

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use

General Certificate of Secondary Education
June 2007

**DESIGN AND TECHNOLOGY
(PRODUCT DESIGN)
Written Paper
Foundation Tier**

**3544/F
F**



Friday 25 May 2007 9.00 am to 11.00 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> a pen, a pencil, a ruler, an eraser, a pencil sharpener and coloured pencils.

For Examiner's Use			
Question	Mark	Question	Mark
1		5	
2		6	
3		7	
4		8	
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			

Time allowed: 2 hours

Instructions

- Use blue or black ink or ball-point pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 125.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

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

Question 1 is about materials.

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

1 (a) The table below shows different types of material.

Choose **two** types of material and complete the row. (You should only complete **two** rows.)

The first material in each row has been completed for you.

Type of material		Material name 1 (Examples)	Material name 2	Material name 3	Material name 4
Paper/Card	⇒	Duplex board			
Timber	⇒	Oak			
Metal	⇒	Copper			
Plastic	⇒	Acrylic			
Ceramic	⇒	Stoneware			
Food	⇒	Cereal			
Textiles	⇒	Wool			

(6 marks)

(b) Materials are sold in a range of shapes, sizes and forms.

Choose **two** of the materials shown below.

Draw a line to link your chosen material with the correct description.

An example has been completed for you.

Material	Description
Metal	A3, thickness, weight and colour
Textiles	Rough sawn, PSE, sheet size and mouldings
Paper/Card	Sheet, rod, bar, and tube
Timber	Granules, sheet, rod, powder and foam
Food	Slip, body, pigment and oxides
Plastic	Roll width, linear metre, weight and ply
Ceramic	Fresh, frozen, dehydrated, liquid and canned

(2 marks)

8

Turn over ►

Question 2 is about the styling of new products.

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

2 Designers often use nature to help them create new products.

An example of a product inspired by nature is shown below.



The Bicep and Tricep muscles hold the arm in place, similar to the tension springs on the Anglepoise lamp.

(a) Choose a product from the list below and circle your choice.

Decorative vase

Printed tablecloth

Child's toy

Birthday cake

Clock


Image board



- (i) Using your chosen product draw **one** detailed idea which should be made up from natural forms. *(8 marks)*

Examples of natural forms are shown on the image board on the opposite page.

- (ii) Make your design look more realistic by adding colour, tone and texture. *(6 marks)*



Question 2 continues on the next page

Turn over ►

(b) Evaluate your design.

Explain the main features of your design.

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(3 marks)







17

Question 3 is about information symbols.

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

3 Choose **three** symbols below.

Explain what each means and name a product where you will find each chosen symbol.

	<p>Explanation</p> <p>.....</p> <p>.....</p> <p>Product</p>
	<p>Explanation</p> <p>.....</p> <p>.....</p> <p>Product</p>
	<p>Explanation</p> <p>.....</p> <p>.....</p> <p>Product</p>
	<p>Explanation</p> <p>.....</p> <p>.....</p> <p>Product</p>
	<p>Explanation</p> <p>.....</p> <p>.....</p> <p>Product</p>
	<p>Explanation</p> <p>.....</p> <p>.....</p> <p>Product</p>

(3 × 2 marks)

6

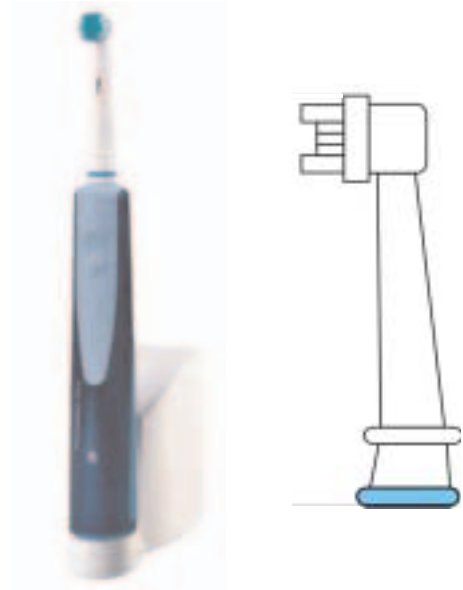
Turn over ►

Question 4 is about product analysis and packaging.

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

4 A rechargeable electric toothbrush and a replacement brush head are shown in **Figure 1**.

Figure 1



(a) (i) Explain, in detail, the advantages of using a rechargeable electric toothbrush.

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

(3 marks)

(ii) Explain, in detail, the disadvantages of using a rechargeable electric toothbrush.

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

(3 marks)

(b) The replacement head for the rechargeable electric toothbrush is a push-pull fitting.

The user instructions are in three stages.

Use diagrams to complete the following user instructions.

Changing a brush head – user instructions	
<p>Stage 1</p> <p>Hold the body of the electric toothbrush.</p> <p>Pull the replacement head away from the toothbrush body.</p>	<p>Add diagram</p>
<p>Stage 2</p> <p>Clean the body of the electric toothbrush.</p>	<p>Add diagram</p>
<p>Stage 3</p> <p>Hold the body of the electric toothbrush.</p> <p>Correctly align the replacement head.</p> <p>Push into the body of the electric toothbrush.</p>	<p>Add diagram</p>

(6 marks)

Question 4 continues on the next page

Turn over ►

(c) A replacement brush head for a rechargeable electric toothbrush is shown in **Figure 2**.

