



Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

GCSE

DESIGN AND TECHNOLOGY: RESISTANT MATERIALS TECHNOLOGY

Unit 1 Written Paper

Thursday 16 June 2016

Morning

Time allowed: 2 hours

Materials

For this paper you must have:

- a black pen
- a pencil
- a ruler
- an eraser
- a pencil sharpener
- coloured pencils.

Instructions

- Use black ink or black ball-point pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this answer book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 120.
- Section A relates to the context referred to in the Preliminary Material that was previously issued.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 8.



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Section A

Answer **all** questions in the spaces provided.

Design Brief

A manufacturer of gardening equipment has asked you to produce a range of designs for devices to help **elderly** people when gardening.

You should produce **five** designs for devices that will help **elderly** people when gardening.

Two of your designs **must** deal with moving gardening tools and equipment around the garden.

Below is a range of gardening tools and equipment.



Question 1 is about the Design Specification.

You are advised to spend about 5 minutes on this question.

1 Give **three** design requirements of devices that will help **elderly** people when gardening.

Explain each of your answers.

An example has been completed for you.

Requirement: The devices should not be affected by water.

Explanation: The devices are for use in the garden where they could get wet and could rot or corrode.

[3 x 3 marks]

Requirement 1 _____

Explanation _____

Requirement 2 _____

Explanation _____

Requirement 3 _____

Explanation _____

9

Turn over ►



Question 2 is about creative design.

You are advised to spend about 20 minutes on this question.

- 2 (a)** Use the information in the Design Brief on page 2, and your answers in Question 1, to help you sketch **three** different ideas for devices that will help **elderly** people when gardening.

Marks will be awarded for creativity.

[3 x 3 marks]



- 2 (b)** Use the information in the Design Brief on page 2, and your answers in Question 1, to help you sketch **two** different ideas for devices that will help **elderly** people move gardening tools and equipment around the garden.

Marks will be awarded for creativity.

[2 x 3 marks]

15

Turn over ►



0 5

Question 3 is about developing the design.

You are advised to spend about 12 minutes on this question.

3 Choose your best idea from either Question **2 (a)** or **2 (b)**.

Use notes and sketches to show how you would develop your design.

Marks will be awarded for:

- details of materials and finishes (explain your choices) **[3 marks]**
- constructional details **[3 marks]**
- design features and sizes **[3 marks]**
- details of how you have considered the needs of **elderly** people. **[3 marks]**



Blank area for writing answers.

Turn over for the next question

12

Turn over ►



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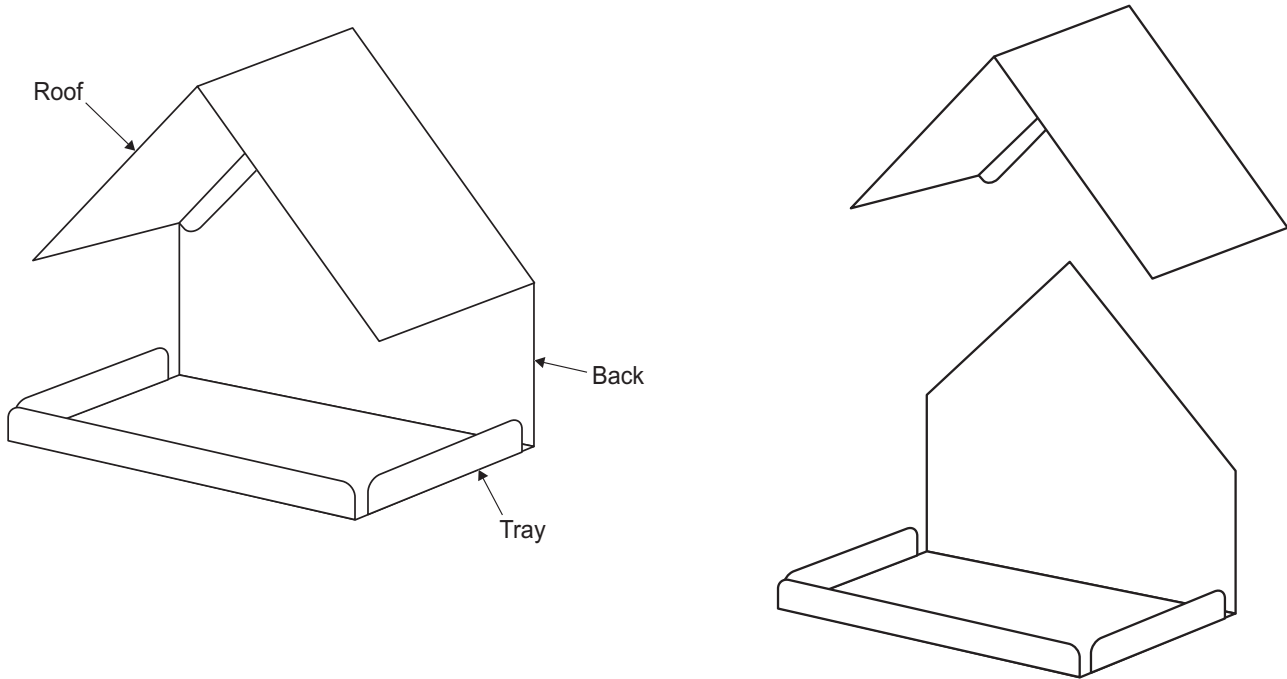
Section B

