



Cambridge International AS & A Level

DESIGN & TECHNOLOGY

9705/11

Paper 1

October/November 2021

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 wooden game which is to be made in a school workshop.

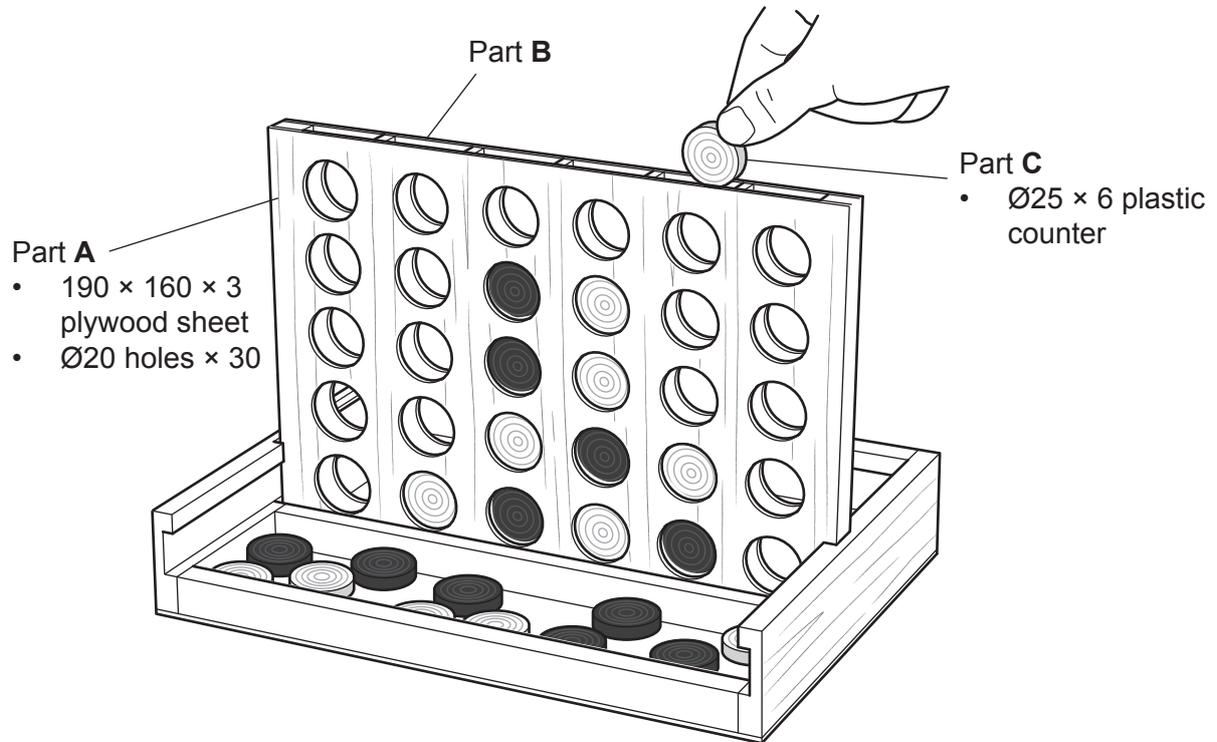


Fig. 1.1

- (a) Use a sketch and notes to show the construction of plywood. [2]
- (b) Use notes and sketches to describe:
- (i) how the holes in Part A could be marked out and cut [6]
- (ii) how Part A and Part B could be joined together [6]
- (iii) a method of making a batch of 50 plastic counters. [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 gives details of a picture frame which is to be made in a school workshop.

