



## Western Australian Certificate of Education Examination, 2013

### Question/Answer Booklet

# MATERIALS DESIGN AND TECHNOLOGY

## Stage 3

### Sections One and Two

Please place your student identification label in this box

Student Number: In figures

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In words

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### Time allowed for this paper

Reading time before commencing work: ten minutes

Working time for paper: two and a half hours

### Time recommended for these sections

Suggested working time for these sections: sixty minutes

### Materials required/recommended for this paper

#### *To be provided by the supervisor*

This Question/Answer Booklet

Section Three Question/Answer Booklet

Number of additional  
answer booklets used  
(if applicable):

#### *To be provided by the candidate*

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener,  
correction fluid/tape, eraser, ruler, highlighters

Special items: non-programmable calculators approved for use in the WACE examinations

### Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

## Structure of the examination

The WACE Materials Design and Technology Stage 3 examination consists of a written component worth 50 per cent of the total examination score and a practical (portfolio) component worth 50 per cent of the total examination score.

## Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of total exam
Section One: Short answer	4	4	20	27	7.5
Section Two: Extended answer	4	4	40	38	12.5
Section Three: Candidates to choose <b>one</b> of the following contexts:					
Wood	5	5	90	78	30
Metal	5	5	90	78	
Textiles	5	5	90	78	
				<b>Total</b>	50

## Instructions to candidates

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2013*. Sitting this examination implies that you agree to abide by these rules.
2. Answer the questions according to the following instructions.  
  
Sections One and Two: Answer **all** questions. Write your answers in this Question/Answer Booklet.
3. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.
4. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.
  - Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
  - Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

See next page

Section One: Short answer

7.5% (27 Marks)

This section has **four (4)** questions. Answer **all** questions. Write your answers in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 20 minutes.

Question 1

(8 marks)

- (a) Identify **one** finish that can be used in your context to protect a product from an environment to which it will be exposed. Outline the advantages and disadvantages of using this finish in the table below. (5 marks)

Finish: \_\_\_\_\_

Advantages	Disadvantages

- (b) Describe how the selection of the appropriate finishing process was fundamental to achieving the design brief for **one** of the projects you completed this year. (3 marks)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Question 2**

**(6 marks)**

In relation to a project you have designed this year, explain how **two** of the following sources of design inspirations were incorporated into your design process.

- historical
- social
- cultural
- political

One: \_\_\_\_\_

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Two: \_\_\_\_\_

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Question 3

(7 marks)

- (a) Table 1 shows the test results for a new fabric that is being developed for the poolside chair illustrated in Figure 1. Evaluate the suitability of this material for the chair. (4 marks)

Properties	Rating				
	Poor	Low	Good	Very good	Excellent
Mildew resistance		■			
Lightweight				■	
Flame resistance	■				
Strength					■
Insulation		■			
Waterproof					■

Table 1

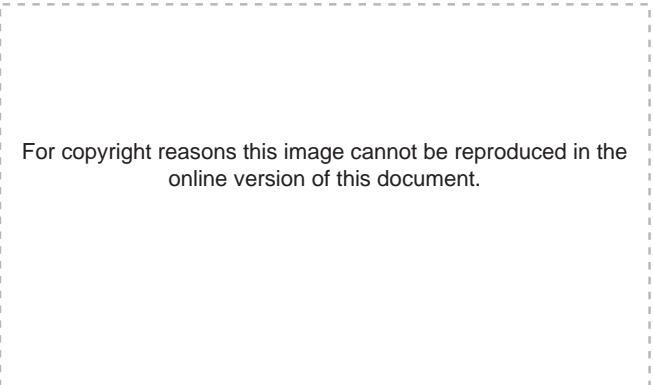


Figure 1

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- (b) Consider planning the mass production of the poolside chair shown above. Explain what factors a designer needs to research and evaluate when selecting materials to be used in the manufacture of the product. (3 marks)

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Question 4

(6 marks)

- (a) Identify **two** ways in which the design fundamentals of aesthetics and function relate to each other in the image of the mobile phone shown in Figure 2. (2 marks)



Figure 2

One: \_\_\_\_\_

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Two: \_\_\_\_\_

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- (b) Discuss how the needs of the target audience influenced the design objectives for this mobile phone. (4 marks)

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End of Section One

See next page

Section Two: Extended answer

12.5% (38 Marks)

This section contains **four (4)** questions. Answer **all** questions. Write your answers in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 40 minutes.

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**Question 5**

**(7 marks)**

One of the members of your year group has become a new employee in the manufacturing industry.

- (a) Outline what he/she would expect to be told in an induction about his/her rights with regard to the legislative requirement that employers ensure that Occupational Safety and Health processes are followed in the workplace. (3 marks)

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- (b) Identify **four** duty of care responsibilities employers have to meet to ensure a workplace is safe for employees and visitors. (4 marks)

One: \_\_\_\_\_

Two: \_\_\_\_\_

Three: \_\_\_\_\_

Four: \_\_\_\_\_

**Question 6**

**(7 marks)**

- (a) Consider a product that would typically be made within your context. Discuss the advantages and disadvantages of using a new and emerging material in its construction, compared with using a traditional material. (4 marks)

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- (b) Explain how demand from consumers can influence the development of the new and emerging materials. (3 marks)

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**Question 7** (continued)

- (c) In the space provided, sketch and annotate a possible alternative design concept that would still meet the list of features developed in part (a). (5 marks)



- (d) Discuss the merits of the alternative design concept you have developed, with reference to the needs and values of the target audience. (4 marks)

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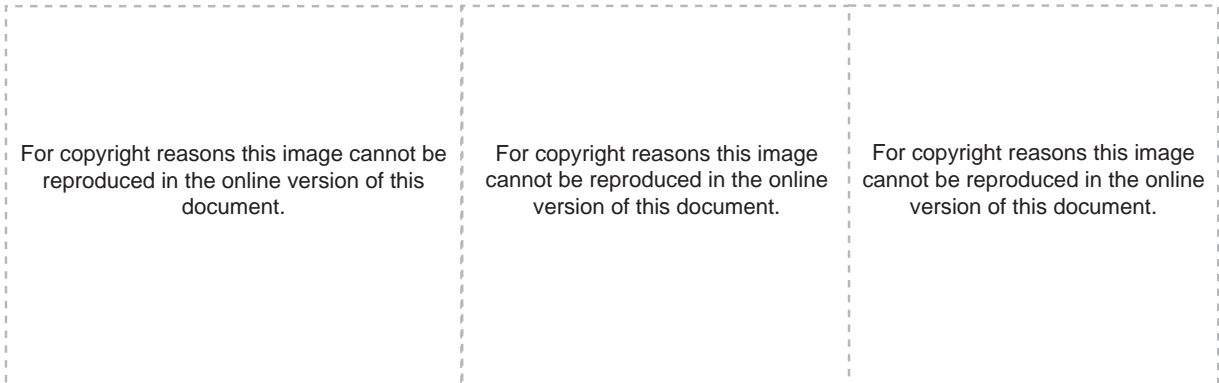
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Question 8

(8 marks)



- (a) Analyse the images shown above and predict **one** safety issue that is evident in **one** of the products. Propose a design solution that would address this issue. (4 marks)

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- (b) Justify the use of a particular material that would be suitable for the product you have chosen in part (a). In your answer, make reference to the properties of that material. (4 marks)

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