



# Victorian Certificate of Education 2013

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

## STUDENT NUMBER

Letter

Figures

Words


# PRODUCT DESIGN AND TECHNOLOGY

## Written examination

Wednesday 6 November 2013

Reading time: 11.45 am to 12.00 noon (15 minutes)

Writing time: 12.00 noon to 1.30 pm (1 hour 30 minutes)

## QUESTION AND ANSWER BOOK

### Structure of book

<i>Section</i>	<i>Number of questions</i>	<i>Number of questions to be answered</i>	<i>Number of marks</i>
A	10	10	41
B	10	10	49
			Total 90

- Students are permitted to bring into the examination room: pens, lead and coloured pencils, water-based pens and markers, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.
- No calculator is allowed in this examination.

### Materials supplied

- Question and answer book of 17 pages including a detachable **design brief** insert in the centrefold.

### Instructions

- Detach the **design brief** insert from the centre of this book during reading time.
- Write your **student number** in the space provided above on this page.
- You may use diagrams, notes or sketches to help explain your answers.
- Use the space provided in this book for your design brief drawings.
- All written responses must be in English.

### At the end of the examination

- You may keep the detached **design brief** insert.

**Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.**

**SECTION A****Instructions for Section A**

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

**Question 1** (4 marks)

Select the most appropriate answer (**A.–D.**) for each of the following questions and write your answer in the box.

- a.** At what stage of the Product design process is risk assessment **most** important? 1 mark

- A.** investigating and defining
- B.** design and development (conceptualisation)
- C.** planning and production
- D.** evaluation

- b.** Four-part evaluation criteria do **not** include 1 mark

- A.** client or end user feedback.
- B.** the evaluation criterion written as a question.
- C.** the relevance of the criterion to the design brief.
- D.** how the completed product could be tested against the criterion.

- c.** A decision matrix is a methodical way to evaluate designs for the purpose of deciding 1 mark

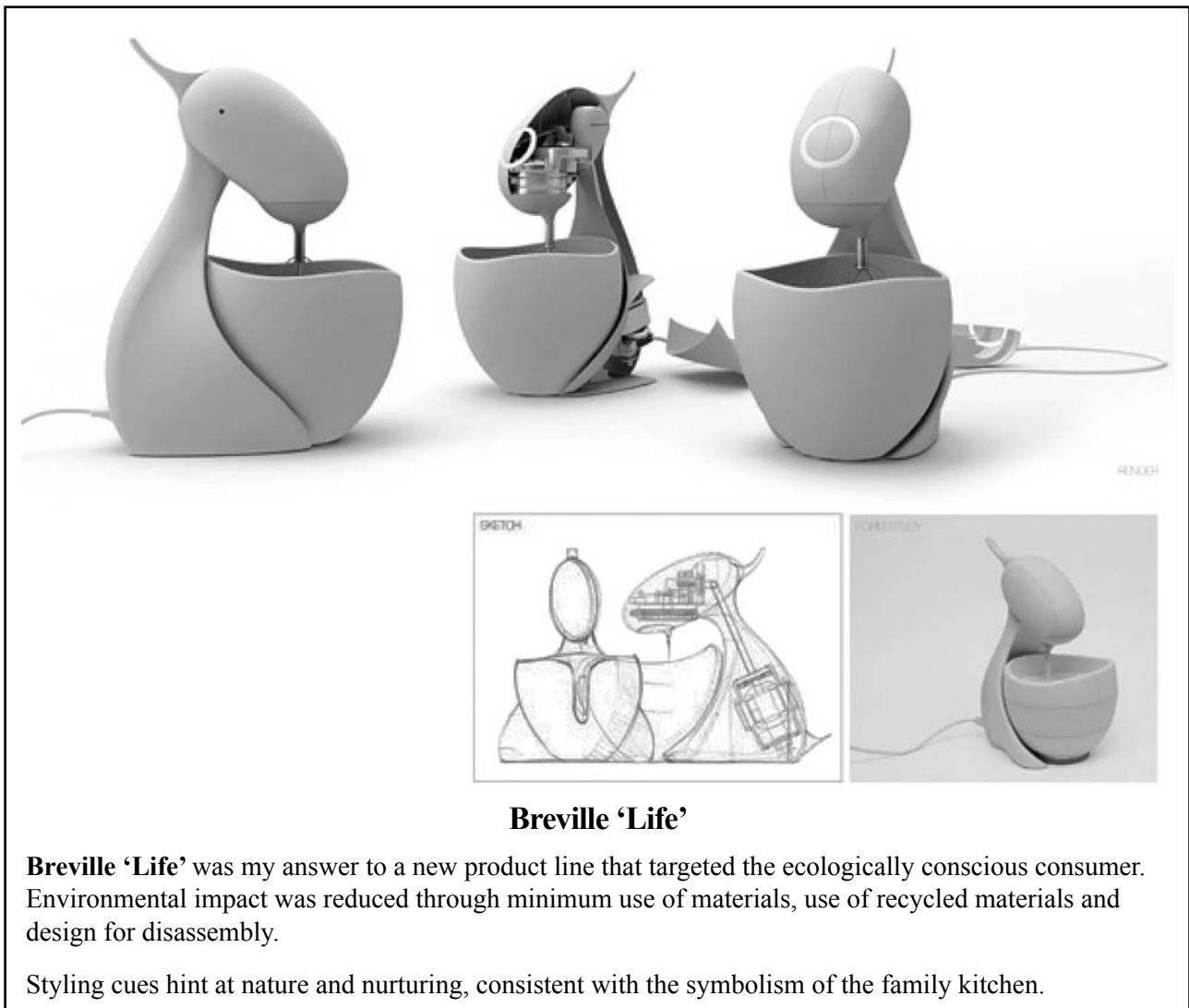
- A.** which design looks best.
- B.** which design the designer thinks is best.
- C.** which design the manufacturer will put into production.
- D.** which design best suits the needs of the client and/or end user.