Packaging is needed for the replacement brush heads.

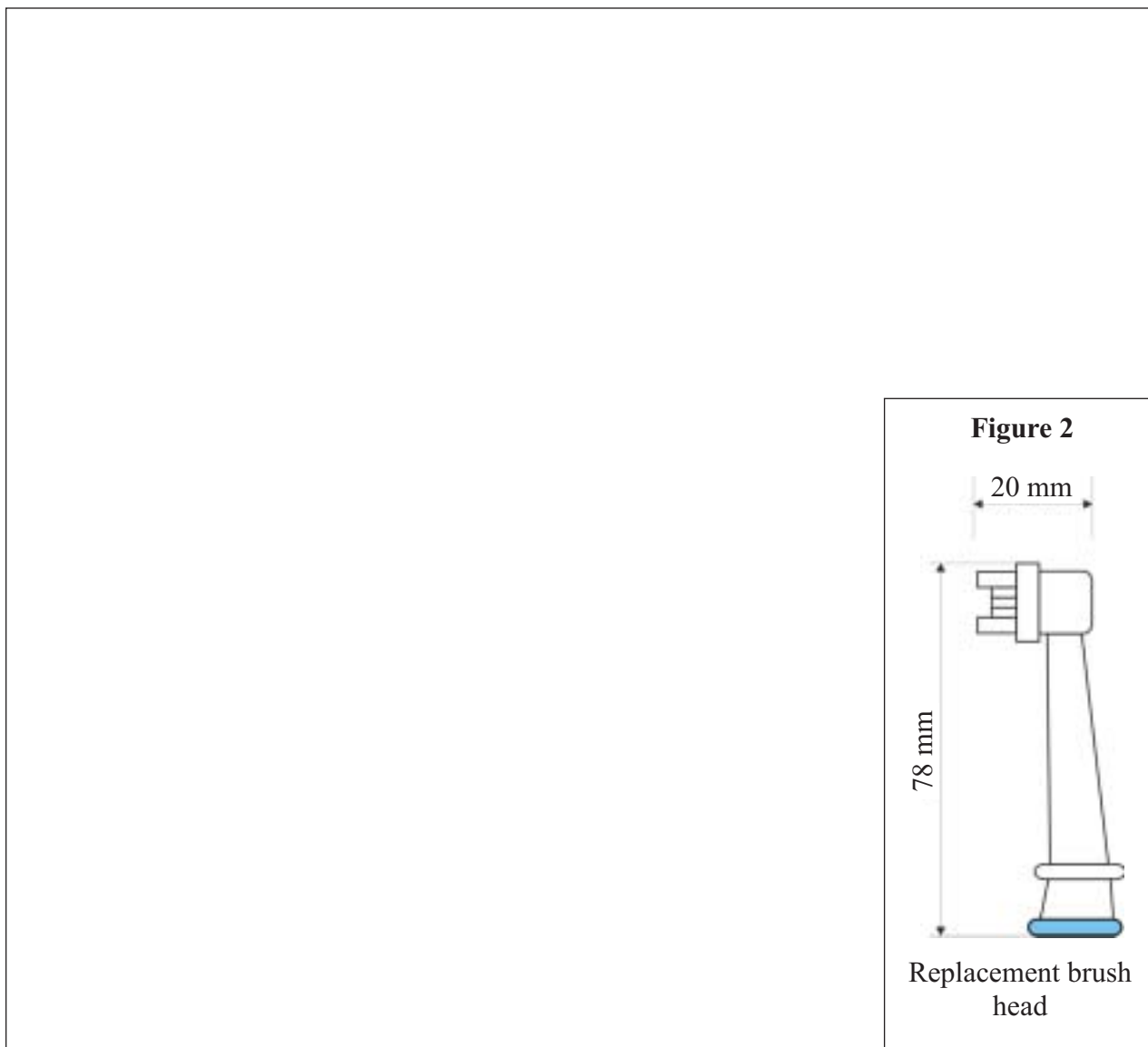
This should be mainly produced from card.

Draw a suitable package, full size, which can be hung on a rack in a supermarket and hold four replacement brush heads.

The replacement brush heads should be visible but sealed for hygiene reasons.

Use the following checklist to help you to add notes to your drawings to explain,

- how the packaging will be hung *(2 marks)*
- where the name and company logo will be printed *(1 mark)*
- where the instructions will be printed *(1 mark)*
- what other specialist materials will be used *(2 marks)*
- how the replacement heads will be visible. *(2 marks)*



(d) In the box below show clearly how you include the following requirements;

- how the packaging will be sealed for hygiene reasons *(1 mark)*
- what printing method will be used *(1 mark)*
- how the card part of the package will be cut out. *(2 marks)*



Question 5 is about similar products with different functions.

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

5 The range of footwear shown below has different uses.

A – Wellington boot



B – Beach shoe



C – Evening shoe



D – Sports shoe



(a) Choose **two** of the above products and describe the type of consumer that would be attracted to the chosen product.

