



## **General Certificate of Education**

# **AS Design and Technology Product Design 5551**

**PD3D Design and Market Influences**

## **Mark Scheme**

*2008 examination – June series*

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available to download from the AQA Website: [www.aqa.org.uk](http://www.aqa.org.uk)

Copyright © 2008 AQA and its licensors. All rights reserved.

#### COPYRIGHT

AQA retains the copyright on all its publications. However, registered centres for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to centres to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Set and published by the Assessment and Qualifications Alliance.

## Quality of Written Communication

The following marks are allocated to the quality of the candidate's written communication. Make a separate assessment of the candidate's overall ability as demonstrated across the paper using the criteria given below.

<i>Performance Criteria</i>	Marks
The candidate will express complex ideas extremely clearly and fluently. Sentences and paragraphs will follow on from one another smoothly and logically. Arguments will be consistently relevant and well structured. There will be few, if any, errors of grammar, punctuation and spelling.	4
The candidate will express moderately complex ideas clearly and reasonably fluently, through well-linked sentences and paragraphs. Arguments will be generally relevant and well structured. There may be occasional errors of grammar, punctuation and spelling.	3
The candidate will express straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well connected. Arguments may sometimes stray from the point or be weakly presented. There may be some errors of grammar, punctuation and spelling, but not such as to suggest a weakness in these areas.	2
The candidate will express simple ideas clearly, but may be imprecise and awkward in dealing with complex or subtle concepts. Arguments may be of doubtful relevance or obscurely presented. Errors in grammar, punctuation and spelling may be noticeable and intrusive, suggesting weaknesses in these areas.	1

This mark scheme is intended as a guide to the type of answer expected but is not intended to be exhaustive or prescriptive. If candidates offer other answers which are equally valid **they must be given full credit.**

Many responses at this level are assessed according to the **quality** of the work rather than the number of points included. The following level descriptors are intended to be a guide when assessing the quality of a candidate's response.

<b>(low mark range)</b>
The candidate has a basic but possibly confused grasp of the issues. Few correct examples are given to illustrate points made. This candidate does not have a clear idea of what s/he is writing about.
<b>(mid mark range)</b>
The candidate has some knowledge but there will be less clarity of understanding. Some correct examples given to illustrate points made. This candidate knows what s/he is writing about but is confused in part.
<b>(high mark range)</b>
The candidate has a thorough understanding of the issues and has provided relevant examples to support the knowledge shown. This candidate knows what s/he is writing about and provides clear evidence of understanding.

1 (a) Expect candidates to give a brief explanation of the purpose of each of the design process stages listed. Good answers will give examples to support points.

1 (a) (i) **Writing the project brief**

- Explains what is to be designed
- May explain the situation or problem to be addressed
- May outline some important design constraints e.g. target market, specific client requirements, etc.
- Etc

1 (a) (ii) **Carrying out market research**

- To identify current trends and fashions
- To identify existing products and analyse strengths/weaknesses
- To establish target market needs/wants/aspirations
- Pricing
- Etc

1 (a) (iii) **Evaluation & testing**

- To identify strengths and weaknesses of design
- To identify areas of further design/development
- To ensure product is safe for consumer use
- To compare product against brief/specification and test fitness for purpose
- Comments could refer to anywhere in design process where evaluation takes place
- Etc

(3 × 4 marks)

**Breakdown**

- Limited understanding of use of the design process stage. Basic, answer with points not explained and not explained and no specific examples given.

(0 – 2 marks)

E.g. “It is a statement of what is to be designed” = 1 mark

“It is a statement of what is to be designed and may set out some specific details e.g. client needs” = 2 marks

- Better understanding of use of the design process stage. Some appropriate examples may be given or additional explanation.

(3 – 4 marks)

E.g. “Market research is used to find out whether there is a need for the product or demand. It might establish if there is a niche or gap in the market” = 3 marks

“Market research is used to establish if there is a need for a new product and to identify specific features that consumers might want. For example; features on a mobile phone such as broadband connectivity, MP3, video streaming, etc. Market research might also identify how much people are willing to pay for a new product” = 4 marks

1 (b) Expect candidates to give a brief explanation what a furniture designer would use the following for:

1 (b) (i) A full size mock up

- To test out materials and finishes before making full size
  - To test ergonomic and anthropometrics are correct
  - To ensure there are no problems/errors in the design prior to the manufacture.
  - To work out tooling requirements for manufacture
  - To show client for approval/evaluation
  - To conduct pre launch user focus group trials
  - Examples may include reference to materials, e.g. a full size card model is useful in testing out proportions
  - Etc
- (4 marks)

**Breakdown**

- Limited understanding of the use of full size mock ups. Basic, generic answer with points not explained. (1 – 2 marks)

E.g. “To prove the design works” = 1 mark

“To see if looks right” = 1 mark

“To prove the design works so that materials aren’t going into production” = 2 marks

- Better understanding of use of full size mock ups. Some appropriate examples may be given to explain points or more detail given. (3 – 4 marks)

E.g. “To prove the design works so that materials aren’t wasted before going into production.

