



**GCSE**

**Design and Technology Graphics**

Unit **A535**: Sustainability and technical aspects of designing and making

General Certificate of Secondary Education

**Mark Scheme for June 2016**

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, Cambridge Nationals, Cambridge Technicals, 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 2016

**Annotations**

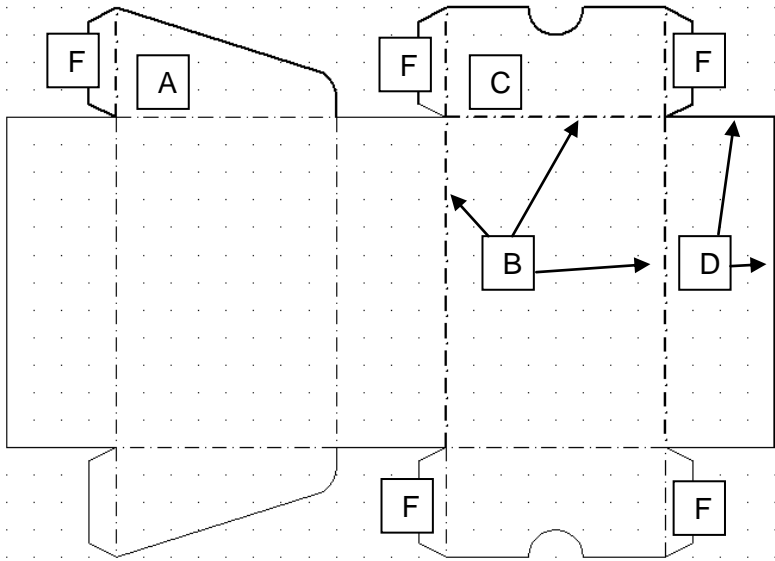
<b>Annotation</b>	<b>Meaning</b>
Green tick	Use for all correct answers and to show where marks are awarded
L1, L2, L3	Use to show the level of response in 16d, and 18f

Question			Answer	Marks	Guidance
1			(c) Last for a set amount of time	1	These are the only acceptable answers. No mark awarded if more than one answer ringed or if a candidate's response is not clear. Accept any other method of indicating response eg. tick
2			(a) Supports workers rights	1	
3			(d) Mend it	1	
4			(c) Paper	1	
5			(d) Balanced or cancelled out	1	
6			REFUSE	1	This is the only acceptable answer
7			Soya, vegetable or water based inks	1	These are the only acceptable answers Do Not Accept: Low VOC
8			Phosphorescent or Fluorescent ink/pigment	1	These are the only acceptable answers – accept variations on spelling (phosphorous) Do Not Accept: Glow in the dark (in the question)
9			Carbon Dioxide	1	This is the only acceptable answer Do Not Accept: Carbon Oxide
10			Globalisation	1	This is the only acceptable answer Do Not Accept: Global / Globalised etc.
11			True	1	These are the only acceptable answers. Only one answer should be ticked. If candidate ticks/marks both answers award zero.
12			False	1	
13			True	1	
14			True	1	
15			False	1	
			<b>Total</b>	<b>15</b>	

Question			Answer	Marks	Guidance
16	(a)		Animals/dinosaurs/cartoons on package Fun activity/contents for children Simple/bold font style used Looks fun/interesting/ lots of things to do Colouring in Colourful / large pictures	2	Accept answers that refer to the package and/or contents being appealing to children.
	(b)		Recycled material used to make the product / made from recycled material  Card able to be recycled after use/ Card can biodegrade  Plastic handle able to be recycled after use / can biodegrade  Non-toxic inks used for printing/ Non-toxic adhesives/Degradable adhesives  Crayons made from non-toxic materials  Unbleached card used  Not use a lot of energy in production of card / low emissions in production / made using renewable energy  Made from sustainable sources  Minimum waste/Tessellated shapes/Economic use of the card  Materials can be separated for recycling	4	Answers must relate to the environment. No marks for 'cheaper'  Be careful not to credit repeat answers
	(c)		No glue/adhesives needed No extra materials/resources needed to make the models Quick / easy to assemble/disassemble	1	

