

Design & Technology (Graphic Products)

General Certificate of Secondary Education **GCSE J303**

General Certificate of Secondary Education (Short Course) **GCSE J043**

Mark Schemes for the Components

January 2010

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Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

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

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A532 Sustainable Design

Section A

| Question | Expected Answers | Rationale | Marks | |
|----------|--|---|-------|-----------|
| 1 | (c) Protect the safety of users | These are the only acceptable answers. No mark awarded if more than one answer ringed or if candidate's response is not clear. Accept any other method of indicating response e.g. tick. | 1 | |
| 2 | (a) Take it apart | | 1 | |
| 3 | (c) Spare parts are not available | | 1 | |
| 4 | (a) The product can be recycled | | 1 | |
| 5 | (b) Respond to the values of different cultures | | 1 | |
| 6 | Reuse/reused/re-use/re-used, rethink/re-think. | These are the only acceptable answers. | 1 | |
| 7 | The period of time the product is in use/existence (from manufacture to disposal) | Variations on this answer are acceptable | 1 | |
| 8 | Ethical Trading Initiative | This is the only acceptable answer and all three words are required for the mark. Accept variations of spelling. | 1 | |
| 9 | Carbon footprint | Do not accept carbon offsetting. | 1 | |
| 10 | Biodegradable/biodegrading/bio-degradable/bio-degrading. | These are the only acceptable answers | 1 | |
| 11 | True | These are the only acceptable answers. No mark awarded if more than one answer ticked or if candidate's response is not clear. Accept any other method of indicating response e.g. tick or cross. | 1 | |
| 12 | True | | 1 | |
| 13 | True | | 1 | |
| 14 | False | | 1 | |
| 15 | False | | 1 | |
| | | | Total | 15 |

Section B

| Question | | Expected Answers | Rationale | Marks |
|----------|---|---|--|-------|
| 16 | a | The designer wants to include things people like/appeal to customer/show different seasons/month(1) | | 1 |
| 16 | b | Accept any reasonable answer that 'rethinks' and uses the picture for a new purpose without reprocessing it. E.G. poster, birthday card, another calendar, picture, postcard, jigsaw, or similar named product. | | 1 |
| 16 | c | Sustainable material A sustainable material is one that comes from a replenishable source (1) can be used over a period of time, without harming the environment (1). The calendar could be printed on recycled paper so it has little impact on the environment (1). | The first two marks are for an explanation of 'sustainable'. The third mark is for making an appropriate reference to the calendar. | 3 |
| 16 | c | Redundant product A redundant product is one that has reached the end of its useful life (1). The calendar will be redundant at the end of the year (1) but the materials can be recycled/reused/disposed of(1). | The first mark is for defining redundant. The second two marks are for: 1 Identifying when the calendar will be redundant (end of the year or a page at the end of each month) 2 What can then be done with the material once it has become redundant? | 3 |
| 16 | c | Carbon offsetting Carbon offsetting is balancing/offsetting the amount of carbon/carbon emissions/carbon dioxide/Co2/greenhouse gases (1) produced in the manufacture or transport of the calendar (1) with such things as the planting of trees (1). | There are three elements to this answer: 1 CO2 produced in the manufacture or transport of the calendar 2 Balancing the carbon emissions 3 Through planting of trees/cash donation/similar method Do not accept references to the reduction of carbon emissions. | 3 |
| 16 | d | Bleach (1) could be poured down the drains and kill fish (1). Chlorofluorocarbon (CFCs) (1) could deplete the ozone layer (1). Accept inks, glues, solvents, dyes, fumes, gasses. Accept references to packaging and transport. | There are other answers relating to photographic chemicals or substances used during printing/binding. There are two marks for each risk. The first mark is for identifying the risk (such as bleach) and the second mark for stating why it is a risk (pollution of water). Do not accept 'because it harms the environment'. Do not penalise if the answer does not directly relate to the production of the calendar but is based on general manufacturing. | 4 |
| Total | | | | 15 |

