

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
TOTAL	



General Certificate of Secondary Education  
June 2011

# Design and Technology: Short Course

# 45751

## Unit 1 Written Paper

Wednesday 25 May 2011 1.30 pm to 2.30 pm

**For this paper you must have:**

- a pen, a pencil, a ruler, an eraser and a pencil sharpener.

**Time allowed**

- 1 hour

**Instructions**

- Use black ink or black ball-point pen. Use pencil 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 maximum mark for this paper is 60.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 3 (d).



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# 45751

Answer **all** questions.

Question 1 is about materials and components.

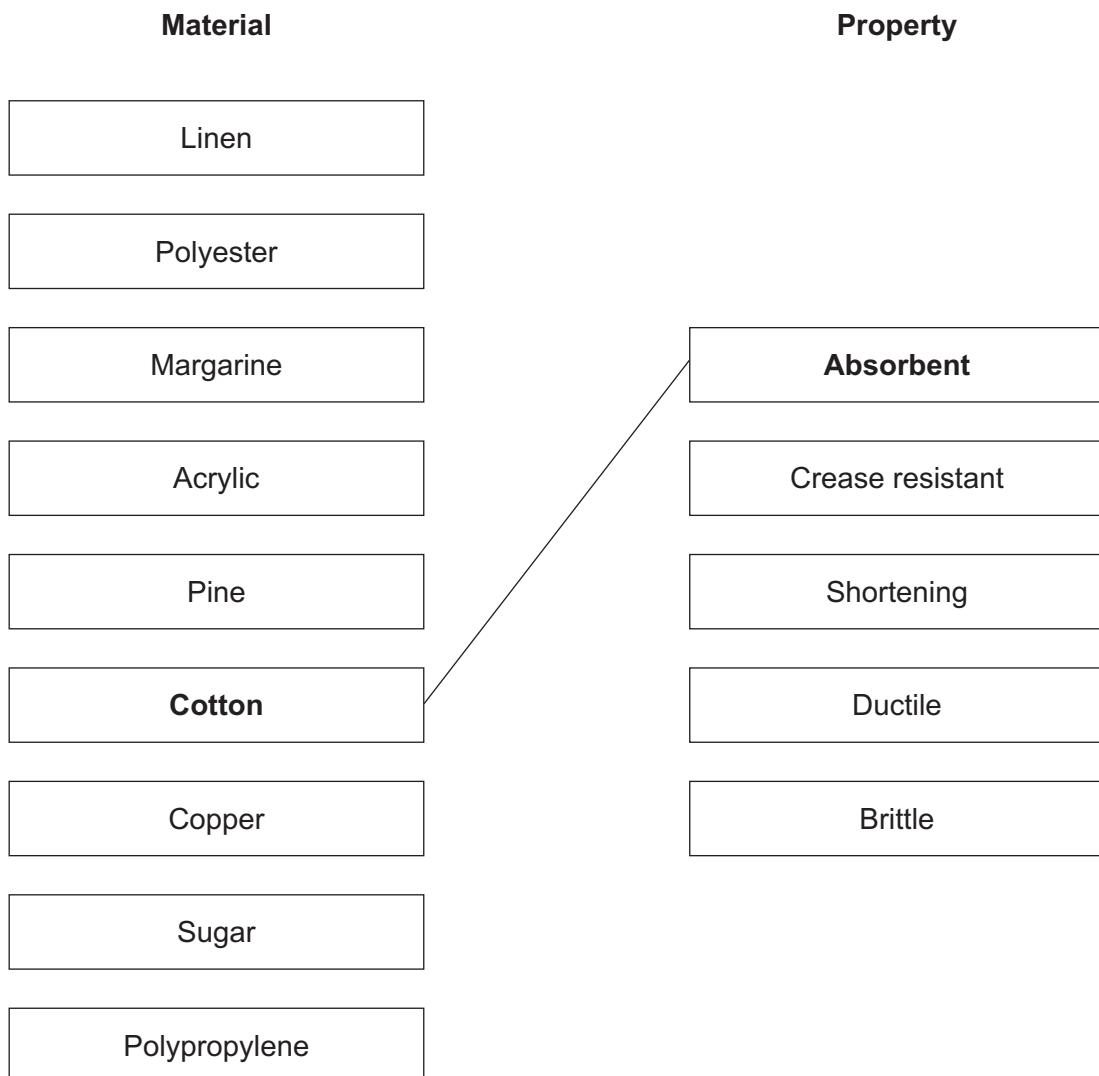
You are advised to spend about 10 minutes on this question.

**1 (a)** Materials have particular properties.

On the chart below use lines to connect **four** of the following materials to an appropriate property.

Each property should only be used once.

An example has been completed for you.



(4 marks)



**1 (b) (i)** Select a property from part (a) and give an example of a product where this property is important.

Property .....

Product .....

