

General Certificate of Education
January 2004
Advanced Subsidiary Examination



DESIGN & TECHNOLOGY: PRODUCT DESIGN PD1D
(3D DESIGN)
Unit 1 Materials and Components

Thursday 8 January 2004 Morning Session

In addition to this paper you will require:

- a lined answer book (AB08) which is provided separately;
- normal writing and drawing instruments;
- a colour Insert Sheet (enclosed).

Time allowed: 1 hour 30 minutes

Instructions

- Use blue or black ink or ball-point pen. Pencil and coloured pencils should be used only for drawing.
- Write the information required on the front of your answer book. The *Examining Body* for this paper is AQA. *The Paper Reference* is PD1D.
- Answer Question 1 and any **two** of Questions 2 to 4.
- Use the Insert Sheet included to help you answer **Questions 1, 2 and 4**.

Information

- The maximum mark for this paper is 100.
- 40 marks are allocated to Question 1, 28 to each of Questions 2 to 4 and 4 marks overall are for quality of written communication.
- Mark allocations are shown in brackets.
- This paper carries 30 per cent of the total marks for AS and 15 per cent for A Level.
- You are reminded of the need for good English and clear presentation. The quality of your written communication will be assessed across all questions.

Advice

- Your answers should be illustrated with sketches and/or diagrams wherever you feel it is appropriate.

Answer Question 1.

1 Study the photographs on the Insert Sheet provided.

- (a) Name a specific material that appears to have been used in the manufacture of the dining chair **Figure 1**. *(2 marks)*
- (b) Explain why this material is suitable for the dining chair shown. *(5 marks)*
- (c) Using notes and diagrams describe how the dining chair could have been manufactured. *(9 marks)*
- (d) The child's chair **Figure 2** is made using a polymer. Name a specific polymer material that could be used. *(2 marks)*
- (e) Explain why this material would be suitable for the child's chair. *(5 marks)*
- (f) Using notes and diagrams, describe how the child's chair could be manufactured using a polymer. *(9 marks)*
- (g) The child's stool in **Figure 3** is produced by rotational moulding. Explain in detail, how a designer could make a prototype model of this stool. *(8 marks)*

Answer any **two** questions from 2, 3 and 4.

2 Study **Figure 4** on the Insert Sheet. It shows a concept design for a one-off desk light.

- (a) Name a specific material that you could make **Part A** from. *(2 marks)*
- (b) Explain why the material you have chosen is suitable. *(5 marks)*
- (c) With reference to the material you have chosen, use notes and diagrams to show how you might make **Part A**. *(9 marks)*
- (d) (i) Name a suitable material for **Part B**. *(2 marks)*
- (ii) Name a suitable material for **Part C**. *(2 marks)*
- (e) Use notes and diagrams to show how you could fasten **Parts B** and **C** together. *(8 marks)*

3 Study the table below.

For each of the materials listed, give **four** reasons why they are suitable for the products shown.

Material	Product
(a) PP (Polypropylene)	Toothbrush handle
(b) PET (PolyEthylene Terephthalate)	Drinks bottles
(c) Aluminium	Drinks cans
(d) Copper	Water pipes
(e) MDF	Flat-pack furniture
(f) Beech	Kitchen utensils (spoon, rolling pin etc)
(g) Glass Reinforced Plastic (GRP)	Boats (small dinghies and canoes)

(7x4 marks)

Turn over ►

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- 4 A jeweller may wish to use a ductile metal to make a bracelet.
- (a) Name a specific metal that is ductile and explain what is meant by the term ductility. *(8 marks)*
- (b) The jeweller may wish to join 'ball ends' to a bracelet, as shown in **Figure 5** on the Insert Sheet. Use notes and diagrams to show how this could be done and explain why this is a suitable way to join them. *(12 marks)*
- (c) (i) The bracelets are to be dispatched in batches to retailers in polystyrene packaging. Explain why this is a commonly used material for packaging. *(4 marks)*
- (ii) Name an alternative packaging material that could be used and explain why it is suitable. *(4 marks)*