| Question | | | Expected Answers | Rationale | Marks |
|----------|---|-----|--|--|------------|
| 17 | a | i | Styrene, aluminium, steel, copper, acrylic, (1) | A specific (and suitable) metal or plastic must be named. | 1 |
| 17 | a | ii | Presents a better public image (1) Saves using virgin materials (1) Good for the environment (1) | Accept any reasonable answer but do not accept cheaper as not all recycled materials are cheaper. | 2 |
| 17 | b | i | Rethink Rethinking is thinking in a new or different way (1). In this case embedding seeds in the paper is a new way of thinking (1). | The two aspects to this answer are: 1 Understanding of the term (what is rethinking) 2 How does this term apply to the product (what is new) Do not reward answers relating to reduce. | 2 |
| 17 | b | ii | Reduce You could lesson the amount of paper used (1) by making the pages smaller (1). | The two aspects to this answer are: 1 Understanding of the term (applied to this product, not just the word reduce) 2 How this term could apply to the product (how would the reduction take place) | 2 |
| 17 | b | iii | Refuse People could say they would not use the calendar (1) if it was offensive to particular cultures (1). Will not buy the product (1), because it uses too much material. Accept answers related to the consumer saying no and the manufacturer saying no. | The two aspects to this answer are: 1 Understanding of the term (What is refusing: no, don't want it, wont have it, not) 2 How the term could apply to the product (why / how / what could people refuse to use it) | 2 |
| 17 | c | | Functional The calendar is functional because it fulfils it purpose (1) by having a page for each month (1) and dates that are easy to read (1). Aesthetic Aesthetic means the calendar is pleasing to look at (1). The calendar is pleasing to look at because it has stylised lettering (1) and distinctive colours (1). | The three aspects required for this answer are: 1 Understanding of the term (fulfils its purpose, how the product works, does what its got to do, doing what it is made to do). 2 How the term might apply to the calendar (seeds can be planted, can stand up, can tear pages off, show dates/months, write on it) (x2) The three aspects required for this answer are: 1 Understanding of the term (the looks, appearance, feel,). 2 How the term might apply to the calendar (colour, shape, texture, style, proportion, finish) (x2) Do not credit 'size' or nice. | 3 3 |
| Total | | | | | 15 |

| Question | | | Expected Answers | Rationale | Marks |
|----------|---|----|---|---|-------|
| 18 | a | i | Tick against 'metal tin' | Do not award a mark if more than one box has been ticked. | 1 |
| 18 | a | ii | A non-sustainable resource cannot be replaced (1) in a short period of time (1) or an example is given (1). | A short period of time is considered to be a human life span. Examples of non-sustainable could include oil, coal, petrol, metals and plastics, fossil fuels. | 2 |
| 18 | b | i | Corrugated card/card/cardboard/boxboard, polypropylene. (1) | Do not accept foam board, corriflute. | 1 |
| | | ii | Expanded polystyrene, polystyrene balls, polystyrene foam, bubble wrap, shredded/bits paper, straw, (1) | Do not accept polystyrene without expanded. | 1 |
| 18 | c | | <p>Material: Made from recycled, recyclable, biodegradable materials, single material (no separation required), from a sustainable source (1)</p> <p>Manufacture: Made with low energy consumption machines, hand made, machines powered by renewable energy (1)</p> <p>Transport: The box is flat packed so that more boxes can be transported on a lorry, materials lightweight so less CO₂, made locally, eco-vehicles (1)</p> <p>Disposal: Recycling, recyclable, biodegradable, re-use, squashed flat (1)</p> | <p>Award one mark for each point. There are many other points that could be considered to ensure the product is eco-friendly. Award marks for the full range of appropriate responses.</p> <p>Do not accept eco-friendly.</p> | 4 |
| 18 | d | | <p>Level 1 (0-2 marks)</p> <p>Basic description, showing some understanding of the manufacturing processes to protect and preserve the environment in the context of the production of graphic products. Can provide a description of some of the manufacturing processes. There will be little or no use of specialist terms. Answers may be ambiguous or disorganised or 'list like'. Errors of grammar, punctuation and spelling may be intrusive.</p> <p>One specific point well made or two general points (2)</p> <p>One general point (1)</p> | <p>Reduce the amount of water used in the system e.g. re-cycle</p> <p>Reduce the amount of chemicals used in the system/ use natural dyes.</p> <p>Reduce the amount of energy used in the system e.g. re-cycle heat used, use energy efficient machinery, avoid wasting energy- windows open, ventilation systems, exits etc.</p> <p>Use enzymes rather than chemicals – less harmful to the environment</p> <p>Use biodegradable chemicals – less harmful to the environment and its wildlife.</p> | |

