

Cambridge International AS & A Level

DESIGN & TECHNOLOGY

9705/12

Paper 1

October/November 2023

3 hours

* 2 8 9 5 0 1 0 8 0 2 *

You must answer on the answer booklet/paper.

You will need: Answer booklet/A4 paper Coloured pencils
A3 drawing paper (2 sheets) Extra sheets of A3 drawing paper if needed
A range of design drawing equipment

INSTRUCTIONS

- Answer **three** questions in total:
 - Section A: answer **one** question on the answer booklet/A4 paper provided.
 - Section B: answer **one** question on the answer booklet/A4 paper provided.
 - Section C: answer **one** question on A3 drawing paper. Use both sides of the paper.
- You may request additional sheets of A3 drawing paper, but only if you have used up both sides of each of the 2 sheets provided.
- If you have been given an answer booklet, follow the instructions on the front cover of the answer booklet.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number on all the work you hand in.
- Do **not** use an erasable pen or correction fluid.
- You may use an HB pencil, or coloured pencils as appropriate, for any diagrams, graphs or rough working.
- At the end of the examination, fasten all your work together. Do **not** use staples, paper clips or glue.

INFORMATION

- The total mark for this paper is 120.
- The number of marks for each question or part question is shown in brackets [].
- All dimensions are in millimetres.

Section A

Answer **one** question from this section on the Answer Booklet/A4 paper provided.

1 Fig. 1.1 gives details of a chair which is to be made in a school workshop.

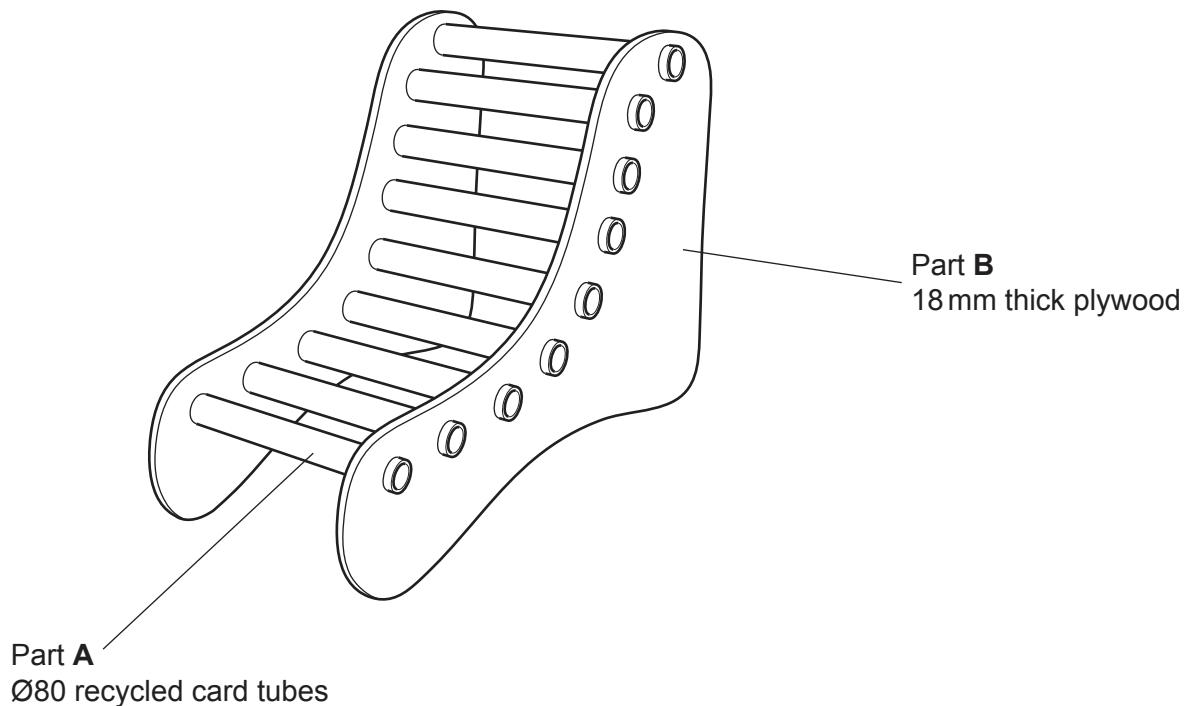


Fig. 1.1

(a) Give **two** reasons why recycled card has been used to make Part A. [2]

