OCR
RECOGNISING ACHIEVEMENT

GCE

Design and Technology

Advanced GCE

Unit **F524/02:** Product Design: Component 2

Mark Scheme for June 2011

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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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Spec	A clear relevant statement – *functional requirement or key design constraint identified.* 1 mark Clear relevant justification – *appropriately made; eg with reference to target users/market.* 1 mark No marks awarded for generic points or information repeated from the question.	3x2
Range	A wide range of significantly different innovative ideas, which are developed as far as possible. *Min **3** different concepts that could meet main needs presented. Good evidence of **design thinking** - eg consideration of practical details and/or user requirements. Significantly different concepts could be seen as part of the development of a single idea.* ***4** or more different practicable concepts with less detail could also be in this box.*	11–15
	A good range of appropriate innovative ideas with limited development of some or all ideas. *2 -3 different concept designs that could meet main design needs with further development. Some evidence of **design thinking**.*	6–10
	A limited range of ideas with little evidence of innovation and little development. *Few ideas which lack inspiration/creativity, concepts repeated with cosmetic changes. Little evidence of **design thinking.***	0–5
Man/const detail	<table><tr><td></td><td>Limited consideration</td><td>Some consideration</td><td>Detailed consideration</td></tr><tr><td>appropriate techniques of construction/assembly</td><td></td><td></td><td></td></tr><tr><td>justification of appropriate materials and components</td><td></td><td></td><td></td></tr><tr><td>measurements Dimensions/quantities</td><td>0 1 2 3 4</td><td>5 6 7 8</td><td>9 10 11 12</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>	0–12
Evaluation	Detailed evidence of objective evaluation or reference to volume production. *Good understanding of the needs of user/target market/manufacturer, some explicit reference to the specification or set design brief. Evidence of perceptive **design thinking.***	5–6
	Some evidence of subjective evaluation or reference to volume production. *Comments should show some consideration of user/target market/manufacturers requirements and some evidence of **design thinking**.*	3–4
	Limited evidence of evaluation or reference to volume production. *Few or no evaluative comments. Comments show little evidence of **design thinking**.*	0–2
Features	Detailed identification and justification of features. *A final outcome presented with 3 or more suitable features clearly visible/identified. Annotation provided to justify choice of 3 or more of the features that would be carried forward to final product.*	7–9
	Some identification and justification of features. *A final outcome presented with 3 or more suitable features visible/identified but not clearly justified.*	4–6
	Limited identification and justification of features. *A partially defined final outcome presented with little of no justification of specific features to be carried forward to a final product.*	0–3
Communication	High level of graphical skill and concise annotation that can be easily followed by a third party. *Expect to see a variety of techniques / styles (appropriate to the focus area) with annotation which is easily understood, all clearly set out to allow good communication of **design thinking**.*	5–6
	Reasonable level of graphical skill and annotation appropriately used. *More than one technique /style used appropriately (eg 2D, 3D, detail, exploded views) with annotation. Presentation may need interpretation by experienced reader to understand **design thinking**.*	3–4
	Limited level of graphical skill and annotation. *One technique / style used throughout. Limited or no evidence of design details presented and/or poorly set out so that it is difficult to follow the design thinking of the candidate.*	0–2
	Paper Maximum	**54**

Level of design thinking judged by a number of factors, including:

- *complexity of designs,*
- *degree of sophistication,*
- *awareness of user and market issues,*
- *consideration of manufacturing issues,*
- *consideration of sustainability,*
- *consideration of moral issues.*

(S) Specification points which are qualified and justified

A clear relevant statement – (1 mark), clear relevant justification – (1 mark)
No marks awarded for generic statements or repeated information given in question.

3 x 2 **[6]**

(R) Range of developed ideas

0-5 A limited range of ideas with little evidence of innovation and little development.

6-10 A good range of appropriate innovative ideas with limited development of some or all ideas.

11-15 A wide range of significantly different innovative ideas, which are developed as far as possible. **[15]**

(D) Consideration of manufacturing/construction detail

0-4 Limited consideration of appropriate techniques, justification of appropriate materials and components and measurements.

5-8 Some consideration of appropriate techniques, justification of appropriate materials and components and measurements.

9-12 Detailed consideration of appropriate techniques, justification of appropriate materials and components and measurements. **[12]**

(E) Evaluation of ideas with reference to the specification and volume production

0-2 Limited evidence of evaluation or reference to volume production.

3-4 Some evidence of subjective evaluation or reference to volume production.

5-6 Detailed evidence of objective evaluation or reference to volume production. **[6]**

(F) Chosen features for FDO and justification of choices made

0-3 Limited identification and justification of features.

