Candidate Name	Centre Number	Candidate Number
		0

WJEC CBAC

GCSE

141/02

DESIGN AND TECHNOLOGY

PAPER 2

FOCUS AREA: RESISTANT MATERIALS TECHNOLOGY

Foundation Tier

A.M. THURSDAY, 21 May 2009

1½ hours

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

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.

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

1. *(a)* From the list below, **choose** the most suitable material to make the products shown and **give** a reason for your choice. [8]

PVC **Acrylic** **Beech** **MDF** **Urea Formaldehyde**

Product	*Suitable material*	*Reason for choice*
Mallet 	.....	....
Body of a 3 pin plug 	.....	....
Bookcase 	.....	....
Sandwich container 	.....	....

Examiner only

(b) Metals are classified as ferrous or non-ferrous. **Study** the list below and put each metal into the correct column in the table. [4]

Lead **Iron** **Stainless Steel** **Gold**

Ferrous metals	*Non-ferrous metals*

(c) A metal alloy is a mixture of two or more metals or a metal and an element. **Study** the list below and **select**:

Mild Steel **Aluminium** **Brass** **Copper**

(i) A **ferrous** alloy: ..... [1]

(ii) A **non-ferrous** alloy: ..... [1]

(iii) **Explain** the advantages of an **alloy**.

.....

.....

[2]

(d) (i) Name a **permanent** method of joining two pieces of metal. [1]

.....

(ii) Name a **temporary** method of joining two pieces of metal. [1]

.....

Turn over.

2. The photograph below shows a wooden toolbox.

(a) (i) **Underline** a suitable **softwood** for making the sides of the box. [1]

Pine **Oak** **Chipboard**

(ii) **Underline** the most suitable material for making the bottom of the box. [1]

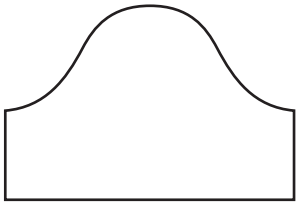
Plywood **Copper** **Polystyrene**

(iii) **Name** and **sketch** a suitable corner joint for making the box.

Name of joint: ..... [1]

Sketch of joint: [3]

(b) The side of the tool box has been marked out as shown below. **Using** notes and sketches, **show** how you would use **hand tools** to cut and shape the side of the toolbox. [5]



(c) **Using** notes and sketches **show** how you would accurately attach the handle to the box. [5]

3. The photographs show **two** garden chairs.

Chair A	**Chair B**
	
Hardwood Made in the UK Batch produced Cost £199	Thermosetting plastic Made in the Far East Mass produced Cost £12

(a) (i) **Underline** a suitable hardwood for making Chair A. [1]

Teak **Balsa** **Red Deal**

(ii) **Give** a reason for your choice. .....

.....

[2]

(b) **Describe three** reasons why Chair A is a lot more expensive than Chair B.

Reason 1: .....

.....

[2]

Reason 2: .....

.....

[2]

Reason 3: .....

.....

[2]

(c) Other than cost, explain **one** other advantage of Chair B.

Advantage: .....

.....

[2]

(d) **Give three specification** points the designer would need to think about before designing a garden chair. ***One*** *has been done for you.*

The chair must be attractive to look at in order to attract buyers.

Specification point 1: .....

.....

[2]

Specification point 2: .....

.....

[2]

