



ATAR course examination, 2021

Question/Answer booklet

MATERIALS DESIGN AND TECHNOLOGY

Sections One and Two

Please place your student identification label in this box

WA student number: In figures

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In words

Time allowed for this paper

Reading time before commencing work: ten minutes
Working time: two and a half hours

Time suggested 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

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: up to three calculators, which do not have the capacity to create or store programmes or text, are permitted in this ATAR course examination

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 material. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Structure of the examination

The Materials Design and Technology ATAR course examination consists of a written component and a practical (portfolio) component.

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of written examination
Section One Short answer	3	3	20	32	15
Section Two Extended answer	4	4	40	36	25
Section Three Candidates to choose one of the following contexts: Wood Metal Textiles	6	6	90	77	60
Total					100

Instructions to candidates

- The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2021: Part II Examinations*. Sitting this examination implies that you agree to abide by these rules.
- Write your answers in this Question/Answer booklet.
- Answer the questions according to the following instructions.

Sections One and Two: Answer all questions.
- You must be careful to confine your answers to the specific questions asked and to follow any instructions that are specific to a particular question.
- Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Section One: Short answer**15% (32 Marks)**

This section has **three** questions. Answer **all** questions. Write your answers in the spaces provided.

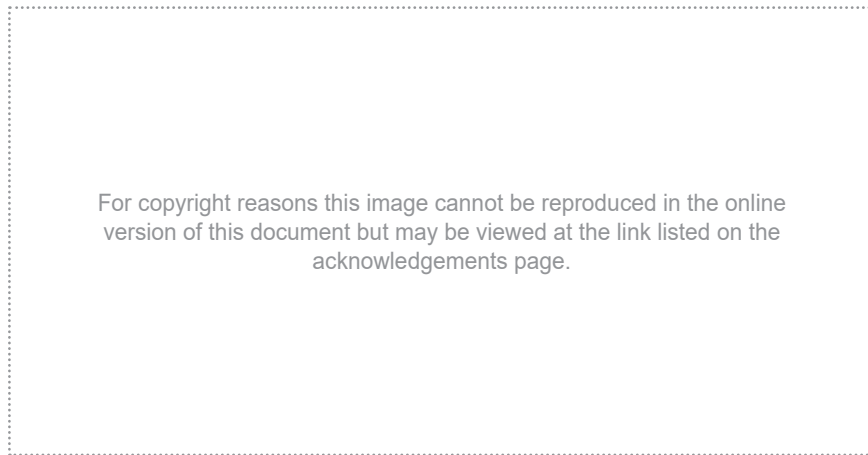
Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 20 minutes.

Question 1

(9 marks)

The image below shows the Forest chair manufactured for use in the garden.



- (a) List **three** elements and **three** principles of design shown in the Forest chair. (6 marks)

Elements

One: _____

Two: _____

Three: _____

Principles

One: _____

Two: _____

Three: _____

- (b) Describe how the designer used the elements **or** principles of design to enhance the marketability of the Forest chair. (3 marks)

Question 2

(13 marks)

- (a) Describe the role of client research **or** market research in developing the design for your major Year 12 production task. (3 marks)

- (b) Identify **three** techniques that could be used to carry out market research. (3 marks)

One: _____

Two: _____

Three: _____

- (c) Outline **three** benefits of using information and communication technology (ICT) when conducting market research. (3 marks)

One: _____

Two: _____

Three: _____

- (d) Describe **two** advantages for a designer of being able to predict the trends in a target market. (4 marks)

One: _____

Two: _____

- (c) Outline **three** reasons for making a prototype during a design process. (3 marks)

One: _____

Two: _____

Three: _____

End of Section One

See next page

Section Two: Extended answer

25% (36 Marks)

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

Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 40 minutes.

Question 4

(14 marks)

Read the scenario below and answer all question parts.

While working on a project in Materials Design and Technology class, Chris inhaled toxic fumes from the products being used and became unconscious. The school has launched an investigation into the accident.

