

Surname					Other Names				
Centre Number					Candidate Number				
Candidate Signature									

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General Certificate of Secondary Education
June 2005



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

**3544/F
F**

Thursday 26 May 2005 9.00 am to 11.00 am

In addition to this paper you will require:

- blue or black pen, pencil, coloured pencils and ruler.

Time allowed: 2 hours

Instructions

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

Information

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

For Examiner's Use	
Number	Mark
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	
Examiner's initials	

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





Question 1 is about materials.

You should spend about 10 minutes on this question.

1 Materials/ingredients come from many different sources.

(a) From the following list of materials/ingredients choose **eight** which are familiar to you and write them in the correct boxes below.

- | | | | |
|-----------|------------|-----------|------------------|
| Copper | Nylon | Silk | Porcelain |
| Starch | Mild steel | Pine | Wool |
| Cheese | Acrylic | PVC | Cartridge paper |
| MDF | Aluminium | Cotton | Lentils |
| Polyester | Polythene | Tuna | Earthenware clay |
| Lard | Chipboard | Cardboard | Beech |

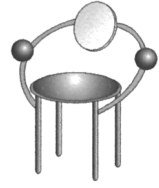
Materials/ingredients made from trees and plants	Materials/ingredients made from oil
	
.....
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.....
Materials/ingredients taken from animals	Made from materials dug out of the ground
	
.....
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(8 marks)

(b) Name a material which is renewable.
(1 mark)

(c) Name a material which is non-renewable.
(1 mark)

Question 2 is about styling new products.
You should spend about 15 minutes on this question.



2 Designers sometimes use mathematics when they design new products.

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

Teapot

Hat

Outer casing for a radio

Cake

Lamp

Waste bin

(b) Draw **one** idea for the product which should be made up entirely of geometric (or regular) shapes such as squares, circles, triangles etc. *(6 marks)*

(c) Add notes to explain the specific materials and processes you would use to manufacture the design. *(4 marks)*

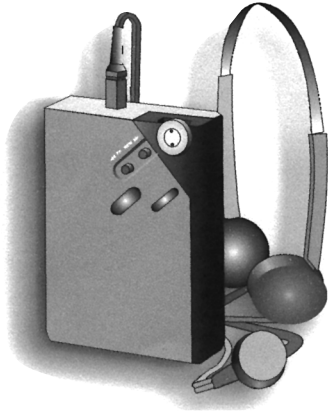
(d) Make your design look more realistic by adding colour, tone and texture. *(4 marks)*

A large empty rectangular box for drawing and notes.

Turn over ►

**Question 3 is about how products change over time.
You should spend about 5 minutes on this question.**

3 Two personal music players are shown below.



Cassette player from 1978



MP3 player from 2004

(a) State **three** features which are common to both designs.

Feature 1

Feature 2

Feature 3

(3 marks)

(b) Successful manufacturers update their products regularly.

(i) Name a product **other than a personal music player** which has been updated regularly.

.....

(1 mark)

(ii) Give **two** reasons why the product you have named might have been updated.

Reason 1

.....

.....

Reason 2

.....

.....

(4 marks)

Question 4 is about packaging design.
You should spend about 25 minutes on this question.

4 Pizza is a popular take-away meal that has to be packaged for transport.

(a) Add to the table below **two** more design needs for a successful cardboard pizza package.

An example has been done for you.

Design Need	Reason
The package must be supplied in flat-pack form	To reduce storage space in the shop
1
.....
.....
2
.....
.....

(4 marks)

(b) Explain why corrugated cardboard is a good material to use for pizza boxes.

Reason

.....

(2 marks)

QUESTION 4 CONTINUES ON THE NEXT PAGE

Turn over ►

(c) Composite materials are sometimes used for food packaging.

(i) Explain what a composite material is

.....
.....

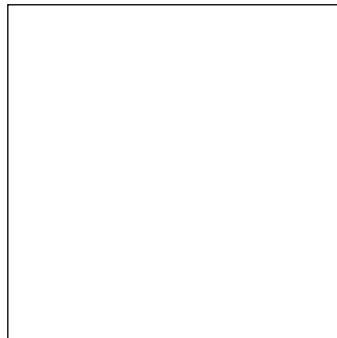
(2 marks)

(ii) Give a reason why composite materials are used for food packaging.

.....
.....

(2 marks)

(d) Sketch a symbol in the space below to remind customers to dispose of the package carefully.



