

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 2013

# Design and Technology: 45551 Product Design

Unit 1 Written Paper

Friday 14 June 2013 1.30 pm to 3.30 pm

**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 3(c).



J U N 1 3 4 5 5 5 1 0 1

**Section A**

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

Question 1 is about designing packaging for children’s lunch products.

You are advised to spend about 35 minutes on this question.

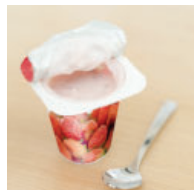
**1** A national supermarket wants to market a complete packed lunch product for children.

The product will contain these items:

Sandwich



Yogurt



Apple



Drink



Snack bar



**1 (a)** The table below gives some of the functions of the packaging of the packed lunch product. Explain why each function is necessary.

An example is completed for you.

Function	Explanation
Contain	<i>The packaging will contain 5 items. It will need to keep the items together and prevent any falling out.</i>
Protect	..... ..... .....
Display	..... ..... .....
Inform	..... ..... .....

(3 x 2 marks)



**1 (b)** The packaging you design must have the following design features.

Explain each feature.

Sustainable

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

*(2 marks)*

Educational

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

*(2 marks)*

Ergonomic

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

*(2 marks)*

**Question 1 continues on the next page**

**Turn over ▶**



**1 (c)** In the space below and opposite, sketch a design for the healthy lunch packaging.

The packaging must be able to contain the five items below.

Sandwich



Yogurt



Apple



Drink



Snack bar



Marks will be given for:

- a creative packaging solution
- materials and construction techniques
- surface decoration including the use of colour.



(15 marks)

Turn over ▶





**Turn over for the next question**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

**Turn over ▶**



**Section B**

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

Question 2 is about materials.

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




**2 (a) (i)** Complete the table below for **three** products.

For each product you have chosen you should:

- name a specific main material or ingredient
- choose the correct finishing technique from the list.

An example is given for you.

Finishing techniques			
Self finish applied in mould	Hand painted	Wax coating applied	Glazed
Transfer image applied	Embossed	Zinc plated	Piped
Stain resistance coating applied	Oiled	Browned using high temperature	Screen printed

Product	Material/ingredient	Finishing technique
Drinks can 	<i>Aluminium</i>	<i>Screen printed</i>
Cottage Pie 		
Helmet 		





<p>Tie</p> 		
<p>Screws</p> 		
<p>Soup carton</p> 		
<p>Cup and saucer</p> 		
<p>Garden bench</p> 		
<p>Wedding invitation</p> 		

(6 marks)

2 (a) (ii) Explain why finishes are applied to materials.

.....

.....

.....


.....

(2 marks)

Turn over ▶



2 (b)

<p>Drinks can</p> 	<p>Cottage Pie</p> 	<p>Helmet</p> 
<p>Tie</p> 	<p>Screws</p> 	<p>Soup carton</p> 
<p>Cup and saucer</p> 	<p>Garden bench</p> 	<p>Wedding invitation</p> 

Materials and ingredients are sold in a range of standard shapes, sizes and forms.

2 (b) (i) Choose **one** of the products from those shown above and circle your choice.

State the main material or ingredient of the product and give **two** examples of a standard form.

Material or ingredient .....

1 .....

2 .....

(2 marks)

2 (b) (ii) Explain why raw materials are processed into standard forms.

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

(4 marks)



Question 3 is about product evolution.

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

**3 (a)** Explain the meaning of each of the following:

**3 (a) (i)** Market pull

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

*(2 marks)*

**3 (a) (ii)** Technology push

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

*(2 marks)*

**3 (a) (iii)** Obsolete

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

*(2 marks)*

**Turn over for the next question**

**Turn over ▶**



**3 (b)** Smart phones are a recent development in mobile phone technology.



Discuss to what extent mobile phones have developed because of market pull or technology push.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)



**3 (c)** Discuss how *Planned Obsolescence* might be harmful for the environment. Give examples of products in your answer.  
Quality of Written Communication will be assessed in your answer.

