



Rewarding Learning

General Certificate of Secondary Education
2016–2017

Centre Number

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Candidate Number

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Science: Single Award

Unit 2 (Chemistry)
Foundation Tier



[GSS21]

THURSDAY 23 FEBRUARY 2017, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.
Answer **all ten** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

Quality of written communication will be assessed in Question **9(b)**.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

A Data Leaflet, which includes a Periodic Table of the Elements, is included for your use.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total Marks	

- 1 Materials that come from living things are described as natural. Other materials are described as man-made.

(a) Place the following materials in the correct column of the table below.

polythene

wool

cotton

silk

Natural	Man-made

[2]

Most modern buckets are made from plastic rather than metal.



© mbongorus / iStock / Thinkstock

- (b) Suggest **two** reasons why plastic is better than metal for making buckets.

1. _____

2. _____ [2]

2 A photograph of a fossil is shown below.



© Dorling Kindersley / UIG / Science Photo Library

(a) What is a fossil?

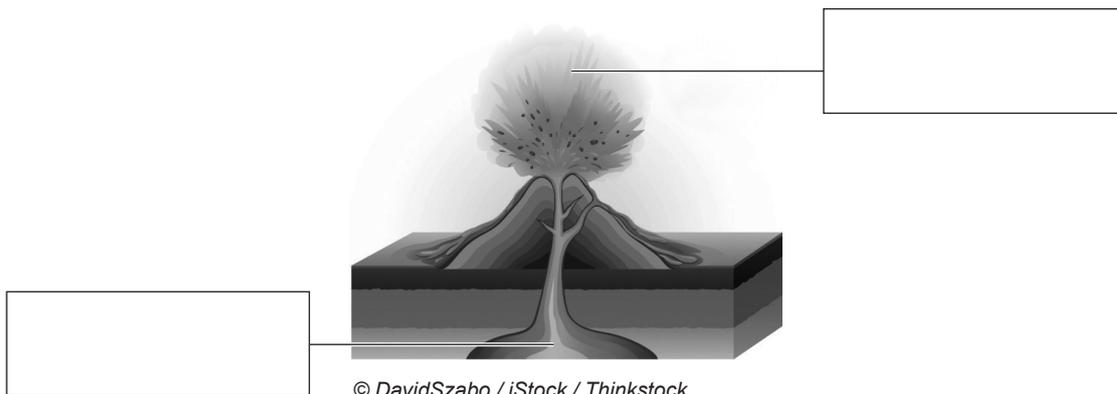
_____ [2]

(b) Complete the sentences below about different rock types.

Volcanic eruptions produce a type of rock called _____.

One example of a sedimentary rock is _____ [2]

(c) The diagram below shows a volcanic eruption.



© DavidSzabo / iStock / Thinkstock

Label the parts of the volcano shown above.

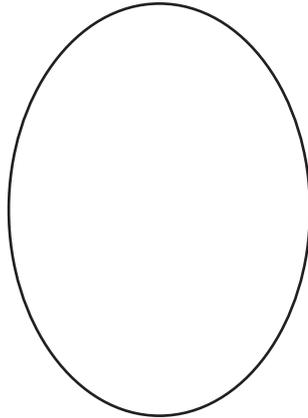
Choose from:

magma : **lava** : **dust and ash** : **crust** [2]

Examiner Only	
Marks	Remark

3 Scientists can take fingerprints from crime scenes.

(a) (i) In the space below draw the pattern of a **whorl** fingerprint.



[1]

(ii) Apart from a whorl, name one **other** type of fingerprint.

_____ [1]

(b) Given below are the steps a scientist might use to take a fingerprint from a white surface at a crime scene. They are **not** in the correct order.

1. brush off excess powder
2. sprinkle carbon black powder onto the surface
3. transfer the print onto card
4. lift the print with clear tape

(i) Put the steps (1, 2, 3, and 4) in the correct order.

_____ [2]

(ii) Suggest one reason why aluminium powder is **not** used on a white surface.

 _____ [1]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

4 Household substances can have a range of pH values.

(a) Complete the table below.

