



Cambridge International AS & A Level

DESIGN & TECHNOLOGY

9705/11

Paper 1

October/November 2022

3 hours



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.

This document has **12** pages. Any blank pages are indicated.

Section A

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

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

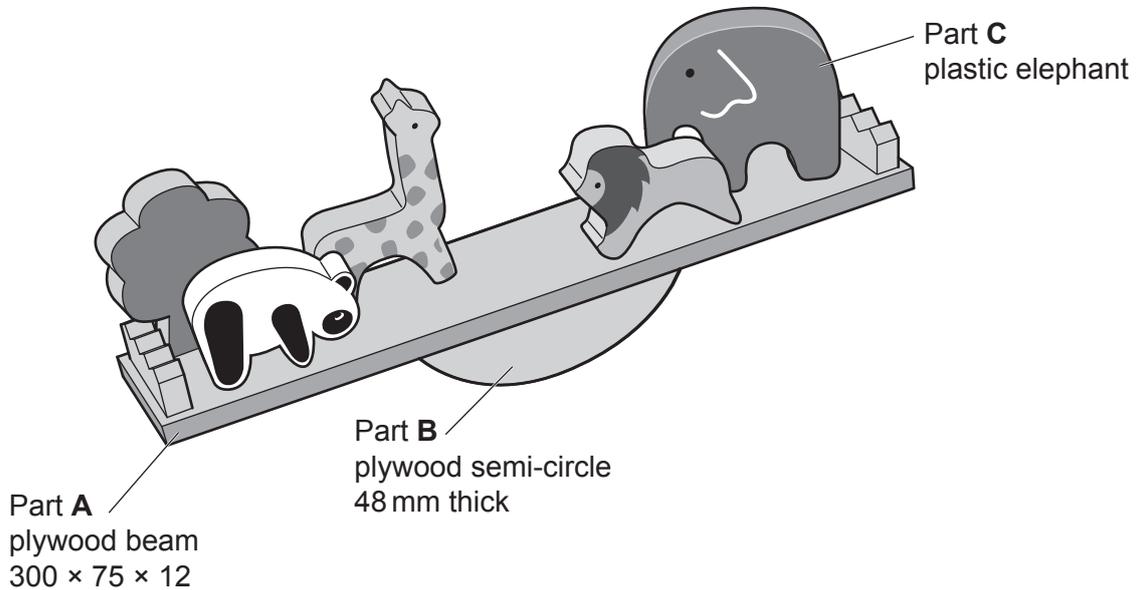


Fig. 1.1

- (a) State **two** reasons why plywood is a suitable material for Part A. [2]
- (b) Use notes and sketches to describe:
- (i) how Part B could be marked out and cut to shape [6]
 - (ii) a temporary method of joining Part A and Part B. [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 a method of making a batch of 500 of Part C, the plastic elephant. [6]

- 2 Fig. 2.1 gives details of a lampshade which is to be made in a school workshop. The polypropylene shade wraps around the mild steel frame.

