

Candidate 6

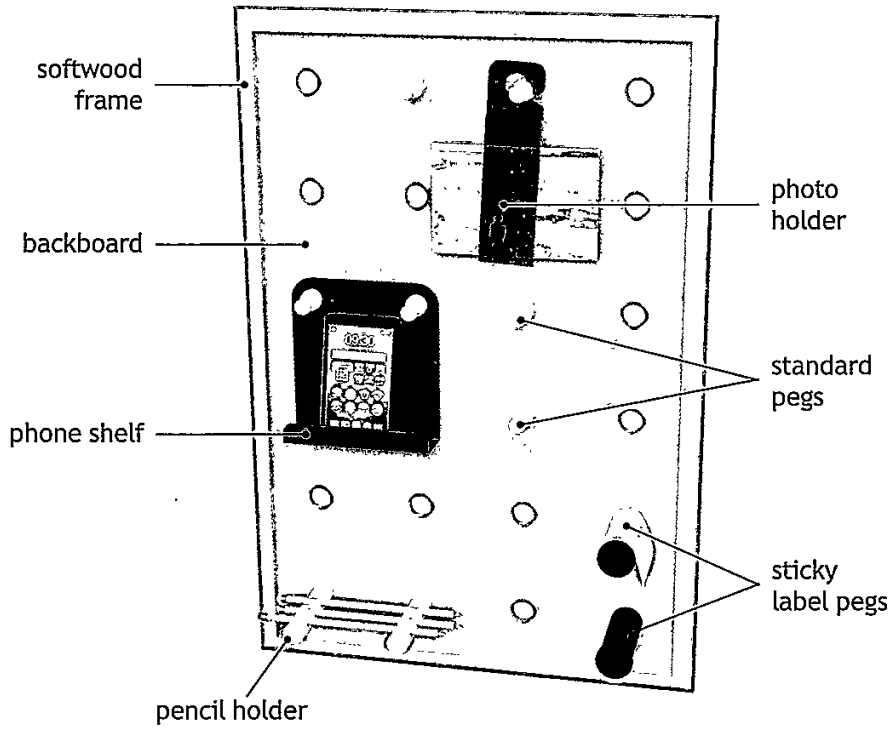
SECTION 1 — 60 marks

Attempt ALL questions

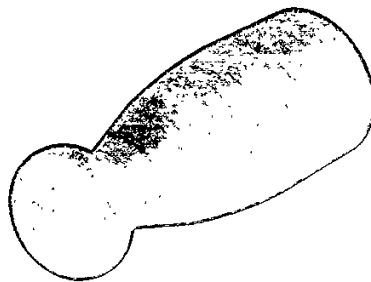
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1. A design proposal for a peg board and accessories is shown below.



(a) The standard pegs were made from hardwood.



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

1

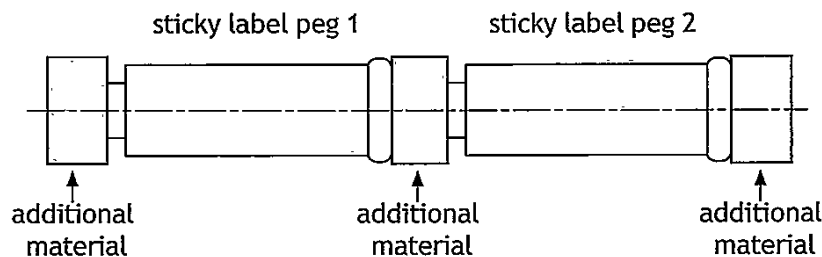
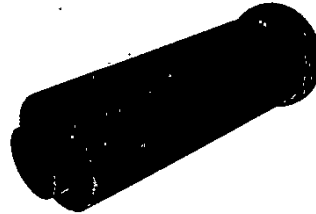
oak

1. (a) (continued)

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

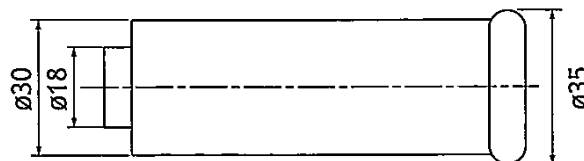


- (ii) Outline two reasons why additional material is included on the length of wood.

2

- So that when it is clamped in the main product is not damaged.
- So that it is held securely.

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

parallel turning.

