

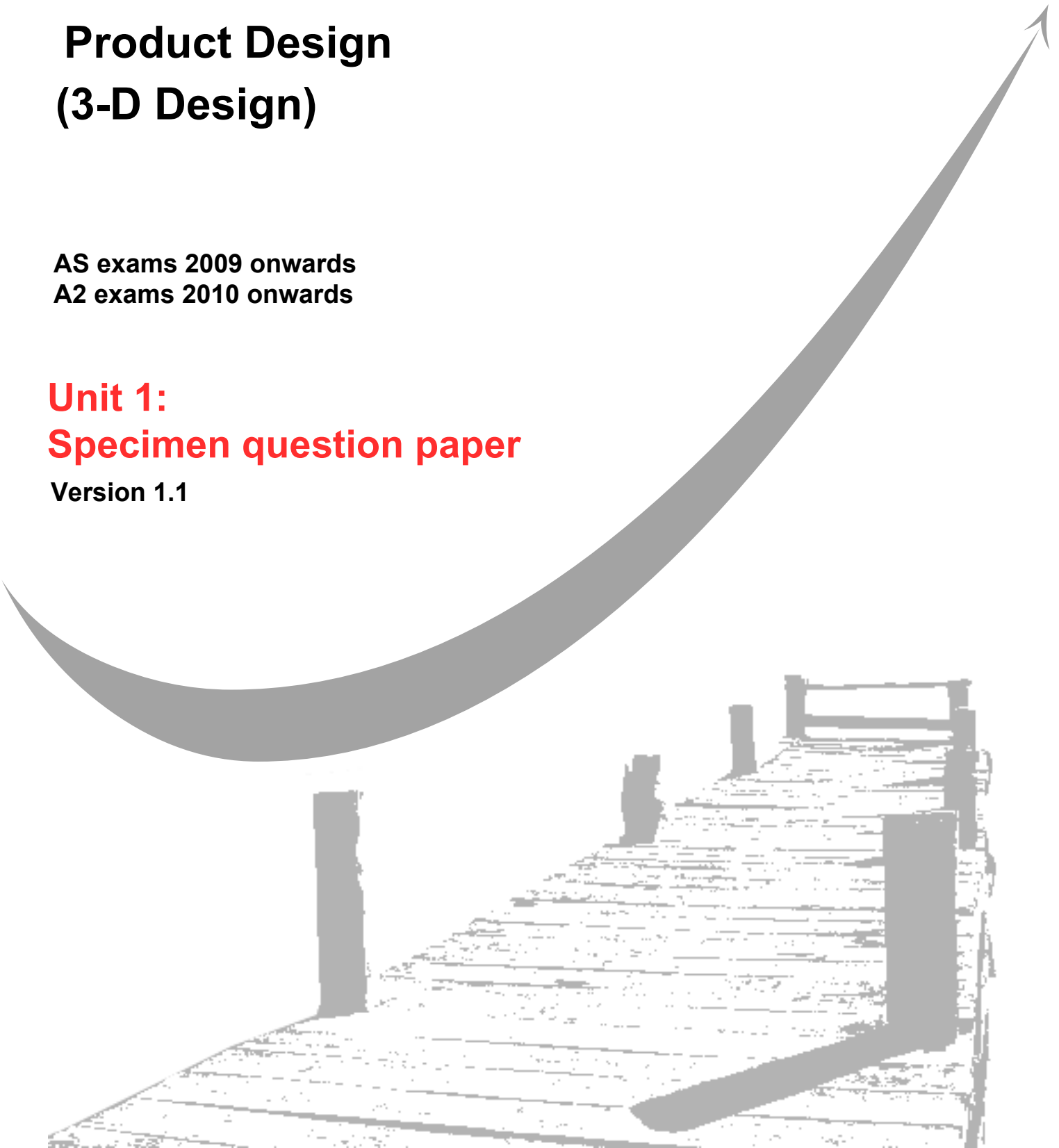
**GCE**  
**AS and A Level**

**Product Design**  
**(3-D Design)**

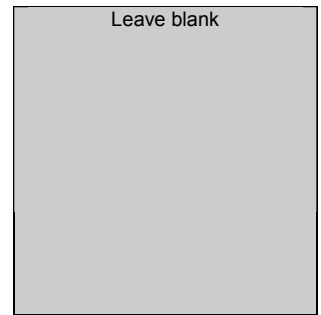
**AS exams 2009 onwards**  
**A2 exams 2010 onwards**

