



# Cambridge International AS & A Level

DESIGN & TECHNOLOGY

9705/12

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

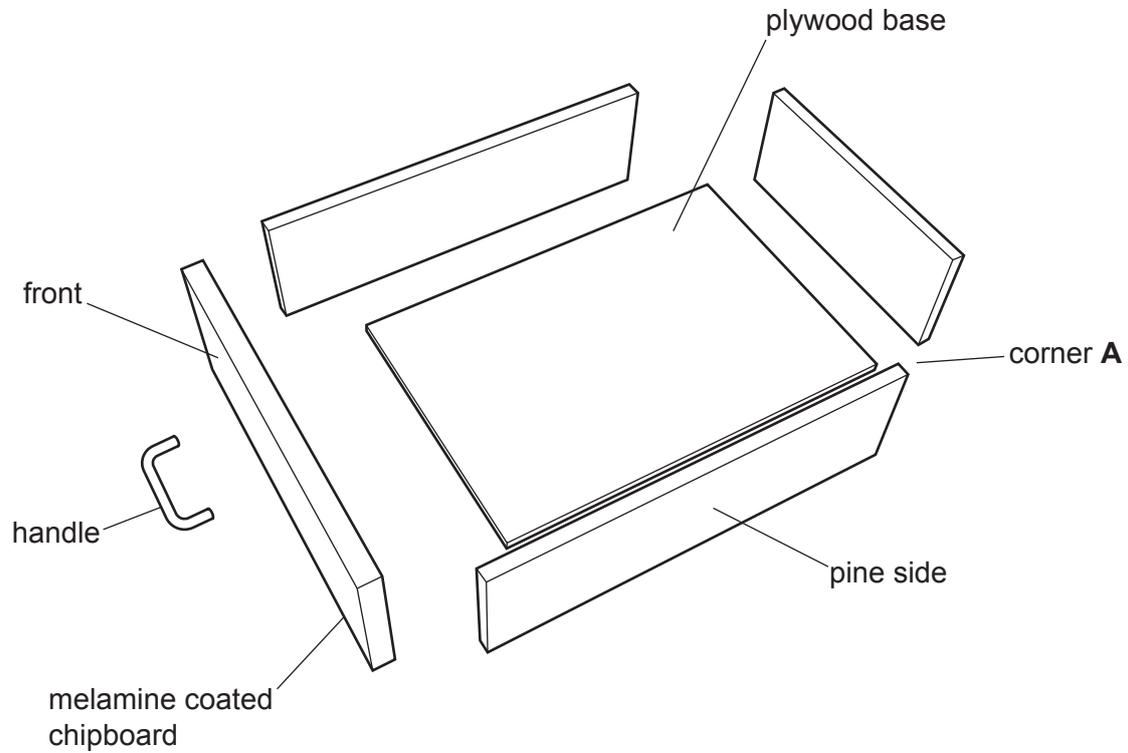
- The total mark for this paper is 120.
- The number of marks for each question or part question is shown in brackets [ ].
- All dimensions are in millimetres.

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.