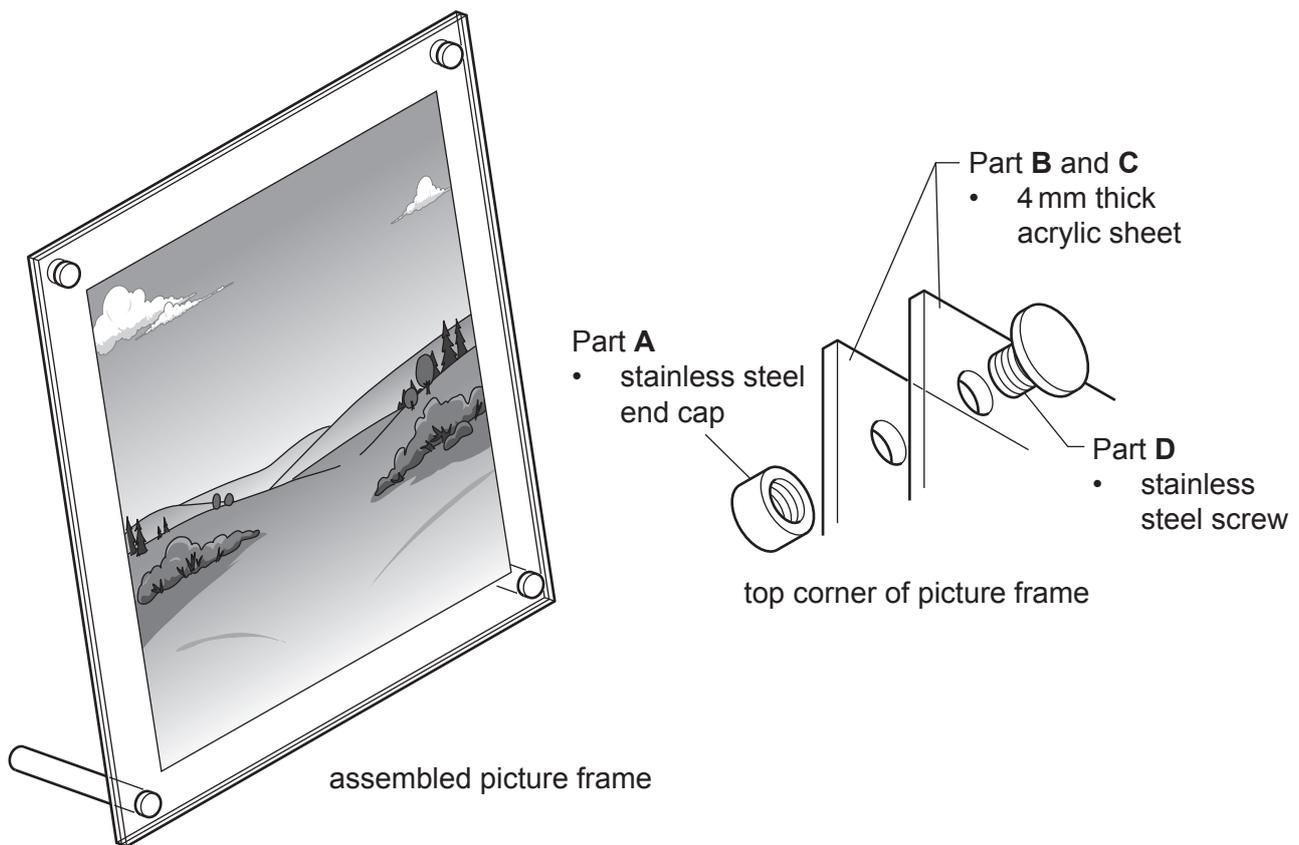


Fig. 2.1

- (a) Give **two** reasons why stainless steel is a suitable material for Part **A**, the end cap. [2]
- (b) Use notes and sketches to describe:
- (i) how to cut and finish the edges of Part **B**, the 4 mm thick acrylic sheet [6]
 - (ii) how the holes in Part **B** and Part **C** could be marked out and cut so that they are aligned. [6]
 - (iii) how to cut an M6 external thread on Part **D**, the stainless steel screw. [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 menu and menu holder which are to be made in a school workshop.

