



# Western Australian Certificate of Education ATAR course examination, 2016

## Question/Answer booklet

### MATERIALS DESIGN AND TECHNOLOGY Section Three

Please place your student identification label in this box

Student number: In figures

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In words

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### Time recommended for this section

Suggested working time for this section: ninety minutes

### Materials required for this section

*To be provided by the supervisor*  
This Question/Answer booklet

### *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 this examination

Place a tick (✓) in one of the following boxes to indicate your examination context

Wood

Metal

Textiles

Number of additional answer booklets used (if applicable):

### 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	35	15
Section Two Extended answer	4	4	40	37	25
Section Three Candidates to choose <b>one</b> of the following contexts:					
Wood	5	5	90	67	60
Metal	5	5		67	
Textiles	5	5		67	
<b>Total</b>					100

## Instructions to candidates

1. The rules for the conduct of the Western Australian Certificate of Education ATAR course examinations are detailed in the *Year 12 Information Handbook 2016*. Sitting this examination implies that you agree to abide by these rules.
2. Write your answers in this Question/Answer booklet.
3. Answer the questions according to the following instructions.

Section Three: Answer all of the questions within your specialised field: Wood, Metal or Textiles.

4. 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.
5. Additional working space pages at the end of this Question/Answer booklet are for planning or continuing an answer. If you use these pages, indicate at the original answer, the page number it is planned/continued on and write the question number being planned/continued on the additional working space page.

**Section Three: Sectionalised and extended answer****60% (67 Marks)**

You are required to choose **one (1)** of the following options, according to the context you have studied in 2016.

Tick one of the boxes below to indicate your choice of context.

<b>Context</b>	<b>✓</b>	<b>Question</b>	<b>Pages</b>
<b>Wood</b>	<input type="checkbox"/>	8–12	4–11
<b>Metal</b>	<input type="checkbox"/>	13–17	12–19
<b>Textiles</b>	<input type="checkbox"/>	18–22	20–27

Now turn to the relevant pages and answer the questions for the context you have studied.

Section Three: Wood context

60% (67 Marks)

This section contains **five (5)** questions. Answer **all** questions.

Suggested working time: 90 minutes.

Question 8

(15 marks)

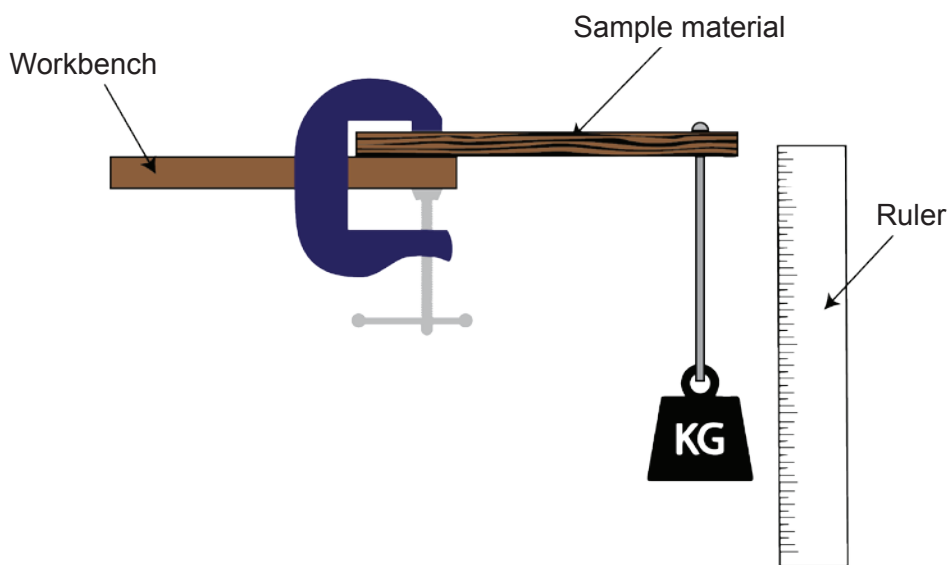


Image of a materials test

- (a) Name the materials test and explain the steps needed to complete this type of test. (5 marks)