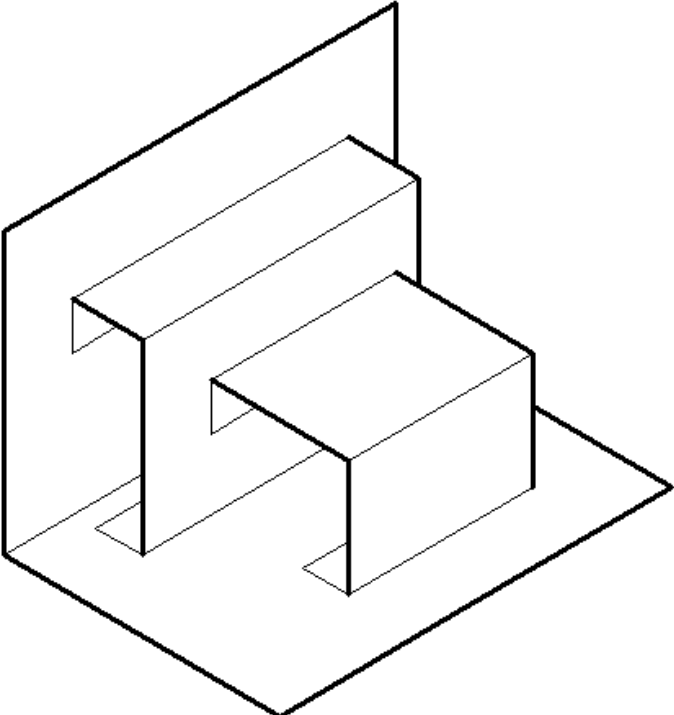
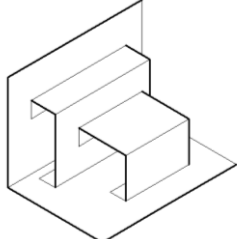
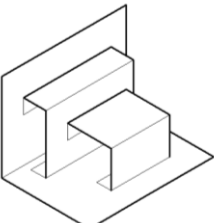
Question			Answer	Marks	Guidance
	(d)	(i)	Perforations/perforated outline	1	
	(d)	(ii)	There is no need for scissors / cutting out  No help from parents needed / safe to use	2	1 mark for no need for scissors or tools 1 mark for explaining a link to safety/dexterity/not needing parents
	(e)		Design is linked to Dinosaur theme eg volcano, forests, lake, mountains, cave, etc (1) (the design must be a background scene)  Box is changed <b>and</b> can be made into a <b>3-dimensional shape</b> (1)  Background scene clearly assembles/fits together and is <b>stable</b> and <b>holds together</b> (sketch shows or explains a suitable method) (1)  Good quality sketch <b>and</b> notes clearly communicated (1)	4	If just a net of the box in fig 1 is shown do not award mark

Question	Answer	Marks	Guidance
(f)*	<p>Read through candidates answer decide on the level of response, then decide whether it just meets that level or clearly meets that level.</p> <p><b>Maximum of 2 marks for a list of separate points</b></p> <p>Points to consider;</p> <ul style="list-style-type: none"> <li>Quality and speed of digital printers / printing techniques is better than previous methods</li> <li>Able to print on a wide range of media eg. Mugs, phone cases, cakes etc.</li> <li>Design and manufacture do not need to take place in the same location</li> <li>Technology such as computers, laptops, tablets, mobile phone, Ipods etc mean that people can have access to the internet through wi-fi, 3G or 4G, books are no longer needed as much as information can be sought instantly</li> <li>People can advertise events on social media websites such as twitter, facebook, this can eliminate the need for printed leaflets to be distributed. People can sell products online on ebay, freecycle etc rather than taking adverts out in newspapers</li> <li>Less use of paper based products such as Yellow pages, telephone books, newspapers, e-books, computer based tests</li> <li>Digital technology allows activities to be undertaken in the home or small businesses which previously relied on factory plants e.g. photo printing, business cards, invitations, etc</li> <li><b>Do Not Accept: Answers relating to 3D printers</b></li> </ul>	<p><b>Level 3</b> <b>(5 - 6 marks)</b></p> <p><b>Level 2</b> <b>(3-4 marks)</b></p> <p><b>Level 1</b> <b>(1 -2 marks)</b></p> <p><b>0</b></p>	<p><b>Thorough discussion</b>, showing clear understanding of the effects of technology on printed material. Can provide clear examples of issues <b>with examples</b>. <b>Specialist terms</b> will be used <b>appropriately and correctly</b>. The information will be presented in a <b>structured</b> format. The candidate will demonstrate the <b>accurate</b> use of spelling, punctuation and grammar.</p> <p><b>Adequate discussion</b>, showing an understanding of the effects of technology on printed material. Can provide a <b>reasonable discussion</b> of the issues with <b>some examples</b>. There will be <b>some</b> use of <b>specialist terms</b>, although these may not always be used appropriately. The information presented will be for the most part in a <b>structured</b> format. There may be <b>occasional</b> errors in spelling, grammar and punctuation.</p> <p><b>Basic discussion</b>, showing some understanding of the effects of technology on printed material. Can provide a limited discussion of some of the issues. There will be <b>little or no</b> use of <b>specialist terms</b>. Answers may be <b>ambiguous</b> or <b>disorganised</b> or 'list like'. <b>Errors</b> of grammar, punctuation and spelling may be intrusive.</p> <p><b>Response worthy of no credit</b></p>

