

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

**DESIGN AND TECHNOLOGY**  
**DESIGN AND COMMUNICATION**

**0445/01**  
**0446/01**

Paper 1 Common Core

October/November 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 name, centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Write in dark blue or black pen.

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 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	
<b>Part A</b>	
<b>Part B</b>	
<b>TOTAL</b>	

Part A

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

- 1 Fig. 1 shows a pictorial drawing of a machined metal block.

In the space provided draw the front view of the block. The end view and plan have been drawn for you.

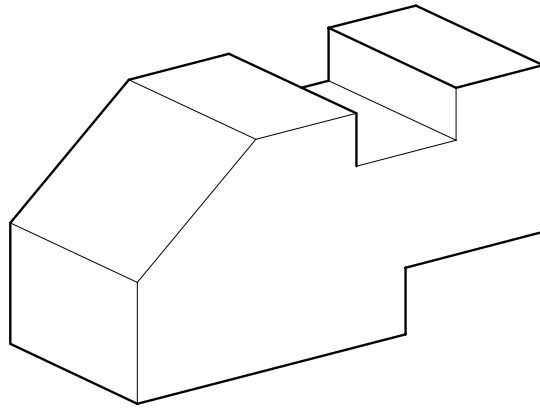
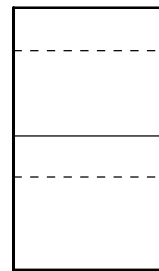


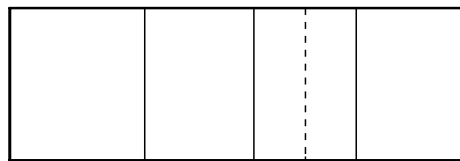
Fig. 1



front view



end view



plan

[5]

2 Complete the table below showing types of material, specific materials and their common uses.

type of material	specific material	use
hardwood		furniture
ferrous metal	steel sheet	
	acrylic	car tail lights
thermosetting plastic	polyester resin	
non-ferrous metal		electrical contacts

[5]

3 (a) List **four** specification points that you consider important when designing a toy for children of up to three years of age.

1. .... [1]
2. .... [1]
3. .... [1]
4. .... [1]

(b) Name a specific material that would be considered suitable for such a toy and give **one** reason for your choice.

Material ..... [1]

Reason ..... [1]

4 Energy comes from different sources and some forms can be stored so that they are portable for use in different places.

Identify **one** type of energy that can be stored in this way, giving the stored form and a possible use.

Energy type ..... [1]

Stored form ..... [1]

Use ..... [1]

5 Fig. 2 shows a simple gear train.

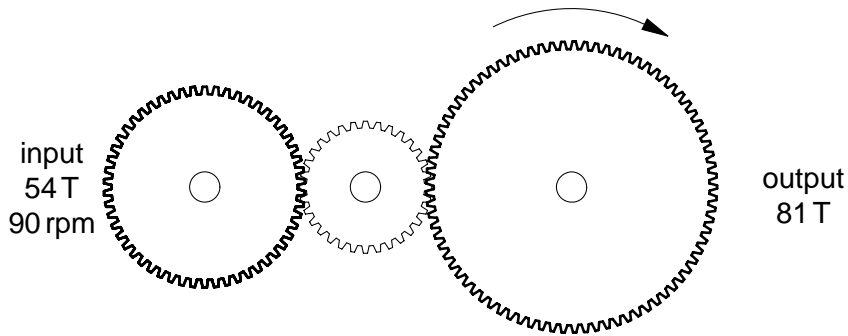


Fig. 2

(a) Draw on Fig. 2 to show the direction of rotation of the input gear. [1]

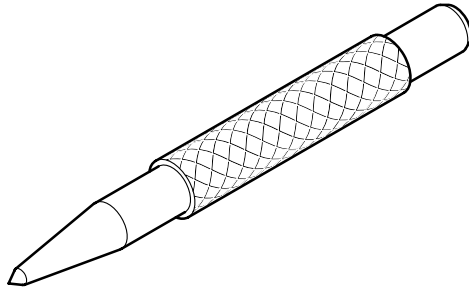
(b) Give the name of the small gear between the output and input gears. [1]  
.....

