

Centre Number	Candidate Number	Name
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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**DESIGN AND TECHNOLOGY**

**0445/01**

Paper 1 Common Core

May/June 2004

**1 hour 45 minutes**

Additional Materials:  
A3 Drawing paper  
Standard drawing equipment

**To be taken together with the optional paper for which you have been entered in one session of 2 hours 45 minutes.**

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.  
Write in dark blue or black pen in the spaces provided on the Question Paper.  
You may use a soft pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

Part A  
Answer **all** questions.  
Write your answers in the spaces provided on the question paper.

Part B  
Answer **one** question.  
Write or draw your answer on the A3 drawing paper provided.

At the end of the examination, fasten all your work securely together.  
The number of marks is given in brackets [ ] at the end of each question or part question.  
You may use a calculator.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

For Examiner's Use	
Part A	
Part B	
Total	

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

- 1 Fig. 1 shows a small vase on display at an exhibition. The light source is also shown. Draw the shadow of the vase on Fig. 1 and add appropriate shading on the vase.

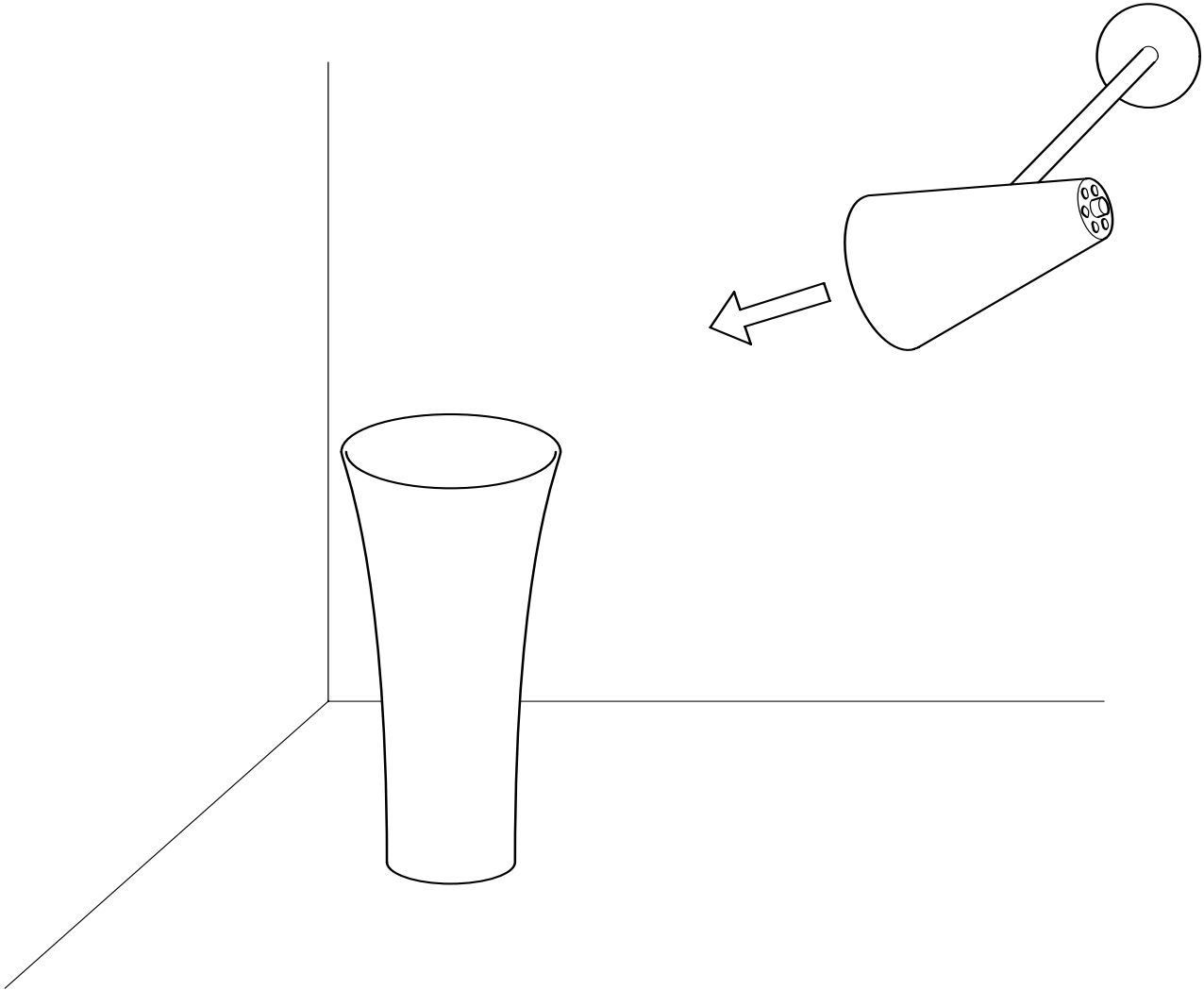


Fig. 1

[5]

2 Fig. 2 shows a metal wheelbarrow for children up to the age of 10 years.

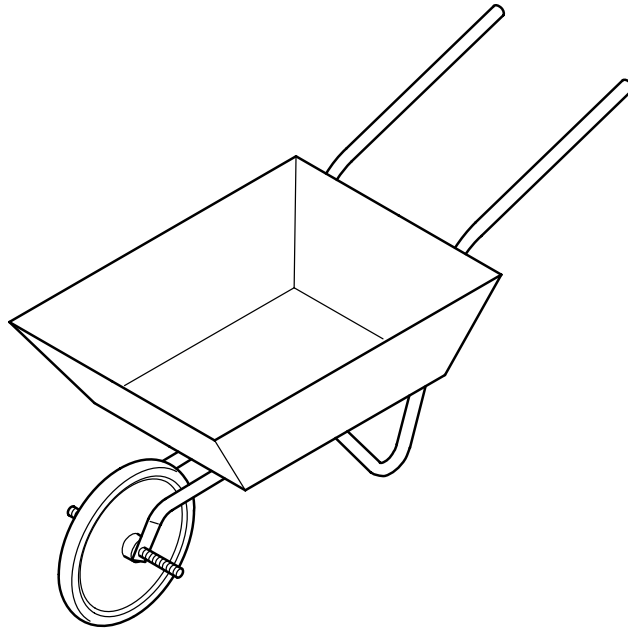


Fig. 2

(a) Identify **two** parts of the wheelbarrow that could be dangerous for children.

(1) ..... [1]

(2) ..... [1]

(b) Use sketches and notes to show how **each** of these dangerous parts could be improved.

(1)

[2]

(2)

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3 Complete the table below showing processes, tools and the materials on which they are used.

Process	Tool	Material
marking centre for hole		steel sheet
	try square	hardwood
cutting curves		acrylic sheet
cutting to length	hacksaw	

[4]

4 (a) Name **two** renewable energy sources.

(1) ..... [1]

(2) ..... [1]

(b) Name **two** non-renewable energy sources.

(1) ..... [1]

(2) ..... [1]

5 (a) Give a method of joining **permanently**:

(i) acrylic sheet; ..... [1]

(ii) steel tube. .... [1]

(b) Give a **temporary** joining method for:

(i) softwood; ..... [1]

(ii) brass sheet. .... [1]

6 (a) Fig. 3 shows a small tent used for camping.

Add labels to Fig. 3 to indicate **one** part that is in tension and **one** part that is in compression.

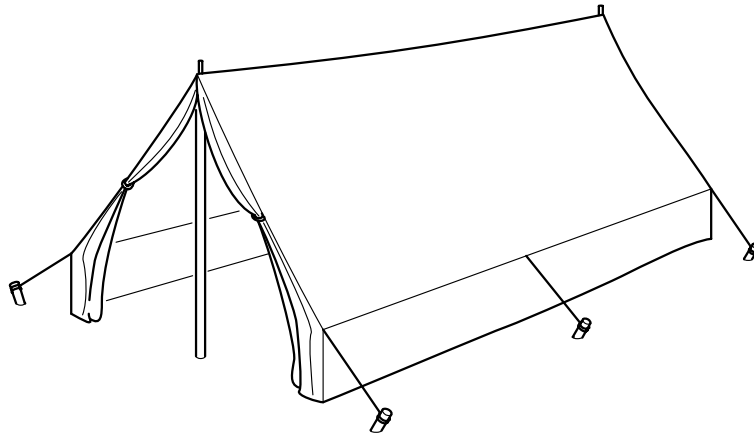


Fig. 3 [2]

(b) Complete the following sentences.