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- (b) The reliability of a materials test is important. Give **two** examples of what can affect a materials test and **two** examples of what the consequences of an inaccurate test might be. (4 marks)

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- (c) (i) If the material being tested in part (a) performed well, identify the material and a suitable use for it. (1 mark)

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- (ii) If the identified material performed poorly, give a suitable use for the material. (1 mark)

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- (d) Identify and explain a manipulation technique you could use to give shape to the material identified in part (c)(i). (4 marks)

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Question 9

(10 marks)

(a) Identify **four** differences in the cellular structure of hardwoods and softwoods. (4 marks)

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(b) Identify **three** characteristics of softwood trees. (3 marks)

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(c) Give **three** advantages of using a softwood for furniture production. (3 marks)

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Question 10

(12 marks)

Read the scenario below and answer all parts of this question.

At 9.12 am on 13 October 2016, Matthew had an accident in his woodwork class while using the power tool pictured below. As a result, he sustained a serious injury to his hand. The school has held an investigation into the accident.



- (a) Give **three** possible reasons why the accident could have occurred. (3 marks)

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

\_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

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**Question 10** (continued)

- (b) After the investigation was completed, the Occupational Safety and Health officer developed a risk management plan for the workshop. What was the purpose of the risk management plan? (2 marks)

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- (c) Identify **three** proactive measures that could be introduced that would better prepare students for using workshop machinery. (3 marks)

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- (d) Identify **four** safety checks that should be carried out by a student before using the machine pictured at the start of this question. (4 marks)

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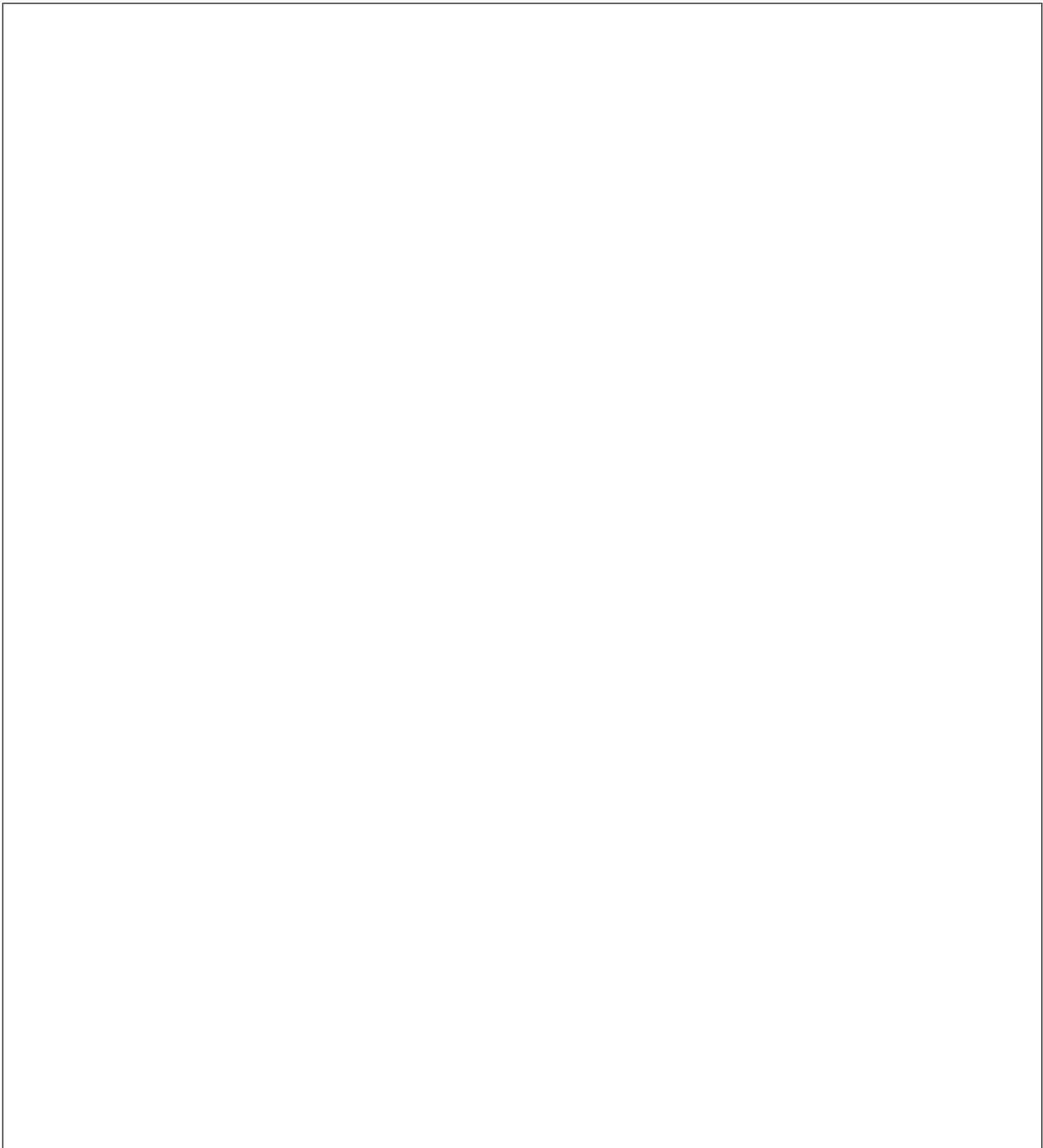


