



Cambridge International AS & A Level

DESIGN & TECHNOLOGY

9705/12

Paper 1

October/November 2020

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. 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 about a book case that is to be made in a school workshop.

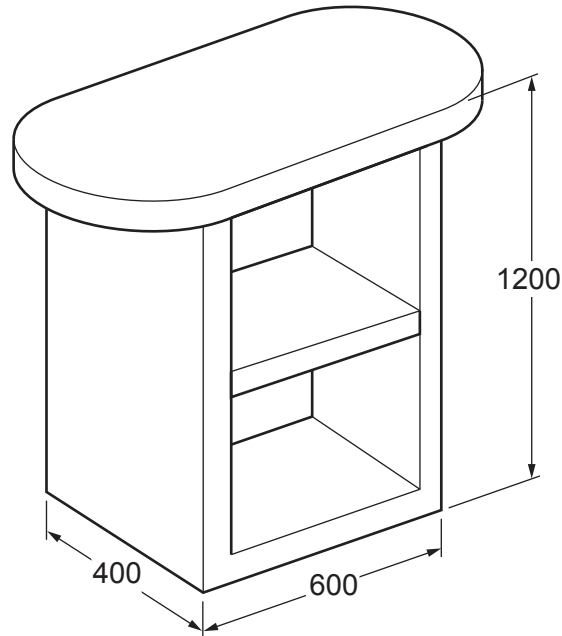


Fig. 1.1

- (a) Give **two** reasons why the book case will be made from 18 mm thick MDF rather than solid wood. [2]
- (b) Use notes and sketches to describe:
- (i) how the top could be cut out and the edges smoothed [6]
 - (ii) how temporary (knock-down) fittings could be used to join the sides to the top [6]
 - (iii) how a decorative finish could be applied to the book case. [6]

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

- 2 Fig. 2.1 shows a prototype pizza cutter handle and guard development (net) made from card that is to be made in a school workshop.

