



# Cambridge International AS & A Level

DESIGN & TECHNOLOGY

9705/13

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

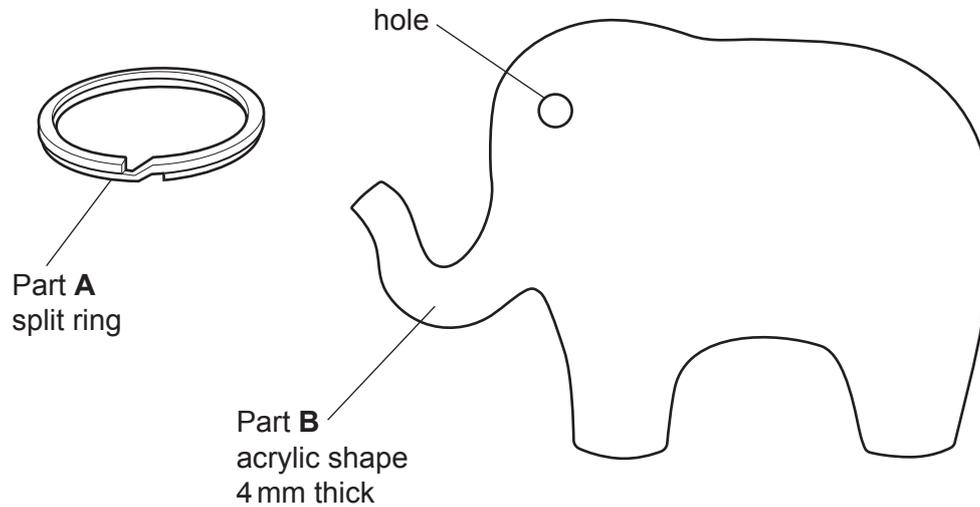
- The total mark for this paper is 120.
- The number of marks for each question or part question is shown in brackets [ ].
- All dimensions are in millimetres.

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 the two parts of a key fob which are to be made in a school workshop.



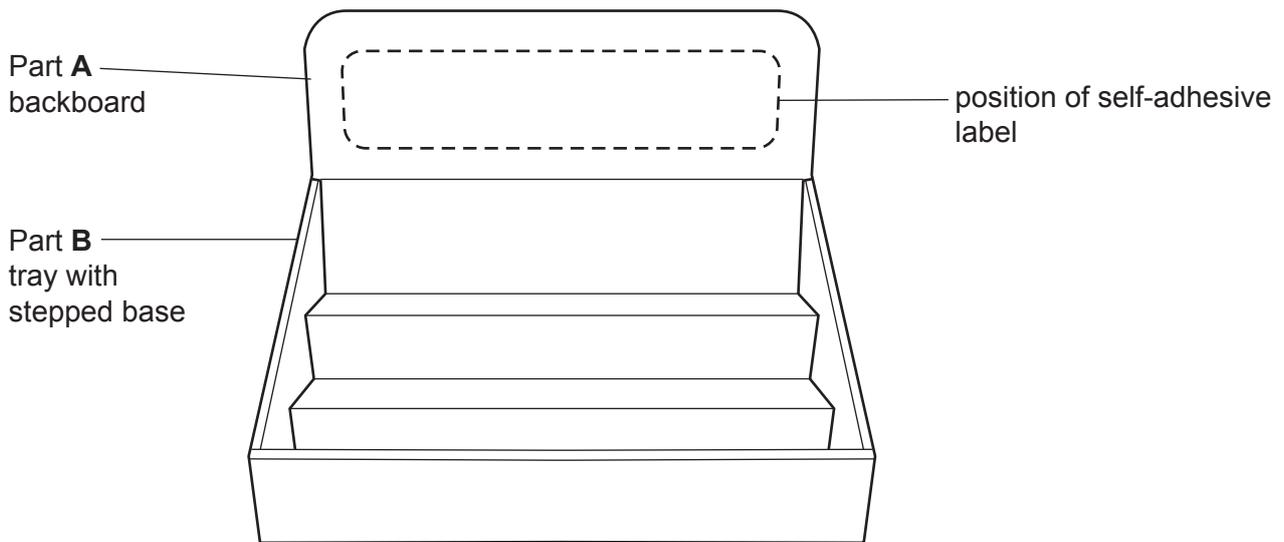
**Fig. 1.1**

- (a) Name a specific metal and finish for Part A. [2]
- (b) Use notes and sketches to describe:
- (i) how the hole in Part B could be produced [6]
- (ii) how Part B could be cut to shape and the edges finished. [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 personalising the key fob by adding a name. [6]

