Questions matter

A-level
Design and Technology: Product Design

7552/2 Paper 2

Report on the Examination

7552
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General Comments

- The paper is structured in two sections and totals 80 marks, making up 20% of the overall qualification.
- Students are familiar with the structure of the paper, which is now in its sixth series.
- There is a clear increase in specific technical knowledge being used within responses; the use of this vocabulary allows students to respond more concisely and effectively.
- Specification content including digital design (3.1.7) and design for manufacture (3.2.9) is a key strength with students confidently referring to specific technical terms in detail.
- Where students are given stimulus material, low level responses continue to be typified by observations without greater depth of understanding or application to the context given.
- When formulating an extended response many students continue to include the question wording within the first few lines. This is unnecessary and does not increase the quality of the response.

Question 01:

Students were asked to analyse and evaluate the suitability of two different chairs for large-scale production.

- Although students are familiar with the question structure and utilised the information given within the table, they were not always able to relate this to the large-scale production context.
- Where students performed well, they used the provided information as a base to expand upon, offering details that were directly related to the large-scale production context.
- Higher level responses offered details of specific production processes related to the context whereas lower-level responses relied on the generic information within the table, offering very limited expansion.

Question 02:

Students were asked to explain how reliance on global supply chains can affect product development.

- Where students performed well, they recognised the importance of transport/trade between different countries and how socio-economic changes can affect prices and availability of materials and energy.
- Where students performed less well, they responded to some of the reference points, but with limited expansion beyond recognising the changes in cost and difficulty with supply.

Question 03:

Students were asked to outline the key features in a self-assembly furniture instruction booklet.

- Where students performed well, they offered specific details regarding aspects such as the graphical presentation of the booklets and utilising exploded diagrams with all parts labelled.
- Where students performed less well, they used generic references to images and tools, without the obvious use of technical knowledge.

Question 04:

Students were asked to calculate the cost of shipping a single flat-packed chair in a container.

- The question required students to assess the number of single chair boxes that could fit into the container.
- A common misconception seen came from students calculating the container volume and dividing it by the volume of the single chair box. This led to a decimal number value.
- Where students recognised that there would be wasted space around the boxes, they were able to calculate the correct value.

Question 05:

Students were asked to state three ways manufacturers can reduce the environmental impact of packaging.

- This was a highly accessible question with students offering a range of applicable methods.
- Where students offered methods which overlapped their marks were limited.

Question 06:

Students were asked to analyse and evaluate different prototyping methods for further development of a hairdryer prototype.

- The highest performing students detailed how specific prototyping methods would be used to test individual aspects of the hairdryer development.
- Students responded well to the virtual prototyping aspect of the question, often giving details of how FEA (Finite Element Analysis) and CFD (Computational Fluid Dynamics) would be used in the development of the hairdryer.
- Where students performed less well, they often referred to generic physical and virtual prototyping, as stated in the question.

Question 07:

Students were asked to describe how a 3D printed component would be designed and produced using a Fused Deposition Modelling process.

- Where students performed well, they were able to describe the development of a CAD model and the conversion of this model into a multiple layer ‘sliced’ file to be reproduced.
- Lower-level responses often referenced the production of a CAD model, but often lacked detail in the conversion process.
- Higher-level responses showed an understanding of the 3D printing process including details of materials, heating and cooling of the models.
- Lower-level responses often referred to models being sent to the printer and then after printing being removed, without any details of the printing process.

Question 08:

Students were asked to describe the term 'acceptable tolerance'.

- This was a very accessible question, with the majority of students recognising tolerance as a range of acceptable measurements within which a component will function correctly.
- When students were able to describe the impact of a measurement falling outside of the range they received greater credit.

Question 09:

Students were asked to describe a quality control check use on a production line to ensure all products conformed to acceptable tolerances.

- This was another very accessible question, with many students referencing go no-go gauges as a suitable method for checking measurements.
- When students also showed understanding of the testing method, they gained both of the available marks.

Question 10:

Students were asked to describe how a user-centred design approach could be used by a designer of a toaster for a family home.

- The question required students to show an understanding of how designers involve users throughout design development.
- When students described stages in the user-centred design process, such as concept development, user testing and focus groups, they were able to access the full range of marks.
- When students under-performed, they often responded to the question with suggested modifications to make a toaster suitable for use in a family home.

Question 11:

Students were asked to discuss what designers and manufacturers are doing to enable consumers to repair electronic products.

- As a discussion question, responses given in a bullet pointed format were not seen as ideal and this impacted on the mark they received.
- When students performed well, they displayed clear technical detail, referring to specific methods undertaken by designers and manufacturers to enable the repair of electronic products.
- Where students performed less well, responses were often generic points that, although sometimes relevant, were not specific to electronic product design.

Question 12:

Students were asked to state two evaluation methods for a prototype product.

- This was a highly accessible knowledge recall question.

- The majority of students offered a good range of suitable evaluation methods.

Question 13:

Students were asked to calculate the maximum and minimum number of screws within a bag, using an acceptable tolerance range.

- This question was well attempted by the majority of students.
- Students often confused the +/-2% tolerance as +/-1% leading to incorrect responses.
- The other main mistake was rounding down of the lower number of screws taking the weight below the 196g limit.

Question 14:

Students were asked to name two specific eco-labels relating to energy use and describe their use.

- Students found this question difficult due to the similarities between the eco-label names.
- Some confusion was seen with reference to general eco-labels which have no relationship to energy use.
- The EU eco-label was the most commonly referenced by students. Responses generally described the inclusion of colour coded efficiency ratings well.

Question 15:

Students were asked to calculate the volume of a Styrofoam block, cut from a cuboid.

- This maths question required students to use trigonometry and specifically sine to calculate the block height before calculating the foam block volume.
- This was well attempted by students as long as they could identify the correct formulae.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.