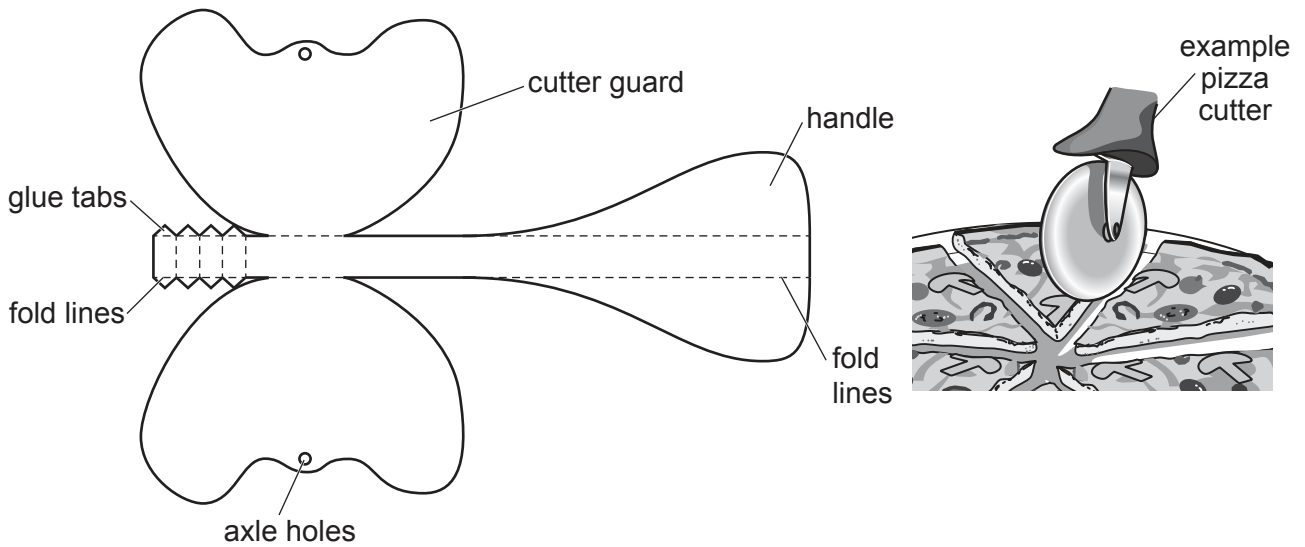


Fig. 2.1

- (a) Give **two** reasons why the prototype will be made from card. [2]
- (b) Sketch an assembled pictorial three-dimensional (3D) view of the prototype. [6]
- (c) Use notes and sketches to describe:
- (i) how the prototype development (net) could be marked out and cut out [6]
- (ii) how the prototype development (net) could be strengthened to allow realistic testing. [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 about a wall mounted magazine rack that is to be made in a school workshop. The magazine rack will be made from one piece of acrylic.

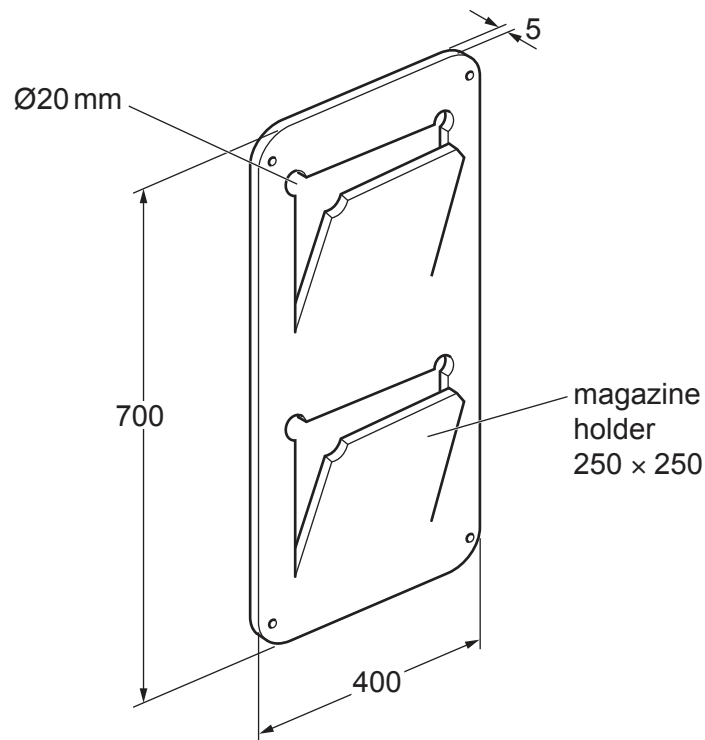


Fig. 3.1

- (a) Give **two** reasons why the magazine rack will be made from acrylic. [2]
- (b) Use notes and sketches to describe:
- (i) how the outer shape of the magazine rack could be cut out and shaped [6]
 - (ii) how the two magazine holders could be cut out, shaped and bent. [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** changes that could be made to the design to improve the aesthetic appeal. [6]

Section B

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

- 4 Fig. 4.1 shows a child's slide. This type of slide is often found in a playground.

