



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:

PRODUCT DESIGN

Unit 1 Written Paper

Monday 26 June 2017

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 the 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.
- The question in Section A relates to the context referred to in the Preliminary Material that was previously issued.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 3(b).

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	



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Section A

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

1 This question is about designing.

You are advised to spend about 30 minutes on this question.

A children's day nursery is a safe and interesting place of play and learning for pre-school children.

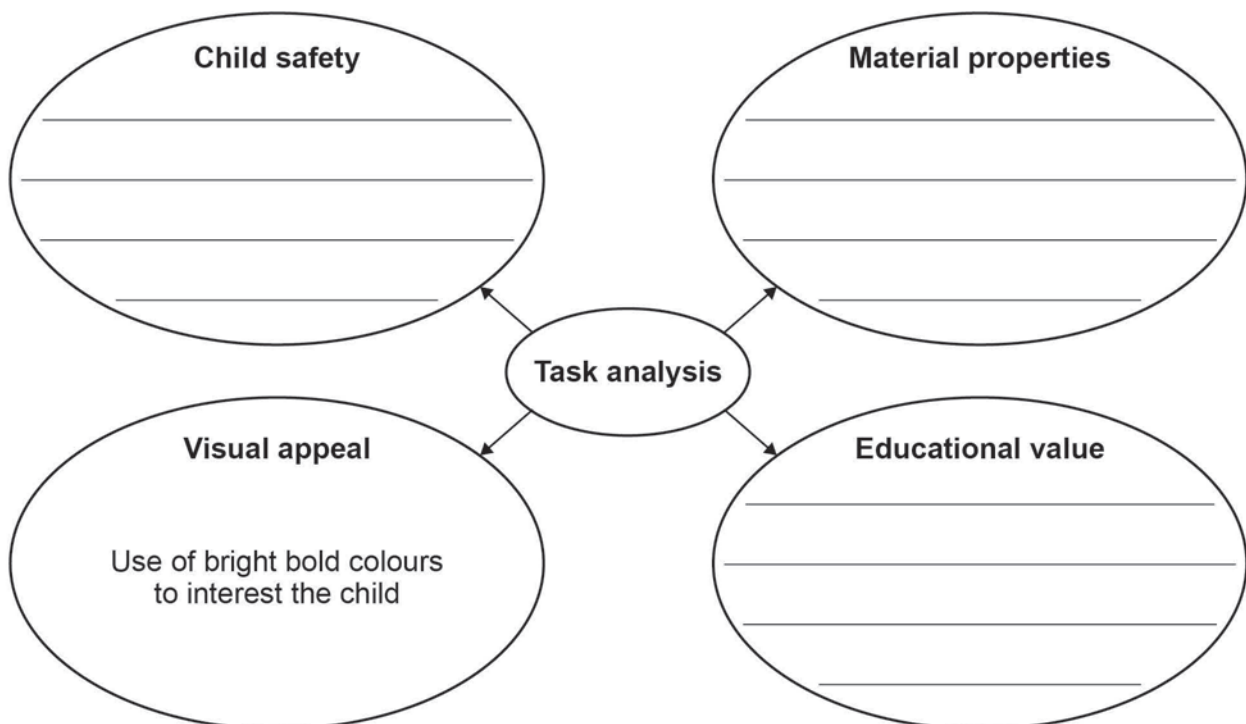


1 (a) A task analysis for designing a nursery product considers many points.

Complete the spider diagram below.

One of the points has been completed for you.

[3 x 2 marks]



Question 1 continues on the next page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

Turn over ►



1 (b)

The products below are likely to be found in a day nursery.

Healthy meal**Pull along toy****Interactive play mat****Desk tidy****Story book**

Choose one of the products and answer the question that follows.

My chosen product is _____

In the space below and opposite, use notes and sketches to design the product you have chosen.

Marks will be given for:

- a creative solution suitable for use in a day nursery
- materials, construction and assembly techniques needed for making
- safety considerations and features necessary for your product to be fit for purpose
- how well your design is communicated.

[15 marks]

Turn over ►



1 (c)

Evaluate how your product is suitable for use in the day nursery.

[4 marks]

1 (d)

What are the advantages of using Computer Aided Design (CAD) to develop your idea?

[4 marks]



1 (e)Describe **two** features your product packaging would need to include.

Explain why each is important.

[4 marks]

Feature 1 _____

Feature 2 _____

33**Turn over for the next question****Turn over ►**

Section B

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

2 This question is about materials and finishing.

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

2 (a) Four different specific paper types are named below:

Isometric grid

Cartridge

Tracing

Graph

Complete the table below by matching the three most appropriate paper types to the correct description.

[3 marks]



Paper type	Description
	Thin paper that allows you to see an image underneath.
	A high quality thick paper used for freehand drawing.
	A paper with guidelines to help create an accurate three dimensional drawing of an object.



2 (b) Many forms of packaging are made from card.

Complete the table below by giving **two** reasons that make each form of packaging suitable for the use shown.


[6 marks]

Packaging	Card/Board	Reasons that make this card/board suitable
Smartphone packaging box 	Solid white board	Reason 1 _____ _____ _____ Reason 2 _____ _____ _____ _____
Packaging for a new TV 	Corrugated cardboard	Reason 1 _____ _____ _____ Reason 2 _____ _____ _____ _____

Question 2 continues on the next page

Turn over ►



<p>Packaging for fruit juice</p> 	<p>Duplex board</p>	<p>Reason 1 _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Reason 2 _____</p> <p>_____</p> <p>_____</p> <p>_____</p>
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2 (c) (i) Explain why finishes are applied to materials for aesthetic reasons.

Give examples in your answer.

[3 marks]

2 (c) (ii) Explain why finishes are applied to materials for functional reasons.