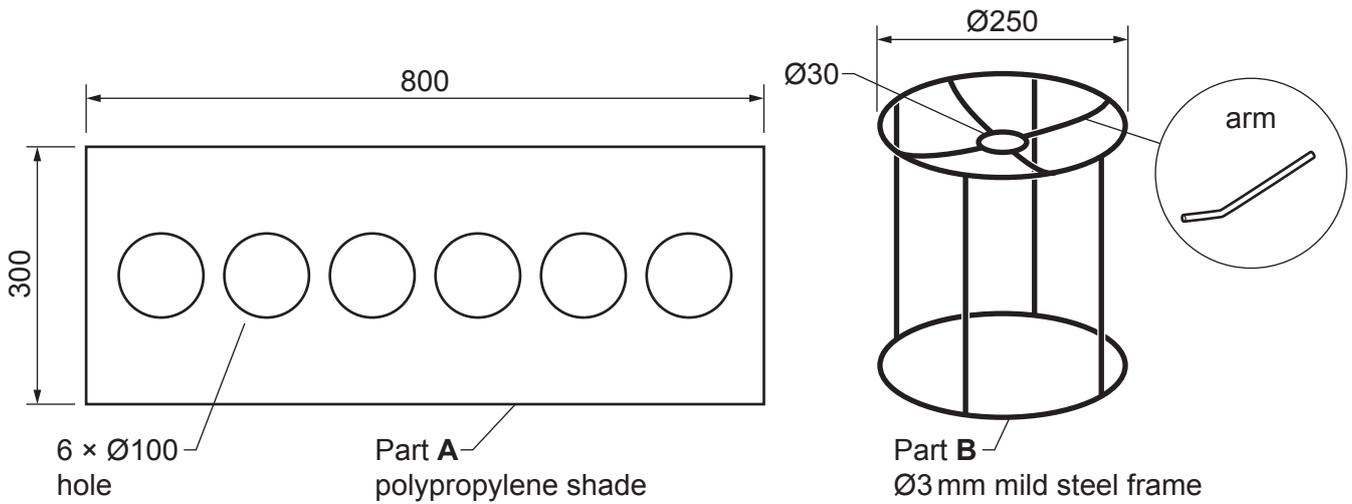


Fig. 2.1

- (a) State **two** properties of polypropylene that make it suitable for the shade. [2]
- (b) Use notes and sketches to describe:
- (i) how Part **A** could be marked out and cut to shape [6]
 - (ii) how Part **A** could be fitted to Part **B** [6]
 - (iii) how the four identical **arms** of Part **B** could be made. [6]

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

- 3 Fig. 3.1 gives details of a battery operated steady hand game which is to be made in a school workshop. A buzzer sounds if the loop on the handle touches Part A.

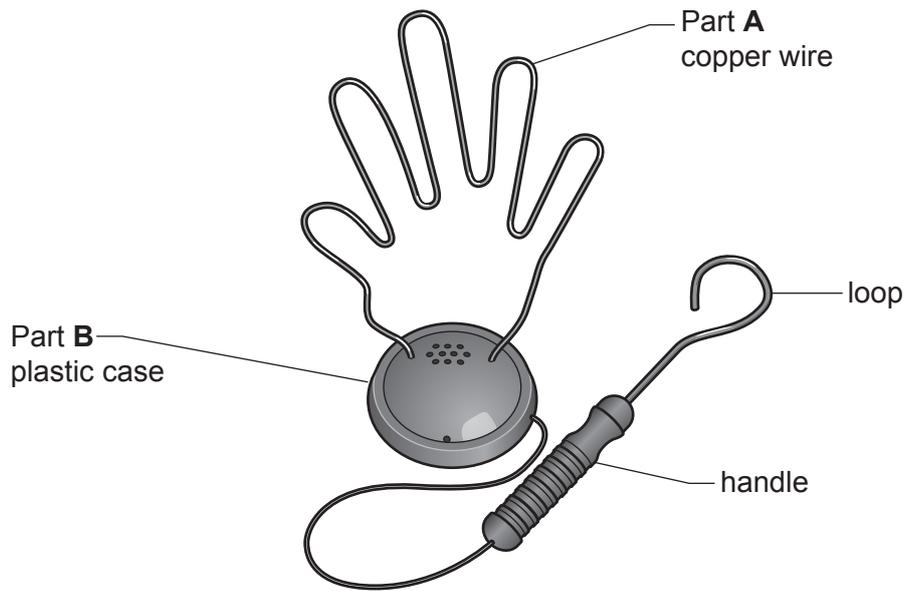


Fig. 3.1

- (a) Give **two** reasons why copper wire is suitable for Part A. [2]
- (b) Use notes and sketches to:
- (i) show the circuit diagram for the steady hand game [6]
- (ii) describe a method used to join the components in the circuit contained in Part B. [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 a method of making Part B, the plastic case. [6]

Section B

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

- 4 Fig. 4.1 gives details of a set of steps to be used around the home.