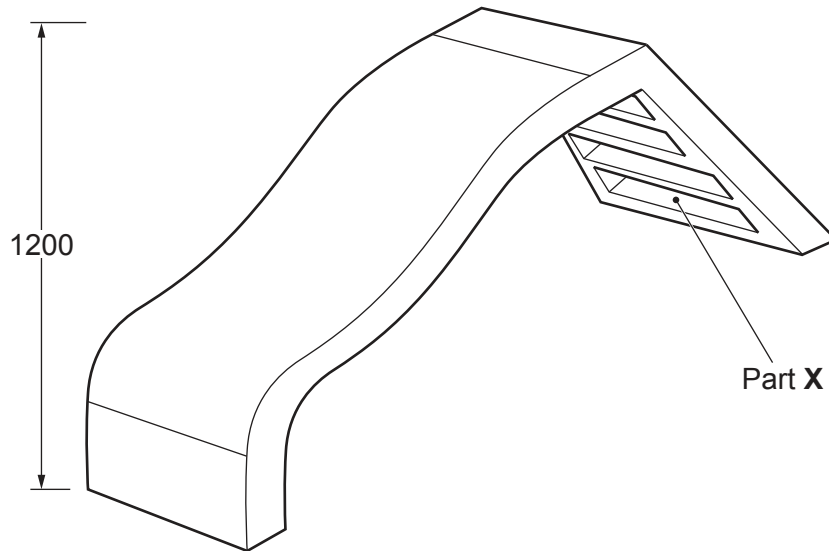


Fig. 4.1

- (a) Explain the function of Part X. [2]
- (b) Identify and describe **two** problems with the design of the slide. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Non-destructive tests are often used during the manufacture of products such as the slide. Discuss why they are needed.

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 about a box that is to be used to package and store health food bars.

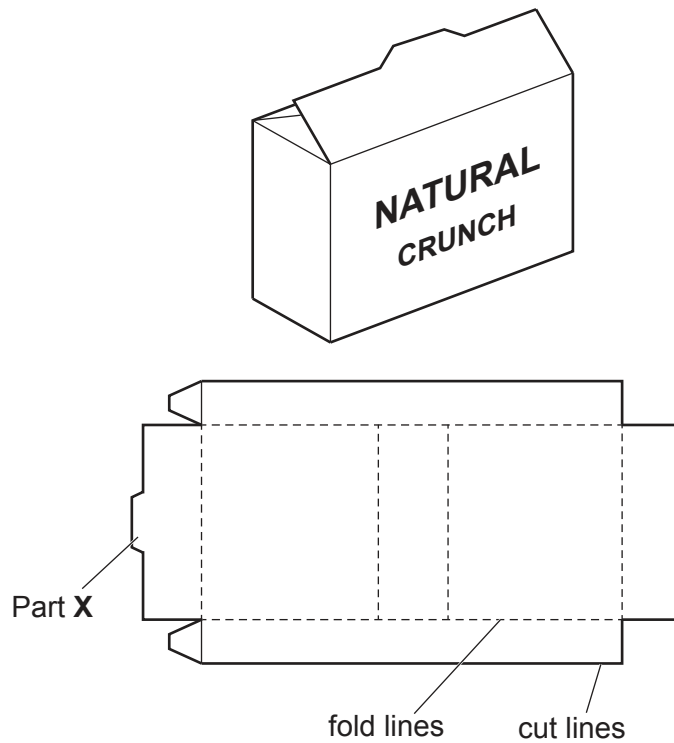


Fig. 5.1

- (a) Explain the function of Part X. [2]
- (b) Identify and describe **two** problems with the design of the development (net). [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss the importance of colour when marketing products such as the health food bar.

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 a design for a hair dryer. The hair dryer is powered by mains electricity and held in the hand.