Household substance	pH	Colour with Universal Indicator	Type of solution
oven cleaner	13		strong alkali
lemon juice		yellow	weak acid
baking soda	8	green/blue	

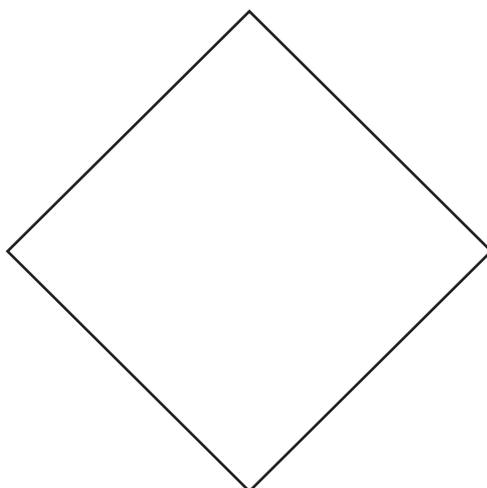
[3]

(b) Most aerosols such as deodorants and air fresheners are flammable.



© Cristina Pedrazzini / Science Photo Library

In the space below draw the hazard symbol you would expect to find on a flammable aerosol.



[1]

Examiner Only	
Marks	Remark

(c) A wasp sting is alkaline. Shown below are three statements made by pupils in a class discussion about treating a wasp sting.



© KiroM / iStock / Thinkstock

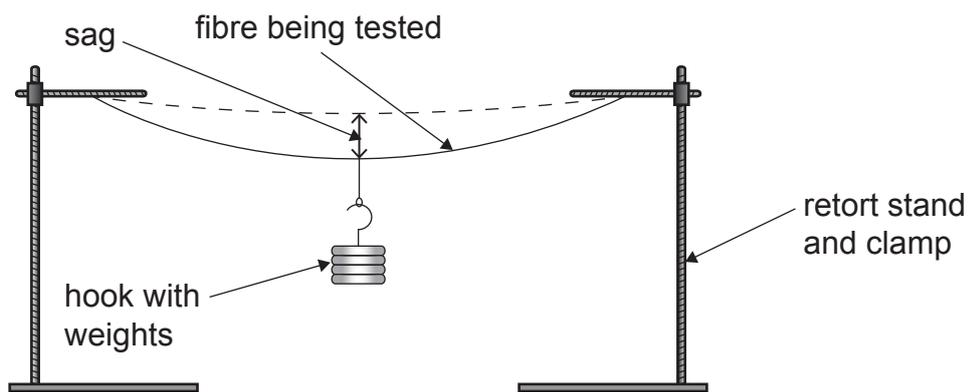
Name the pupil who gave the best answer. Explain fully your choice.

[3]

Examiner Only

Marks Remark

- 5 The apparatus shown below was used to test the flexibility of four different fibres.



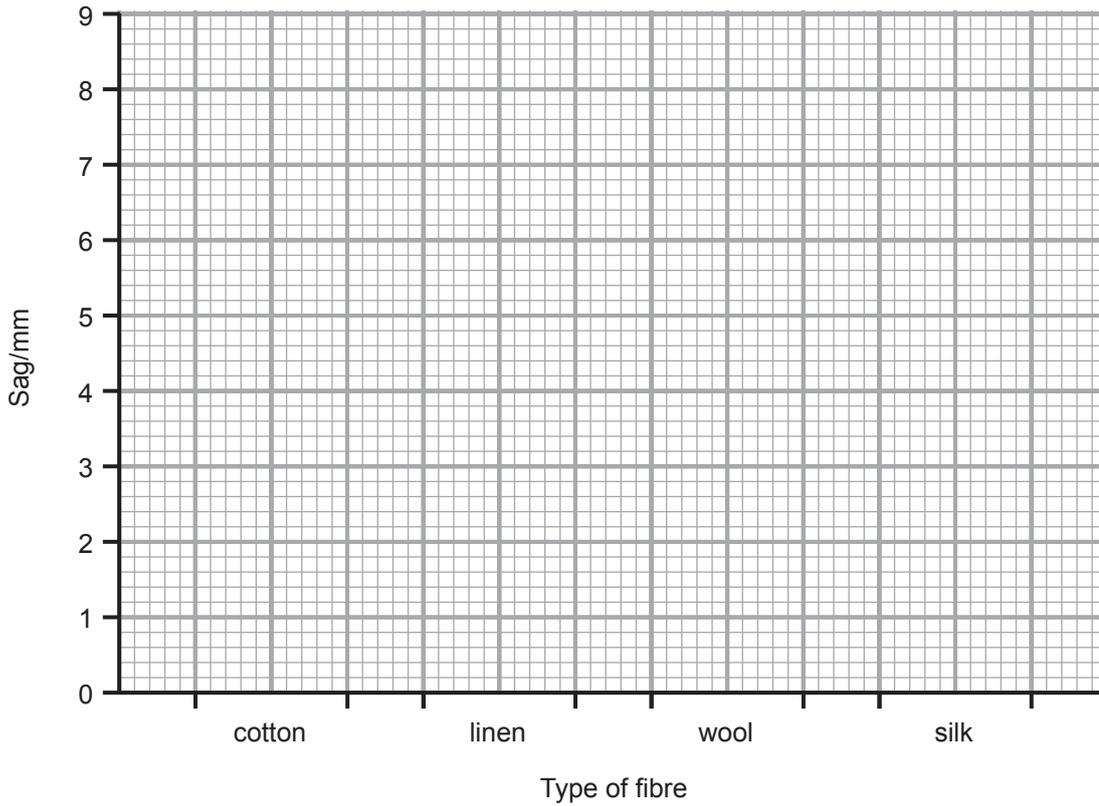
Source: Principal Examiner

When the weights were added the amount the fibre sagged was measured. The results are shown below.

Type of fibre	Sag/mm
cotton	7.0
linen	2.0
wool	8.5
silk	5.2

Examiner Only	
Marks	Remark

(a) (i) On the grid below, draw a **bar chart** for these results.



[2]

(ii) Which fibre is the most flexible?

_____ [1]

(b) State **one** thing that should have been done to make this a fair test.

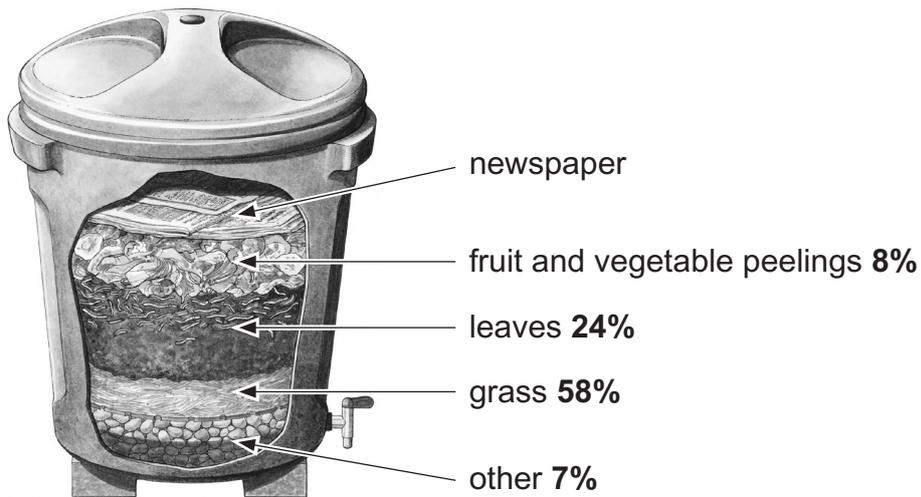
 _____ [1]

(c) State **one** thing that should have been done to make the results reliable.

_____ [1]

Examiner Only	
Marks	Remark

- 6 Below is some information about the percentage of different types of waste in a compost bin.



© Dorling Kindersley / Thinkstock

- (a) Calculate the percentage of newspaper in the compost bin.

_____ % [1]

- (b) All the waste in a compost bin is biodegradable. What is meant by the term **biodegradable**?

 _____ [2]

- (c) Suggest **one** reason why the percentage of grass added to the compost bin decreases in winter.

 _____ [1]

- (d) Aluminium is a material that can be recycled. Give **two** reasons why it is important to recycle aluminium.

