

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	



General Certificate of Secondary Education
Foundation Tier
November 2012

Science B

SCB1FP R

Unit 1 My World

F

Written Paper

Monday 5 November 2012 9.00 am to 10.00 am

For this paper you must have:

- a ruler.
- You may use a calculator.

Time allowed

- 1 hour

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.
- Question 7(c) should be answered in continuous prose.
In this question you will be marked on your ability to:
 - use good English
 - organise information clearly
 - use specialist vocabulary where appropriate.

Advice

- In all calculations, show clearly how you work out your answer.



N 0 V 1 2 S C B 1 F P 0 1

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SCB1FP R

Answer **all** questions in the spaces provided.

1 To be able to make the best use of the materials our planet provides, scientists need to understand the chemical structure of the materials.

1 (a) Draw **one** line from each particle to the correct description of the particle.

Particle

Description

Electron

Has a negative
electrical charge

Proton

Has two atoms
mixed together

Molecule

Is found in the
nucleus of an atom

Has two or more
atoms bonded
together

(3 marks)



1 (b) Figure 1 shows the model of an atom.

Use the correct answers from the box to label Figure 1.

nucleus

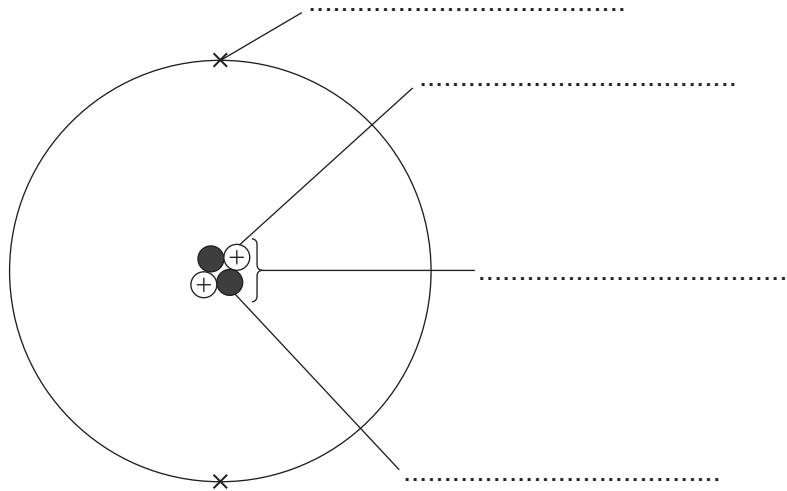
electron

ion

neutron

proton

Figure 1



(4 marks)

1 (c) Figure 2 gives information about an atom of sodium.

Figure 2

23
Na
11

1 (c) (i) What is the atomic number of sodium?

.....
(1 mark)

1 (c) (ii) What is the mass number of sodium?

.....
(1 mark)

1 (c) (iii) How many neutrons are there in a sodium atom?

.....
(1 mark)

10

Turn over ►



- 2 Many useful materials have to be dug from the ground.



- 2 (a) Which **one** of the metals in the list is always removed from the ground as a metal ore?

Draw a ring round the correct answer.

gold

iron

platinum

(1 mark)

- 2 (b) Lead is extracted from lead oxide by reacting it with carbon monoxide.

