



Cambridge IGCSE™

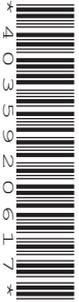
DESIGN & TECHNOLOGY

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.

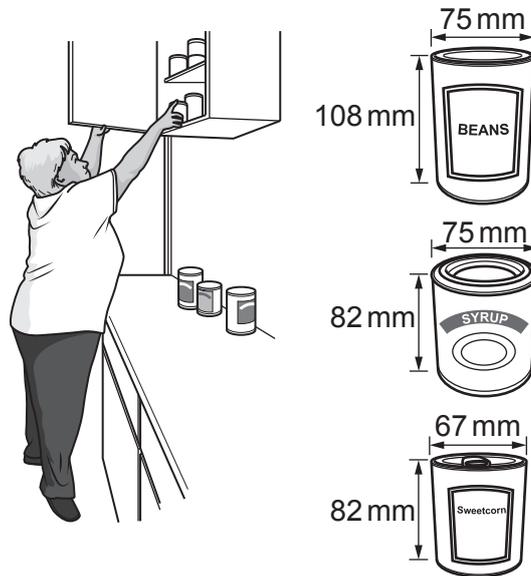
INFORMATION

- 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.

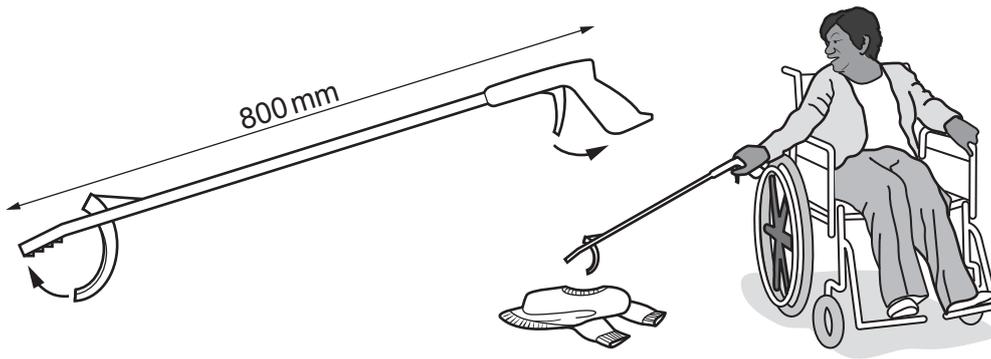
- 1 Elderly people and people with disabilities often have difficulty reaching food cans in a wall-mounted kitchen cupboard.



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]

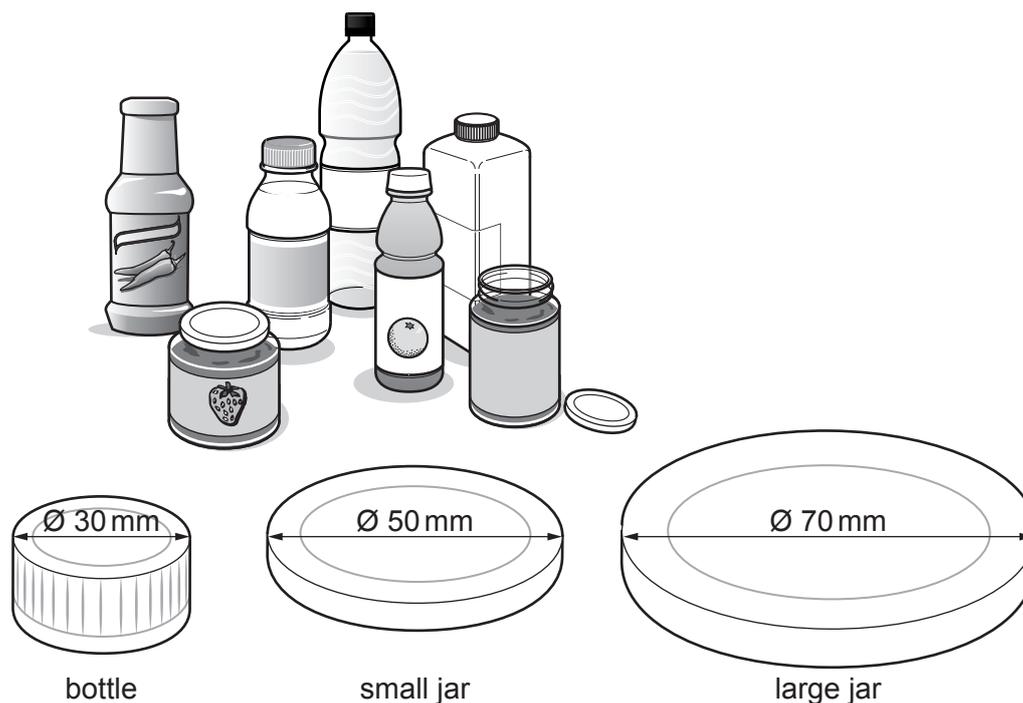
- 2 People who use wheelchairs often use long-reach devices to help them pick up items out of range.



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.

- List **four** additional points about the function of such a device that you consider to be important. [4]
- Use sketches and notes to show **two** mechanical methods of gripping cylindrical items. [4]
- Develop and sketch **three** separate ideas for the device. [12]
- Evaluate your three ideas. Choose **one** idea to develop further and justify your choice. [8]
- Draw, using a method of your own choice, a full solution to the design problem. Include construction details and important dimensions. [12]
- Suggest **two** suitable specific materials for the solution you have drawn in part (e) and give reasons for your choice. [4]
- 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]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.