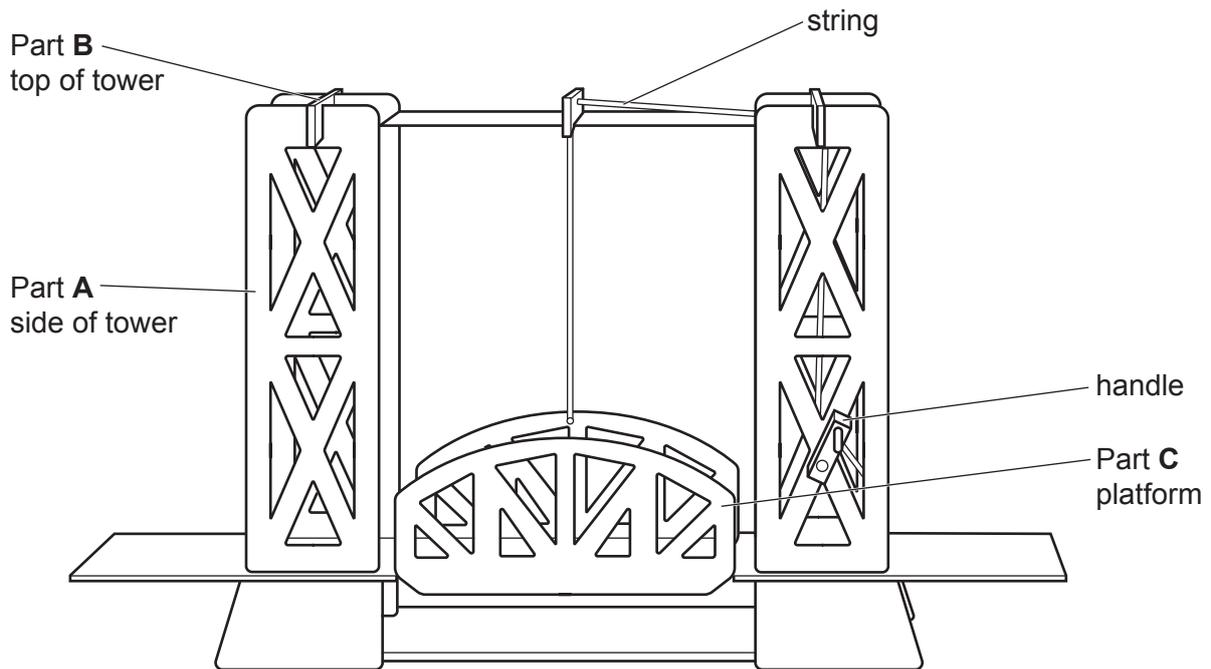
- 2 Fig. 2.1 gives details of a corrugated cardboard point of sale (POS) display which is to be made in a school workshop.



**Fig. 2.1**

- (a) Use a sketch and notes to show the construction of corrugated cardboard. [2]
- (b) Use notes and sketches to describe:
- (i) how Part **A** could be cut out and joined to Part **B** [6]
  - (ii) a method of making a self-adhesive label with an image on it. [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 the one-piece development (net) required to make Part **B**, the tray with stepped base. [6]

- 3 Fig. 3.1 gives details of a plywood model bridge which is to be made in a school workshop.



**Fig. 3.1**

- (a) Use a sketch and notes to show the force acting on the string as Part C, the platform, is raised. [2]
- (b) Use notes and sketches to describe:
- (i) how the triangular-shaped holes in Part A could be cut out [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 how the mechanism, used to raise Part C and lock it in a raised position, operates. [6]

## Section B

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

- 4 Fig. 4.1 gives details of a bathroom rack.

