

Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE  
General Certificate of Secondary Education



CYD-BWYLLGOR ADDYSG CYMRU  
Tystysgrif Gyffredinol Addysg Uwchradd

141/02

**DESIGN AND TECHNOLOGY**

**PAPER 2**

**FOCUS AREA: RESISTANT MATERIALS TECHNOLOGY**

(Foundation Tier – Grades G to C)

P.M. TUESDAY, 6 June 2006

(1½ hours)

	<b>Leave Blank</b>
<b>Question 1</b>	
<b>Question 2</b>	
<b>Question 3</b>	
<b>Question 4</b>	
<b>Question 5</b>	
<b>TOTAL MARK</b>	

**ADDITIONAL MATERIALS**

You will need basic drawing equipment and coloured pencils 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.

No certificate will be awarded to a candidate detected in any unfair practice during the examination.

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

1. (a) **Complete** the table by placing the materials listed below under the correct heading. [5]


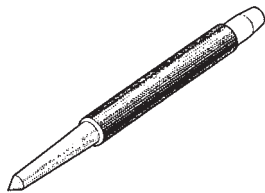
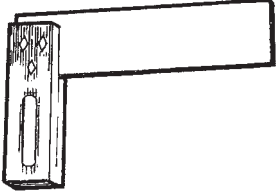
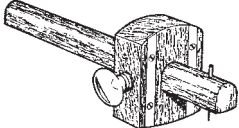
**Aluminium          Pine          Stainless steel          Mahogany          Red Cedar**

Metal		Wood	
<i>Ferrous</i>	<i>Non Ferrous</i>	<i>Hardwood</i>	<i>Softwood</i>

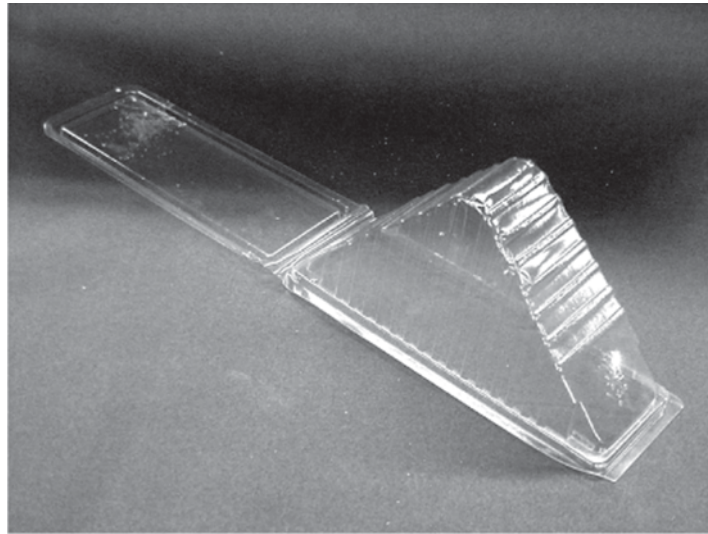
- (b) (i) From the list below, **select** the correct name for **each** marking out tool. [4]

- (ii) **Underline** the correct use of **each** tool from the statements given. [4]

**Marking Gauge          Tri Square          Centre Punch          Scriber**

Marking out tool	Name	Use
	.....	To mark lines in metal. To indent in metal for drilling. To draw lines on wood.
	.....	To draw lines on plastic. To indent in metal for drilling. To mark a parallel line.
	.....	To measure a length of material. To mark out a parallel line. To mark out a 90° angle.
	.....	To measure angles. To mark a line parallel to an edge. To mark out a 90° angle.

- (c) A disposable plastic sandwich container is shown below.



- (i) From the list below, **underline** the correct process used to manufacture the sandwich container. [1]

**Blow Moulding**

**Vacuum Forming**

**Press Moulding**

- (ii) **Name** a suitable plastic material for the sandwich container. [1]

.....

- (iii) **Give two** reasons why the material you named in part (ii) is suitable for the sandwich container.

Reason 1: .....

.....

