

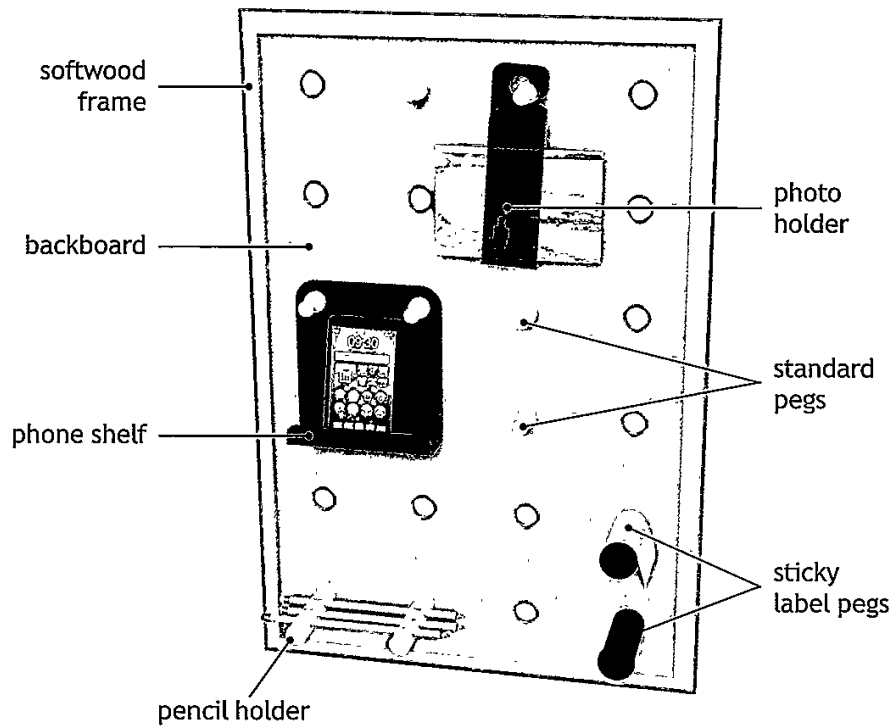
## Candidate 2

## SECTION 1 — 60 marks

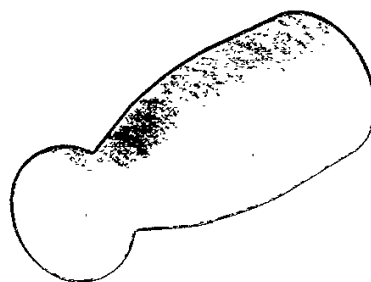
Attempt ALL questions

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1. A design proposal for a peg board and accessories is shown below.



- (a) The standard pegs were made from hardwood.



- (i) Name a suitable light coloured hardwood for the standard peg.

oak

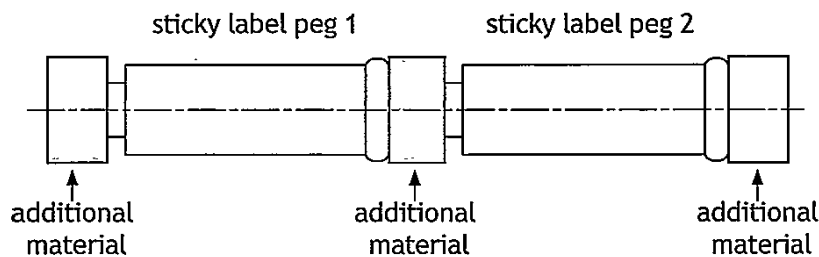
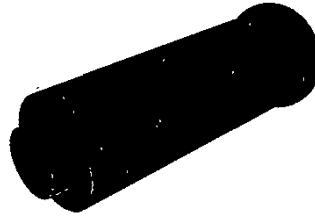
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## 1. (a) (continued)

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Two sticky label pegs were turned on the wood lathe from a single length of wood.

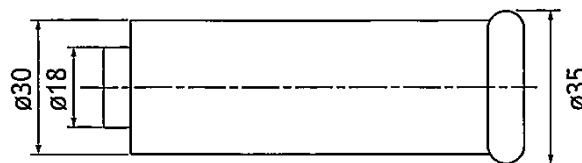


- (ii) Outline two reasons why additional material is included on the length of wood.