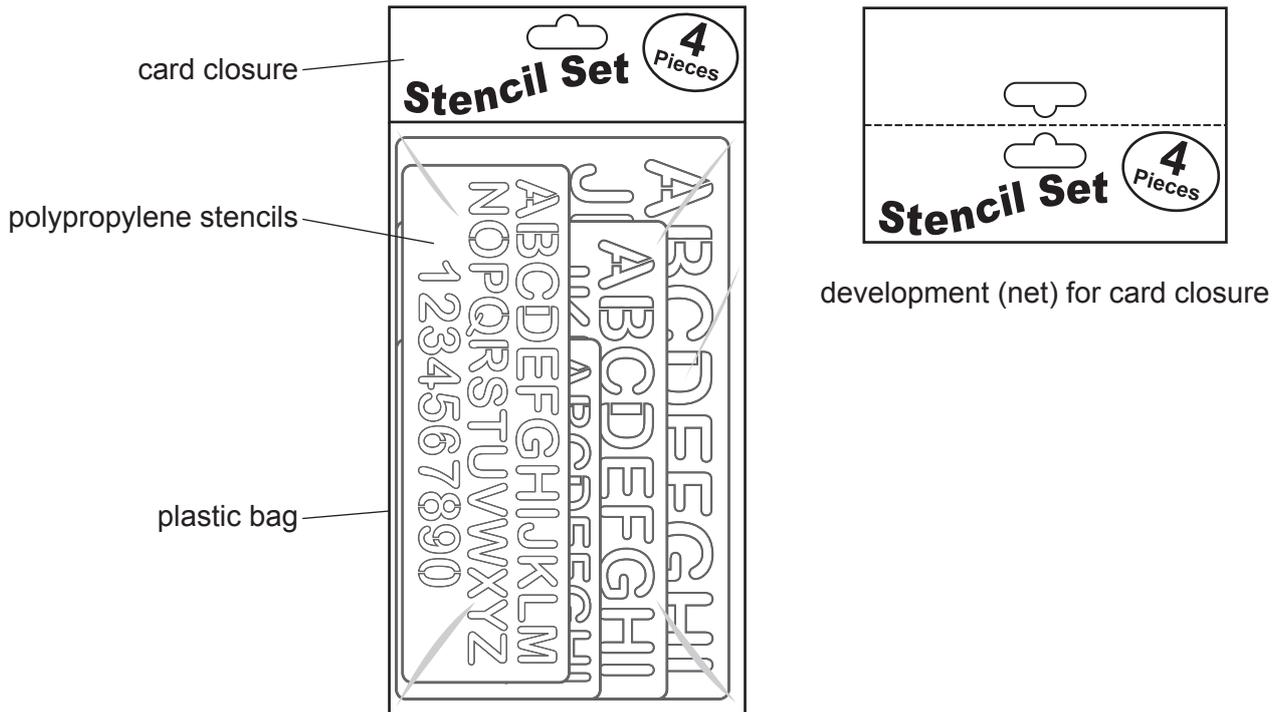
- 1 Fig. 1.1 gives details of a drawer which is to be made in a school workshop.



**Fig. 1.1**

- (a) State **two** reasons why the drawer front is made from melamine coated chipboard. [2]
- (b) Use notes and sketches to describe:
- (i) how a knock down (KD) fitting could be used to join corner **A** [6]
  - (ii) a method of joining the plywood base to the sides. [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 temporary method of attaching the handle to the front of the drawer. [6]

2 Fig. 2.1 gives details of a stencil set which is to be made in a school workshop.



**Fig. 2.1**

- (a) Explain why polypropylene is a suitable material for the stencils. [2]
- (b) Use notes and sketches to describe:
- how to mark out and cut out the development (net) for the card closure [6]
  - a method of joining the card closure to the plastic bag, so that it can be opened and closed. [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 reproducing the text on 1000 copies of the card closure. [6]

3 Fig. 3.1 gives details of two adjustable tools which are used in a school workshop.

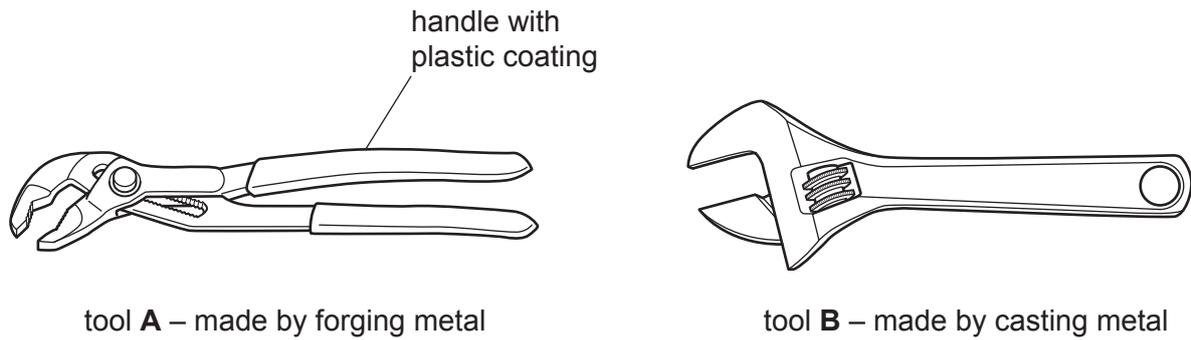


Fig. 3.1

(a) State **two** reasons why the handle of tool **A** has a plastic coating. [2]

(b) Use notes and sketches to describe **one** of the following processes:

- forging metal

or

- casting metal.