(b) Use notes and sketches to describe:

(i) how the Ø80 mm holes in Part B could be set out on 180 mm centres and cut out [6]

(ii) how Part B could be prepared for a finish and the finish applied. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

(c) Use notes and sketches to show **two** temporary methods of joining Part A to Part B. [6]

2 Fig. 2.1 gives details of a crate for vegetables which is to be made in a school workshop.

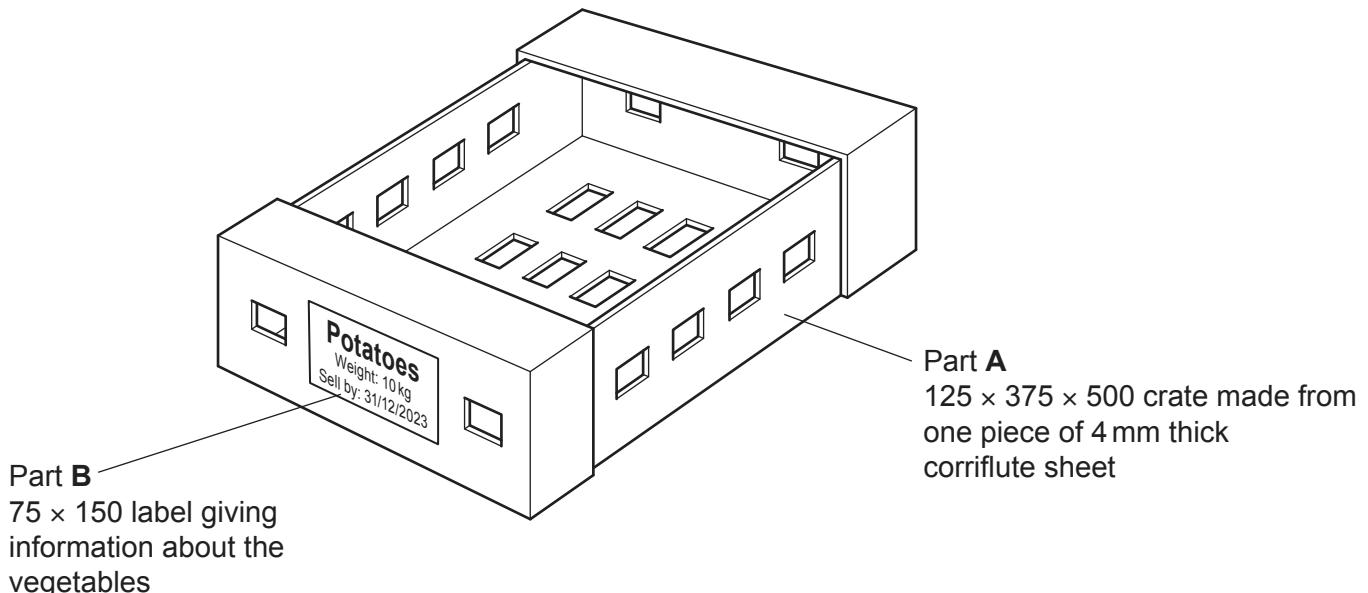


Fig. 2.1

(a) Give **two** reasons why the crate has holes in it. [2]

(b) Use notes and sketches to show the shape of the one-piece development (net) required to make Part A, the crate. [6]

(c) Use notes and sketches to describe how the one-piece development (net) required to make Part A, the crate, could be cut and folded to shape. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

(d) Use notes and sketches to show a method of designing and making a label that allows the name of the vegetable, weight and sell by date to be changed. [6]