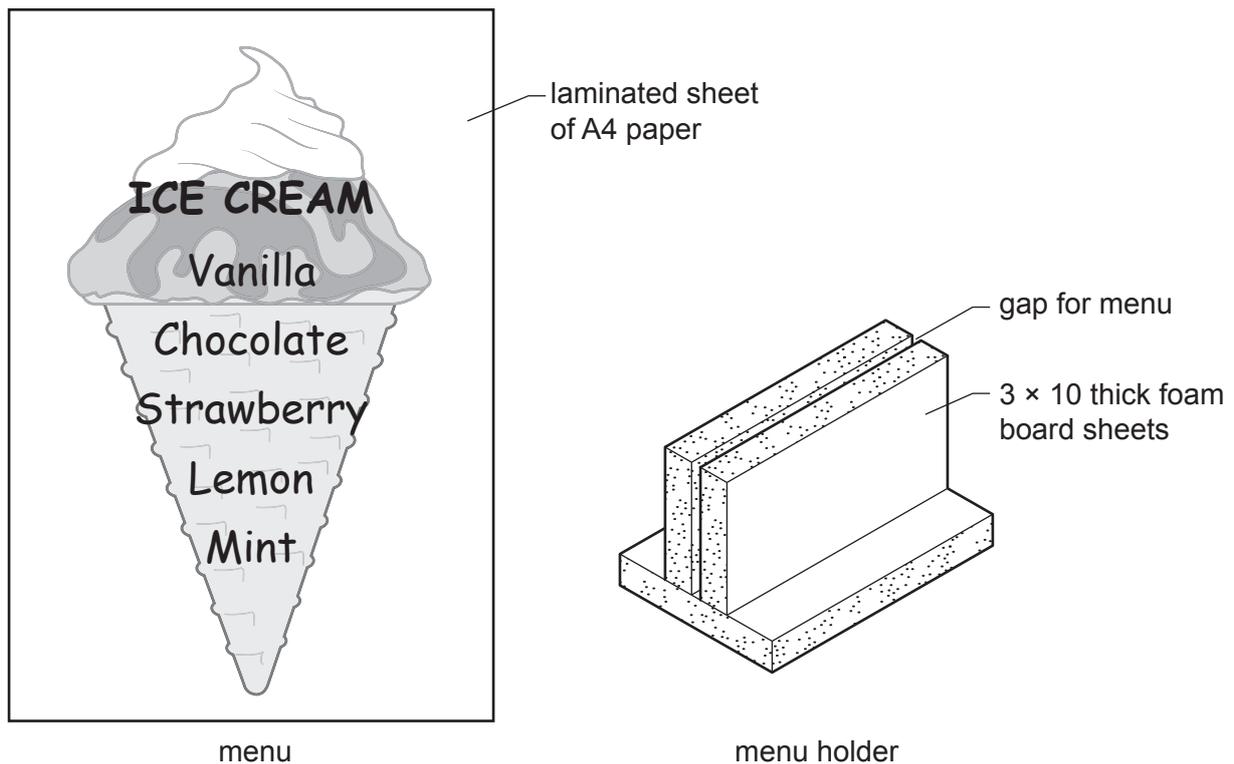


Fig. 3.1

- (a) Give **two** reasons why laminated paper is suitable for the menu. [2]
- (b) Use notes and sketches to describe how to:
- (i) accurately produce the image and lettering on the menu [6]
 - (ii) cut out and join the three pieces of foam board required to make the menu holder. [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 describe a method of making an alternative menu holder from 3 mm thick acrylic sheet. [6]

- 5 Fig. 5.1 gives details of a storage crate and storage rack. The storage crate has MDF ends and corrugated slats that are joined together with PVA glue. The storage rack has adjustable shelves and feet.

