



General Certificate of Secondary Education  
2010–2011

Centre Number

71

Candidate Number

**Science: Single Award (Modular)**  
Chemical Patterns and our Environment  
Module 3

Foundation Tier

[GSC31]



THURSDAY 19 MAY 2011, MORNING

**TIME**

45 minutes.

**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 seven** questions.

**INFORMATION FOR CANDIDATES**

The total mark for this paper is 45.

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

A Data Leaflet is provided for use with this paper.

For Examiner's  
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	

Total  
Marks

- 1 (a) Common household substances contain chemicals. Use lines to link each household substance to the chemical it contains.

### Household substance



Lemon Juice

© Linda Stradley

<http://whatscookinginamerica.net>



Oven cleaner

© iStockphoto / Thinkstock



Milk of Magnesia

© Charles D. Winters / Science Photo Library

### Name of chemical

magnesium hydroxide

sodium hydroxide

ethanoic acid

citric acid

Examiner Only

Marks Remark

- (b) The symbols below can be seen on bottles of chemicals in the laboratory.



A



B



C



D

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- (i) What are these symbols called?

**Circle** the correct answer.

chemical symbols : danger symbols : hazard symbols [1]

- (ii) What danger is shown by **symbol A**?

\_\_\_\_\_ [1]

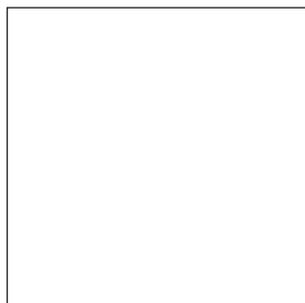
- (iii) Which symbol, **A**, **B**, **C** or **D** should be seen on a chemical that is explosive?

\_\_\_\_\_ [1]

- (c) Give **one** reason why these symbols are used on bottles of chemicals.

\_\_\_\_\_  
 \_\_\_\_\_ [1]

- (d) In the box below draw the symbol for a substance which is an irritant.



[1]

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Marks Remark

2 Some sweets contain sherbet.



© Tangerine Confectionery Ltd

Complete the following sentences.

Choose from:

**salt : citric acid : oxygen : hot**

**fizzing : carbon dioxide : hydrogen : icing sugar**

When sherbet is made, baking soda, \_\_\_\_\_ and \_\_\_\_\_ are mixed together.

When the sherbet mixes with moisture in the mouth, it produces a gas called \_\_\_\_\_.

This gas gives a pleasant \_\_\_\_\_ sensation in the mouth.

[4]

Examiner Only	
Marks	Remark

3 The diagram below shows the position of electrons, protons and neutrons in an atom.

(a) Complete the diagram by drawing lines from the names to label an electron, a proton and a neutron.

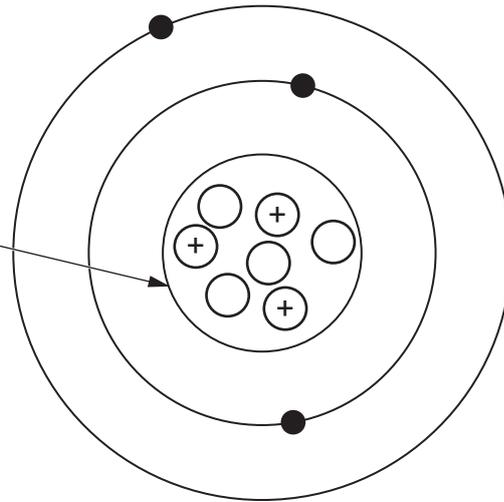
**Names**

proton

nucleus

neutron

electron



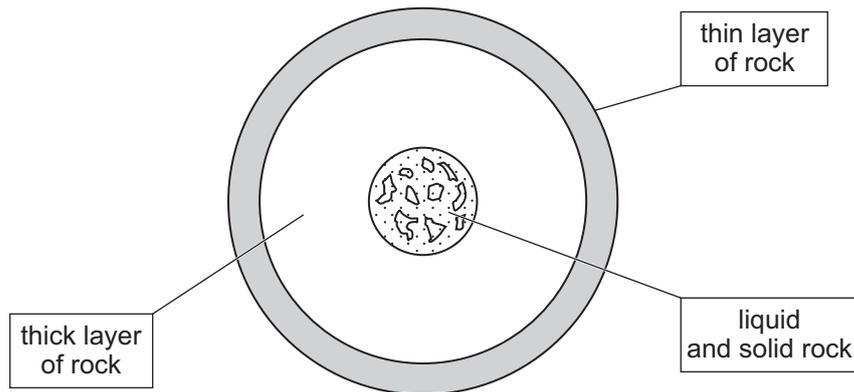
[3]

(b) Name the particle in the atom that has the smallest mass.