2

- Allow the wood to remain secure in lathe when working on wood,  
 - allow you to form desired shape before you cut it off the lathe

The sticky label pegs were turned to the sizes shown below.



- (iii) Name the lathe process carried out to reduce the diameter from 35 to 30mm.

1

Step turning

- (iv) Name the hand tool that should be used to check that the diameters are the correct size.

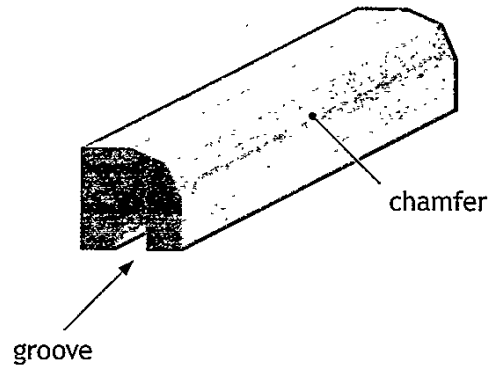
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Steel rule

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1. (continued)

- (b) The four sides of the frame were cut from one length of wood and shaped as shown below.



Complete the sequence of operations shown below by filling in the appropriate process and tools.

(i)	Step	Process	Tools
	1	Mark lengths	Try-square, rule, pencil
	2	Mark chamfer	Rule, pencil, Try-square
	3	Cut groove	Plough plane
	4	Cut chamfer	Beveredge chisel, Jack plane
	5	Cut lengths	Band saw

4

- (ii) Explain why Step 4 was carried out before Step 5 in the table above.

1

So all chamfers are at the same place across the whole length of wood.

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## 1. (b) (continued)

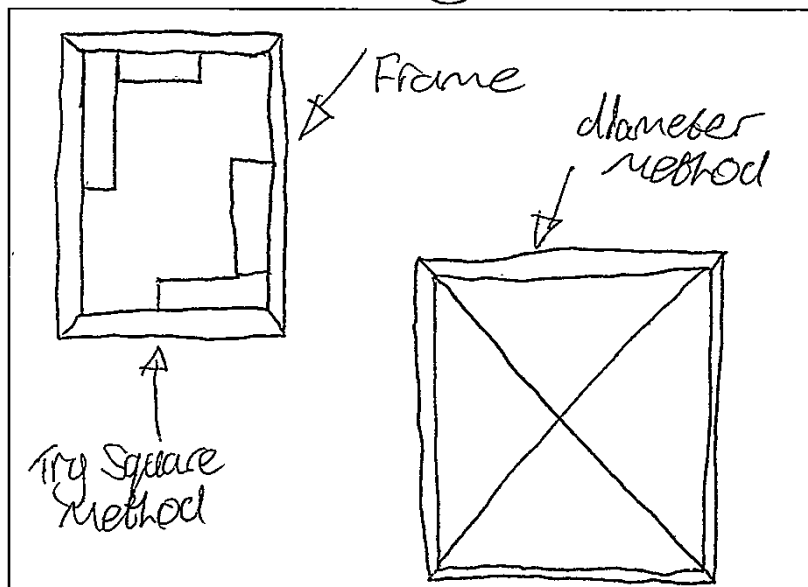
The frame was checked for squareness during assembly.

(iii) Describe two methods of checking the frame is square.

You may use sketches to illustrate your answer in the box below.

2

Use two try squares to check corners are square. Measure from corner to corner diagonally across, and make sure they are the same length using a steel rule.

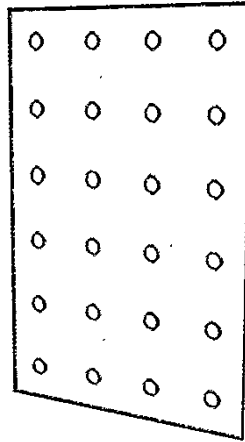


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1. (continued)

(c) MDF was used to make the backboard.



- (i) State two reasons why MDF is a suitable choice of material for the backboard.

2

It is durable and strong, and  
it is easy to work with  
in the workshop.

A pillar drill was used to create the holes.

- (ii) State two safety checks that must be carried out on the pillar drill before use.