**Question 11****(18 marks)**

In the space provided, sketch the final project that you designed and manufactured this year. Identify the key features and, with the use of annotation, justify the choices for:

- materials
- manufacturing techniques used
- joining methods
- finish
- historical, social and cultural sources of design inspiration
- client/end user needs
- design features/decoration.

Sketching (4 marks)  
Annotation (14 marks)



**See next page**





Section Three: Metal context

60% (67 Marks)

This section contains **five (5)** questions. Answer **all** questions.

Suggested working time: 90 minutes.

Question 13

(15 marks)

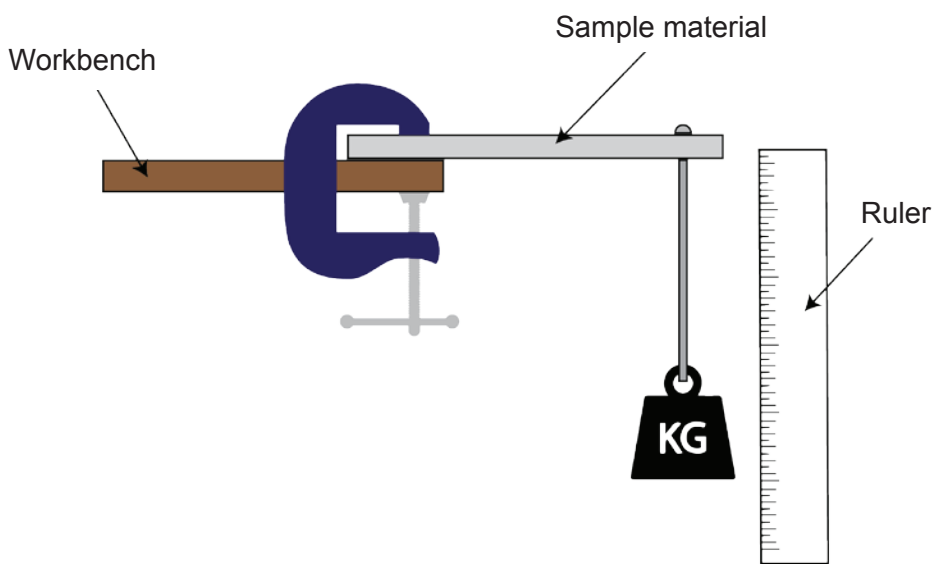


Image of a materials test

- (a) Name the materials test and explain the steps needed to complete this type of test. (5 marks)

