

Candidate Name	Centre Number	Candidate Number
		0



GCSE

144/04

**DESIGN AND TECHNOLOGY
PAPER 2**

FOCUS AREA: PRODUCT DESIGN

Higher Tier

A.M. MONDAY, 2 June 2008

1½ hours

	Leave Blank
Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
TOTAL MARK	

ADDITIONAL MATERIALS

You will need basic drawing equipment for this examination.

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet. Where the space is not sufficient for your answer, continue the answer at the back of the book, taking care to number the continuation correctly.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

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

- 1. The basic squeezable shampoo bottle shown below needs to be **redesigned for a specific target group**.



- (a) (i) Select **one** of the following target groups. State **two** design features for the new bottle.

Children Teenagers Hair dressers

The chosen target group is:

Design Feature 1:

.....

[2]

Design Feature 2:

.....

[2]

- (ii) Name a suitable plastic material that could be used to make the squeezable shampoo bottle. Give **one** reason for your choice.

Material: [1]

Reason:

.....

[2]

- (iii) Name the process used to make the bottle. [1]

(iv) State **one** piece of anthropometric data that would need to be considered in the redesign of the bottle.

.....
 [2]

(v) State **two** ergonomic factors that would need to be considered in the redesign of the bottle.

Factor 1:
 [2]


Factor 2:
 [2]

(vi) Market Research is to be carried out to see how successful the redesigned bottle is. Describe what is meant by market research.

.....
 [2]

(b) The symbol shown below is used on packaging.

Explain what this symbol means.

Symbol	Explanation
	<p>..... [2]</p>

2. The design for a travel game of *noughts* and *crosses* is shown.
The game is to be designed using CAD and made using CAM.



- (a) (i) Name a suitable sheet plastic material which could be used to make the travel game and give **two** reasons for your choice.

Plastic material: [1]

Reason 1: [1]

Reason 2: [1]

- (ii) Name a suitable CAM machine you could use to cut out the game board and the playing counters. [1]

- (iii) Complete the table below to describe the main steps for cutting out the game on a CAM machine. [3 × 2]

<i>Stage</i>	<i>Description</i>
1	Load the drawing onto the computer and open it in the correct program for the CAM machine.
2	
3	
4	
5	Run CAM machine to cut the parts.

- (iv) Apart from cost, state **two** advantages to the manufacturer of using CAM to produce the game. [2 × 1]

Advantage 1:

.....

Advantage 2:

.....

- (v) Explain **one quality control** measure that would be put in place to ensure that all of the counters are exactly the size needed.

.....

.....

[2]

- (vi) When using a **CAM** machine like the one shown on the right, an **offset tool path** is needed to guide the 2 mm cutting tool. Complete the following two diagrams, showing the tool paths for:

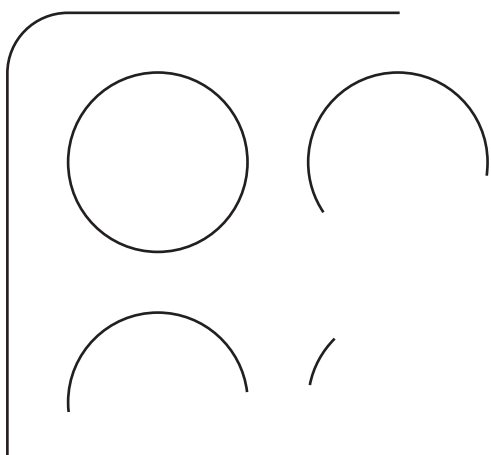


A, the tool path needed to cut the outline of the board;

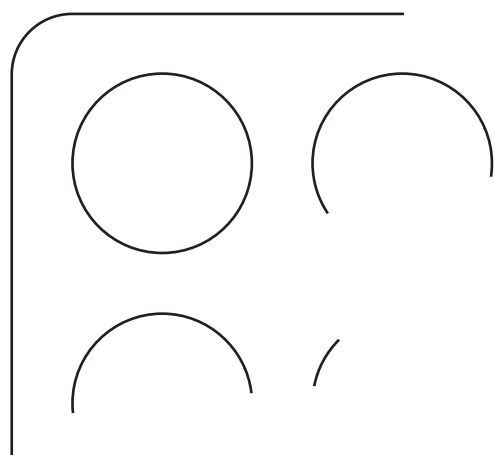
B, the tool path needed to cut the spaces for the counters.

