

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use

General Certificate of Secondary Education
June 2006

**DESIGN AND TECHNOLOGY
(PRODUCT DESIGN)
Written Paper
Foundation Tier**

**3544/F
F**



Thursday 25 May 2006 9.00 am to 11.00 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> a pen, pencil, ruler, eraser, pencil sharpener and coloured pencils

Time allowed: 2 hours

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.

Information

- The maximum mark for this paper is 125.
- The marks for questions 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			
3			
4			
5			
6			
7			
8			
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			

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

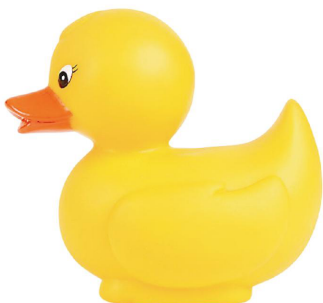
Question 1 is about materials.

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

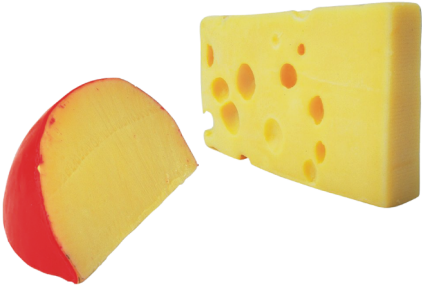



1 (a) Select **two** of the products below.

Circle the material they are made from and tick whether or not it is recyclable.

An example has been completed for you.

Product	Materials	Recyclable Non-recyclable
Toy 	Polypropylene Glass Concrete	Recyclable <input checked="" type="checkbox"/> Non-recyclable

Product	Materials	Recyclable Non-recyclable
Shirt 	Carbon fibre Cotton Wire wool	Recyclable Non-recyclable
Skateboard deck 	Plywood Chipboard MDF	Recyclable Non-recyclable

Product	Materials	Recyclable Non-recyclable
Cheese 	Flour Milk Eggs	Recyclable Non-recyclable
Playing cards 	Laminated card Paper Corrugated card	Recyclable Non-recyclable
Scooter 	Pewter Copper Aluminium alloy	Recyclable Non-recyclable
Teacup 	Plaster Fibreglass Porcelain	Recyclable Non-recyclable

(4 marks)

(b) Composite materials are created to improve the properties of materials.

- (i) Underline **one** material from each column which might be combined together to make a composite material.

Copper	Urea formaldehyde
Cotton	Zinc
Wood fibres	Elastane (Lycra)
Polyester resin	Aluminium
Cardboard	Glass

(1 mark)

- (ii) Using a specific product explain where and why this composite material might be used.

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(3 marks)

Turn over for the next question

Turn over ►

Question 2 is about designing.

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

- 2 (a) Select **two** of the following terms and explain how they can help when designing products.

- Market Research
- Product Analysis
- Questionnaire
- Design Specification

(i) Term

Explanation

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(2 marks)

(ii) Term

Explanation

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(2 marks)

- (b) Explain how you could use ICT (Information Communication Technology) in your design folder.

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(3 marks)

Question 3 is about improving products.
You are advised to spend about 25 minutes on this question.

- 3 (a) Drive-in fast-food outlets sell hot and cold drinks in disposable containers.

Figure 1 shows two drinks containers.

Figure 1



- (i) Explain why these containers can be easily knocked over.

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.....

.....

(2 marks)

- (ii) Give **one** special quality that a hot drinks container should have.

.....

(1 mark)

- (iii) Explain why this quality is important.

.....

.....

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(2 marks)

- (iv) From the list below circle a suitable material from which to make a disposable hot drinks container.

- Chipboard
- Expanded polystyrene
- Cartridge paper

(1 mark)

Question 3 continues on the next page

(b) A company called 'Easy Drink' requires a carrier for drinks containers.