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- (b) The reliability of a materials test is important. Give **two** examples of what can affect a materials test and **two** examples of what the consequences of an inaccurate test might be. (4 marks)

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- (c) (i) If the material being tested in part (a) performed well, identify the material and a suitable use for it. (1 mark)

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- (ii) If the identified material performed poorly, give a suitable use for the material. (1 mark)

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- (d) Identify and explain a manipulation technique you could use to give shape to the material identified in part (c)(i). (4 marks)

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**Question 14**

**(10 marks)**

- (a) Identify **four** differences between the characteristics of ferrous and non ferrous metals. (4 marks)

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- (b) Identify **three** properties of alloys. (3 marks)

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- (c) Give **three** advantages of using aluminium over steel. (3 marks)

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Question 15

(12 marks)

Read the scenario below and answer all parts of this question.

At 9.12 am on 13 October 2016, Jaime had an accident in her metalwork class while using the power tool pictured below. As a result, she sustained a serious injury to her hand. The school has held an investigation into the accident.



- (a) Give **three** possible reasons why the accident could have occurred. (3 marks)

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

\_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

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

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**Question 15** (continued)

- (b) After the investigation was completed, the Occupational Safety and Health officer developed a risk management plan for the workshop. What was the purpose of the risk management plan? (2 marks)

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- (c) Identify **three** proactive measures that could be introduced that would better prepare students for using workshop machinery. (3 marks)

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- (d) Identify **four** safety checks that should be carried out by a student before using the machine pictured at the start of this question. (4 marks)

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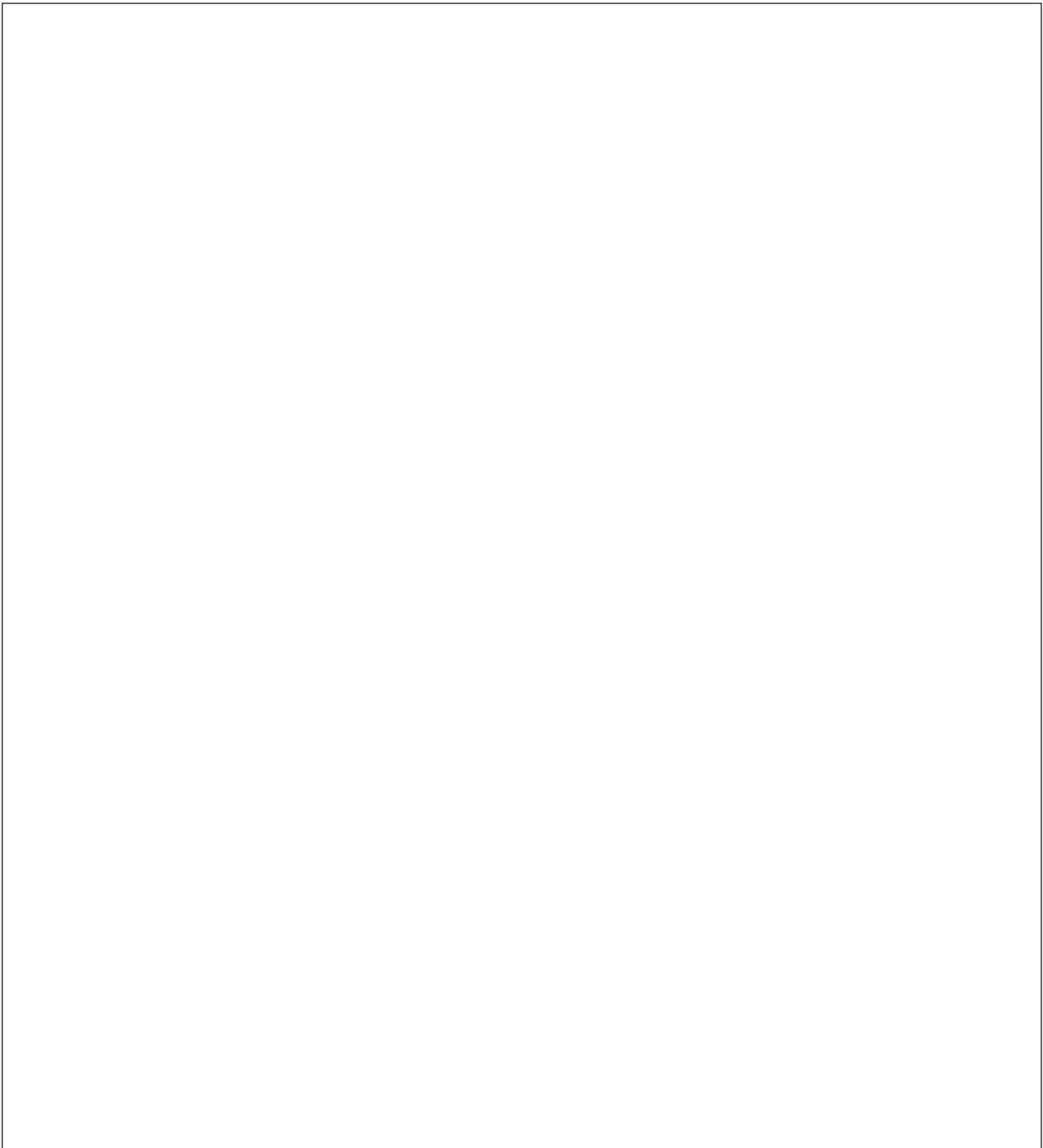


