

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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



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).



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

H/Jun12/45551

**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
<i>Transport</i>	<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>
.....	..... ..... ..... .....
.....	..... ..... ..... .....

(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 ►**



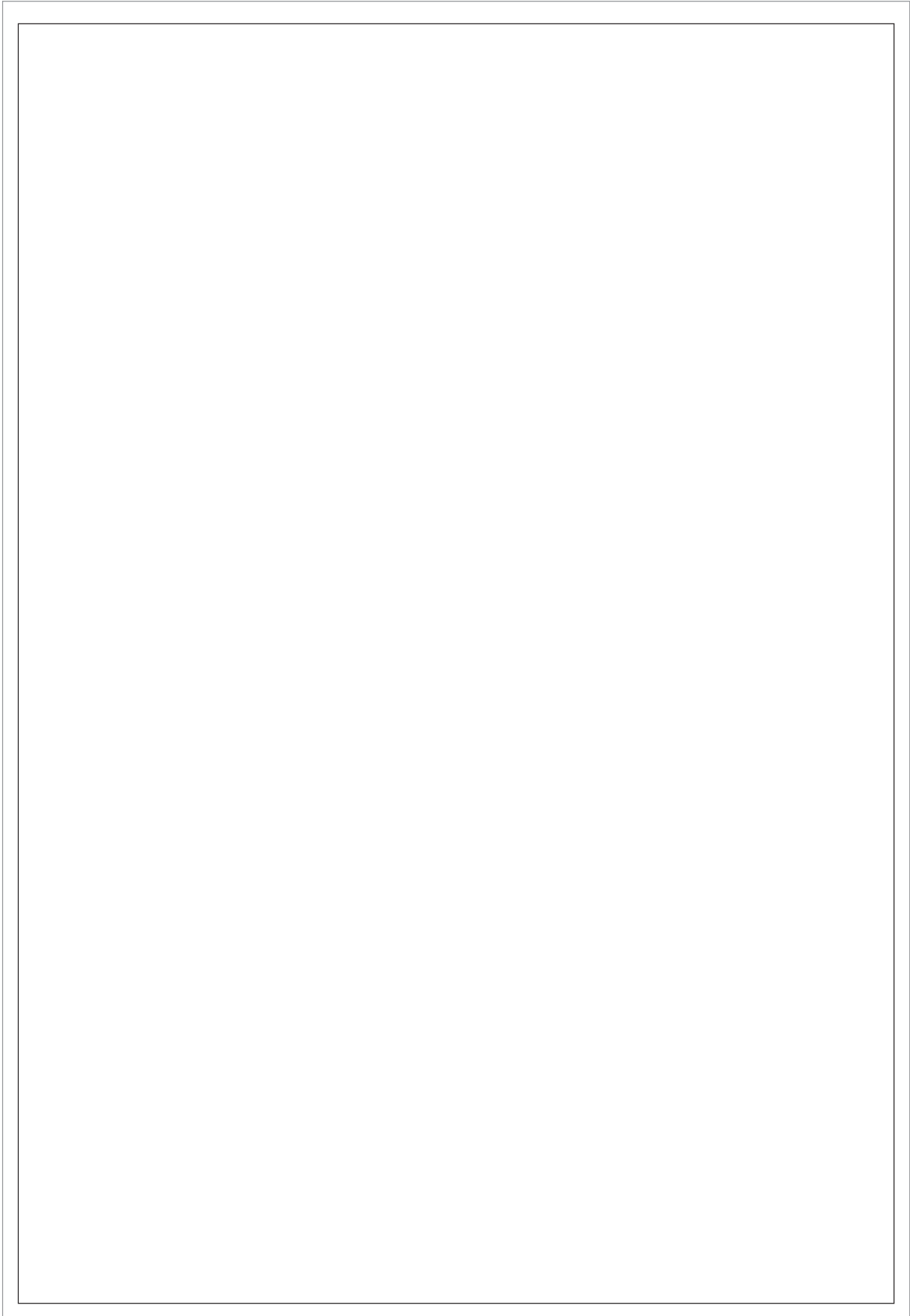
- 1 (c)** In the space below and opposite, sketch a design for packaging the fragrance bottle.



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)





30

Turn over ►




**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	<i>Aluminium</i>	<i>Bauxite ore</i>	<b>✗</b>

*(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 ►**







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*.

.....  
.....  
.....  
.....  
(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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.....

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(4 marks)

14

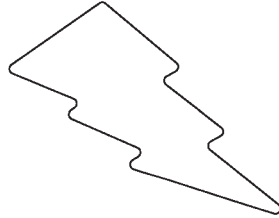


Question 4 is about manufacturing products.

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.

.....  
.....  
.....  
.....  
(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

**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: .....

.....  
.....  
.....

(3 marks)

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

Modification: .....

Explanation: .....

.....  
.....  
.....

(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

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*?

.....  
.....

(2 marks)

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



.....  
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.....  
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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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.....  
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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.

.....  
.....  
(1 mark)

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

.....  
.....  
.....  
.....  
(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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.....

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(2 marks)

**Question 7 continues on the next page**

**Turn over ►**