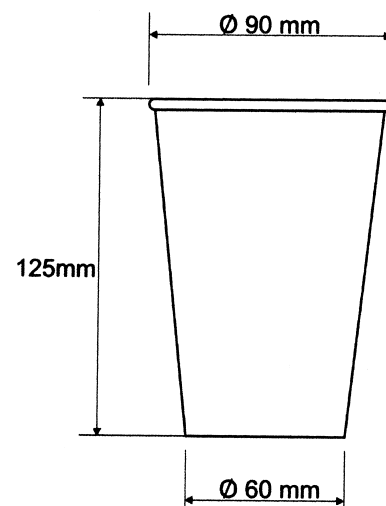
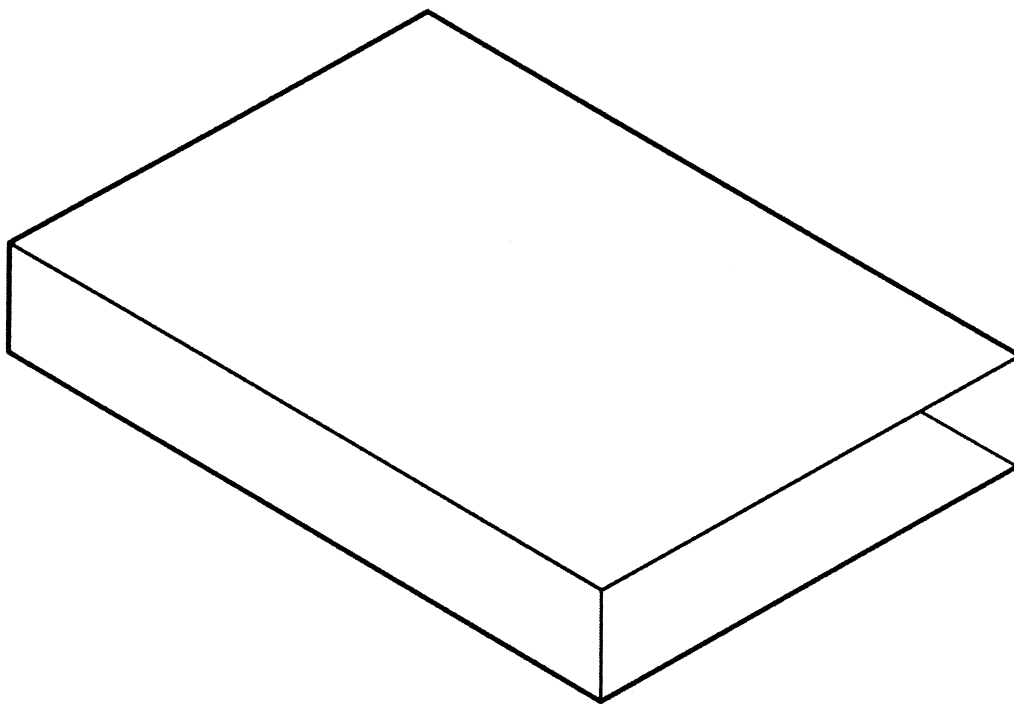
The carrier will be made from stiff card.

(i) Change the basic tray/carrier shown below to include the following improvements.

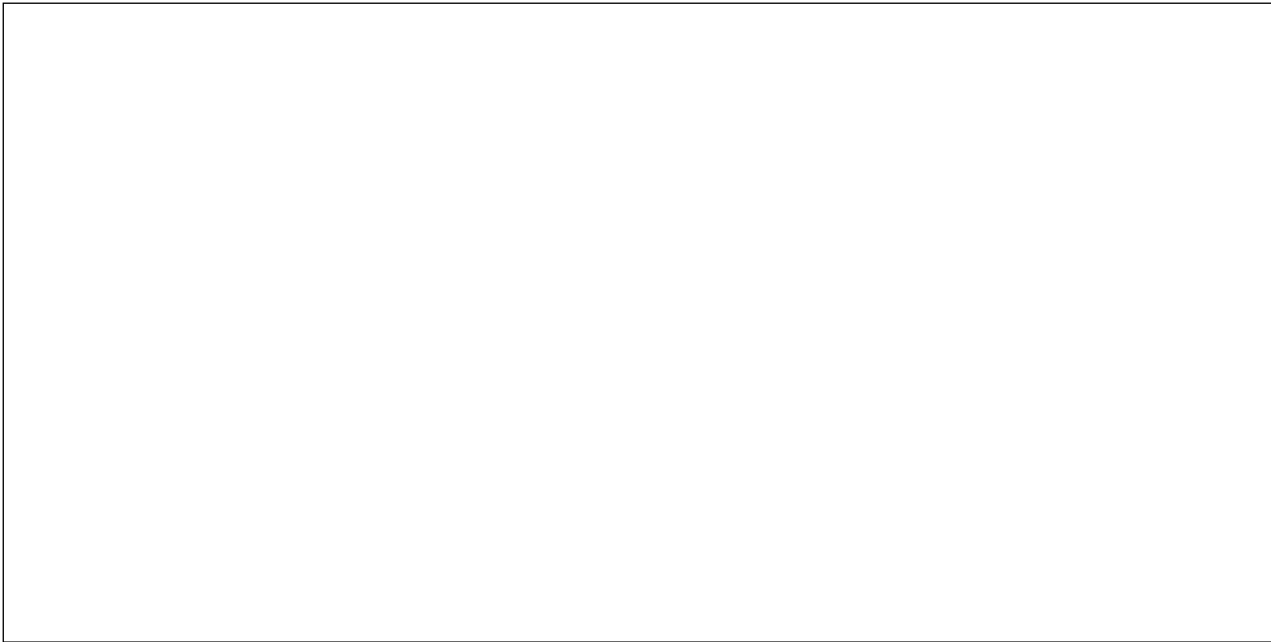
- Show how it could hold up to four drinks securely. You will need to add dimensions. (6 marks)
- Show how you could make the carrier more rigid. (4 marks)
- Show where you would put the company logo. (2 marks)