(c) Calculate the speed of rotation of the output gear, showing all your workings. [3]  
.....  
.....  
.....  
.....  
.....  
.....

6 Fig. 3 shows two different tools, each of which has to be used with another tool or piece of equipment if it is to be used correctly.

Write the name under each tool shown and add the name of the other tool or piece of equipment.

(a)

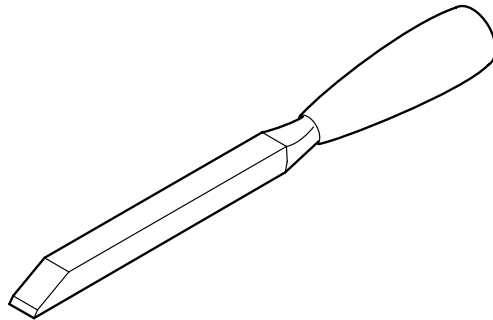


Name .....

Other tool/equipment .....

[2]

(b)



Name .....

Other tool/equipment .....

[2]

Fig. 3

7 Fig. 4 shows a student using an electric drill incorrectly in a school workshop.

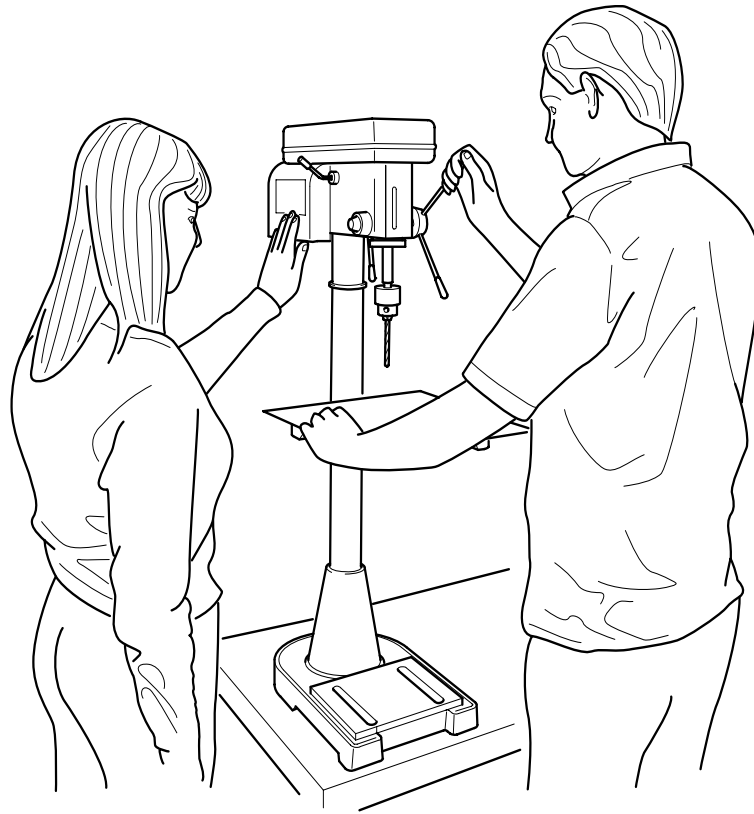


Fig. 4

Give **three** reasons why the student should be stopped immediately from using the drill.

- 1. .... [1]
- 2. .... [1]
- 3. .... [1]

8 Fig. 5 shows a dining chair made from wood.

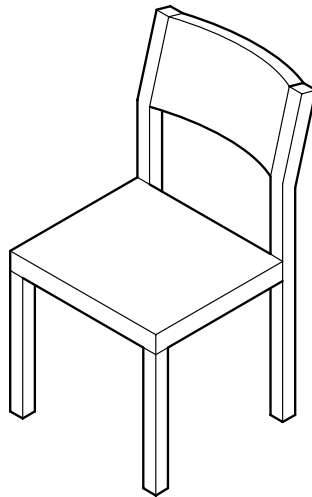


Fig. 5

(a) Explain **two** ways in which anthropometric information would be taken into account in the design of the chair.

