

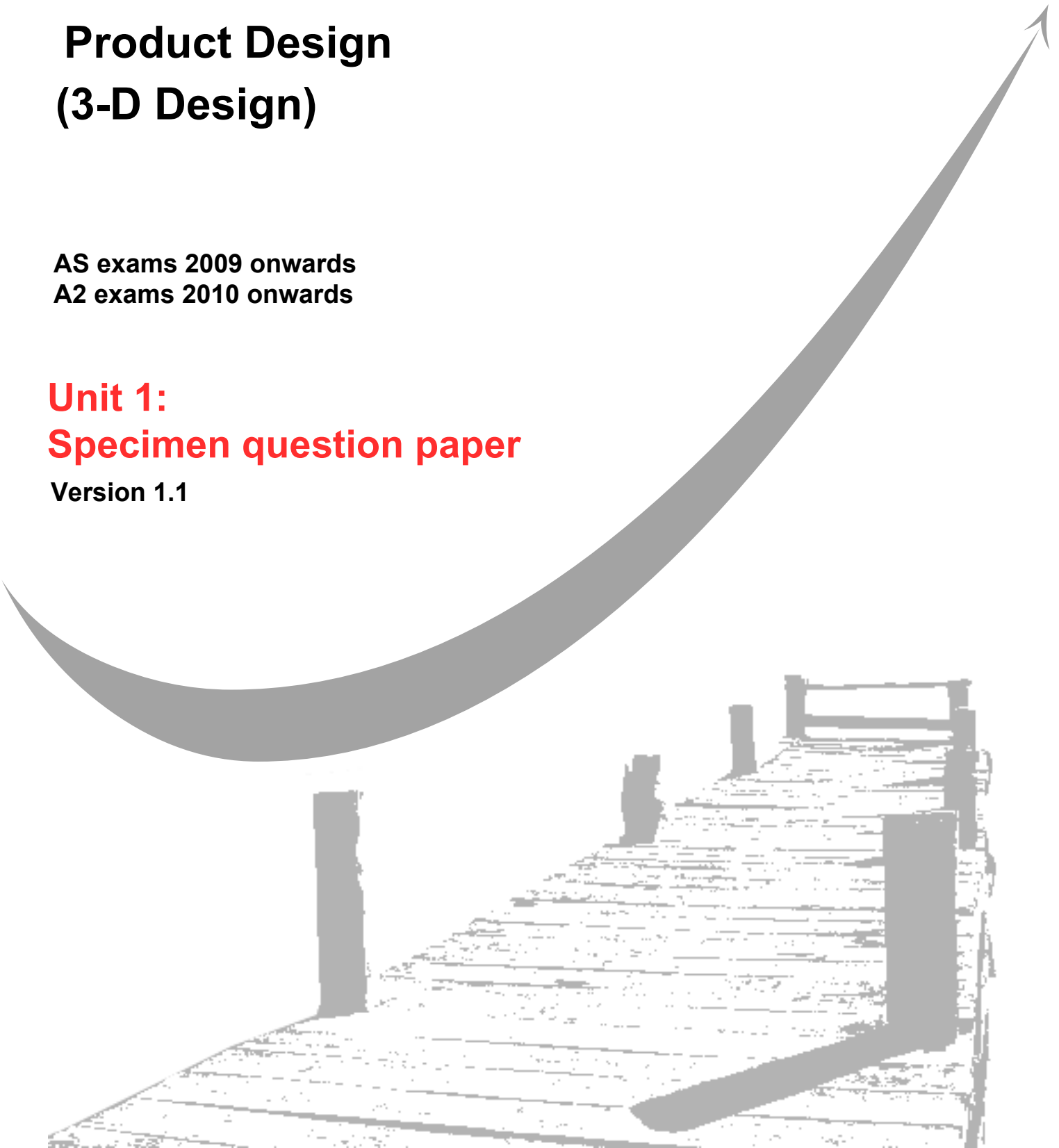
GCE
AS and A Level

Product Design
(3-D Design)

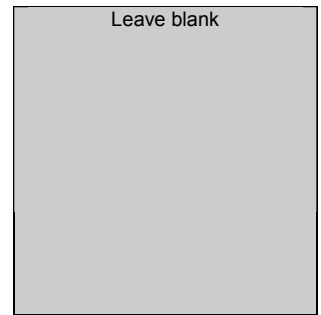
AS exams 2009 onwards
A2 exams 2010 onwards

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

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)		→	
TOTAL			
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.

Material	Product
(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