- (a) List **four** proactive measures to ensure students' safety in a workshop. (4 marks)

One: _____

Two: _____

Three: _____

Four: _____

- (b) Describe **three** ways of controlling hazards that have been identified in a workshop. (6 marks)

One: _____

Two: _____

Three: _____

- (c) Identify **two** areas of information given on a Material Safety Data sheet and state the purpose of material safety data. (4 marks)

One: _____

Two: _____

Purpose: _____

Question 5

(7 marks)

The images below are a range of manufactured products.

<p>For copyright reasons this image cannot be reproduced in the online version of this document but may be viewed at the link listed on the acknowledgements page.</p>	<p>For copyright reasons this image cannot be reproduced in the online version of this document but may be viewed at the link listed on the acknowledgements page.</p>	<p>For copyright reasons this image cannot be reproduced in the online version of this document but may be viewed at the link listed on the acknowledgements page.</p>
<p>Knit shirt</p>	<p>Metal clock</p>	<p>Wooden decorative box</p>

- (a) Choose **one** of the images above and identify a computer numerically-controlled (CNC) process that could have been used to manufacture the product. (1 mark)

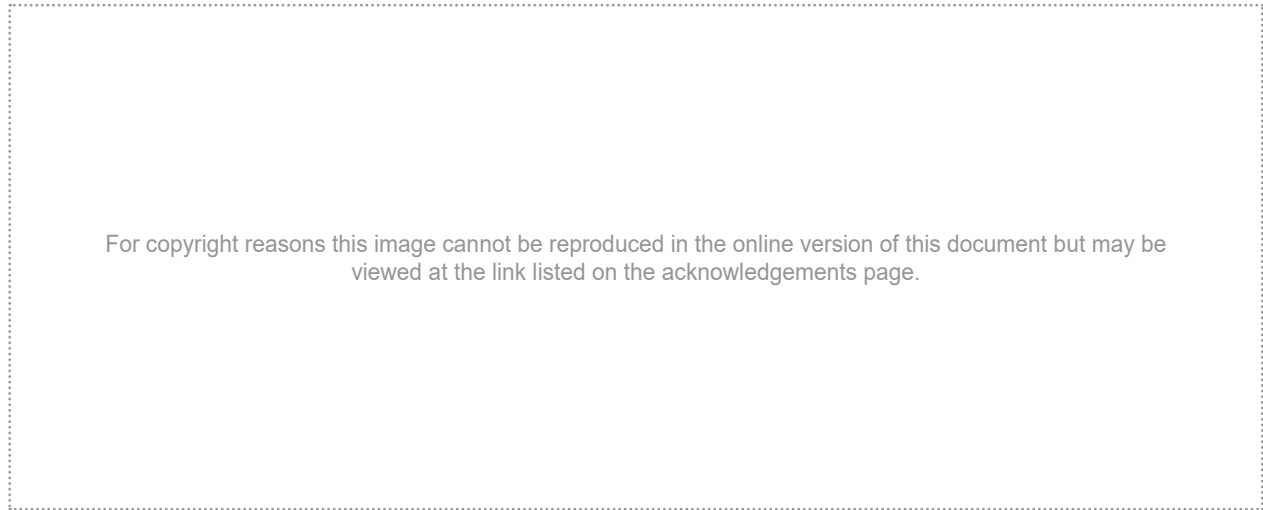
- (b) Outline **two** reasons a designer would choose to use the process identified in part (a) to create a product. (2 marks)

One: _____

Two: _____

Question 6

(8 marks)



The artwork on the aircraft above is called *Yananyi Dreaming*. It was developed using motifs painted by an Aboriginal and Torres Strait Islander artist and represents the vibrant and dramatic desert landscape of Central Australia.

Outline the historical, social, cultural and political aspects of using Aboriginal and Torres Strait Islander art as a source of design inspiration.

