

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use

General Certificate of Secondary Education
June 2008

**DESIGN AND TECHNOLOGY
(RESISTANT MATERIALS TECHNOLOGY)
Written Paper
Foundation Tier**

**3545/F
F**



Monday 2 June 2008 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
- an insert of colour photographs (enclosed).

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. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- Show the working of your calculations.

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.

For Examiner's Use			
Question	Mark	Question	Mark
1		9	
2		10	
3			
4			
5			
6			
7			
8			
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			



J U N O 8 3 5 4 5 F 1 0 1

Questions 1 and 2 on this paper relate to the **Design Brief** given below.

Design Brief

A manufacturer of outdoor seating wishes to extend its range of products to include outdoor furniture that is suitable for a family picnic.

Below is a list of places where there is a need for outdoor furniture that is suitable for a family picnic:

- at the zoo,
- at a 'theme park',
- in a country park,
- at a skateboard park,
- in the park,
- at the seaside,
- at a shopping centre,
- outside a 'fast food' café.

You are to produce **three** different design ideas for outdoor furniture that is suitable for a family picnic. You may wish to use the list above to help you with your design ideas.



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

Question 1 is about the **Design Specification**.

You are advised to spend about 5 minutes on this question.

- 1** Give **four** design requirements of outdoor furniture that is suitable for a family picnic.

Explain each of your answers.

An example has been completed for you.

Requirement: *The outdoor furniture should be durable.*

Explanation: *It will need to last for a number of years.*

Requirement 1

Explanation

(2 marks)

Requirement 2

Explanation

(2 marks)

Requirement 3

Explanation

(2 marks)

Requirement 4

Explanation

(2 marks)



Question 2 is about design ideas.

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

- 2** Study the information given in the **Design Brief** (page 2) and your **Design Specification** (page 3).

Use this information to help you sketch **three** different design ideas for outdoor furniture that is suitable for a family picnic.

Add notes to explain each of your design ideas.

Marks will be awarded for:

- three different design ideas, *(3 × 6 marks)*
- quality of sketches, *(6 marks)*
- quality of notes. *(3 marks)*

Design idea 1



Design idea 2

Design idea 3

27

Turn over ►



0 5

Question 3 is about health and safety.





You are advised to spend about 5 minutes on this question.

3 Study the safety symbols shown in the table below.

Complete the table below by:

- explaining the meaning of each symbol,
- describing a process where you would expect to see this symbol.

One example has been completed for you.

Symbol	Meaning	Process
	<i>Safety glasses must be worn</i>	<i>Drilling a piece of metal</i>
		
		
		
		
		

(10 marks)

10



Question 4 is about making.

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

4 **Figure 1** on the insert of colour photographs shows two designs for a cup holder.

Both of them could be made in a school workshop.

Choose **one** of the cup holders.

Chosen cup holder

4 (a) Name **one** suitable *specific* material which could be used to make your chosen cup holder.

Give **one** reason for your choice.

Material
(2 marks)

Reason
.....
(1 mark)

Question 4 continues on the next page

Turn over ►



- 4 (b) Use notes and sketches to show clearly how your chosen cup holder could be made in a school workshop.

At each stage, name **all** the tools, equipment or software that would be used.

Marks will be awarded for quality of notes and sketches.

(4 marks)

Stage 1 Marking out **or** CAD (Computer Aided Design)

(4 marks)

Stage 2 Cutting and shaping **or** CAM (Computer Aided Manufacture)

(4 marks)



Stage 3 Bending **or** joining

(4 marks)

Stage 4 Finishing

(4 marks)

23

Turn over ►



Question 5 is about materials.

You are advised to spend about 5 minutes on this question.

5 Study the serving spoons shown in **Figure 2** on the insert of colour photographs.

Name **one** suitable, *specific* material which could have been used to make each serving spoon.

Give **one** reason for **each** choice.

Serving spoon A

Material (2 marks)

Reason
..... (1 mark)

Serving spoon B

Material (2 marks)

Reason
..... (1 mark)

Serving spoon C

Material (2 marks)

Reason
..... (1 mark)



Question 6 is about making.

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

6 Study the joints and the fixings shown in **Figure 3** on the insert of colour photographs.

Complete the table below by:

- matching the joint with the correct fixing,
- naming the fixing,
- naming a suitable tool which you could use with the fixing.

Joint	Fixing letter	Name of fixing	Tool name
1			
2			
3			
4			

(12 marks)

12

Turn over ►



Question 7 is about systems.

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

- 7 A mountain bike is made up of a number of different mechanical systems.