**Question 16****(18 marks)**

In the space provided, sketch your final project that you designed and manufactured this year. Identify the key features and, with the use of annotation, justify the choices for:

- materials
- manufacturing techniques used
- joining methods
- finish
- historical, social and cultural sources of design inspiration
- client/end user needs
- design features/decoration.

Sketching (4 marks)  
Annotation (14 marks)



**See next page**





Section Three: Textiles context

60% (67 Marks)

This section contains **five (5)** questions. Answer **all** questions.

Suggested working time: 90 minutes.

Question 18

(15 marks)

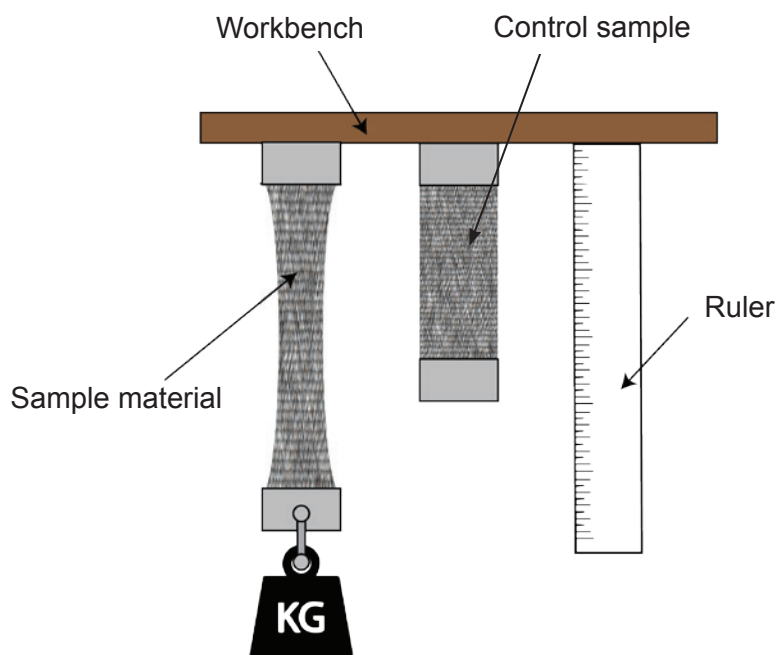


Image of a materials test

- (a) Name the materials test and explain the steps needed to complete this type of test. (5 marks)

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- (b) The reliability of a materials test is important. Give **two** examples of what can affect a materials test and **two** examples of what the consequences of an inaccurate test might be. (4 marks)

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- (c) (i) If the material being tested in part (a) performed well, identify the material and a suitable use for it. (1 mark)

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- (ii) If the identified material performed poorly, give a suitable use for the material. (1 mark)

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- (d) Identify and explain a manipulation technique you could use to give shape to the material identified in part (c)(i). (4 marks)

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Question 19

(10 marks)

(a) Identify **four** differences between cellulosic and protein fibres.