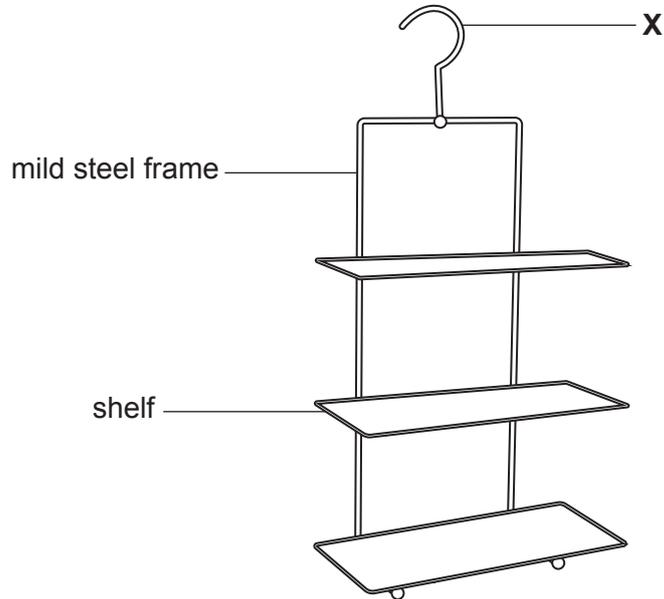


Fig. 4.1

- (a) Explain the function of the design feature shown at **X**. [2]
- (b) Identify and describe **two** problems with the bathroom rack. [4]
- (c) Use notes and sketches to explain how the bathroom rack would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why many racks, such as the bathroom rack, 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 gives details of a desk tidy made from six pieces of thin plastic sheet that slot together.

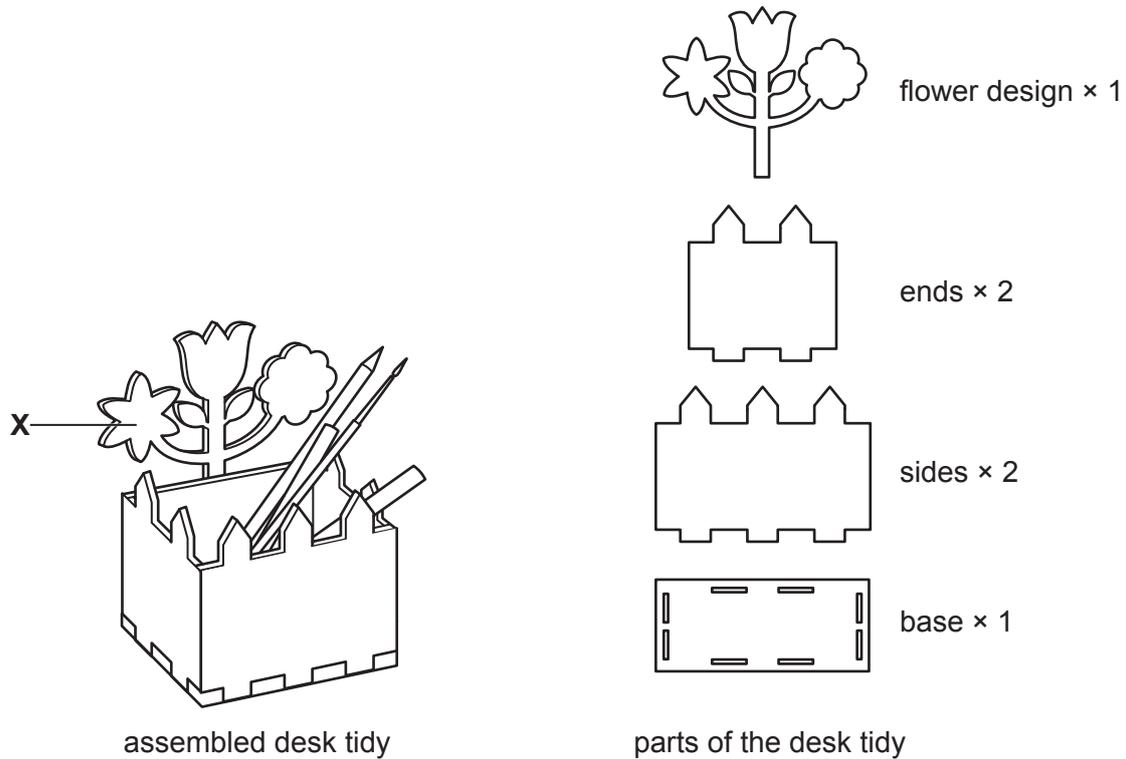


Fig. 5.1

- (a) Explain the function of the design feature shown at X. [2]
- (b) Identify and describe **two** problems with the pieces required to make the desk tidy. [4]
- (c) Use notes and sketches to explain how the pieces would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why products, such as the desk tidy, are designed with reference to the influence of fashion and style. 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 a scissor lift trolley.