Answer **all** questions in the spaces provided.

Question 4 is about making.

You are advised to spend about 20 minutes on this question.

4 Study the drawings of the garden bird feeder shown below.



The garden bird feeder is to be made from **two** sheets of metal.

The roof is made from one sheet and the back and the tray are made from a second sheet of metal.

4 (a) Name a suitable metal for the bird feeder.

Explain why you have chosen this metal.

[3 marks]

Metal _____

Explanation _____

Turn over ►



4 (b) Use notes and sketches to show clearly how you would make a batch of **ten** garden bird feeders in a school workshop.

At each stage, name **all** the tools, equipment and/or software you would use.

Stage 1: Marking out **or** Computer Aided Design (CAD).

[4 marks]

Stage 2: Cutting and shaping **or** Computer Aided Manufacture (CAM).

[4 marks]



Stage 3: Bending/forming the tray/back.

[4 marks]

Stage 4: Joining the roof to the back.

[4 marks]



Question 5 is about materials and manufacturing processes.

You are advised to spend about 15 minutes on this question.

5 Study the three kitchen utensils shown below.



Beech spoon



Melamine spoon



Stainless steel ladle

5 (a) (i) Explain why beech has been used to make the wooden spoon.

[2 marks]

5 (a) (ii) Explain why melamine has been used to make the plastic spoon.

[2 marks]

5 (a) (iii) Explain why stainless steel has been used to make the metal ladle.

[2 marks]



5 (a) (iv) Explain why a finish has **not** been applied to the kitchen utensils.

[3 marks]

5 (b) Explain the advantages and disadvantages of industrial processes used for volume production.

[6 marks]

15

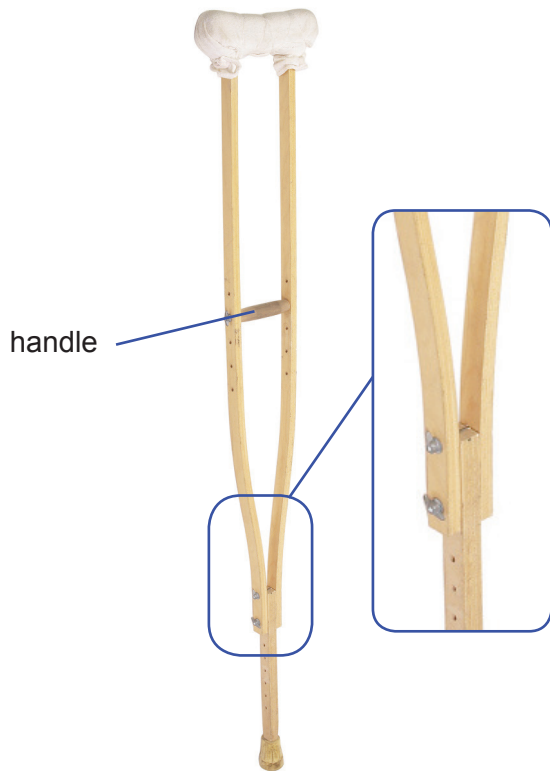
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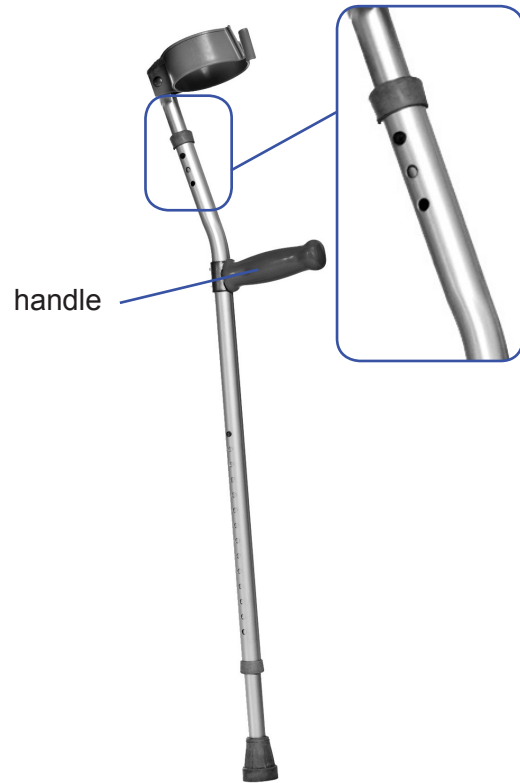
Question 6 is about product analysis.