(i) A structural part in tension is called a ..... [1]

(ii) A structural part in compression is called a ..... [1]

7 Name a piece of safety equipment that must be worn by a person using:

(a) a drilling machine; ..... [1]

(b) a wood sanding machine. .... [1]

8 Fig. 4 is a block diagram of a simple control system.

Label Fig. 4 to indicate: process; input; output and feedback.

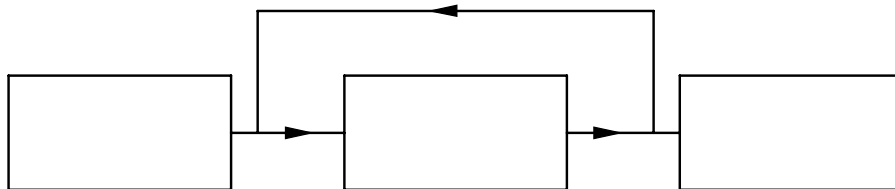
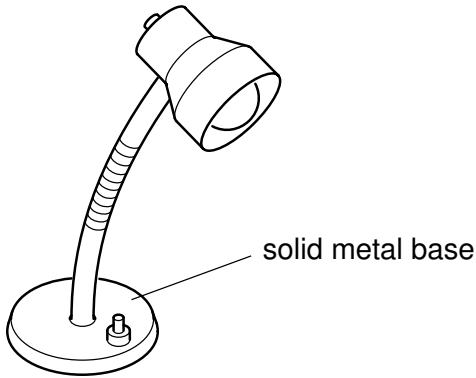


Fig. 4 [4]

9 Fig. 5 shows three items in everyday use.

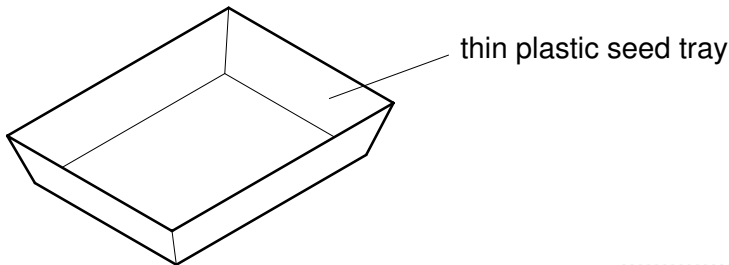
Suggest a method of manufacture for each of the items or parts named.

(a)



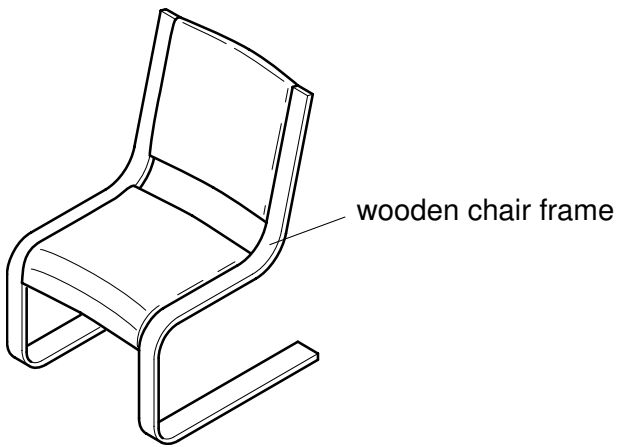
..... [1]

(b)



..... [1]

(c)



..... [1]

Fig. 5

10 (a) Explain why models and mock-ups are often used in a design process.

.....  
.....  
..... [2]

(b) Give **two** ways of producing models and mock-ups.