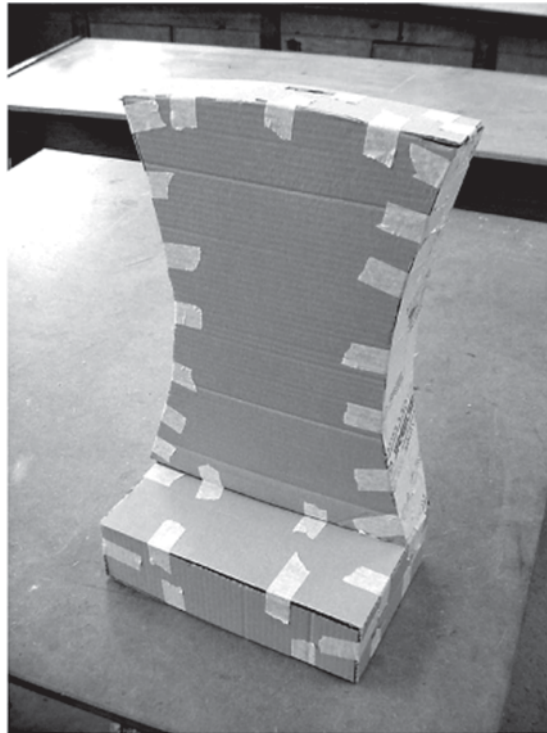
[2]

Reason 2: .....

.....

[2]

2. The photograph below shows a model that has been made out of card.



(a) **Give two** advantages of making a card model when developing a design. 2 × [2]

Advantage 1: .....

.....

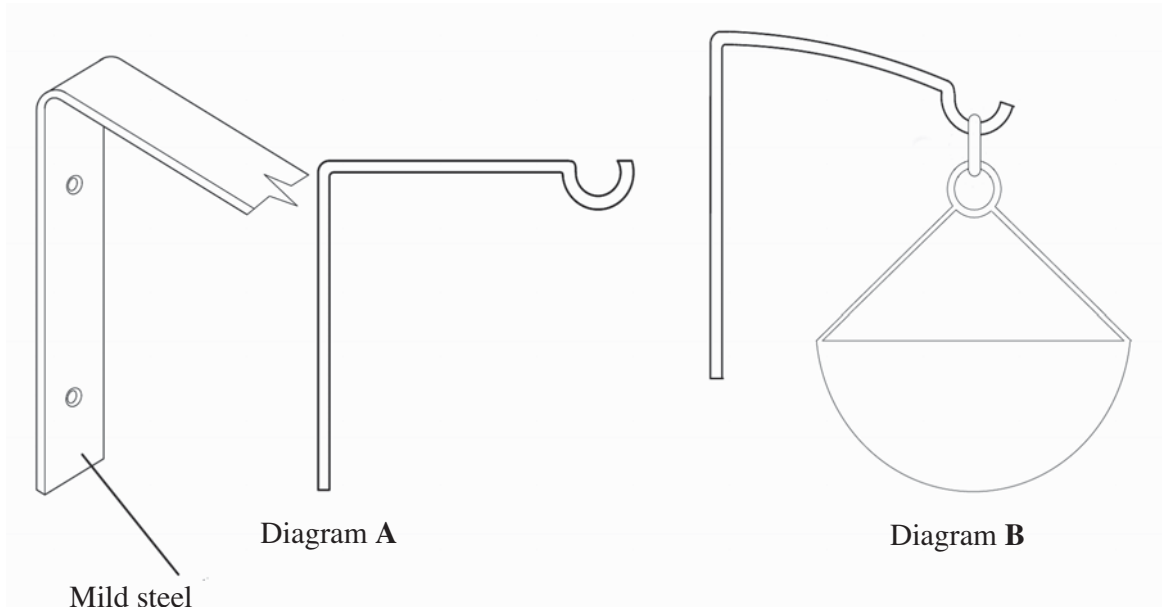
.....

Advantage 2: .....

.....