In each case give reasons why the chosen product would be suitable.

(i) Footwear selected

Type of consumer

.....

.....

(2 marks)

(ii) Reasons

.....

.....

(2 marks)

(iii) Footwear selected

Type of consumer

.....

.....

(2 marks)

(iv) Reasons

.....

.....

(2 marks)

(b) Choose **one** of the products you have selected in part (a).

Explain what changes you would make to the product to enable it to meet the needs of a different consumer group.

Product

New consumer group

(1 mark)

Product changes

.....

.....

.....

(2 marks)

Turn over for the next question

Turn over ►

Question 6 is about the manufacture of new products.

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

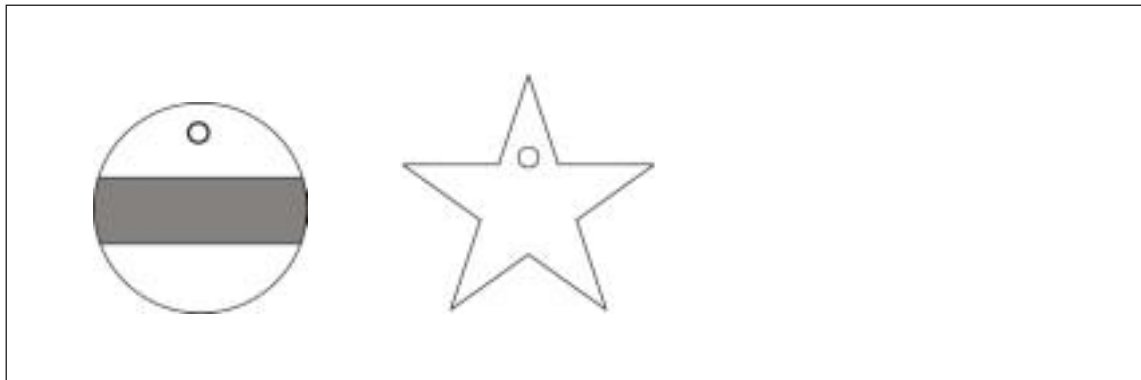
- 6 Your Headteacher has asked the Design and Technology department (Food, Textiles, Resistant Materials, Graphics, Electronics and Ceramics) to make a number of Christmas tree decorations for the school Christmas fayre.

The decorations will be sold in packs of three.

Two shapes have already been chosen.

You are required to design the third shape, which must be easily produced in a batch of 50.

- (a) Add your shape in the box below to complete the pack.



(3 marks)

- (b) (i) Choose a suitable material to make the Christmas tree decorations.

.....
(1 mark)

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

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

- (c) Use notes and sketches to explain how you would make 50 packs of the Christmas tree decorations.

Marks will be awarded for:

- (i) an accurate description of each stage of the production process *(4 marks)*
- (ii) correct naming of tools and equipment *(3 marks)*
- (iii) details of surface decoration *(3 marks)*
- (iv) quality of communication. *(3 marks)*

Use the space below to complete your answer.

Tools and equipment

Question 6 continues on the next page

Turn over ►

- (d) Using notes and sketches design a method of attaching the Christmas decorations to a tree.

(3 marks)

- (e) Explain what safety tests should be taken before the Christmas tree decorations are used.

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(3 marks)

- (f) Give **two** safety rules and the reasons you would follow them when making the Christmas tree decorations.

Safety rule 1

.....

Reason

.....

Safety rule 2

.....

Reason

.....

(4 marks)

Turn over for the next question

Turn over ►

Question 7 is about Human and Social Factors.

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

7 (a) The picture below shows a tablet container.



(i) Give **three** special features this container should have.

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.....
.....

(3 marks)

(ii) Explain why the lid of this container might be difficult to open for some people.

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

(3 marks)

(b) Apart from tablets, many products create safety issues for the user or others.

(i) Name such a product.

.....
(1 mark)

(ii) What is the safety issue?

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

(iii) Explain what has been done to make the product you have named as safe as possible.

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

(c) Some products give pleasure to one group of people but may be regarded as a nuisance to another group.

(i) Name such a product.

.....
(1 mark)

(ii) What could the nuisance be?

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

(iii) Explain what could be done to improve the situation.

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

Question 8 is about design and style.

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

8 The Dyson cleaners shown below have become design classics.



Reproduced by kind permission of Dyson Ltd.

(a) List **three** features that have made the Dyson cleaner a successful product.

- 1
- 2
- 3

(3 × 1 mark)

(b) Explain in detail **one** of these features.

.....

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.....

.....

(3 marks)

(c) Explain how Computer Aided Design (CAD) could be used to develop a design, such as the Dyson cleaner.

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

(3 marks)

(d) Explain why other manufacturers might have been influenced by Dyson designs.

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

(3 marks)

(e) Imagine you have been asked to select a product from the present or the past to go into a design exhibition, alongside the Dyson cleaner.

(i) Name the product

(1 mark)

(ii) Explain the reasons for choosing this product.

.....
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.....
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(3 marks)

END OF QUESTIONS

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