(4 marks)

- (e) A client has provided the logo artwork which he wants printed onto pizza cartons together with the words "Pizza Chef".

Complete a design idea below **for a single colour print** by completing the following tasks:

- (i) draw an accurate 120 mm square around the image (it does not need to be in the centre); *(3 marks)*
- (ii) position the words **Pizza Chef** in a suitable style (the words must have impact on the design). *(6 marks)*



- (f) Explain how you would use a computer to complete this artwork ready for printing.
 - (i) Name the program you would use. *(2 marks)*
 - (ii) Explain how you would get the logo image onto the computer.

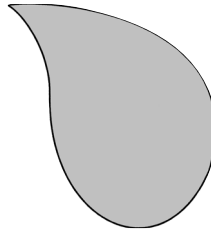
 *(3 marks)*

Turn over ►



Question 5 is about manufacturing.
You should spend about 25 minutes on this question.

5 Hornbeam School is having an Industry Week. All of the material areas of the Technology Department (Food, Textiles, Resistant Materials, Graphics, Ceramics) have been asked by the head teacher to manufacture 50 of the leaf shapes found on their school crest. All the leaves must be the same. These are to be given away to visitors.



The shape needed

(a) Choose a material you are familiar with and explain why it is suitable for this scale of production.

(i) Material (1 mark)

(ii) Reason
..... (2 marks)

(b) Use sketches and notes to explain how you would make 50 of these leaves.

Marks will be awarded for:

(i) accurate description of each stage of the process; (4 marks)

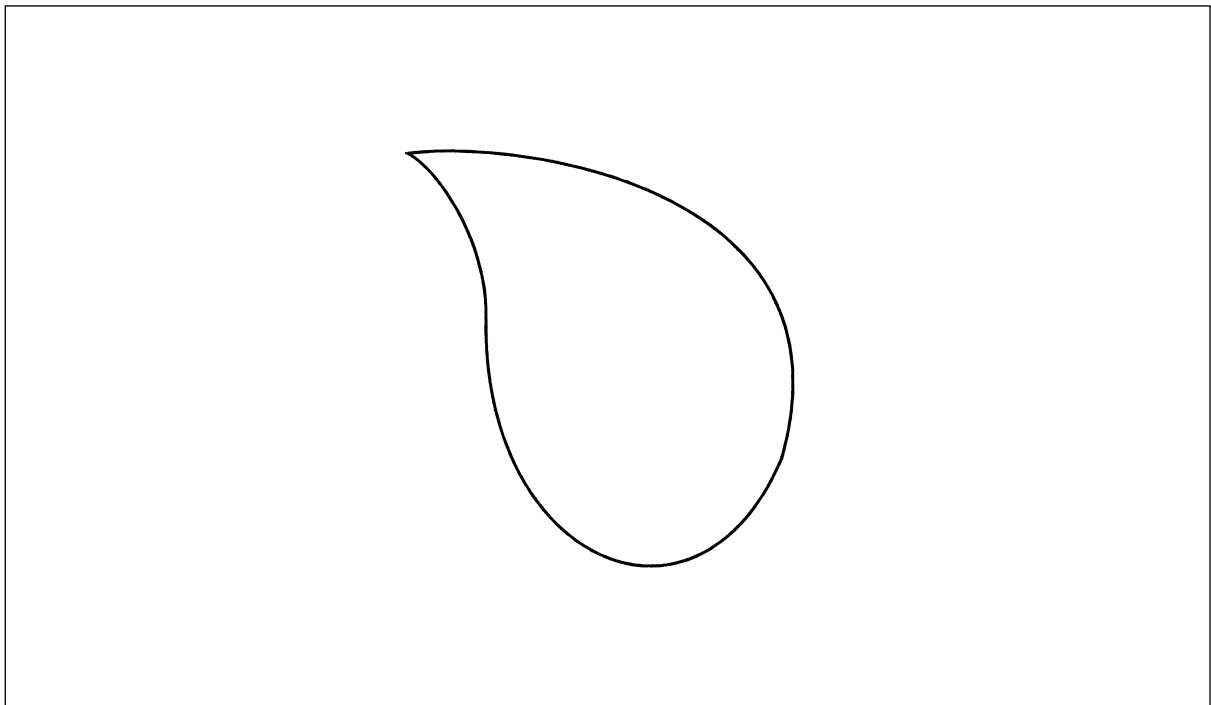
(ii) correct naming of tools and equipment; (3 marks)

(iii) quality of communication. (3 marks)

Use the space below and on the next page to complete your answer.