(1) ..... [1]  
(2) ..... [1]

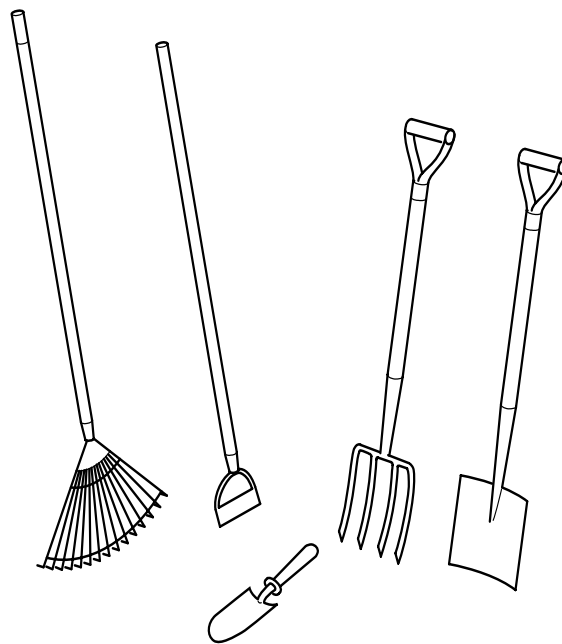
Answer **one** question using the A3 paper provided.

11



A primary school runs a gardening club which children can attend while they are waiting to be collected by their parents at the end of each day.

An outdoor storage system is required so that the following tools can be stored each night.





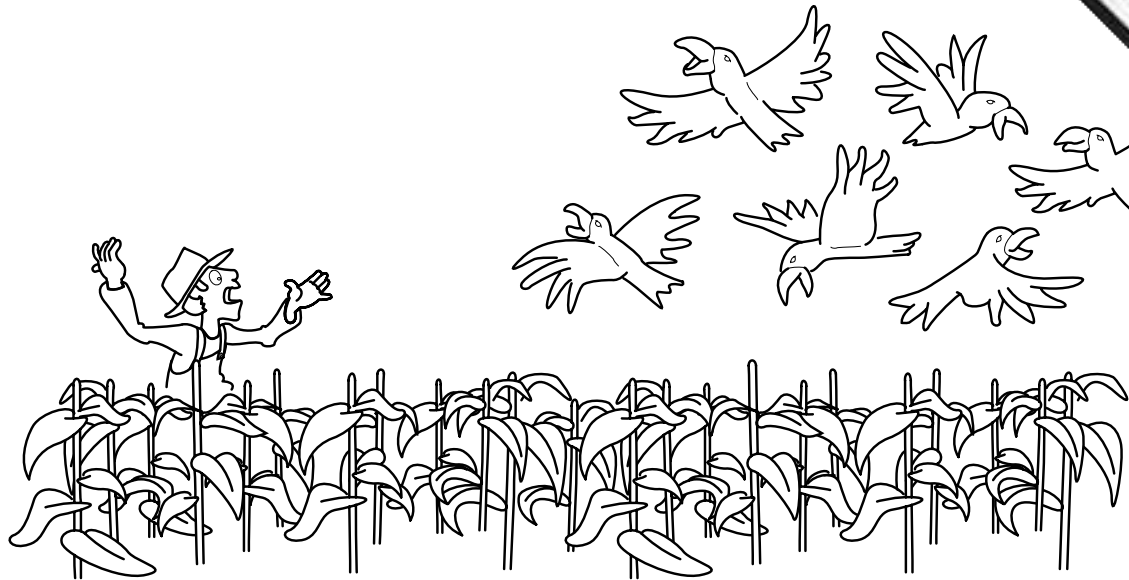
- (a) List **four** points about the function of such a storage system that you consider most important.
- (b) List **four** points about the appearance of such a storage system that you consider most important.
- (c) Develop and sketch ideas for the storage system. [15]
- (d) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to your problem. [18]
- (f) Suggest suitable materials for your solution and give reasons for your choice. [4]
- (g) Outline a method used to manufacture **one** part of your solution in the school workshop. [7]



Design and Technology projects include the production of design drawing sheets, models and mock-ups. It is often necessary to carry these to and from school so that designing can be continued as homework.

A lightweight carrier for these items would be helpful.