(You do not need to design a logo at this stage, just indicate the position).

The dimensions of the drinks containers are also shown below.



(ii) Design a suitable logo for the company 'Easy Drink'.



(5 marks)

(c) (i) Name a suitable printing process for the card drinks carrier.

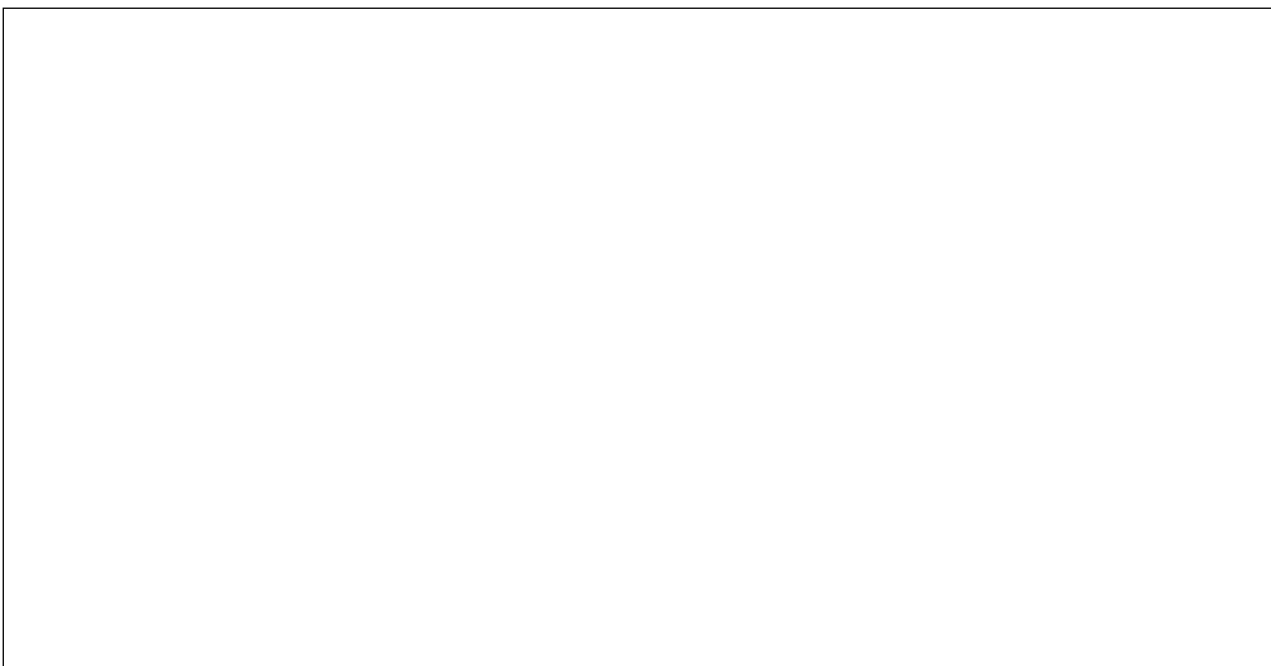
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(2 marks)

(ii) Using notes and sketches explain how the drinks carrier will be cut out and creased.



(4 marks)

Turn over ►

Question 4 is about products that have similar functions.
You are advised to spend about 10 minutes on this question.