Give examples in your answer.

[3 marks]



3 This question is about safety.

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

3 (a) Products are designed and manufactured to promote safety when in use.

Look at the picture below.



3 (a) (i) On the picture above, label **two** features on the electric tooth brush that improve its safety for the user.

[2 marks]

3 (a) (ii) Explain how **both** of your identified features improve safety for the user.

[4 marks]

Turn over ►



Health and Safety in a design and technology department is important to ensure that everyone is protected from accidents.

- The possible hazards associated with your chosen material area
- Actions to minimise risk
- Promotion of safe use

Quality of Written Communication will be assessed in your answer.

[illegible]

4 This question is about environmental and sustainability issues.

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

4 (a) Explain what each word given below means in relation to environmental and sustainability issues.

[3 x 2 marks]

4 (a) (i) Finite

Explanation _____

4 (a) (ii) Biodegradable

Explanation _____

4 (a) (iii) Reuse

Explanation _____

Turn over ►



4 (b) Products need to be disposed of at the end of their useful life.

4 (b) (i) In what ways is information about the disposal communicated to the consumer?

Give examples in your answer.

[4 marks]



4 (b) (ii) Choose **one** of the products shown below:

		
Sports bag	Toaster	Pre packed foods
		
Aerosol container	Knock down furniture	Magazines

My chosen product is: _____

How would your chosen product be designed and manufactured with sustainability in mind?

[4 marks]

Turn over for the next question

Turn over ►



5

This question is about methods of production, manufacturing and marketing.

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

5 (a)

Explain the difference between one-off and continuous production.

Give an example product made using each method.

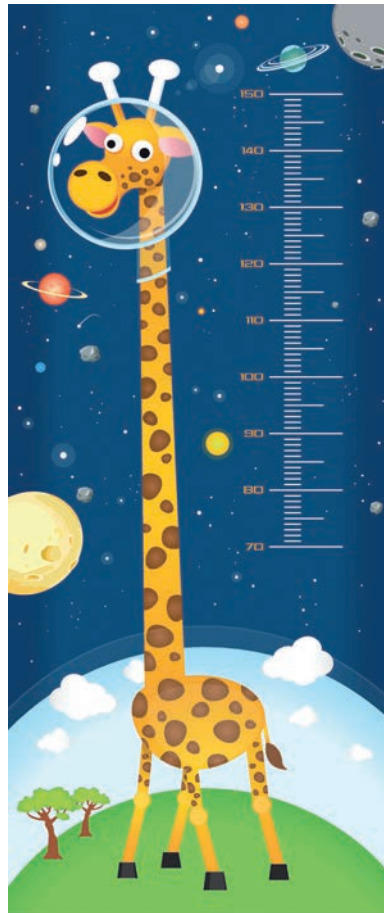
[4 marks]



5 (b)

A manufacturer produces the height chart shown below to hang in a child's bedroom. It will be sold on the internet.

In the box below, use notes and sketches to give relevant details of suitable materials, manufacturing and finishing processes.

[4 marks]**Turn over ►**

5 (c) This part of the question is about the manufacture of the height chart.

Complete the boxes below using notes and/or sketches.

5 (c) (i) How materials would be checked on arrival in the factory.

[3 marks]

5 (c) (ii) The quality control measures the manufacturer should take when making the height chart.

[4 marks]



- 5 (c) (iii)** Describe how Computer aided manufacture (CAM) could be used in the manufacture of the height chart.

[5 marks]

- 5 (c) (iv)** Packaging methods which could be used by the manufacturer for the height chart to be sold on the internet.

[3 marks]

Turn over ►



5 (d)

The height chart is advertised on the internet.

Explain **two** advantages of advertising on the internet.**[2 x 2 marks]**

Advantage 1 _____

Advantage 2 _____



6

This question is about human factors and inclusive design.

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

Look at the exercise bike below.



6 (a)

Identify and explain **three** features where anthropometrics have been used to inform the design.

[3 x 2 marks]

Feature 1 _____

Explanation _____

Feature 2 _____

Explanation _____

Feature 3 _____

Explanation _____

Turn over ►



6 (b)

The 5th to 95th percentile range is used in applying anthropometric data to the design of the exercise bike. Explain why.

[3 marks]

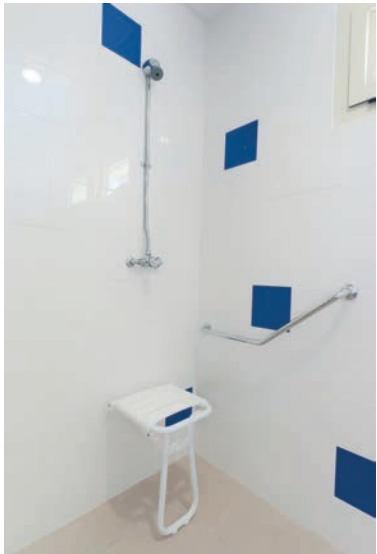

6 (c)

What problems might arise for a user of the exercise bike outside the 5th to 95th percentile range?

[2 marks]



The pictures below show two environments that have been modified for people with limited mobility.

Modified shower environment	Modified bathroom environment
 <p>A photograph of a modified shower environment. The shower stall is white with blue safety mats on the walls and floor. A white shower seat is installed, and a grab bar is mounted on the wall. The floor is light-colored tile.</p>	 <p>A photograph of a modified bathroom environment. The room features a white toilet, a white sink, and a white bathtub. A grab bar and shower seat are installed in the bathtub area. The walls are white, and the floor is light-colored carpet.</p>

Explain how each feature makes the environment more suitable for the user.

[6 marks]

[illegible]

END OF QUESTIONS



There are no questions printed on this page

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