

A-LEVEL  
**DESIGN AND TECHNOLOGY:  
PRODUCT DESIGN**

PROD3

Report on the Examination

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### **General comments:**

The format of the paper was similar to that of recent examinations, although the increased number of items within individual questions, generally enabled students to access a greater range of marks.

Unfortunately the use of supportive diagrams continues to be an issue with very few responses including vital sketches and relying heavily on written explanations. When students used sketches to explain points made they were more able to access the high mark bands within questions.

Lower level responses were identified by, unsupported statements, with little or no relevant explanation. Higher level responses showed an understanding of the relevance of the points made. When points were explained they often had contextual examples, which added further justification to the point made.

### **Section 1**

#### **Question 1:**

- 01** The question required students to use a combination of diagrams and detailed descriptions to explain how the chair design shown would need to be modified to be suitable for sale as a flat pack piece of furniture. The majority of responses used diagrams to show the individual sections the design would be separated into. Lower level responses referred to the use of temporary fixings, but failed to describe how these could be fitted/attached to the design. High level responses identified several modifications, focussing on individual joints within the design and describing methods of attachment that showed an understanding of forces being applied on the chair. Where students used detailed diagrams of suitable joining methods, such as threaded inserts, they were able to access the highest mark band.
- 02** The question required students to explain how the accuracy would be maintained in the mass production of the jigsaw puzzle shown. The majority of responses showed a basic understanding of a suitable production method for the puzzle, however detail referring to the image printing was limited. High level responses referred to specific QA procedures used to maintain accuracy within the printing process, the alignment of the image on the puzzle board and the cutting of the puzzle pieces. Lower level responses referred to printing in general and often failed to identify the correct order of assembly to ensure accuracy. They may have referred to several opportunities within production where monitoring accuracy could take place, but no detail was given with the generic term 'check' being used throughout.
- 03** For this question it was expected that students would give details of a method of manufacture for a jigsaw puzzle reliant on simple wastage techniques found in a workshop. High level responses gave specific details of the manufacturing process including a suitable method of applying a surface design. Low level responses used generic terms such as 'cutting' and 'painting' with little consideration of the correct order for manufacture.

**Question 2:**

- 04** When students referred to more than one specific product, using diagrams to illustrate their examples they were able to access the full mark range. High level responses used examples by different designers, or movements and referred to the use of form and specific functional aspects of the products. Low level responses often referred to generic product categories, such as mobile phones.
- 05** This question required students to show their understanding of intellectual properties, including patents. High level responses offered specific details of patent applications and restrictions, combined with accurate applications for copyright and trademark protection. Low level responses tended to recognise the concept of IPR but were unable to differentiate between concepts such as patents and copyright protection.
- 06** This question required students to show an understanding of relevant consumer safety legislation and standards. High level responses referred to a range of legislation/standards, such as BSI and gave specific product examples where standards are used to protect the consumer. Low level responses made reference to legislation/standards but failed to explain how these protect the consumer.

**Question 3:**

- 07** This was a popular question with the majority of students able to accurately discuss relevant properties of HDPE making it suitable for the packaging shown in figure 4. The material used for the sachets shown in figure 5 was very rarely identified as Lactel, with many responses referring to LDPE sheet, missing the required water solubility.
- 08** The majority of students who attempted this question were able to reference several products where the energy efficiency of electrical products has been improved. The choice of products often limited their ability to expand on the points. High level responses gave well explained reasons for modifications and often referred to a single product where a variety of design changes have been made. Low level responses recognised design changes, but failed to explain how the change affected energy use.
- 09** This question was well answered, with the majority of students able to discuss a range of issues associated with polymers in product manufacture. High level responses discussed points in detail, giving specific situations to contextualise the environmental issues. Low level responses failed to explain the environmental issues and discussed a limited range of issues.

**Question 4:**

- 10** This was a very popular question with most responses identifying the main safety features evident from the images. Low level responses identified features without adding specific detail as to how they improved safety. High level responses justified all the points made using knowledge of material properties and technically accurate vocabulary in their explanations.
- 11** Students who attempted this question were able to discuss a range of modern manufacturing systems and these were often explained using specific industrial contexts. High level responses showed an understanding of how these methods allowed manufacturers to be flexible and adjust to changing demand. Lower level responses often mentioned modern systems, but failed to explain their relationship to changing customer demand.

**Question 5:**

- 12** The majority of responses to this question showed a clear understanding of the key material properties of concrete that make it suitable for a car park stairway. The manufacturing technique used for production was less well known. Higher level responses correctly referred to concrete being weak in tension without reinforcement and often showed clear diagrams of the casting process.
- 13** This was another popular question, explanations of focus groups often lacked detail. Although diagrams were not specifically required the clearest explanation of a flow chart benefited from supporting sketches illustrating the use of feedback loops. When explaining a specification, many responses failed to detail the use during evaluation. Rapid prototyping was a term that many students were unfamiliar with, describing the quick production of foam models by hand rather than referring to 3D printing, FDM etc.

**Question 6:**

- 14** This question was generally answered well, most students correctly identified the five stages of the PLC graph. Students who were able to offer suggestions as to why sales may have increased or decreased in each stage were able to access full marks. If a candidate purely explained that sales increased as shown on the graph without a justified reason their mark was restricted.
- 15** This question required students to refer to one specific product and describe how it has been developed to maintain sales. The majority of students used specific mobile phones as their specific product, with some opting for products such as the Dyson vacuum cleaner. Where responses used multiple product examples the final mark was restricted. High level responses described both of the stated bullet points related to their chosen product and gave a range of justified examples. Low level responses focussed on listing developments in technology with limited detail explain their points.

### **Use of statistics**

Statistics used in this report may be taken from incomplete processing data. However, this data still gives a true account on how students have performed for each question.

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

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.