Study the mountain bike shown in **Figure 4** on the insert of colour photographs.

- 7 (a) Name the part of the bike labelled as **Part A**.

.....
(1 mark)

- 7 (b) Name the part of the bike labelled as **Part B**.

.....
(1 mark)

- 7 (c) **Part A** and **Part B** of the bike form a mechanism. Explain what this mechanism does.

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

- 7 (d) Give **two** maintenance operations which need to be carried out on this type of mechanism.

Operation 1
.....
(1 mark)

Operation 2
.....
(1 mark)

- 7 (e) Explain why regular maintenance of machinery is important.

.....
.....
.....
.....
.....
(4 marks)



Question 8 is about ergonomics.

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

8 Study the BBQ (barbeque) fork shown in **Figure 5** on the insert of colour photographs.

8 (a) Give **two** reasons why the BBQ fork should not be used without a handle. Explain each of your answers.

Reason 1

Explanation.....

.....

(2 marks)

Reason 2

Explanation.....

.....

(2 marks)

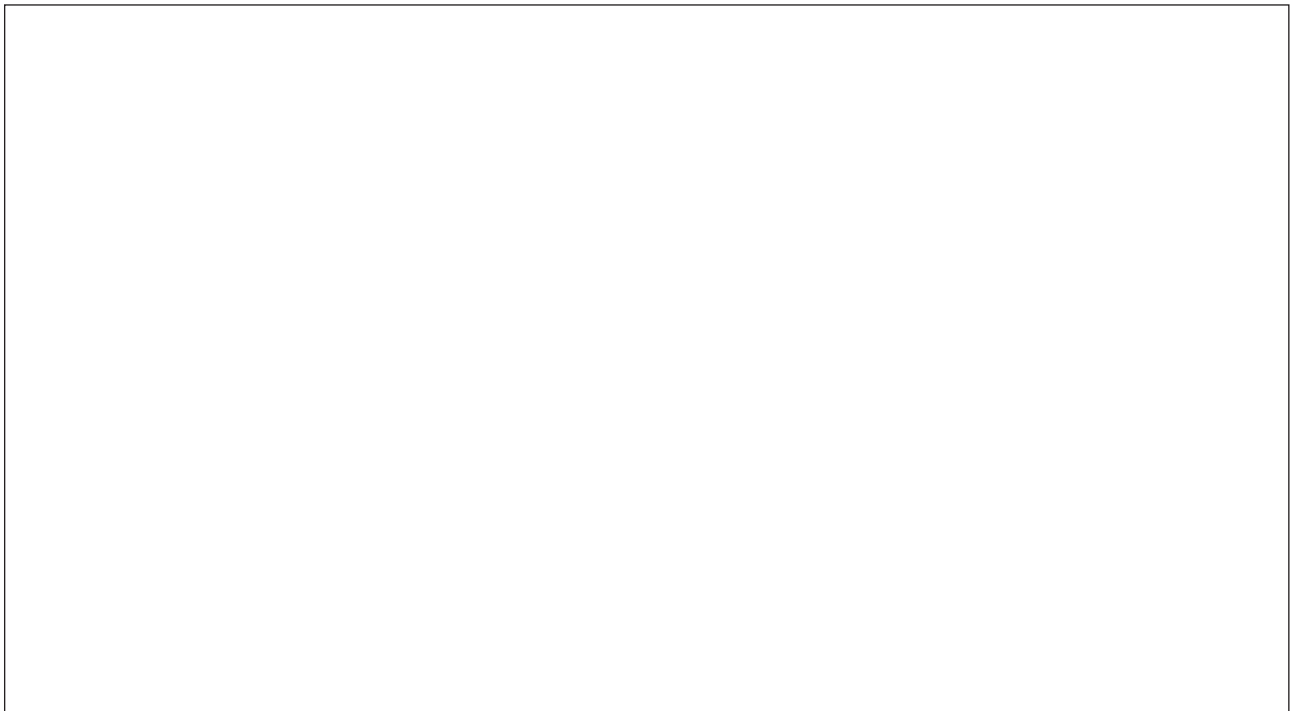
8 (b) In the box below, sketch a design for a handle for the BBQ fork. Add notes to explain your design.

Marks will be awarded for:

- an ergonomically designed handle,
- quality of communication.

(5 marks)

(3 marks)




Question 9 is about 'smart' materials.

You are advised to spend about 5 minutes on this question.

- 9 (a) Name a 'smart' material which you could use when making a prototype of the handle you have designed in Question 8.

.....
(2 marks)

- 9 (b) Give **two** advantages of using this 'smart' material to make a prototype of your handle.