| Question | Expected Answers | Rationale | Marks |
|----------|--|--|-----------|
| | <p>Level 2 (3-4 marks) Adequate description, showing an understanding of the manufacturing processes to protect and preserve the environment in the context of the production of graphic products. Can provide a description of the manufacturing processes. 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 Two specific point well made (4) Two specific points adequately made (3)</p> <p>Level 3 (5-6 marks) Thorough description, showing clear understanding of the manufacturing processes to protect and preserve the environment in the context of the production of graphic products. Can provide three clearly different ways of improving using environmental considerations. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate will demonstrate the accurate use of spelling, punctuation and grammar. Three specific points well made (6) Three specific points adequately made (5)</p> | <p>Regulate and reduce waste products – be more efficient</p> <p>Remove chemicals such as dyes more efficiently from water and waste products</p> <p>Reduce emissions into the atmosphere Use alternative energy sources. Solar/wind power to reduce the use of fossil fuels.</p> <p>More efficient and less use of packaging and labelling. Transport issues.</p> | 6 |
| | | Total | 15 |

A534 Graphics: Technical Aspects of Designing and Making

| Question | | Expected Answers | Rationale | Marks |
|----------|---|---|--|-------|
| 1 | a | Horizontal and vertical line added to complete the rectangle | Freehand or accurate lines are acceptable. Do not mark to a tolerance but judge on whether the two lines actually complete the outline, as requested in the question. | 1 |
| 1 | a | The word Eddie added The word Eddie added in capital letters and of a consistent size | (1) (1) Candidates should be given one mark for completing the word Eddie (upper or lower case). Award this mark even if the given E is used as the last letter of the name. The second mark is only to be awarded if the word EDDIE is in capital letters and consistent in terms of size and style with the given letter. The second mark must be awarded for high quality freehand work. | 2 |
| 1 | b | Cutting mat Safety rule | (1) (1) Candidates are asked to name two pieces of equipment that would be used with a craft knife to cut out a rectangular shape in card. The only answers worth two marks are cutting mat and safety rule. Award one mark if candidates give one correct answer and a piece of equipment such as a guillotine, scissors or rotary trimmer. Award one mark if candidates name two other pieces of equipment such as a guillotine, scissors or rotary trimmer. | 2 |
| 1 | c | 1. Easy to cut, can be folded easily or available in different colours 2. Self adhesive vinyl or self adhesive labels 3. Laminated card or a specific plastic. E.g. PVC 4. Lightweight, good surface to print on or sturdy / rigid | 1. The key thing is that the candidate must name a physical property of paper. 2. The key thing is that the candidate must name a material that does not require glue to fasten it to a surface. 3. The key thing is that the candidate must name a material that is waterproof. 4. The key thing is that the candidate must name a physical property of foamboard. | 4 |

| Question | | Expected Answers | Rationale | Marks |
|----------|---|--|---|-------|
| 1 | d | Male former Female former Pressure | (1) (1) (1) Candidates are asked to describe the embossing process. The key features of this process are a male former, female former and pressure being applied. These may appear in any order in candidate's answers. Tick (✓) each key feature to indicate the award of a mark. | 3 |
| Total | | | | 12 |