- (a) List **four** points about the function of such a carrier that you consider to be important. [4]
- (b) List **four** points about the appearance of such a carrier that you consider to be important. [4]
- (c) Develop and sketch ideas for the carrier. [15]
- (d) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to your problem. [18]
- (f) Suggest suitable materials for your solution and give reasons for your choice. [4]
- (g) Design a logo for the carrier that represents your Design and Technology coursework. Describe the method used to put the logo on the carrier. [7]

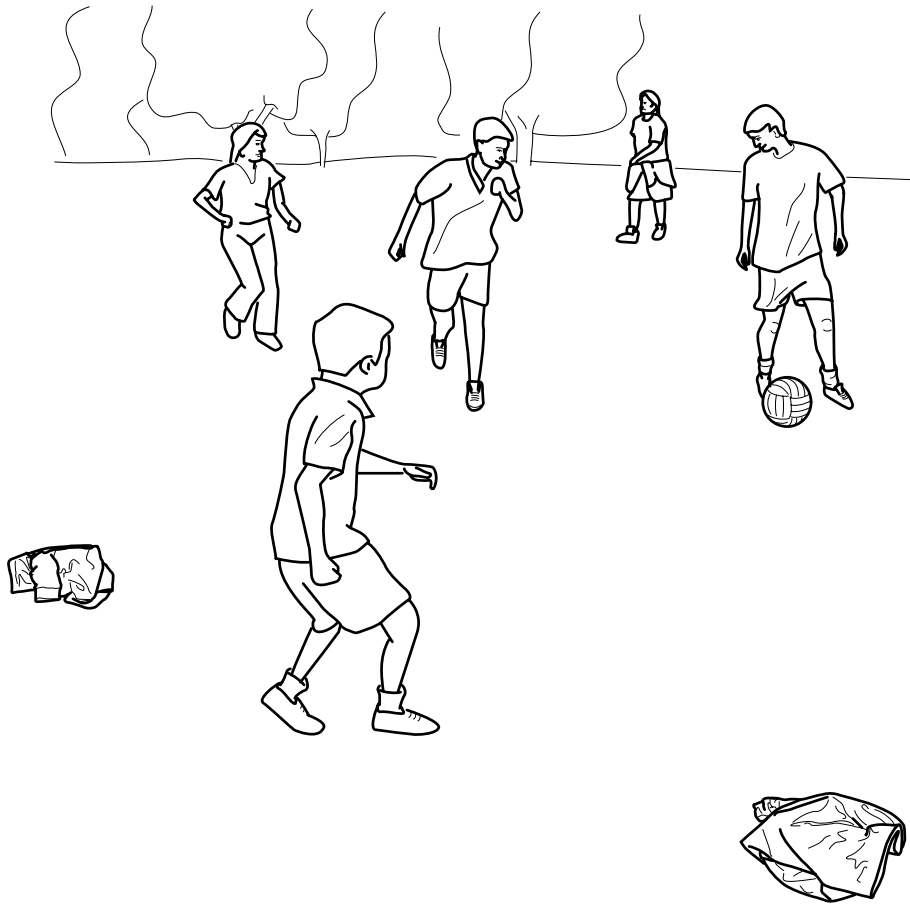


Birds can be a nuisance for farmers as they often destroy crops before they are ready to be harvested.

A device is required that will not harm the birds but will scare them off before the crops are destroyed.

The device must create movement or noise and must operate in open fields where there is no mains electricity supply.

- (a) List **four** points about the function of such a device that you consider to be important. [4]
- (b) List **four** possible ways of providing power to such a device in a remote field. [4]
- (c) Develop and sketch ideas for the device. [15]
- (d) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to your problem. [18]
- (f) Suggest suitable materials for your solution and give reasons for your choice. [4]
- (g) Outline a method used to manufacture **one** part of your solution in the school workshop. [7]



Children will play football (soccer) wherever they can and use whatever is at hand for goalposts. A pair of folding goalposts is required so that your local children can take them to any open space when they want to play football.

Each goal opening should be 3.5 metres wide and 2.5 metres high.

- (a) List **four** points about the function of the goalposts that you consider to be important. [4]
- (b) List **four** points about the safe use of the goalposts that you consider to be important. [4]
- (c) Develop and sketch ideas for the goalposts. [15]
- (d) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to your problem. [18]
- (f) Suggest suitable materials for your solution and give reasons for your choice. [4]
- (g) Outline a method used to manufacture **one** part of your solution in the school workshop. [7]