This might be by testing out the ergonomics” = 3 marks

“To prove the design works so that materials aren’t wasted before going into production. This might be by testing out the ergonomics such as checking the seat height and back rest position of a chair” = 4 marks

1 (b) (ii) **A working drawing.**

- To create different views, e.g. 3<sup>rd</sup> angle to show how the design looks from different elevations
- To convey dimension details to tool maker/manufacturer
- To specify materials and surface finishes to manufacturer
- To calculate accurate material quantities for costing purposes
- To calculate size constraints for 3D CAD modelling, prototyping, etc.
- Etc (4 marks)

**Breakdown**

- Limited understanding of the use of working drawings. Answer is basic and not explained. (1 – 2 marks)

E.g. “Working drawings show the sizes of a product” = 1 mark  
“Working drawings show the sizes of a product and the three views; front, plan and end” = 2 marks

- Better understanding of the use of working drawings. Examples may be given to illustrate relevance to furniture design and manufacture (3 – 4 marks)

E.g. “Working drawings show the dimensions of a product. For example the overall height, width and depth of a chair. They might also have the sizes of individual parts such as the actual seat” = 3 marks

Working drawings show the dimensions of a product sufficient for it to be made.

This would include the overall height, width and depth of say a chair plus the dimensions of sub components such as individual legs. Such drawings also give details of materials and finishes. = 4 marks

2 (a) **Range of ideas.**

Marks will be awarded as follows:

- Limited range of ideas which are very similar. Little annotation to indicate potential for development. Such ideas will generally be worthy of 1 mark per drawing. (1 – 5 marks)
- Range of appropriate ideas. May be small in number but have some variety, having alternative design features. Such ideas will generally be worthy of **up to** 3 marks per drawing. (6 – 10 marks)
- Wide range of good quality design ideas. Designs will be varied and show a number of different features. Such ideas will generally be worthy of 3-4 marks per drawing. **Candidates with fewer ideas but ones that are very good quality should be able to access marks in this band.** (11 – 15marks)

N.B. Look for differences in overall shape, styling, etc.

**Total 15 marks**

2 (b) (i) **Quality of graphical communication.**

- Drawing mainly 2D, untidy, limited annotation with little thought (1 – 3 marks)
- Drawings combination of 2D and/or 3D. Annotation showing some thought to the design requirements. Use of colour, texture, or tone to enhance the drawings (4 – 7 marks)
- Drawings combination of 2D and 3D. Good use of colour, texture or tone to enhance drawings. Thorough annotation showing consideration to the design criteria (points from the spec, details of materials and components etc). (8 – 10 marks)

**Total 10 marks**



2 (b) (ii) **Originality/innovation of product**

Marks will be awarded as follows:

- Uninspiring initial ideas and final design which are stereotypical. Designs will probably be inappropriate for intended end-use; however, there will be an attempt to incorporate a design feature, an interesting use of a material or component. (1 – 2 marks)
  - Designs may be varied and the final design lacks flair but will probably be appropriate to end use. There will be **one to two** innovative features, innovative use of materials or components. (3 – 4 marks)
  - Candidate has attempted to produce imaginative designs but products lack interest and designs are not wholly relevant to the theme. There will be **several (2-3)** examples of innovative features, innovative use of materials or components. (5 – 6 marks)
  - Sound ideas and final design clearly appropriate to theme with a **wide range of** examples of innovative features, innovative use of materials or components. (7 – 8 marks)
  - Highly original ideas which exploit the use of the theme. There will be **numerous** occasions where the candidate has shown innovative design features, innovative use of materials or components. (9 – 10 marks)
- Total 10 marks**

**Note:** Some candidates may only produce a small number of designs but they may be extremely original and innovative. If this is the case, award marks in the higher mark range for innovation and originality.

Some examples of originality/innovation may include:

- Unusual/striking shape or form in the item designed.
- Unusual/innovative use of found or recycled materials e.g. packaging waste (furniture made from newspapers, drinks bottles, etc).E.g. Fusing broken windscreen glass.
- Innovative use of moulds, fixtures, jigs to aid manufacture. E.g. mould for making of ‘slabs’ from recycled newspaper, press die for fusing covers into panel, etc.
- Unusual/creative surface treatment of materials e.g. carving, engraving, trapping/encapsulating found objects in glass/plastics, ageing techniques (beyond simple lime wash or antique wash) such as abrasion/indentation with various tools.
- Innovative combination of traditional hand techniques with CNC laser engraving, cutting, CNC router machining and so on.
- Innovative joining methods of materials e.g. use of ‘drill and stitch’ with wire, binding with rope, weaving of fibres (possibly multiple fibres of different materials), non-standard flat pack jointing, etc.
- Etc.