2 × [1]

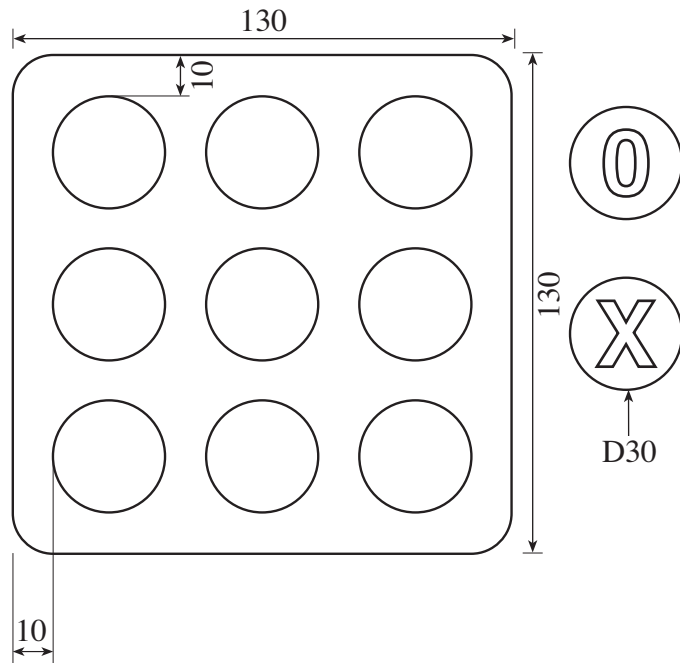
A



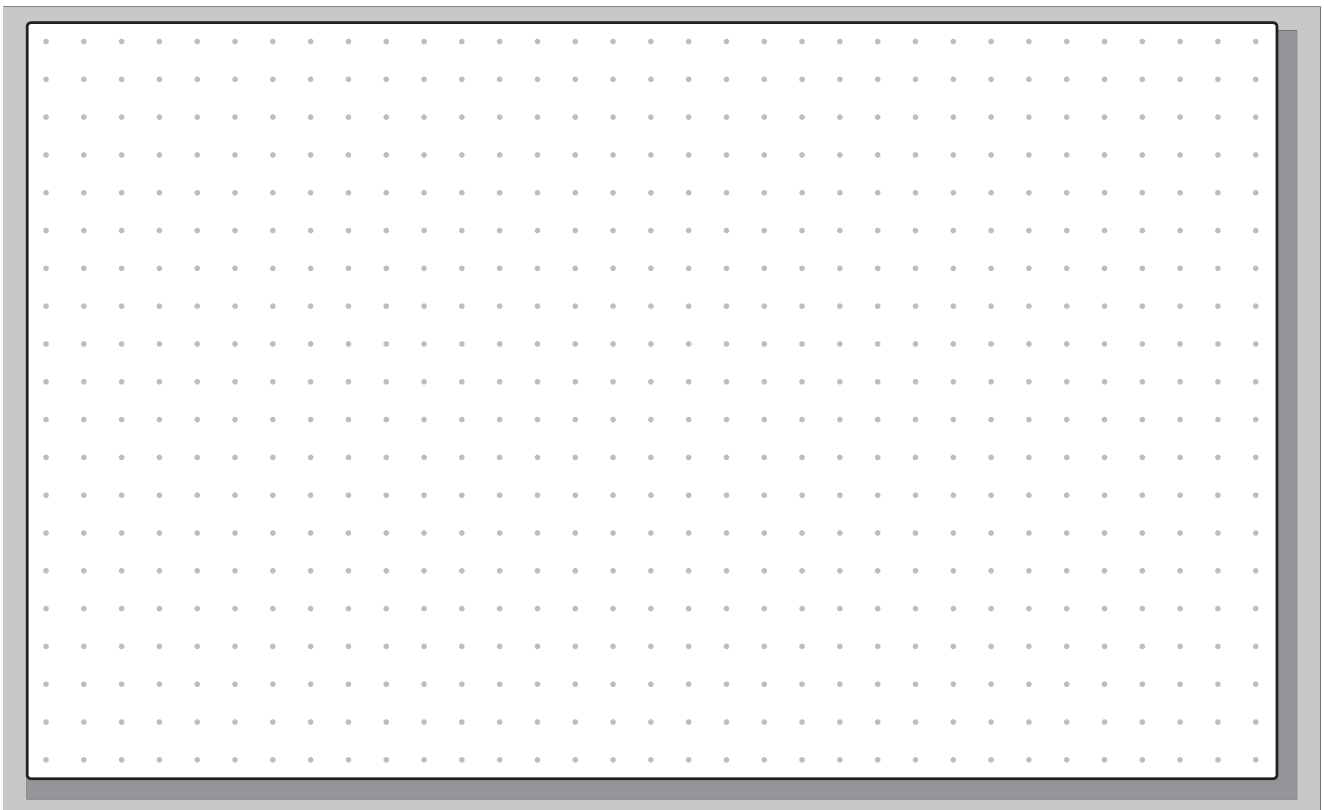
B



- (vii) The illustration below shows the design of the game. The game and its playing counters are made using CAM. All the dimensions are shown below.



