

GCSE

Design and Technology

General Certificate of Secondary Education

Unit A554: Designing Influences

Mark Scheme for June 2012

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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.

© OCR 2012

Any enquiries about publications should be addressed to:

OCR Publications PO Box 5050 Annesley NOTTINGHAM NG15 0DL

Telephone:0870 770 6622Facsimile:01223 552610E-mail:publications@ocr.org.uk

Q	uesti	on		Answer		Marks	Guidance
1	(a)		shiny surface. rubber feet to provide traction, comes in a range of colours, handle, base, pivot, lever, return spring, adjustable paper guide, captive tray for waste, rubber foot, circular punches or blades, slot for paper, safety guard	size(ergonomics), adjustable for different sized paper, comfortable handle, grips on handle, wide/stable base	lightweight easy to use, non-rusting, hardwearing (durable), strength/stiffness/ri gidity, portable	3	One word answers might be acceptable form the list on the left. Otherwise clarification / qualification is needed Do not accept (unless clarified): colour, light, small, safe, easy, simple, punch holes in paper, easy to clean
	(b)	(i)	opener, nail clipper	liers, nut cracker, whe s, claw hammer, crov kes, trimmers, door ha	v bar, foot pump,	1	1 mark for any correct answer Answer must be a specific product with a lever mechanism (accept all classes of lever) Do not accept - pump
		(ii)	moved and the efform To find the MA of a force by the effort f the less force is new would affect the de handle. Mechanical advant the force/effort/pro hole) [1]	a machine, you can div orce. With a lever, the eded to be applied. T sign of the hole punct	vide the resistance e longer the handle, Therefore, the MA h by the length of the quired (to punch a	3	Answer must relate to the hole punch. Do not reward marks for "ease of use" unless qualified by use of the lever/ less effort required Good answer: There is a long lever on the side you push down (1), and a short distance between the pivot of the cutter(1). This means it is easier to push down (1)and it will put a lot of pressure (1) on the paper so it cuts easily. <i>4 marking points provided for the 3 marks available.</i>

Question	Answer	Marks	Guidance
(C)	Answers should refer to: Examples of new materials [1] Smart materials: shape memory alloys & polymers, polymorph, thermochromic materials, photochromic materials, nano technology Modern materials: Flexiply, Flexi veneer, Hexaboard, anodised aluminium sheet, composites, Kevlar, carbon fibre Explanation of the material/ properties [1] Materials that react to external changes Combine different materials to create better properties e.g. better strength to weight ratio Innovative design opportunities created because of the developments [1] Aircraft/car body applications Bulletproof clothing Products that can change colour, glow in the dark Medical product applications Advancements in robotics	3	Look for specific examples of materials and products Good answer Thermochromic plastic materials (1) are materials that change colour when the temperature changes.(1) An example of a product that has been developed to use this material is a baby bottle that changes colour if the milk is too hot (1) Do not accept general references to plastics as new materials. Allow examples where a clear description of one material superseding another is given, irrespective of era e.g. aluminium replacing timber in aircraft frames.
	Total	10	

Question	Answer	Marks	Guidance
2 (a)	Wide base so doesn't topple, electrical insulation, insulated handle, warning light, temperature cut off, whistle, short electrical lead, can remove from base/lead, hinged/secure lid for pouring, rubber grip on base for stability, water level indicator to prevent overfilling, handle positioned on side to avoid burns, use of thermosetting plastics, spout/easy to pour, on/off switch, cordless, colour change	4	 1 mark for each point Do not accept: lid, base, handle, made from plastic, wires covered in plastic unless qualified Only allow max 1 mark for reference to electrical safety of the lead and/or plug.
(b)	 Answers should refer to: Relevant feature of the kettle [1] How the feature works/description [1] Environmental impact [1] Examples include: Visible water meter: to boil small amount of water safely, avoids waste of water & energy Automatic Off switch: to switch off once temperature has been rechecked & avoids wasting energy 	3	The answer must discuss one relevant feature of the kettle. Do not accept: less environmental impact unless qualified, references to recycling. Good answers: The meter on the side (1) telling the user how much water is inside ready to be boiled (1). This reduces the amount of water used and prevents wastage. It also reduces the amount of energy/electricity required to boil the water.(1) The automatic switch off (1) turns off the kettle off when it reaching boiling point (1) prevents the excessive use and waste of electricity. This helps the environment as less fossil fuels are burnt to generate the electricity saving resources and lessening the CO2 levels. (1)