(4 marks)

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(b) Identify **three** characteristics of manufactured fibres.

(3 marks)

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(c) Give **three** advantages of using a fibre blend.

(3 marks)

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**Question 20**

**(12 marks)**

Read the scenario below and answer all parts of this question.

At 9.12 am on 13 October 2016, Carly had an accident in her textiles class while using the machine pictured below. As a result, she sustained a serious injury to her hand. The school has held an investigation into the accident.



- (a) Give **three** possible reasons why the accident could have occurred. (3 marks)

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

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

Three: \_\_\_\_\_  
 \_\_\_\_\_  
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**Question 20** (continued)

- (b) After the investigation was completed, the Occupational Safety and Health officer developed a risk management plan for the workshop. What was the purpose of the risk management plan? (2 marks)

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- (c) Identify **three** proactive measures that could be introduced that would better prepare students for using machinery. (3 marks)

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- (d) Identify **four** safety checks that should be carried out by a student before using the machine pictured at the start of this question. (4 marks)

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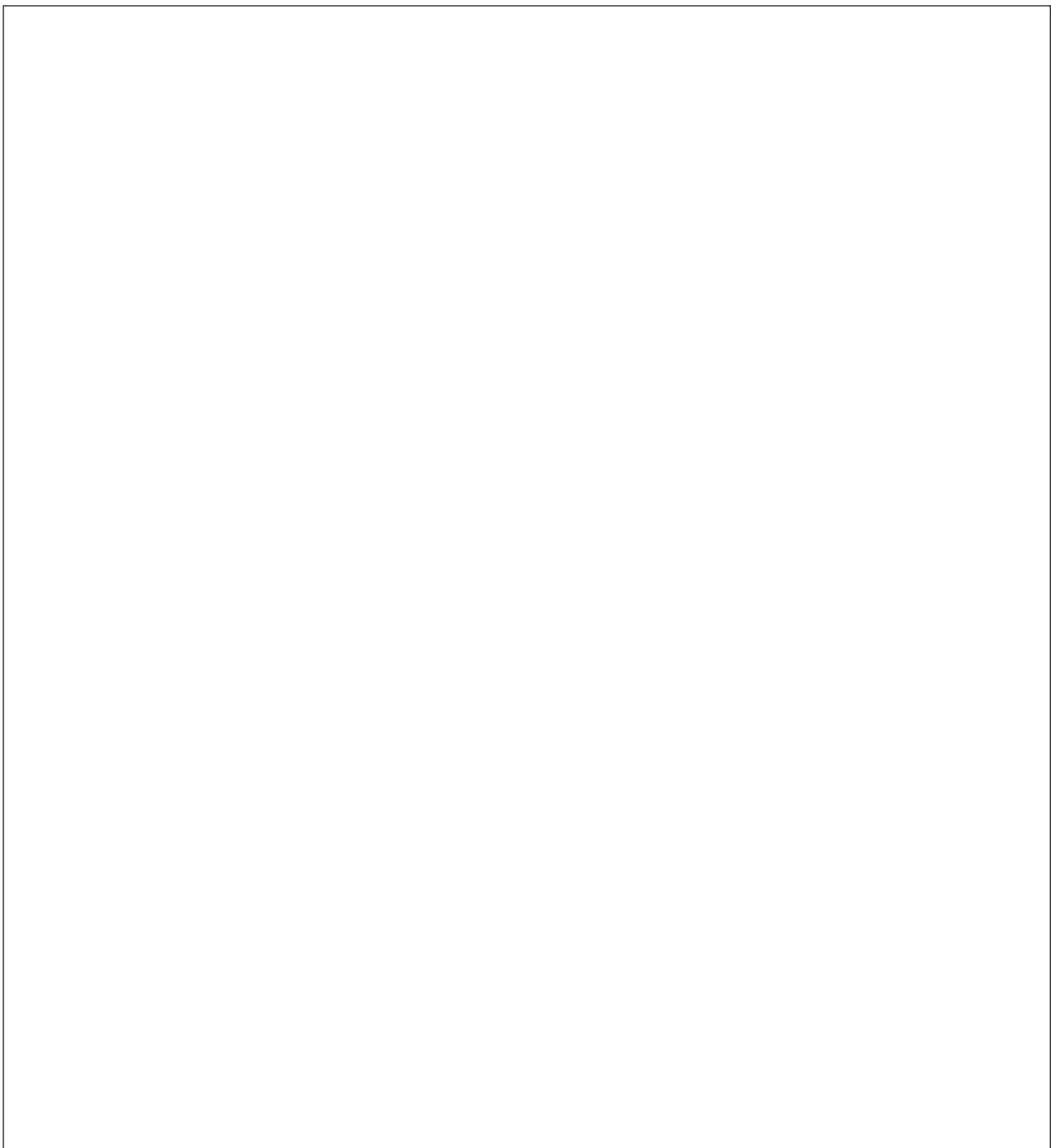


