GCSE
DESIGN AND TECHNOLOGY

8552/W: Paper 1
Report on the Examination

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General

This year has seen the arrival and first examination for the new GCSE course, replacing all legacy specifications. Considerable care has been taken in the production of the paper, to maintain a similar style to that established with both sets of sample assessment materials produced during the launch and planning phases. Students have responded to 2019 questions with precision and accuracy, demonstrating clear evidence of effective planning and preparation of students by teachers. Schools are to be congratulated on this.

A significant change with the new specification has seen the removal of designing questions and the inclusion of a minimum 15% of marks testing mathematical skills in a differing design and technology contexts.

Section A

This section required students to respond to a mixture of multiple choice questions and short answers 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 focuses totally on the designing and making principles. Questions here are typically a mixture of short and extended response. questions.

Question A1 – A10- MCQs

A series of 10 multiple choice questions covering aspects of the core technical principles including multiple material and component areas.

Question A11 - cost of charging a smoke alarm

This question was the first to directly assess mathematical skills, requiring students to use arithmetic and numerical computation to calculate and allow a customer to compare the cost of two different methods of powering a smoke alarm. One mark each was rewarded for the two correct costs. Responses across the available mark range were achieved by a majority of students.

Question A12 - Kevlar fibres

Students attempted this question with confidence, with many responses considering fibre arrangements, weaves and even chemical treatments to achieve desired properties.

Question A13 – properties of manufactured boards

This question required two properties of manufactured boards to be identified. References as prescribed in the specification considering MDF, plywood and chipboard were being tested and not cardboards. Successful responses clearly identified specific properties, though it was not

uncommon to find one word responses like cheap, strong or recycle given by students. These were not accepted and were not awarded credit.

Question A14 – Just in Time production

This question got many quality responses with students recognising that each point of explanation would gain more credit due to four marks available in total. Popular responses correctly discussed materials arriving just in time to be used/going to the production line rather than into storage.

Question B15 – forces

This question rewarded only specific correctly named forces. Answers such as ‘pressure’ and ‘downward force’ were not specific enough and gained no credit.

Question B16 – addition processes

This question required students to communicate using a mixture of notes and sketches to gain maximum marks. The question was constructed to allow a student to respond using knowledge and understanding from a specific material area where they had developed a deeper understanding during the course. More effective responses made several correct points of process, backed up with specific tools and equipment used. Less effective responses used either notes or sketches only and hence lacked the clarity for the highest mark. Some students did not understand what addition was and even in isolated cases made up calculations in the space provided.

Question B17 – wastage

Many students answered this question well, understanding that wastage was about the physical removal of material from a part or prototype. There were several instances where the question was not read/understood correctly, with students talking about nesting, tessellation and recycling. Marks were not awarded under description of process for a repeat of the process named on the first line.

Question 18 – quality control

18.1 – for two marks students were expected explain their understanding as to the purpose of quality control, not name specific methods of quality control.

18.2 - this was not a repeat of question 18.1. The question clearly wanted one specific method of quality control to be given, with a second mark for additional clarification.

Question 19 – material sources and origins

19.1 – students were in the vast majority of cases able to provide a specific source of origin for their chosen materials category.

19.2 – students were able to link 19.2 to their chosen material category. Unfortunately, named processes were often either too vague, eg heating up the metal, or incorrect, sometimes having nothing to do with conversion into a workable form, eg batik.

19.3 – sketches were used to clarify the named process in 19.2. Credit was awarded even if the process named in 19.2 was wrong, but the explanation in 19.3 was correct.

Question B20 - analysis and evaluation

Many highly detailed and correct responses were seen. Marks were limited if no exemplification was used as requested in the question stem. Responses considered extraction eg mining and drilling, habitats, the 6Rs, and many other relevant issues.

Some students discussed issues around 'Fairtrade' which was irrelevant for this question. Students who attempted to answer this question using a list of bullet points were unable to provide much analysis or and evaluation and restricting marks awarded.

Question C21 – playground equipment

21.1 – many students correctly analysed and evaluated points provided in the specification or seen in the visual image. No credit was possible for repeating named specification features eg use of weatherproof materials. The question was looking for a well described analysis with evaluation and conclusions for the top range of marks.

21.2 – safety considerations were effectively explored, with many students able to identify, analyse and draw conclusions as to merit for several safety aspects. Common responses focused on anti-slip surfaces, recessed fittings and height of the play equipment as seen in the image. Marks could not be awarded for things like waterproof material preventing slipping as this was a feature of the material/finish and not a safety feature.

21.3 – less effective responses considered basic size and average measurements of the table data. More effective responses considered means and percentiles to clarify how a designer would make sense of the provided data and use it to design the equipment. A range of both positive and negative points in using the provided data were also considered eg restrictions on who could use the equipment.

Question C22 – manufacturing tolerances/step ladders

22.1 – this question required the use of appropriate mathematical skills to solve real D&T manufacturing issues. Many students showed working and detail regarding how they arrived at an answer.

In this case, as the question was a low mark tariff, only correct answers to two decimal places (with or without units of measurement) were credited. Some students did not gain marks as they failed to read the question and did not provide answers to two decimal places.

22.2 – some student responses involved premature rounding preventing them from gaining full marks. Many students also provided an answer to one decimal place.

Where a correct answer with no evidence of working was provided, full marks were awarded. If working was given, but an incorrect answer was arrived at, credit was awarded in part.

Question C23 – collaboration

This was a well attempted question with most students giving a response. Students discussed the sharing of ideas, improving designs and the ability to innovate to name but a few. Examples of actual specific collaboration and specific products designed through collaboration regularly appeared to extend responses and gain credit.

Question C24 – five safety precautions

This was a well answered question with full and complete responses from all materials categories covered by the specification. Responses had to be more than just a list of equipment eg goggles. Where an item of equipment was named and it was given a context of use credit could be awarded, eg 'isolation button – so you know where to turn the power off immediately if an accident occurs'.

Question C25 – surface finishes

25.1 - the question was looking for more than a definition of aesthetics and or a repeat of the phrase aesthetics given in the question stem. Examples covering colour, textures and changing surface appearance all scored well. Some confusion was evident in students talking about functional reasons for finishes and this was incorrect for this question.

25.2 – there were many high quality examples with specific named finishes from all material categories evidenced. The naming of specific finish examples gave students the confidence to then go into detail explaining why finishes are applied for functional reasons.

Question 26 – drawings to communicate information

26.1 – this question was about drawing techniques and not CAD. Many students were able to express ideas about visualising products, making them 3D and looking more 'real' extremely well. Some students explored the concept of exploded sketches in 3D to see how things were put together without using words eg flat pack furniture instructions.

26.2 – this question focused on orthographic and isometric drawing. Whilst 100% accurate drawings with zero errors were not expected for maximum credit, marks were awarded for specific details/ key features eg hidden detail, clear attempt to draw an isometric drawing – not oblique or perspective.

Question 27 – calculation of a material volume

This question saw several approaches used to good effect, eg π as 22/7, 3.14, 3.142 etc. Responses that were correct and then rounded to the nearest mm^2 gained full marks. Where calculation to the nearest full mm^2 had not taken place, credit was awarded for appropriate working out. A common error with many student responses was the calculation of the area of the circular hole and not the volume.

Question C28 - modelling

Students approached this from several different angles and clearly drew on their own personal experiences in the school context. Numerous responses considered examples of virtual and physical modelling to expand and clarify their responses. Examples of specific products, eg a wedding dress for textiles and modelling techniques, such as bread boarding in electronics, were both highly acceptable.

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.