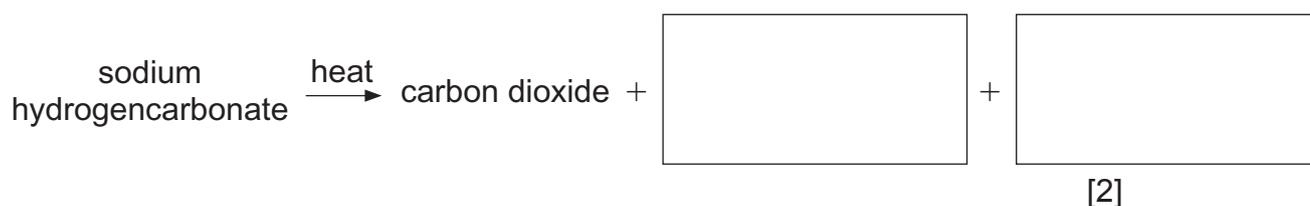
1. _____
 2. _____ [2]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

7 (a) Carbon dioxide is produced when sodium hydrogencarbonate is heated.

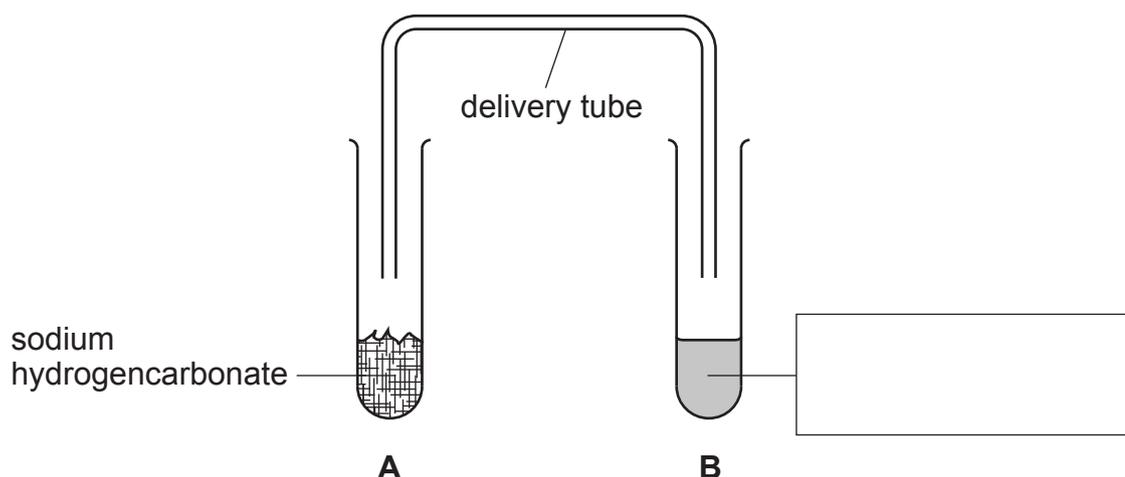
(i) Complete the word equation for this reaction.



(ii) What name is given to this **type** of reaction?

_____ [1]

(b) A student wanted to use the apparatus shown below to make and test for carbon dioxide. However, it did not work as it was not correctly set up.



Source: Principal Examiner

(i) On the diagram above, name the chemical in test tube **B**, that is used to test for carbon dioxide. [1]

(ii) Describe one mistake in the set-up of test tube **A** and one mistake in the set-up of test tube **B**.

Test tube **A** _____ [1]

Test tube **B** _____ [1]

Examiner Only	
Marks	Remark

(c) Baking powder contains sodium hydrogencarbonate and is used in making cakes.

(i) Name the chemical added to sodium hydrogencarbonate to make baking powder.

_____ [1]

(ii) State **one** reason why baking powder is used in making cakes.

_____ [1]

Examiner Only

Marks Remark

8 The table below gives some properties of five materials.

material	relative heaviness	relative strength	relative stiffness	relative cost
steel	7800	10	105	low
Kevlar	1400	30	70	high
graphene	1000	2000	5	very high
glass reinforced plastic	1900	15	10	medium
wood	5000	5	40	low

Using **only** the information in the table, answer the questions below.

- (a) Traditionally, canoe bodies were made from wood. However, modern canoes can be made from Kevlar.



© Jim West / Science Photo Library

State the main advantage and the main disadvantage of using Kevlar.

