



GCSE

DESIGN AND TECHNOLOGY

8552/W Written Paper
Report on the Examination

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General

This year has seen the fourth examination sitting for this specification. Due to the Covid pandemic however, it is only the second year that an exam has been taken by all students entered for the qualification.

Students made good use of the advance information supplied by AQA earlier in the year to inform their preparation and revision for the examination.

Section A

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

Section B

This section addressed elements of the specialist technical principles, allowing students to demonstrate their in-depth knowledge and understanding of at least one material category.

Section C

This section focused totally on designing and making principles. Questions in this section were a mixture of short and extended responses. Some were questions with multiple parts that needed to be addressed.

Question A1 to A10

These questions were all multiple choice, covering a broad range of core technical principles testing different material and component areas. A2 proved the most challenging question for candidates, with just over 25% responding with the correct answer. A9 proved to be the most accessible, with nearly all candidates responding correctly.

Question A11 – modern materials

This question was in two parts, requiring students to name a specific modern material and then explain how modern materials improved product function. Responses identifying specific smart materials were also accepted as they are a sub group of modern materials and usually a very recent invention. For the purpose of this question, modern materials were deemed to be ones invented since World War Two.

Question A12 – HDPE containers

Two detailed reasons were required to access the full 4 marks available. It is important to note that students should not respond with generic reasons like strong or cheap. However, many candidates in 2022 added additional clarification to qualify their use of these words, e.g. 'strong to stop the package from splitting if dropped', which allowed them to gain at least a mark.

Question A13 – car windscreen wipers

13.1 A recall question identifying the type of motion in wiper arm 1. It was clear from responses that many students were unfamiliar with the four specific forms of motion. Several responses using words and phrases like 'sideways' or 'back and forth' were provided and not credited.

13.2 Many correct and fully explained responses were evidenced for Q13.2. Students were able to articulate how the linkage joined the wiper arms together so they moved in unison, at the same speed, so they didn't collide.

Question B14 – material processes

This question allowed students to select the process appropriate to the material area(s) studied. Some processes were relevant to more than one material area, e.g. shearing which was relevant to both textiles and paper. Appropriate responses for all four processes were seen. Students responded using a mixture of notes and/or sketches which helped in clarifying their understanding.

Question B15 – bow and arrow

15.1 was testing the specific forces identified in the specification and not generic forces like gravity of friction. Lots of responses made reference to tension, compression and bending. The mark scheme did allow for at least 1 mark to be awarded even if there was no mention of a specific force, as identified in the mark scheme.

15.2 There was evidence of confusion in some responses to Q15.2. Students seemed unclear what a reinforcement was. Some responses talked about applying a finish or alloying metals which was not correct. Detailed indicative content of what was appropriate and correct is provided in the published mark scheme.

Question B16 – template and calculation question

This question was in 3 parts, requiring students to explain the purpose of a template, before the calculation of a key dimension and angle of the template.

16.1 Many responses correctly considered time saving, ease of making out and repeatability.

16.2 1 mark was awarded for evidence of the number 45 (mm). There was no credit for indicating correct units in this instance as the question was for 1 mark only.

16.3 The correct answer was 120 degrees. Evidence of this number with no working was still sufficient for the full 2-mark award. Where 60 was seen in any working, that was rewarded with 1 mark for evidence of correct method.

Question B17 – selecting materials

A question requiring an explanation. Many students attempted both parts of the question, with varying degrees of success. Availability was considered in terms of sourcing available stock forms and standard components for ease of replacement and repair. Detailed responses for cultural factors and social factors correctly considered religious beliefs in society, as well as sensitivity to animal welfare and sustainable sourcing.

Question B18 – carbon footprint

The extended written response question with a focus on analysis and evaluation of a theme. A good variety of response ensuring the full range of marks was awarded. Many responses were supported with helpful examples to clarify understanding. The best responses clearly considered the full life cycle of products and how CO₂ was released during the lifetime of product(s) and were characterised by personalised and insightful evaluative content. Many students made use of the additional paper provided at the back of the answer booklet for extending responses.

Question C19 – garden furniture and packaging

This question required students to analyse and evaluate stimulus material in terms of:

- Functionality
- Deforestation

19.1 Responses considered both the furniture and packaging in terms of functionality. High scoring responses identified, analysed and evaluated functionality issues to do with several parts fabricated using different materials. Most students found it easy to access marks by completing analysis, fewer were able to fully evaluate the significance of issues identified.

19.2 Students clearly understood what deforestation was and its impact on all timber derived products. A small number of students were able to link deforestation to ground clearing for mineral extraction to make steel for component fittings used in assembly of garden furniture.

Question C20 – hoop structure calculation.

20.1 Marks were awarded for correctly arriving at 283 (mm) as the fully rounded number. Where the correct answer was given full marks were awarded even without evidence of working out. Where students had not rounded up to the nearest whole mm, 2 marks were awarded.

20.2 Again, arrival at 121cm without working could achieve 4 marks. Where the answer was incorrect, students could still score well by clearly showing working of the following:

- Material needs for 3 legs
- Material needed for 3 hoops added to 3 legs
- Final answer not converted to centimetres e.g. 1208.34

Question C21 – deforming and reforming

21.1 Many correct deforming and reforming processes were correctly named for 1 mark. If no process was named in the space provided but was clearly named in 21.2 or 21.3, credit was still given.

21.2 Marks were awarded to a correct explanation matching the process identified in 21.1.

21.3 Safety issues had to be relevant and appropriate for the process identified in 21.1. Where the student had incorrectly named a process in 21.1, but then explained a process in 21.2 marks were awarded if the safety issues were appropriate so as not to double penalise students.

Question C22 – pencil sharpener/exploded isometric

A well answered question. Many students were able to score marks for recognisable isometric drawing(s) and drawing parts exploded. It did prove more challenging for some students to ensure parts were correctly proportioned and aligned for higher mark awards.

Question C23 – sketching

Students were able to explain with confidence about both an advantage and disadvantage of freehand sketching. Several responses were clearly drawn from personal experience when designing work. Some students did misread the question, where an advantage and disadvantage of CAD drawing was given rather than freehand sketching.

Question C24 – datum points

24.1 The most common correct responses made reference to starting points and origin points for 1 mark.

24.2 Responses correctly made reference to accuracy and consistency as the main reasons why datum points are used. More sophisticated responses explained specifically how a datum point would be used in a specific instance e.g. ensuring material and pattern alignment.

Question C25 – specialist equipment

25.1. All specialist equipment identified in the question stem was selected in student responses. The full range of marks was used to reward students for their descriptions of how their chosen piece of equipment was used. A few students did misread the question and constructed responses where they focused on why their chosen specialist equipment was used rather than how it was used.

25.2 Students had a good understanding of checks and how they link to the producing quality outcomes. Lots of mention was made of visual checks and set up checks before starting to use equipment.

Question C26 – evaluating

Students demonstrated a good understanding of the importance of evaluating when developing prototypes. For example, considering why we test when developing prototypes. The question was well interpreted, with responses considering examples of evaluation during both the designing and manufacture, and how evaluating was essential to ensure prototypes were fit for purpose and meeting client need.

Mark Ranges and Award of Grades

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