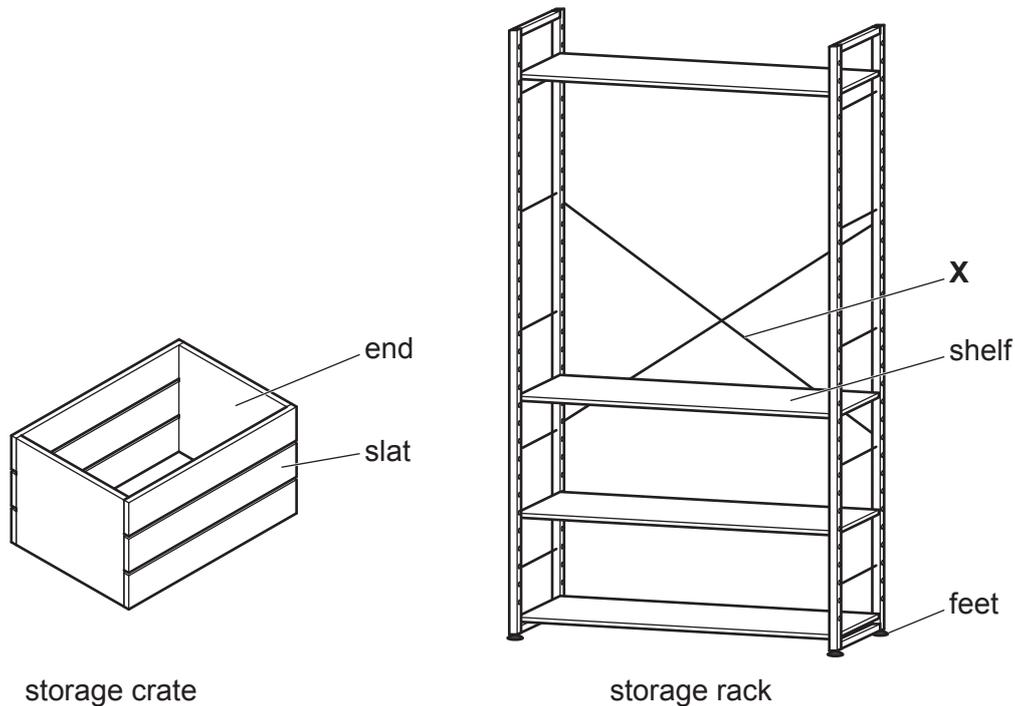


Fig. 5.1

- (a) Explain the function of the design feature shown at X. [2]
- (b) Identify and describe **two** problems that make the **storage crate** unsuitable for use. [4]
- (c) Use notes and sketches to explain modifications to the storage crate to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why the **storage rack** has been designed to be adjustable.
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 adjustable electric lamp. The shade is made from acrylic and the frame from pine. Each joint on the frame is held together with two woodscrews.

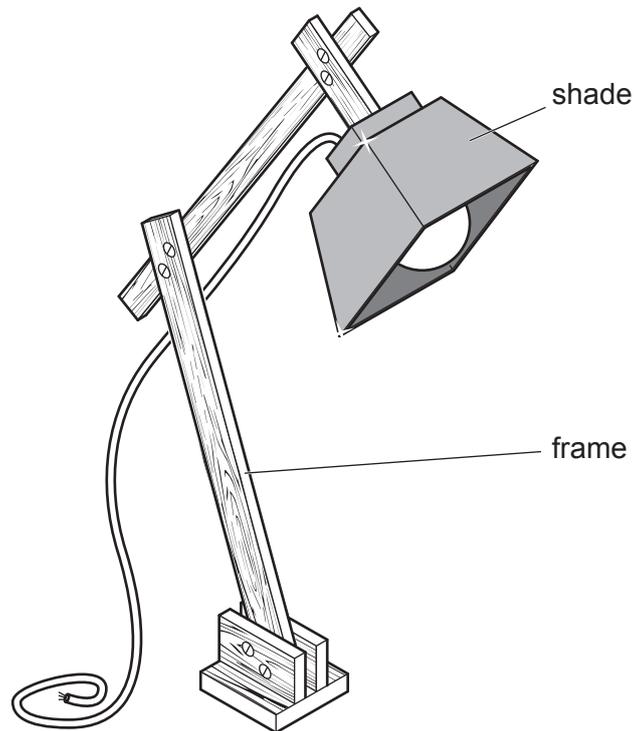


Fig. 6.1

- (a) Give **two** examples of how fashion influences the design of electric lamps. [2]
- (b) Identify and describe **two** problems with the adjustable electric lamp. [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 surface finishes are used on products such as lamps.
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 incomplete design for a child's bed made from 20 mm thick melamine faced chipboard.