4-6 Some identification and justification of features.

7-9 Detailed identification and justification of features. **[9]**

(C) Communication skills and techniques

0-2 Limited level of graphical skill and annotation.

3-4 Reasonable level of graphical skill and annotation appropriately used.

5-6 High level of graphical skill and concise annotation that can be easily followed by a third party. **[6]**

Paper Total [54]

(S) Specification points which are qualified and justified

Specification points could be:

1 Built Environment and Construction

The area must allow free circulation of people around the facilities to prevent congestion.

The washing facilities must allow adults to supervise/assist young children who may be learning how to wash their hands.

All finishes must be suitable for thorough wet cleaning for easy maintenance of the washroom.

There must be easy access to all pipework to make repair and maintenance as quick as possible.

Floor surfaces must be non-slip and incorporate slopes and drainage to prevent pooling in event of leaks or spillages.

2 Engineering focus

The work platform must be strong enough to support the weight of a large adult.

The platform must be easy to assemble and dismantle.

The size of the platform must allow the user to stand safely whist working.

The platform must be stable in use to prevent toppling.

The platform could include facilities to hold tools and equipment.

When folded/dismantled, the platform should take up the minimum amount of space for storage.

The surface of the platform should be ‘non-slip’ for safety in use.

The platform must be safe to assemble, use and dismantle.

3 Food Focus

The product must be hand held to avoid use of cutlery.

The product must contain fruit or vegetables to contribute towards ‘5 a day’.

The product must be low fat, salt and sugar to meet healthy eating guidelines

The product should provide no more than 1/3 of the RDA of energy for a teenager to prevent obesity.

The product must be suitable for ambient storage to prevent the risk of food poisoning.

The product must require minimal packaging to reduce litter and be more sustainable.

4 Graphic Products

The matching facemask and hat must reflect a suitable theme for a party eg jungle.

It should be cost effective as parents normally buy these in bulk for the children attending the party.

It should be safe and easy to fit to the face and head, no sharp staples sticking out.

It should be well balanced; 3D features should not make the mask fall off.

The hat should be secure and not interfere with the facemask

It should be made from a material that is suitable for the mass production of this item such as 300 gsm card.

It should be easy to colour eg print on by the manufacturer or to allow the children to draw on as part of the party theme.

5 Manufacturing focus

The container should be compact to take up a minimum of space on a worktop or shelf.

The container must be easy to use to encourage recycling.

It should be easy to sort the batteries into different sizes.

The construction of the container should be simple to enable economic manufacture.

The container should be easy to clean after emptying out the batteries.

The container must be strong enough to resist breakage if dropped.

The container should be aesthetically pleasing to fit into the household environment.

6 Resistant materials focus

The unit must be stable in use to provide solid working position/prevent injury to children.

The unit must not have any dangerous folding parts, which could trap or injure parts of the body.

The unit must have provision to hold painting equipment so that the children have everything within easy reach.

The unit must be easily washable, as children tend to be messy with art activities.

The unit must be adjustable to provide different working heights for seated or standing positions.

The unit must quick and easy to assemble and disassemble to minimise time wastage.

7 Systems and Control focus

The product should emit an audible and a visual alert when the pan is approaching boiling over point so that the cook can take appropriate action.

The alert should intensify as the pan continues to boil over so that an extra degree of urgency is communicated to the cook.

All parts in contact with the food should be washable for food safety reasons.

The product should be adaptable for different foodstuffs so that it can sense a variety of different foods boiling over (eg water, milk, starchy water etc.)

The product should automatically sense the type of food being heated and calibrate itself accordingly.

The product should look fashionable and in keeping with current kitchen product designs so that it is appealing to potential buyers.

The product should be heat resistant in normal use as it will be used around intense heat sources.

The product should be compatible with all types of hob (eg gas/electric) so that it is universal.

The product should not add additional hazards to the process of cooking using saucepans so that it is safe for the cook to use.

The product should have a self-contained power supply, ie batteries, which last at least 12 months in normal domestic use.

The product should have no trailing leads as these could be caught and dragged causing a significant safety hazard.

The product should be simple and intuitive to use so that the cook is encouraged to actually use it.

The product should not prevent the cook from using the saucepan in the normal way (eg stirring the contents or using the saucepan lid) otherwise the product is unlikely to be used.

8 Textile Focus

The toy must appeal to boys and girls to widen the market potential

The toy must be washable for cleanliness and hygiene reasons

Primary colours must be used for visual impact and to teach the child the primary colours

The toy must comply with BSI standards for toys

The toy must include buttons/buttonholes, zips, Velcro, laces and ribbons to teach fine motor skill

The toy must include electronic components to create sounds and light.

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