3 Fig. 3.1 gives details of a model of a compound pulley system which is to be made in a school workshop.

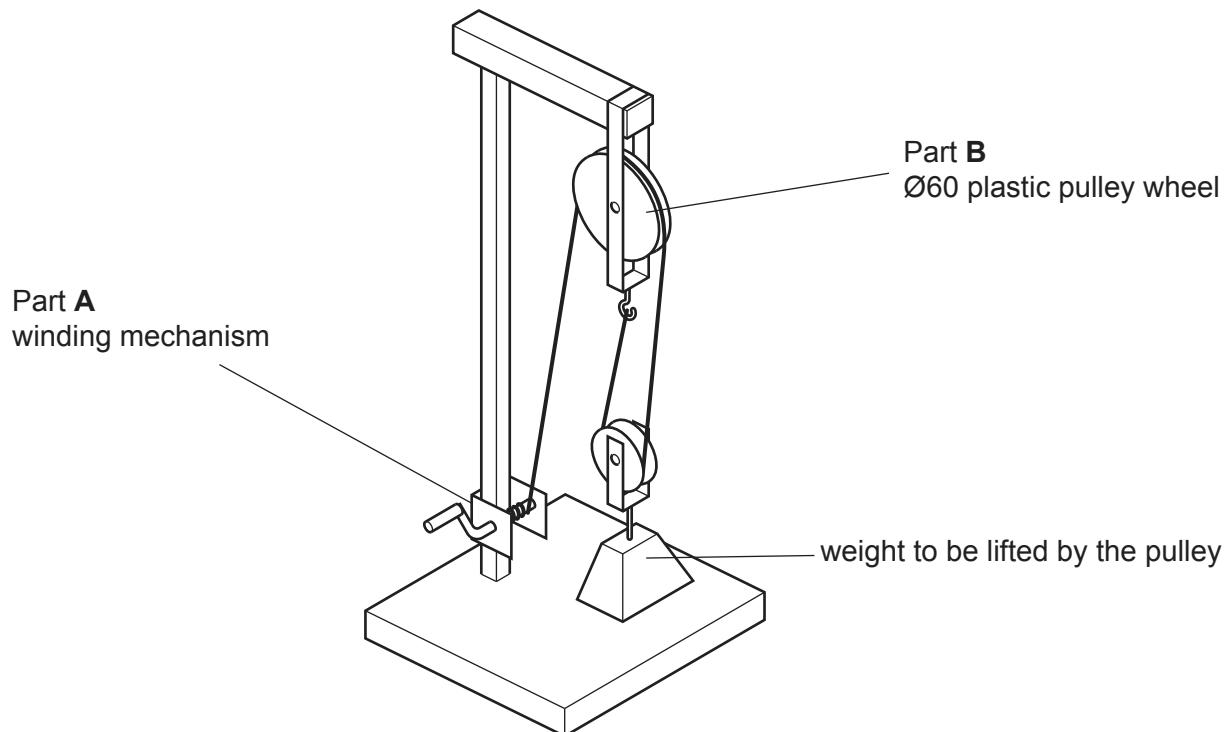


Fig. 3.1

(a) Give **two** reasons for making a model of a mechanism. [2]

(b) Use notes and sketches to describe how to make Part A, the winding mechanism. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

(c) Use sketches and notes to describe how:

(i) to make a batch of 1000 of Part B [6]

(ii) a compound pulley system makes it easier to lift loads. [6]

Section B

Answer **one** question from this section on the Answer Booklet/A4 paper provided.