END OF QUESTIONS

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The photographs on this sheet are for use in answering:
Questions 1, 2 and 4



Figure 1



Figure 2



Figure 3

Turn over ►

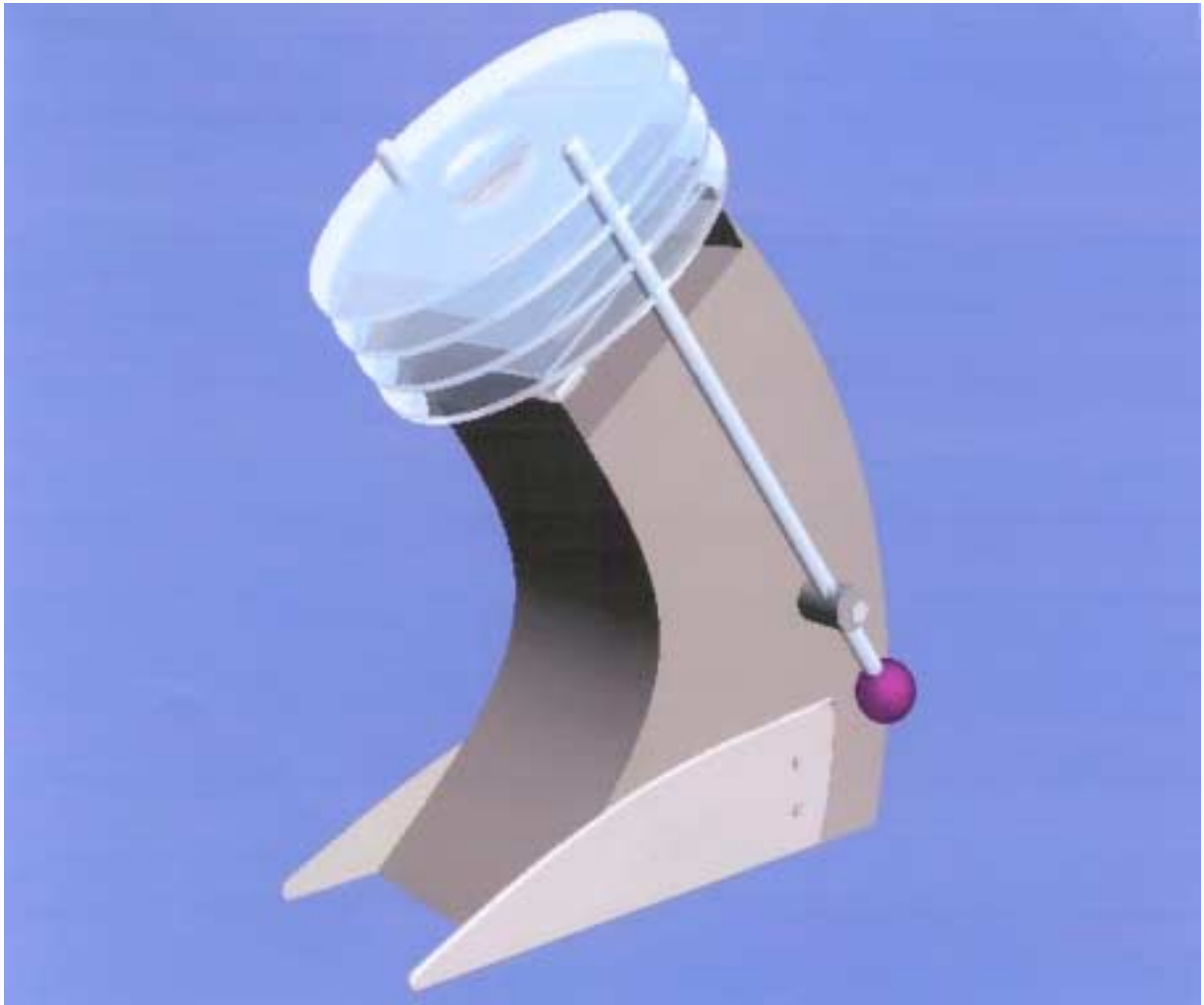


Figure 4



Figure 5