

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education  
June 2012

# Design and Technology: Product Design

**45551**

**Unit 1 Written Paper**

**Friday 25 May 2012 9.00 am to 11.00 am**

**For this paper you must have:**

- a pen, a pencil, a ruler, an eraser, a pencil sharpener and coloured pencils.

**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.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this answer book. Cross through any work you do not want to be marked.

## Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 120.
- The question in Section A relates to the context referred to in the preliminary material that was previously issued.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 7(b).

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	



J U N 1 2 4 5 5 5 1 0 1

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**45551**

**Section A**

Answer **all** questions in the spaces provided.

Question 1 is about designing a packaging solution for a fragrance bottle.

You are advised to spend about 30 minutes on this question.

- 1** The fragrance bottle below needs to be packaged.



- 1 (a)** The table below gives one function of packaging for the fragrance bottle above. Give **two** more functions and in each case explain your answer.

Function	Explanation
Transport	<i>The packaging will allow lots of fragrance bottles to be stacked together for transportation to the shop and reduce space needed for storage.</i>
.....	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
.....	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

(6 marks)



- 1 (b)** Name **two** materials which would be suitable for packaging the fragrance bottle.  
Give a reason for each material chosen.

Material 1 .....

Reason .....

.....

Material 2 .....

Reason .....

.....

(4 marks)

**Question 1 continues on the next page**

**Turn over ►**



- 1 (c)** In the space below and opposite, sketch a design for packaging the fragrance bottle.



Marks will be given for:

- a creative packaging solution (6 marks)
- how the packaging would be constructed (5 marks)
- surface decoration including the use of colour (5 marks)
- notes to explain how the packaging performs the functions described in 1(a). (4 marks)







## Section B

Answer **all** questions in the spaces provided.

Question 2 is about materials and sustainability.


You are advised to spend about 20 minutes on this question.

2

				
Cutlery	Spatula	Vase	Greetings card	Bread
				
Oven glove	Food packaging	Sketchbook	Wine goblet	Jeans


- 2 (a) (i) Choose **two** products from those shown above.  
For **each** product you have chosen, complete the table below.

An example is given for you.

Product	Main material	Source of material	Renewable? ✓ or ✗
 Drink can	Aluminium	Bauxite ore	✗

(6 marks)



				
Cutlery	Spatula	Vase	Greetings card	Bread
				
Oven glove	Food packaging	Sketchbook	Wine goblet	Jeans

- 2 (a) (ii)** Choose **one** product from those shown above.  
Name the main material and give **two** of its properties.  
Explain why these properties make the material suitable for the product.

Product .....

Material .....

Property 1 .....  
(1 mark)

Explanation .....

.....  
(2 marks)

Property 2 .....  
(1 mark)

Explanation .....

.....  
(2 marks)

**Question 2 continues on the next page**

**Turn over ►**



**2 (b)** Explain the reasons why different materials are combined.

Give specific examples in your answer.

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(6 marks)

18





Question 3 is about how products have changed over time.

You are advised to spend about 15 minutes on this question.

- 3** A leading retailer of home products sells many *Flat Pack* items.



- 3 (a)** Explain the meaning of *Flat Pack*.

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(2 marks)

- 3 (b)** Knock down fittings are used to assemble flat pack products.

- 3 (b) (i)** Give **two** advantages to the user of assembling furniture with knock down fittings.

1 .....

2 .....

(2 marks)

- 3 (b) (ii)** Give **two** advantages to the manufacturer of knock down fittings.

1 .....

2 .....

(2 marks)

**Question 3 continues on the next page**

**Turn over ►**



- 3 (c) (i)** Explain how retailers selling flat pack products have changed the way people furnish their homes.

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(4 marks)

- 3 (c) (ii)** What is the impact of these changes on the environment?

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(4 marks)

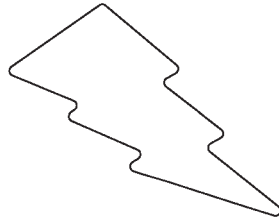


Question 4 is about manufacturing products.

You are advised to spend about 15 minutes on this question.

**4** A young designer plans to make and sell a range of simple products at a craft fair.

The range of products will all be based on the same shape shown below.  
They will be manufactured in batches of 200.



**4 (a)** Use notes and sketches to develop the shape into **one** of the products from the list below suitable for making in batches of 200. Circle the product you have chosen.

Biscuit

Jewellery

Badge

Key fob

(4 marks)

Turn over ►



**4 (b) (i)** Name a suitable main material for your product.

.....  
(1 mark)

**4 (b) (ii)** Explain why the material you have chosen is suitable for this scale of production.

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.....  
(2 marks)

**4 (c)** Explain how you would make sure all 200 products are the same.

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(4 marks)



**4 (d)**

Name **two** tools or pieces of equipment needed to make the product.  
Give **one** health and safety consideration for each.

1 .....

.....

Health and safety consideration .....

.....

2 .....

.....

Health and safety consideration .....

.....

(6 marks)

17
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**Turn over for the next question**

**Turn over ►**



Question 5 is about inclusive design.

You are advised to spend about 10 minutes on this question.

**5** Products are often modified for disabled users.



**5 (a)** Suggest how the telephone shown above could be modified to be more suitable for each of the following users with disabilities.

Explain how the modification helps the user.

**5 (a) (i)** A hearing impaired user

Modification: .....

Explanation: .....

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.....

.....

(3 marks)

**5 (a) (ii)** A visually impaired user

Modification: .....

Explanation: .....

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(3 marks)



**5 (b)**

A wheelchair user can find moving around their daily environment difficult.



Suggest ways in which designers can help minimise these difficulties for wheelchair users.

Give reasons in your answer.

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(6 marks)

12
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Turn over ►



Question 6 is about human factors and product labelling.

You are advised to spend about 20 minutes on this question.

**6 (a) (i)** What is meant by the term *anthropometrics*?

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(2 marks)

**6 (a) (ii)** Explain how *anthropometrics* was used in the design of the hair dryer shown below.



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(4 marks)





**6 (b) (i)** What is meant by the term *ergonomics*?

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(2 marks)

**6 (b) (ii)** Explain how the designer considered *ergonomics* in the design of the hair dryer shown on page 16.

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(4 marks)

**Question 6 continues on the next page**

**Turn over ►**



- 6 (c)** The symbol shown below is displayed on the hair dryer.



Give the meaning of this symbol.

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 .....  
 (1 mark)

- 6 (d) (i)** Why do manufacturers use symbols on products?

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

- 6 (d) (ii)** What is the benefit to the user of the CE symbol?

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



Question 7 is about the use of computers in product manufacture.

You are advised to spend about 10 minutes on this question.

**7** Computers are now a major part of product manufacture.

**7 (a)** Explain how computers are used in each of the following:

Just In Time manufacture .....

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(2 marks)

Stock control .....

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(2 marks)

**Question 7 continues on the next page**

**Turn over ►**



Explain why many products are manufactured in mass production using Computer Aided Manufacture (CAM).

[illegible]

12