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

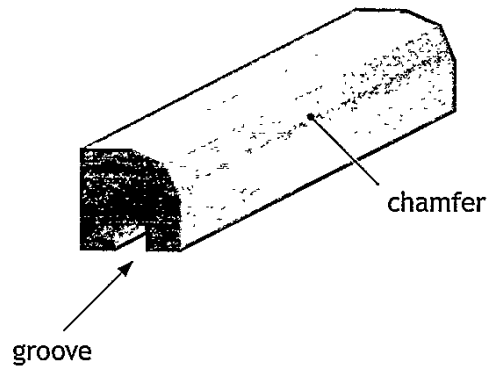
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steel rule

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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 | steel rule, pencil |
| | 3 | Mark Groove | Plough plane |
| | 4 | Cut chamfer | tenon saw |
| | 5 | Cut lengths | tenon saw |

4

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

1

If would make it more difficult
to cut the chamfer after the
lengths.

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| 2 | |

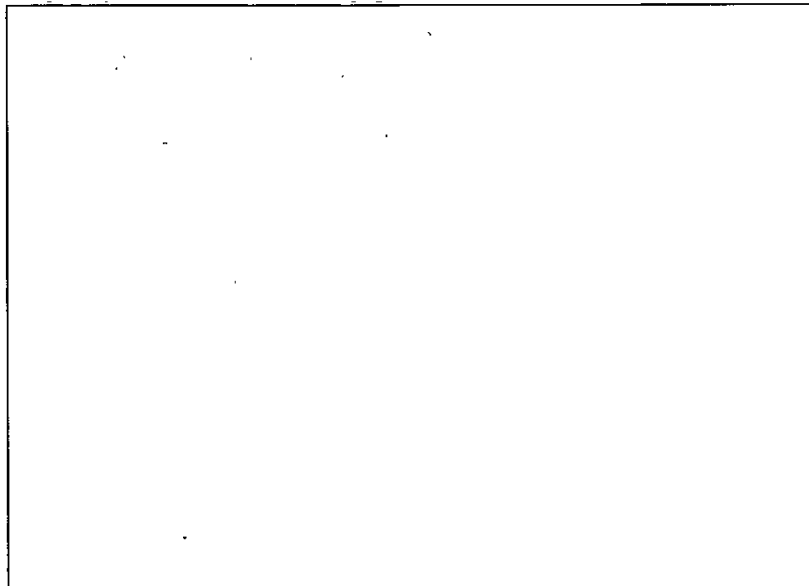
1. (b) (continued)

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.

- Use a try square to see if the corners are 90°
- Use a steel rule to see if all lengths are the same.

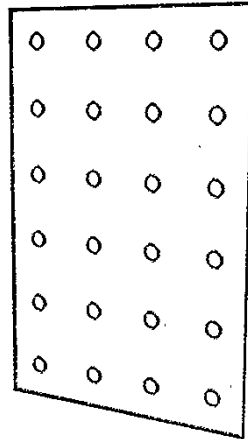


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1. (continued)

(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 cheaper than hard or softwoods.
- It is not seen/visible as it is the backboard.

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.

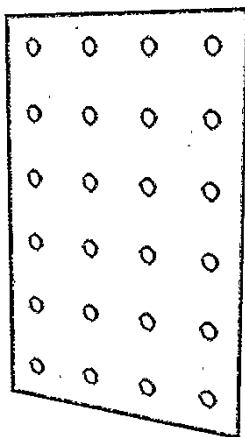
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- If the drill bits are in place firmly.
- That there is another piece of wood behind your wood so you don't drill the metal.

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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

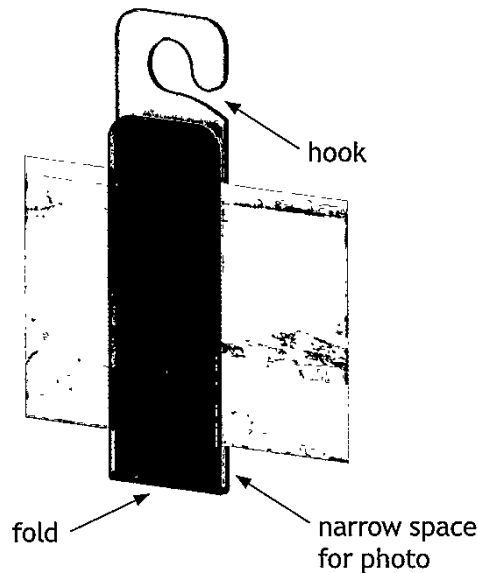
- Use a new paint brush for better results.
- Sand the wood then raise the grain before painting the wood.
- Make sure the surface of the ~~wood~~ wood is as flat as possible.

