

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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



General Certificate of Secondary Education
June 2015

Design and Technology: Product Design

45551

Unit 1 Written Paper

Monday 22 June 2015 9.00 am to 11.00 am

For this paper you must have:

- a black 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 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 4(d).



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45551

Section A

Answer this question in the spaces provided.

Question 1 is about designing.

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

- 1 Pattern and structure found in nature are often used as starting points for designing and making.



- 1 (a) Which of the design movements listed below is inspired by nature? Tick **one** box only. [1 mark]

De Stijl

☐

Memphis

☐

Art Nouveau

☐

Postmodernism

☐

Art Deco

☐


- 1 (b)** A garden centre is organising a competition for local schools to design and manufacture a product to represent nature and the environment.

The table below gives details of four areas of research that you will have to carry out before you start designing. The details of one of these areas have been completed for you.

Complete the table by giving details of the three other areas of research.

[6 marks]

Existing products	Look at different websites to find out more about products that are similar to the one you are going to design.
Target market
Materials and components
Impact on the environment

Question 1 continues on the next page

Turn over ►



- 1 (c)** The garden centre has indicated that the following products are suitable for the competition.

Breads	Lighting	Hats
Calendars	Drinking mugs	

Choose **one** of the products and answer the question that follows.

My chosen product is.....

In the space below and opposite, use notes and sketches to design the product you have chosen.

Marks will be given for:

- a creative product using pattern and structure found in nature
- materials and construction details
- finish and decoration of the product using colour and tone.

[15 marks]



Turn over ►



1 (d) Evaluate how the product you have designed is:

1 (d) (i) aesthetically pleasing

[4 marks]

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1 (d) (ii) functional and fit for purpose.

[4 marks]

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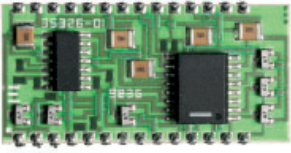




Section BAnswer **all** questions in the spaces provided

Question 2 is about materials and processes.

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

2 (a) Choose **two** products from the table below and answer the questions that follow.**[2 × 3 marks]**

			
Cup	Chocolate box	Pizza	Rocking horse
			
Step ladders	Printed Circuit Board	Cushion	Menu

2 (a) (i) Chosen product 1

Main material, component or ingredient used

Describe **one** process used during manufacture

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.....

.....

Question 2 continues on the next page**Turn over ►**

2 (a) (ii) Chosen product 2

Main material, component or ingredient used

Describe **one** process used during manufacture

.....

.....

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2 (b) 'New' and 'smart' materials allow designers to meet a variety of user needs in exciting ways.

Explain what is meant by the terms 'new' and 'smart' materials.

[4 marks]

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2 (c) The products in the table below make use of new or smart materials.

					
Baby bottles	Necklace	Dental braces	Protective clothing	Food packaging	Prosthetic limb

Choose **one** product from the table above and answer the questions that follow.

My chosen product is.....

2 (c) (i) Name a new or smart material used in your chosen product.

[1 mark]

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2 (c) (ii) Explain why the properties of the new or smart material you have named make it suitable for use in your chosen product.

[4 marks]

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Question 2 continues on the next page

Turn over ►



2 (d) Products can make use of pre-manufactured standard components in their assembly.

2 (d) (i) Name **one** pre-manufactured standard component.

[1 mark]

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2 (d) (ii) Give **two** advantages to the manufacturer of using pre-manufactured standard components.

[4 marks]

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2

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20



Question 3 is about product labelling.

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

3 (a) Product labels are an important way of providing information for the customer.

Give **two** reasons why product labelling is important. Explain each reason.

[6 marks]

Reason 1

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Explanation

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Reason 2

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Explanation

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Question 3 continues on the next page

Turn over ►



- 3 (b)** The label below is from a child's toy. It gives information through the use of recognised symbols.

Study the label and answer the question on the opposite page.



Complete the table below.

The first symbol has been completed.

[12 marks]

Symbol	Name of symbol	Importance to the manufacturer or customer
A	Lion Mark	<p>A symbol of toy safety. Tells the customer that the</p> <p>supplier adheres to strict manufacturing rules.</p>
B		
C		
D		
E		

Turn over ►

18



Question 4 is about human factors.

You are advised to spend about 25 minutes on this question.

4 (a) (i) Explain what is meant by the term 'anthropometrics'.

[2 marks]

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4 (a) (ii) Explain what is meant by the term 'ergonomics'.

