GCSE

Design and Technology

8552/W

Report on the examination

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General

Centres are to be congratulated in the effective way students of all abilities have been prepared for most aspects of the written exam in 2025.

Section A

This section required students to respond to a mixture of multiple-choice questions (MCQs) and short answer questions covering the specification core technical principles.

Section B

This section assessed students on the specialist technical principles section of the specification. It allowed students to demonstrate their deeper knowledge and understanding of at least **one** material category.

Section C

This section assessed students on designing and making principles section of the specification.

Questions A1 to A10

These questions followed the established multiple-choice format with a broad coverage of the core technical principles content.

Question A11 – material properties.

This question required students to describe briefly two material properties named in the specification. The mark scheme exemplified a range of acceptable properties that could be given as one word or sentence responses. Words like strong, thick, and cheap must be qualified to gain credit. Popular correct answers were scratch and dent for hardness and break and bend for strength.

Question A12 – nuclear power.

This question assessed students on their ability to explain why some people are opposed to nuclear power to generate energy. Many responses were thoughtful and detailed, showing impressive knowledge and understanding into the associated dangers, problems of waste disposal and construction costs. Some students gave responses stating greenhouse gases/ CO2 causing global warming were the main issues. These responses were not accepted as they are only a concern in the construction of nuclear power plants and not the generation of energy.

Question A13 – elastic properties.

A well answered question by students reading the question carefully. Many students responded with clear reference to stretch and return to access both available marks. In some instances, students provided an example of a product that stretched which did not access the second mark for indicating how an elastic material returns to its original shape when no longer under load.

Question B14 – standard components.

14.1 An extensive range of acceptable standard components were exemplified in the mark scheme covering all materials areas in the specification. The list was not exhaustive, and any correctly named standard component was credited. Some students named a material stock form which was incorrect.

14.2 Two advantages to the manufacturer were required for this part of the question. Many detailed responses were able to access all four marks available. Some responses were a little vague i.e., easily replaced, readily available, but still gained credit.

Question B15 – calculation of production rates.

Students in most cases were well prepared for this question. In many instances, there was clear evidence of working out, sometimes with an incorrect final answer given. This allowed method marks for correct working to be awarded. In limited number of scripts, students did not correctly round up to 80% meaning the final mark could not be awarded.

Question B16 – aesthetics and sourcing of materials and components.

16.1 Students successfully accessed marks across the three-mark range. Responses detailed how a material or component could be selected, with consideration of colour, pattern, texture, and finish.

16.2 Students successfully accessed marks across the three-mark range. Common responses considered how a material or component might be selected based on extraction costs, wider ethical issues, and issues related to scales of production.

Question B17 – allowing for waste when making prototypes.

Many students found this question challenging due to gaps in their knowledge and understanding regarding the phrase ‘allowing for waste’ and confused it with general ‘waste’. Correct responses did explain the need for waste (extra bits) to allow for adjustments and make improvements with a prototype. An example being allowing for saw cuts when cutting several pieces of material.

Common incorrect responses explained:

- how waste material could be used to make a final product
- more waste if the prototype is not liked
- the prototype may not work and hence be waste
- don't waste materials on a final product
- throwing away waste versus recycling

Question B18 – surface treatment or applied finish.

18.1 Many students were able to name one specific main material. Examiners did however still see a substantial number of generic responses such as wood, metal, plastics, and cloth. These did not gain credit.

18.2 Some students were unable to access this part of the question as they were unfamiliar with the term 'modification' in relation to the specification. Several responses discussed cutting and shaping techniques e.g., sawing, turning, and milling. Finishing e.g. by varnishing was accepted.

18.3 Students were credited with marks for correctly reasoned responses linked to an appropriate material identified in 18.1 or 18.2. Responses considered how modification made materials more suitable in their chosen product in varying detail across the available mark range.

Question B19 –scales of production.

