

Cambridge IGCSE™

DESIGN & TECHNOLOGY

0445/13

Paper 1 Product Design

October/November 2020

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

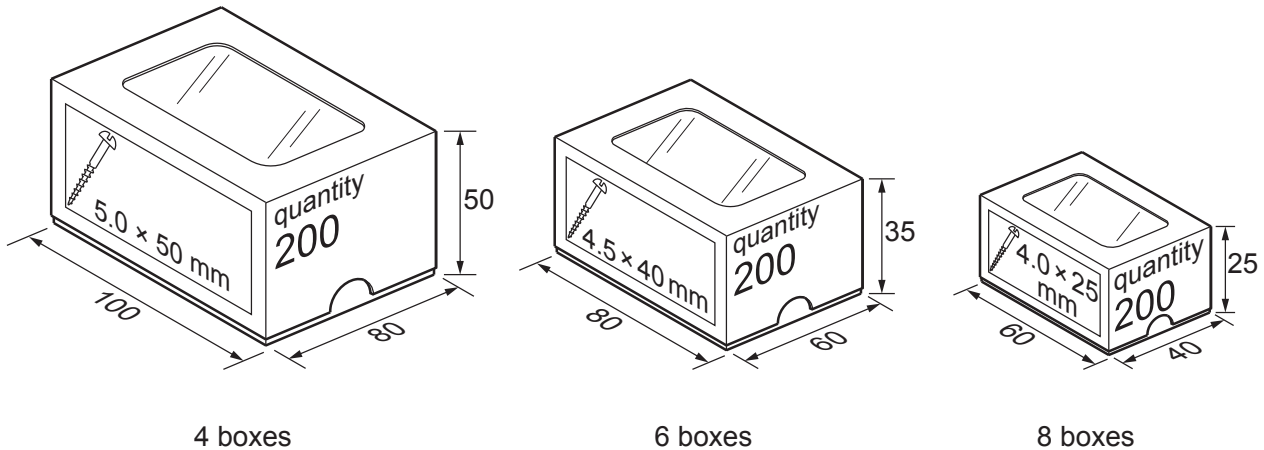
- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [].
- All dimensions are in millimetres.

This document has **4** pages. Blank pages are indicated.

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

1 Problem:

Screws of different lengths and diameters, used in the school workshop, are bought in different size boxes.

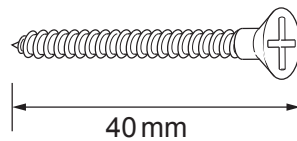
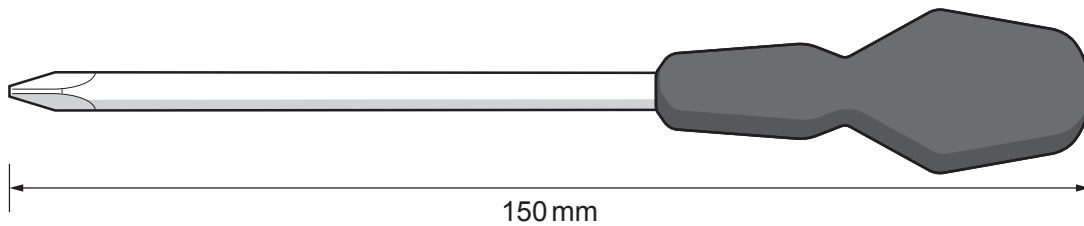


Design a unit that would hold the size and quantity of screw boxes shown so that they can be easily accessed. The unit could be positioned anywhere in the school workshop.

- (a) List **four** additional points about the function of such a unit that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods of fixing such a unit to a wall. [4]
- (c) Develop and sketch **three** separate ideas for the 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 Problem:

Screws can be bought with different types of head depending on the situation in which they are to be used. Each type of screw requires a matching screwdriver.

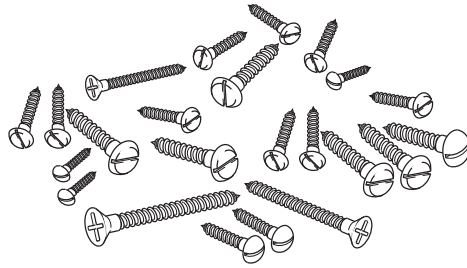


Design packaging that would hold fifty of the screws and the screwdriver shown. It must be possible to see one of the screws and the screwdriver from the outside of the packaging.

- (a) List **four** additional points about the function of such packaging that you consider to be important. [4]
- (b) Use sketches and notes to show **two** methods of making the contents visible from the outside of the packaging. [4]
- (c) Develop and sketch **three** separate ideas for the packaging. [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 Problem:

Screws of different sizes often get mixed up and are difficult to sort out.



Design a device that would sort a large number of mixed screws of head diameters 10 mm, 8 mm and 6 mm.

- (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 that could be used to create a vibrating action. [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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