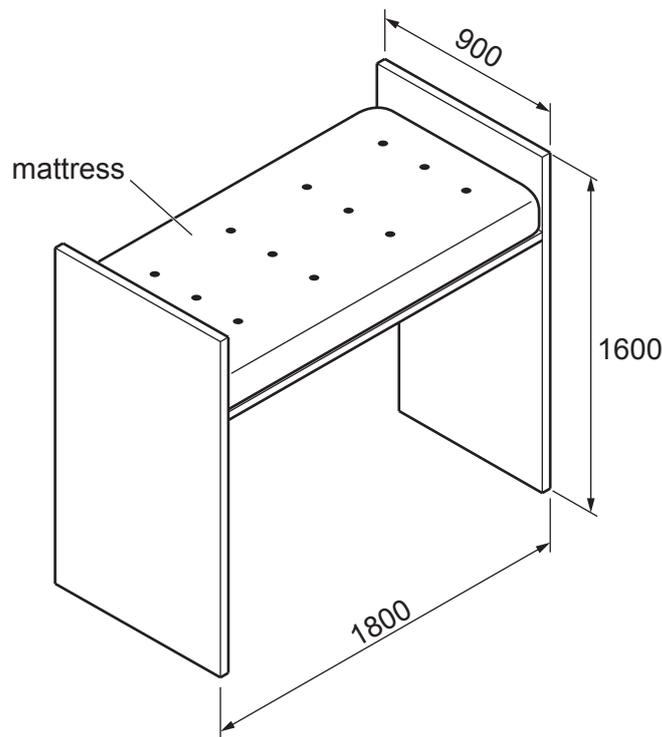


Fig. 7.1

- (a) Use notes and sketches to **develop** a design for the child's bed that can be assembled at home. The design must prevent the child from falling out of bed. [20]
- (b) Use notes and sketches to **develop** a design for a seat to go underneath the bed. The seat must include storage for toys. [20]
- (c) Use notes and sketches to **develop** a design for a detachable ladder that will allow a child to climb safely in and out of bed. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete bed which shows all of the features that you have designed in **parts (a) – (c)**. [20]

- 8 Fig. 8.1 shows the parts of a self-assembly trophy kit. The $\text{Ø}60\text{ mm} \times 5\text{ mm}$ plastic disc has an athletics logo printed on one side and a swimming logo on the other side.