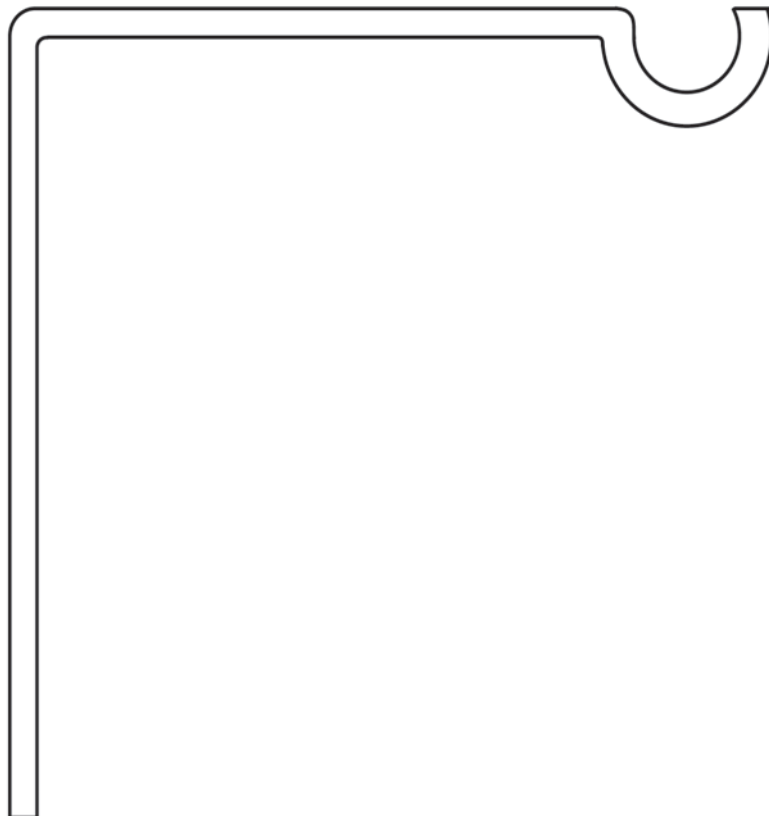
.....

- (b) The diagram shows a design for a hanging basket bracket (Diagram A). The designer has found that the weight of the basket causes the bracket to bend (Diagram B).



- (i) **Improve** the design of the bracket shown below in order to prevent it bending.  
**Label** your design.

[2]



(ii) Using notes and sketches, **explain** how you would attach the extra part you have drawn in part (i) to the bracket. [5]

(iii) The bracket is to be used outside.

(I) **Name one** suitable finish for the bracket. [1]

.....

(II) **Give one** reason why a finish is needed. [1]

.....

(III) **Explain** how you would apply the finish to the mild steel bracket to get a high quality finish. [3]

.....

.....

.....

.....

.....

.....

(c) **List four** important safety precautions that need to be followed when drilling metal. [4]

Precaution 1: .....

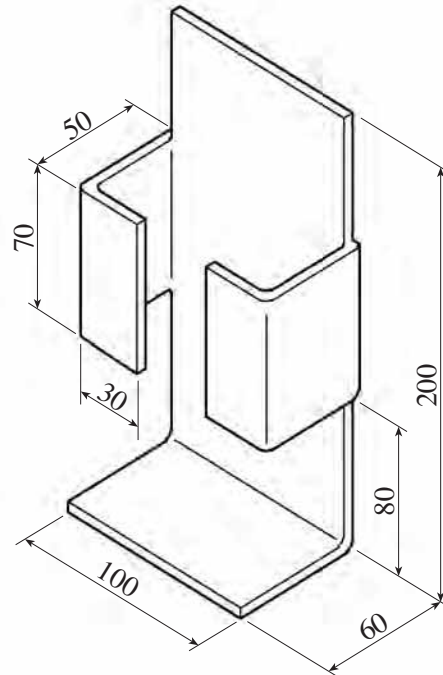
Precaution 2: .....

Precaution 3: .....