The grid below is set to 10 mm. Accurately sketch all the pieces needed to make the travel game using CAM. [5]



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3. Environmental concerns are important.
Study the photographs below and answer the questions that follow.

Product A



Product B



- (a) (i) Explain why the packaging for product **A** might be more environmentally friendly than the packaging for product **B**. [2]

.....

.....

- (ii) The packaging for product **B** includes a plastic outer covering that protects the product.
State **one** method of making the plastic outer packaging. [1]

.....

- (iii) The packaging for product **A** is made from a renewable material. Explain what **renewable** means. [2]

.....

.....

- (b) The photograph shows a block model of a torch.



(i) State a suitable material to make the model. [1]

.....

(ii) Give **two** reasons why a designer would make a block model when developing a new design. [2 × 2]

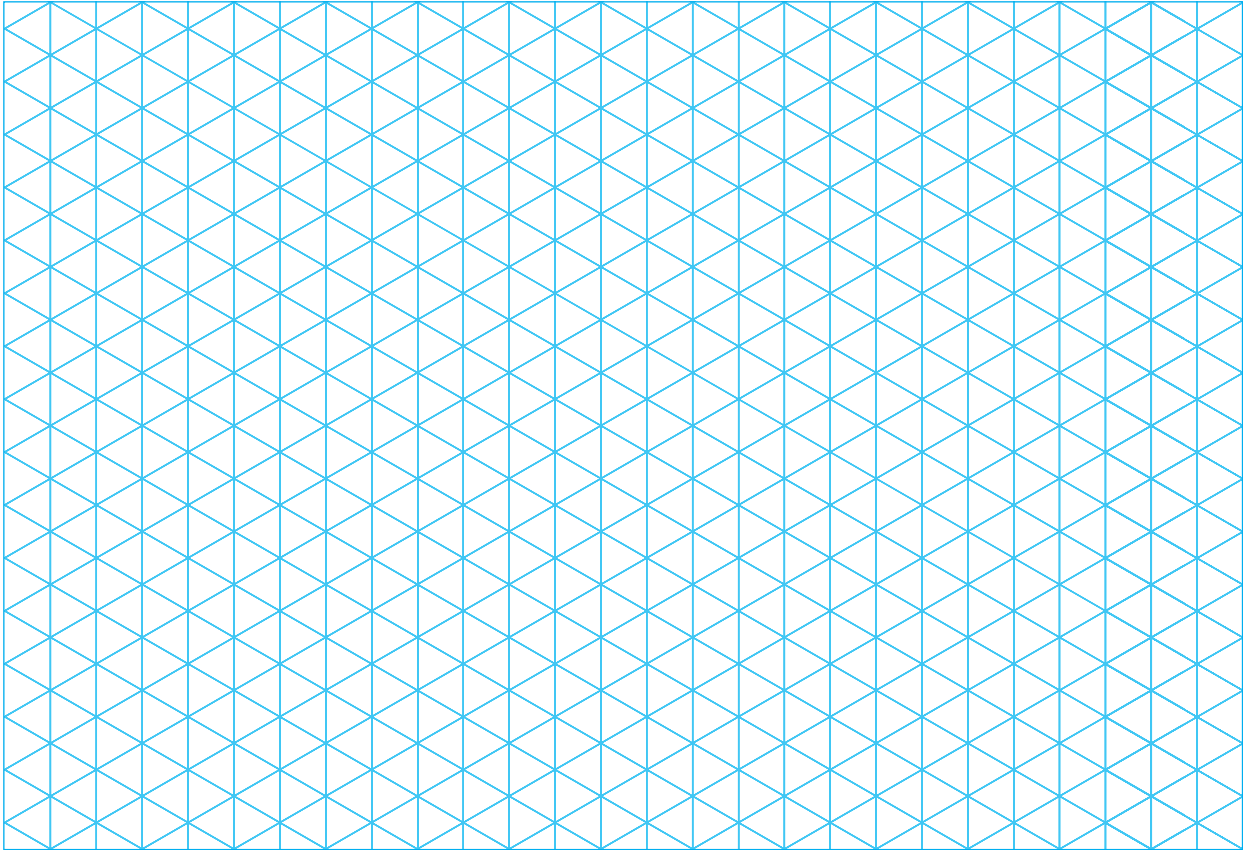
Reason 1:

.....