- d.** The reason why the designer explains the care requirements of the product to the client and/or end user is to 1 mark

- A.** explain the attributes of the product.
- B.** meet international and Australian standards.
- C.** prolong the product's life and maintain its appearance.
- D.** meet the specific needs and requirements of the client and/or end user.

*Use the following information to answer Questions 2–9.*

In conjunction with Breville, a competition was run for student-designers to redesign the Breville kitchen mixer. One of the constraints of the design brief was that students had to use the existing motor and gearbox. Below is an example of one student-designer's response to the brief.



### **Breville 'Life'**

**Breville 'Life'** was my answer to a new product line that targeted the ecologically conscious consumer. Environmental impact was reduced through minimum use of materials, use of recycled materials and design for disassembly.

Styling cues hint at nature and nurturing, consistent with the symbolism of the family kitchen.

Source: Christian Tucker (designer); GOTYA 2009, gallery 8, <http://www.dia.org.au/index.cfm?id=319>

**Question 2** (4 marks)

Research is important when a new product is being developed.

Describe two specific areas of research that the student-designer needed to carry out in order to design the Breville 'Life' mixer effectively.

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Question 3** (3 marks)

Identify **one** parameter within the visual/aesthetic design factor of the Breville 'Life' mixer and explain how this parameter would make the product appealing.

parameter \_\_\_\_\_

explanation \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Question 4** (5 marks)

When developing the Breville 'Life' mixer, the student-designer applied the Design for Disassembly approach to make the product more sustainable.

- a. Identify and explain one way in which the product could be designed to make disassembly easy. 3 marks

identify \_\_\_\_\_

explanation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- b. The student-designer has placed value on the product's ability to undergo disassembly. Explain why it is important to prioritise attributes of products. 2 marks

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**Question 5** (3 marks)

The design of the Breville 'Life' mixer would need to comply with international and Australian standards.