\_\_\_\_\_ [1]

Examiner Only	
Marks	Remark

4 The diagram below shows the structure of the Earth.



(a) Use the diagram to describe:

(i) the crust of the Earth.

\_\_\_\_\_ [1]

(ii) what the core is made from.

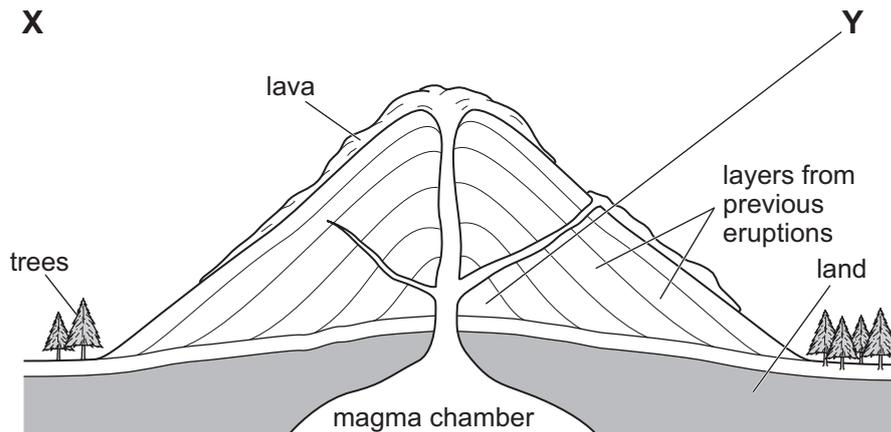
\_\_\_\_\_ [1]

(b) Complete the sentence below.

Radioactive decay produces \_\_\_\_\_ which causes rocks to melt. [1]

Examiner Only	
Marks	Remark

(c) The diagram shows a section through a volcano.



(i) Draw a line from **X** to any part of the volcano which is liquid. [1]

(ii) The label **Y** shows the first eruption of this volcano. Including the current eruption, how many eruptions have there been?

\_\_\_\_\_ [1]

(iii) Sometimes a volcano can cause a huge sea wave to form. What name is given to this type of wave?

\_\_\_\_\_ [1]

(d) A large volcano erupted in Iceland in May 2010. It caused problems for many people travelling by air. Draw a diagram, in the space below, to show what came out of the volcano causing the problem.

[1]

Examiner Only	
Marks	Remark

5 The table below gives five lists of elements.

A	B	C	D	E
lithium	beryllium	helium	sodium	fluorine
sodium	magnesium	neon	magnesium	chlorine
potassium	calcium	argon	aluminium	bromine

Use the information above and your Data Leaflet to answer the following questions.

(a) Which list, **A**, **B**, **C**, **D** or **E** contains alkali metals only?

\_\_\_\_\_ [1]

(b) Give the name of an element which would have similar properties to chlorine.

\_\_\_\_\_ [1]

(c) Which list, **A**, **B**, **C**, **D** or **E** contains chemically inert elements?

\_\_\_\_\_ [1]

(d) Give the symbol of an element belonging to the alkaline earth metals.

\_\_\_\_\_ [1]

(e) Which list, **A**, **B**, **C**, **D** or **E** does not represent a **Group** from the Periodic Table? Give a reason for your answer.