[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:

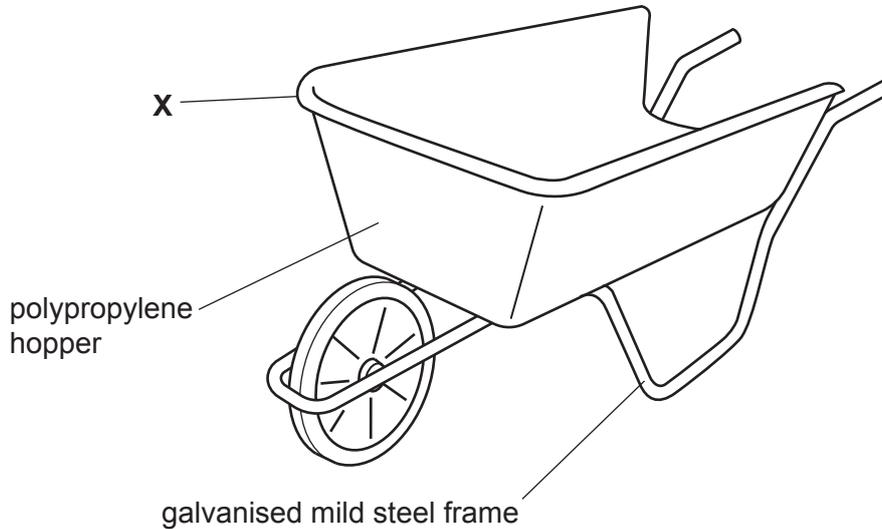
(i) the mechanism that makes tool **A** adjustable [6]

(ii) the mechanism that makes tool **B** adjustable. [6]

## Section B

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

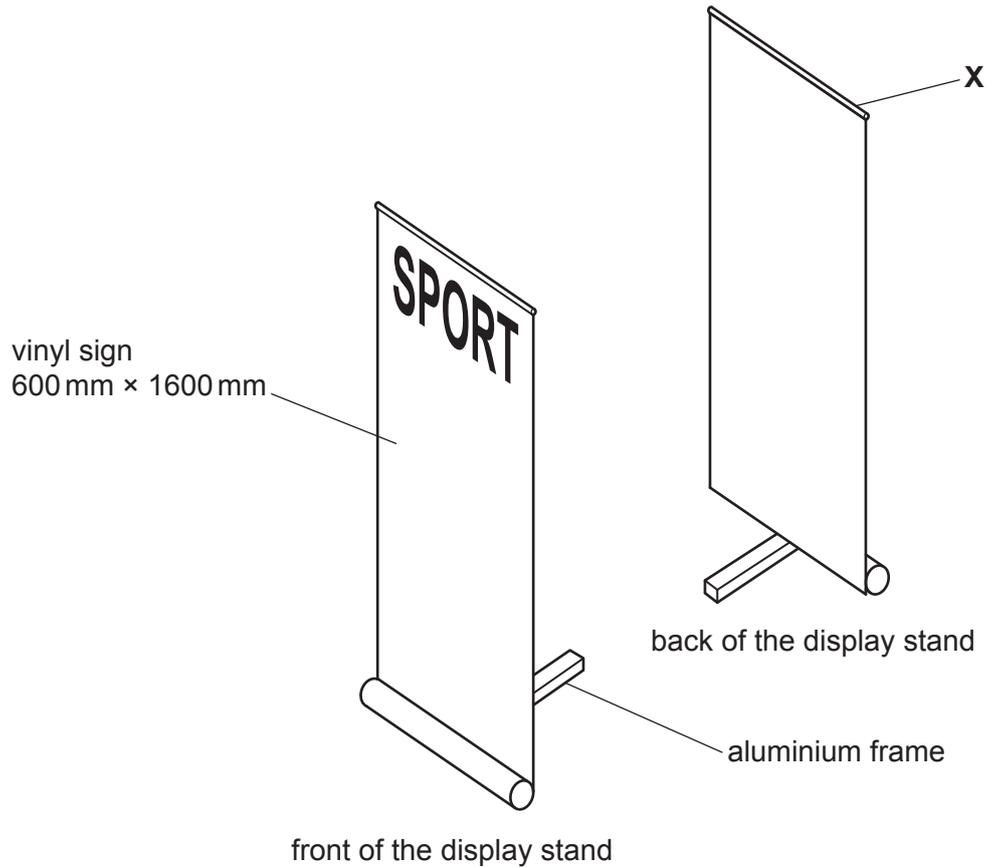
- 4 Fig. 4.1 gives details of an incomplete wheelbarrow that is used for moving garden rubbish.