Reason 2:

.....

(c) Use the grid below to make isometric sketches of the individual parts needed to make the block model for the torch above. [5]



4. Kettles have **evolved** in design but they all have the same function. Study the pictures of the products shown below.



Kettle A



Kettle B

(a) Explain why Kettle B could help the user to save energy. [2]

.....

.....

(b) (i) Evaluate Kettle B using the following headings: 3 × [2]

Function:

.....

Materials:

.....

Aesthetics:

.....

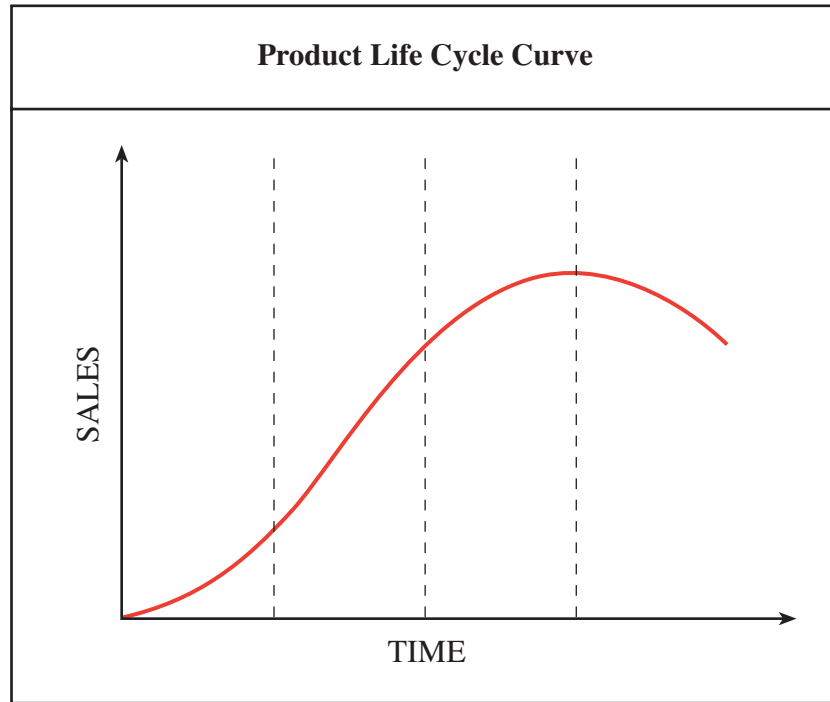
(ii) Kettle B makes use of feedback in its control system. Describe what is meant by the term feedback. [2]

.....

.....

- (c) (i) Using the words given below label the diagram to show the four stages in a product lifecycle. [4]

Decline Growth Introduction Maturity



- (ii) Explain what happens to sales in maturity.

.....
 [2]

- (iii) Explain what happens to sales in growth.

.....
 [2]

- (d) Name a product of your choice and discuss the issues that will affect its product lifecycle. [3]

Name of product:

.....

5. A company plans to launch a compact fan that can be clipped to a flat screen monitor. The product is to be marketed under the name '**Breeze**'. You have been asked to design the new compact fan and logo. The fan will be used when you are working at a computer.



Specification – *Your design must:*

- be aesthetically pleasing and compact;
- clip to the monitor without causing damage;
- include a suitable logo for the 'Breeze' fan;
- be powered by a USB connection to the computer.

Marks will be awarded for:

- | | | |
|-------|--|-----|
| (i) | designing a logo for the fan; | [4] |
| (ii) | showing clear labelled sketches of your design for the fan, including construction details and material(s) used; | [6] |
| (iii) | showing clear details of the clip that holds the fan onto the monitor; | [4] |
| (iv) | including three important sizes; | [3] |
| (v) | showing how the USB cable connects to the fan. | [2] |
| (vi) | quality of communication including the use of colour. | [6] |
- (a) (i) A logo is needed for the new desk fan.
Draw **one** idea for the logo in the space below.
- (ii) **Sketch** your solution on the **opposite** page.

