

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use

General Certificate of Secondary Education
June 2006

**DESIGN AND TECHNOLOGY
(RESISTANT MATERIALS TECHNOLOGY) (Short Course)
Written Paper
Higher Tier**

**3555/H
H**



Thursday 25 May 2006 9.00 am to 10.30 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • a pen, pencil, ruler, eraser, pencil sharpener and coloured pencils • an insert of colour photographs (enclosed)

Time allowed: 1 hour 30 minutes

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.
- Show the working of your calculations.

Information

- The maximum mark for this paper is 100.
- 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			

Questions 1 to 3 on this paper relate to the Design Brief given below.

Design brief

A manufacturer of children's toys has asked you to design an educational toy.

The toy is for a child aged between 6 months and 3 years.

Your ideas should focus on the following situations:

Situation 1 a toy which encourages a young child to walk;

Situation 2 a toy which uses a mechanism.

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

Question 1 is about the design specification.

You should spend about 5 minutes on this question.

- 1** Give **four** design requirements for a child’s educational toy. (The toy is for a child aged between 6 months and 3 years.)

Explain each of your answers.

Requirement 1:

Explanation:

.....
(2 marks)

Requirement 2:

Explanation:

.....
(2 marks)

Requirement 3:

Explanation:

.....
(2 marks)

Requirement 4:

Explanation:

.....
(2 marks)

8

Turn over ►

Question 2 is about design ideas.

You should spend about 30 minutes on this question.

2 Study your **design specification** (question 1) and the information given in the **design brief** (page 2).

Use this information to help you to sketch **one** idea for **each** situation.

Remember to:

- add notes to explain your sketches;
- evaluate each idea.

This question is worth 24 marks.

Marks will be awarded for:

- two different ideas; *(2 × 6 marks)*
- quality of sketches; *(5 marks)*
- quality of notes; *(3 marks)*
- quality of evaluations. *(2 × 2 marks)*

Situation 1 a toy which encourages a young child to walk

Evaluation :

.....

Situation 2 a toy which uses a mechanism

(You will be asked to develop this mechanism in Question 3.)

Evaluation :
.....

Turn over for the next question

24

Turn over ►

Question 3 is about systems and control.

You should spend about 10 minutes on this question.

- 3** Use notes and sketches to show details of the mechanism you have used in **Question 2 (Situation 2)**.

Show clearly how the mechanism works.

Marks will be awarded for:

- details of the mechanism; *(5 marks)*
- quality of sketches; *(2 marks)*
- quality of notes. *(3 marks)*

Question 4 is about making.

You should spend about 15 minutes on this question.

- 4** **Figure 1** on the colour insert sheet shows two designs for a counting frame which could be made in a school workshop.

Choose **one** of the counting frames.

Chosen counting frame:

Use notes and sketches to show clearly how you would make **a batch of ten** counting frames.

At each stage, name all the tools and equipment you would use.

Answer this question on pages 8 and 9.

Question 4 continues on the next page

Turn over ►

Stage 1: Marking out **or** CAD (computer aided design)

(4 marks)

Stage 2: Shaping and drilling **or** CAM (computer aided manufacture)

(4 marks)

Stage 3: Joining the frame to the base

(4 marks)

Stage 4: Finishing

(2 marks)

Question 5 is about designing.

You should spend about 5 minutes on this question.

5 A model is often produced during the designing of a product.

Study **Figure 2** and **Figure 3** on the colour insert sheet.

Give **one advantage** and **one disadvantage** of using construction kits, such as those shown in **Figure 2** on the colour insert sheet, rather than the modelling materials shown in **Figure 3** on the colour insert sheet.

Explain your answers.

Advantage:
.....
(1 mark)

Explanation:
.....
(1 mark)

Disadvantage:
.....
(1 mark)

Explanation:
.....
(1 mark)

4

Question 6 is about health and safety.

You should spend about 5 minutes on this question.

6 Handling and working with plastic can be a dangerous activity.

Complete the table shown below.

Hazard	Risk to user	Safety precaution
Picking up hot plastic		
Hot plastic gives off fumes		
Adhesive touches clothing		

(6 marks)

<hr/> 6

Turn over for the next question

Turn over ►

Question 7 is about materials and finishes.

You should spend about 5 minutes on this question.

