



Cambridge IGCSE™

DESIGN & TECHNOLOGY

0445/13

Paper 1 Product Design

May/June 2024

1 hour 15 minutes



You must answer on the two pre-printed A3 answer sheets.

You will need: Two A3 pre-printed answer sheets (enclosed)
Standard drawing equipment
Coloured pencils

INSTRUCTIONS

- Answer **one** question.
- Use an HB pencil for any drawings and a black or dark blue pen for any writing.
- Write your name, centre number and candidate number in the space on **both** pre-printed answer sheets.
- Answer in the space provided on the answer sheets.
- Do **not** use an erasable pen, staples, paper clips, glue or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You may use standard drawing equipment, including coloured pencils.
- At the end of the examination, hand in your named A3 answer sheets. Do **not** fasten them together and do **not** punch holes in the sheets or tie with string.

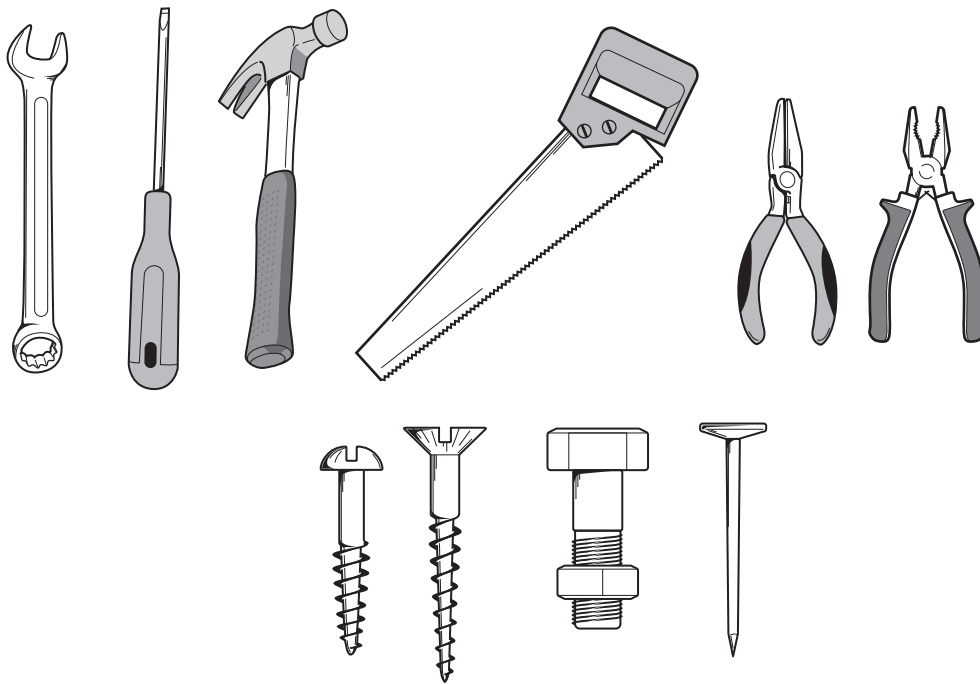
INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [].
- All dimensions are in millimetres unless otherwise stated.

This document has **8** pages. Any blank pages are indicated.

Answer **one** question only on the A3 pre-printed answer sheets provided.

- 1 In small workshops, it is often difficult to store hand tools and small components to make them easily accessible.