Question	Answer	Marks	Guidance
(c)	Answers should refer to any of the following and how this relates to the marketing of the product/ encourages the consumer to buy. Branding on labels, gives customers recognition/brand loyalty/trust Environmental labelling (recycling, energy rating) helps customers to make an informed choice Easy for people to understand (avoids use of language) Visual impact grabs people's attention Product details can be seen quickly by consumer to inform purchase choice Labels provide statutory information such as price, product, materials/ingredients, Safety labelling (Kitemarks, Lion Marks) to inform and reassure the consumer.	3	Good answer: Labels are important when marketing a product because they show off the good aspects of the product. They also inform the buyer of the ingredients/materials used in the product to help them choose (1). A label can also be used to display the popular brand name (1), which in turn may encourage the consumer to purchase the product if it is a brand that they have trust in (1). If no explanation given max. 2 marks
	Total	10	

Question	Answer	Marks	Guidance
3 (a)	Comfortable/cushioned, lightweight, allow feet to breathe, hard wearing/durable/strong, fashionable, laces/better fit, non slip/better grips on sole, thicker soles, design/pattern on sides, shaped sole, insoles removable, more aerodynamic, heel support, reflective, logos, colour, waterproof/water resistant, adjustable, longer lasting/more durable, non marking, better traction.	3	Accept one word answers. Do not accept looks good, attractive, more aesthetically pleasing, cheaper, new materials (unless qualified) If more than three features given or if two or more features given within the same sentence, then tick the most creditable up to a maximum of 3.
(b)	An explanation of <u>two different</u> points that justify the choice in part (a) Each explanation must consist of two creditable linked points that justify why the chosen feature makes the modern trainer successful. Restating the feature attracts no further credit: <i>laces</i> A simple explanation such as: <i>ensures the trainer does</i> <i>not fall off [1]</i> A detailed explanation such as: <i>the trainer will not fall off</i> [1] and can be tightened or adjusted to the users preference/size [1] 2 x 2	4	If the point given is incorrect eg cheap, but a clear explanation is given the marks can be awarded accordingly. The explanation requires a point plus a reason why the feature is successful. Good answers: Modern trainer has grip on the bottom The modern trainer has appropriately shaped rubber at the bottom giving a more stable and supported step (1) for the user, allowing the user to move in varying conditions easily.(1) Removable insole Has a separate insole that can be easily removed, It can therefore be separately cleaned (1) or replaced without the need to replace the entire trainer (1).

Question	Answer	Marks	Guidance
3 (c)	Answers should include reasons for the changes in design features: Advances in manufacturing technology. Improved support given to feet. This has been achieved through new moulding techniques such as injection moulding, Advances in ergonomic design has led to more comfortable designs/aerodynamic Advances in materials has led to trainers becoming more Lightweight/hardwearing/breathable Changes in lifestyle Increase in designer/branded footwear has led to fashions changing and more competition in the market, increase in people exercising/more competitive in sport/increase in range of sports and surfaces 1 mark for up to two of the above plus 1 for discussion OR	3	This is not just a comparison of why the trainers are different (repeating parts a & b). It requires and explanation of why changes have occurred. Good answer – The modern show has been adapted to meet the changes of the present time. There are different surfaces where people use the modern trainer (1), not just in 'gyms' therefore the shoe had adapted to prevent injury (1). People are much more fashion conscious and want the latest new trainer so manufacturers have to keep the aesthetics up to date with trends. (1)
	1 mark for any one of the above plus up to 2 marks for detailed explanation/discussion.		If no explanation given max. 2 marks
	Total	10	