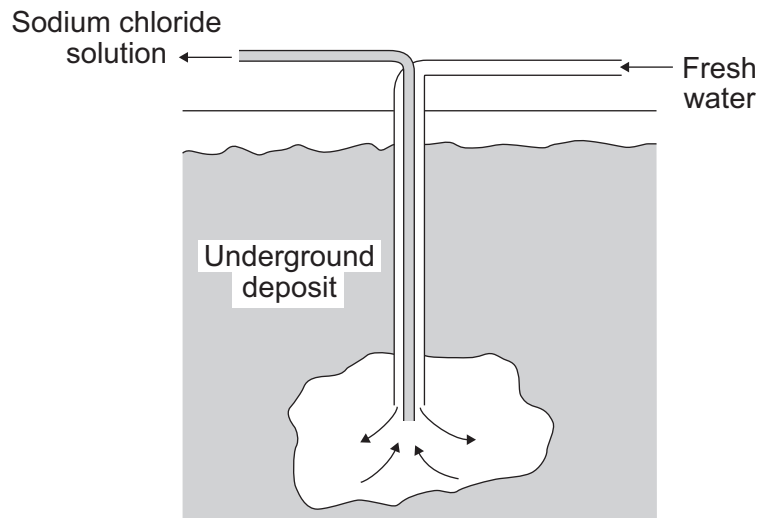
Complete the word equation for the reaction.

lead oxide + → +

(3 marks)



- 2 (c)** The diagram shows how pure salt crystals can be obtained from an underground deposit of rock salt.



Sentences **A**, **B**, **C**, **D** and **E** describe how pure salt crystals are obtained from an underground deposit of rock salt.

The sentences are **not** in the correct order.

- A** The water dissolves the salt.
- B** The water is allowed to evaporate.
- C** The solution is pumped to the surface.
- D** Water is pumped into the underground deposit.
- E** The solution is filtered.

Put sentences **A**, **B**, **C**, **D** and **E** in the correct order. The first one has been done for you.



(3 marks)

7

Turn over ►



3 Scientists use telescopes to study objects in space to help us understand more about the universe.

3 (a) Telescopes can detect visible light or other types of electromagnetic waves.

Give **two** types of electromagnetic wave, other than visible light, that telescopes can detect.

1

2

(2 marks)

3 (b) Scientists have built two new telescopes.

Telescope **A** is on the Earth's surface.

Telescope **B** is in space in orbit around the Earth.

Both telescopes detect visible light.

Telescope **B** gives the clearest image of an object in space. Suggest **two** reasons why.

1

.....

2

.....

(2 marks)

3 (c) When we look at distant stars, the light from the stars has changed because the stars are moving away from us.

What is the name of this effect? Draw a ring around the correct answer.

blue shift

red shift

black shift

(1 mark)

5



4 The biosphere is made up of all the living things on Earth. All living things on Earth require energy.

4 (a) (i) Complete the sentences about energy flow in the biosphere.

Energy enters the biosphere as

Energy leaves the biosphere as

(2 marks)

4 (a) (ii) Draw a ring around the correct answer in the box to complete the sentence.

Biomass is broken down to release energy by

- | |
|-----------------|
| excretion. |
| photosynthesis. |
| respiration. |

(1 mark)

4 (b) In the autumn, the leaves fall from trees onto the ground.



Over the next year the leaves decay.

The leaves decay more quickly in summer than in winter.

Give **one** reason why.

.....

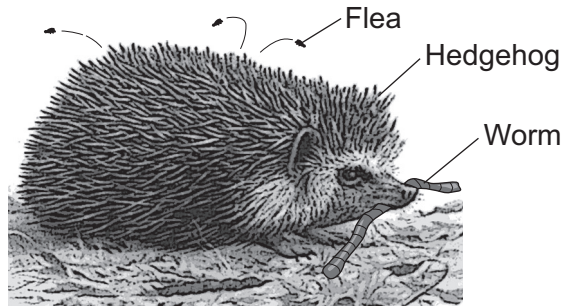
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(1 mark)