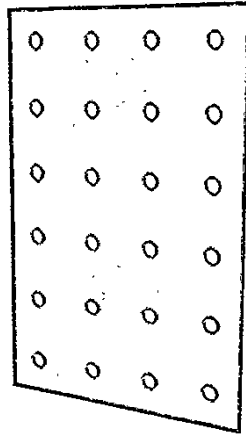
2

- Check drill bit is secured  
within the drill chuck.  
- Place down drill guard.

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## 1. (c) (continued)

Grey paint was applied to the surface of the backboard.



(iii) Describe three ways to ensure a high quality paint finish.

3

- Sand off any rough marks from wood.

- Smooth wood with fine sand paper and remove dust before painting

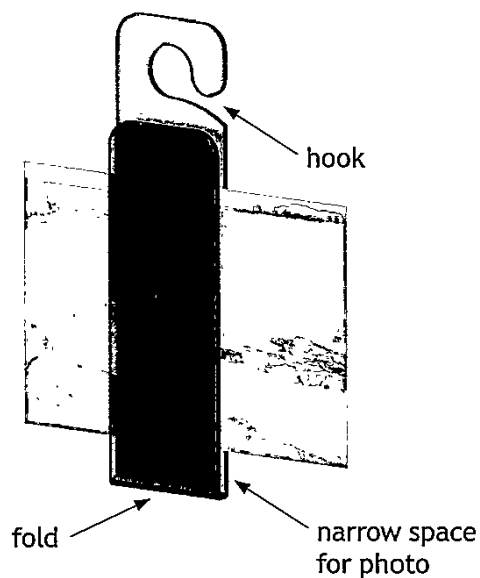
- Paint in a clean, dust free environment.

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## 1. (continued)

(d) A photo holder was made from thermoplastic sheet.



The thermoplastic sheet was marked out and folded to securely hold a photo.

Describe how the photo holder would have been folded into shape, with reference to workshop tools and equipment.

2

- heat plastic on a strip heater  
until it is soft and bends  
easily.

- bend plastic over a job wearing  
heat proof gloves.

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1. (continued)

(e) The phone shelf was made from copper sheet.



(i) State two reasons why copper is a suitable choice of material for the phone shelf.

2

- easy to cut and shape  
- It is a non ferrous metal

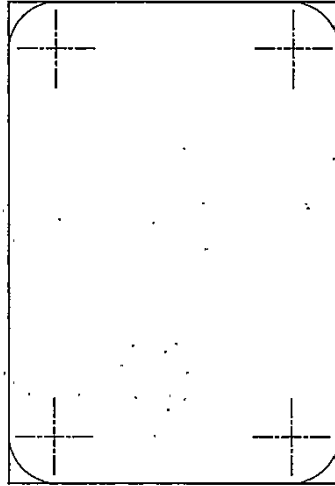
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## 1. (e) (continued)

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The phone shelf corners were marked out on a sheet of copper as shown below.

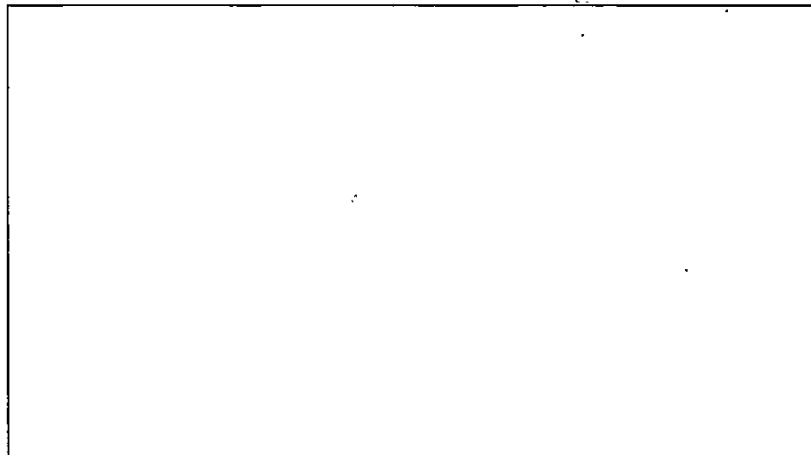


- (ii) Describe how to mark out the corners, with reference to workshop tools.

You may use sketches to illustrate your answer in the box below.