| Question | | | Expected Answers | Rationale | Marks |
|----------|---|----|---|--|-------|
| 2 | a | i | Elephant shape added to end view by drawing any rectangle from the given starting point (1) Elephant shape added correctly to end view (right side of back, one square in width and eight squares in height) (1) Back added to plan by showing a rectangle of approx half a square in thickness and twenty squares in length (1) Back added in the correct position (above) the plan (1) | Each mark is for completing a different aspect of the orthographic views. First mark - any rectangle Second mark - height of elephant shape Third mark - size of back (thickness and length) Fourth mark - position of rectangle Whilst the challenges are progressively more demanding there is no dependency between the marks. It is perfectly possible for a candidate to score 0, 0, 0 1. Ignore additional lines. | 4 |
| 2 | a | ii | Back completed (1) Elephant completed (1) Hole shown in correct corner and with depth (1) | Candidates must produce a pictorial sketch in order to score any marks. From the given drawing candidates are required to complete the base and elephant shape and add a hole in the correct corner of the base. | 3 |
| 2 | b | | Rounded corner or modified corner shown that would not be as 'sharp' (1) | The question asks for a modification that would make the PVC sheet safer to handle. Accept answers that show only one corner modified. Accept answers that show the modification with words. E.g. This corner rounded. | 1 |
| 2 | c | i | 'C' ticked (✓) or clearly identified (1) | The question asks candidates to tick (✓) the correct answer. Other methods of identification can be allowed (cross, circle...). Do not award any marks if two or more letters have been identified. | 1 |
| 2 | c | ii | Reason explained - creates less waste, easier to cut or leaves larger piece for later use | Candidates can be awarded this mark even if they have selected the incorrect shape in (c) (i). | 1 |
| 2 | d | | Contact adhesive, Evostick or double sided tape | - | 1 |

| Question | | | Expected Answers | Rationale | Marks |
|----------|---|--|--|---|-----------|
| 2 | e | | Foam board will squash, break off or crumble | The question asks candidates to state why foamboard is unsuitable for this application. Answers should relate to the physical properties of the material. | 1 |
| Total | | | | | 12 |

| Question | | Expected Answers | Rationale | Marks |
|----------|----|---|--|-------|
| 3 | a | Square tool (1) | Other answers would be acceptable if they are 'explained' correctly. For example it is possible to use separate lines. | 1 |
| 3 | b | Scan or take a digital photograph of the image (1) | - | 1 |
| 3 | c | Save to disc, CD, DVD, internet or memory stick (1) (1) + (1) | Expect a wide range of answers. Candidates will be very familiar with electronic items such as mobile telephones and iPods. Accept all answers that would allow the image to be stored in an electronic format. | 2 |
| 3 | d* | <p>Level 1 (0-2 marks) Explanation shows limited understanding of how to alter the electronic image. 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> <p>Level 2 (3-4 marks) Explanation shows some understanding of how to alter the electronic image and names ways, such as resize or crop. 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>Level 3 (5-6 marks) Thorough explanation, showing detailed understanding of how to alter the electronic image. 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>Explanation could include:</p> <ul style="list-style-type: none"> • crop • resize • rotate • layer • re-colour • distort • blur • mirror • justify | 6 |

| Question | | | Expected Answers | Rationale | Marks |
|----------|---|----|--|--|-----------|
| 3 | e | i | Vinyl cutter or laser cutter (1) | This question asks specifically for a type of CAM machine. Do not accept model names or numbers. | 1 |
| 3 | e | ii | Faster to make or the shapes will be identical (1) | Do not accept just faster or quicker | 1 |
| Total | | | | | 12 |