4 Fig. 4.1 shows an incomplete design for a garden shed.

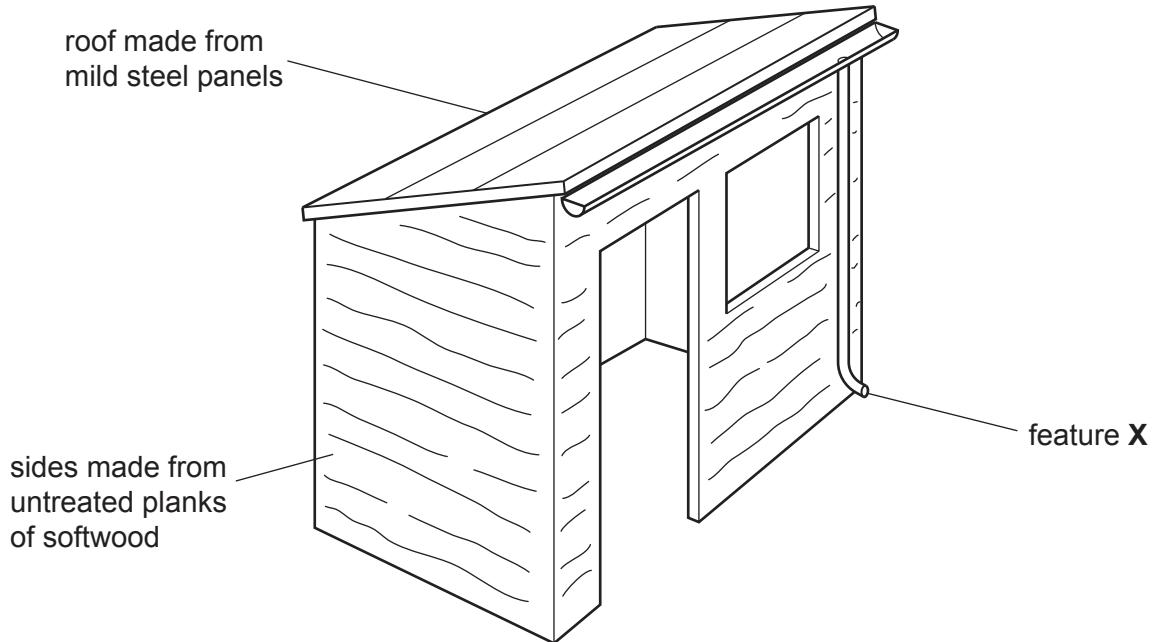


Fig. 4.1

- (a) Explain the function of the design feature shown at X. [2]
- (b) Identify and describe **two** problems that make the garden shed unsuitable for use. [4]
- (c) Use notes and sketches to explain how the garden shed would need to be changed to overcome the **two** problems you have identified in part (b). [6]
- (d) Discuss why many products, such as the garden shed, are designed to be assembled at home. Your answer should:
 - (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
 - (ii) explain why you consider these issues to be relevant [3]
 - (iii) contain specific examples/evidence to support your conclusions. [2]