3

- Create a template to  
draw around on your metal  
- draw round the curved corners  
on the template onto the  
metal  
- clip out corners using  
a hand saw



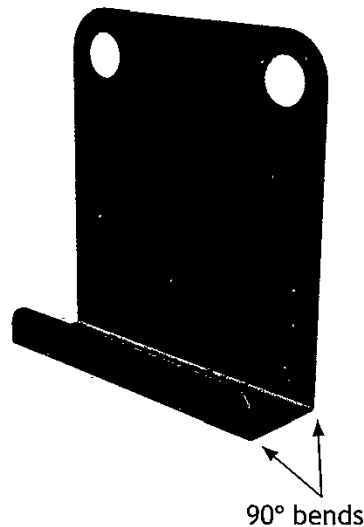
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## 1. (e) (continued)

- (iii) Describe how to cut and shape the corners, with reference to workshop tools.

2

- Cut corners using a hacksaw  
~~finish corners of steel~~  
- File down to the line creating  
a nice round shape using a  
flat file.



- (iv) Describe how to form the 90° bends, with reference to workshop tools.

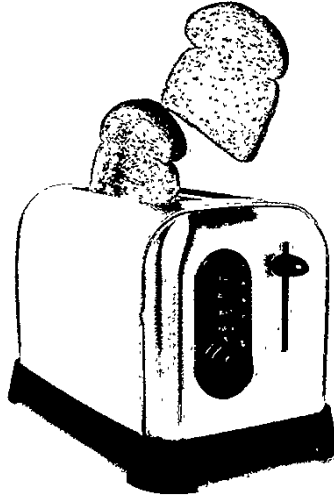
2

- Mark out the bends using  
a steel rule, pencil and an  
engineers square  
- bend metal using a box  
folder by bending it on  
the lines you've marked.

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2. A company that manufactures kitchen appliances wishes to add a toaster to their range.



- (a) The designer used a questionnaire to research existing toasters.

- (i) Describe the key stages of a questionnaire.

3

- create your questionnaire  
with different type questions  
such as finish, colour, shape,  
where it would be used.  
- hand out questionnaires to  
the target market  
- collect your results and  
collate them in a table/chart.

- (ii) Name an alternative research technique which the designer may have used.

1

Mood board

## 2. (continued)

The designer produced a product specification after completing the research.

- (b) Explain why a specification is used during the design process.

1

To make sure the appliance reaches  
the requirements of the target market.

The designer used brainstorming as an idea generation technique.

- (c) Describe the key stages of brainstorming.

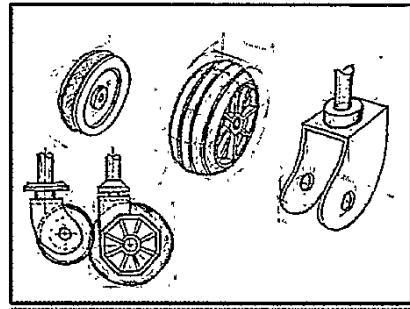
3

- collect various images that  
may influence your design  
- Annotate images/ideas  
- collect main/favourite ideas  
from brainstorming and  
transfer them to develop  
ideas.

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3. A range of graphic techniques were used throughout the design of the trolley wheel shown below.



- (a) Sketches were used at the initial ideas stage.

State two reasons why this graphic technique is appropriate.

2

- It is quick and easy to draw and change ideas
- allows you to show client initial ideas, easily.

- (b) During the planning for manufacture stage, the designer would produce working drawings.

State two reasons why working drawings are required.

2

- Allows a cabinet to be made
- gives you an idea of sizes of the trolley wheels.

4. Models are often used during the design process.

Explain why models may be used during the design process.

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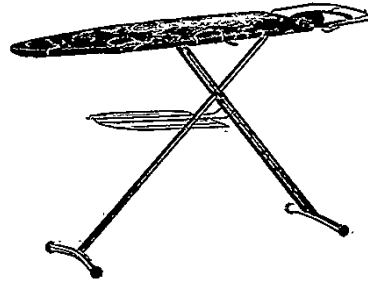
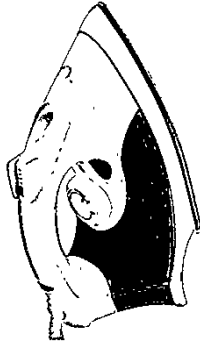
3

- allows you to see a scaled down version of your product
- quick and easy to make, allowing you to show the customer
- test out function of the item and make changes to the design before making a full size model.

