



Cambridge IGCSE™

DESIGN & TECHNOLOGY

0445/13

Paper 1 Product Design

October/November 2023

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.

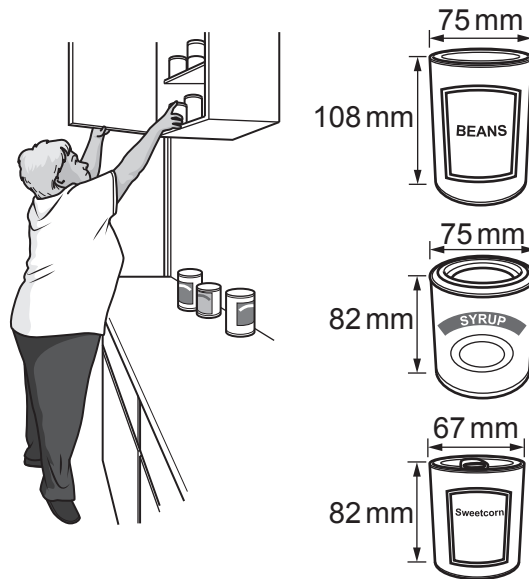
INFORMATION

- 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.

This document has 4 pages.

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

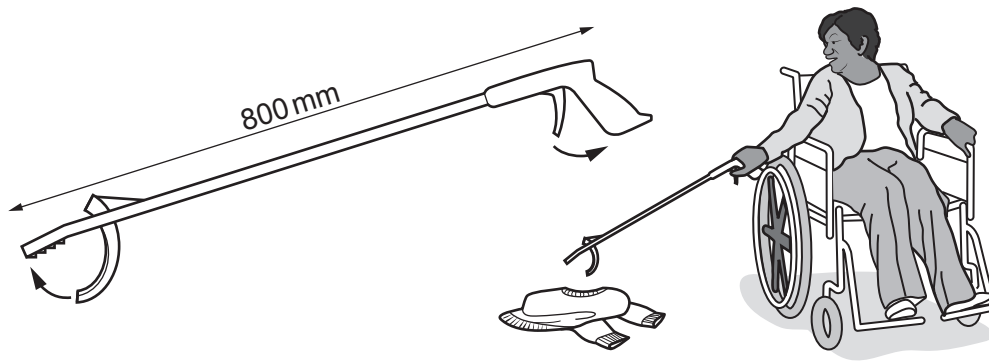
- 1 Elderly people and people with disabilities often have difficulty reaching food cans in a wall-mounted kitchen cupboard.



Design a storage unit for food cans to be positioned on the top of a kitchen work surface. The storage unit must hold four of each-sized food can. The food cans must be easy to identify and reach.

- (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** permanent methods of joining resistant materials. [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]

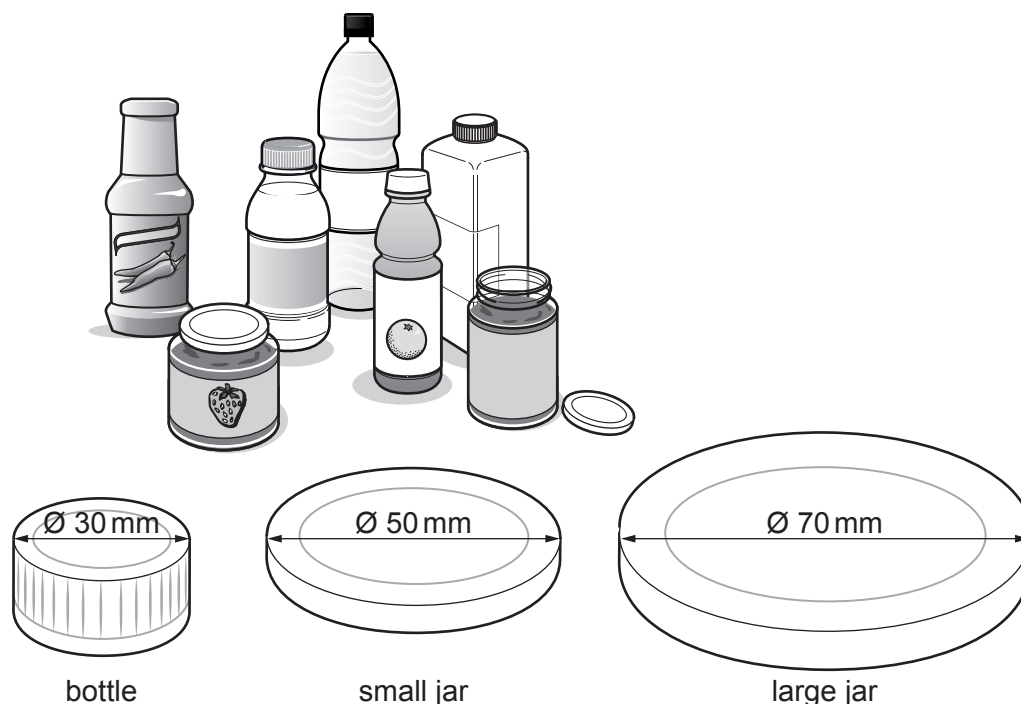
- 2 People who use wheelchairs often use long-reach devices to help them pick up items out of range.



Design a package for a long-reach picker that will hang on a shop display.
The customer must be able to see and try the picker without opening the package.

- (a) List **four** additional points about the function of the package that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods of attaching products to a package. [4]
- (c) Develop and sketch **three** separate ideas for the package. [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 Screw-top jars and bottles can sometimes be difficult to open.



Design a device that makes it easier to remove a screw-top lid from a jar or bottle. The device should securely hold the jar or bottle whilst the screw-top lid is being removed.

- (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** mechanical methods of gripping cylindrical items. [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]

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