Tools and equipment

- (c) Use sketches and notes to explain how you could make the leaf more interesting by adding some form of appropriate decoration during manufacture of the 50.



(4 marks)

QUESTION 5 CONTINUES ON THE NEXT PAGE

Turn over ►

(d) Explain how you would ensure that each of the leaves is exactly the same.

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

(3 marks)

(e) Give **two** safety rules and the reasons you would follow them when making the leaves.

Safety rule 1

Reason

Safety rule 2

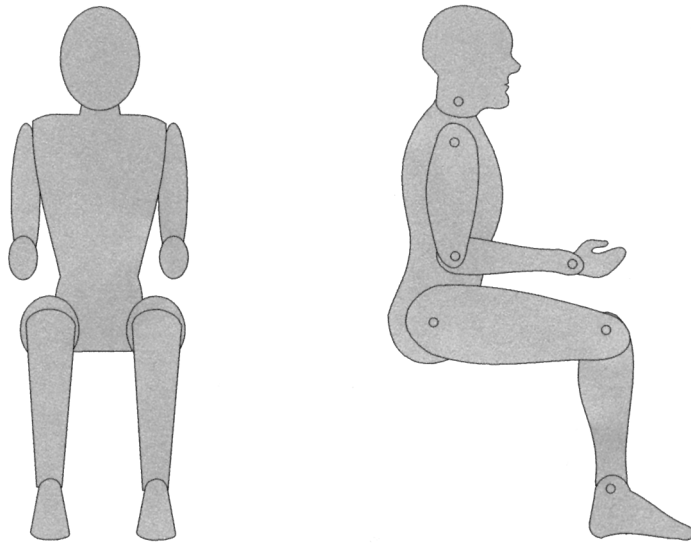
Reason

(4 marks)

**Question 6 is about human factors.
You should spend about 20 minutes on this question.**

6 Consider the chair you are now sitting on.

(a) Indicate clearly on the diagram below the measurements of people which would have been taken in order to design the chair.



(6 marks)

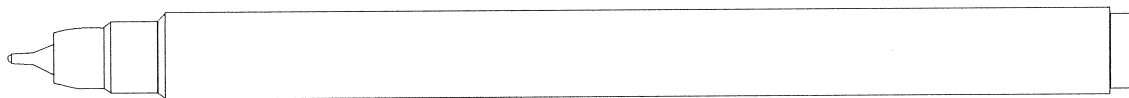
(b) What name is given to the study of human measurements?

.....

(2 marks)

(c) Consider how you hold your pen.

(i) Draw on the pen shown below how you would improve the comfort and grip.



(4 marks)

(ii) Explain the improvements you have made.

.....

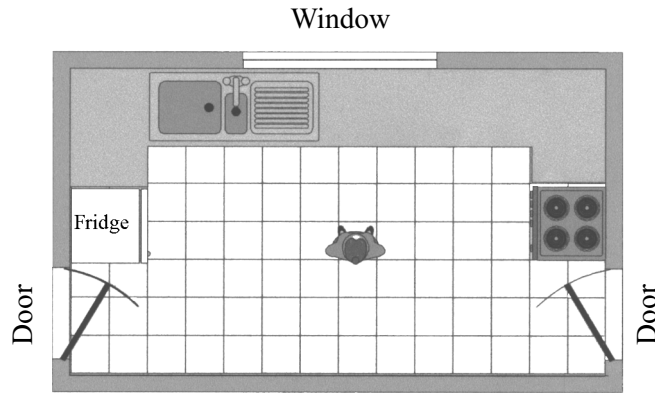
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(2 marks)