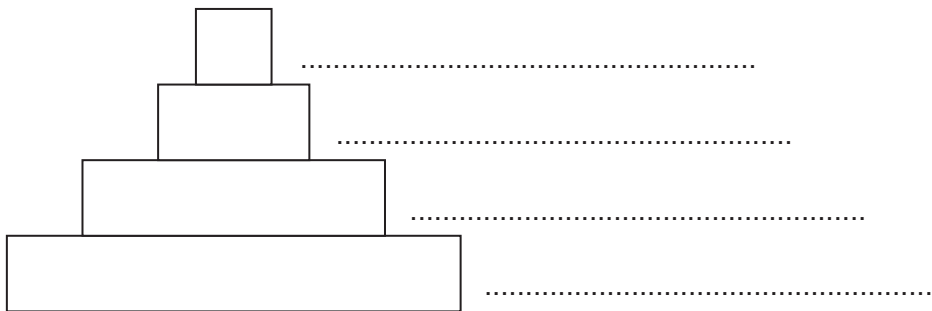
Turn over ►



4 (c) The worms in the forest eat leaves. The worms form part of a food chain. The picture shows some organisms in one food chain in the forest.



Use information from the picture to label the pyramid of biomass.



(1 mark)

4 (d) Some hedgehogs ate some worms. The worms contained 1255 kJ of energy. The hedgehogs used only 10% of this energy for growth.

4 (d) (i) Calculate how much of this energy the hedgehogs used for growth.

.....

.....

.....

Answer kJ
(2 marks)



4 (d) (ii) When a hedgehog eats a worm, some of the energy in the worm is **not** transferred to the hedgehog.

Give **one** reason why.

.....
.....

(1 mark)

4 (e) Carbon is also passed through the stages in a food chain.

The compounds in the list are found in living organisms. Which **two** compounds in the list contain carbon?

Tick (✓) **two** answers.

Fat

Protein

Stomach acid

Water

(2 marks)