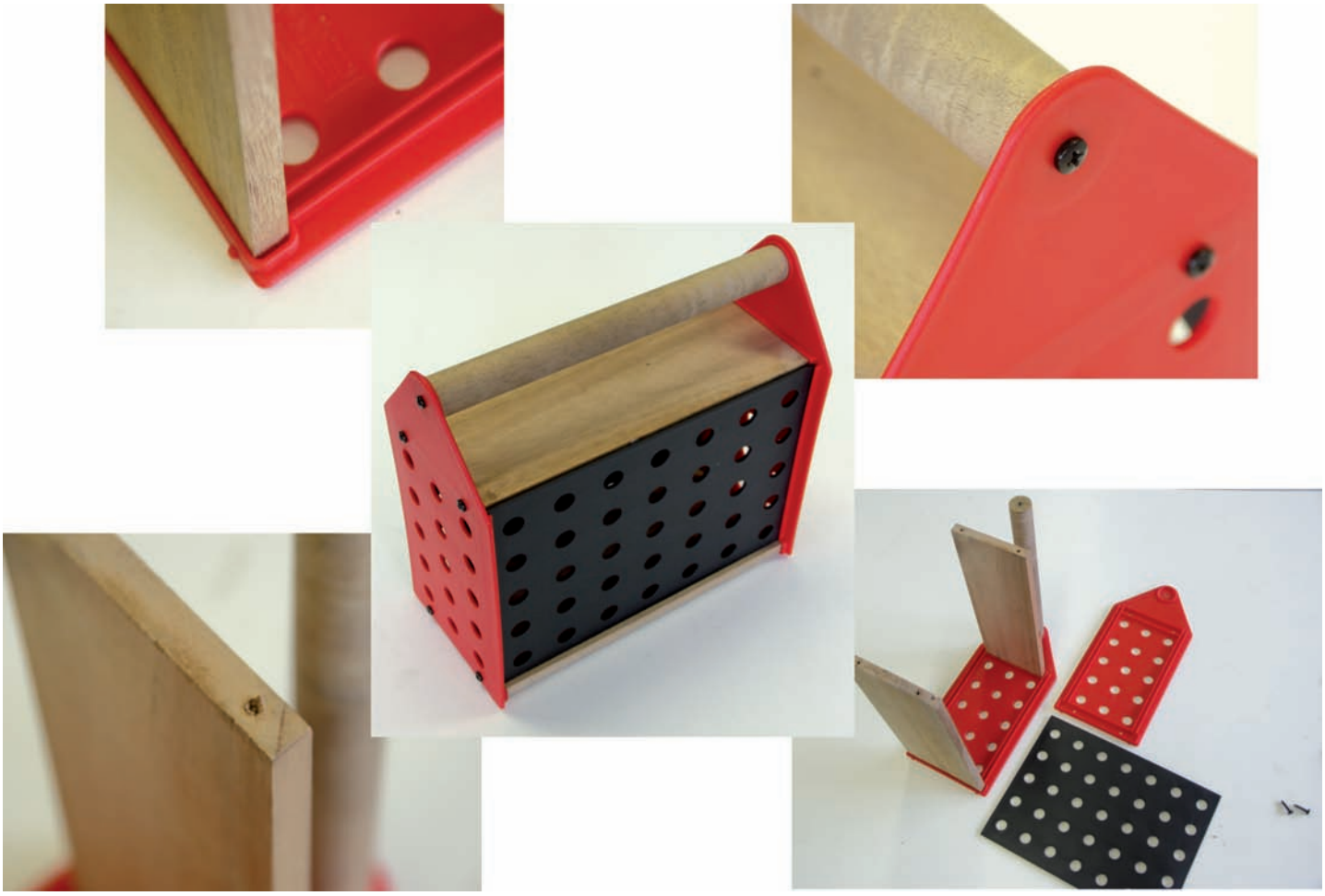
Specification point 3: .....

.....

[2]

Examiner only

4. The photographs below show the **disassembly** of an existing product.



(a) **Describe three** pieces of information you could find by looking at and disassembling this product.

1. .....

.....

[2]

2. .....

.....

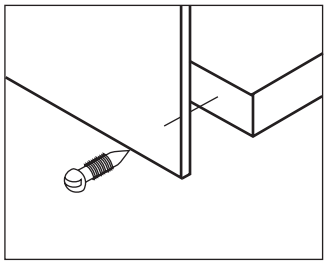
[2]

3. .....

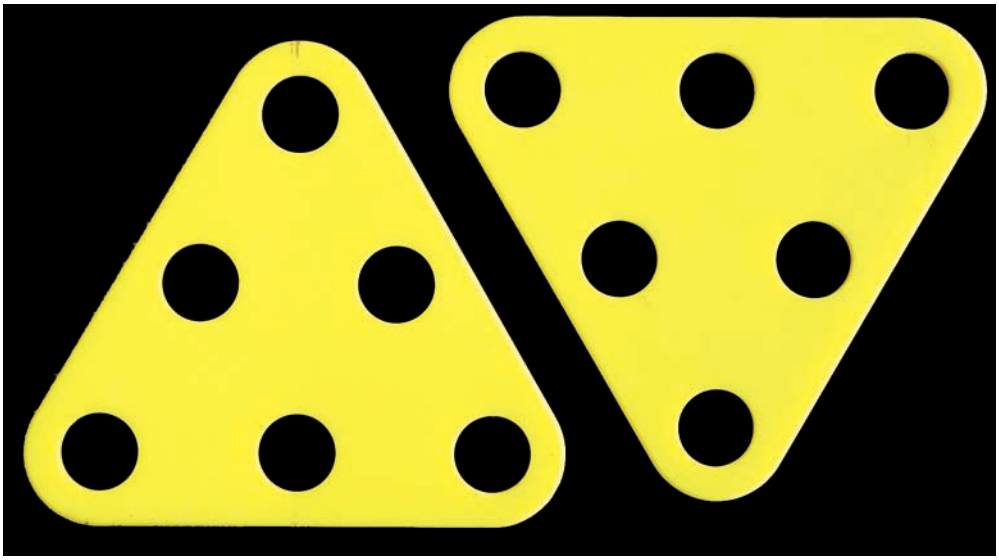
.....