1. ....  
..... [2]

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

(b) Give **one** way in which the strength of the chair could be increased.

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

9 Environmentalists are becoming very concerned about the disappearance of forests in parts of the world. This is caused, in part, by an increase in the use of hardwoods for the manufacture of furniture.

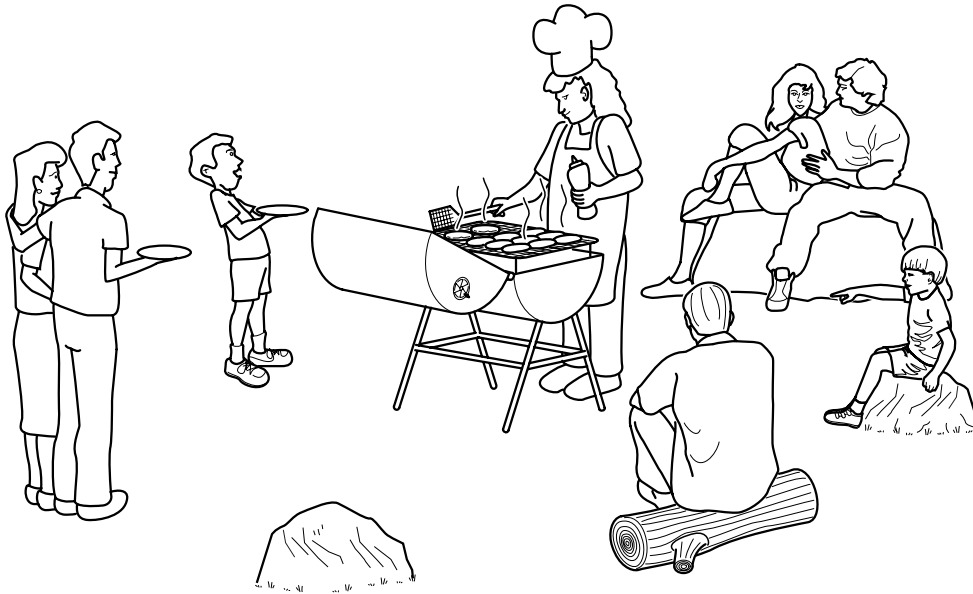
Explain briefly how manufacturers could reduce the amount of timber used but still maintain the quality of their furniture.