Historical: _____

Social: _____

Cultural: _____

Political: _____

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See next page

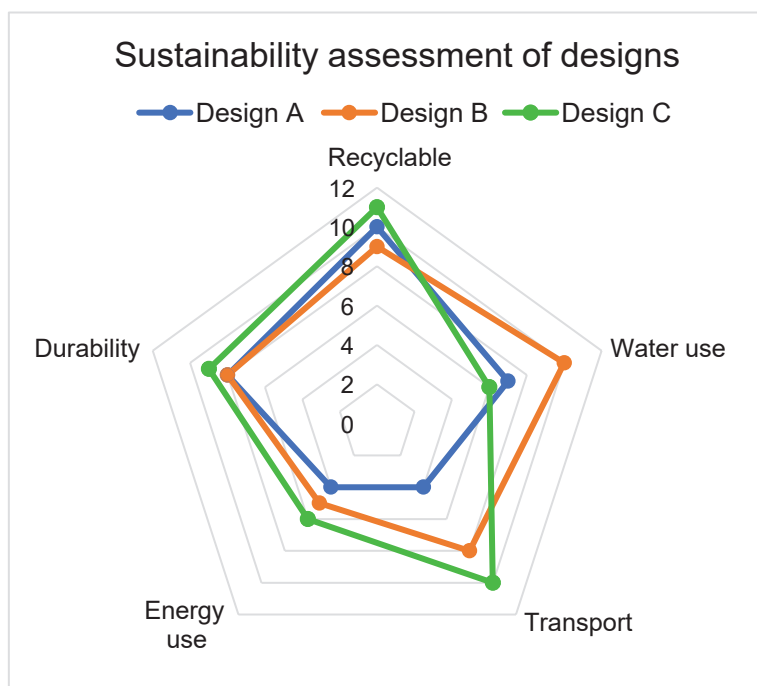
Question 7

(7 marks)

A sunglasses company is investigating alternative products for release next season. During the design stage, a choice had to be made between three options based on the overall sustainability of each design.

The graph below shows the sustainability features of each design.

0 = poor sustainability, 12 = strong sustainability.



- (a) Examine the graph above and explain, with reference to the features, which design would be the **most** sustainable. (4 marks)

In the three designs for the sunglasses, the energy use during manufacture was the weakest feature.

- (b) Outline **three** recommendations on how energy use could be reduced to improve the sustainability of the designs. (3 marks)

One: _____

Two: _____

Three: _____

ACKNOWLEDGEMENTS

- Question 1** Weishaeupl. (n.d.). [Photograph of latticed branch forest chairs]. Retrieved May, 2021, from https://cdn.trendhunterstatic.com/php-thumbnails/72/72469/72469_1_800.jpeg
- Question 3** [Photograph of easy grip pizza cutter]. (n.d.). Retrieved May, 2021, from <https://www.amazon.co.uk/Good-Cook-321248-Pizza-Slicer/dp/B0055B6TMM> (first image)
- Question 5** First image: [Photograph of back of long sleeve black top with butterfly cut-out]. (n.d.). Retrieved May, 2021, from <https://themommysess.com/wp-content/uploads/2020/06/shirt-cutting-ideas-5.jpg>
Middle image: Tolonensis Creation. (2013). *Columbus wall clock*. [Photograph]. Retrieved May, 2021, from <http://tolonensis.over-blog.com/horloge-murale-colombus>
Right image: [Photograph of a decorative wooden box]. (n.d.). Retrieved May, 2021, from <https://i.pinimg.com/originals/12/79/03/127903daaa68b31ec3a63cca8f92d84c.jpg>
- Question 6** Kuitja, R. (2002). *Yananyi dreaming - Boeing 737-300* [Photograph]. Retrieved May, 2021, from <https://www.qantas.com/images/qantas/aircraft/exterior/yananyi-aircraft-flying-art/jpg/block-col-8.desktop.jpg>
- Question 7** Jöbstl, E. (2016). *EmiMa-054* [Photograph of sunglasses]. Retrieved May, 2021, from <https://commons.wikimedia.org/wiki/File:EmiMa-054.jpg>

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