

Design and Technology

General Certificate of Secondary Education **A532**

Graphics: Sustainable Design

Mark Scheme for June 2010

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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.

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Section A

Question	Expected Answers	Rationale	Marks	
1	(a) Return it to working order	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 eg tick or cross.	1	
2	(b) A moral issue		1	
3	(d) Using less materials		1	
4	(c) Can be recycled		1	
5	(a) Eye protection must be worn		1	
6	Product is no longer of use, out of date /not needed/not relevant/ not suitable for use / not suitable for it's function or purpose/ doesn't meet current standards/obsolete	Not accept: made into something else/no job/job not needed (as in redundancy) / not made or produced anymore/ does not work or is broken, out of style/fashion, discarded/thrown away/recycled.	1	
7	A renewable material is one that can be replaced within a relatively short period of time / easily replaced/ regenerated / replenished / re-grown /good supply for the future	Relatively short period of time is considered to be a human lifespan. Replaced usually means re-grown. Not accept: renewed (its in the question) / made new again after/ infinite use/recycled/reused/used again/ never run out, always available or remade unless qualified	1	
8	The term disposal means to get rid of / thrown away/got rid of/discarded	Not accept: destroyed/what you do with something no longer of use/no further purpose after primary use. Do not accept incinerate/ recycle / landfill unless qualified	1	
9	Eco label / European Eco label / Eco / Eco design	Not accept: Eco friendly / fair trade / ergonomic / recycle / ethical trading/sustainable/European standard/green dot/ mobius loop Do not accept references to economic	1	
10	Wind/solar/sun/wave/tide/tidal/hydroelectric/ biomass/ thermal/nuclear/kinetic	Not accept: wood/light/electricity/water unless qualified as to why it is a sustainable source	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 eg 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	<p>Lightweight/easily stacked/low tech production(1) reduced transport/lower transport emissions/lower Co2 (1)</p> <p>Inert/non-toxic/unbleached (1) it is not a problem to customers or handlers (1)</p> <p>Biodegradable (1) no/less harm to the environment (1)</p> <p>Made from recycled materials (1) less use of virgin materials/ comes from a renewable resource (1)</p> <p>Can be recycled/reused/made into other products (1) it saves on natural resources/ reduces use of fossil fuels / stops increase in landfill (1)</p>	<p>The two aspects to each part of this answer are:</p> <p>1 A property of the material.</p> <p>2 How the property of the material makes it environmentally friendly.</p> <p>1 mark for property, 1 mark for linked explanation</p> <p>Do not accept references to cost or function of the box (ie cheaper/ holds the eggs safely)</p> <p>Do not accept just the words 'it's environmentally friendly' unless qualified</p>	<p>2</p> <p>2</p> <p>2</p>
16	b	<p>One mark for each point from the following;</p> <p>Lightweight / Offers some protection / Good strength to weight ratio / absorbs shocks / easily formed or shaped/ strong / egg won't leak through if they break / protects eggs from damage / soft on impact if dropped / durable / shape maintained</p>	<p>Do not accept answers that suggest polystyrene is environmentally friendly.</p> <p>This is about the material not the box, lid, compartments, etc.</p> <p>Do not accept: holds eggs tight, easy to make, cheap to make, easy to open lid, the word 'safe' 'stable' 'secure' or 'soft' on its own.</p>	<p>1</p> <p>1</p>
16	c	<p>Excessive/wasteful packaging (1) by using more material than is necessary by having an extra top/more costly to produce (1)</p> <p>Cannot easily be recycled (1) because the card and the plastic need to be separated (1)</p> <p>Eggs do not fit in box well (1) so are not as well protected (1)</p> <p>Made from plastic/ unsustainable material (1) not as environmentally friendly (1)</p> <p>Plastic does not protect eggs as well (1) so eggs may be damaged easily (1)</p>	<p>The two aspects to each part of this answer are;</p> <p>1 An identified problem with package C</p> <p>2 A linked explanation/justification of the identified problem</p>	<p>2</p> <p>2</p>
16	d	<p>An appropriate modification to the egg box (sketch or notes) that would be suitable for a partially sighted person (embossed, raised, pierced or enlarged lettering, or method shows clear colour contrast, window/transparent lid) (1).</p> <p>A modification that allows partially sighted person to understand the size of egg (sketch or notes) (1)</p> <p>Clarity of communication (must be notes and sketches to explain an appropriate method) (1)</p>	<p>There are 3 aspects to this question;</p> <p>1 A modification to the egg box suitable for the partially sighted</p> <p>2 A modification allows a partially sighted customer to understand the size of egg</p> <p>3 Sketches and notes to clearly show their modification (third mark cannot be given on its own)</p>	<p>3</p>
			Total	15