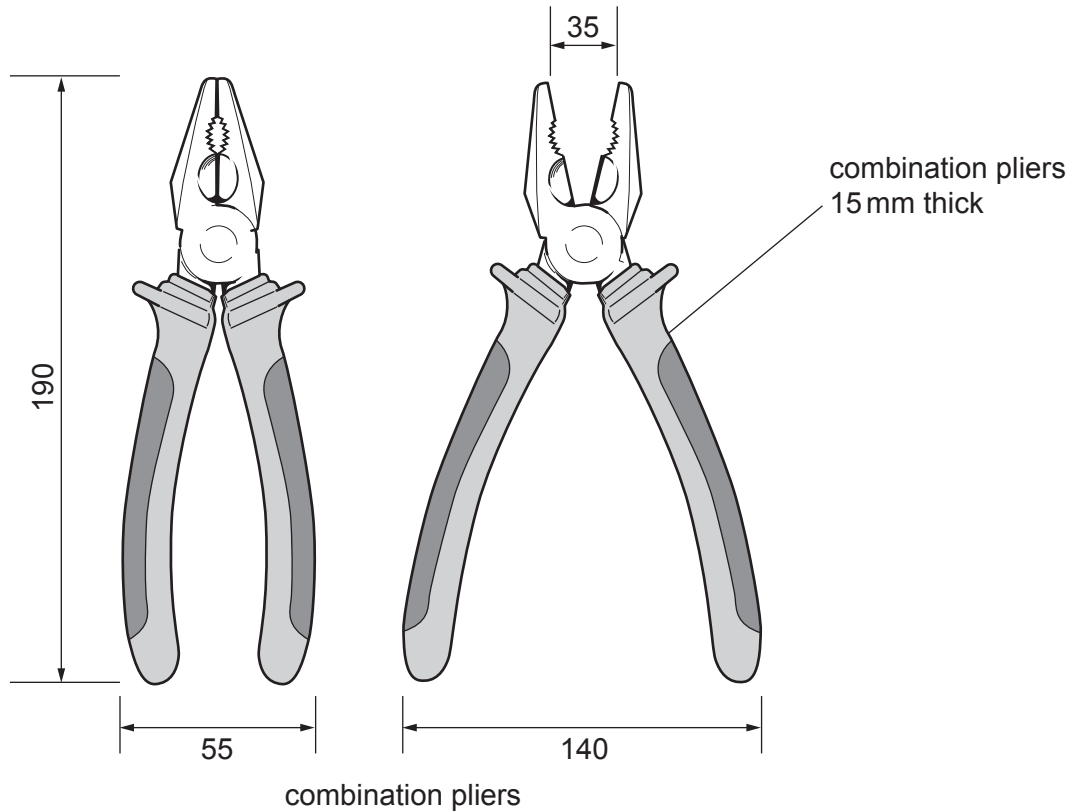
Examples of hand tools and small components (not to scale).

Design a wall-mounted storage unit that can hold a variety of different hand tools and small components.

The unit must be able to be modified to allow additional tools and components to be added.

- (a) List **four** additional points about the function of such a wall-mounted storage unit that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods of temporarily attaching hand tools to a wall unit. [4]
- (c) Develop and sketch **three** separate ideas for the wall-mounted storage unit. [12]
- (d) Evaluate your three ideas. Choose **one** idea to develop further and justify your choice. [8]
- (e) Draw, using a method of your own choice, a full solution to the design problem. Include construction details and important dimensions. [12]
- (f) Suggest **two** suitable specific materials for the solution you have drawn in part (e) and give reasons for your choice. [4]
- (g) Outline a method that could be used to manufacture **one** part of your solution drawn in part (e). Include the names of the tools used. [6]

- 2 Customers like to hold and operate new tools in a shop before buying.