5 Fig. 5.1 shows an incomplete design of packaging for socks.

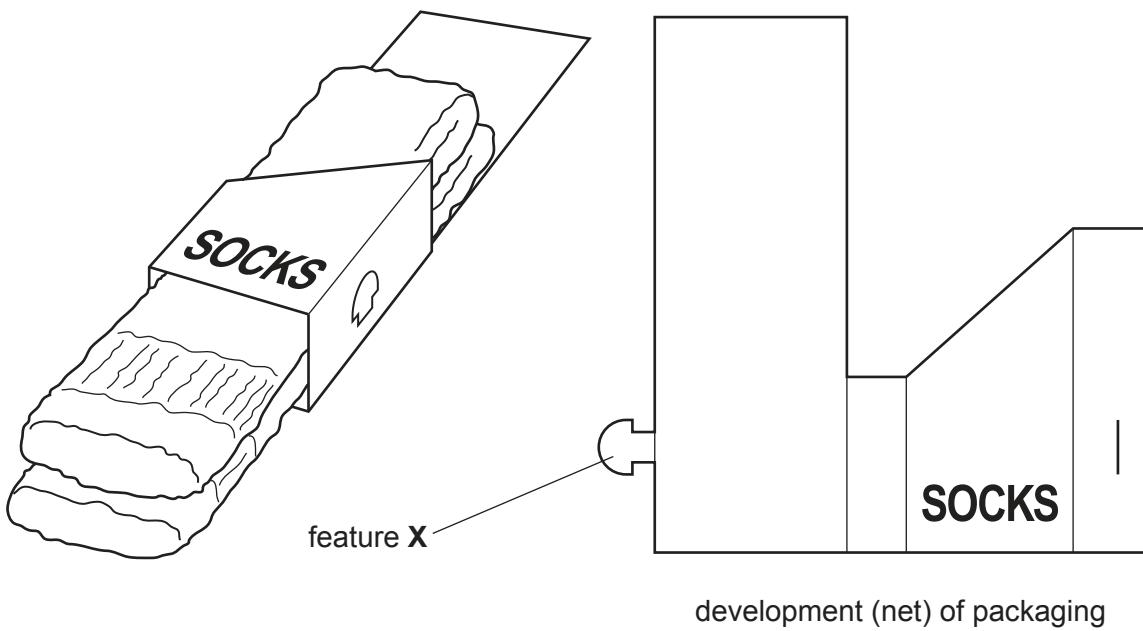


Fig. 5.1

- (a) Explain the function of the design feature shown at **X**. [2]
- (b) Identify and describe **two** problems that make the packaging for socks unsuitable for use. [4]
- (c) Use notes and sketches to explain how the packaging would need to be changed to overcome the **two** problems you have identified in part (b). [6]
- (d) Discuss why designers of packaging use research to inform their design. Your answer should:
 - (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
 - (ii) explain why you consider these issues to be relevant [3]
 - (iii) contain specific examples/evidence to support your conclusions. [2]

6 Fig. 6.1 shows an incomplete design for a coffee machine.

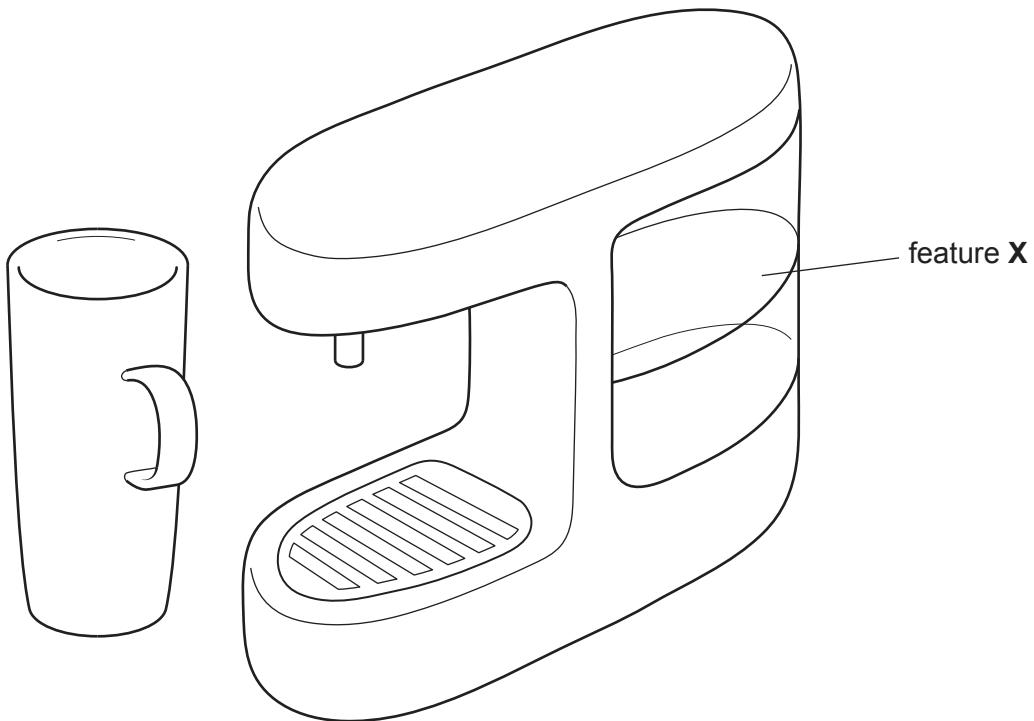


Fig. 6.1

- (a) Explain the function of the design feature shown at **X**. [2]
- (b) Identify and describe **two** problems with the coffee machine. [4]
- (c) Use notes and sketches to explain how the design would need to be changed to overcome the **two** problems you have identified in part (b). [6]
- (d) Discuss why designers of electrical products, such as the coffee machine, consider the effects of form and surface finishes. Your answer should:
 - (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
 - (ii) explain why you consider these issues to be relevant [3]
 - (iii) contain specific examples/evidence to support your conclusions. [2]

Section C

Answer **one** question from this section on the plain A3 paper provided.

You are provided with two sheets of plain A3 paper. You should use **both** sides of the paper. **Each** of the four parts **(a) – (d)** of the question you choose to answer should take up one side of paper.

When you are asked to **develop** a design you must show, using notes and sketches, the development and evaluation of a **range** of ideas into a single design solution. The design proposal should be annotated to give details about materials, joining methods and important sizes.

