



# **General Certificate of Secondary Education**

## **Design and Technology: Product Design**

### **45551 Written Paper**

# **Report on the Examination**

*2010 examination – June series*

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## **General**

The new specification paper is a development on from the well established format of the legacy examination paper. The new paper proved accessible for the majority of the entry and candidates appeared to have prepared well using past (legacy) paper questions. The majority of candidates attempted all the questions on the paper.

Manufacturing in quantity is an important feature of the Product Design papers and this is a key area where the new paper has developed on from the legacy paper. Candidates were able to describe the making process for a specific shape but found the organisation of manufacturing challenging. Candidates could score more highly if they had firsthand experience of working in a team to manufacture in batch in the school workshop.

The standard of designing and sketching was mixed for the entry and candidates could score much more highly by preparing some carefully practised drawings.

### Question 1

This question was quite well answered but it was not apparent that candidates had been very well prepared for the topic despite the pre release material. Very few sophisticated concepts or innovative use of natural forms were seen.

- (a) Most candidates were able to identify design criteria appropriate to the target user and the product. A very small minority of candidates did not choose a product or chose a product and then developed a different product later in the question. Parts a, b, c and d were treated separately so that candidates were not disadvantaged in this scenario. Many candidates scored full marks.
- (b) The best responses showed a fully developed pattern, well drawn with a sensitive use of colour and repeated within the box. A large number of candidates produced a much simplified and poorly drawn pattern or did not show how the pattern would be repeated.
- (c) Responses covered the full range of marks. A small percentage of candidates fully developed a design sufficiently to gain full marks. The best responses included different views of the product, detailed materials and manufacturing processes and made reference to design features which were specific to the chosen target user.
- (d) The best responses made reference to the design criteria given in 1(a) and qualified fully how the design met those criteria. Many candidates simply listed the design features without fully exploring their suitability for the user. Many candidates also described build qualities which could not be evaluated at the design stage. A limited number of candidates scored full marks.

### Question 2

A mixed response to this question, many candidates scored well but a significant number were unable to name specific materials.

- (a)
  - (i) Many candidates listed non specific types of paper and card such as A4, cardboard, paper. Marks were awarded for specific materials only. As card was given in the question rubric, candidates could not gain a mark for listing 'card'.
  - (ii) Most candidates were able to fully respond with specific materials, wood was the most popular and mechanical components the least.
- (b)
  - (i) A majority of candidates were able to identify an appropriate product and finish combination. A very small number of candidates identified a specific material / waste product and, therefore, failed to score.
  - (ii) Candidates were able to identify appropriate reasons for applying a finish to a product and therefore scored well. The most successful were expanded responses to qualify the reason with an outcome should the finish not be applied e.g. wood will rot if not protected from the weather by varnish.
- (c)
  - (i) Many candidates did not understand the term 'stock form' and were therefore unable to correctly match a stock form to a material. A large proportion of candidates did respond successfully with a range of materials / stock forms combinations.
  - (ii) Most candidates were able to write about transportation, storage and readiness for the user. The best responses discussed readiness for manufacture, machines set to process standard size materials etc.

### Question 3

Very well answered by the majority of candidates. Most showed a very thorough understanding of sustainability issues.

- (a) Most candidates were able to gain full marks with a sound description of each concept. The best responses gave examples of products in the explanation. Some candidates confused recycle with reuse.
- (b) (i) Most candidates understood the term 'carbon footprint' and made good points. The more able candidates were clearly aware of sustainable materials, global warming and carbon footprint.  
The most popular chosen products were: dishwasher, soft drink and games console. Some answers mentioned light and sound pollution from the games console and heat from the hair straighteners.
- (ii) Most answers obtained full marks, many mentioned not leaving the games console on standby, reducing transport, washing dishes by hand to heat less water or using solar or wind power as an energy source.

### Question 4

Candidates found this question challenging as it tested their experience of manufacturing in quantity. A minority of candidates fared better where perhaps the centre had run a batch production type exercise in the school workshop.

- (a) Most candidates scored 2 marks. The best responses detailed simple feasible product, well drawn, some included annotation and gained full marks.
- (b) (i) Most candidates were able to name a specific material which they were later able to use to describe the making process. A minority of candidates used generic names which could not be rewarded.
- (ii) Most candidates were able to describe two properties of the material which made it suitable for making their drawn product, showing good understanding of the working properties, source and supply of the material named. Many candidates referred to cost incorrectly particularly with regards to acrylic.
- (c) Most candidates were able to describe a sequential making process although only a minority drew a flow chart with appropriate QC checks. Quality was poorly answered with very generic 'check all ok' type instructions. Candidates who described specific tests such as dimensional or registration were able to access the full range of marks.
- (d) Poorly answered by the majority of candidates, this question required a feasible layout of processes clearly showing the division of labour for a team of workers. Many candidates allocated 2 or more workers to the design function but did not reallocate those workers to a later part of the process showing a misunderstanding of the time required and the order of processes.  
Many candidates repeated their response to part c which did not therefore enable them to score highly in d.

### Question 5

- (a) Most candidates were able to identify 2 distinct design features and explain how the iron had improved for the user over time. Some candidates listed more than two design features without qualifying the reason / benefit for the development and therefore did not score more than 2 marks.
- (b) Most candidates scored highly by describing clear benefits for the manufacturer and user.
- (c) A very well answered question where most candidates were able to show their understanding of continuous production and its impact on the environment. Many candidates related their response to irons and talked about the impact from cradle to grave in terms of using up the earth's resources through raw materials, transport and energy.
- (d) Many candidates were able to score highly on this question. Most candidates talked about de-scaling the iron or cleaning the base plate, emptying out the water for storage and storing the flex correctly to prevent it twisting.

### Question 6

Candidates responded extremely well to this question and most scored highly.

- (a)
  - (i) Most candidates were able to appropriately describe anthropometrics in terms of the study of human measurements, a survey of averages etc. Some candidates confused anthropometrics and ergonomics.
  - (ii) Most candidates had an awareness of the range of measurements and its relationship with ensuring products fit most people but very few candidates accessed the full range of marks. The best responses explained the exclusion of the 10% extremes and how the range informed designers for specific products.
- (b)
  - (i) Most candidates understood how adjustments can assist the user to be comfortable. A majority of candidates described the adjustment / range of movement and / or its benefit. The best responses described both the range of movement and the benefit to the user to gain full marks.
  - (ii) Well answered by most candidates. A minority of candidates chose the wrong data figures.

### Question 7

Well answered by most candidates and many candidates achieved full marks.

- (a) A minority of candidates were able to identify a design movement and then describe to key features of the movement. A significant minority chose Art Movements which were not rewarded. There were a good range of Design Movements, the most popular movements selected were Art Deco, De Stijl and Bauhaus.
- (b) Well answered by most candidates and most were able to score at least one mark. The best responses correctly described an iconic design as innovative, ground breaking, copied, inspiring and gave examples of specific iconic products such as the iPod, the vw beetle, the mini.

***Mark Ranges and Award of Grades***

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