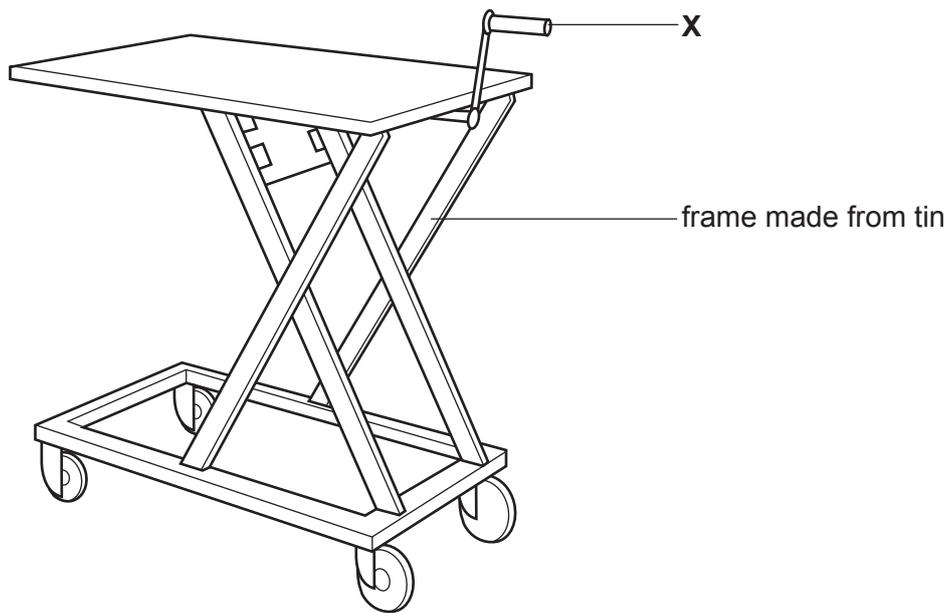


Fig. 6.1

- (a) Explain the function of the design feature shown at X. [2]
- (b) Identify and describe **two** problems with the scissor lift trolley. [4]
- (c) Use notes and sketches to explain how the scissor lift trolley would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why manufacturers of lifting equipment, such as the scissor lift trolley, consider the total number to be made before deciding on the method of production to be used. 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 outdoor exercise machine and a water bottle.