2 (b) (iii) **Appropriateness of materials and components**

Marks will be awarded as follows:

- Limited range of materials across designs with little clear detail. E.g. 'steel'. May be repeated throughout the drawings. Some may be inappropriate. (1 – 3 marks)
- Range of appropriate materials and components. Some may be repeated. (**More than 2**) different specific materials described, and/or components sketched to gain top of this range). (4 – 7 marks)
- Wide range of appropriate materials and components, with some components sketched or developed into the final design. Materials and components are entirely appropriate to the theme. (8 – 10 marks)

**Note:** Some candidates may produce a small number of designs but will be able to access marks in the top band if they indicate the use of a **wide range** of materials and components.

**Total 10 marks**

The following is a list of possible materials and components (Not exhaustive):

FSC certified timber  
 Gluelam/Engineered timber beams/sections  
 Recycled LDPE or similar.  
 'Plastic wood' (recycled polystyrene)  
 Railway sleepers  
 Bamboo  
 Rope  
 Electrical flex  
 Reclaimed slate tiles, brick, breeze block, etc  
 Recycled pallets  
 Recycled floorboards  
 CDs  
 Scaffolding poles  
 Reclaimed construction timber e.g. joists  
 Reclaimed window frames, glazing  
 Recycled tyres/rubber crumb  
 Packaging e.g. drinks cans, bottles (both glass and plastic)  
 Woven carrier bags, textile strips, electrical flex, car seat belts, etc.  
 Textile off-cuts (used in stuffing or in a patch work cover)  
 Carton board (brown card box)  
 Car parts e.g. bonnets, boot lids, etc  
 Laminated glass windscreens  
 Car wheels  
 Cable drums  
 Tree stumps  
 Tree branch cuttings.(bent greenwood).  
 Willow 'withies'  
 Recycled newspaper (re formed into slabs, bricks).

Straw bales  
Mud/straw brick  
Driftwood  
Pebbles/stone  
Pine cones or similar (used in decorative)  
Mosaic tile/broken tiles  
Circuit boards/components used in panels or encapsulated

**Materials not acceptable:** Anything that is a primary material e.g. any metal or polymer derived from oils (unless specifically stated from a recycled source).

2 (b) (iv) **Methods of construction.**

Marks will be awarded as follows:

- Limited information about how the product will be constructed. Probably **one or two** stated in simple labels. (1 – 3 marks)
- Variety (**two to three**) of appropriate construction methods stated and/or at least one construction/manufacturing method sketched and explained – awarding the higher mark for level of detail. (4 – 7 marks)
- Clear information about appropriate construction methods with use of exploded drawings to show assembly of **two** areas of the product or drawing(s) of industrial manufacture with accompanying notes explaining its use in the product. (8 – 10 marks)

Note: Where the construction method or manufacturing process is complex and the candidate answers in detail, only one drawing is needed to access the higher mark range.

**Total 10 marks**

**Do not** give marks for:

Injection moulding, blow moulding, extrusion.  
Press forming (industrial scale)  
Die casting

2 (b) (v) **Dimensions and dimensioning (Must be on Sheet 2)**

Marks will be awarded as follows:

3 marks for overall length, width and depth.

Up to 6 marks if single component item is dimensioned in detail/sub components dimensioned appropriately. If a primary dimension missing – maximum 4 marks.

**Total 6 marks**

2 (b) (vi) **Details of finish.**

Marks will be awarded as follows:

- Specific finish named e.g. acrylic paint (1 – 2 marks)
- Specific finish named with a basic description of its application, justification for its use or justification for no finish. (3 – 4 marks)
- Specific finish named with a full description of application or justification for its use or justification for no finish. (5 marks)

2 (b) (vii) **Specification criteria met.**

Marks will be awarded for:

- Some points of the specification addressed. ( 1 – 2 spec points) (1 – 3 marks)
- Most of the specification points addressed (3 – 4 spec points) (4 – 6 marks)
- All specification points addressed (5 spec points) (7 – 10 marks)

**Total 10 marks**

<b>Specification criteria</b>	<b>Addressed (1 mark)</b>	<b>Addressed well (1 additional mark)</b>
Be suitable for an item to be retailed in a contemporary art or craft gallery.	1 mark	1 mark
Be a functional chair	1 mark	1 mark
Be suitable for one off or limited batch production.	1 mark	1 mark
Make use of sustainable materials.	2 mark	2 mark

**Total 76 marks**

Annotation to be used for Q2

I = Innovation / Originality

M = Materials + Construction

C = Construction

F = Finish / Finishing Process

S = Specification