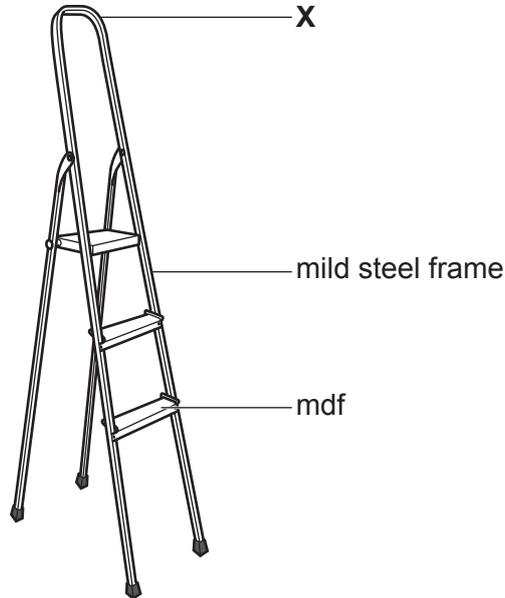


Fig. 4.1

- (a) Explain the function of the design feature shown at **X**. [2]
- (b) Identify and describe **two** problems with the set of steps. [4]
- (c) Use notes and sketches to explain how the set of steps would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why many pieces of equipment, such as the set of steps, are designed to be folded or dismantled. 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 gives details of the packaging for a table tennis bat. The development (net) is folded into shape to make the packaging.

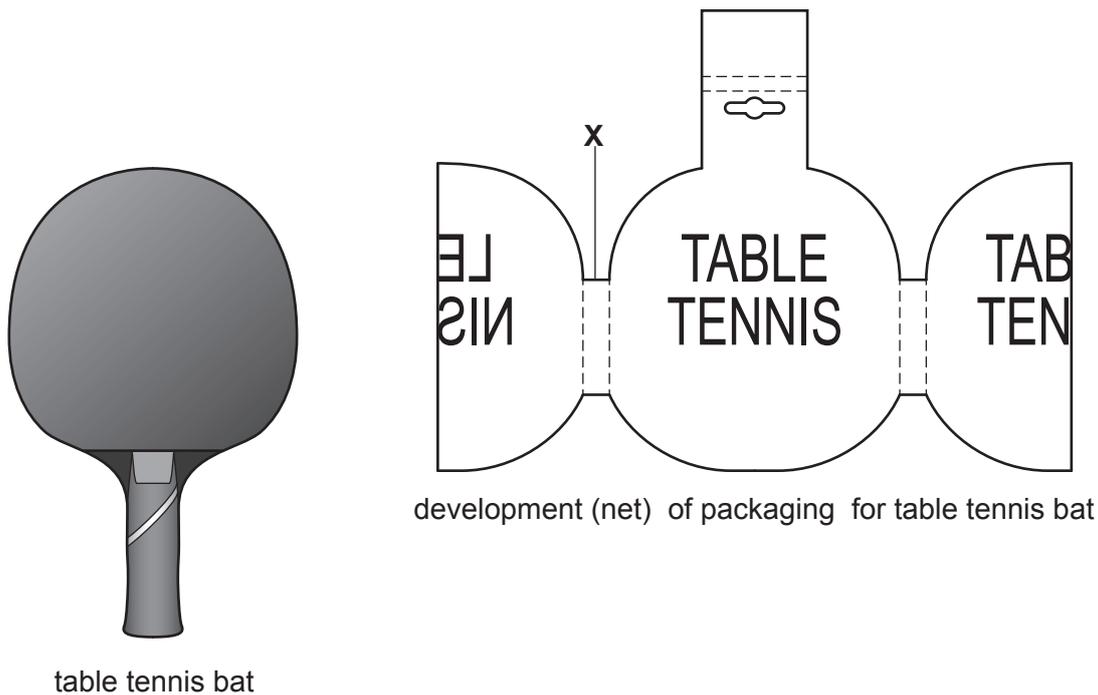


Fig. 5.1

- (a) Explain the function of the design feature shown at X. [2]
- (b) Identify and describe **two** problems with the **development (net)** required to make the packaging for the table tennis bat. [4]
- (c) Use notes and sketches to explain how the development (net) would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why many card products, such as the packaging for the table tennis bat, are made from recycled materials. 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 gives details of an electric extension cable for use with portable power tools.