7 Fig. 7.1 shows a design for a box to hold precious items, including rings.

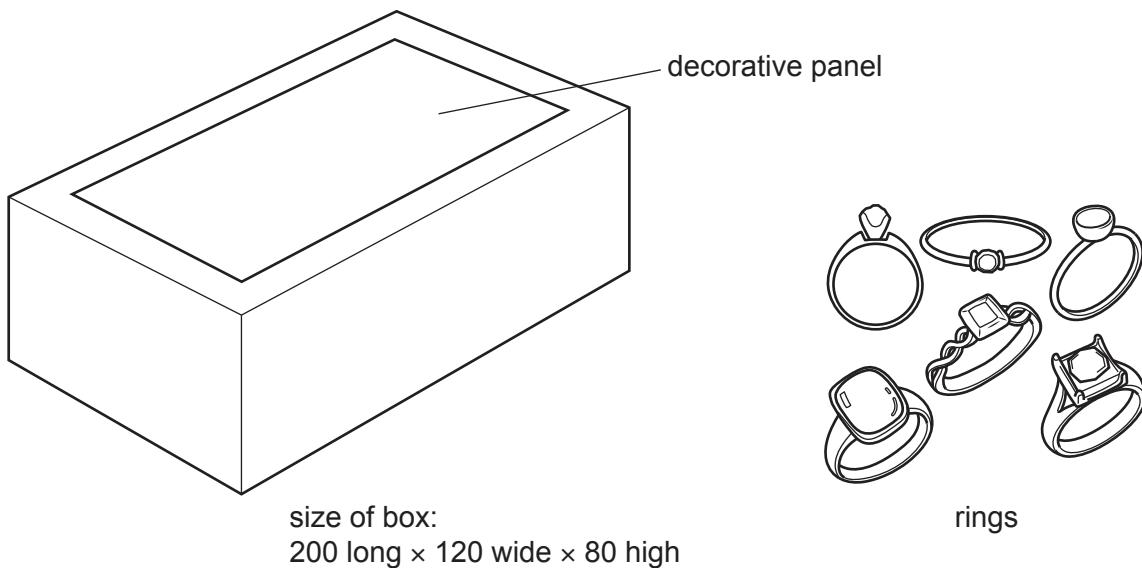


Fig. 7.1

- (a) Use notes and sketches to **develop** a design for a box to hold precious items. The box must include a lid that can be locked. [20]
- (b) Use notes and sketches to **develop** a design for a decorative panel for the top of the box you designed in **part (a)**. The purchaser of the box must be able to personalize the decorative panel. [20]
- (c) Use notes and sketches to **develop** a design for a method of holding six rings. The method of holding must fit inside the box you designed in **part (a)**. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete box which shows all of the features that you have designed in **parts (a) – (c)**. [20]

8 Fig. 8.1 shows an incomplete design for a paper carrier bag. The bag is to be used by a shop selling high quality clothes.