Mark Scheme

Q	uestion	Answer	Marks	Guidance
4	(a)	Level 1 (0 to 2 marks) Some understanding of the influence of the Trend Setter Little or no use of specialist terms. Answers ambiguous or disorganized. Errors of grammar, punctuation and spelling. Limited range of points made with some relation to the Trendsetter and with limited justification		 Answer space for this question covers two pages. Examiners must ensure that the entire scoris screen is checked for creditable points. Continuous prose – question is marked for quality of written communication. Only <u>one</u> Trend Setter must be referred to. If the answer relates only to the Iconic product then only award Level 1
		Level 2 (3 to 4 marks) Reasonable understanding of the influence of the Trend Setter. Some use of specialist terms, not always used appropriately. Information presented for most part in a structured format. Occasional errors in grammar, punctuation and spelling.		There is no credit for mention of the Trendsetter by name or the name of the Iconic Product, as these are given in the question. Bullet points or list/sequence of discrete points maximum of 2 marks
		Range of points adequately made with some relationship to the Trendsetter, with explanations and some justification Level 3 (5 to 6 marks) Detailed understanding of the influence of the Trend Setter. Specialist terms used appropriately and correctly. Information presented in structured format. Accurate use of grammar, punctuation and spelling with some minor errors.		Typical connectives that may be used to link points of discussion: so that, because, therefore, however, although, but, consequently, alternatively, whenever, besides, moreover, since, whereas, despite.

Question	Answer	Marks	Guidance
	Range of well made points that mostly relate to the Trendsetter and with reasoned explanations through discussion and justification	6	
(b)	Content of answer refers to creditable points about the influence of the Iconic Product with reference to aesthetics and/technology. These may be discrete points referring to different aspects of the Iconic Product, or they may be linked points that discuss, explain, exemplify, qualify or describe one aspect of the impact or influence.		 Quality of written communication is not assessed in this part of Question 4. This can be a different Iconic Product to that of the Trendsetter chosen in part (a). There is no credit for mention of the Trendsetter by name or the name of the Iconic Product, as these are given in the question.
	Answers must relate to what was so different about the Iconic Product and or why the Iconic Product has been so influential. 4 x 1	4	Some answers may provide more than two creditable points for each or either reason. Credit the points wherever they are presented. Typical connectives that may be used to link points of discussion: so that, because, therefore, however, although, but, consequently, alternatively, whenever, besides, moreover, since, whereas, despite.

C	Question	Answer	Marks	Guidance
C 4	Question (a) (b)	OPTION 1 (a) The Memphis Group Furniture, fabrics, ceramics, glass and metal objects Broke away from Form follows Function Inspiration from Art Deco, De Stijl, Mondrian, 1950's Pop Art, Warhol. Rejected/disregarded idea of functional design and rules of good taste (modernism) Focussed almost entirely on aesthetics rather than ergonomics Bright bold (often primary) colours In contrast to the dull dark colours (browns and black) of the 1980's Geometric. Shocking. Outrageous. Massive visual impact. Instantly recognisable. Ground breaking	Marks 6 4	OPTION 1 (b) Carlton Room Divider Combined a range of functions (bookshelf, storage, drawers) in a unique unit It is a room divider, a storage unit and a work of art/sculpture. Looks toy like, a fantasy ship Sheer size makes it stand out Open plan homes of the 60's and 70's: this was a way of dividing the space. Broke away from Form follows Function: Aesthetic
		Challenged the established norms of design of the period Caused a widespread re-think about the rational industry-oriented conventions Made for a rethink of many strongly held beliefs One off gallery pieces: became collectable Used cheaper materials: chipboard and laminates. To a high standard. Used materials out of context: kitchen work top surfaces for wardrobes Massive impact on the design world Inspired many new designers: Philippe Stark Influenced Swedish company Ikea Designs still sought after today		Random use of Bold Bright colours Geometric shapes unusual angles Central weight distribution, drawer in the middle, whereas traditional products were symmetrical and balanced on each side Combination of simple shapes to give a complex look/unusual/interesting/unique One off Aimed at high end market but cheap materials Chipboard and laminates/ melamine Used to high standard Copies still made/sold today.
4	(a) (b)	OPTION 2 (a) Abba One of the most commercially successful acts in the history of popular music. Sold 537 million albums worldwide 4 th next to Elvis, Beatles and Michael Jackson Eurovision Winners. Successful for 10 years 1972 to 1982 major influence for a long time catchy song hooks, simple lyrics, sound effects (reverb, phasing) and a	6 4	Rubik cube and Channel 4 logo OPTION 2 (b) Lycra Spandex: a rubbery segment for stretch and recovery, a rigid segment for strength and durability. Is always blended with another fibre such as cotton or linen. Does not lose integrity with exposure to lotions or the body's natural oils, unlike rubber thread. Lycra (DuPont's