**Unit 1:**  
**Specimen question paper**

**Version 1.1**



Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											



Version 1.1

General Certificate of Education  
Specimen Paper



**DESIGN AND TECHNOLOGY:  
PRODUCT DESIGN (3-D DESIGN) PROD1  
UNIT 1 Materials, Components and Application**

Date tbc Time tbc

- |  |
|--|
| <p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>• Normal writing and drawing instruments</li> <li>• Insert Sheet</li> </ul> |
|--|

Time allowed: 2 hours

**Instructions**

- Use black ink or black ball-point pen.
- Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions in Section A.
- Answer **one** question from Section B.
- Answer Section C.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this booklet. Cross through any work you do not want to be marked.

**Information**

- The maximum mark for this paper is 80.
- 20 marks are allocated to each of Sections A and B and 40 marks to Section C.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

**Advice**

- Illustrate your answers with sketches and/or diagrams wherever you feel it is appropriate

For Examiner's Use			
Number	Mark	Number	Mark
1		5	
2		6	
3			
4			
Total (Column 1)		→	
Total (Column 2)		→	
<b>TOTAL</b>			
Examiner's Initials			

**SECTION A**

Answer **all** questions in this section.

- 1** (a) Explain in detail what the term ‘thermoset polymer’ means. You should refer to the molecular structure of the polymer in your answer.

.....

.....

*(2 marks)*

- (b) Name a thermoset polymer often used in the manufacture of electrical fittings

.....

*(1 mark)*

- (c) Explain what the term ‘thermoplastic’ means. You should refer to the molecular structure of the polymer in your answer

.....

.....

*(2 marks)*

- (d) Name a thermoplastic used in the manufacture of mobile phones.

.....

*(1 mark)*

2 (a) Define what is meant by the term ‘alloy’ and using examples explain the general advantages of alloys.

.....  
.....  
*(2 marks)*

(b) Name an alloy that is often used in kitchen utensils.

.....  
*(1 mark)*

(c) Define what is meant by the term ‘Smart material’? In your answer name a specific smart material and describe a useful physical or mechanical property it has.

.....  
.....  
*(2 marks)*

(d) Name a specific smart material and an application for that smart material.

.....  
*(1 mark)*

3 (a) Define what is meant by the term ‘composite material’ and using examples, describe the general advantages of composites over traditional materials.

.....  
.....  
*(2 marks)*

(b) Explain how the structure of plywood gives the material strength.

.....  
.....  
*(2 marks)*

(c) Name the materials combined to make Medium Density Fibreboard and briefly describe the useful properties of MDF.

.....  
.....

*(2 marks)*

(d) Name the materials that are combined to make Glass Reinforced Plastic and briefly describe the useful properties of GRP.

.....  
.....

*(2 marks)*

**SECTION B**

Answer **one** question in this section.

- 4 (a) For each of the following materials, explain why they are suitable for the product listed. Your answers should make reference to the function, aesthetics or manufacture of the product.

<b>Material</b>	<b>Product</b>
(i) Aluminium	Drinks can
(ii) 'Plaswood'	Park Bench
(iii) Biodegradable Polyethylene	Carrier Bags
(iv) Metalised card	Takeaway meal container

- (i) .....  
.....
- (ii) .....  
.....
- (iii) .....  
.....
- (iv) .....  
.....

*(4 × 4 marks)*

- (b) Use an annotated diagram to critically analyse the function of aluminium drinks cans and explain how this has to some extent, determined their form.

.....  
.....

*(4 marks)*



| (d) The Juicy Salif Lemon squeezer is often said to be more about aesthetics than its function. Provide justification why this is so.

.....

.....

.....

.....

*(4 marks)*









Figure 1:  
Juicy Salif Lemon  
Squeezer

Figure 2: CAD  
drawing of a mobile  
phone

