

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
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4	
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7	
8	
9	
10	
TOTAL	



General Certificate of Secondary Education
June 2010

Design and Technology: 45601 Resistant Materials Technology

Unit 1 Written Paper

Wednesday 26 May 2010 1.30 pm to 3.30 pm

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 questions in Section A relate 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 8.



J U N 1 0 4 5 6 0 1 0 1

Section A

Answer **all** questions.

Design Brief

You have been asked by a company that designs and manufactures children's toys to help them produce a design for a new toy.

The toy should:

- be educational
- be suitable for pre-school children
- improve hand-eye co-ordination.



1 Question 1 is about the Design Specification.

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

Give **three** design requirements for a child’s educational toy that will improve hand-eye co-ordination.

Explain each of your answers.

An example has been completed for you.

Requirement: The toy should be brightly coloured.

Explanation: Children are attracted to bright colours.

1 (a) Requirement 1
Explanation
.....
(2 marks)

1 (b) Requirement 2
Explanation
.....
(2 marks)

1 (c) Requirement 3
Explanation
.....
(2 marks)

6

Turn over ►



2 Question 2 is about creative design.

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

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

Use this information to help you sketch **five** different design ideas for a child's educational toy that will improve hand-eye co-ordination.

Marks will be awarded for creativity.

(5 x 3 marks)

15



3 Question 3 is about developing a design.

You are advised to spend about 12 minutes on this question.

Choose your best idea from Question 2.

Use notes and sketches to show how you would develop this design. You should include **three** important sizes.

Marks will be awarded for:

- quality of notes (3 marks)
- quality of sketches (3 marks)
- **three** important sizes. (3 marks)



4 Question 4 is about evaluation.

You are advised to spend about 3 minutes on this question.

Evaluate your chosen design against the original design specification that you gave in answer to Question 1.

.....

.....

.....

.....

.....

.....

(3 marks)

3



Section B

Answer **all** questions.

5 Question 5 is about tools and equipment.

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

5 (a) Name each of the following tools.

Give details of a specific process where you would use each tool.

5 (a) (i)



Name

Process

.....

.....

(2 marks)

5 (a) (ii)



Name

Process

.....

.....

(2 marks)

5 (a) (iii)



Name

Process

.....

.....

(2 marks)

Question 5 continues on the next page

Turn over ►



5 (b) Study the picture of the disc sander shown below.



Complete the table below by identifying a hazard and stating a precaution.

An example has been given.

Hazard	Precaution
<i>Long hair could get caught in the disc</i>	<i>Ensure long hair is tied back</i>
.....
.....
.....
.....
.....

(10 marks)

16



6 Question 6 is about making.

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

Two designs for a kitchen roll holder are shown below.
Both of them could be made in a school workshop.

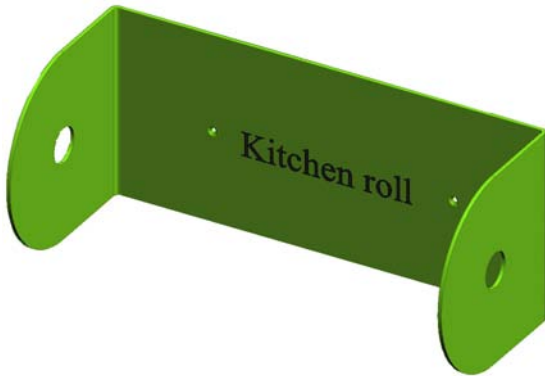
Choose **one** of the kitchen roll holders and tick the appropriate box.

Plastic kitchen roll holder

Metal kitchen roll holder

Wooden kitchen roll holder

A plastic or metal kitchen roll holder



A wooden kitchen roll holder



Question 6 continues on the next page

Turn over ►



Use clear notes and sketches to show how you would make a batch of **ten** of your chosen kitchen roll holders in a school workshop.

At each stage, name **all** the tools, equipment or software you would use.

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: Applying the surface finish

(2 marks)

Stage 5: Producing the 'kitchen roll' text

(2 marks)

16

Turn over ►



7 Question 7 is about materials.

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

7 (a) Study the products shown below.

Name **one** suitable, *specific* material which has been used to make each product.

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

7 (a) (i)

Nest of tables



Material
(2 marks)

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

7 (a) (ii)

Ring



Material
(2 marks)

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

7 (a) (iii)

Food storage boxes



Material
(2 marks)

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



7 (a) (iv)

Tennis racket



Material
(2 marks)

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

7 (b)

Discuss the environmental impact of using wood to manufacture products.

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

(6 marks)

Turn over for the next question

18

Turn over ►



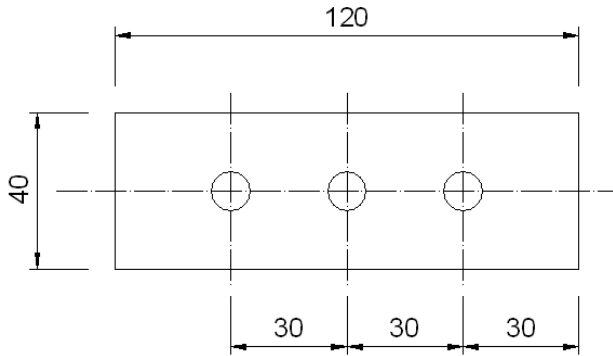
**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**



9 Question 9 is about quality control.

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

9 (a) Study the drawing shown below.



Explain how you would ensure that the three holes are accurately marked out on a piece of mild steel.

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

(4 marks)

9 (b) Explain the importance of *tolerance* when manufacturing components.

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

(4 marks)



9 (c) Explain the importance of quality control to the consumer.

.....

.....

.....

.....

.....

(4 marks)

Turn over for the next question

12

Turn over ►



10 Question 10 is about product analysis.

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

Study the buggy shown below.



10 (a) Give **four** ergonomic features of the buggy.

Explain each of your answers.

10 (a) (i) Feature 1

Explanation:

.....
(2 marks)

10 (a) (ii) Feature 2

Explanation:

.....
(2 marks)



10 (a) (iii) Feature 3

Explanation:

.....

(2 marks)

10 (a) (iv) Feature 4

Explanation:

.....

(2 marks)

10 (b) (i) Name a mechanism that is used on the buggy.

.....

(1 mark)

10 (b) (ii) Draw a labelled diagram of the mechanism you named in 10(b)(i) above.

(4 marks)

Question 10 continues on the next page

Turn over ►



10 (b) (iii) Explain the function of your chosen mechanism.

.....

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.....

.....

.....

(4 marks)

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END OF QUESTIONS

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