**Fig. 4.1**

- (a) Explain the function of the design feature shown at **X**, the rim on the polypropylene hopper. [2]
- (b) Identify and describe **two** problems with the wheelbarrow. [4]
- (c) Use notes and sketches to explain how the wheelbarrow would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why manufacturers of gardening equipment, such as the wheelbarrow, compare materials through the use of destructive testing. 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]

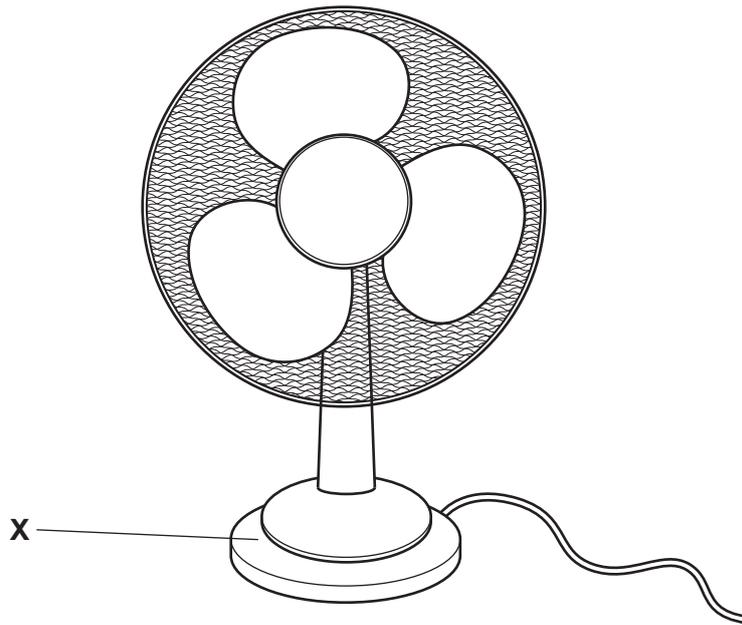
- 5 Fig. 5.1 gives details of an incomplete portable display stand used by a sportswear company.



**Fig. 5.1**

- (a) Explain the function of the design feature shown at **X**, the metal top rail. [2]
- (b) Identify and describe **two** problems with the display stand. [4]
- (c) Use notes and sketches to explain how the display stand would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why designers of products, such as the display stand, should consider the positive and negative effects of advertising on society. 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 incomplete electric fan.



**Fig. 6.1**

- (a) Explain the function of the design feature shown at **X**. [2]
- (b) Identify and describe **two** problems with the electric fan. [4]
- (c) Use notes and sketches to explain how the electric fan 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 the fan, are designed with built-in obsolescence. 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 information required to design a spice jar holder.

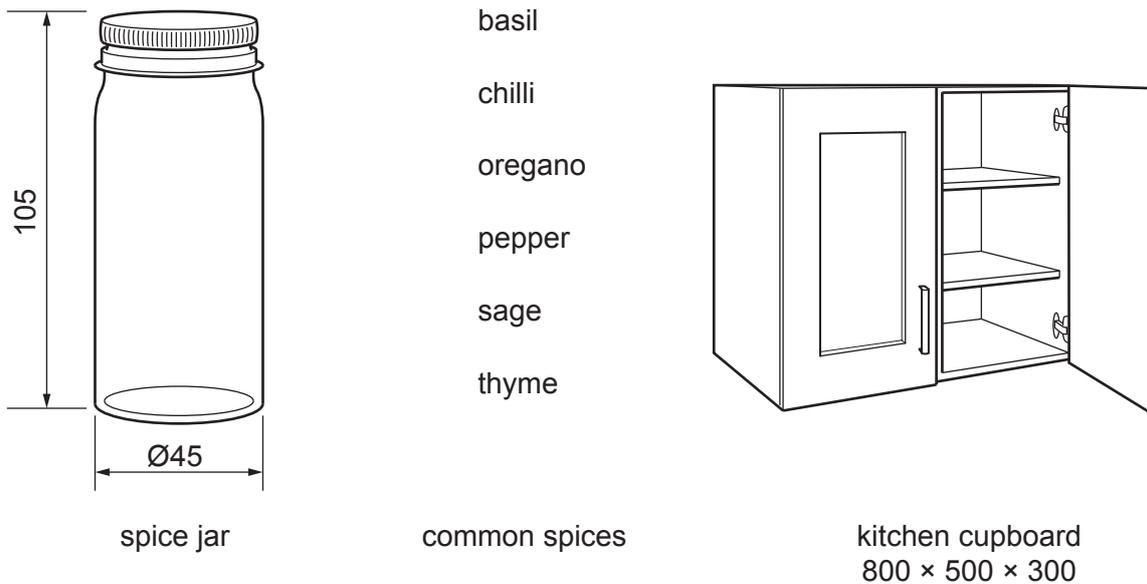
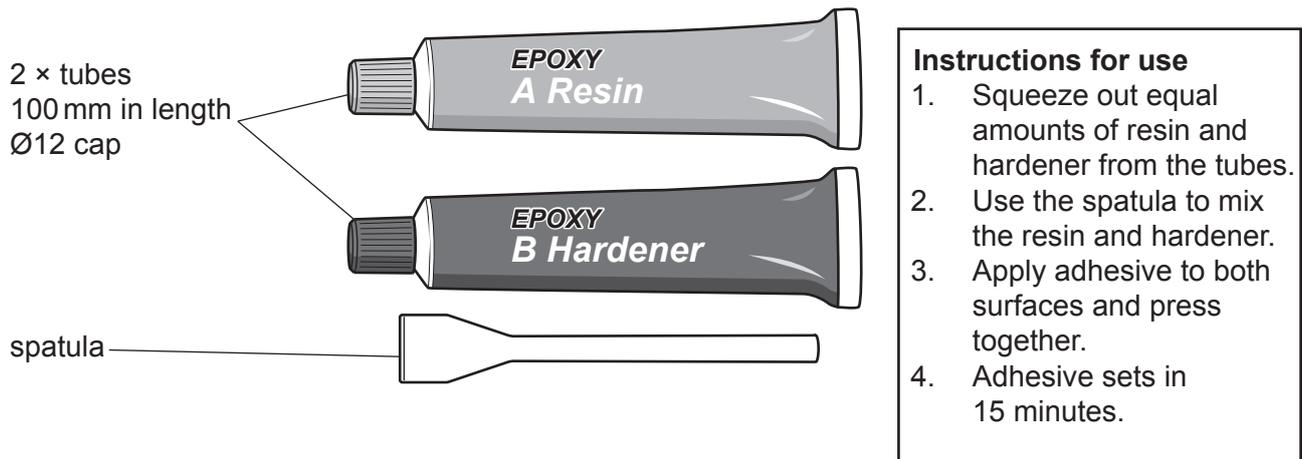