Q	uestion	Answer	Marks	Guidance
		 Wall of Sound achieved by overdubbing the female singers' voices in multiple harmonies. Made videos because their songs were hits in many different countries and some of these videos became classics because of the 1970s-era costumes and early video effects, such as the grouping of the band members in different combinations of pairs, overlapping one singer's profile with the other's full face, and the contrasting of one member against another. Long boots and all-in-one suits (jump suits) Bright colourful and trend-setting costumes, leggings, sequins and tops, flower print dresses. GLAM ROCK What Abba wore was copied by public and modern day singers and dancers: Madonna, Lady Gaga, clubbing outfits of today Genre of music: Tribute bands. Abba themed evenings. Films. 		brand of spandex), began its foray into the fashion world during the 1960's in women's pantyhose and undergarments. The fabric is rather uniquely "ex-pandable", and thus ideal for a range of active lifestyle garments and applications. Widely used: comfort and easy movement on stage Beautiful sheen under stage lighting. Bright and bold colours. Provides maximum support during high impact activities. Exercise, keep fit, modern day clubbing outfits, gymnastics, athletics, sportswear. Clothing appropriate for men and women. Comfortable, proud of their body. Fits snugly round body, shows off figure.
4	(a) (b)	 OPTION 3 (a) Confectionary packaging It is the science, art and technology of enclosing or protecting products for distribution, storage, sale, and use. Packaging contains, protects, preserves, transports, storage/display, promotes/appeals/brands, informs, sells and allows for 'eat on the go'. Originally, confectionary was stored in glass jars and sold in paper/greasproof bags. Confectionary packaging today is a major buisness. Branding: graphics, colours logos. Information: contents, nutritional, allergies. Preserves: stay fresh for longer, chocolate melts at body temperature. Protects: until ready to be consumed, easy to open and hold, sold in many different outlets, consumer protection. 	6 4	OPTION 3 (b) Kit Kat Britain's number one biscuit since invention in 1930's. Originally developed after a worker at Rowntree's put in a suggestion for a snack that a "man could have in his lunch box for work". The slogan for the Kit Kat has been <i>"Have a break have a Kit Kat"</i> . Easy to break one finger off at a time, easy to share equally. Simple easy to remember name and slogan. Good 'on-the-go' and in lunchbox. Appeals to children and adults. In wartime ration pack. The iconic status has come about through the simplicity and effectiveness of its design: Use of red – an aggressive selling colour which