(1 mark)

**1 (b) (ii)** Explain why this property is important for the product you have chosen in part (i).

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

(2 marks)

**1 (c)** Smart materials change their properties in response to changes in their environment. For example, some dyes / inks alter colour in response to changes in temperature.

In the box below use notes and sketches to show how using a colour changing dye could improve an everyday product.

Name of product .....

(3 marks)

Turn over ►

10
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Question 2 is about the process of designing.

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

**2** Geometric shapes can be used as a source of inspiration when designing products.

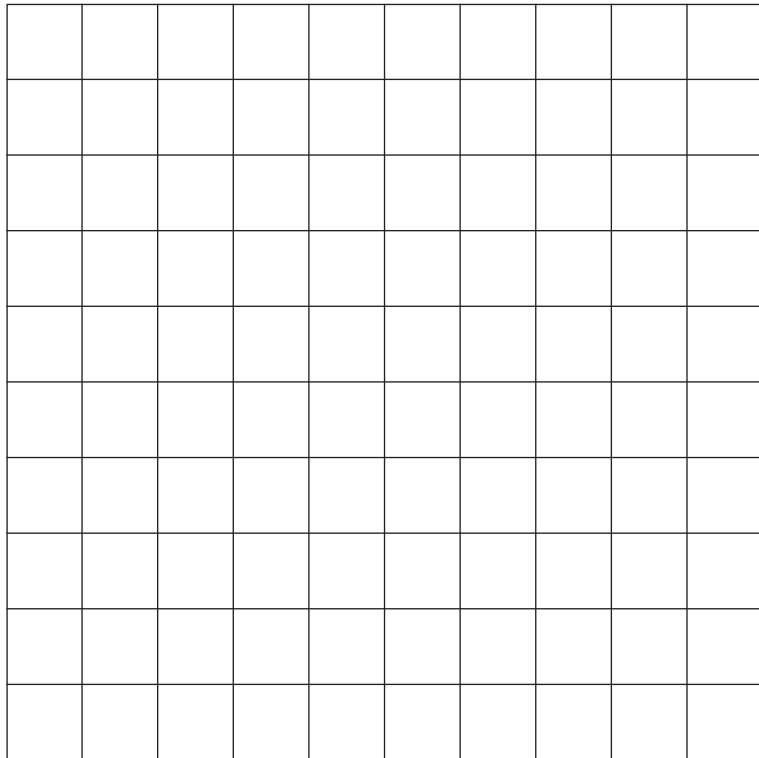
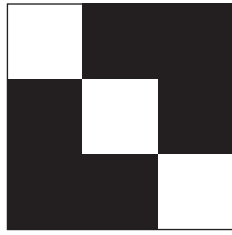
An example is shown below.



**2 (a)** A design that uses a geometric shape is shown opposite. Modify this design to make it more interesting. Your design must be made up of one or more geometric shapes in black and white only.

It must be possible to apply your design to a product using equipment and processes you are familiar with. You will be asked how this would be done in parts (d) and (e).





(3 marks)

Question 2 continues on the next page

Turn over ►

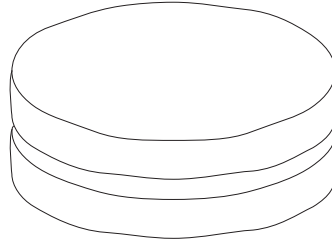


**2 (b)** Below are three products that you could make at school.

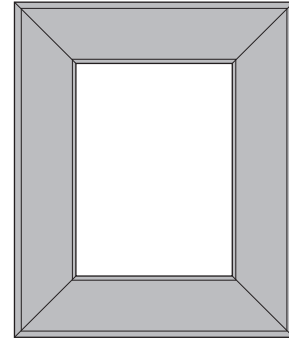
Apron



Cake



Picture frame



In the box below, use notes and sketches to show how **one** of these products would look with your design from part (a) applied to it.

Your drawing must be in black and white.

Blank area for drawing and notes.

(4 marks)



**2 (c) (i)** Name a Computer Aided Design (CAD) package that you could use to draw your design.

.....  
(1 mark)

**2 (c) (ii)** What are the advantages of using CAD when designing?

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

**2 (d)** Name the process you would use to apply your design to the surface of the product you have chosen in part (b).

.....  
(1 mark)

**Question 2 continues on the next page**

**Turn over ►**



**2 (e)** Produce a step-by-step plan to explain how you would use the process you have named in part (d) to apply the design to the product.

Marks will be awarded for providing enough information to allow someone else to decorate the product.

- Description of each stage of the process (6 marks)
- Tools and equipment used (3 marks)

Process

Tools and equipment used

20





Question 3 is about evaluating the suitability of products.

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

- 3 Anthropometric (human) data is often needed to design products for specific groups of users.

A picture of a toy phone is shown below.

Toy phone



- 3 (a) What anthropometric data would be needed to design a toy phone suitable for children aged 12–36 months?

.....

.....

.....

.....