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5. An iron and ironing board are shown below.



You must give different examples in (a), (b) and (c).

(a) Describe how ergonomics may have influenced the design of the iron and/or the ironing board.

4

- The height of the ironing board would be influenced by ergonomics and anthropometric data to make sure it suited most clients.
- The type of material the iron's handle is made of so that it is comfortable to hold and
- The pressure needed to operate the buttons would be influenced by ergonomics.
- The size of the cap to fill the iron with water would be influenced by ergonomics so that it was easy to fill with water.

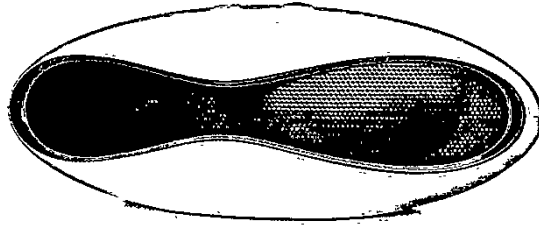
5. (continued)	MARKS	DO NOT WRITE IN THIS MARGIN
(b) Describe how function may have influenced the design of the iron and/or the ironing board.	2	
<p>- The strength of the ironing board so that it provides a smooth stable surface to iron on.</p> <p>- The temperature the iron can support, so that it can withstand heat to iron the clothes.</p>		
(c) Describe how safety may have influenced the design of the iron and/or the ironing board.	2	
<p>- The plastic casing on the iron, which means it will not heat up as much as the metal making it safe to handle.</p> <p>- Plastic guard around the metal piece of the iron to stop you from burning yourself easily.</p>		

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6. A portable speaker is shown below.



(a) Describe three aesthetic aspects of the speaker.

3

- bright attractive colours
- unique shape make it appealing to target market.
- mesh grille gives it a clean look, meaning you can see internal speaker.

The company developing the speaker has a strong brand image.

(b) Explain two benefits of a strong brand image.

2

- brand loyalty
- gives you a strong platform to sell your product on.

Marketing techniques can be used to influence sales.

(c) Name two marketing techniques that the company could use to promote the speaker.

2

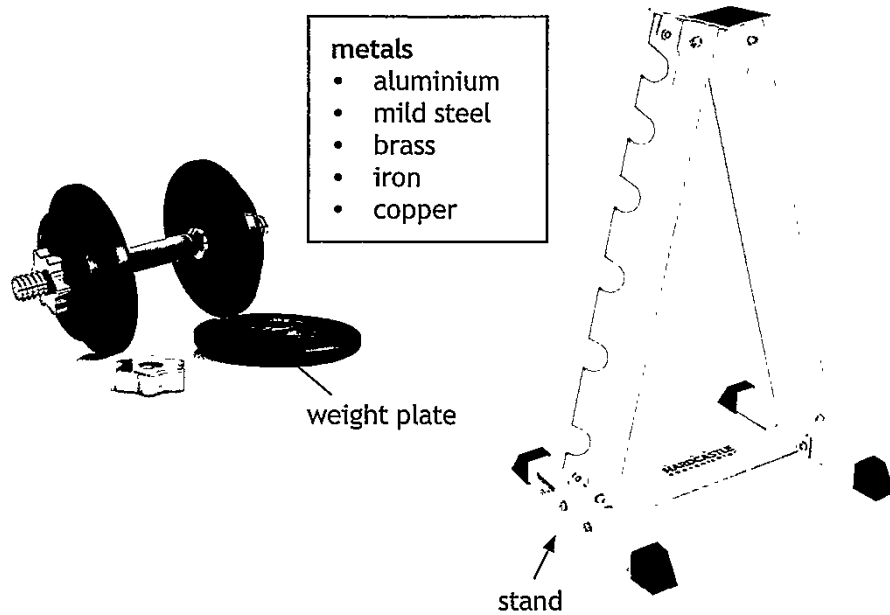
- user <sup>trial</sup> ~~trial~~ and selling under a brand name.

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## SECTION 2 — 20 marks

Attempt ALL questions

7. The dumbbell and stand shown below have been produced using a range of metals and processes.



- (a) Select appropriate metals for the weight plate and stand from the list provided and explain why they would be suitable.