Fig. 7.1

- (a) Use notes and sketches to **develop** a design for a spice jar holder that will hold six spice jars of the size shown in Fig. 7.1. [20]
- (b) Use notes and sketches to **develop** a design for a method of allowing a visually impaired person to identify the spice in each jar. [20]
- (c) Use notes and sketches to **develop** a design for a height adjustable fixing that will allow the spice holder designed in **part (a)** to be mounted on the inside of a kitchen cupboard door. [20]
- (d) Produce a pictorial (3D) rendered drawing of the spice holder mounted on a door which shows all of the features that you have designed in **parts (a) – (c)**. [20]

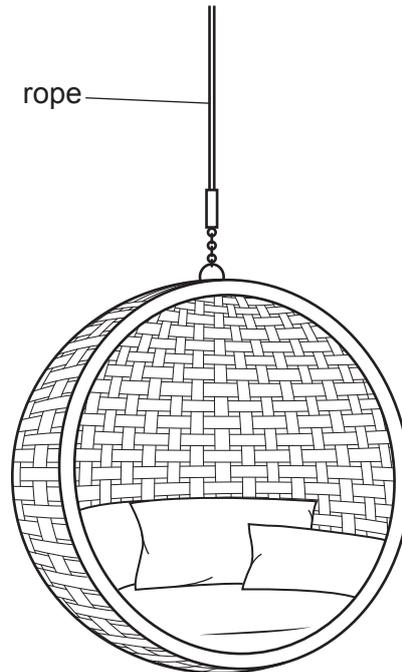
8 Fig. 8.1 shows the three components of an adhesive pack and the instructions for use.



**Fig. 8.1**

- (a) Use notes and sketches to **develop** a design for an instruction leaflet to show how to use the adhesive. The leaflet should only use pictures and **not** words. [20]
- (b) Use notes and sketches to **develop** a design for an environmentally friendly package for the three components of the adhesive pack and the instruction leaflet designed in **part (a)**. [20]
- (c) Use notes and sketches to **develop** a design for a brand name and colour scheme for the adhesive and the package designed in **part (b)**. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete package for the adhesive which shows all of the features that you have designed in **parts (a) – (c)**. [20]

- 9 Fig. 9.1 shows an outdoor chair that hangs by a rope from a frame.



**Fig. 9.1**

- (a) Use notes and sketches to **develop** a design for a freestanding frame that will allow the chair to swing from the rope. [20]
- (b) Use notes and sketches to **develop** a design for a temporary method of fixing the frame designed in **part (a)** to the ground so that it can easily be moved to a new position. [20]
- (c) Use notes and sketches to **develop** a design for a device that will attach to the frame designed in **part (a)** to allow the height of the chair to be adjusted. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete frame which shows all of the features that you have designed in **parts (a) – (c)**. [20]



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