7 Study the high chairs shown in **Figure 4** on the colour insert sheet.

- (a) Name **one** suitable, *specific* material from which to make the *frame* of **high chair A** and **high chair B**. Give **two** reasons for each choice.

High chair A

Material: (1 mark)

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

Reason 2:
..... (1 mark)

High chair B

Material: (1 mark)

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

Reason 2:
..... (1 mark)

- (b) Name **one** suitable, *specific* finish for the material you have chosen for **high chair A**.

Finish: (1 mark)

- (c) Give a specific health and safety requirement of a finish which is to be used on a high chair.

Health and safety requirement:
..... (1 mark)

Question 9 is about using ICT.

You should spend about 5 minutes on this question.

9 Designers and manufacturers of children’s educational toys may use the Internet in their work.

(a) Give **three** ways designers and manufacturers of children’s educational toys could use the Internet in their work.

1 (1 mark)

2 (1 mark)

3 (1 mark)

(b) Give **three** advantages of using CAD (computer aided design) rather than designing with paper and pencil.

Advantage 1: (1 mark)

Advantage 2: (1 mark)

Advantage 3: (1 mark)

Question 10 is about product development.

You should spend about 5 minutes on this question.

10 Study the play centre shown in **Figure 5** on the colour insert sheet.

- (a) Give **two** features of the play centre which make it appealing to a child.

Explain each of your answers.

Feature 1:

Explanation:

.....

(2 marks)

Feature 2:

Explanation:

.....

(2 marks)

- (b) Explain how developments in material and manufacturing technology have assisted the design and manufacture of the product.

Explanation:

.....

.....

.....

.....

.....

.....

.....

.....

.....

(8 marks)

END OF QUESTIONS

There are no questions printed on this page

**DESIGN AND TECHNOLOGY
(RESISTANT MATERIALS TECHNOLOGY)
FULL AND SHORT COURSES**

H

Higher Tier

This insert is provided for use in the examination.

Figure 1

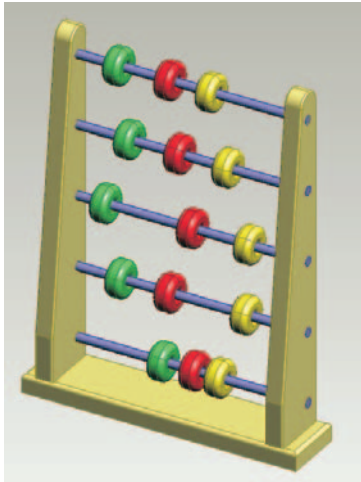
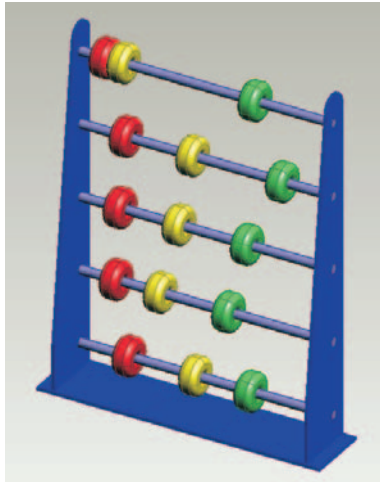
<p>Design One – a wooden product</p> 	<p>Design Two – a plastic or metal product</p> 
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Figure 2


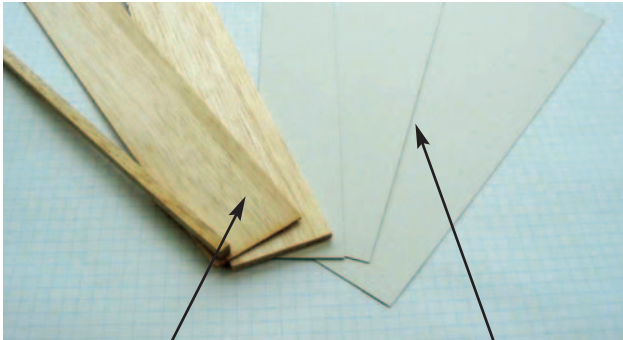


Figure 3



Balsa **Card**

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Figure 4

High chair A



High chair B



High chair C

Image of metal high chair.

Figure 5

Image of children playing on a slide which is part of a play centre.

For copyright reasons it has not been possible to include two of the images on this page.

A full copy of the paper and insert can be obtained from Centre Services.

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