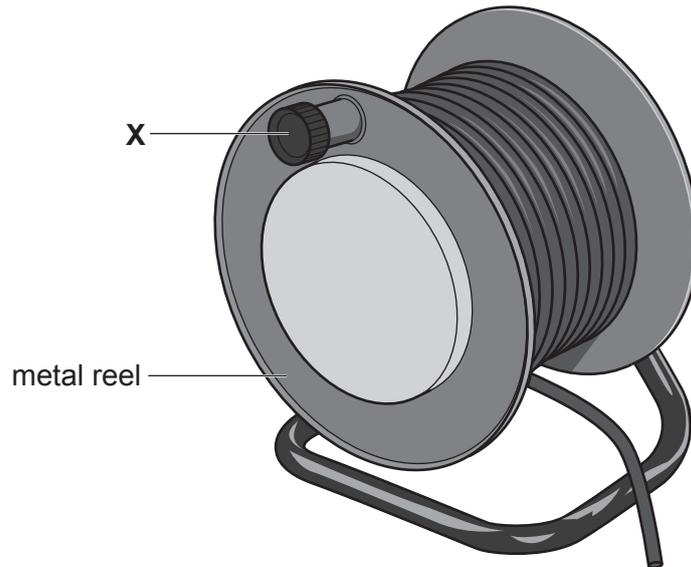


Fig. 6.1

- (a) Explain the function of the design feature shown at **X**. [2]
- (b) Identify and describe **two** problems with the electric extension cable. [4]
- (c) Use notes and sketches to explain how the extension cable would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why many electrical products, such as portable power tools, use a rechargeable battery as a power source rather than mains electricity. 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 an indoor climbing frame and a pair of children's shoes. Children must remove their shoes when using the climbing frame.

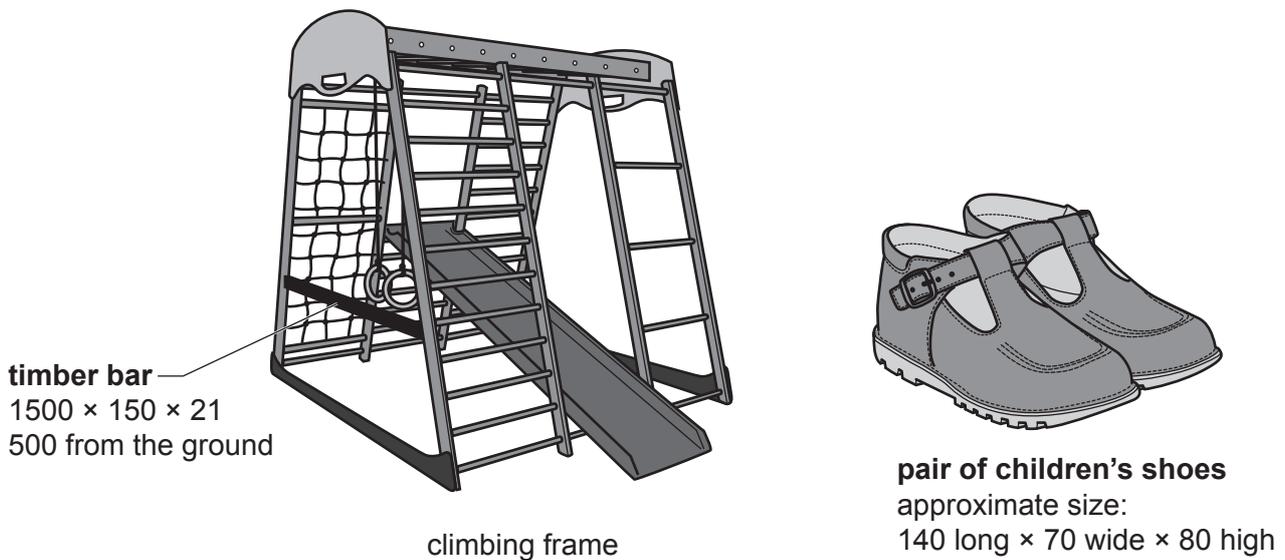
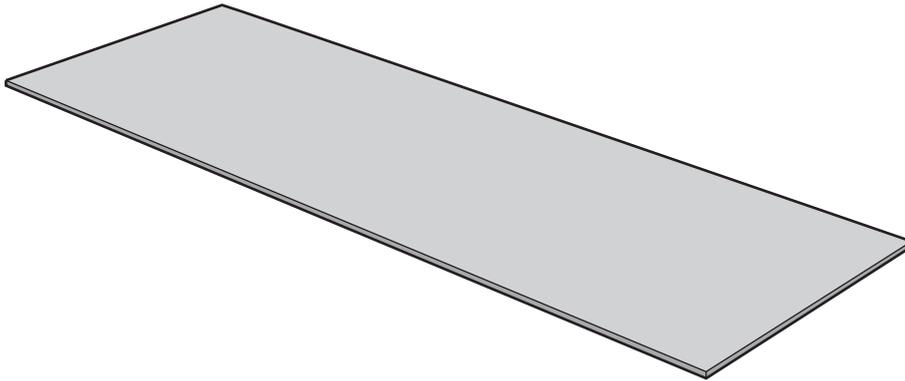