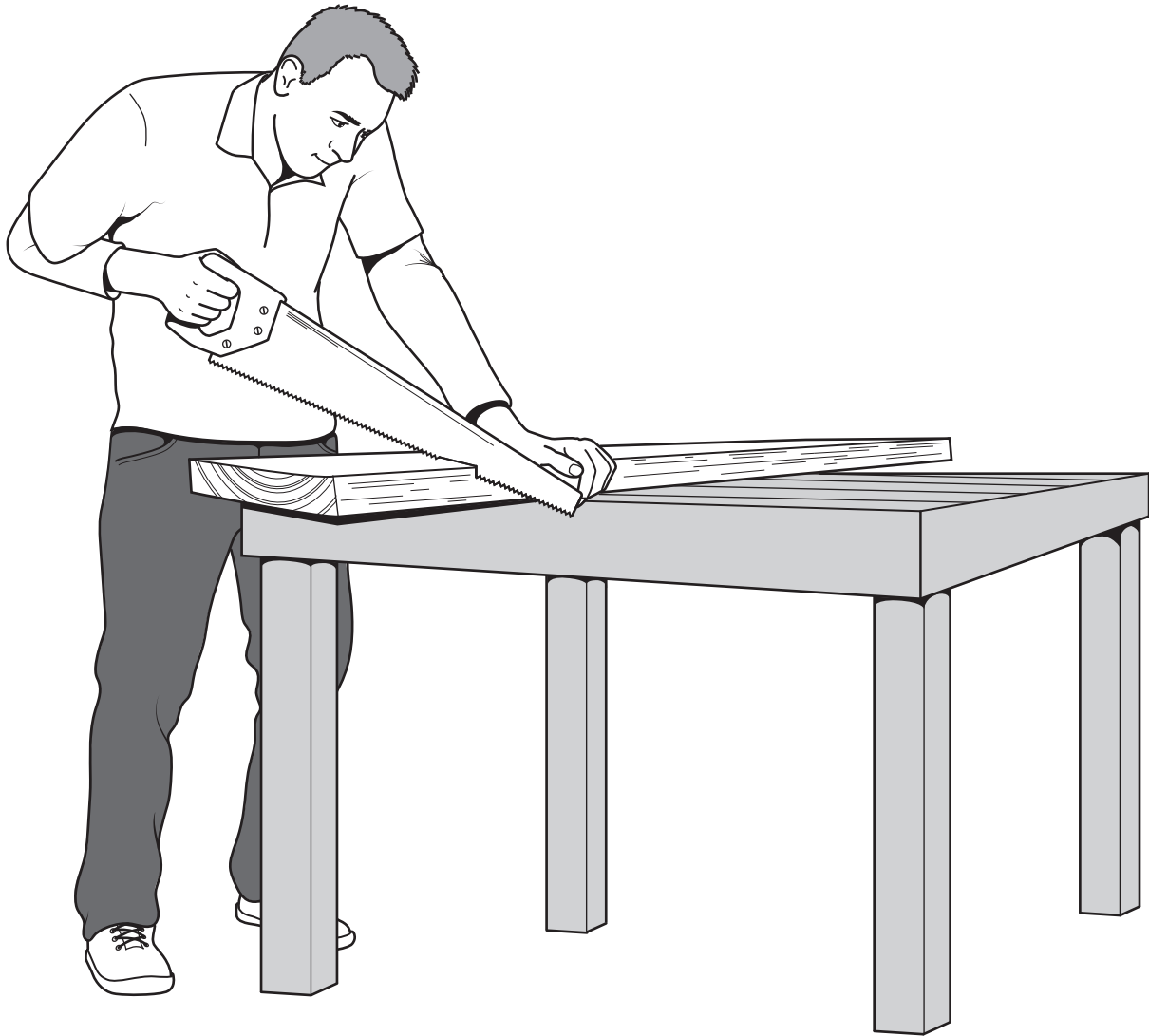


Design a package for a pair of combination pliers which allows customers to operate the pliers without removing them from the package.

The package must show the tool's common functions of gripping and wire cutting.

- (a) List **four** additional points about the function of such a package that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods of securing the pliers to a package. [4]
- (c) Develop and sketch **three** separate ideas for the package for a pair of combination pliers. [12]
- (d) Evaluate your three ideas. Choose **one** idea to develop further and justify your choice. [8]
- (e) Draw, using a method of your own choice, a full solution to the design problem. Include construction details and important dimensions. [12]
- (f) Suggest **two** suitable specific materials for the solution you have drawn in part (e) and give reasons for your choice. [4]
- (g) Outline a method that could be used to manufacture **one** part of your solution drawn in part (e). Include the names of the tools used. [6]

- 3 Materials need to be held securely on a work bench when cutting and shaping.



Design a bench-mounted device that can be used to temporarily hold materials down on a flat surface.

- (a) List **four** additional points about the function of such a device that you consider to be important. [4]
- (b) Use sketches and notes to show **two** mechanisms that will hold materials securely to a flat surface. [4]
- (c) Develop and sketch **three** separate ideas for the bench-mounted device. [12]
- (d) Evaluate your three ideas. Choose **one** idea to develop further and justify your choice. [8]
- (e) Draw, using a method of your own choice, a full solution to the design problem. Include construction details and important dimensions. [12]
- (f) Suggest **two** suitable specific materials for the solution you have drawn in part (e) and give reasons for your choice. [4]
- (g) Outline a method that could be used to manufacture **one** part of your solution drawn in part (e). Include the names of the tools used. [6]

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