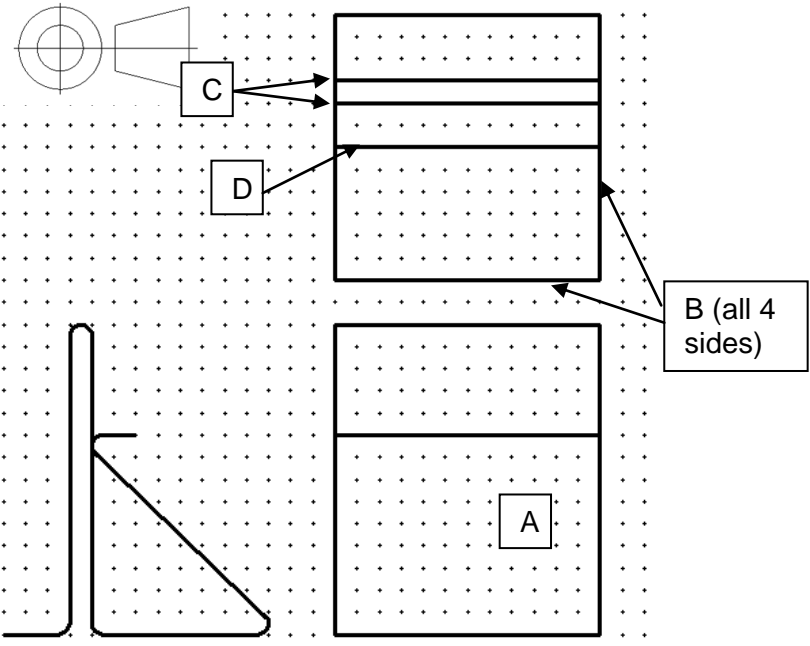
Question	Answer	Mark	Guidance
17 (a)		1 1 1 1 1 1	Side of lid completed correctly – (A) Must be 1 square of vertical line before radius.  3 sides of Base completed correctly – (B)  Side of box completed correctly – (C) Drawn shape of circle not critical but must be 2 squares in dia.  2 sides of Front of box completed correctly – (D)  5 flaps correctly added – (F) (Ignore long glue tab on D if added)  Accept solid or dotted fold lines
17 (b) i	Rhombus, Quadrilateral, Parallelogram	1	These are the only correct answers
	ii Italic	1	This is the only correct answer
17 (c)	<p>Images may not be used without permission from the owner</p> <p>May cost the manufacturer money to use the image</p> <p>Using images without permission is illegal and may result in legal action</p> <p>Using images without permission can lead to legal action/ fines etc.</p>	2	2 x 1  Do not accept references to patents / trademarks.  Do not credit 'copyright' on its own, it must be justified.





Question	Answer	Mark	Guidance
18 (a)		<p>1</p> <p>1</p>	<p>All outside edges of the card shown as thick</p> <p>Horizontal and vertical sides of the two inner pieces shown as thick (not folds)</p> <p><b>If extra lines are thickened do not award second mark:</b></p> <div>  </div> <div> <p>2 outer edges missing = 0 marks All inner lines correct = 1 mark <b>Total = 1 mark</b></p> </div> <div>  </div> <div> <p>Outer edges correct = 1 mark Extra inner lines added = 0 marks <b>Total = 1 mark</b></p> </div>
18 (b)	Multiple layer , Parallelogram, internal stand mechanism	1	These are the only correct answers
18 (c)	Shape 2 = Cylinder, circular prism    Shape 3 = Cone	2	Award 1 mark for each shape
18 (d)	<p><b>Rotated</b> – The rocket needs to be turned / spun / rotated around to fit into the correct position.</p> <p><b>Enlarged/stretched</b> – The rocket needs to be made bigger to fit into the required space.</p> <p><b>Moved/dragged</b> – The rocket needs to be moved / dragged into the correct space.</p>	4	<p>Award 1 mark for each manipulation method.</p> <p>Award final / fourth mark for a description of what this means</p>