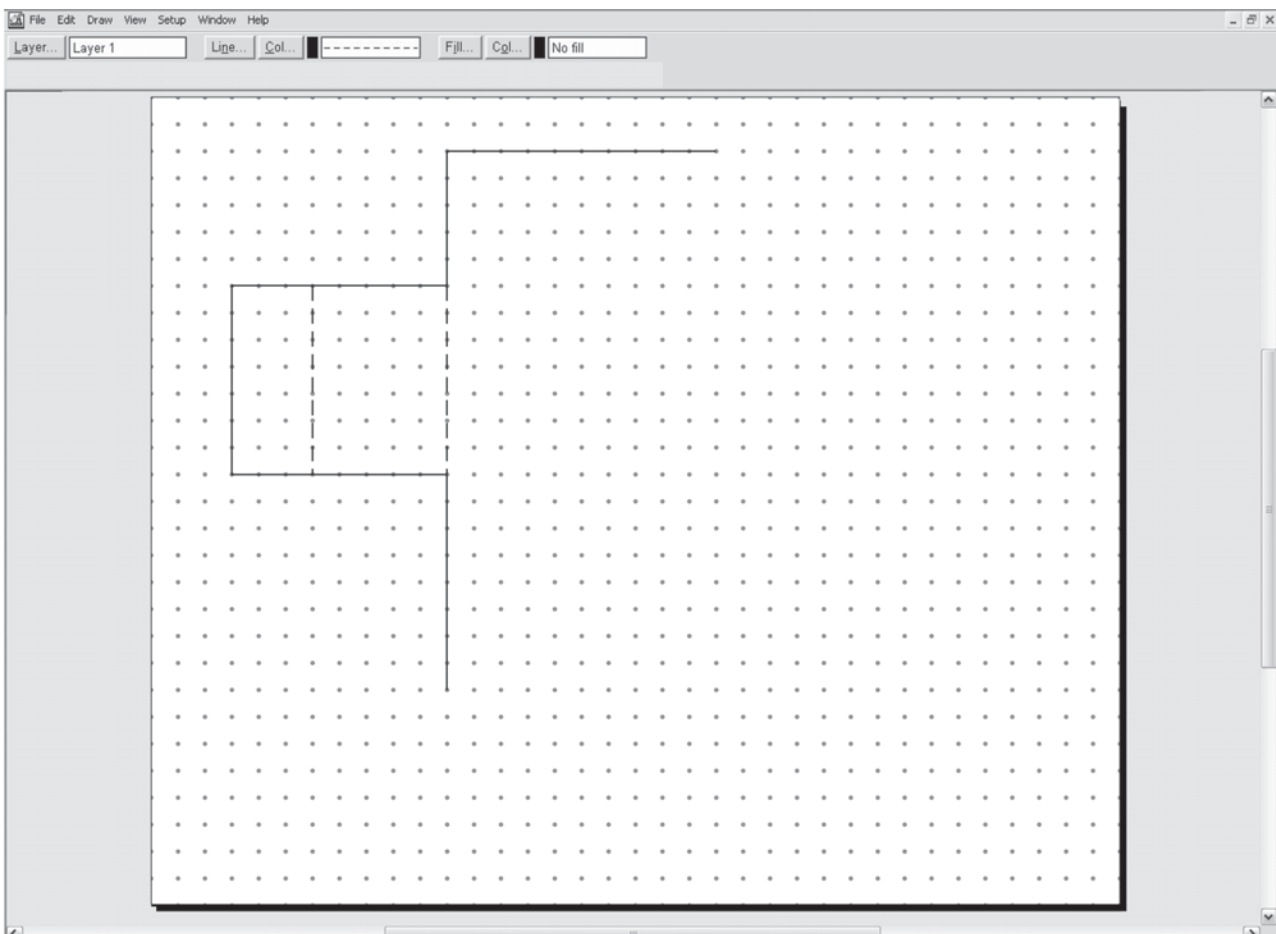
Precaution 4: .....

3. A design for a wall mounted holder for an electric razor is shown below. The holder is designed and made using CAD and CAM (computer aided design and computer aided manufacture).

**Note:** all dimensions are shown in mm.



- (a) The holder is to be made from a single piece of plastic material. The net of the holder is designed on CAD. **Accurately complete** the net started on the screen below. The grid spacing is 10mm. [5]





(b) (i) **Give two** advantages of using **CAD** to **design** the holder.

Advantage 1: .....  
..... [1]

Advantage 2: .....  
..... [1]

(ii) **Give two** advantages of using **CAM** to **make** the holder.

