



Please write clearly in block capitals.

Centre number

--	--	--	--	--

Candidate number

--	--	--	--

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	
<b>TOTAL</b>	



J U N 1 7 4 5 5 5 1 0 1

IB/M/Jun17/E5

**45551**

## 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.

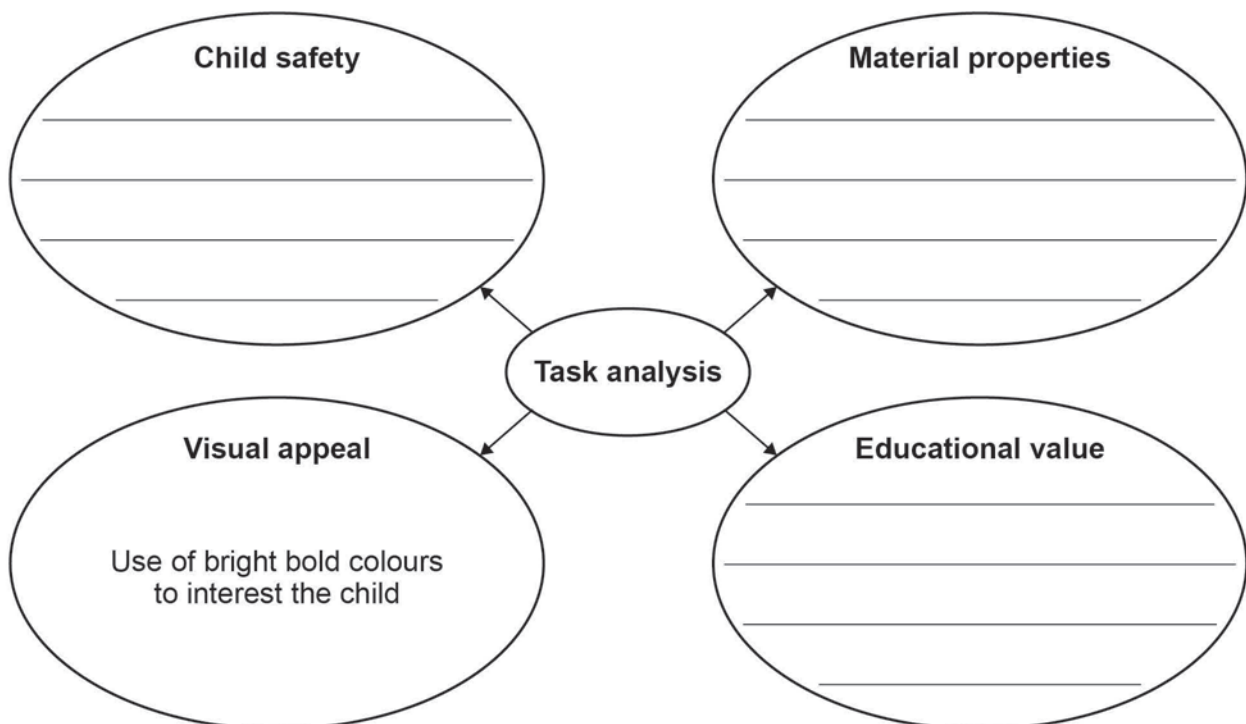


**1 (a)** A task analysis for designing a nursery product considers many points.

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>
--	---------------------	---

**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]**

---

---

---

---

---

---

---

---

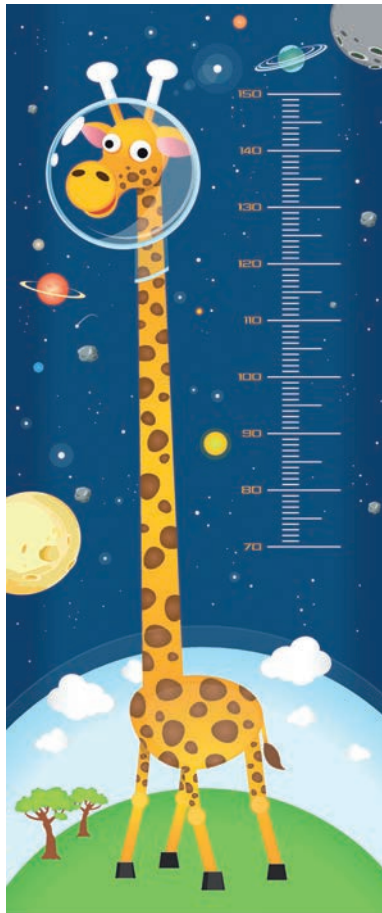




**5 (b)**

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 5<sup>th</sup> to 95<sup>th</sup> 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 5<sup>th</sup> to 95<sup>th</sup> percentile range?

**[2 marks]**

---

---

---

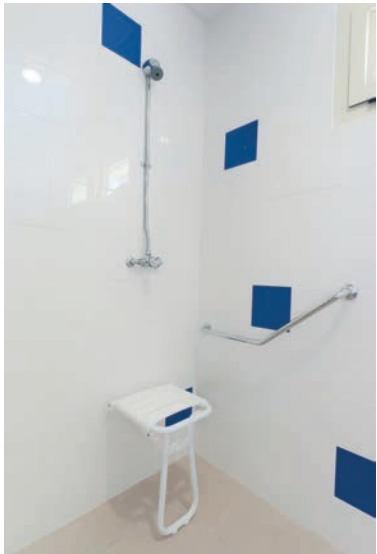

---

---

---



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 visible on the wall.</p>	 <p>A photograph of a modified bathroom environment. The room includes a white toilet, a white sink, and a white bathtub. The bathtub is equipped with a shower seat and grab bars for safety.</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**

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

**Copyright Information**

For confidentiality purposes, from the November 2015 examination series, acknowledgements of third party copyright material will be published in a separate booklet rather than including them on the examination paper or support materials. This booklet is published after each examination series and is available for free download from [www.aqa.org.uk](http://www.aqa.org.uk) after the live examination series.

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team, AQA, Stag Hill House, Guildford, GU2 7XJ.

Copyright © 2017 AQA and its licensors. All rights reserved.