Question			Answer	Mark	Guidance
18	(e)		<p>Award marks for:</p> <p>The design incorporates a waving hand in the design</p> <p>The design uses a mechanical method to make the hand wave</p> <p>The mechanism shown that will make the hand oscillate (rock back and forth around a pivot point)</p> <p>The mechanism shown <b>converts</b> linear movement of the push/pull tab into oscillating movement of hand</p> <p>The design incorporates appropriate graphic design</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>A hand is shown</p> <p>Award one mark for the use of a mechanism (mechanism must operate without having to open the card up).</p> <p>Award mark for naming and labelling pivots and direction arrows which <b>clearly show how</b> it will work.</p> <p>Award 1 mark for a mechanism that gives the required hand movement (Oscillating).</p> <p>A push/pull tab is shown that clearly converts <b>linear motion to oscillating motion</b></p> <p>Images <b>and</b> text are shown that convey the message <b>for leaving</b>.</p>
			<b>Total</b>	<b>15</b>	

Question	Answer	Mark	Guidance
19 (a)		<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Front view completed correctly – (A)</p> <p>Plan view:</p> <p>Outline completed correctly – (B)</p> <p>2 lines for upstand completed correctly – (C)</p> <p>Line for front lip completed correctly – (D)</p> <p>Do not double penalise.</p> <p>If plan is drawn in wrong orientation / alignment do not award mark B but C &amp; D can still be awarded.</p> <p>Use overlay.</p>
(b)	Flexible, waterproof, wipeclean, lightweight	1	Award 1 mark for any of the answers shown opposite. Do Not Accept: cheap, durable, readily available, strong
(c)	<p>Cutting the plastic sheet to size: Band saw, jigsaw, laser cutter, craft knife, Stanley knife, hacksaw, junior hacksaw, hegner saw</p> <p>Bending the plastic sheet to shape: Strip heater, line bender, heat gun, former</p>	<p>1</p> <p>1</p>	

Question			Answer	Mark	Guidance
	(d)	i	Could burn your hand, plastic could catch fire, electric shock, Plastic could shatter / snap / break (hurt eyes or cut hands)	1	Award 1 mark for identifying 1 risk
		ii	Wear gloves, use tongs, get machine safety tested regularly, use a rcd/circuit breaker, relevant and correct training/instructions completed / wear goggles/glasses, ensure plastic is heated sufficiently etc.	1	Award 1 mark for identifying a way of minimising the risk.  Must relate to the risk in part (i), must be a health and safety risk.

Question			Answer	Marks	Guidance
19	(e*)		<p>The description should focus on the different stages in the life cycle of the menu holder from extraction of raw materials, manufacturing methods used, transportation, use and disposal.</p> <p>Key factors to be discussed:</p> <ul style="list-style-type: none"><li>• The raw materials used to make the product and how they are found, extracted and used.</li><li>• The manufacturing processes used to cut, shape, finish the menu holder.</li><li>• The different kinds of CAD/CAM equipment and manual tasks used in the manufacture.</li><li>• The amount of waste materials produced in the manufacture of the products.</li><li>• The different ways of packaging and transporting the product to the many different restaurant outlets.</li><li>• The products daily use, wear and tear etc.</li><li>• The end of life stage, disposal of the product once old, broken or no longer needed.</li><li>• How product could be re-used/recycled</li></ul>	<p>Level 3 (5-6 marks)</p> <p>Level 2 (3-4 marks)</p> <p>Level 1 (1-2 marks)</p> <p>0</p>	<p>Thorough description, showing detailed understanding of the stages in the products life cycle. 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 spelling, punctuation and grammar.</p> <p>Description shows some understanding of the different stages in the products life cycle. There will be 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 may be occasional errors in spelling, grammar and punctuation</p> <p>Discussion shows limited understanding of the different stages in a products life cycle. 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.</p>
			Total	15	

**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](mailto:general.qualifications@ocr.org.uk)

[www.ocr.org.uk](http://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**

© OCR 2016