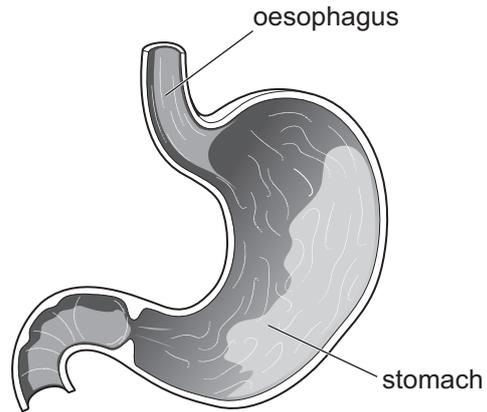
\_\_\_\_\_

\_\_\_\_\_ [2]

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Marks Remark

6 The diagram below shows the human stomach.



Sometimes too much acid collects in the stomach and this causes pain.

(a) What is the name of the condition caused by too much acid in the stomach?

\_\_\_\_\_ [1]

(b) One of the cures for this condition is to take baking soda. Describe how baking soda can help.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_ [2]

(c) Explain why sometimes people burp after they have taken baking soda to cure excess acid in the stomach.

\_\_\_\_\_  
 \_\_\_\_\_ [2]

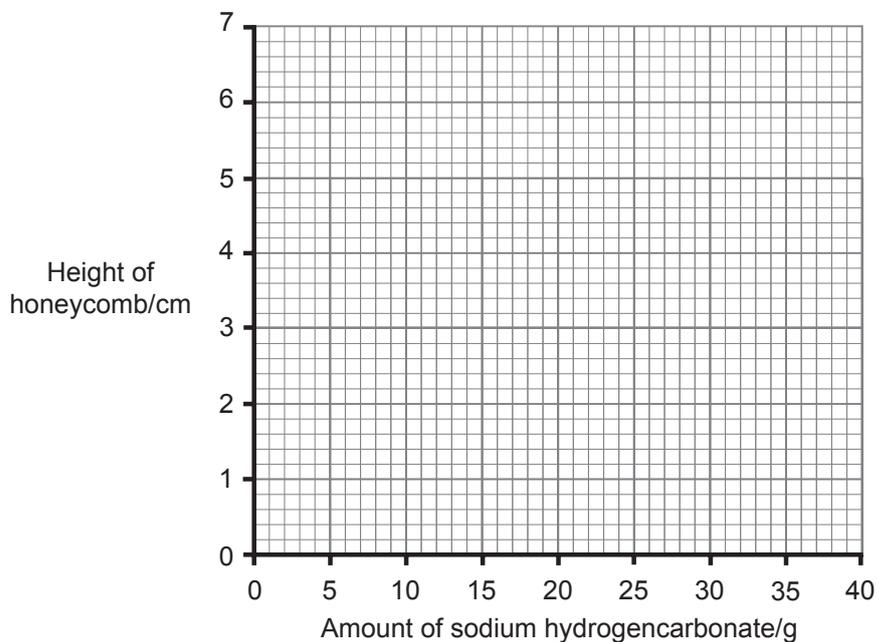
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Marks	Remark

- 7 John investigated how the amount of sodium hydrogencarbonate affects the height of honeycomb toffee. His results are shown below. One of his results is **not** correct.

Amount of sodium hydrogencarbonate/g	4	8	12	16	20	24	28	32	36
Height of honeycomb/cm	2.0	3.0	4.0	4.2	6.0	6.4	6.6	6.6	6.6

- (a) (i) Plot the points and draw a line graph on the grid below.

NB: When drawing the line take into account that **one** result is not correct.



[3]

- (ii) From the graph, predict what is the correct height for the anomalous result.

\_\_\_\_\_ cm [1]

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Marks	Remark

- (b) From the results describe how the amount of sodium hydrogencarbonate affects the height of the honeycomb.

\_\_\_\_\_ [2]  
\_\_\_\_\_

- (c) The teacher decided to make more honeycomb. What is the least amount of sodium hydrogencarbonate she should use to get the maximum height?

\_\_\_\_\_ g [1]

- (d) John asked if he could add a few drops of vinegar to the mixture to try and get an even greater height. Explain fully why adding vinegar could make a difference.

\_\_\_\_\_ [2]  
\_\_\_\_\_

- (e) Complete the word equation for the reaction of vinegar with sodium hydrogencarbonate.



[2]

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**THIS IS THE END OF THE QUESTION PAPER**

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Marks	Remark

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