

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	



General Certificate of Secondary Education  
June 2011

# Design and Technology: 45501 Graphic Products

Unit 1 Written Paper

Friday 10 June 2011 1.30 pm to 3.30 pm

**For this paper you must have:**

- a black fine-line pen, a pencil, a ruler, an eraser, a pencil sharpener and coloured pencils.

**Time allowed**

- 2 hours

**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 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.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 4 (a).



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

**There are no questions printed on this page**

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



**Section A**

Answer this question.

Section A is about designing and is worth 35 marks.

You are advised to spend about 35 minutes on this question.

**Design Theme: Helping primary school children learn how to tell the time**

1 Study the Design Brief and Design Specification below.

**Design Brief**

An educational supplier wants to produce a teaching aid to help primary school children learn how to tell the time.

**Design Specification**

The teaching aid must:

- have hands which are moveable
- be manufactured from 2mm white faced corrugated board
- be easy to assemble
- be stable and free standing on a primary school table
- be able to be flat packed for storage in a tray in the classroom.

**Question 1 continues on the next page**

**Turn over ►**



The design specification from page 3 is repeated opposite.

- 1 (a)** Sketch with notes **two** creative ideas for a teaching aid to help primary school children learn how to tell the time. Clearly show constructional details.

Marks will be awarded for:

- **two** different annotated ideas using the design specification (2 x 5 marks)
- quality of sketching (3 marks)
- creative solutions (3 marks)
- notes explaining constructional details. (2 marks)

Do **not** include any surface decoration or colour.

**Idea 1**



**Design Specification**

The teaching aid must:

- have hands which are moveable
- be manufactured from 2 mm white faced corrugated board
- be easy to assemble
- be stable and free standing on a primary school table
- be able to be flat packed for storage in a tray in the classroom.

**Idea 2**

Question 1 continues on the next page

Turn over ►



**1 (b) (i)** Develop the surface decoration for the face of the teaching aid, including the design of the hands, which will appeal to primary school children.


*(5 marks)*

**1 (b) (ii)** Using notes and sketches, show how the hands are attached to the face of the teaching aid to allow movement.

*(3 marks)*



**1 (c)** Produce a 3-D drawing of the assembled teaching aid.



(6 marks)

**1 (d)** Evaluate the effectiveness of your design as a teaching aid.

.....

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.....

.....

(3 marks)

<b>35</b>

**Turn over ►**



**Section B**

Answer **all** questions.

This question is about scale of production and is worth 14 marks.

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

- 2 Learner car drivers must display a learner plate on their vehicle. Learner plates are made in quantity by a batch production process.



© Thinkstock

- 2 (a) State **three** design requirements of the learner driver plates.

An example has been completed for you.

Example: *Easy to attach and remove from a vehicle.*

- 1 .....
- 2 .....
- 3 .....

(3 marks)

- 2 (b) Explain the term *batch production*. Give **one** example of a graphic product to support your answer.

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(3 marks)





**2 (c) (i)** Name a suitable commercial printing process used to create the red letter 'L' on white vinyl film.

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(2 marks)

**2 (c) (ii)** Explain how the quality is controlled during this process.

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(2 marks)

**2 (d) (i)** Explain the meaning of the term *smart material*.

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(2 marks)

**2 (d) (ii)** It has been decided to print the red letter 'L' on the white vinyl film using a phosphorescent ink.

Explain how phosphorescent ink works and give an example of its use.

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(2 marks)



This question is about materials and the environment and is worth 18 marks.

You are advised to spend about 18 minutes on this question.

**3** A chocolate manufacturer has changed their packaging from tin to corrugated board.



**3 (a)** Explain how the use of corrugated board can benefit the manufacturer, the customer and the environment.

**3 (a) (i)** The manufacturer and the environment would benefit because:

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(3 marks)

**3 (a) (ii)** The customer and the environment would benefit because:

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(3 marks)



**3 (b)** Different materials have properties which make them suitable for different uses.

Complete the table below.

An example is given for you.

Do **not** repeat your answers.

