

A-LEVEL
**DESIGN AND TECHNOLOGY:
PRODUCT DESIGN (3-D)**

PROD1

Report on the Examination

2550
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Introduction

General

The format of this paper is well established and was similar to that of recent examinations. In section B, question 6 was by far the most popular question on the paper. Questions that are linked to polymers were well answered. Questions based on metals continue to be the weakest area for responses.

The reduction in the use of generic terms such as ‘durable’ and ‘cheap’ is continuing but there are still some students who continue to use this terminology throughout. It is important that all students are aware that generic terminology will not obtain any credit. Students should make it very clear that any properties of materials discussed are linked explicitly to the product referred to in the question.

Section A

1(a)

This question was generally well answered with students making references to ‘trees that didn’t lose their leaves’ or ‘deciduous trees’.

1(b)(i)

The majority of students were able to correctly name a hardwood and suggest an appropriate application.

1(b)(ii)

In the main, this was a well answered question. The most common error was when students referenced an ‘attractive grain pattern’ but then did not go onto comment on the colour of the chosen wood or explain that a grain pattern was a good thing in terms of the aesthetics or quality of the named material.

1(c)

This question was poorly answered and showed a lack of familiarity with these acronyms.

2

Most students were able to correctly identify ‘Personal Protective Equipment’. COSHH was not answered so well and again showed a lack of familiarity with the acronym.

3

The most popular knock-down fittings were CAM locks/fittings, corner plates, block connectors and modesty blocks. ‘Dowel joint’ did not get credited.

4(a)

A vast majority of students correctly identified the material as either an Alloy or Non-Ferrous.

4(b)(i)

Most students were able to name a suitable application for Bronze. Popular answers ranged from jewellery, medals, statues and coins.

4(b)(ii)

In higher attaining responses, material properties were clearly linked to the product use. Lower level answers lacked appropriate justification, which was needed to award the 2nd mark e.g. 'Bronze is weather resistant'.

5

Many students were able to choose the correct material for the application. The most common error was the swimming pool slide where students selected Polylactide (PLA) instead of Glass-fibre reinforced plastic (GRP).

Section B

6(a)(i)

Those students who linked a property of Polypropylene explicitly to the use of the margarine tub scored well. Popular answers included 'PP is non-toxic and will therefore not affect the quality of the margarine that is stored within in the tub', and 'PP is a thermoplastic therefore can be recycled which is good as the product has a short life cycle'.

Responses such as 'it can be coloured', 'it is durable', 'it can be printed on' and 'it is cheap' were not awarded any marks

6(a)(ii)

The higher attaining students made reference to Stainless Steel being malleable and therefore suitable for the sink to be press formed or spun into shape. Other popular responses included that Stainless Steel was scratch resistant and therefore wouldn't scratch when kitchen items were put into the sink, or noted its 'shiny colour' which looks good in the kitchen.

Lower attaining students made reference that it was 'corrosion resistant' or 'chemical resistant' but then failed to justify why this was important in relation to the kitchen sink.

6(b)(i)

Students were able to explain what a biodegradable plastic is e.g. a plastic that 'breaks down'. Higher level responses then went on to give external causes that assist with ways in which biodegradable plastics break down.

6(b)(ii)

Many students were able to explain why biodegradable polymers were used for carrier bags e.g. because they have short life cycle but then failed to justify the point they had made.

7(a)(i)

Responses to this question were very varied. Unjustified statements such as 'lightweight', 'cheap' and references to the 'colour' did not attain credit.

7(a)(ii)

Many students scored within the middle mark band. Many students were able to correctly identify that the material was placed in a clamp/bolster, students were able to identify that there was a 'male and a female'/'lower and upper' mould, that the die moves down and the shape is pressed, and that the pressed product is then removed.

In order for the higher marks to be awarded, we were looking for references to the material stretching and thinning, references to the edges needing trimming and for the mould to look like the shape of the product. Any references to piercing and blanking were not credited as the question asked students to describe the process of press forming.

7(b)

Many students were able to correctly identify the 'container' and 'power supply'. The other 3 labels were very poorly answered. An error with this diagram meant that the power supply box had the negative and positive symbols the incorrect way around. A correct answer of 'anode' or 'cathode' was therefore credited in either box to ensure that no student was disadvantaged by this error.

Section C

8(a)(i)

This question was very well answered, linking the properties of LDPE to the water bottle. There were a lot of references to the material and its 'suitability for blow moulding the shape', 'the fact the material is 'flexible to allow the water bottle to be squeezed to get the water out' and 'impact resistance as the bottle is likely to be dropped when used in a sporting event therefore it will not shatter or crack'.

Those answers that were weaker offered generic unjustified answers such as 'can be coloured', 'can be printed on' and 'cheap material' therefore did not attain credit.

8(a)(ii)

Students are familiar with this process and answers for this question were mostly in the mid to high level mark bracket. Many students identified the key features and were able to describe the process in detail either identifying the 'stages' of the blow moulding process or through the annotations around the diagram.

Those answers that were marked in the 7-9 bracket were ones who noted that any flash was to be removed and made reference to split moulds.

8(b)(i)

Students are familiar with this process and the diagram. Many students were able to identify the key features of the process. Marks were awarded either through written descriptions or through the diagrams.

In order to access the higher mark band references to the ejector pins, removal of excess material/sprue and the mould must look like the product in the question.

8(b)(ii)

This was largely well answered. A number of responses referred to the fact it was a fast process therefore suitable to large volumes being produced at once. Many students made links to the 'details' such as the screw top is able to be produced with ease through the design of the mould.

8(c)

Student responses to this question were hugely varied due to the open nature of this question. It was expected that the packaging was to be fully functional, so not only offer the bottle protection whilst being transported but also to serve as a way of promoting the product kept within.

The best responses were those that named materials, referenced named printing processes and made links to die cutting for cutting and folding materials. Other elements that were seen in stronger responses were nets being sketched that included cut, fold lines and tabs and ideas that took into account environmental considerations such as using minimal materials or biodegradable polymers. Other strong responses included being very specific with surface decorations such as identifying why certain colours had been used whilst linking it to the target market, the use of endorsements to market the product, embossing surface decorations, making the packaging reusable or making it interactive with the use of smart materials.

Those students who were awarded lower marks offered generic material and processes such as the use of 'card', the graphics would be 'printed on', with the shapes of the packaging often simplistic in nature.

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.