A554

Question	Answer	Marks	Guidance
4 (a) (b)	OPTION 4 (a) Lasers A device that emits light through a process of optical amplification based on the stimulated emission of photons. The term "laser" originated as an acronym for Light Amplification by Stimulated Emission of Radiation. Lasers have the property of being highly directional and focused. Lasers in the Medical Field: Laser Eye Surgery. Lasers and Electronics: Compact Disk Players, Video CDs, Supermarket Scanners. Lasers and Entertainment: Laser Shows Other Uses of Lasers: Laser fibre optics used by computers, measuring distances, cutting, blasting, and welding,	6 4	 stands out; Sans serif font used on the logo – uncomplicated, on a red background really stands out Visual similarity to oxo, coca cola, virgin – the obvious value of red on white Developed many variations Chunky, Bite-size, Mint, Orange. Always retain the brand identity. Multipacks/valuepacks available in Supermarkets. Two finger and four finger available in shops and petrol stations. Original packaging was tinfoil, primary packaging, over the chocolate and a bright colourful paper wrapper, secondary packaging: fresher/longer shelf life/convenient. Now freshfoil wrapping and easy tear strip. OPTION 4 (b) Bar Code Readers An electronic device for reading printed barcodes. Convenient, time saving, accurate and foolproof. Provides wealth of information to the retailer about what is selling well, buying profile of customers, seasonal selling patterns, daily selling patterns. Cashiers just scan bars and all information accessed: price so that bill made up for customer, stock records updated for re socking shelves and automatic re-ordering from central distribution centre. Self scanners now available.

Question	Answer	Marks	Guidance
			Pen-type readers, Laser scanners, CCD readers, Camera-based readers, Video camera readers.
4 (a) (b)	 OPTION 5 (a) Ice Cream Ice cream became popular throughout the world in the second half of the 20th century after cheap refrigeration became common. There was an explosion of ice cream stores and of flavours and types. Vendors often competed on the basis of variety. Ice Cream Parlours were popular, particularly with the emerging youth culture, in the UK after WW2 and are still to be seen in seaside holiday towns. However in bigger towns and cities they tended to be replaced by Coffee Bars in the late 1950's. The connection of many homes to the National Grid in the 1940/50's provided the electricity needed to eventually run a fridge/freezer. Moving to the end of the 1960's, Ice Cream began to be available in supermarkets in 1 ltr tubs. Different varieties were available. It was easy to store and easy to serve. Popular with children so it has become one of the top deserts in many homes. There are many derivatives using Ice Cream with other ingredients: arctic roll, eskimo pie, and many additions to to give chocolate chip or crunchy ice cream. One important development in the 20th century was the introduction of soft ice cream. A research team in Britain discovered a method of doubling the amount of air in ice cream, which allowed manufacturers to use less of the actual ingredients, thereby reducing costs. 	64	 OPTION 5 (b) Knickerbocker Glory An ice cream <u>sundae</u> that is served in a large tall glass, particularly in the United Kingdom. They were big, bright and colourful, with an eye catching individual look. Popular after WW2 when people looked to over-indulge themselves. The knickerbocker glory was first described in the 1930s and contains ice cream, jelly, and cream. Layers of these different sweet tastes are alternated in a tall glass and topped with different kinds of syrup, nuts, whipped cream and often a cherry. Layers of meringue, fruit and even alcohol may be included but, as with an ice cream sundae, there is no precise recipe. The name knickerbocker glory is drawn from knickerbockers, a type of long trouser traditionally worn by young children (but particularly young boys). Versatility of Ice Cream as a desert component, adding fruits and other ingredient, and the adding of flavours to the Ice Cream itself, expand the possibilities for more personalised deserts. It is almost always offered in restaurants as an option of cream, custard or ice cream with puddings and tarts.