Material	Product use or example	Why suitable?	Bio-degradable?
Cartonboard	Packaging of drinks	Cartonboard is mechanically strong and robust which makes it very good for protecting drinks.	Yes
Card spiral wound tubing	..... ..... ..... (1 mark)	..... ..... ..... (2 marks)	..... (1 mark)
Polypropylene sheet	..... ..... ..... (1 mark)	..... ..... ..... (2 marks)	..... (1 mark)
Foamboard	..... ..... ..... (1 mark)	..... ..... ..... (2 marks)	..... (1 mark)

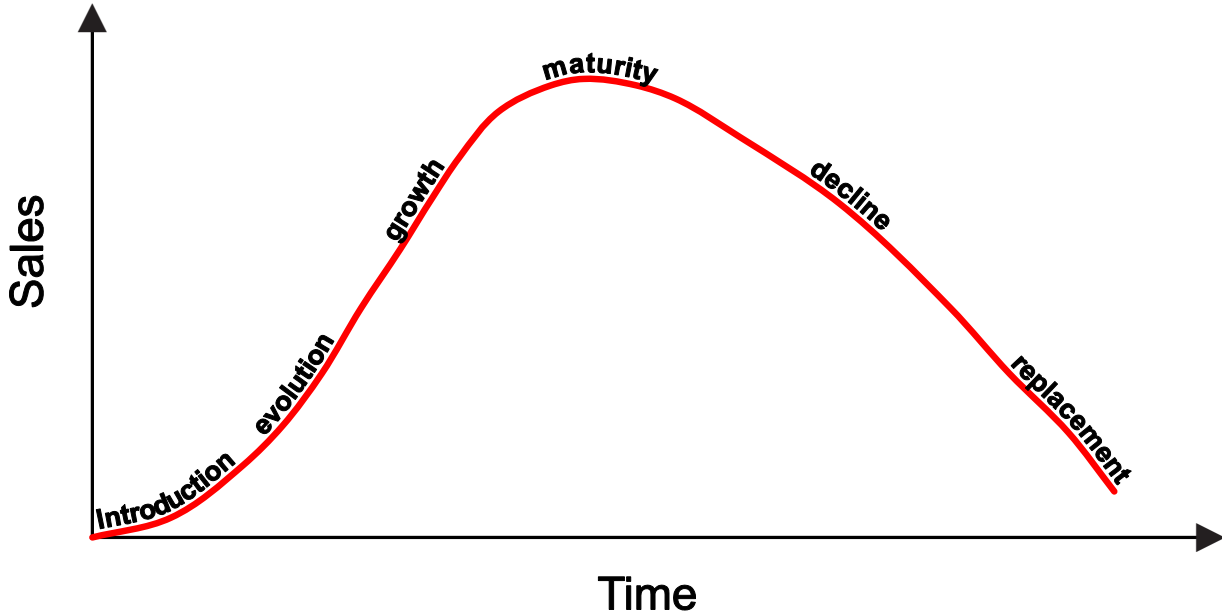
Turn over ►



This question is about product lifecycle and is worth 14 marks.

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

4 A typical product lifecycle graph for a seasonal greetings card is shown below.



4 (a) Quality of Written Communication will be tested in this question.

What do you understand by the term *Product Lifecycle*? Use the example of a seasonal greetings card to support your answer.

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(8 marks)

**4 (b)** What is meant by the term *throw away society*? Give an example to support your answer.

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(3 marks)

**4 (c)** Why do some products have a lifecycle built into them?

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(3 marks)

