



# Western Australian Certificate of Education Examination, 2015

## 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	3	3	20	24	15
Section Two: Extended answer	3	3	40	22	25
Section Three: Candidates to choose <b>one</b> of the following contexts:					
Wood	5	5	90	67	60
Metal	5	5	90	67	
Textiles	5	5	90	67	
				<b>Total</b>	100

## Instructions to candidates

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2015*. 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.

Section One: Short answer

15% (24 Marks)

This section has **three (3)** 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

(9 marks)

Below there are three safety signs that can be found in a workshop.

Identify **one** element and **one** principle of design that has been used in the design of each safety sign. Explain how the elements and principles are used to convey the message.

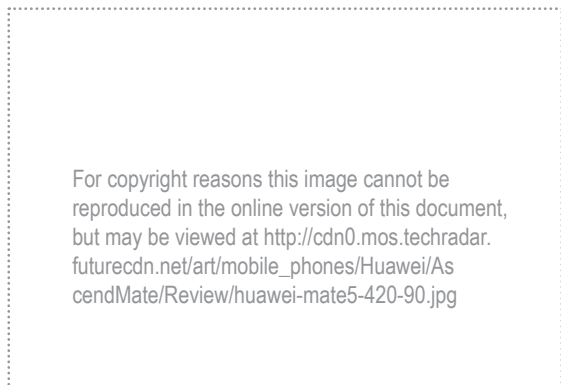
<p>For copyright reasons this image cannot be reproduced in the online version of this document, but may be viewed at <a href="http://images.labelbar.co.uk/images/products/zoom/1359544428-73168100.gif">http://images.labelbar.co.uk/images/products/zoom/1359544428-73168100.gif</a></p>	<p>Element: _____</p> <p>Principle: _____</p> <p>Explanation: _____</p> <p>_____</p>
	<p>Element: _____</p> <p>Principle: _____</p> <p>Explanation: _____</p> <p>_____</p>
<p>For copyright reasons this image cannot be reproduced in the online version of this document, but may be viewed at <a href="http://www.newforestfootwear.com/resources/wp-content/uploads/2011/03/p1-6.jpg">www.newforestfootwear.com/resources/wp-content/uploads/2011/03/p1-6.jpg</a></p>	<p>Element: _____</p> <p>Principle: _____</p> <p>Explanation: _____</p> <p>_____</p>

**Question 2**

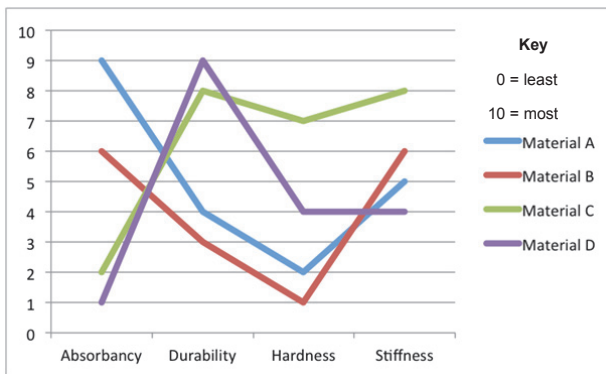
**(4 marks)**

During the design of the mobile phone shown in Figure 1, the designer considered four different materials for the outer casing. To ensure that the most suitable material was selected, each was tested for absorbency, durability, hardness and stiffness.

The table below shows the results for each of the materials. Analyse the table and explain, with reference to the properties, which material would be the **most** suitable for the mobile phone.



**Figure 1**



**Table 1**

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Question 3

(11 marks)

Answer the following parts of this question with reference to a project that you have manufactured this year.

- (a) Identify **four** environmental impacts your project may have had on the environment.

(4 marks)

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- (b) How could you reduce the impacts referred to in Question 3(a) if you were to make your project again?

(3 marks)

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Question 3 (continued)

- (c) Identify an emerging material that could be used to make your project referred to in Question 3(a) and discuss the properties of the material that make it appropriate for this project. (4 marks)

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**End of Section One**

**Section Two: Extended answer**

**25% (22 Marks)**

This section contains **three (3)** 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.

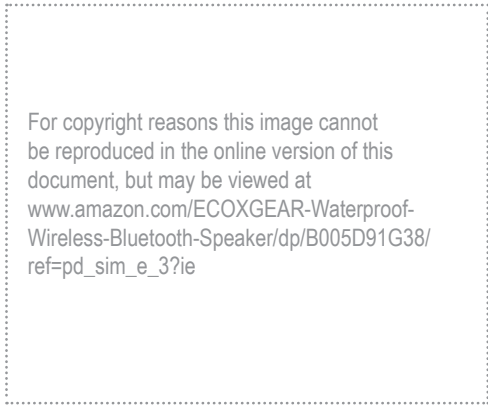
- **Planning:** If you use the spare pages for planning, indicate this clearly at the top of the page.
- **Continuing an answer:** If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of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

Suggested working time: 40 minutes.

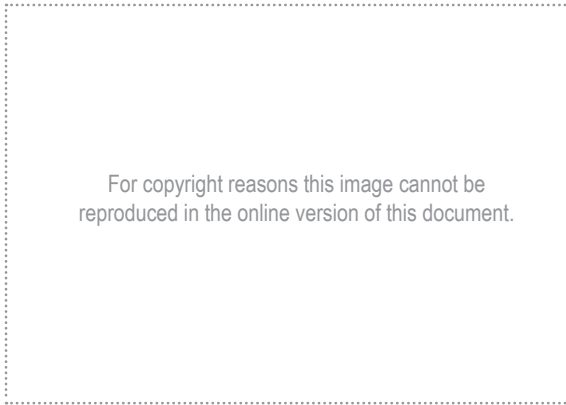
**Question 4**

**(10 marks)**

Compare the portable speakers below, referring to **five** relevant design fundamentals.



Product A



Product B

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Question 4 (continued)

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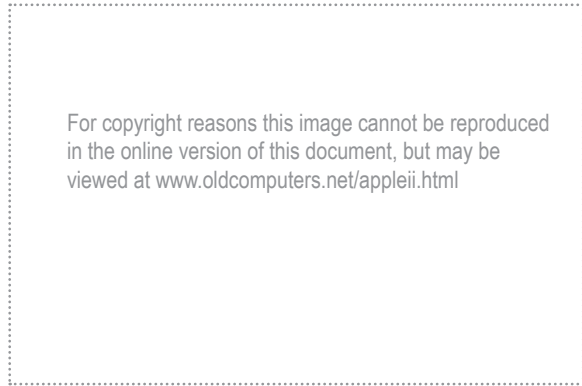
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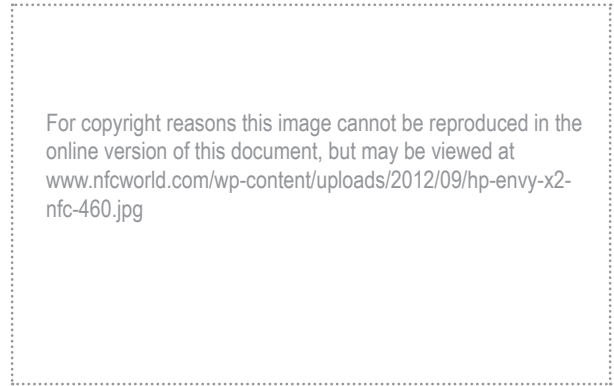
**Question 5**

**(6 marks)**

Examine the products below and discuss the social and cultural factors that have influenced their development from 1987 to 2014.



Product A



Product B

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