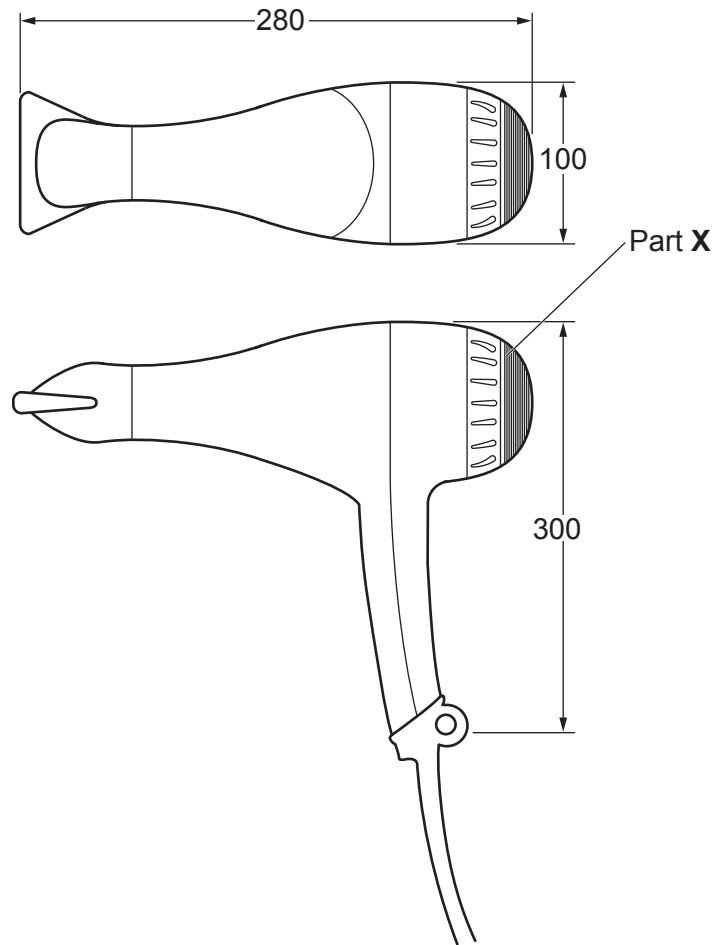


Fig. 6.1

- (a) Explain the function of Part X. [2]
- (b) Identify and describe **two** problems with the design of the hair dryer. [4]
- (c) Using notes and sketches, explain how the design of the hair dryer would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why products, such as the hair dryer, are designed to be energy efficient.

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 solution. The design proposal should be annotated to give details about materials, joining methods and important sizes.

7 Fig. 7.1 shows an incomplete design for a child's outdoor play house.

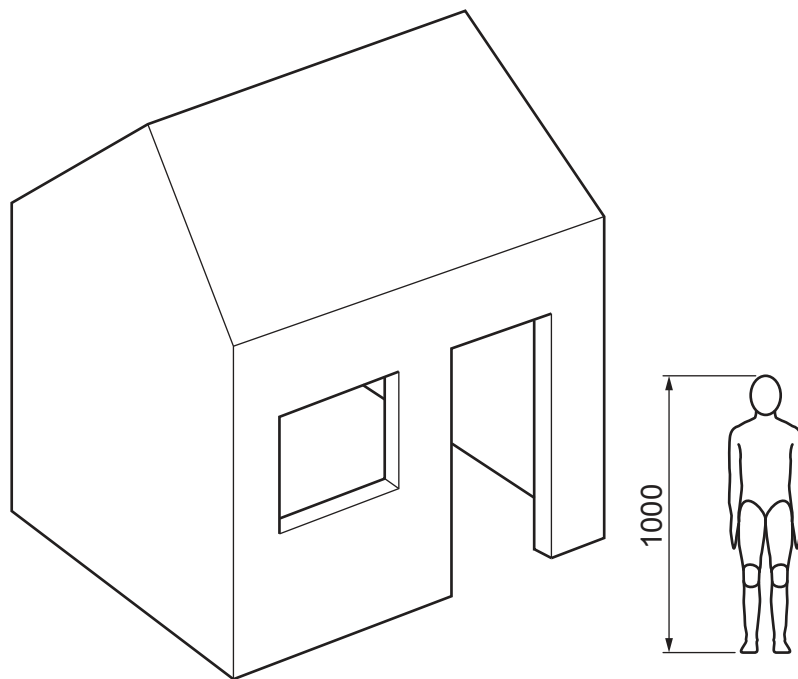


Fig. 7.1

- (a) Using notes and sketches, **develop** a design for the play house that allows it to be easily collapsed for storage. [20]
- (b) Using notes and sketches, **develop** a design for a play house door that allows it to be easily opened and closed by a small child. [20]
- (c) Using notes and sketches, **develop** a design for a detachable window box that would allow children to grow small plants. The window box must be easily fixed to and removed from the play house. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete play house which shows all of the features that you have designed in **parts (a) – (c)**. [20]

- 8 Fig. 8.1 shows an incomplete idea for a display stand that will be used to promote a new café called '24/7 Ice cream'. The display stand will be made from a lightweight sheet material.