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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

- The fold would have been marked out by using a steel rule, ~~by~~ engineer's square, ~~pen~~ scribe.
- The plastic would then be heated up by a strip heater and then folded by a former to its desired position.

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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

- Copper is cheaper than a lot of other materials.
- Copper does not rust.

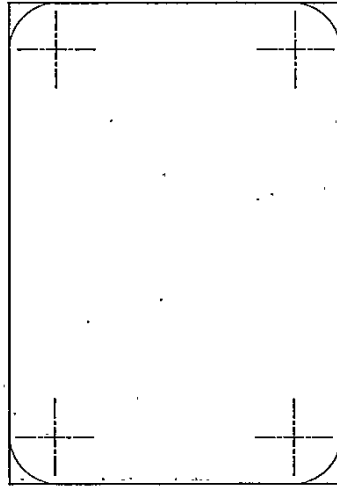
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1. (e) (continued)

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

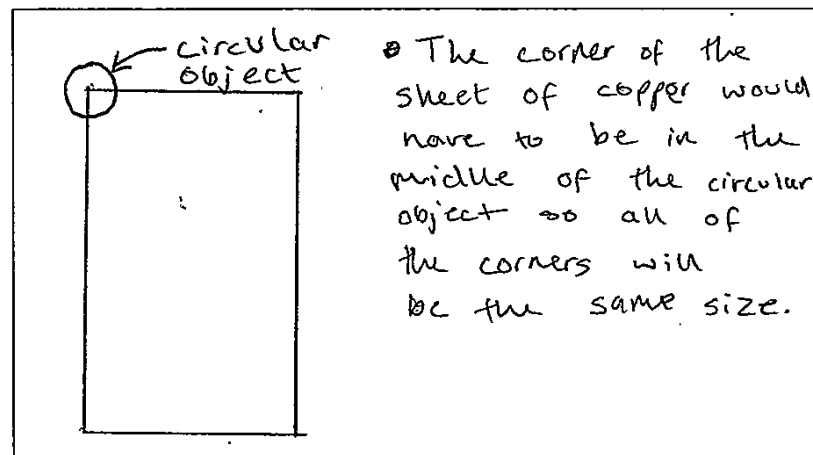


- (ii) Describe how to mark out the corners, with reference to workshop tools.

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

3

- The corners would have been created by a circular object or a compass.
- If using a compass it would have to be in the centre point as all corners will then be the same size.



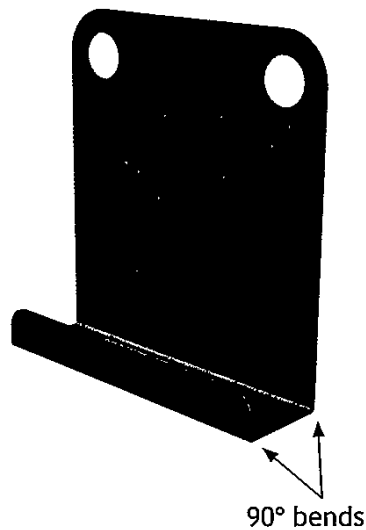
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1. (e) (continued)

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

2

- Use a hacksaw to cut away the excess copper.
- Then use a flat file to smoothen and rounden the corners.



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

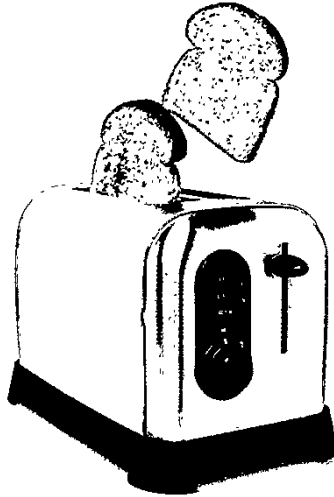
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- Mark out the bend with a steel rule, engineers square and a scriber.
- Use the wooden formed to bend the copper at 90°.

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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

- ASK a reasonable amount of
people to answer the questionnaire.
- Don't make it too long as people
will become bored and tick anything
without reading it.
- Ask questions that are relevant
and will help you create better
ideas from the public.

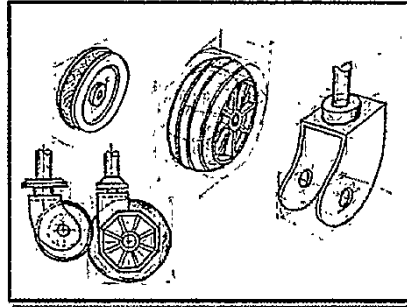
- (ii) Name an alternative research technique which the designer may have used.