Fig. 7.1

- (a) Use notes and sketches to **develop** a design for a device for holding a pair of shoes together and making them easily identifiable whilst in storage. [20]
- (b) Use notes and sketches to **develop** a design for a shoe storage system that can hold eight pairs of shoes. [20]
- (c) Use notes and sketches to **develop** a design for a bracket for attaching the shoe storage system designed in **part (b)** to the timber bar on the climbing frame. [20]
- (d) Produce a pictorial (3D) rendered drawing of the shoe storage system which shows all of the features that you have designed in **parts (a) – (c)**. Do **not** include the climbing frame. [20]

8 Fig. 8.1 shows a sheet of modelling material, such as foamboard, and a sports watch.



sheet of modelling material (foamboard)



'ACTIVE' sports watch (strap Ø70)

Fig. 8.1

- (a) Use notes and sketches to **develop** a design for a point of sale (POS) display, for the 'ACTIVE' sports watch, made from the sheet of modelling material (foamboard). [20]
- (b) Use notes and sketches to **develop** a design for a leaflet to promote the use of the 'ACTIVE' sports watch in fitness training. [20]
- (c) Use notes and sketches to **develop** a design for a holder for 20 copies of the leaflet designed in **part (b)**.
The holder must be attached to the point of sale (POS) display designed in **part (a)**. [20]
- (d) Produce a pictorial (3D) rendered drawing of the completed point of sale display (POS) which shows all the features that you have designed in **parts (a) – (c)**. [20]

- 9 Fig. 9.1 shows the parts of a solar powered circulatory system for a garden water feature. The water is pumped out of the tray, through the hose to the feature and then falls back into the tray.

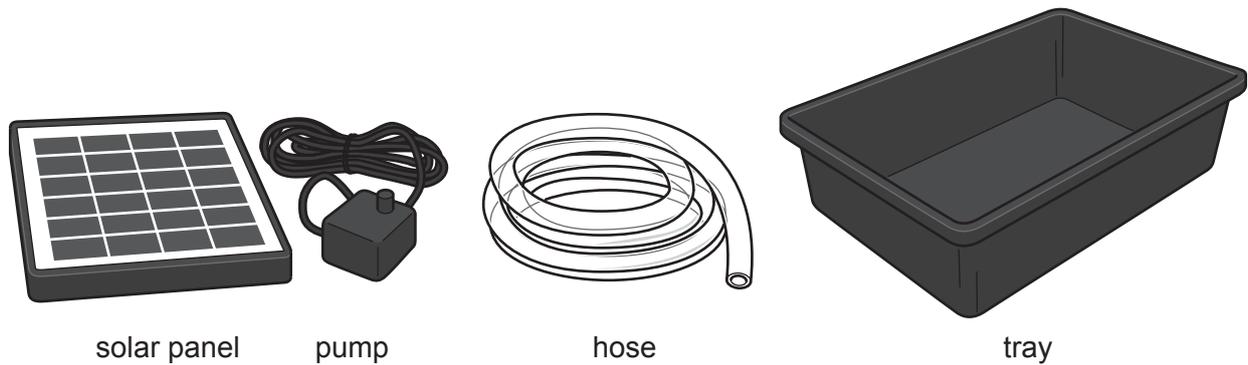


Fig. 9.1

- (a) Use notes and sketches to **develop** a design for a garden water feature that uses the flow of water to produce movement. [20]
- (b) Use notes and sketches to **develop** a design for a device that attaches to the hose to adjust the flow of water. [20]
- (c) Use notes and sketches to **develop** a design for a method of mounting the solar panel on a wall so that it can be adjusted to face the sun. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete garden feature which shows all the features that you have designed in **parts (a) – (c)**. [20]

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