(2 marks)

Question 3 continues on the next page

Turn over ►



**3 (b)** Evaluate the extent to which the following features of the toy phone on page 9 make the product suitable for its intended user.

**3 (b) (i)** Colour .....

.....

.....

.....

.....

(2 marks)

**3 (b) (ii)** Shape/form .....

.....

.....

.....

.....

(2 marks)

**3 (b) (iii)** Educational features .....

.....

.....



.....

.....

(2 marks)



3 (c) The symbols below are found on products for children. Explain what each of these symbols means.

	Explanation..... ..... ..... .....
	Explanation..... ..... ..... .....

(4 marks)

3 (d) What safety issues would need to be considered when designing products (such as the toy phone on page 9), to be used by very young children?

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(6 marks)

Turn over ►

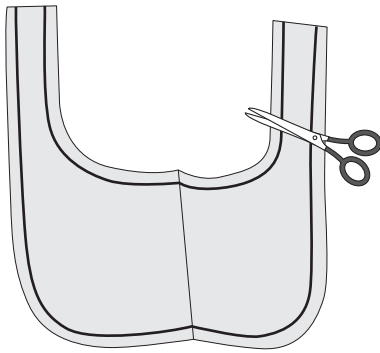


Question 4 is about using equipment to make products at school.

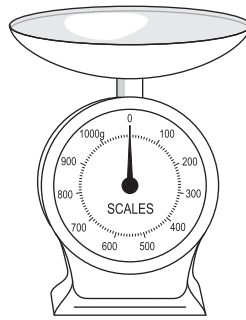
You are advised to spend about 15 minutes on this question.

**4** The equipment shown below is used to mark out or measure materials prior to making.

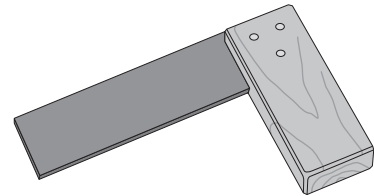
Paper pattern



Weighing scales



Tri square



**4 (a)** Choose **one** piece of equipment from above and explain how you would use this accurately to prepare materials for making.

Chosen equipment .....

(3 marks)



**4 (b)** Name **two** other pieces of equipment you could use to measure materials.

1 .....

.....

2 .....

.....

(2 marks)

**4 (c)** When buying materials or ingredients, different units of measurement are used.

Complete the table below to show the **metric** units used to measure these materials / ingredients.

Material or ingredient	Metric unit of measurement
Timber	.....
Fruit	.....
Milk	.....

(3 marks)

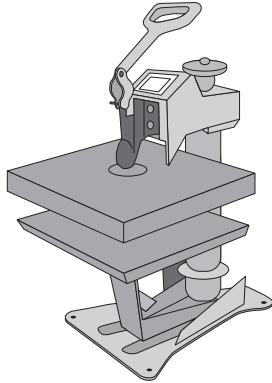
**Question 4 continues on the next page**

**Turn over ►**



**4 (d)** Electrical tools and machinery often have safety features built in to minimise the risk of injury.

For example:

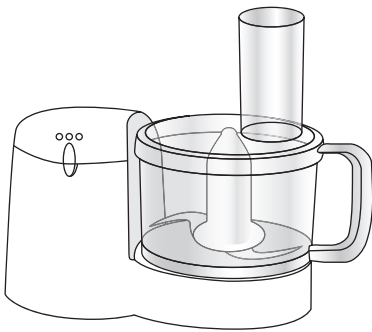


*Description*

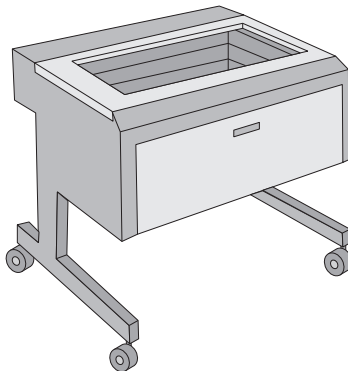
A heat press has a plastic coated handle so that hands are kept away from hot surfaces. This helps to prevent burns.

**4 (d) (i)** Circle the name of **one** of the pieces of equipment shown below **and** describe the safety features built into the design of it.

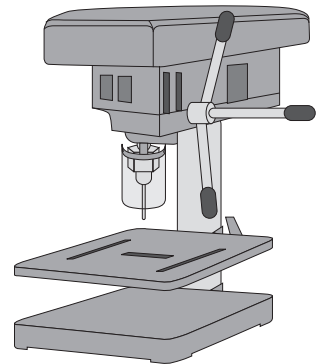
Food processor



Laser cutter



Pillar drill



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

(2 marks)



**4 (d) (ii)** Explain what other safety precautions should be followed when using the piece of equipment you have chosen in part (i).

.....

.....

.....

.....

(2 marks)

**END OF QUESTIONS**

<b>12</b>



**There are no questions printed on this page**

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ANSWER IN THE SPACES PROVIDED**

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