1

User trial

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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

- You can understand and have a better view of what's being shown.
- This graphic technique shows how the product will work.

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

State two reasons why working drawings are required. 2

- To show development of the product.
- To show how the product will work.

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4. Models are often used during the design process.

Explain why models may be used during the design process.

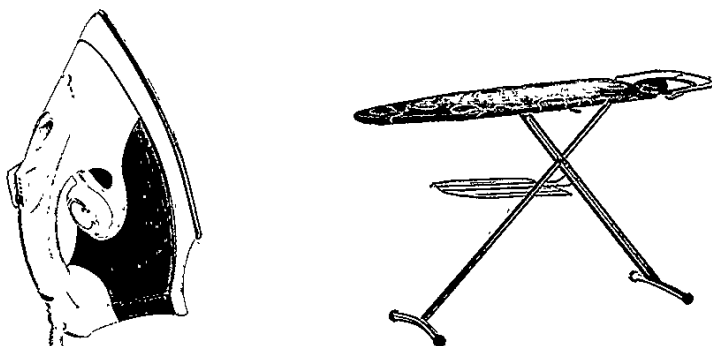
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- Models may be used for testing.
 - Models may be used so people have a better understanding of the product.
 - Models can also help generate some ideas.
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5. An iron and ironing board are shown below.



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 size of the handle would have to suit the average size of a males hand.
- The size of the buttons on the iron would have to suit the average size of a males thumb.
- The height of the ironing board would have to suit the average height of a man so that it is comfortable.
- The length of the ironing board would have to suit the average length of a mans leg as the clothes will be ironed on the ironing board, and the legs are often the longest parts of the body.

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5. (continued)

- (b) Describe how function may have influenced the design of the iron and/or the ironing board.

2

- If it is easy to fill it up with water.
- If the buttons are easy to press when in use.

- (c) Describe how safety may have influenced the design of the iron and/or the ironing board.

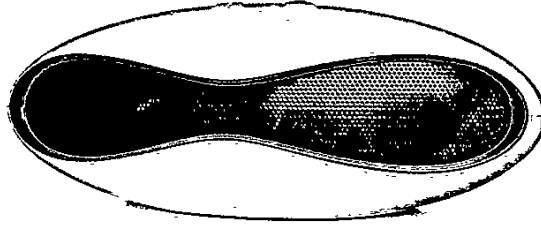
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- If there is a red light to show when the iron is on.
- If there is grips at the bottom of the ironing board as it could slide and hurt someone.

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6. A portable speaker is shown below.



(a) Describe three aesthetic aspects of the speaker.

3

- ~~If people like the colours.~~
- If people like the shapes of the design.
- If people find the colours appealing.
- If the materials look appealing on the product.

The company developing the speaker has a strong brand image.

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

2

- A lot of people will recognise the brand and want to buy it.
- People who use the brand a lot will become very interested.

Marketing techniques can be used to influence sales.

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

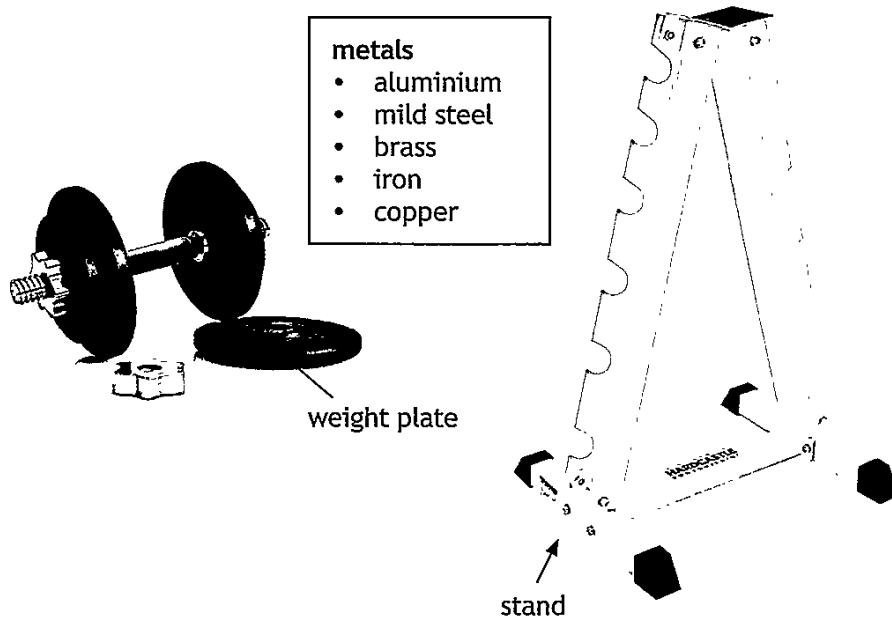
2

Create an online app and ~~posting~~
Creating posters and putting them
up in public.

