



# Cambridge IGCSE™

---

## DESIGN & TECHNOLOGY

0445/12

Paper 1 Product Design

May/June 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

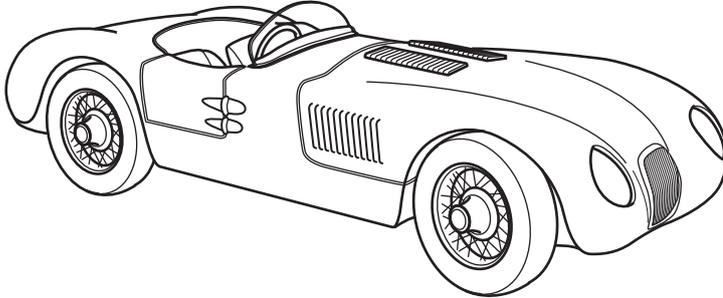
- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].
- All dimensions are in millimetres.

---

This document has 4 pages.

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

- 1 Many people collect and display model cars.



**size of model car:**

length: 80 mm

width: 35 mm

height: 20 mm

Design a display unit for **six** model cars that are similar in size to the one shown. The display unit must be modular so that several identical units can be joined together as the collection grows.

- (a) List **four** additional points about the function of such a display unit that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods of joining modular display units together. [4]
- (c) Develop and sketch **three** separate ideas for the display 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 Manufacturers make and sell replica ancient coins to collectors.

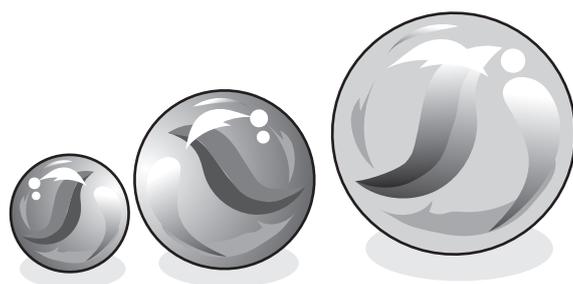


**size of coin:**  
 Ø40 mm  
 thickness: 4 mm

Design a package for **three** replica ancient coins that are similar in size to the one shown. The package must provide protection for the coins during transportation and convert to clearly display the coins for presentation.

- (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 protecting products during transportation. [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 Different-sized glass marbles are collected and used for games.



**size of marble:**

small marble: Ø16 mm

medium marble: Ø24 mm

large marble: Ø32 mm

Design a container that will hold 20 of each size of marble. The container must include a method that sorts the marbles by size.

- (a) List **four** additional points about the function of such a container that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods of sorting objects by size. [4]
- (c) Develop and sketch **three** separate ideas for the container. [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]

---

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](http://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.