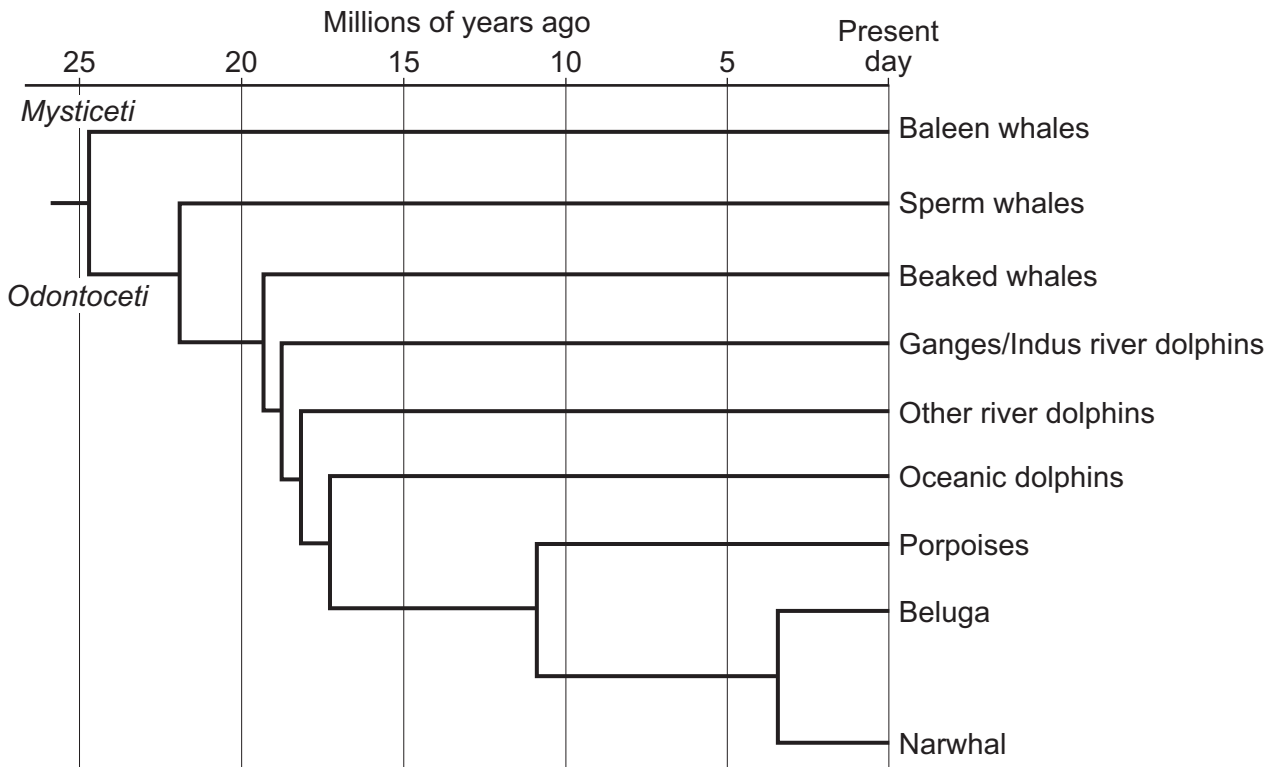
10

Turn over for the next question

Turn over ►



5 Cetacea is a group of mammals that includes whales, dolphins and porpoises. The diagram shows an evolutionary tree for Cetacea.



Use information in the diagram to help you answer the questions.

5 (a) Name **one** whale alive today that existed between 20 million and 25 million years ago.

.....
(1 mark)

5 (b) Name the **two** groups of Cetacea that evolved most recently.

.....
.....
(2 marks)

5 (c) Which group of *Odontoceti* alive today are the closest relatives of Oceanic dolphins?

.....
(1 mark)

4



Turn over for the next question

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ANSWER IN THE SPACES PROVIDED**

Turn over ►



6 Environmental scientists found the soil near a disused mine was contaminated with nickel.

They suggested that plants could be used to help remove the metal from the soil.

6 (a) What is the name of the process of using plants to remove metal from soil?

Use the correct answer from the box to complete the sentence.

plant mining	phytomining	quarrying
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Using plants to extract metals is called
(1 mark)

6 (b) Companies use plants to remove nickel from the soil near mines.

Suggest **two** reasons why.

1

.....

2

.....

(2 marks)



6 (c) The environmental scientists grew five different types of plant in soil from the disused mine.

The different types of plant all had the same average mass of roots.

The average mass of the stem and leaves was the same as the average mass of the roots.

The table shows the nickel concentration in different parts of the five types of plant, **A–E**, when the plants were harvested.

	Type of plant				
	A	B	C	D	E
Nickel concentration in the plant root when harvested in parts per million	231	247	623	1317	1708
Nickel concentration in the plant stem and leaf when harvested in parts per million	1470	1697	241	450	272

6 (c) (i) Which **two** types of plant would be the best ones to use for removing nickel from soil?

.....

 (2 marks)

6 (c) (ii) Which type of plant would be the easiest one to collect the largest amount of nickel from?

Give a reason for your answer.

Type of plant

Reason

.....
 (2 marks)

7

Turn over for the next question

Turn over ►



7 Plants produce hormones.

7 (a) One hormone controls plant growth.

Give the name of the hormone that controls plant growth.

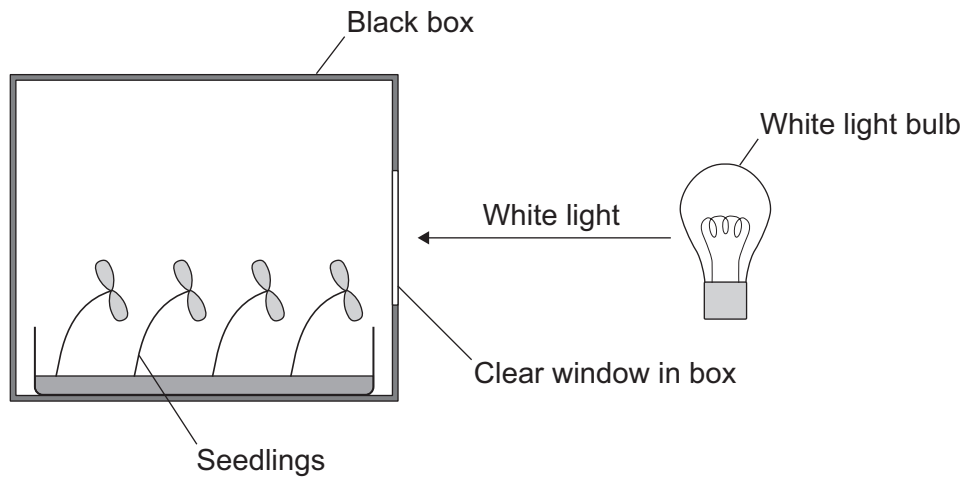
.....
(1 mark)