The extended written response question focused on the scales of production available for a manufacturer to use. Virtually all students were familiar with scales of production to some degree. Students were able to analyse and evaluate batch, continuous, mass and prototype methods with varying levels of detail and understanding. Some excellent examples of specific products linked to specific scales of production to access maximum marks.

Question C20 – production aids.

Students had to explain how or why jigs and patterns/templates were used. Successful responses made reference regularly to consistency and replication and their vital importance in speeding up production where more than one of a product was required. Responses for patterns/templates were better than those for jigs. Some responses commented on how patterns improved aesthetics, demonstrating a degree of misunderstanding of this question.

Question C21 – the exercise bike.

21.1 This part focused on user needs and wants was well answered, often using all the available writing space and sometimes requiring additional space. Responses made effective use of the indicated specification. However, clear analysis and evaluation of the bike was

required for the award of the highest marks. Simply producing a list of the specification features did not gain marks.

21.2 Students were required to evaluate the exercise bike in terms of both anthropometrics and ergonomics to access all available marks. Successful responses linked features like hand size for the grips and different user heights/leg length to the adjustable seat. Common ergonomic points considered were having a padded seat for comfort or soft/foam hand grips to hold onto so hands would not slip.

21.3 This part of the question was designed to assess if students knew what innovation was in the context of features found in the exercise bike. It proved to be the most challenging part of question 21 for students. Strong responses invariably focused on the interactive screen features and how they improved the overall experience of exercise for the user. Less successful responses tended to repeat ergonomic features e.g., a comfortable seat given in 21.2. These responses did not gain additional credit.

Question C22 – material management.

An extensive range of indicative content is provided in the published mark scheme to show how all students attempting the question were able to gain some of the available six marks even if their final answer was incorrect. The calculation of both the total panel size and the area of one blue panels were the most common method marks to gain credit. A common misconception was to divide the total panel size (7200mm^2) by the area of six panels (2400mm2) giving an incorrect ratio of 3:1.

Question C23 – 3rd angle orthographic projection

A good discriminator question allowing students who understood orthographic drawing and drawing conventions to perform well.

23.1 This part of the question provided opportunities to gain marks for basic understanding of the component right hand side view and technical detail showing distinctive features using correct drawing conventions. Most students gained some marks, especially the basic 'L' shape of the component and drawing it the correct way round with a vertical line to indicate the angled face.

23.2 There was one mark available for the correct 3rd angle orthographic projection symbol (D)

Question C24 – calculation and manufacture of six weathervanes.

24.1 Many students were able to correctly give the required answer of £558. Where an error in arriving at the correct answer was seen many other students still gained a mark for having evidence of using a correct method in their response.

24.2 Students had three opportunities to gain method marks in this part of the question without necessarily arriving at the correct answer. A common error present in students' working was neglecting to take into account that cost of six weathervanes was in fact £30 and not £5.

24.3 Two marks were available for identifying that method 2, five workers, table 3 was the most cost-effective method of manufacture with a brief explanation. In many cases precise comparative responses comparing costs were given. Some students just repeated the question stem saying method two was cost effective. This did not gain credit.

Question 25 – selecting materials and components.

Some students focused on products without linking to the specific question demands of material and components. This meant that some responses did not answer the question. This was particularly evident for the first factor of product function. Subsequent responses for cost and availability of materials and components were better answered.
Centres need to remind their students not just to repeat words from the question stem as they cannot gain credit.

Question C26 – carbon dioxide level and impact on the design and manufacture of products.

Students were able to explain with varying degrees of confidence, knowledge and understanding of how increasing CO^2 levels are making manufacturers rethink design and manufacture practice. Common responses considered the sourcing of materials, energy consumption and using fewer materials. There were a number of responses that did not relate to the question, with discussion of global warming and climate change in isolation.

Question C27 – designers use of investigation and research.

A well attempted question. Many responses demonstrated a secure understanding of the value quality investigation and research plays in the work of designers. Typical students responses considered:

- the needs and wants of potential users
- good and bad points in existing designs
- gaps in the markets
- the price point
- avoiding patent infringment.

Mark Ranges and Award of Grades

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