



GCE AS/A LEVEL

2603U10-1

MONDAY, 15 MAY 2023 – AFTERNOON

DESIGN AND TECHNOLOGY – AS unit 1

Product Design

2 hours plus your additional time allowance

Surname _____

First name(s) _____

Centre Number _____

Candidate Number 2 _____

For Examiner's use only

Question	Maximum Mark	Mark Awarded
1.	8	
2.	8	
3.	8	
4.	8	
5.	8	
6.	40	
Total	80	

ADDITIONAL MATERIALS

A calculator, ruler, pencils and coloured pencils.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen or your usual method.

Answer ALL questions.

Write your name, centre number and candidate number in the spaces provided on the front cover.

Write your answers in the spaces provided in this booklet. If you run out of space, use the continuation pages at the back of the booklet, taking care to number the question(s) correctly.

(Turn over)

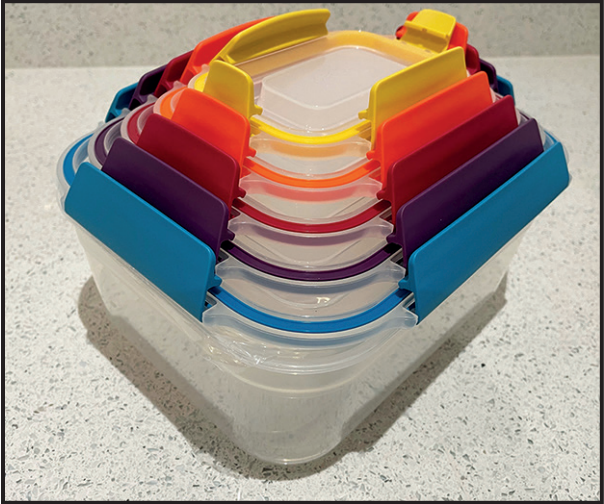
INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question. You are advised to divide your time accordingly.

The total number of marks available is 80.

You are reminded of the need for good English and orderly, clear presentation in your answers.

The quality of your written communication, including appropriate use of punctuation and grammar, will be assessed in your answer to question 5.



1 (b) The food storage containers have been injection moulded.

(i) Explain ONE essential requirement of the surface finish of the containers for the user. [2 marks]

(ii) Describe a critical feature of the mould for the manufacture of the containers. [2 marks]

(Turn over)

2. Material development is advancing, and designers have access to a range of new smart materials.

(a) Explain the term ‘smart materials’. [2 marks]

2 (b) Name a smart material that could be used in the lenses of the product shown below. [1 mark]



(c) The frames are made from a shape memory alloy. Discuss how this smart material will improve the functionality and lifespan of the frame. [5 marks]





5. The trainer shown below has been made from ocean waste.



Evaluate the ethical and moral reasons for developing products from ocean waste. [8 marks]

Marks will be awarded for the content of the answer and the quality of written communication.

(Turn over)



Drinking cup



Desk



Outdoor table

6. Drinks can easily be spilt in many different locations both indoors and outdoors.

(a) Design Brief

You are asked to design a product that will securely hold a drinking cup like the one opposite which will prevent spillage of liquid. The product must attach to the edge of a table or desk.

Specification

Your design proposal must:

- **Securely attach to any fixed surface up to 40 mm in thickness**
- **Hold a container up to 75 mm in diameter**
- **Be easily attached and removed with one hand**
- **Be strong and lightweight for ease of transportation**
- **Include appropriately named materials**

On page 18 produce a design for your product.

You are required to use a mixture of 2D and 3D annotated freehand drawings.

(Turn over)

6 (a) Marks will be awarded for:

- (i) An innovative functioning product that meets the design brief and specification. [6 marks]**
- (ii) Annotating your product to show how it can be easily attached, removed, hold the cup securely and be transportable. [10 marks]**
- (iii) Justification of TWO APPROPRIATELY NAMED materials. [4 marks]**
- (iv) The quality/presentation and communication of your 2D/3D drawings. [4 marks]**

6 (a)

DESIGN PROPOSAL

You are not expected to render, colour or shade your design.

(Turn over)

6 (b) In the space below produce a working drawing of your design proposal. [8 marks]

Note: You must include all dimensions and specific details