[2]

(b) The plastic sides of the product are to be screwed into the solid wood base. **Using notes** and **sketches** show how you would do this. [5]



(c) The product contains parts for a child's construction kit as shown in the photograph below. The parts are made from plastic.



(i) **Name** a suitable plastic for making the parts. ..... [1]

(ii) The parts are manufactured on a Computer Aided Manufacturing (CAM) system.

Name a CAM machine that could be used to make the parts.

..... [1]

(iii) **Give two** advantages of using a CAM system.

Advantage 1: .....

.....

[2]

Advantage 2: .....

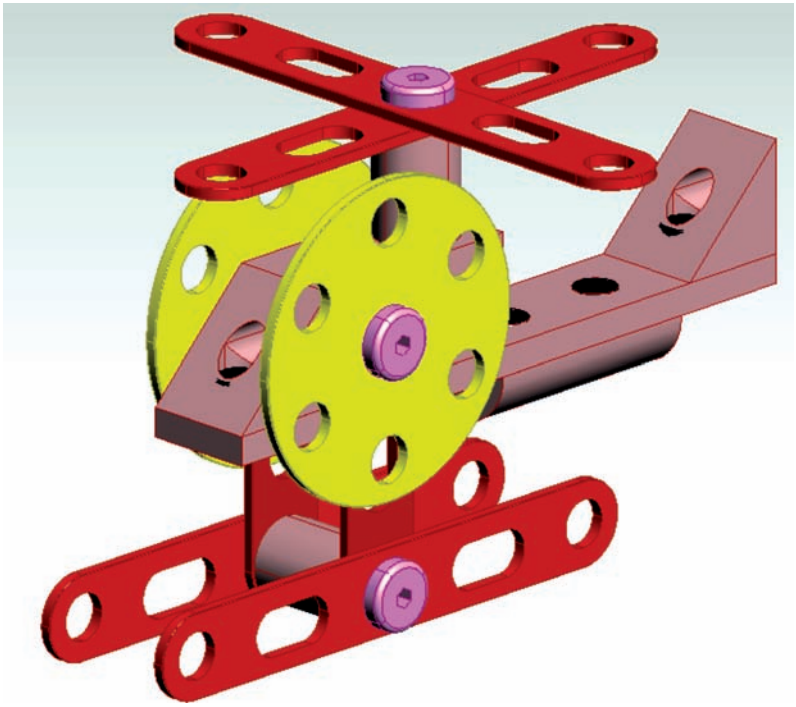
.....

[2]

(d) **Give three** safety precautions you would have to think about when designing the parts for a construction kit for young children. [3]

1	
2	
3	

(e) The diagram shows parts designed on a 3 dimensional CAD package such as Prodesktop.



Describe two advantages of using such a CAD package.

Advantage 1: .....

.....

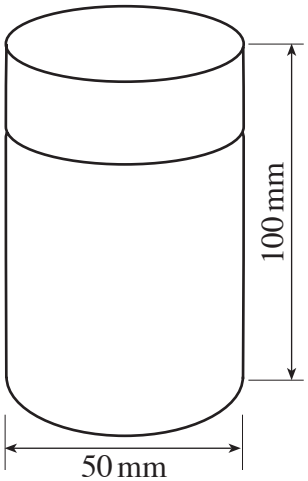
[2]

Advantage 2: .....

.....

[2]

5. The diagram below gives the dimensions of a spice jar. You are asked to design a **revolving** spice rack. The rack must hold **6 jars** and rotate through 360 degrees to allow easy access to each jar.



Specification

The design must:

- securely hold 6 spice jars;
- allow the jars to be easily removed;
- rotate through 360 degrees;
- be aesthetically pleasing.

Marks will be awarded for:

(i)	full constructional details of the spice rack;	[4]
(ii)	full constructional details of how the spice rack rotates;	[4]
(iii)	details of how the spice jars are held securely in place;	[3]
(iv)	details of how the jars can be easily removed;	[3]
(v)	reference to materials, components and processes used;	[3]
(vi)	two dimensions;	[2]
(vii)	quality of communication.	[6]

Show your design in the boxes that follow.

Show a sketch of your design with constructional details.

Show full constructional details of how the rack rotates.

Show details of how the jars are securely held and easily removed.

For continuation only