Cambridge Assessment International Education

Cambridge IGCSE™

DESIGN & TECHNOLOGY **0445/13**

Paper 1 Product Design **October/November 2022**

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.

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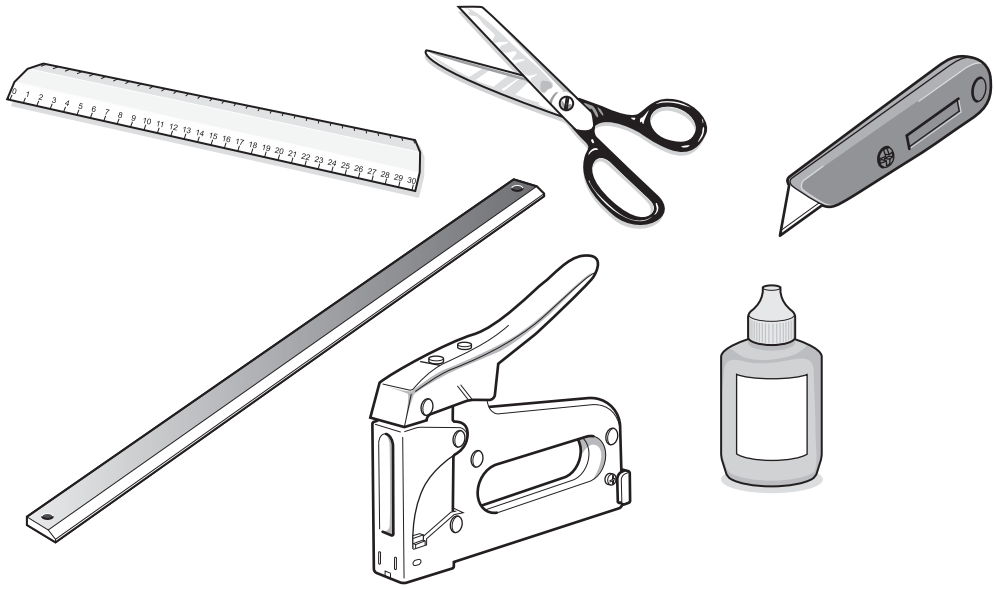
Answer **one** question only on the A3 pre-printed answer sheets provided.

1 A range of equipment is required when working with modelling materials.



Design a storage unit that would hold the equipment shown. The unit should include a flat surface that could be used when cutting materials.

(a) List **four** additional points about the function of such a storage unit that you consider to be important. [4]

(b) Use sketches and notes to show **two** methods of holding items when being stored. [4]

(c) Develop and sketch **three** separate ideas for the 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 Small offcuts of lightweight materials are produced when making models in a Graphics studio.

Design a collection unit into which small offcuts of any three different materials could be collected, for recycling, at each workstation in a graphics studio.
Collection units will be made from lightweight material and delivered to the school in flat-pack form.

(a) List **four** additional points about the function of such a collection unit that you consider to be important. [4]

(b) Use sketches and notes to show **two** temporary joints that could be used in lightweight flat-pack items. [4]

(c) Develop and sketch **three** separate ideas for the collection 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]

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3 Cardboard can be folded successfully if a shallow indentation is made on one surface.

Design a device that would produce a shallow indentation on cardboard where it is to be folded.

(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** methods of producing indentations suitable for this purpose. [4]

(c) Develop and sketch **three** separate ideas for the 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]