Explain each of your answers.

Advantage 1

Explanation.....

.....
(2 marks)

Advantage 2

Explanation.....

.....
(2 marks)



Question 10 is about social, moral and environmental issues.

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

10 Designers and manufacturers must be aware of the social, moral and environmental effects of their products.

10 (a) Study the following list of words.

non-toxic offend pollute safe hard

Use the words once only to complete the following sentences.

Designers should make sure that their designs are to use and that they do not any particular groups of people.

Manufacturers should make sure that the materials and finishes they use are and that they do not the environment.

(4 marks)

10 (b) Give **two** detailed explanations why packaging can be harmful to the environment.

Explanation 1
.....
.....
(2 marks)

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

END OF QUESTIONS



There are no questions printed on this page

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**Design and Technology
(Resistant Materials Technology)
Full Course
Foundation Tier**

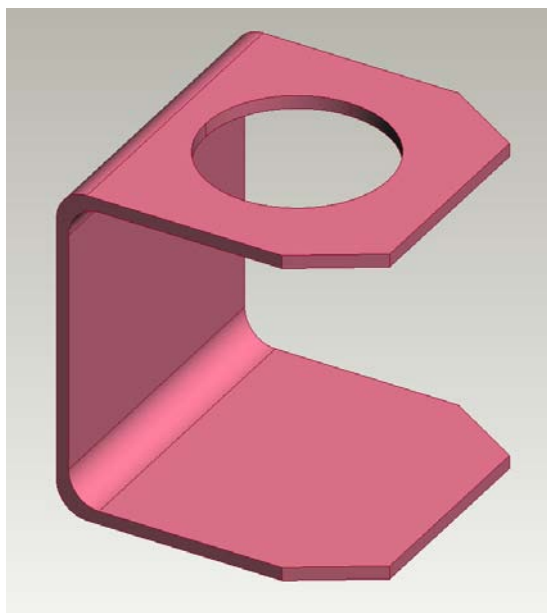
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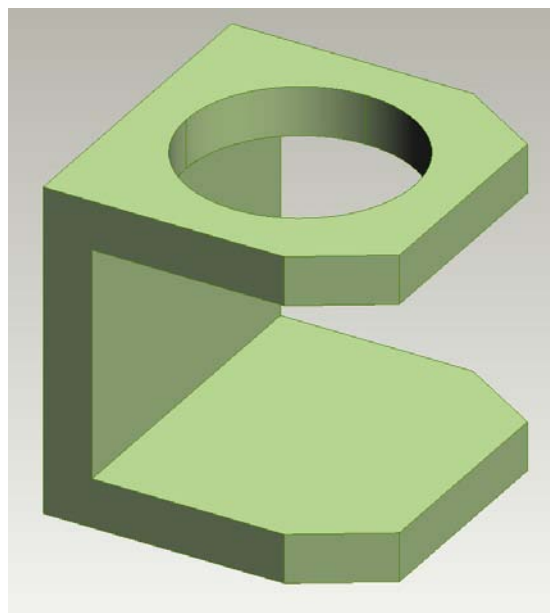
For use with the Written Paper

Figure 1

Design A



Design B



This insert page should **not** be sent to the examiner.

Figure 2

Serving spoon A



Serving spoon B



Serving spoon C



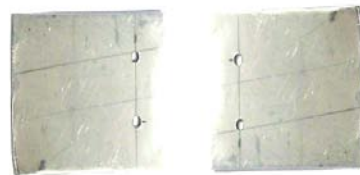
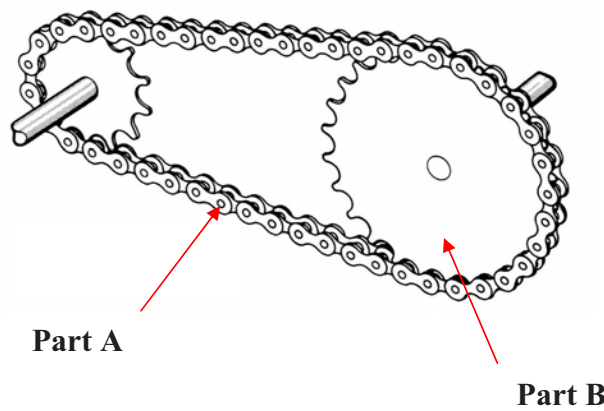
Figure 3**Joint 1****Joint 3****Joint 2****Joint 4****Fixing A****Fixing B****Fixing C****Fixing D**

Figure 4**Figure 5**

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