Advantage 1: .....  
..... [1]

Advantage 2: .....  
..... [1]

(iii) The design is manufactured from 3mm plastic material. **Underline** the most suitable plastic material for making the holder and **give two** reasons for your choice.

**Acrylic**                      **Urea Formaldehyde**                      **Nylon**                      [1]

Reason 1: ..... [1]

Reason 2: ..... [1]

(iv) **Name** a specific CAM machine that would be suitable for making the holder. [1]

.....

(c) After machining, the edges of 3mm plastic material need to be ‘cleaned up’ to get a good finish.

**Describe** how you would do this. [3]

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

- (d) Use notes and sketches to **explain** how you would accurately bend the plastic material into the correct shape. [5]

**THERE ARE NO QUESTIONS ON THIS PAGE**

**TURN OVER FOR QUESTION 4**

4. The picture shows a hardwood garden bench together with a close up detail of a leg and cross rail (Diagram A).

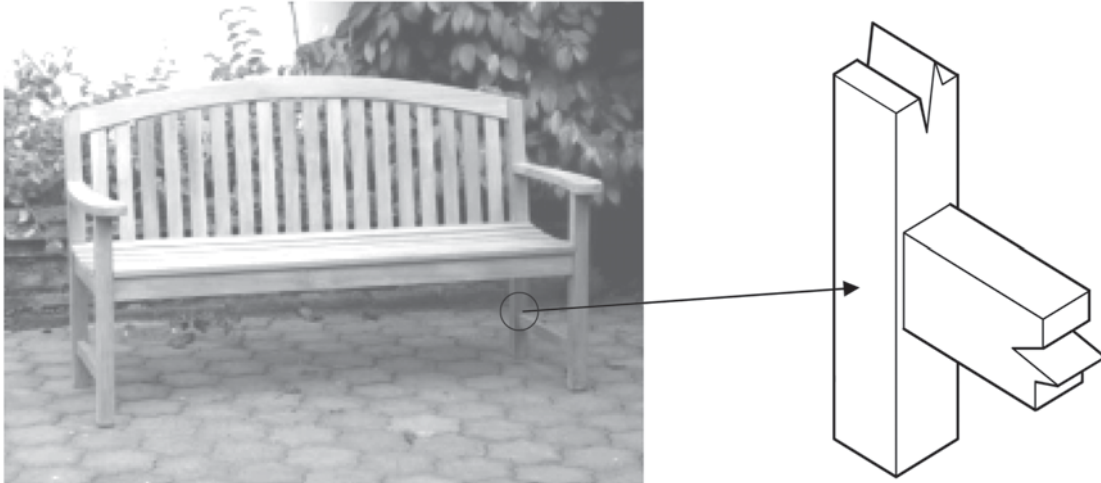


Diagram A

- (a) (i) **Name** a suitable hardwood for making the bench. [1]

.....

- (ii) **Give two** reasons for your choice of material. [2]

Reason 1: .....

Reason 2: .....

- (b) In the space below, **name** and **sketch** a suitable permanent joint to join the leg and cross rail. (Diagram A) [5]

Name of permanent joint : .....

- (c) Many garden centres and DIY outlets sell garden benches 'flat packed'. Give two advantages for the retailer of selling furniture 'flat packed'.

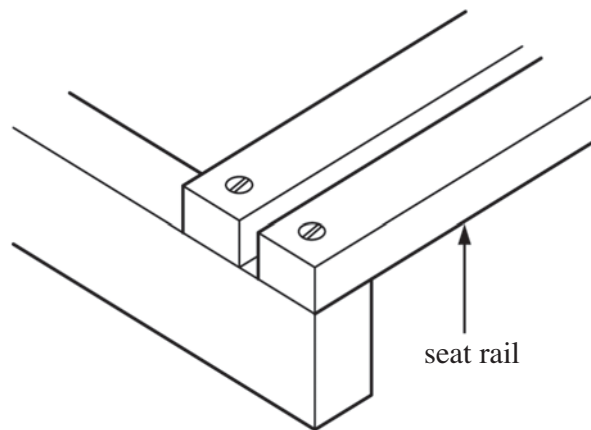
Reason 1: .....

