Surname		Other Names	
Centre Number			Candidate Number				
Candidate Signature									

For Examiner's Use

General Certificate of Secondary Education
June 2006

DESIGN AND TECHNOLOGY **3555/F**
(RESISTANT MATERIALS TECHNOLOGY) (Short Course) **F**
Written Paper
Foundation Tier

Thursday 25 May 2006 9.00 am to 10.30 am

For this paper you must have:
- 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.
- Mark allocations 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.

LEAVE MARGIN BLANK

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 **three** 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.

(An example has been completed for you.)

Requirement: The toy should be brightly coloured.

Explanation: Children are attracted to bright colours.

Requirement 1: .....

Explanation: .....

.....

(2 marks)

Requirement 2: .....

Explanation: .....

.....

(2 marks)

Requirement 3: .....

Explanation: .....

.....

(2 marks)

6

Question 2 is about design ideas.

You should spend about 20 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 **two** different design ideas for a child's educational toy.

Add notes to explain each of your ideas.

This question is worth 23 marks.

Marks will be awarded for:

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

Idea 1

Idea 2

Turn over for the next question

23

Question 3 is about designing.

You should spend about 5 minutes on this question.

3 Choose your best design idea from **Question 2**.

Chosen idea: Idea number .....

(a) Give **two** reasons why you think this is your best idea.

Reason 1: .....

.....

(1 mark)

Reason 2: .....

.....

(1 mark)

(b) Study the list of materials shown below.

Balsa	**Acrylic**	**Card**
Oak	**Mahogany**	**MDF**

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

Circle **two** materials from the list above which you could use to make a *model* of your child's educational toy. *(2 marks)*

4

Question 4 is about making.

You should spend about 25 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: .....

(a) Name **one** suitable *specific* material from which to make your chosen counting frame.

Material: .....

(2 marks)

Question 4 continues on the next page

(b) Use notes and sketches to show clearly how you would make the side labelled **Part A (Figure 1)** of your chosen counting frame.

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

This part of the question is worth 20 marks.

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: Drilling **or** CAM (computer aided manufacture)

(4 marks)

Stage 3: Shaping **or** CAM (computer aided manufacture)

(4 marks)

Stage 4: Finishing

(4 marks)

22

Question 5 is about health and safety.

You should spend about 5 minutes on this question.

5 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)

6

Question 6 is about materials and finishes.

You should spend about 5 minutes on this question.

6 Study the high chairs shown in **Figure 2** 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 **one** reason for each choice.

High chair A

Material: .....
(2 marks)

Reason: .....

.....
(1 mark)

High chair B

Material: .....
(2 marks)

Reason: .....

.....
(1 mark)

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

Finish: .....
(2 marks)

8

Turn over for the next question

Question 7 is about using ICT.

You should spend about 5 minutes on this question.

7 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)

6

Question 8 is about making.

You should spend about 5 minutes on this question.

8 Study the tools and materials shown in **Figure 3** on the colour insert sheet.

Complete the table below by matching the hand tools to the saw cuts.

Name the tool.

You may **not** use any tool more than once.

Saw cut	Tool letter	Tool name
1		
2		
3		

(6 marks)

6

Turn over for the next question

Question 9 is about product analysis.

You should spend about 10 minutes on this question.

9 Study the swing shown in **Figure 4** on the colour insert sheet.

(a) Give **two** reasons why the seat (labelled **Part A**) should **not** be used by a one-year-old child. Explain each of your answers.

Reason 1: .....

Explanation: .....

.....

(2 marks)

Reason 2: .....

Explanation: .....

.....

(2 marks)

(b) In the box below, sketch a seat design which would be suitable for use by a one-year-old child.

This question is worth 8 marks.

Marks will be awarded for:

- a design which is specifically for a one-year-old child; *(6 marks)*
- quality of sketch. *(2 marks)*

12

Question 10 is about environmental issues.

You should spend about 5 minutes on this question.

10 (a) Plastic materials are widely used in the manufacture of children's toys.

Study the following list of words.

reduce **recycle** **non-renewable**

Use the words to complete the sentences.

Plastic is a ..... resource. To save the environment we must ..... the amount of plastic we use.

We must also ..... waste plastic.

(3 marks)

(b) Give **two** reasons why solid wood is generally considered to be an environmentally friendly material.

Explain each of your answers.

Reason 1: .....

Explanation: .....

.....

Reason 2: .....

Explanation: .....

.....