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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 Iron

Suitable because it is heavy and perfect for weights.

- (ii) Stand. 2

Metal mild steel

Suitable because It is strong and would be able to hold up weights.

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7. (continued)

(b) The weight plates have been sand cast.

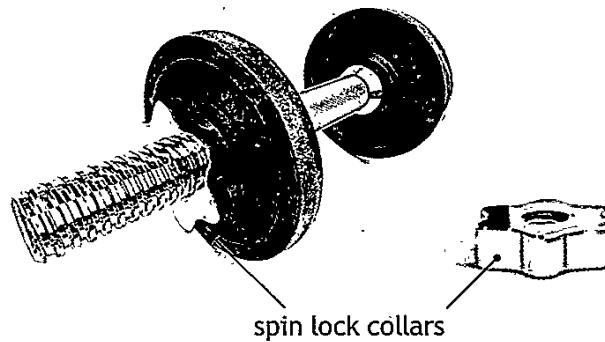


Describe two identifying features that would show the weight plates have been sand cast.

2

- The plate would feel rough & almost like an old piece of sand paper.
- The plates will also have some patch areas and will also look rough.

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



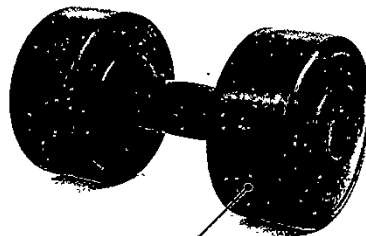
Explain why die casting was used to manufacture the spin lock collars.

2

- Die casting looks good as it is shiny.
- It is quite hard to wear off after time.

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MARGIN**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

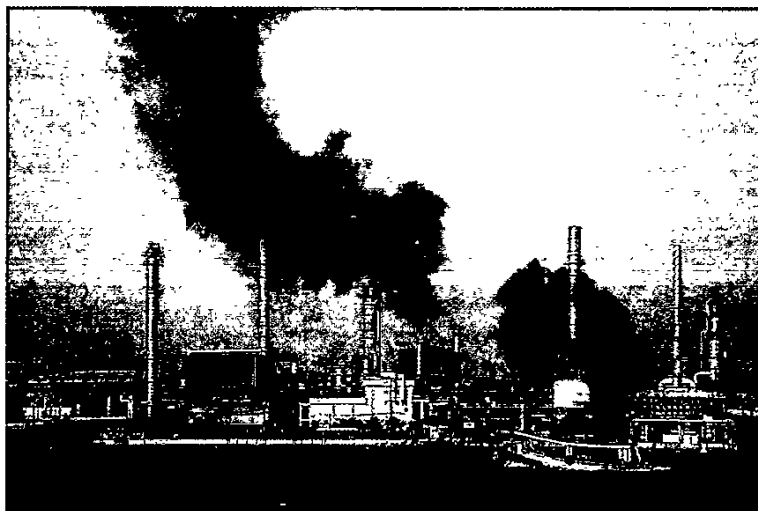
Suitable because It is hollow inside.

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| 8. Many products are mass manufactured. | | |
| (a) Describe the impact of mass manufacturing on society. | 3 | |
| ◦ A lot of products may not sell in store so then they are wasted and thrown away or recycled. | | |
| ◦ Some of the prices of the products that have been mass produced could increase because of the machinery used. | | |
| ◦ Products are produced quicker so people can get a hold of products faster. | | |
| Not all products are mass manufactured. | | |
| (b) Explain why some products are not suitable for mass manufacture. | 1 | |
| Some products are not suitable for manufacture as some products can take a lot of time to produce. | | |
| 9. Manufacturers often use standard components in the production of products. Outline the possible benefits of using standard components. | 2 | |
| ◦ They are really easy to find as they're in a lot of local stores. | | |
| ◦ It saves time as you won't have to create your own components. | | |
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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

- Don't use as much packaging as it gets thrown away.
- Try ^{to reduce} ~~not to~~ transport of the products as it causes pollution due to all of the fumes.
- Make online websites and apps instead of posters, leaflets and books as they get thrown away.
- Try to not use as much machinery in the factories as it causes a lot of fumes which leads to pollution.

[END OF QUESTION PAPER]