**Question 21****(18 marks)**

In the space provided, sketch the final project that you designed and manufactured this year. Identify the key features and, with the use of annotation, justify the choices for:

- materials
- manufacturing techniques used
- joining methods
- finish
- historical, social and cultural sources of design inspiration
- client/end user needs
- design features/decoration.

Sketching (4 marks)  
Annotation (14 marks)



See next page













## ACKNOWLEDGEMENTS

### Question 3

#### Image 1

Dyson. (2016). *Dyson DC34 handheld*. Retrieved June, 2016, from [www.amazon.com/Dyson-DC34-Handheld/dp/B006WS39NE](http://www.amazon.com/Dyson-DC34-Handheld/dp/B006WS39NE) (top image)

#### Image 2

Newhealthguide. (2016). *Best toys for 9-12-month-olds* (2. Shape sorters). Retrieved June, 2016, from [www.newhealthguide.org/Best-Toys-For-9-Month-Old.html](http://www.newhealthguide.org/Best-Toys-For-9-Month-Old.html)

### Question 5

#### Sculpture

Poole, C., & Wooldridge, J. (2014). *Whale tail*.

#### Image

Shire of Esperance. (2014). Masterpiece: The whale tail is the centrepiece of the James Street precinct. In M. Baxter. (2014, May 20). Poll: Esperance whale tail creates waves. *Esperance Express*. Retrieved June, 2016, from [www.esperanceexpress.com.au/story/2293624/poll-esperance-whale-tail-creates-waves/](http://www.esperanceexpress.com.au/story/2293624/poll-esperance-whale-tail-creates-waves/)

### Question 10

Image adapted from: DeWalt. (2016). *Advanced DeWalt D26203 1/4in 8mm plunge routers variable speed \*\**. Retrieved June, 2016, from [www.amazon.co.uk/Advanced-DeWalt-D26203-Routers-Variable/dp/B00I9FG9TE](http://www.amazon.co.uk/Advanced-DeWalt-D26203-Routers-Variable/dp/B00I9FG9TE)

### Question 15

Image adapted from: Ozito. (2016). *Ozito 850W 100mm angle grinder*. Retrieved June, 2016, from [www.bunnings.com.au/ozito-850w-100mm-angle-grinder\\_p6290244](http://www.bunnings.com.au/ozito-850w-100mm-angle-grinder_p6290244)

### Question 20

Image adapted from: JMB. (2016). *JMB overlock sewing machine*. Retrieved June, 2016, from [www.amazon.co.uk/JMB-JMSM1020-OVERLOCK-SEWING-MACHINE/dp/B00AQMZU8E](http://www.amazon.co.uk/JMB-JMSM1020-OVERLOCK-SEWING-MACHINE/dp/B00AQMZU8E)

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