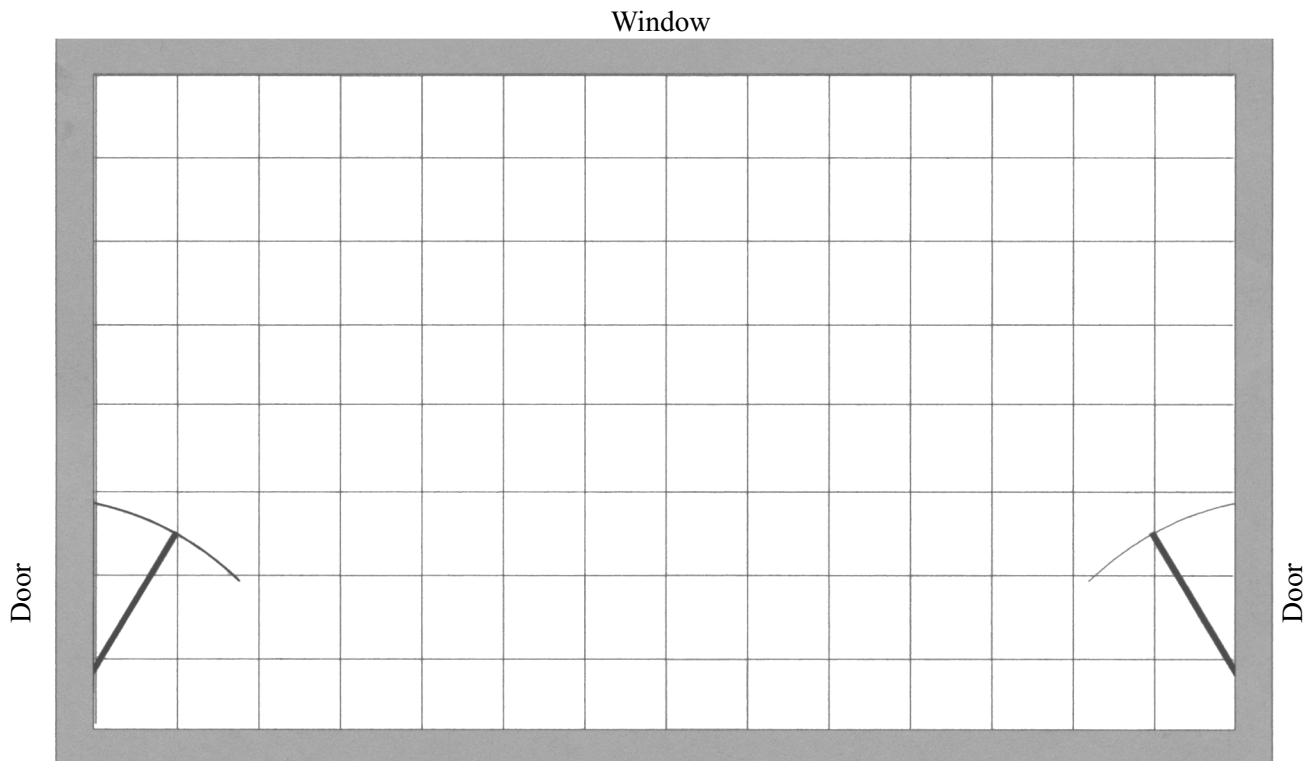
QUESTION 6 CONTINUES ON THE NEXT PAGE

Turn over ►

- (d) Working triangles are often used when planning manufacturing areas to make the tasks easier to carry out.



Using notes and sketches on the plan of the kitchen shown below, improve the layout to create a better **working triangle** when undertaking food preparation tasks. Use a coloured pencil to indicate the improved working triangle.



(4 marks)

- (e) Explain the improvements you have made.

.....

.....





.....

.....

(3 marks)

Question 7 is about product maintenance.
You should spend about 10 minutes on this question.

- 7 Many products require some form of care or maintenance in order to increase their useful life.
- (a) Explain what **two** of these symbols found on products, the packaging or labelling tell the customer.

 <p>.....</p> <p>.....</p>	 <p>.....</p> <p>.....</p>
 <p>.....</p> <p>.....</p>	 <p>.....</p> <p>.....</p>

(4 marks)

QUESTION 7 CONTINUES ON THE NEXT PAGE

Turn over ►

- (b) The drawings below show examples of products which require regular care and maintenance.

Use notes to indicate on one or more of the illustrations, **three** essential maintenance tasks which are needed.

(6 marks)



**Question 8 is about modelling and testing products.
You should spend about 10 minutes on this question.**

8 Product designers need to model and test their ideas.

(a) Circle **one** product from the following list and briefly explain how you **could** model it in school.

- | | | | | |
|---------------|--------------|-------|-----|--------------|
| Chocolate bar | Hairdryer | Chair | Hat | Mobile phone |
| Magazine | Wall hanging | Lamp | Jug | Photo frame |

.....

.....

.....

(3 marks)

(b) Once you have made a prototype, or scale model of your product, tests are often needed. Describe **two** tests that could be used to evaluate the success of your design.

Test 1

.....

Test 2

.....

(4 marks)

(c) These symbols are often found on products.



What would these tell the customer about the product?

.....

.....

(3 marks)

END OF QUESTIONS

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE