

z



**Surname** \_\_\_\_\_

**Other Names** \_\_\_\_\_

**Centre Number** \_\_\_\_\_

**Candidate Number** \_\_\_\_\_

**Candidate Signature** \_\_\_\_\_

**I declare this is my own work.**

**GCSE**

**DESIGN AND TECHNOLOGY**

**Unit 1 Written Paper**

**8552/W**

**Friday 22 May 2020**

**Afternoon**

**Time allowed: 2 hours**

**At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.**

**[Turn over]**



JUN 20 8 5 5 2 W 0 1

**For this paper you must have:**

- normal writing and drawing instruments
- a calculator
- a protractor.

## **INSTRUCTIONS**

- Use black ink or black ball-point pen. Use pencils only for drawing.
- Answer ALL questions.
- You must answer the questions in the spaces provided. Do not write on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.



## **INFORMATION**

- **All dimensions are in millimetres.**
- **The marks for questions are shown in brackets.**
- **The maximum mark for this paper is 100.**
- **There are 20 marks for Section A, 30 marks for Section B and 50 marks for Section C.**

**DO NOT TURN OVER UNTIL TOLD TO DO SO**



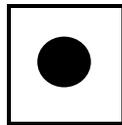
**SECTION A – Core technical principles**

**Answer ALL questions in this section.**

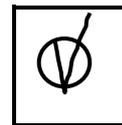
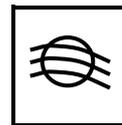
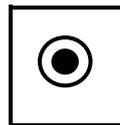
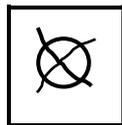
**Each of Questions 01 to 10 is followed by four responses, A, B, C and D.**

**For each question completely fill in the circle alongside the appropriate answer.**

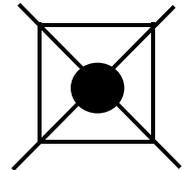
**CORRECT METHOD**



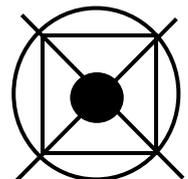
**WRONG METHODS**



**If you want to change your answer you must cross out your original answer as shown.**



**If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown.**



**0 1**

Which type of renewable energy is sourced from plants? [1 mark]

**A Biomass**

**B Solar**

**C Tidal**

**D Wind**

**[Turn over]**



**0 2**

**Planned obsolescence is when a product is designed [1 mark]**

**A to be repairable.**

**B to have a short lifespan.**

**C to have replaceable sections.**

**D to take upgrades.**



**03** What is the electrical component shown in FIGURE 1 used for? [1 mark]

**FIGURE 1**



**A To detect pressure levels**

**B To detect temperature levels**

**C To switch equipment on or off**

**D To switch the direction of a motor**

**[Turn over]**



**0 4**

**Identify the smart material used to darken windows in bright sunlight. [1 mark]**

**A Aluminium foam**

**B Photochromic pigment**

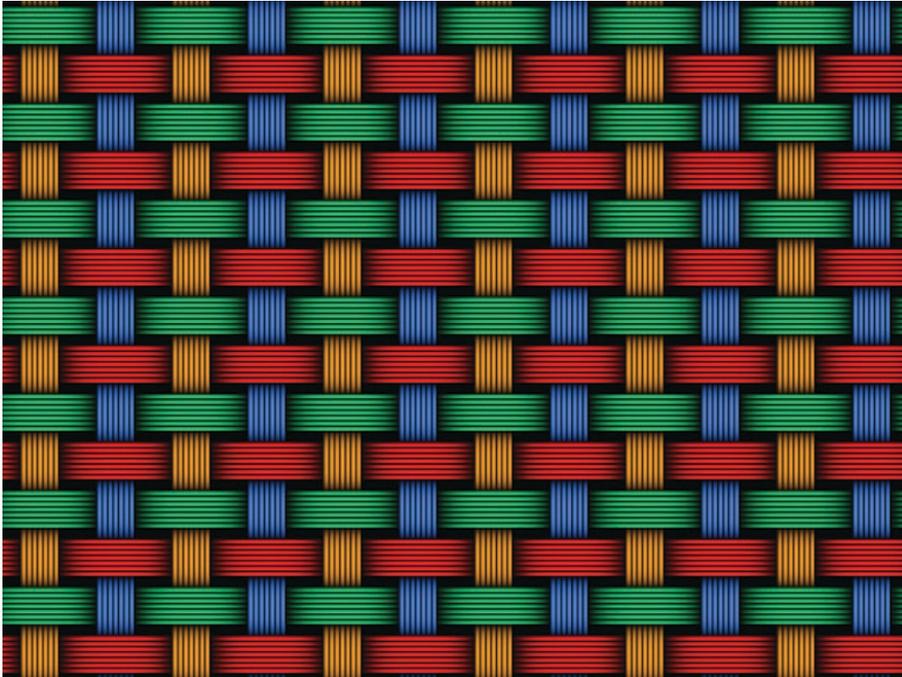
**C Shape memory alloy**

**D Thermochromic pigment**



**0 5** Identify the textile fabric shown in FIGURE 2.  
[1 mark]

**FIGURE 2**



**A Bonded fabric**

**B Felted fabric**

**C Knitted fabric**

**D Woven fabric**

**[Turn over]**



**06**

**'Technology push' describes when products are developed [1 mark]**

**A due to improvements in new materials.**

**B due to increased consumer demand.**

**C in response to consumer feedback.**

**D with the user in mind.**



**07**

Which **ONE** of the following statements about industry is true? [1 mark]

**A** An increased use of robotics has led to a reduction in manual jobs.

**B** An increased use of robotics means more people need to be employed.

**C** The latest production lines require more people who can use hand tools skilfully.

**D** The use of **CAD** and **CAM** in industry has led to less efficiency.

**[Turn over]**



**0 8**

Which of the following is part of a kinetic pumped storage system? [1 mark]

**A Alkaline battery**

**B Oil field**

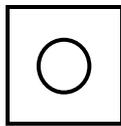
**C Photovoltaic cell**

**D Turbine**

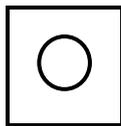


**09** Name the identified component shown in **FIGURE 3**. [1 mark]

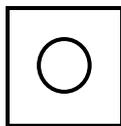
**FIGURE 3**



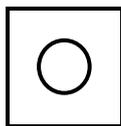
**A Cam**



**B Gear**



**C Lever**



**D Pulley**

**[Turn over]**



**1 0**

**A ductile material is commonly described as one that [1 mark]**

**A can be drawn into a long length.**

**B does not scratch easily.**

**C resists corrosion and oxidation.**

**D shatters under a sudden impact.**

**1 1****. 1**

**Name ONE alloy. [1 mark]**

---

---





**1 2 . 1** Composite materials such as foil and polymer lined boards are used in food and drink packaging.



**Give ONE advantage and ONE disadvantage of using composite materials for packaging.  
[2 marks]**

**Advantage** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Disadvantage** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**[Turn over]**



- 1 2 . 2** TABLE 1 shows the number of food and drink containers successfully recycled by a manufacturer in 2010 and 2017.

**TABLE 1**

<b>Recycling of composite food and drink containers</b>	
<b>2010</b>	<b>2017</b>
<b>32 billion tonnes</b>	<b>46 billion tonnes</b>

**What is the percentage increase in recycling of composite food and drink containers between 2010 and 2017? [2 marks]**

---

---

---

---

---

---

---

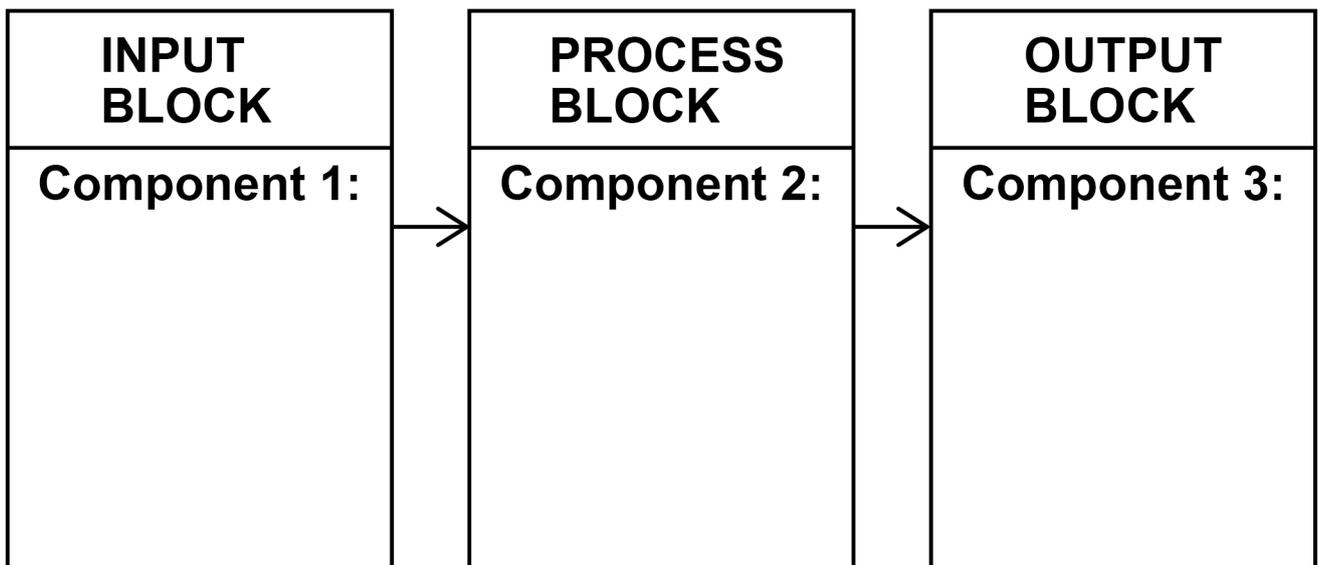
---

**Answer** \_\_\_\_\_



**1 3****FIGURE 4 shows a system diagram for an alarm.**

**Complete the diagram by naming ONE component that could be used in EACH block.  
[3 marks]**

**FIGURE 4****[Turn over]****20**

**SECTION B – Specialist technical principles**

**Answer ALL questions in this section.**

**1 | 4**

**Name ONE specific commercial manufacturing process and describe what it is used for.**

**Name of process** \_\_\_\_\_

\_\_\_\_\_

**Using notes and/or sketches describe the process you have named above. [4 marks]**



1 5

**Explain why EACH factor below would need to be considered by a manufacturer when sourcing materials/components. [2 x 2 marks]**

**Bulk buying**

---

---

---

---

---

---

---

---

**Ethical factors**

---

---

---

---

---

---

---

---

**[Turn over]**



16.1

The products/components shown below are manufactured from different materials.



**Metal can opener**



**Card shoe box**



**Textile shopping bag with logo**



**Wooden toy**



**Polymer gears**



**Choose ONE product/component and complete TABLE 2. [3 marks]**

**My chosen product/component is \_\_\_\_\_**

**TABLE 2**

<b>Specific main material</b>	<b>Stock form used in manufacture</b>	<b>Appropriate finishing technique</b>

**[Turn over]**



16.2

A number of calendars are being made.

Given the sizes provided in FIGURE 5 and FIGURE 6, how many calendar pages can be made from ONE sheet? [2 marks]

FIGURE 5

1187 mm



841 mm

FIGURE 6

280 mm



210 mm

The diagrams are not drawn to scale.



---

---

---

---

---

---

**Answer** \_\_\_\_\_

**[Turn over]**



**BLANK PAGE**



16.3

What percentage of material is waste after cutting the pages calculated in Question 16.2?

Show your working and give your answer to TWO decimal places.  
[3 marks]

---

---

---

---

---

---

---

---

---

Answer

[Turn over]







---

---

---

---

---

---

---

---

---

---







---

---

---

---

---

---

---

[Turn over]

30



**SECTION C – Designing and making principles**

Answer ALL questions in this section.

**19** TABLE 3

<b>Alessi</b>	<b>Apple</b>	<b>Braun</b>	<b>Dyson</b>
<b>Gap</b>	<b>Primark</b>	<b>Under Armour</b>	<b>Zara</b>

Choose ONE of the companies from TABLE 3.

Outline the design features and/or manufacturing techniques that have made your chosen company successful.

You should refer to specific products in your answer. [6 marks]

My chosen company is \_\_\_\_\_

---

---

---

---

---

---

---





**20** FIGURE 7 shows THREE different kettles.

**FIGURE 7**



**Cast iron stove kettle**



**Polymer electric kettle**



**Whistling kettle**

**Analyse and evaluate the kettles in terms of the THREE features identified below.**

**You should not use an analysis or evaluation point more than ONCE.**













- 2** **2** . **1** A designer has been asked to design a prototype toy suitable for use by a child between 3 and 5 years of age. They are using the data in TABLE 4.

Complete the TWO missing values in TABLE 4 for popularity votes. [1 mark]

**TABLE 4**

Type of toy	Popularity votes	Popularity votes as a percentage
Role play	65	26%
Construction	40	16%
Letters and numbers		34%
Jigsaws and puzzles	25	10%
Soft toys		14%
Total	250	100%

---



---



---



---



---



---

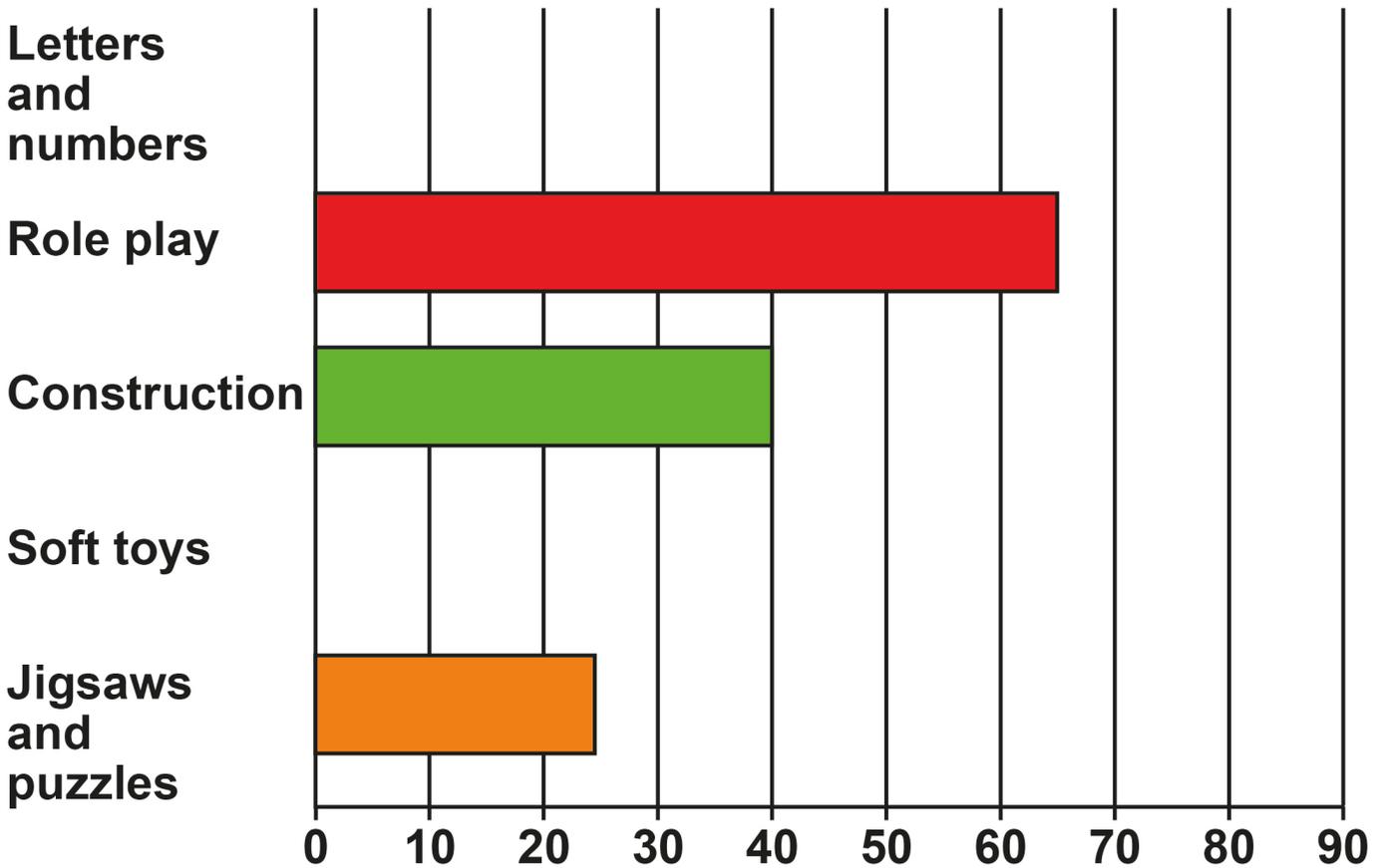


---

---

---

**22.2** Use your values from Question 22.1 to complete the bar chart and label the x axis. [3 marks]



[Turn over]



2	3
---	---

**Give FIVE detailed specification points to help with the designing of a toy for use by a child between 3 and 5 years of age. [5 marks]**

**1**

---

---

---

**2**

---

---

---

**3**

---

---

---

**4**

---

---

---



5

---

---

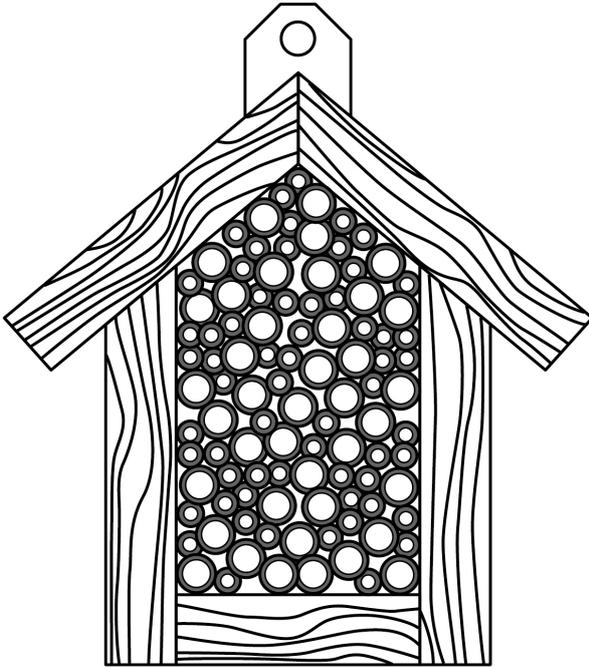
---

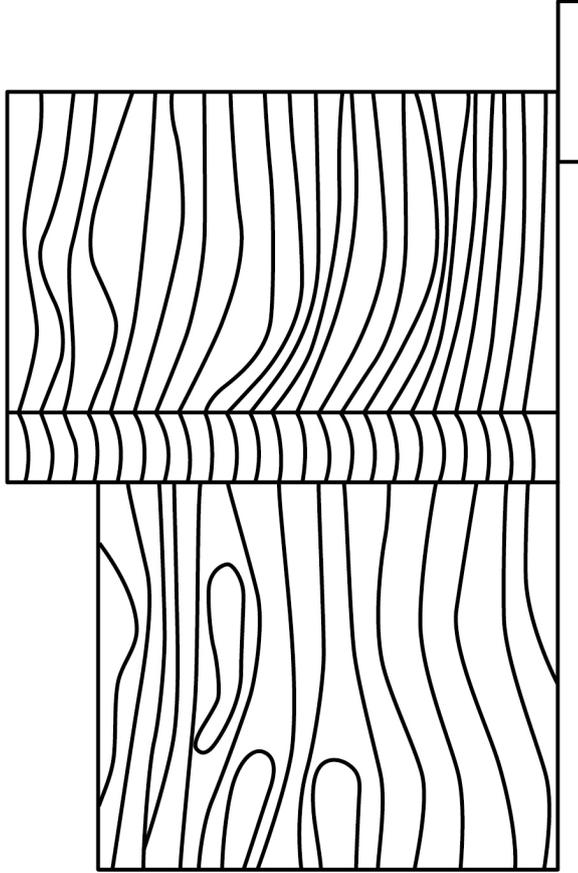
[Turn over]



**2 4** FIGURES 8 and 9 show a front and side view of a bug box used to encourage insects to visit a garden.

**FIGURE 8**



**FIGURE 9**

**The front and side views are drawn  
in third angle projection  
Hidden detail has not been included**

**[Turn over]**



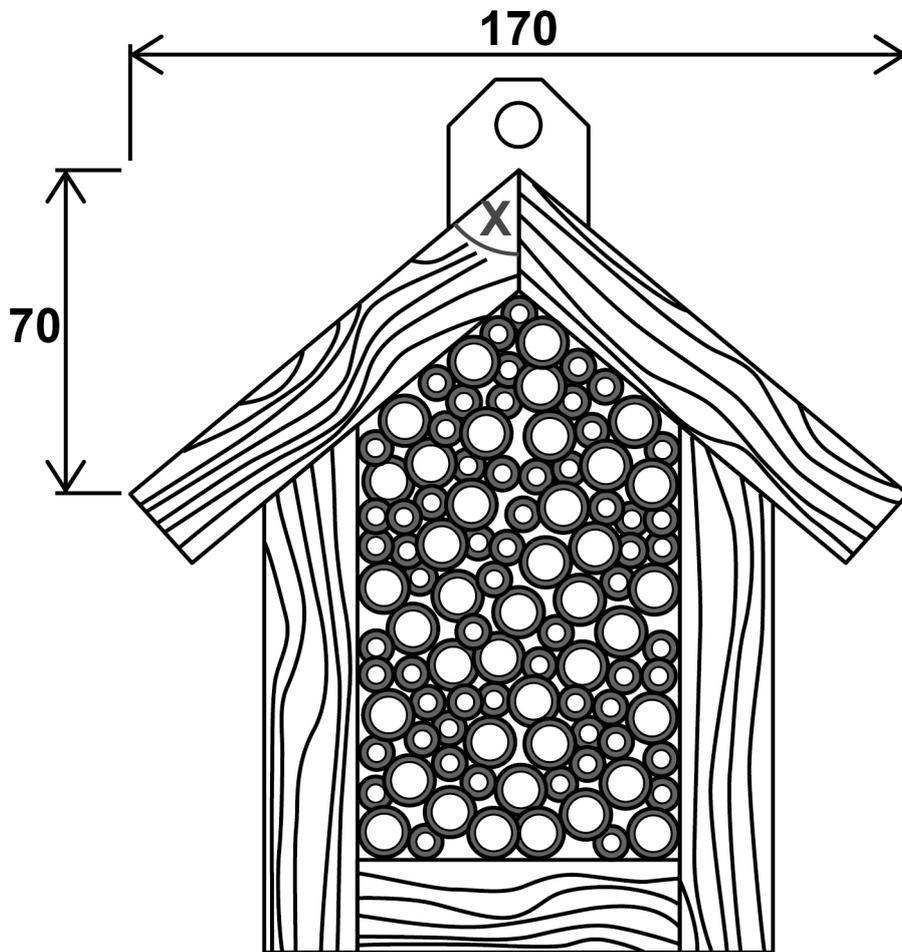
**BLANK PAGE**



**24.1** Complete a two-point perspective drawing of the bug box in the space provided below.  
**[4 marks]**

**[Turn over]**



**2 4 . 2** FIGURE 10

**All dimensions are in millimetres  
Not drawn to scale**



Calculate the size of angle X in FIGURE 10 to the nearest whole degree to ensure an accurate fit of the two roof pieces.

Show your working/construction. [4 marks]

Answer \_\_\_\_\_

[Turn over]







2 | 6

**Describe how material can be formed when making a prototype. [3 marks]**

---

---

---

---

---

---

---

---

---

---

---

**END OF QUESTIONS**

50









**BLANK PAGE**

For Examiner's Use	
Section	Mark
A	
B	
C	
<b>TOTAL</b>	

**Copyright information**

For confidentiality purposes, all acknowledgements of third-party copyright material are published in a separate booklet. This booklet is published after each live examination series and is available for free download from [www.aqa.org.uk](http://www.aqa.org.uk).

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team.

Copyright © 2020 AQA and its licensors. All rights reserved.

**IB/M/CH/Jun20/8552/W/E4**