Cambridge Assessment International Education

Cambridge IGCSE™

DESIGN & TECHNOLOGY **0445/13**

Paper 1 Product Design **May/June 2024**

1 hour 15 minutes

3431872958

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.

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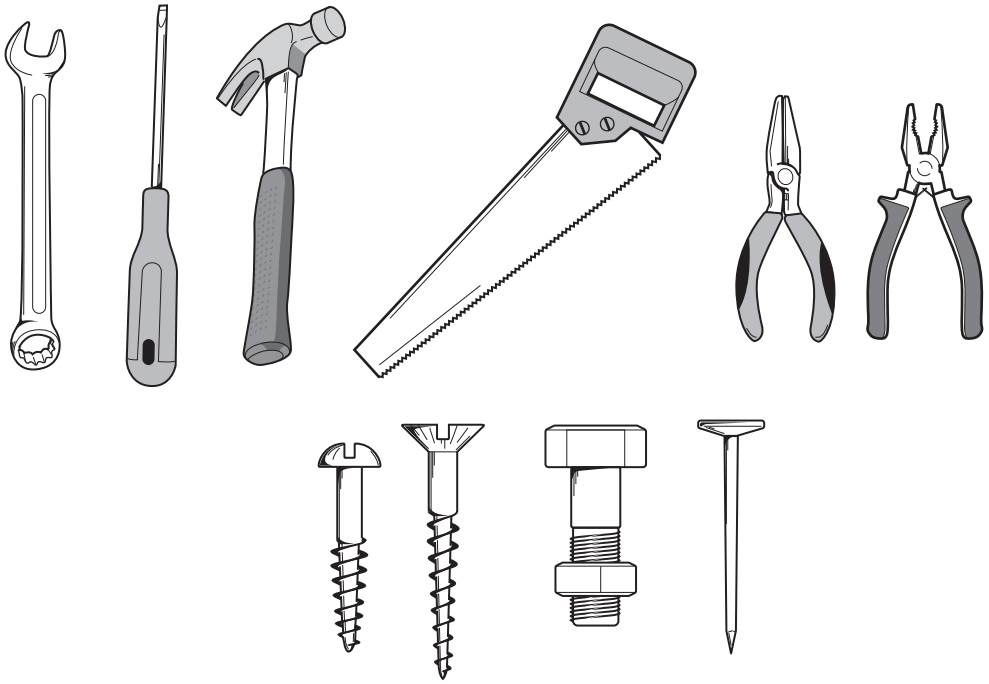
[Turn over

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]

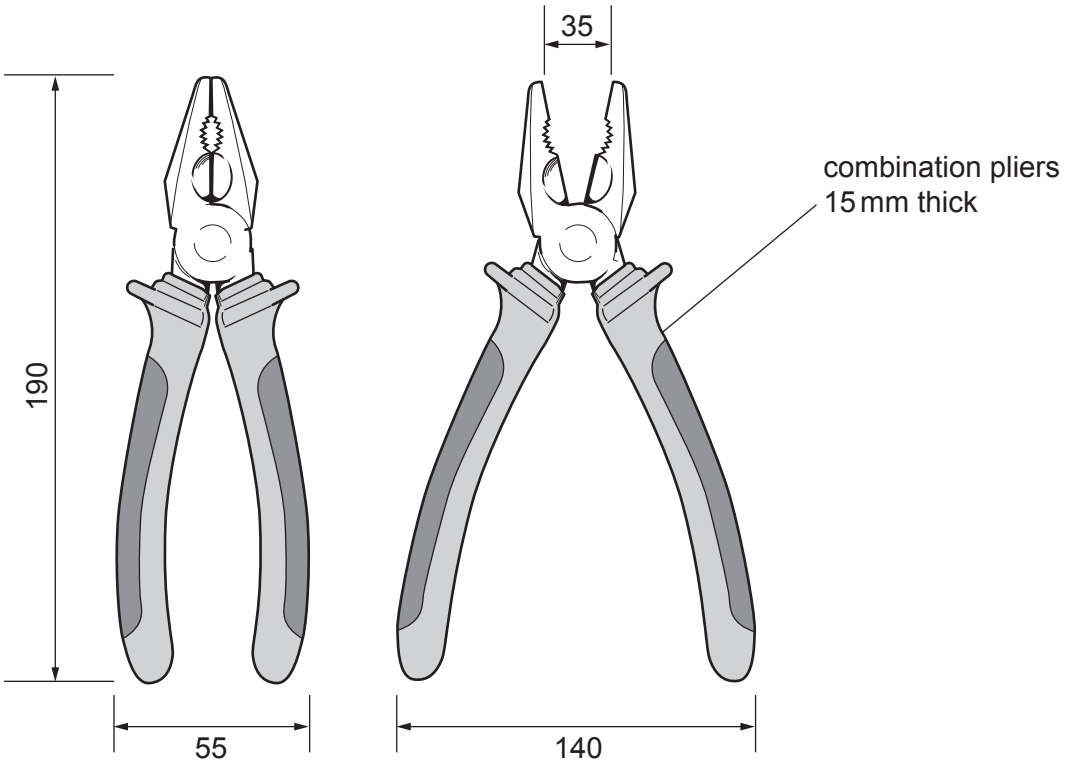
(d) Evaluate your three ideas. Choose **one** idea to develop further and justify your choice. [8]

(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.



combination pliers

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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