- 4 (a) Cameras are designed for different markets.

Select **two** cameras from below and explain **one** advantage and **one** disadvantage of each camera.



- (i) **One** advantage of using camera

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.....

.....

(2 marks)

(ii) **One** disadvantage of using camera

.....

.....

.....

(2 marks)

(iii) **One** advantage of using camera

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(2 marks)

(iv) **One** disadvantage of using camera

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.....

(2 marks)

(b) Give **two** reasons why products change over time.

Reason 1

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(2 marks)

Reason 2

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.....

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(2 marks)

Question 5 is about modelling and testing.

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

- 5** During the production of a product, designers will use modelling and testing, which can be undertaken in a number of different ways.

- (a) Using notes and sketches explain how you have used modelling at some stage in your own work.



(6 marks)

- (b) Explain **one** test you might have carried out during your coursework project.

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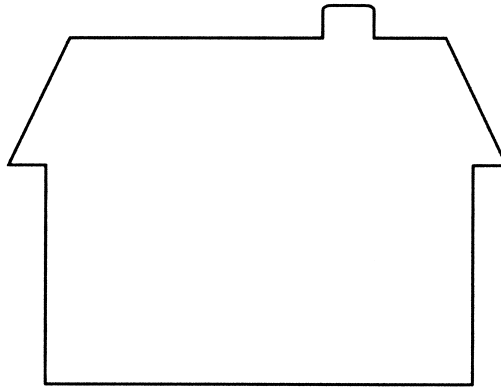
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(3 marks)

Question 6 is about the design and manufacture of new products.
You are advised to spend about 30 minutes on this question.

- 6 Hillside school has developed a reward scheme for pupils completing homework on time. The Headteacher has asked the Technology Department (Food, Textiles, Resistant Materials, Graphics, Ceramics) to make a number of products that could be given away to celebrate excellent work.

The same house outline shape will be used for all material areas.



50 identical house shapes are required.

- (a) Choose a material you are familiar with and explain why it is suitable for this scale of production.

(i) Material

.....
(1 mark)

(ii) Reason

.....
.....
(1 mark)

Question 6 continues on the next page

Turn over ►

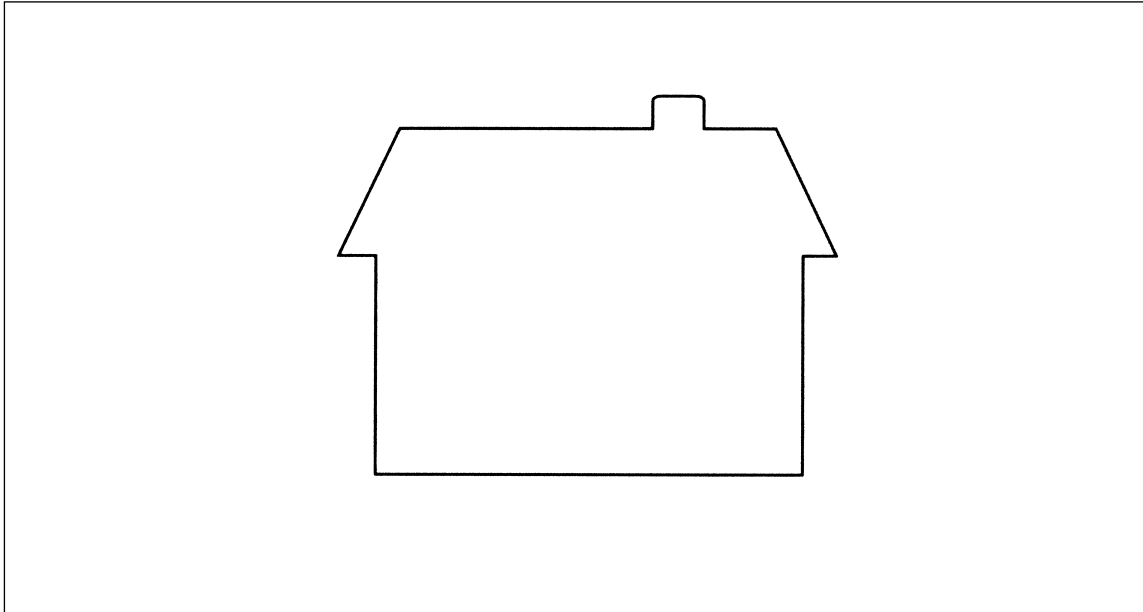
Marks will be awarded for:

- (i) an accurate description of each stage of the process; (4 marks)
- (ii) correct naming of tools and equipment; (3 marks)
- (iii) quality of communication. (3 marks)

Use the space below to complete your answer.