C	Question	Answer	Marks	Guidance
5	(a)	SpecificationSpecification that may be incomplete or repeated from the question(1)Vague/generic specification that gives limited design requirements(2)Adequate specification that gives some key design requirements (3)Detailed specification gives key design requirements (4)	4	"It must be colourful" VAGUE "It must use a range of bright colours" ADEQUATE "It must use bright colours such as orange and turquoise" DETAILED
	(b)	Initial ideas Only one sketched solution with no accompanying notes (1)	5	 Marks can be awarded for addressing the specification points irrespective of the quality of the candidate's specification points given in (a). One word labels can identify and name, features on a sketch: e.g. base, aluminium, pattern, seam. Two and three word labels can qualify the feature: e.g. handle of wood, stable base.
		One sketched solution with notes OR Two or more solutions with no notes (2)		Notes are complete statements that can explain, justify, exemplify and quantify the feature: e.g. 3mm red acrylic will be used for the sides and top. Dimensions on a drawing or sizes stated, and weights or quantities of ingredients come under the heading of notes.
		Two or more sketched solutions with notes (3)		 <i>Different ideas</i> refers to: 1. whole solutions or parts of a solution. 2. conceptually different thinking. 3. not just variations on a theme.
		A range of different ideas that address at least two specification points (4)		 Addressing specification points: 1. may be explicitly evidenced in the notes. 2. implicitly evidenced in the idea.

Question	Answer	Marks	Guidance
	A creative approach to designing	(5)	 3. the two specification points need to be evidenced only once each, in any of the notes or the ideas. Creative approach to designing is judged in the context of an examination situation with strictly limited time. Do the ideas impress you enough for just ten minutes work from a 15 yr old?
(C)	 Development of ideas – <u>must</u> reflect the product foce One solution may be presented in more than one view: top and front, inside and outside. One sketched solution showing an idea from the initial ideas with some development – no notes 	IS 5 (1)	 In this part candidates must address the requirements of the "design need in the situation". If both requirements of the design need are not met the maximum available is 3 marks. 1. Book shelf and Memphis style. 2. Lycra dancewear and Jungle Rock. 3. Cruncher Cereal bar and fits dimensions. 4. Room measuring and a laser. 5. Ice cream desert and 1950s For measuring device, a system (circuit or block diagram) must be shown. Where there is clear development without a system design up to 3 marks can be awarded.
	Development of an idea evidenced with supporting sketches and/or notes Development of an idea with notes that link	 (2) (3) (4) (5) 	To obtain full marks candidates must consider their own specification.

Question	Answer	Marks	Guidance
(d)	 Final proposal: look at the information and drawing on the page for 5d, and any detail from 5c: A simple solution with limited detail/notes (1) Details of one or more bullet points from the list of materials/parts/sizes/tools/etc. (1) 	6	 Candidates should show any (not all) relevant details for manufacture: materials/ingredients/components. sizes / dimensions / quantities, methods / joining / mixing techniques, tools / equipment,
	 Look at the writing on the page for 5d: Notes and associated sketches showing how the design meets spec point 1 (1) e.g The shelves are adjustable to allow for different sized books to be accommodated. Notes and associated sketches showing how the design meets spec point 2 (1) e.g. The lycra costume has orange and black stripes and a fur trim to represent a tiger in the jungle 		 Accept justified points related to the candidates' own specification, even if not rewarded in 5(a). If solution in 5(d) has no relationship with 5(c) then only award up to 4 marks for the justifications of how the idea meets their specification.
	 Notes and associated sketches showing how the design meets spec point 3 (1) e.g The package is perforated along the top in a rectangular shape so that it can be opened easily with a finger nail. Notes and associated sketches showing how the design meets spec point 4 (1) 		
	e.g. The desert contains fresh strawberries and raspberries to contribute to your 5 a day potions of fruit.		

OCR (Oxford Cambridge and RSA Examinations) 1 Hills Road Cambridge CB1 2EU

OCR Customer Contact Centre

Education and Learning

Telephone: 01223 553998 Facsimile: 01223 552627 Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations is a Company Limited by Guarantee Registered in England Registered Office; 1 Hills Road, Cambridge, CB1 2EU Registered Company Number: 3484466 OCR is an exempt Charity

OCR (Oxford Cambridge and RSA Examinations) Head office Telephone: 01223 552552 Facsimile: 01223 552553