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

(8 marks)

18

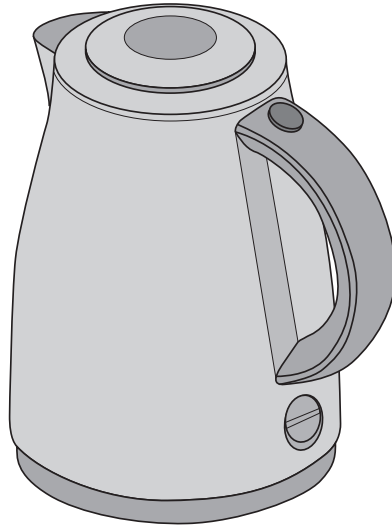
Turn over ▶



Question 4 is about product marketing.

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

**4**



**4 (a)** For each of the following types of user describe a feature of a kettle that would make it desirable.

**4 (a) (i)** Energy conscious

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

*(2 marks)*

**4 (a) (ii)** Style conscious

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

*(2 marks)*



4 (b) The kettle requires packaging.



How do colours used in packaging encourage people to buy products?

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

(3 marks)

4 (c) Describe **two** different techniques the manufacturer could use to advertise a kettle.

1.....  
.....  
2.....  
.....

(4 marks)

4 (d) Explain how manufacturers can protect their invention from being copied by other manufacturers.

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

(3 marks)



Question 5 is about manufacturing products.

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

**5** A manufacturer uses a production line to assemble its products in batches of 200.

Select **one** of the products from the list below.

- |             |            |           |            |            |
|-------------|------------|-----------|------------|------------|
| Wind chimes | Wall clock | Cup cakes | School bag | Board game |
|-------------|------------|-----------|------------|------------|

Circle your choice.

**5 (a)** Use notes and sketches to describe your selected product.

Show how it might be suitable for assembly in batches of 200.

Add notes to explain the separate parts.

(7 marks)

**5 (b)** Explain how a production line is used in commercial manufacturing.

.....

.....

.....

.....

(3 marks)





**5 (c)** Use notes and sketches to show how a batch of 200 of your selected product would be assembled using a production line.

Marks will be given for:

- |                                    |           |
|------------------------------------|-----------|
| (i) correct order of assembly      | (3 marks) |
| (ii) quality control checks        | (2 marks) |
| (iii) tools and equipment required | (2 marks) |
| (iv) disposal of waste.            | (2 marks) |



**Turn over ▶**



**5 (d) (i)** Identify **one** health and safety risk involved in the assembly of your selected product.

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

(2 marks)

**5 (d) (ii)** Explain how the manufacturer could minimise the risk you have given.

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

(2 marks)

**5 (e)** Data transfer, e.g. Electronic Data Interchange (EDI), is commonly used in modern manufacturing. Explain how the manufacturer of the product you have chosen might use data transfer.

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

(4 marks)

27



Question 6 is about developing products.

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

**6** Designers use a variety of techniques to develop their ideas.



Choose **one** of the products shown above and circle your choice.

**6 (a)** Describe how modelling might have been used to develop the product you have chosen.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(6 marks)

Turn over ▶



**6 (b)** Computers are an important part of product design and manufacture.

Describe how a designer might use a computer in the development of the product you have chosen.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(6 marks)

<b>12</b>

**END OF QUESTIONS**

ACKNOWLEDGEMENT OF COPYRIGHT-HOLDERS AND PUBLISHERS  
Permission to reproduce all copyright material has been applied for. In some cases efforts to contact copyright-holders have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements in future papers if notified.

- Question 1: © Thinkstock
- Question 2: © Thinkstock
- Question 2: Tie © Hannu Liivaar/Alamy
- Question 2: Soup carton © Alamy
- Question 3: © Thinkstock
- Question 4: © Thinkstock
- Question 6: © Thinkstock
- Question 6: Pop-up card © 2012 Hilltop Studios, LLC
- Question 6: Dress © Semen Lihodeev/Alamy

Copyright © 2013 AQA and its licensors. All rights reserved.