You must give a different metal and explanation for each item.

- (i) Weight plate.

2

Metal mild iron

Suitable because durable/strong, and a heavy material

- (ii) Stand.

2

Metal mild steel

Suitable because strong enough to hold weights.

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7. (continued)

(b) The weight plates have been sand cast.

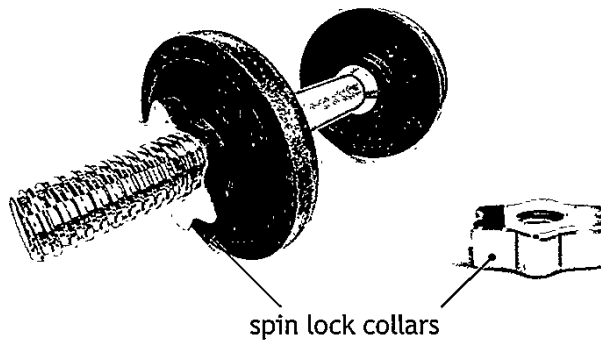


Describe two identifying features that would show the weight plates have been sand cast.

2

rough finish and marks  
where the mould splits.

(c) The spin lock collars have been die cast.



Explain why die casting was used to manufacture the spin lock collars.

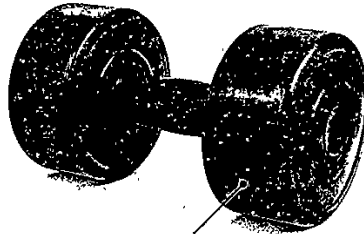
2

- Hardens the metal making  
it durable and strong  
- easy to manufacture.

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7. (continued)

(d) A concrete filled dumbbell is shown below.



thermoplastic casing

Name a suitable process to manufacture the thermoplastic casing of the dumbbell and explain why it is suitable.

2

Process ~~Rotational moulding~~ Injection moulding

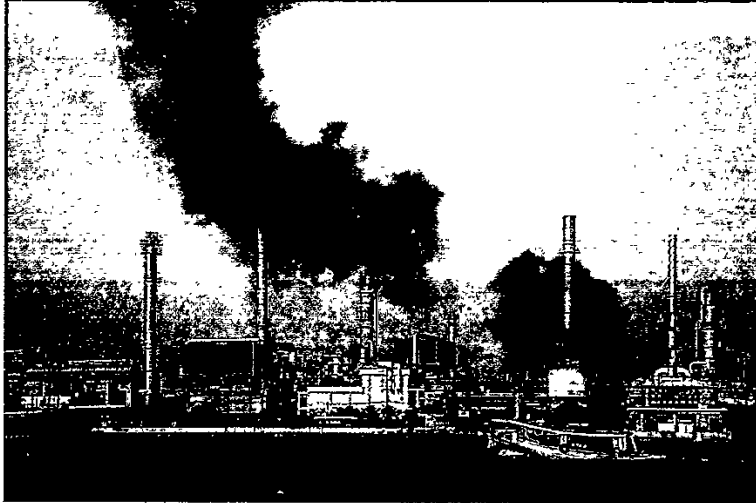
Suitable because creates a hollow  
shape.

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8. Many products are mass manufactured.		
(a) Describe the impact of mass manufacturing on society.	3	
<p>-It removes the need for local factories resulting in the loss of jobs and local economic decline.</p> <p>-It removes the demand for skilled workers as a lot of mass manufacturing is done by machines.</p>		
Not all products are mass manufactured.		
(b) Explain why some products are not suitable for mass manufacture.	1	
<p>Some products <del>are made</del> can't be mass manufactured as they need skilled workers and are too expensive.</p>		
9. Manufacturers often use standard components in the production of products. Outline the possible benefits of using standard components.	2	
<p>-easy to source <del>man</del> and/or <del>make</del> manufacture</p> <p>-affordable to buy.</p>		

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10. Manufacturers have a responsibility to reduce the damage they cause to the environment.



Outline the steps that a manufacturer could take to reduce their impact on the environment.

4

- create on big, productive factory rather than having lots around the world
- source local material to save on transport across the world
- use sustainable sources of materials
- treat harmful gasses before letting them out into the atmosphere.

[END OF QUESTION PAPER]