14

Turn over ►

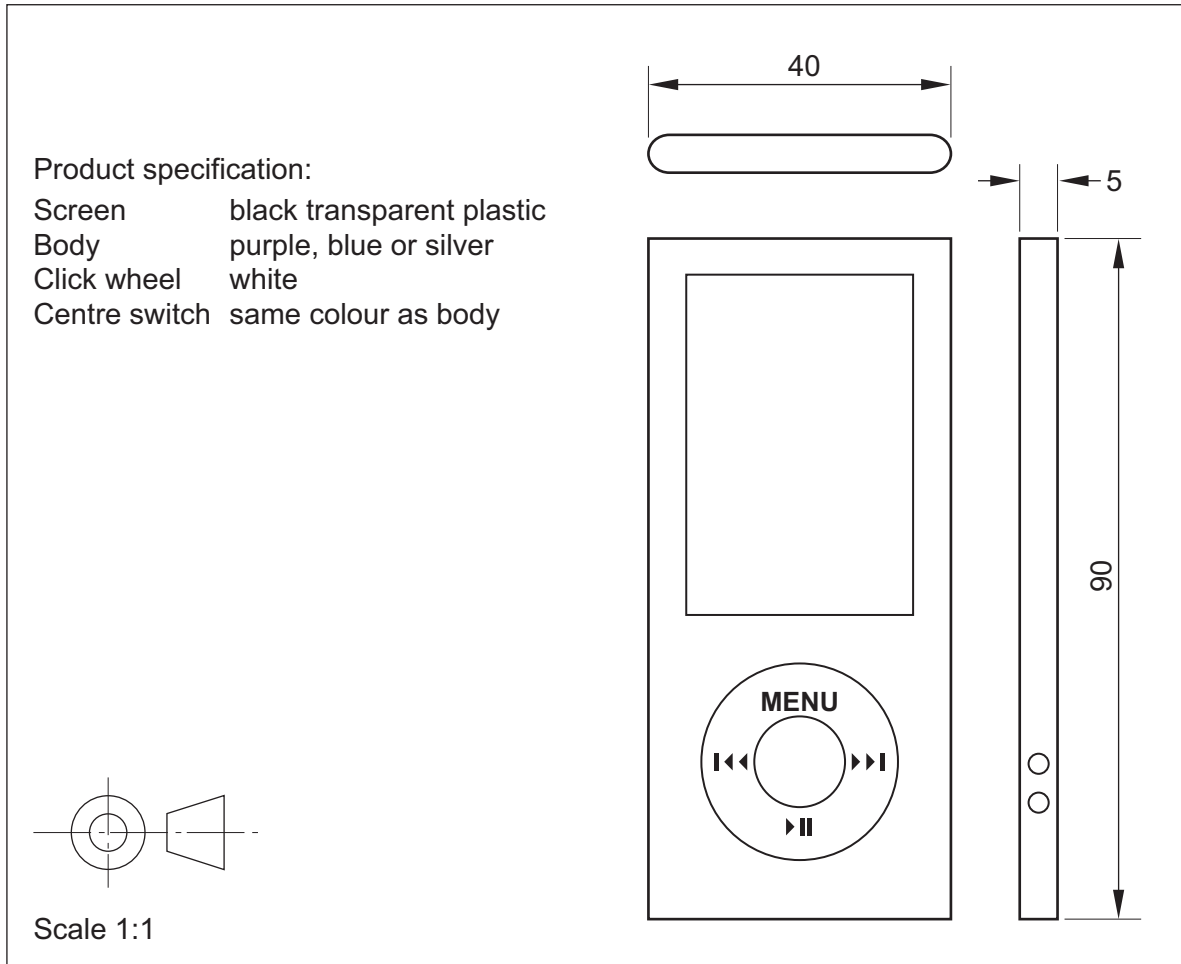


This question is about 3-D sketching and rendering and is worth 10 marks.

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

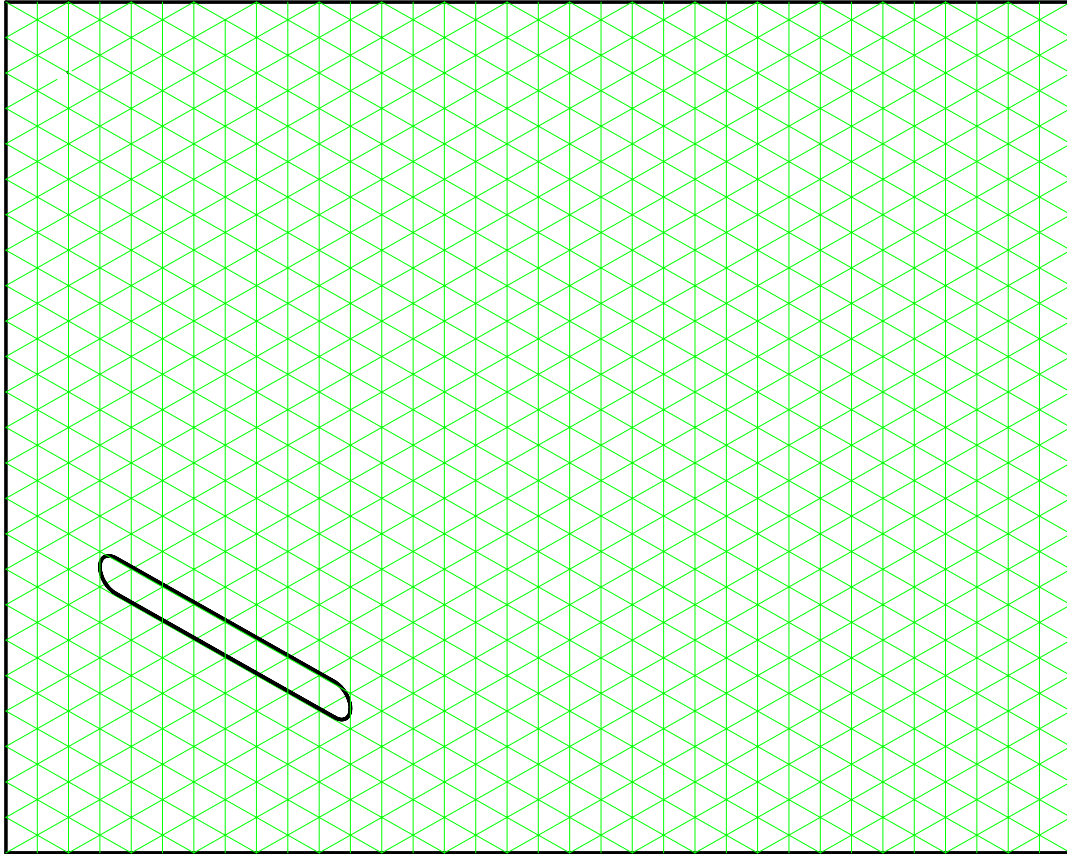
**5** The orthographic drawing below is of a music storage device.