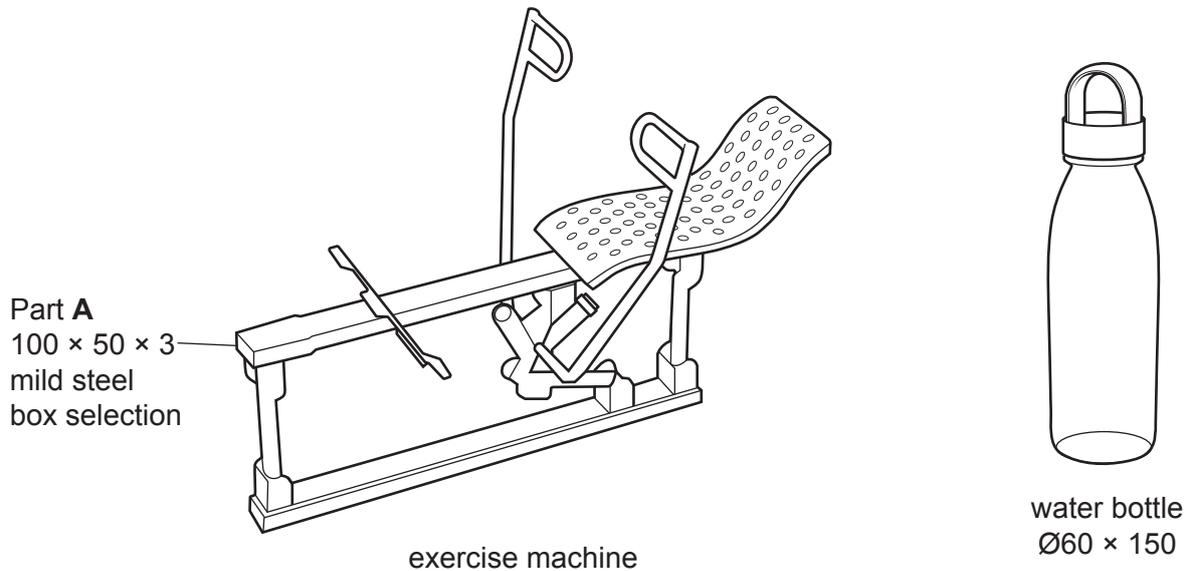


Fig. 7.1

- (a) Use notes and sketches to **develop** a design for a notice board that attaches to Part A and displays printed A3 information on the safe use of the exercise machine. [20]
- (b) Use notes and sketches to **develop** a design for a cover to protect the notice board from the weather and allow the information to be easily changed. [20]
- (c) Use notes and sketches to **develop** a design for a water bottle holder that attaches to the back of the notice board. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete notice board which shows all of the features that you have designed in parts (a) – (c). [20]

8 Fig. 8.1 shows the annual use of energy in a typical home.

Heating	30%
Cooling	18%
Hot water	15%
Laundry and cooking	12%
Lighting	10%
TV and computer	6%
Charging electric cars	6%
Other	3%

**Fig. 8.1**

- (a) Use notes and sketches to **develop** a design for a flat pack teaching aid to be used in a school to show the annual use of energy in a typical home. [20]
- (b) Use notes and sketches to **develop** a design for a novelty item to be given to each child in a class to encourage them to save energy. [20]
- (c) Use notes and sketches to **develop** a design for a sustainable package that allows the teaching aid and 20 of the novelty items to be posted to a school. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete teaching aid which shows all of the features that you have designed in **parts (a) – (c)**. [20]

9 Fig. 9.1 shows a baby's cot and an arm for a mobile.

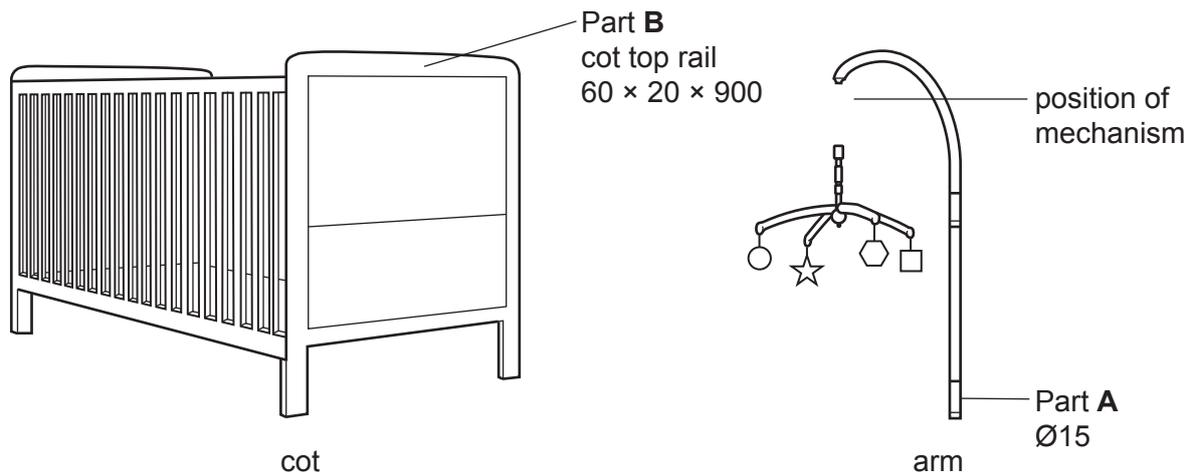


Fig. 9.1

- (a) Use notes and sketches to **develop** a design for a bracket that attaches Part **A** of the arm to Part **B** of the cot but allows the height and position to be adjusted. [20]
- (b) Use notes and sketches to **develop** a design for a mechanism that slowly rotates the geometrical shapes. [20]
- (c) Use notes and sketches to **develop** a design for an animal-shaped case for the mechanism designed in **part (b)**. [20]
- (d) Produce a pictorial (3D) rendered drawing of the mobile which shows all of the features that you have designed in **parts (a) – (c)**. Do **not** include the geometrical shapes. [20]



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