Advantage _____

Disadvantage _____ [2]

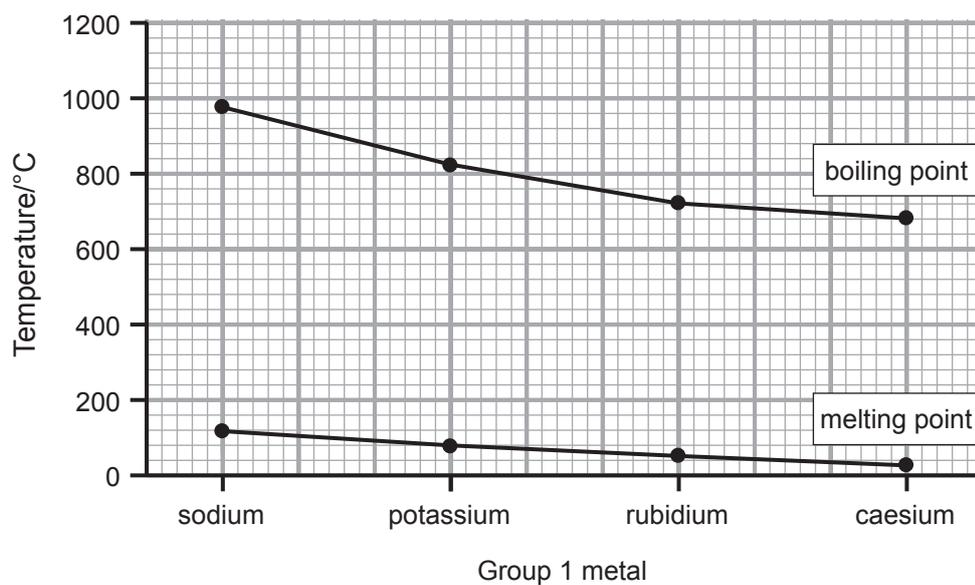
- (b) The first tennis rackets were made from wood. However, scientists are now investigating the use of graphene instead of wood. Describe fully how graphene tennis rackets will be different from wooden rackets when used.

 _____ [2]

Examiner Only

Marks Remark

- 10 The graph below shows the melting and boiling points of some Group 1 metals.



You may find your Data Leaflet helpful.

- (a) Give **one** similarity and **one** difference between the trends in melting points and boiling points of the metals in Group 1.

Similarity _____

_____ [1]

Difference _____

_____ [1]

- (b) What name is given to the metals in Group 1 of the Periodic Table?

_____ [1]

Examiner Only	
Marks	Remark

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SYMBOLS OF SELECTED IONS

Positive ions

Name	Symbol
Ammonium	NH_4^+
Chromium(III)	Cr^{3+}
Copper(II)	Cu^{2+}
Iron(II)	Fe^{2+}
Iron(III)	Fe^{3+}
Lead(II)	Pb^{2+}
Silver	Ag^+
Zinc	Zn^{2+}

Negative ions

Name	Symbol
Carbonate	CO_3^{2-}
Dichromate	$\text{Cr}_2\text{O}_7^{2-}$
Ethanoate	CH_3COO^-
Hydrogen carbonate	HCO_3^-
Hydroxide	OH^-
Methanoate	HCOO^-
Nitrate	NO_3^-
Sulfate	SO_4^{2-}
Sulfite	SO_3^{2-}

DATA LEAFLET

For the use of candidates taking
 Science: Chemistry,
 Science: Double Award
 or Science: Single Award

Copies must be free from notes or additions of any kind. No other type of data booklet or information sheet is authorised for use in the examinations.

SOLUBILITY IN COLD WATER OF COMMON SALTS, HYDROXIDES AND OXIDES

Soluble
All sodium, potassium and ammonium salts
All nitrates
Most chlorides, bromides and iodides EXCEPT silver and lead chlorides, bromides and iodides
Most sulfates EXCEPT lead and barium sulfates Calcium sulfate is slightly soluble

Insoluble
Most carbonates EXCEPT sodium, potassium and ammonium carbonates
Most hydroxides EXCEPT sodium, potassium and ammonium hydroxides
Most oxides EXCEPT sodium, potassium and calcium oxides which react with water

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