[2 marks]

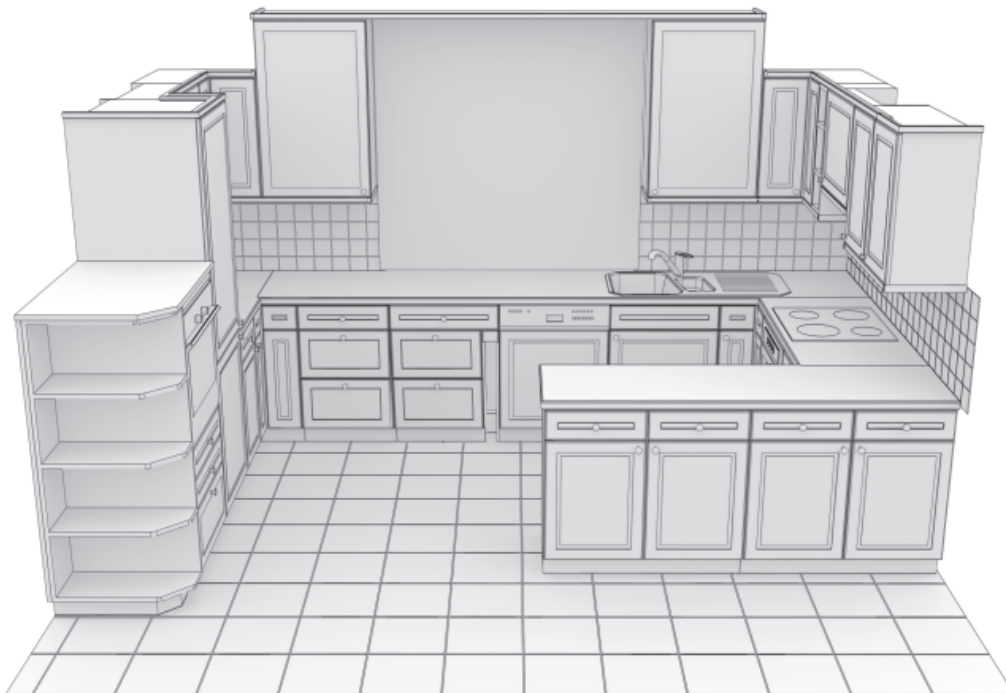
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4 (b) Look at the image below of a view of a kitchen environment and answer the questions on the opposite page.



- 4 (b) (i)** Explain how designers would have used anthropometrics in the design of the kitchen units.

Give specific examples in your answer.

[3 marks]

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- 4 (b) (ii)** Explain how designers would have used ergonomics in the design of the kitchen units.

Give specific examples in your answer.

[3 marks]

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Question 4 continues on the next page

Turn over ►



4 (c) Colour is used by designers to reinforce messages.

Give a location or use in a kitchen where designers might use red and green colours.

Explain each answer.

4 (c) (i) Red

[3 marks]

Location

Explanation

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.....

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.....

4 (c) (ii) Green

[3 marks]

Location

Explanation

.....

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.....

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[8 marks]

[illegible]

24



Question 5 is about manufacturing products.

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

- 5** A primary school wants to manufacture a card with a novelty feature to celebrate a religious festival or social event.

The card will be similar to the design below. It will be made in batches of 20.



- 5 (a)** Use notes and sketches to show how the card, including the novelty feature, will be manufactured to ensure repeatability.

[4 marks]



5 (b) (i) The cards will be printed in school. Name a suitable printing method.

[1 mark]

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5 (b) (ii) Explain why the printing method you have chosen in part (b)(i) is suitable for this scale of production.

[3 marks]

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5 (c) Describe **one** example where quality assurance might be used in the production of your card design.

[2 marks]

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Question 5 continues on the next page

Turn over ►



5 (d) (i) Name a suitable commercial method to print 10,000 units of your design.

[1 mark]

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5 (d) (ii) Explain why the printing method you have chosen in part (d)(i) is suitable for this scale of production.

[3 marks]

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5 (e) Describe **one** example of quality control used in the commercial manufacture of your card design.

[2 marks]

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Turn over for the next question

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ANSWER IN THE SPACES PROVIDED**

Turn over ►



Question 6 is about product development and inclusive design.

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

6 The two lights shown below could be used on a camping trip.



Oil camping lamp



Battery powered torch

6 (a) In the table below, identify **one** feature of each light and explain what makes it suitable for a camping trip.

[6 marks]

Oil camping lamp	Battery powered torch
Feature:	Feature:
Explanation:	Explanation:



6 (b) Oil camping lamps are not used by many people.

Name a feature that could be changed to increase the range of people using them.

[3 marks]

Feature.....

Explanation

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6 (c) Battery powered torches can be unreliable light sources on a camping trip.

Explain what feature could be developed to increase the effectiveness of the product.

[3 marks]

Feature.....

Explanation

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END OF QUESTIONS



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