Question			Expected Answers	Rationale	Marks
17	a	i	Corrugated card, corrugated, corrugation	These are the only acceptable answers. Do not accept thick card reinforced card, chipboard, corriflute, plastic recycled card or card on it's own	1
17	a	ii	Any 2 performance characteristics from; Easy to cut/shape/fabricate, good strength to weight ratio, lightweight, easy to colour/print onto, won't hurt someone if it falls on them, strong enough to stand up, not easily bent, rigid in one direction, not easily ripped.	Do not accept answers relating cost or environmental factors Do not accept: hard, thick, strong, safe, durable, unless qualified/exemplified.	1 1
17	b		The symbol shows that the material is flammable/inflammable (1) Which means it could easily catch fire/become a fire hazard (1). It is important for the customer/consumer to know this so that they can take sensible precautions (1).	Accept variations on this answer as long as the following three elements are present: 1 The word flammable/inflammable 2 Understanding that this means the material could catch fire 3 Allows the customer/consumer to take precautions against fire	3
17	c		Any 3 from the following; Less congestion caused by transport to outlets (1) Less gases/Co2/emissions caused by transport (1) Less use of fossil fuels for transport reasons (1) Reduces carbon footprint (1) Reduced/no packaging needed as sold locally (1) Reduced energy consumption through distribution (1) Noise pollution reduced (1) as less transportation/lorries	Need to ensure same kind of response is credited only once. Must relate to environmental advantage, not manufacture or customer service. Do not accept: jobs for local people, less petrol used, local resources used, unless qualified, exemplified	1 1 1
17	d		Safety signs are shown on machinery (1) to prevent workers from incorrectly using the machine (1). COSHH regulations require symbols on cans (1) to show the substance gives off harmful fumes (1). Regulations restrict the hours people work (1) so that they do not become over tired (1) Goggles must be worn (1) to protect the eyes (1), Hard hats (1) must be worn in case rubbish is dropped from above (1), Hazardous equipment should be guarded (1) to prevent injury to those around (1), Long hair must be tied back (1) so that it does not get caught in a machine (1).	There are many acceptable answers to this question but all answers should explain how Health and Safety Regulations protect workers. The two elements are: 1 What is protecting the workers (a sign, hard hat, ear defenders, fluorescent jackets, a poster, safety equipment, instructions...) 2 What is it protecting the workers from (fumes, dust...) Do not accept references to wages, fair trade, child labour, sweat shops or legal action/litigation.	2 2 2
Total					15

Question			Expected Answers	Rationale	Marks
18	a	i	<p>Primary recycling: Second hand use/re-using of products - simply to use the product again for the same use.</p> <ul style="list-style-type: none"> • Charity shops/car boot • Giving it to a friend or relative • Sending it abroad • Selling via newspapers or internet websites • Re using packaging/ labels 	<p>Explanation of the term primary recycling (1)</p> <p>An example given (1 for each example, up to a maximum of 2)</p> <p>Or</p> <p>A suitable example (1) explained well (1)</p>	3
18	a	ii	<p>Secondary recycling: The process of turning the product into something else (typically by cutting/ mechanical recycling)</p> <ul style="list-style-type: none"> • Creating decorations • Altering the product in some way for a new purpose • Creating a new product from the old product (ie For sale signs cut up and used as plant labels) • Old clothes cut up to make dusters • Aluminium cans cut up to make model aeroplanes/jewellery 	<p>Explanation of the term secondary recycling (1)</p> <p>An example given (1 for each example, up to a maximum of 2)</p> <p>Or</p> <p>A suitable example (1) explained well (1)</p>	3
18	a	iii	<p>Tertiary recycling Products are completely broken down and reformulated (chemical recycling.)</p> <ul style="list-style-type: none"> • Insulation made from plastic bottles • Paper recycled into pulp then processed into card • Plastic bottles broken down, processed then made into textile fibres/threads • Leaving a product to biodegrade before regenerating it into something else (ie paper & organic waste to make compost) 	<p>Explanation of the term tertiary recycling (1)</p> <p>An example given (1 for each example, up to a maximum of 2)</p> <p>Or</p> <p>A suitable example (1) explained well (1)</p>	3

Question	Expected Answers	Rationale	Marks
18 b	<p>Level 1 (0-2 marks) Basic description, showing some understanding of paper production and how it contributes to harming the environment. Can provide a description of some problems with examples. 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. One specific point well made or two general points (2) One general point (1)</p> <p>Level 2 (3-4 marks) Adequate description, showing an understanding of the meaning of paper production and how it contributes to harming the environment. Can provide a description of the problems with examples. 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 points well made (4) Two specific points adequately made (3)</p> <p>Level 3 (5-6 marks) Thorough description, showing clear understanding of paper production and how it contributes to harming the environment. Can provide clear examples of current methods that do harm the environment. 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>Please show by ticks where each point is made.</p> <p>Points to consider:</p> <ul style="list-style-type: none"> Use of non renewable energy resources Too much electricity Too many chemicals/ dyes in water systems Waste management Too much paper & card in manufacturing packaging and labelling Deforestation Pollution from transportation of goods Production of high care products - lots of washing or specialist cleaning processes. Lack of ecologically manufacturing Use of cheap and poorly paid workers - exploitation and then high transport costs Waste - too many unwanted items, cheaply produced and thrown away Built in Obsolescence. 	6
Total			15

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