- (c) Use sketches and notes to improve the house design by adding a door and **three** windows.

Your notes should explain in detail how this would be achieved.



(4 marks)

- (d) Explain how you would ensure that each of the house shapes is exactly the same.

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(2 marks)

- (e) Give **two** safety rules and the reasons you would follow them when making the house shape.

Safety rule 1

.....

Reason

.....

Safety rule 2

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Reason

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(4 marks)

Question 7 is about assembling products.

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

- 7 (a) Products are often assembled from several parts.

Explain why this might be the case.

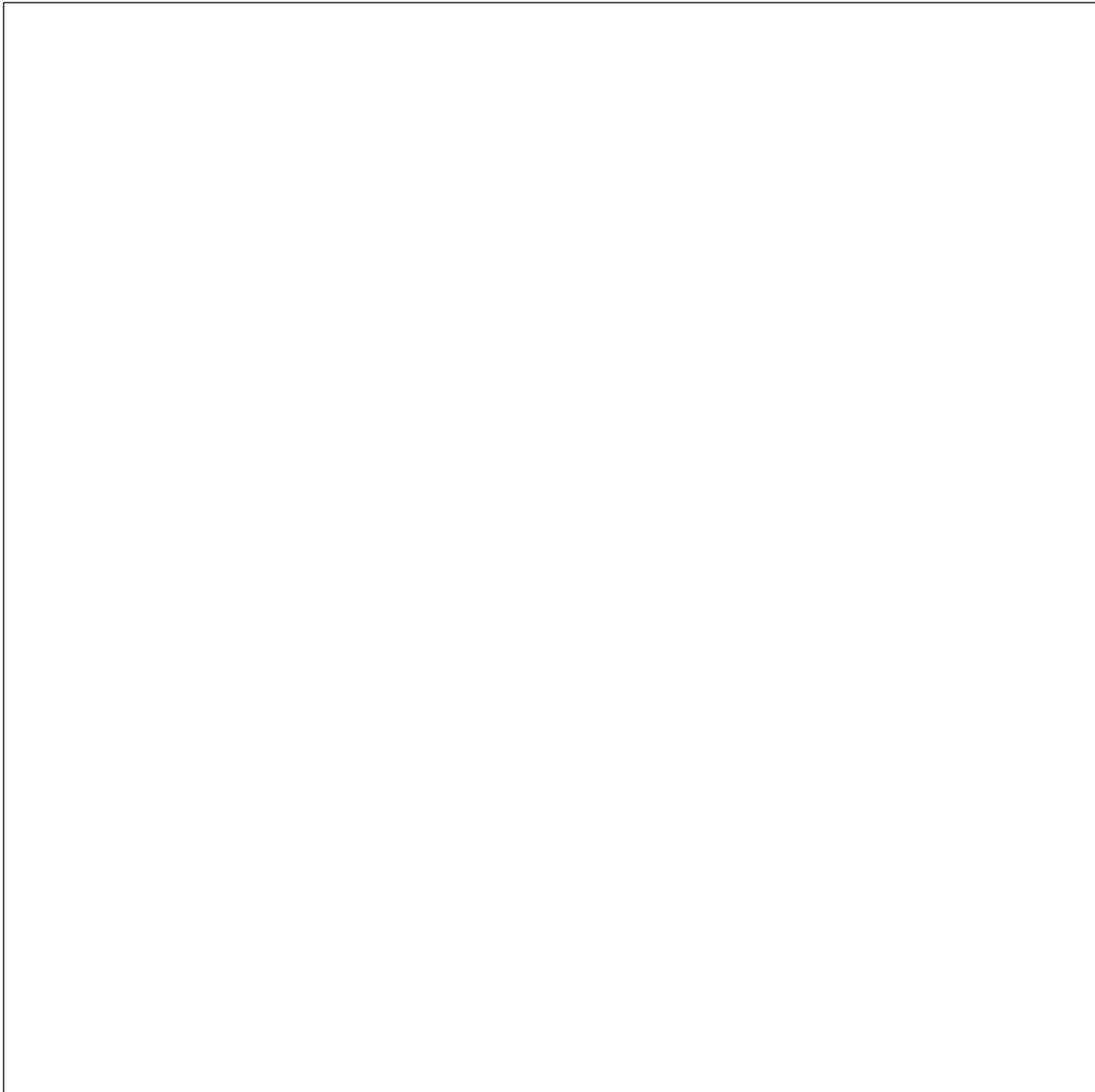
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(2 marks)

- (b) Using notes and sketches explain in detail **one** assembly method you have used.