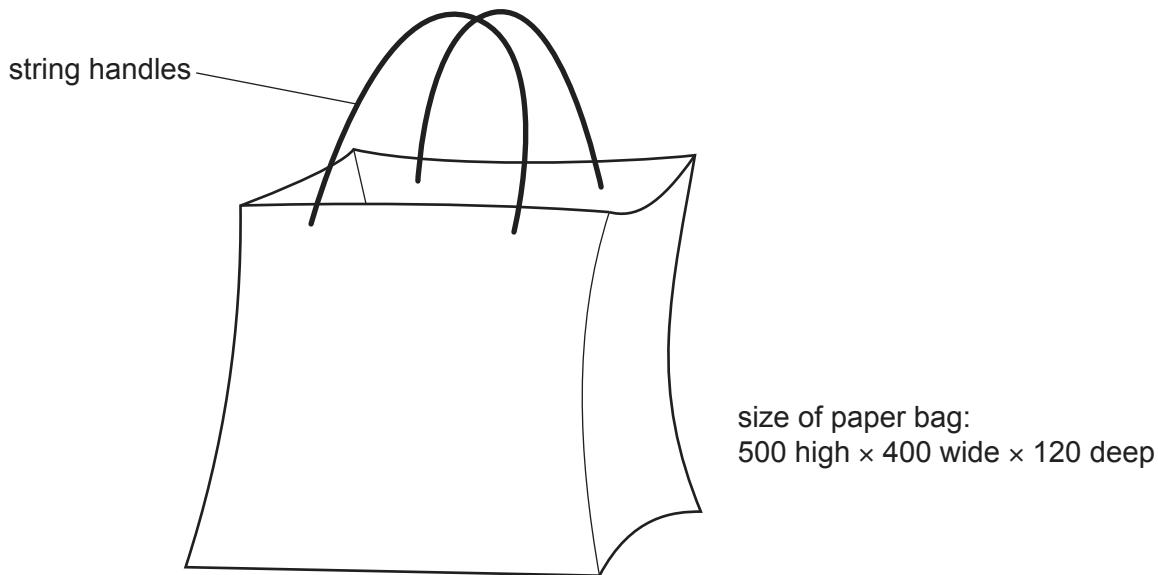


Fig. 8.1

- (a) Use notes and sketches to **develop** a design for the development (net) for a paper carrier bag. The bag must fold flat when not in use. [20]
- (b) Use notes and sketches to **develop** a design for a logo to be printed on the paper carrier bag. The logo must be based upon the name 'GL Clothes'. [20]
- (c) Use notes and sketches to **develop** a design for an attachment to go on the string handles that will make the paper carrier bag more comfortable to carry. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete paper carrier bag which shows all of the features that you have designed in **parts (a) – (c)**. [20]

9 Fig. 9.1 shows a magnifying glass and a circuit board. It can be difficult to hold and see small electronic components when fault finding.

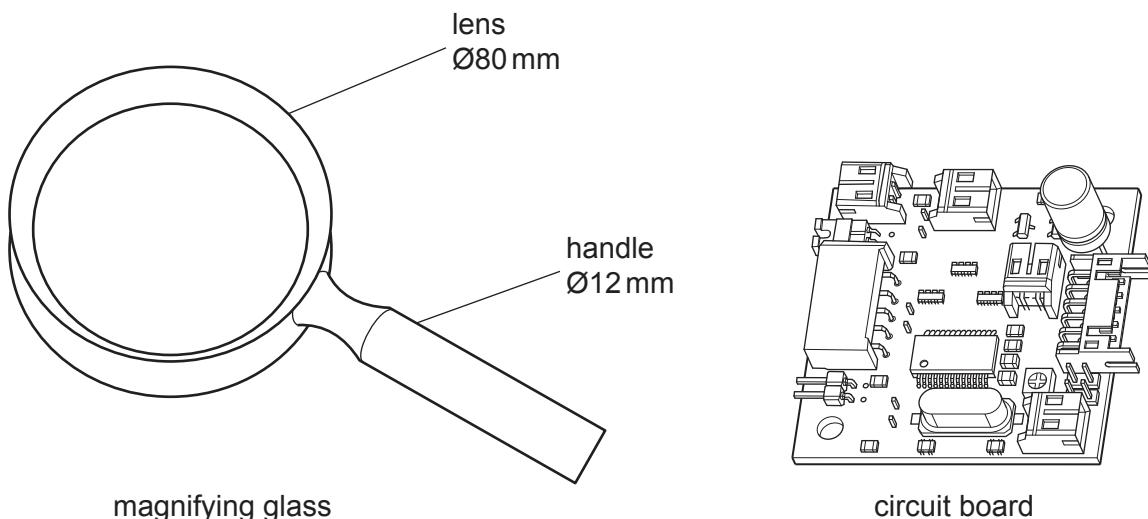


Fig. 9.1

- (a) Use notes and sketches to **develop** a design for a device that will sit on a bench and hold a magnifying glass. The magnifying glass must be easily adjusted to different angles. [20]
- (b) Use notes and sketches to **develop** a design for an attachment to the device you designed in **part (a)** that will hold a circuit board without damaging the components. [20]
- (c) Use notes and sketches to **develop** a design for an attachment to the device you designed in **part (a)** that will illuminate (light up) the work whilst it is being held. [20]
- (d) Produce a pictorial (3D) rendered drawing of the device which shows all of the features that you have designed in **parts (a) – (c)**. [20]

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