commercial arts</i> used for magazine illustrations, comic books, record albums or advertising campaigns. Famously said "When you think about it, department stores are kind of like museums".</p> <p>Associated with the Pop Art movement – screen prints became mass produced all around the world – the most famous being Marilyn Monroe.</p> <p>The pop artist not only depicted mass products but he also wanted to mass produce his own works of pop art.</p> <p>Warhol's favorite printmaking technique was <i>silkscreen</i>. His first one was called <i>Sleep</i> and showed nothing else but a man sleeping over six hours.</p> <p>Warhol's activities became more and more entrepreneurial. He started the magazine <i>Interview</i> and even a night-club. In 1974 the <i>Factory</i> was moved to 860 Broadway. In 1975 Warhol published <i>THE philosophy of Andy Warhol</i>. In this book he describes what art is: "Making money is art, and working is art and good business is the best art."</p>
<p>4(b)</p>	<p>3 different points clearly explained: 1 mark for each point 1 mark for each justification. [6]</p>	<p>Only <u>one</u> product must be referred to. Trend setter and iconic product can differ from 4a to 4b. Iconic Product can be different from 4a but answer must relate to chosen product. Must explain <b>impact</b> of the iconic product, not merely describe the product. Reward good justification even if the point is relevant but not worthy of credit.</p>

	Points	Legacy / impact
Campbell's Soup	Simple, bold use of colour, reproduced as silk screen prints, characterised the pop art movement	Instantly recognisable, an iconic design because it has transcended time and fashion
	<p><b>Only <u>one</u> trend-setter must be referred to.</b> View parts (a) and parts (b) a whole and reward: Up to 3 marks for three different points plus 1 mark for explanation of one of the points <b>OR</b> 2 different points (0-2) both explained (0-2) [4] Reward content even if no trend-setter or incorrect trend-setter identified.</p>	
	<p>Some discrete, most now found in integrated circuits, microchips, chips.</p> <p>Low cost, flexible, reliable, physically rugged, long life, insensitive to shock or vibration.</p>	Used extensively for signalling application and light emitting/receiver circuits. Low cost applications proved 'invisible light spectrum. Low energy consumption makes them perfect for applications such as remote control switching circuits.
	<p>3 different points clearly explained: 1 mark for each point 1 mark for each justification. [6]</p>	<p>Only <u>one</u> product must be referred to. Trend setter and iconic product can differ from 4a to 4b. Iconic Product can be different from 4a but answer must relate to chosen product. Must explain <b>impact</b> of the iconic product, not merely describe the product. Reward good justification even if the point is relevant but not worthy of credit.</p>
	A symbol of 80's decadence. Superseded the cable remote which was its forerunner. Used infra technology to provide flexible, reliable low cost/low energy solution	At first had a novelty value now seen as an essential part of TV experience.

	Points	Legacy / impact
	<p><b>Only <u>one</u> trend-setter must be referred to.</b> View parts (a) and parts (b) a whole and reward: Up to 3 marks for three different points plus 1 mark for explanation of one of the points <b>OR</b> 2 different points (0-2) both explained (0-2) [4] Reward content even if no trend-setter or incorrect trend-setter identified.</p>	
		<p>The peasant look killed the space age look. Yves Saint Laurent's gypsy collection was gay, colourful, soft and exotic. In 12 months the space age look disappeared and was replaced with flower power, hippies and a return to earth lifestyle. Students wore long flowing hair and faded denim jeans with army surplus shirts and combat jackets at anti-war rallies. The no make-up look and swirling psychedelic patterns became popular. Afghans and Kaftans</p>
	<p>3 different points clearly explained: 1 mark for each point 1 mark for each justification. [6]</p>	<p>Only <u>one</u> product must be referred to. Trend setter and iconic product can differ from 4a to 4b. Iconic Product can be different from 4a but answer must relate to chosen product. Must explain <b>impact</b> of the iconic product, not merely describe the product. Reward good justification even if the point is relevant but not worthy of credit.</p>
	<p>Characterised the loose fitting flowing clothes of the hippy movement. Dominated by 'peace', flower power and freedom of the individual. The clothes represented the antithesis of the austere/formal clothes of the 50's which represented conformity 'to the system.</p>	<p>The Kaftan a symbol of the 60's and 70's hippy movement. A time of heightened interest in eastern mysticism and eastern culture. Clothes were flowing breaking with tradition and representing freedom.</p>

	Points	Legacy / impact
	<p><b>Only <u>one</u> trend-setter must be referred to.</b> View parts (a) and parts (b) a whole and reward: Up to 3 marks for three different points plus 1 mark for explanation of one of the points <b>OR</b> 2 different points (0-2) both explained (0-2) [4] Reward content even if no trend-setter or incorrect trend-setter identified.</p>	
	<p><b>Vegetarianism</b> is the practice of a diet that excludes meat (including game and slaughter by-products), fish (including shellfish and other sea animals) and poultry. There are several variants of the diet, some of which also exclude eggs and/or some products produced from animal labour such as dairy products and honey.</p> <p>The 60s saw a rise in vegetarianism as part of the revolution of the 60s and the anti-establishment attitudes.</p> <p>The rise in vegetarianism led to a range of new vegetarian products including interest in pulses such as lentils.</p>	<p>Changed peoples attitudes to food. Led to new recipes – demand led companies to develop meat substitutes such as soya.</p>
	<p>3 different points clearly explained: 1 mark for each point 1 mark for each justification.[6]</p>	<p>Only <u>one</u> product must be referred to. Trend setter and iconic product can differ from 4a to 4b. Iconic Product can be different from 4a but answer must relate to chosen product. Must explain <b>impact</b> of the iconic product, not merely describe the product. Reward good justification even if the point is relevant but not worthy of credit.</p>