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

## Part B

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

10

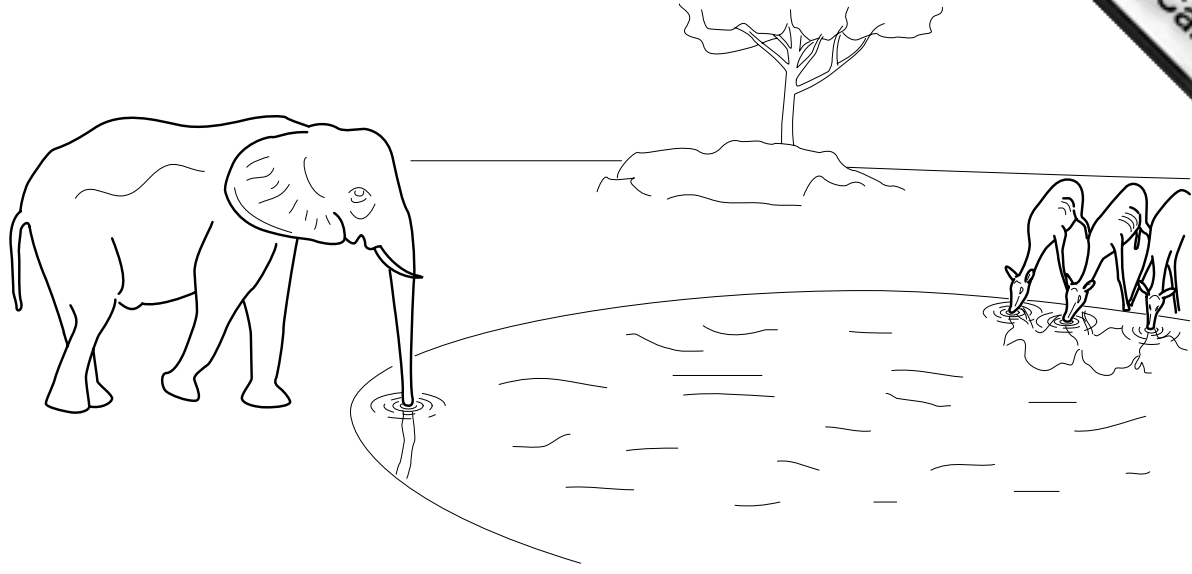


Barbecues in the countryside on warm evenings are popular in many countries. Because these are often away from the house seating is not available.

Lightweight folding seats for this purpose would be very useful.

- (a) List **four** points about the function of such seats that you consider to be important. [4]
- (b) List or draw **four** different types of pivot or sliding mechanism that could be used in the design of the folding seats. [4]
- (c) Develop and sketch ideas for the seats. [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]



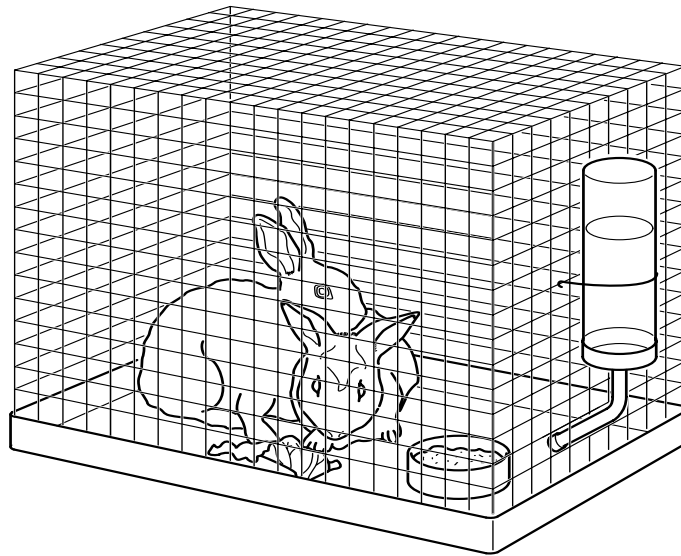


Many rare animals are close to extinction as the areas in which they live are getting smaller or, in some cases, destroyed completely. A major campaign to inform people of this problem is required if the animals are not to disappear.

A new logo and slogan are required which will appear on a range of products, some of which will be given away and others sold to the public.

- (a) List **four** points about the appearance of such a logo/slogan that you consider to be important. [4]
- (b) List **four** different items on which the logo/slogan could appear so that the campaign would be successful. [4]
- (c) Develop and sketch ideas for the logo/slogan. [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) Explain how the use of computers might assist in the design of such a product. [4]
- (g) Use sketches and notes to describe an item that could be used for the campaign including details of how the logo/slogan would be applied. [7]

12



Small pet animals require feeding regularly so that the food is fresh and clean.

An automatic feeding system is required so that dry food is given to the pets when the owner is away for several days.

- (a) List **four** points about the function of such a feeding system that you consider to be important. [4]
- (b) Describe **two** mechanisms that could be used to control the supply of food. [4]
- (c) Develop and sketch ideas for the feeding 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]



Most cans of drink are opened by removing a ring pull on the top.

This can often be difficult, particularly for some people who are not able to grip the ring firmly.

A simple device to help with this would be very useful.

- (a) List **four** points about the function of such a device that you consider to be important. [4]
- (b) Describe **two** simple mechanisms that could be used to decrease the effort needed. [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]