| Question | | | Expected Answers | Rationale | Marks |
|----------|----|----|---|---|-------|
| 4 | a | | Environmentally friendly (1) Less trees need to be cut down (1) Morally more acceptable to customers (1) Ticket does not need to be really high quality (1) (2x1) | Candidates are asked to give two reasons for using recycled paper for the cinema ticket. Exemplar answers are given on the left. Many candidates will say recycled paper is cheaper. Do not accept this answer unless it is qualified. | 2 |
| 4 | b | i | A perforated line is partly cut (1) | Clear understanding of a perforated line being a partly cut line. Words such as dashes or dotted might be used but the cut aspect is required for the mark. | 1 |
| 4 | b | ii | Easy to separate the two halves of the ticket | The idea of the ticket being easy to separate or tear is required for the mark. | 1 |
| 4 | c | i | Lithography or digital printing | - | 1 |
| 4 | c | ii | Die cutting, stamping or press knives | - | 1 |
| 4 | d* | | Level 1 (0-2 marks) Discussion shows limited understanding of the implications of moving to electronic tickets. 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. Level 2 (3-4 marks) Discussion shows some understanding of the implications, for the cinema and/or customer, of emailing electronic tickets to customers. 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 | Discussion could include: Cinema <ul style="list-style-type: none"> • Cheaper (less paper) • Quicker delivery • Viewed as an environmentally friendly organisation • Requires expensive equipment • Customer information details stored electronically so can be used for future promotions/advertising Customer <ul style="list-style-type: none"> • Reliable delivery • Can reprint if lost after printing • Customers must have a computer | |

| Question | | Expected Answers | Rationale | Marks |
|----------|----|---|-----------|-----------|
| 4 | d* | <p>Cont.</p> <p>Level 3 (5-6 marks) Discussion shows a thorough understanding of the implications, for the cinema and customer, of emailing electronic tickets to customers. 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> | | 6 |
| | | | Total | 12 |

| Question | | | Expected Answers | Rationale | Marks |
|----------|---|----|---|---|-----------|
| 5 | a | | Sketches and notes show a design for headwear: | | |
| | | | ...design (that will work as headwear) made from a single sheet of card (1) | The design for the headwear is drawn on a single sheet of card. | 1 |
| | | | ...fastens without the use of other materials (1) | Sketches/notes clearly show how the design joins together without the use of other materials. | 1 |
| | | | ...adjustable to different head sizes (2) | Award one mark if there are a number of adjustments for different head sizes and two marks if the design will lock in each of the positions. | 2 |
| | | | ...design incorporates the shape of an elephant (2) | Award one mark if the elephant shape is simply drawn on the headwear and two marks if it is incorporated in the design by cutting out or adding an elephant or part elephant shape. | 2 |
| 5 | b | i | Photochromic pigment (1) Thermochromic ink (1) | Accept any answer that names a smart material that could be used to enhance the headwear. | 1 |
| 5 | b | ii | Thermochromic ink - the colour of the elephant will change when it becomes warm (2) | The two key things are what happens and why it happens. | 2 |
| 5 | c | i | Copyright mark (1) Trade and Services Marks (Trademark) (1) Print registration marks (1) | Candidates should name a suitable symbol.. | 1 |
| 5 | c | ii | Check that the printing is aligned correctly by visually checking one in a hundred products (2) | Candidates are asked to describe a simple quality control check to ensure accuracy and quality of finish. The description should state what is being checked (1) and how (1). | 2 |
| Total | | | | | 12 |

Grade Thresholds

General Certificate of Secondary Education
Design and Technology (Graphic Products) (J303 J043)

January 2010 Examination Series

Component Threshold Marks

| Unit | | Max Mark | A* | A | B | C | D | E | F | G | U |
|------|-----|----------|-----|----|----|----|----|----|----|----|---|
| A531 | RAW | 60 | 54 | 48 | 42 | 36 | 30 | 24 | 18 | 12 | 0 |
| | UMS | 120 | 108 | 96 | 84 | 72 | 60 | 48 | 36 | 24 | 0 |
| A532 | RAW | 60 | 50 | 44 | 38 | 33 | 27 | 21 | 16 | 11 | 0 |
| | UMS | 80 | 72 | 64 | 56 | 48 | 40 | 32 | 24 | 16 | 0 |

The total entry for unit A531 was 47

The total entry for unit A532 was 752

Statistics are correct at the time of publication.

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

OCR Customer Contact Centre

14 – 19 Qualifications (General)

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

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Facsimile: 01223 552553

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