	<b>Points</b>	<b>Legacy / impact</b>
	The concept of a nut loaf is almost a bad joke. Many of the early recipes for these vegetarian baked loaves in the 70's, when vegetarianism began to become a popular trend, were terribly bland. The addition of dates and other varieties of nuts led to a richer variety of tastes	

Expected Answer	Mark	Additional information
<p><b>5 (a)</b> One mark for each key specification point – no marks awarded for points identified in the question. (0-4)</p>	<b>[4]</b>	<p><b>Specification point is a positive statement about the form, the function, the user requirements, or the constraints of the situation.</b></p> <p><b>Together with the design need, the specification points should inform the design activity.</b></p> <p>Examples:</p> <p>It must be very easy for people to open so that they can see what's inside; the pop out must attaché to the card securely</p>
<p><b>5 (b) Initial ideas</b></p> <p>Only one sketched solution with no accompanying notes (1)</p> <p>One sketched solution with notes <b>OR</b> range of solutions with no notes (2)</p> <p>More than one sketched solution with notes (3)</p> <p>A range of different ideas that address at least two specification points (4)</p> <p>A creative approach to designing (5)</p>	<b>[5]</b>	<p><b>For Fridge Alarm responses reward according to mark scheme even if an electronic system not shown.</b></p> <p><b>For Processed Meal accept each course as a separate idea if that is the candidate approach.</b></p>

Expected Answer	Mark	Additional information
<p><b>5 (c) Development of ideas – <u>must</u> reflect the product focus</b></p> <p>One sketched solution showing an idea from the initial ideas with some development - no notes (1)</p> <p>One developed idea with notes (2)</p> <p>Development of an idea evidenced with supporting sketches/notes (3)</p> <p>Clear development of an idea with notes that link to at least two specification points (4)</p> <p>A range of developed sketches with notes that link to at least three specification points (5)</p>	[5]	<p><b>In this part candidates must address the requirements of the “<i>design need in the situation</i>”.</b></p> <p><b>Candidates should draw upon specific subject material knowledge, and focus their design thinking towards the specification.</b></p> <p><b>Where there are no creditable specification points in 5a maximum marks available are 2.</b></p> <p><b>To move beyond 2 marks there must be evidence on the page of developmental activity/decision making</b>  <b>To obtain full marks candidates must consider their own specification.</b></p> <p><b>For remote control responses a system must be shown, and no marks to be awarded for aesthetic developments. Where there is clear development without system design 1 – 2 marks may be awarded according to specification points.</b></p>
<p><b>5 (d) final proposal</b></p> <p>A simple solution with limited detail/notes (1)</p> <p>A solution with details of all components/parts (2)</p> <p>Notes/clear sketches showing how the design meets their specification point 1 (1)</p> <p>Notes/clear sketches showing how the design meets their specification point 2 (1)</p> <p>Notes/clear sketches showing how the design meets their specification point 3 (1)</p> <p>Notes/clear sketches showing how the design meets their specification point 4 to include some manufacturing details (1)</p>	[6]	<p>Candidates should show relevant <b>details</b> for manufacture:</p> <ul style="list-style-type: none"> <li>• materials/ingredients/components.</li> <li>• sizes / dimensions / quantities,</li> <li>• methods / joining / mixing techniques,</li> <li>• tools / equipment,</li> </ul> <p>Evidence of <b>detail</b> may be taken from 5c and/or 5d, but <b>not</b> 5b</p> <p><b>Accept</b> justified points related to the candidates’ <b>own specification</b>, even if not rewarded in 5(a), and / or any points given to the candidates in the <b>design need</b> of the actual question. <i>Eg 1970’s nutritionally balanced meal.</i></p>

# Grade Thresholds

GCSE Product Design (Specification Code J305/J045)

January 2010 Examination Series

## Unit Threshold Marks

Unit		Maximum Mark	a*	a	b	c	d	e	f	g	u
A551	Raw	90	81	72	63	54	45	36	27	18	0
	UMS	120	108	96	84	72	60	48	36	24	0
A552	Raw	60	54	48	42	37	32	27	23	19	0
	UMS	80	72	64	56	48	40	32	24	16	0
A553	Raw	No candidates									
	UMS	120	108	96	84	72	60	48	36	24	0
A554	Raw	60	45	39	33	27	23	20	17	14	0
	UMS	80	72	64	56	48	40	32	24	16	0

Statistics are correct at the time of publication

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