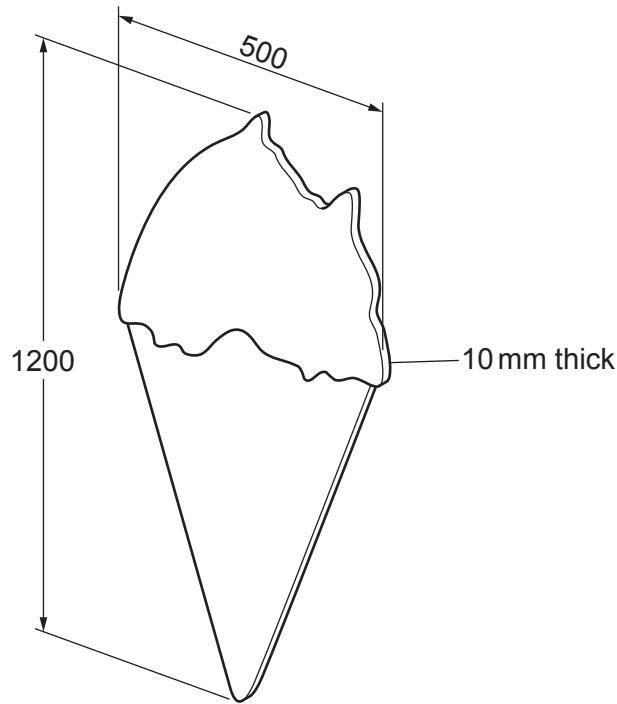


Fig. 8.1

- (a) Using notes and sketches, **develop** a design for the display stand. The display stand must be freestanding and collapsible. [20]
- (b) Using notes and sketches, **develop** a design for lettering and imagery to promote the café. The name of the café is '24/7 Ice cream'. [20]
- (c) Using notes and sketches, **develop** a design for a menu holder that can be attached to the display stand. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete display stand, which shows all of the features that you have designed in **parts (a) – (c)**. [20]

9 Fig. 9.1 shows an incomplete design for a school flipchart stand.

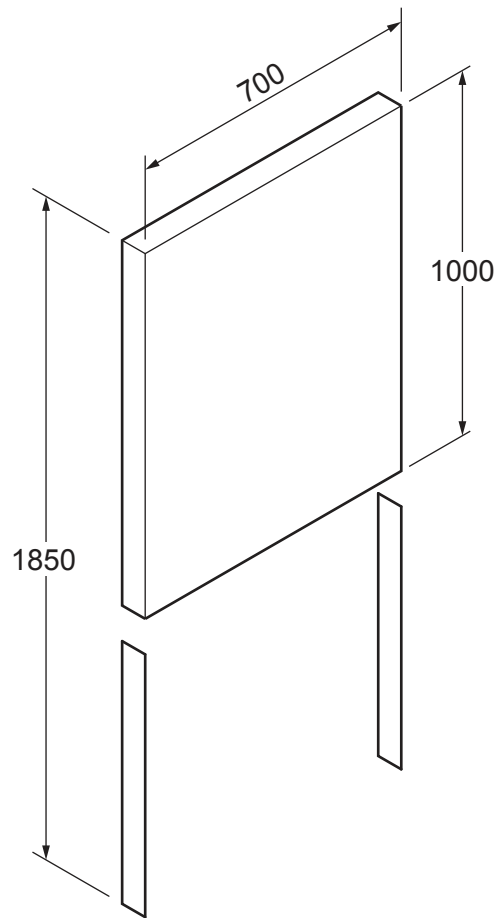


Fig. 9.1

- (a) Using notes and sketches, **develop** a design for the flipchart stand. The stand must be easy to move around the school. [20]
- (b) Using notes and sketches, **develop** a design to hold marker pens on the stand. The pens should be held securely when the stand is moved. [20]
- (c) Using notes and sketches, **develop** a design for attaching an A2 flip chart pad to the stand. It must be possible to remove the flip chart pad easily. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete flip chart stand which shows all of the features that you have designed in **parts (a) – (c)**. [20]

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