(4 marks)

7

END OF QUESTIONS

There are no questions printed on this page

General Certificate of Secondary Education
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DESIGN AND TECHNOLOGY (RESISTANT MATERIALS TECHNOLOGY) FULL AND SHORT COURSES

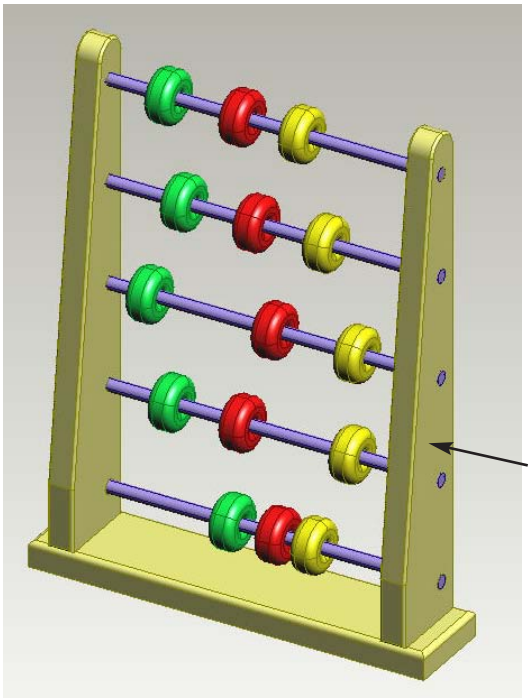
Foundation Tier

F

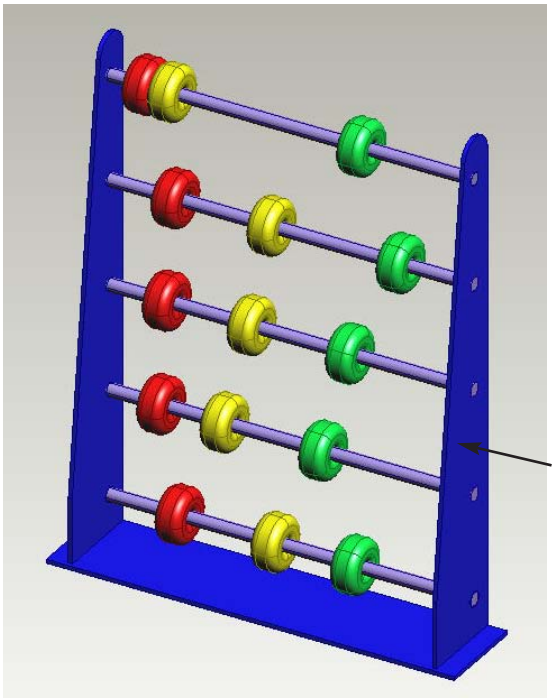
This insert is provided for use in the examination.

Figure 1

Design One – a wooden product



Design Two – a plastic or metal product



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

Turn over ►

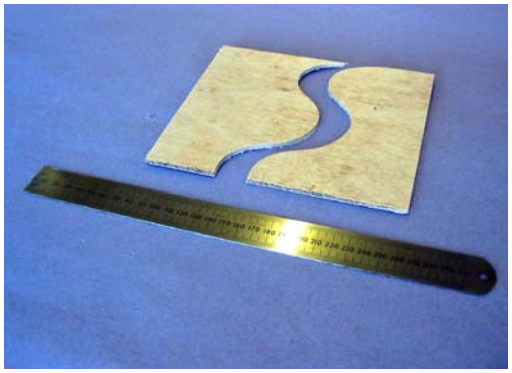
Insert to **3545/F 3555/F**

Figure 2

High chair A	High chair B	High chair C
		Image of metal high chair.

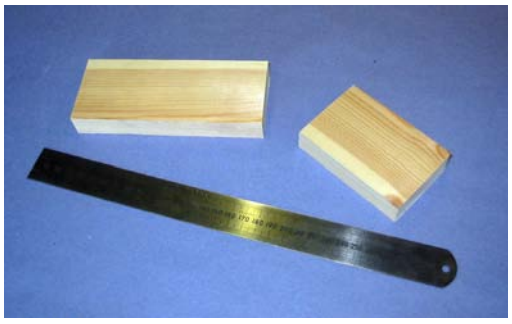
Figure 3

Saw cut 1

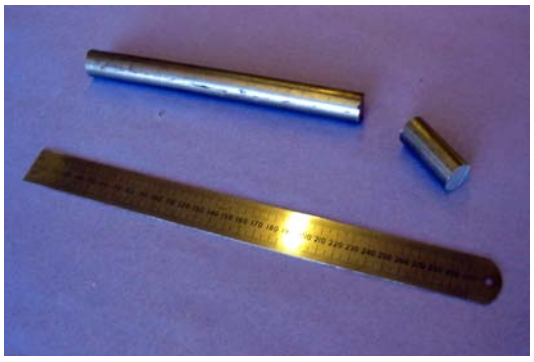


Saw cut 2

Saw cut 3



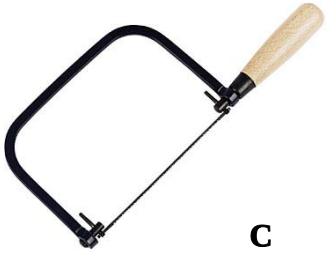
Saw cut 4



A

B

D



C

Turn over ►

Figure 4

Image of swing.

For copyright reasons it has not been possible to include the image of the metal high chair on page 2 and the swing on page 4.
A full copy of the paper and insert can be obtained from Centre Services.
E-mail: Despatches-M@aqa.org.uk Tel: 0161 953 1180