..... [1]

Reason 2: .....

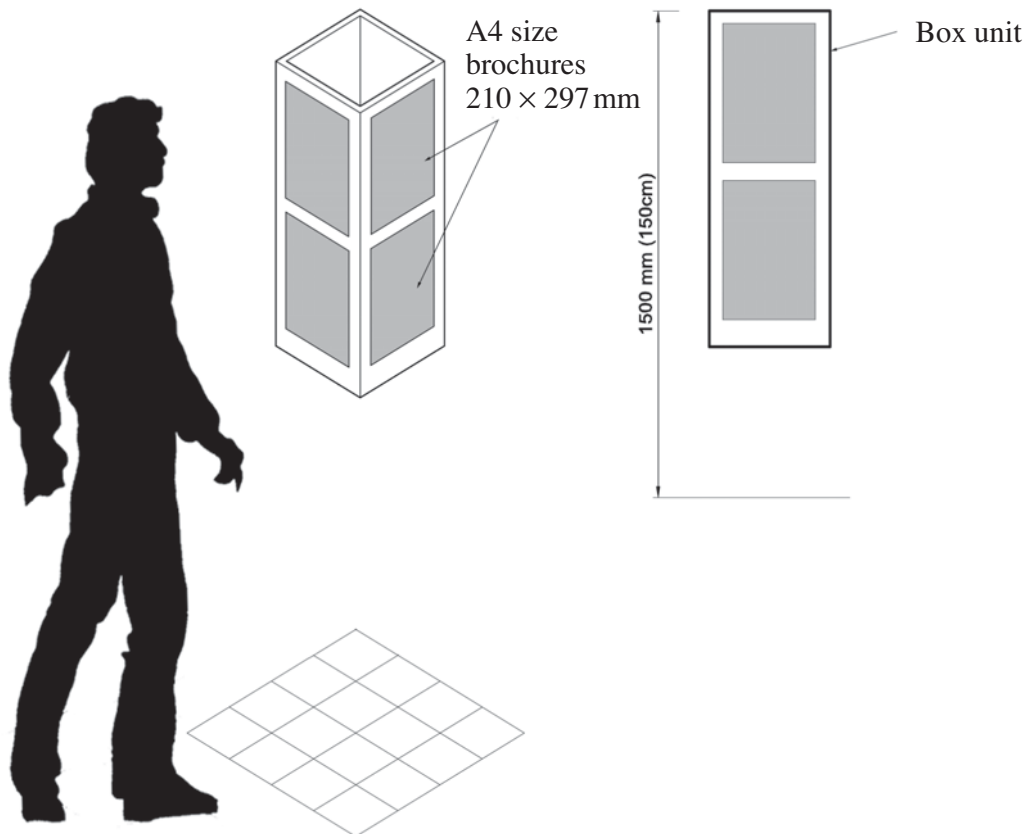
..... [1]

- (d) A student has designed a garden bench and wants to screw the seat rails in place as shown in the diagram below. Using notes and sketches, describe how you would successfully do this. [5]



5. The diagram shows the basic design for a display unit to hold A4 size school brochures in the reception area in a secondary school. The design is to be a box unit supported at an appropriate height by a stand.

You have been asked to **complete** the design.



### Specification

The unit must:

- be freestanding;
- allow visitors to easily remove the A4 brochures.

(a) **Sketch** your solution on the opposite page.

### Marks will be awarded for:

- |   |     |
|---|-----|
| (i) showing clear details of the size and construction of the box unit;   | [4] |
| (ii) showing clear details of how the supporting stand is constructed;    | [6] |
| (iii) showing clear details of how the box unit is attached to the stand; | [3] |
| (iv) materials and fastenings used;                                       | [2] |
| (v) quality of communication.   | [5] |

On this page, **show** your design for the box unit, the stand and the way they are joined together.

**Turn over for part (b)**

- (b) In the space below, **show** a method of holding and displaying the A4 size brochures in position on the box unit. The brochures will be the same size and thickness as this exam paper. [5]