You are advised to spend about 14 minutes on this question.

6 Study the two crutches shown below.



Crutch A



Crutch B

6 (a) Describe **two** improved ergonomic features of the handle used on Crutch B.

[4 marks]

Feature 1: _____

Description: _____

Feature 2: _____

Description: _____

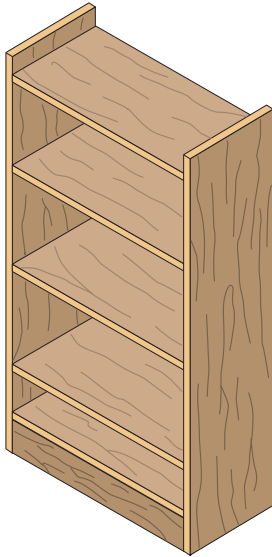


Question 7 is about quality control.

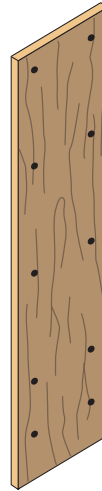
You should spend about 12 minutes on this question.

7 Study the wooden bookcase and the side of the bookcase shown below.

Ten wooden bookcases are to be made in a school workshop.



Wooden bookcase



Side of bookcase

7 (a) Produce a labelled drawing of a simple drilling jig that would be used when drilling the holes into the sides of the wooden bookcases.

[4 marks]



Question 8 is about product development.

You are advised to spend about 10 minutes on this question.



8 A health food restaurant named 'Healthy Foods' would like to redesign the furniture in their children's area.

Describe the roles of the **client**, the **designer**, the **manufacturer** and the **user** in the product development of new tables and chairs.

Explain how they interact with each other.

Quality of Written Communication will be assessed in this question.

[8 marks]



Question 9 is about health and safety.

You are advised to spend about 12 minutes on this question.

9 Study the drilling machine shown below.



9 (a) Complete the table by:

- describing the safety precautions you would carry out before using the drilling machine
- describing the hazard each precaution will prevent.





Precaution	Hazard
<p style="text-align: right;">[1 mark]</p> <hr/> <hr/>	<p>Cuttings (swarf) could damage your eyes</p>
<p>Long hair should be tied back</p>	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/>
<p style="text-align: right;">[1 mark]</p> <hr/> <hr/>	<p>The work could spin out of your hands</p>
<p>Make sure there is only one person inside the safety zone/using the drill.</p>	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/>
<p style="text-align: right;">[1 mark]</p> <hr/> <hr/>	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/>

Turn over ►



9 (b) Complete the table by:

- giving the meaning of each sign
- explaining a precaution you should take when you see each sign in a workshop.

Sign	Meaning	Precaution
	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/> <hr/>	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/> <hr/>
	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/> <hr/>	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/> <hr/>
	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/> <hr/>	<p style="text-align: right;">[1 mark]</p> <hr/> <hr/> <hr/>
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END OF QUESTIONS



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