- a. Identify **one** aspect of the product's design that is likely to be covered by these standards. 1 mark

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- b. Describe **one** problem that might occur if the product did **not** comply with these standards. 2 marks

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**Question 6** (6 marks)

Identify **two** steps from the product development process in industry that the student-designer has already completed in order to get the Breville 'Life' mixer to a prototype stage. Describe the specific tasks that the student-designer might have carried out during each of those steps.

Step	Description of specific task
<hr/>	
<hr/>	

**Question 7** (3 marks)

Identify an appropriate form of a new or emerging technology that could be used in the design and/or the production of the Breville 'Life' mixer, and explain why that technology would be useful.

identify \_\_\_\_\_

explanation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Question 8** (4 marks)

Two of the Five Ps of marketing have been identified below.

Describe an appropriate marketing approach for the Breville 'Life' mixer for each of the 'Ps' listed below that would suit the target market (people) identified by the student-designer in the box on page 3.

Marketing area (P)	Description of marketing approach
place	<hr/> <hr/> <hr/> <hr/> <hr/>
promotion	<hr/> <hr/> <hr/> <hr/> <hr/>

**Question 9** (3 marks)

Explain why it is important to develop a marketing strategy **during** the product development process rather than after a product has been manufactured.

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**Question 10** (6 marks)

The design brief plays a strategic and important role for the designer.  
Discuss the role of the design brief within the Product design process.

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**SECTION B****Instructions for Section B**

1. Read the **design brief** insert.
2. Select one product that you intend to design and answer the following questions.

Tick (✓) **one** stallholder (end user) that you intend to design for.

sells handmade hats		sells handmade clocks	
sells handmade toys		sells handmade teapots	

Tick (✓) the equipment **or** personal attire that you intend to design.

stall table or cart	
mobile display unit	
clothing	
identification accessories	

**Question 1** (3 marks)

Identify the primary function of the product.

- a. Write the primary function as an evaluation question.

1 mark

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- b. Explain the relevance of the primary function to the design.

2 marks

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**Question 2** (3 marks)

Choose **one** aspect of the **design brief** that needs research and explore that aspect using a concept map.

**Question 3** (4 marks)

a. Apart from a concept map, what method could you use to explore your ideas? 1 mark

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b. Justify the value of this method. 3 marks

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**Question 4** (18 marks)

Draw and annotate a design option for the product that you have selected on page 9.

Draw your design option on this page.

Draw detailed views of three processes from your design option in the boxes provided. Include at least **one** process from the **degree of difficulty list** in the **design brief** insert.

<b>Assessment criteria</b>	
<b>i.</b> function/suitability of the design option for intended use	3 marks
<b>ii.</b> drawing, in the boxes, of processes, including at least one from the <b>degree of difficulty list</b>	3 marks
<b>iii.</b> use of visual, tactile and aesthetic Product design factors in the design option	3 marks
<b>iv.</b> annotations, on the design option, that indicate how the requirements of the design brief have been met	3 marks
<b>v.</b> clarity and detail of drawing in the design option	2 marks
<b>vi.</b> innovation and creativity in the design option	4 marks

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**Question 5** (2 marks)

The design brief states that your product needs to be of a high quality.

Identify **two** steps that you will take to ensure that your product is of a high quality.

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**Question 6** (4 marks)

- a. Identify the scale of manufacturing system that you would employ in the production of your product. 1 mark

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- b. Explain the suitability of this scale of manufacturing system over others. 3 marks

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**Question 7** (4 marks)

- a. Identify **one** important measure that you could take **prior** to construction to ensure that you manage your time and resources effectively and efficiently when making your product. 1 mark

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- b. Explain how this measure would prevent problems from occurring. 3 marks

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**Question 8** (5 marks)

Choose **one** process from the **degree of difficulty list** that you have used in your design option.

- Rate its level of risk (high, medium or low).
- Identify a hazard that is associated with this process.
- Explain the reason for your rating.
- Describe **one** action that can be taken to control that risk.

process \_\_\_\_\_

level of risk \_\_\_\_\_

hazard \_\_\_\_\_

explanation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

description \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Question 9** (3 marks)

Working drawings play a significant part in the design and development (conceptualisation) stage of the Product design process.