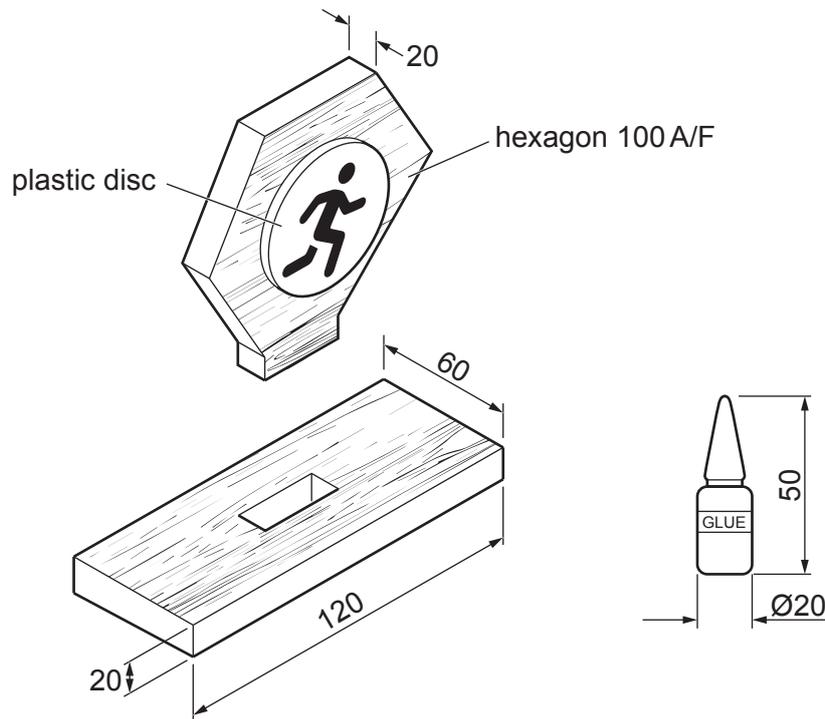


Fig. 8.1

- (a) Use notes and sketches to **develop** a design for a plastic tray that will securely hold the parts of the trophy and the bottle of glue. [20]
- (b) Use notes and sketches to **develop** a design for a one-piece development (net) for a card package that:
- holds the plastic tray designed in **part (a)**
 - has a window so that the plastic disc can be seen when the package is closed. [20]
- (c) Use notes and sketches to **develop** a design for a leaflet that fits inside the card package designed in **part (b)** and shows how to assemble the trophy, using either the athletics or swimming logo. [20]
- (d) Produce an exploded pictorial (3D) rendered drawing of the complete package which shows all of the features that you have designed in **parts (a) – (c)**. Do **not** show the trophy in this drawing. [20]

- 9 Fig. 9.1 shows incomplete designs for three parts of a screwdriver set. The screwdriver handle is made from polypropylene and the two screwdriver bits from Ø6 mm chromium plated steel bar.

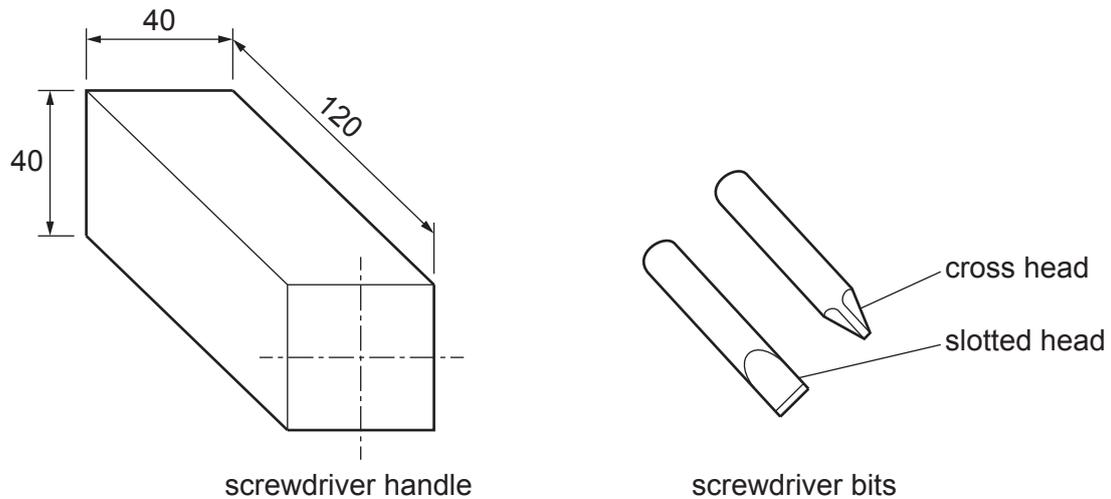


Fig. 9.1

- (a) Use notes and sketches to **develop** a design for a method of holding the screwdriver bits in the handle. The screwdriver bits must 'lock' in position in the handle but easily be changed. [20]
- (b) Use notes and sketches to **develop** a design for an ergonomic handle. The design must include a light to aid visibility when using the screwdriver. [20]
- (c) Use notes and sketches to **develop** a design for a holder for the handle and bits that will clip onto a belt. [20]
- (d) Produce a pictorial (3D) rendered drawing of the screwdriver set which shows all of the features that you have designed in **parts (a) – (c)**. [20]

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