(4 marks)

- (c) Many products are designed for self assembly.

Give **two** advantages of producing self assembly products.

Advantage 1

.....

Advantage 2

.....

(2 marks)

- (d) Using notes and sketches explain in detail **one** non-permanent fastening found on products.

(3 marks)

Turn over ►

Question 8 is about consumer information and packaging.
You are advised to spend about 15 minutes on this question.

- 8 (a) There are a variety of reasons why packaging is used.

State and explain **two** reasons for packaging a product.

Reason 1

Explanation

(2 marks)

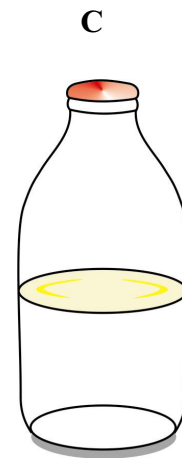
Reason 2

Explanation

(2 marks)

- (b) Select **one** of the milk containers below.

Give **one** advantage and **one** disadvantage of the container.



Container

Advantage

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(2 marks)

Disadvantage

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(2 marks)

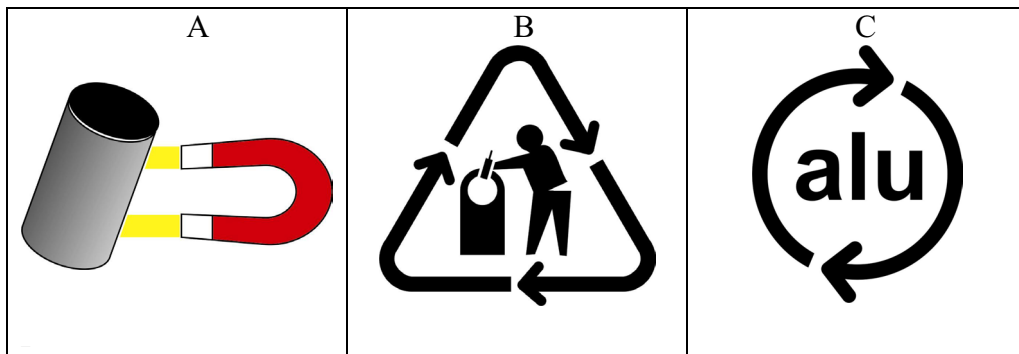
(c) Give **one** advantage of using biodegradable materials for packaging.

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(1 mark)

(d) The following information is often found on products or the packaging.



For each one state the recyclable material they represent.

A

B

C

(3 marks)

Question 8 continues on the next page

Turn over ►

- (e) Explain why recycling is an important consideration for consumers.

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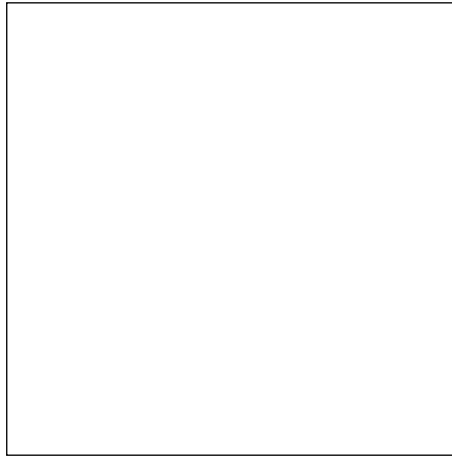
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(3 marks)

- (f) Draw **one** of the symbols found on plastic products to assist with recycling.



(2 marks)

Question 9 is about the use of ICT systems.

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

9 (a) What does the term CAD mean?

.....
(1 mark)

(b) Give **two** advantages, with explanations, of using CAD.

(i)
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(2 marks)

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

(c) What does the term CAM mean?

.....
(1 mark)

(d) Give **two** advantages, with explanations, of using CAM.

(i)
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(2 marks)

(ii)
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(2 marks)

END OF QUESTIONS

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