Explain why a designer needs to have working drawings in the design and development (conceptualisation) stage.

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**Question 10** (3 marks)

You are to produce a presentation for your client that showcases the unique design features of your product. From your design option, identify and explain **one** specific aspect that you would include in the presentation.

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Please remove from the centre of this book during reading time.

## D E S I G N B R I E F

Craft markets have become a popular way for communities to come together and for people to sell handmade items. Woodlane Council has decided to modernise its craft market as part of the renovation of the outside space where the market is held. The council is aware of the competitive nature of craft markets and has decided to try to create a more thematic and professional look for the stalls. The council would like all equipment and personal attire used by the stallholders to reflect what each stallholder makes and sells.

- a stall table or cart
- a mobile display unit
- clothing
- identification accessories

By presenting a professional, but unique, look for each stall, the council aims to improve the way stallholders present their handmade items and increase the number of visitors to the market.

Each stallholder needs a range of stall equipment and personal attire that

- reflects the individual stallholder's handmade stock
- will be easy to maintain
- is finished to a high degree of quality
- is durable.

Woodlane Council has requested that you, as a designer

1. select **one** stallholder
2. select the equipment **or** personal attire from the list that is provided
3. be aware of the specific requirements for each of the products.

TURN OVER

## **SELECT AN END USER**

### **End user – stallholder**

- sells handmade hats
- sells handmade toys
- sells handmade clocks
- sells handmade teapots

## **THEN SELECT A PRODUCT**

### **Product – the equipment or personal attire**

#### **Stall table or cart**

- must be easy to move
- must have some form of handle to assist with easy movement – detachable for safety reasons
- must provide protection from the sun or rain

#### **Mobile display unit**

- must include space to display pictures/samples of stock
- must include space for pamphlets (leaflets) about the stallholder
- maximum size – 2000 mm height × 900 mm width

#### **Clothing for stallholders**

- must include three pieces of clothing – a top, a jacket and long pants **or** a top, a jacket and a skirt (knee-length or longer)
- the top must protect the wearer from the sun
- the jacket must protect the wearer from the wind

#### **Identification accessories for stallholders**

- must include two items that can be easily secured to the body or clothing
- must include an upper-arm adornment identifying the items sold
- must include an item that identifies the name of the stallholder

Your design should include at least **three** processes with a degree of difficulty; one of these processes **must** be from the **degree of difficulty list** below.

<b>Degree of difficulty list</b>			
<b>Metal</b>	<b>Polymers (plastics)</b>	<b>Textiles</b>	<b>Wood/Timber</b>
<ul style="list-style-type: none"> <li>• bronze brazing</li> <li>• cold bending</li> <li>• folding</li> <li>• forging</li> <li>• riveting</li> <li>• rolling</li> <li>• silver soldering</li> <li>• turning (using an engineer's lathe)</li> <li>• welding</li> </ul>	<ul style="list-style-type: none"> <li>• blow moulding</li> <li>• casting</li> <li>• injection moulding</li> <li>• riveting</li> <li>• turning (using an engineer's lathe)</li> <li>• vacuum forming</li> </ul>	<ul style="list-style-type: none"> <li>• boning</li> <li>• buttonhole making</li> <li>• collar making</li> <li>• cuff making</li> <li>• gathering</li> <li>• piping</li> <li>• pleating</li> <li>• pocket making</li> <li>• rolled hemming</li> <li>• sleeve insertion</li> <li>• surface decoration</li> <li>• zip insertion</li> </ul>	<ul style="list-style-type: none"> <li>• biscuit jointing</li> <li>• crossed housing jointing</li> <li>• dovetail jointing</li> <li>• dowel jointing</li> <li>• housing jointing</li> <li>• mortise and tenon jointing</li> <li>• rebate/shoulder butt jointing</li> <li>• routing (decorative edge)</li> <li>• spline and mitre jointing</li> <li>• veneering</li> <li>• wood turning (using a wood lathe)</li> </ul>

**END OF DESIGN BRIEF INSERT**