Dimensions are given in millimetres (mm).



- 5 (a)** Using the information opposite, complete the full-size isometric sketch of the music storage device.

Estimate any sizes not given.



(6 marks)

- 5 (b)** Add thick and thin lines to enhance your drawing. (2 marks)

- 5 (c)** Render the plastic screen to represent a black transparent shiny surface. (2 marks)

10
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Turn over ►



This question is about card engineering and is worth 16 marks.

You are advised to spend about 16 minutes on this question.

- 6 Miniature soap bars are often purchased in card packaging such as the Dove soap box below. The box measures 50 mm x 30 mm x 15 mm.



Key	
Perforated line	
Glue area	
Cut line	
Fold line	



- 6 (a) Use the key above to draw a full size surface development (net) of the soap box on the grid below to enable a third party to manufacture the box. Do **not** include any surface decoration.

(10 marks)





6 (b) Study the symbols below which appear on soap packaging. Give their meaning and importance.

Symbol	Meaning and importance
	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p style="text-align: right;">(3 marks)</p>
	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p style="text-align: right;">(3 marks)</p>

Turn over for the next question

Turn over ►



This question is about designers and is worth 13 marks.

You are advised to spend about 13 minutes on this question.

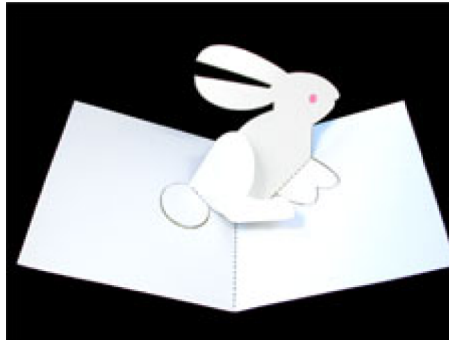
**7 (a)** Which of these designers is best known for designing pop-up books?

Put a tick (✓) in the box.

Harry Beck	<input type="checkbox"/>
Robert Sabuda	<input type="checkbox"/>
Alberto Alessi	<input type="checkbox"/>
Jock Kinneir and Margaret Calvert	<input type="checkbox"/>
Wally Olins	<input type="checkbox"/>

(1 mark)

**7 (b)** The pop-up rabbit shown below is a one-page spread in a pop-up book submitted as part of a GCSE Graphic Products project.



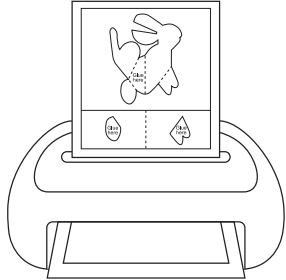
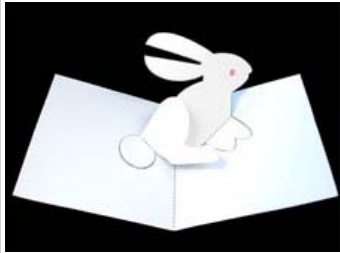
Complete the table opposite (page 19) by:

**7 (b) (i)** describing the stages of making the one-page spread (3 marks)

**7 (b) (ii)** naming **one** item of equipment used at each stage (3 marks)

**7 (b) (iii)** drawing diagrams to show how you would make this pop-up spread in your classroom by hand. (6 marks)



Description of Stage	Equipment	Diagram
<p>Stage 1 Print out the pop-up card and rabbit onto white card</p>	<p>Laser black and white printer</p>	
<p>Stage 2 – Cut</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p>	
<p>Stage 3 – Crease and fold</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p>	
<p>Stage 4 – Glue and assemble</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p>	
<p>Stage 5 Completed pop-up spread ready for assembly into the book</p>	<p>None required</p>	

END OF QUESTIONS



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