7 (b) Plant shoots grow towards the light. Name this growth response.

.....
(1 mark)

7 (c) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

A student grew some plants in white light and noted how they responded.



Suggest how you could do an experiment to find out if the plants have the same response to different colours of light.

You should include:

- the apparatus you would use
- the variables you would control
- what observations you would make.

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(6 marks)

8

Turn over for the next question

Turn over ►



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8 (a) The structure of the Earth has three parts. The outer part is the crust.

Name the other **two** parts of the Earth.

.....
.....

(1 mark)

8 (b) (i) The Earth's crust is broken into pieces.

Give the name of the pieces of the Earth's crust.

.....

(1 mark)

8 (b) (ii) The pieces of the Earth's crust move.

The theory that describes the movement of the pieces of the Earth's crust is called continental drift.

Explain how continental drift happens.

.....
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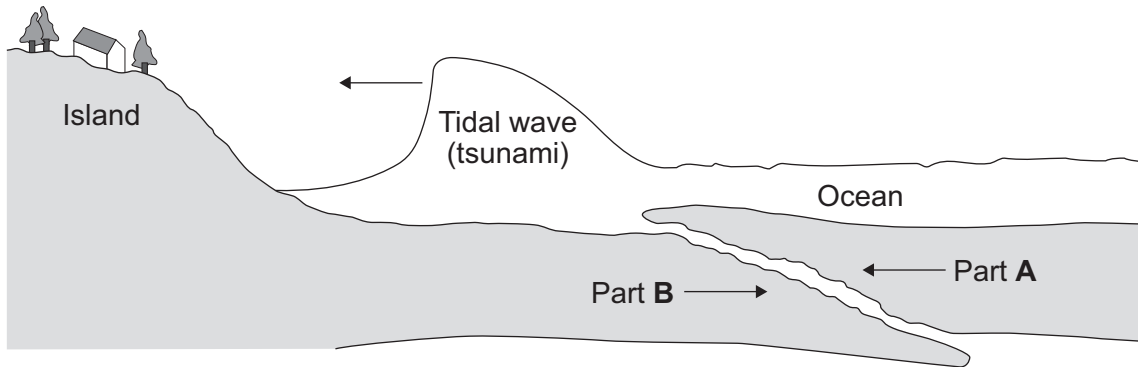
(3 marks)

Question 8 continues on the next page

Turn over ►



8 (b) (iii) The diagram shows two parts of the Earth's crust moving together.



The table shows information about how far the part of the crust labelled **A** moved in relation to the part of the crust labelled **B** on each date.

Date	Jan 1st	Feb 1st	Mar 1st	Apr 1st	May 1st	Jun 1st	July 1st	July 8th	Aug 1st	Sep 1st	Oct 1st	Nov 1st
Movement of A over B in metres	0.05	0.05	0.05	0.05	0.05	0.05	0.05	7.0	0.05	0.05	0.05	0.05
Upward movement in metres	0.01	0.02	0.01	0.01	0.03	0.02	0.03	21.0	0.06	0.05	0.04	0.02



Use information from the diagram and the table to give the date of the tidal wave (tsunami), and to explain how the tidal wave (tsunami) shown in the diagram was caused.

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(4 marks)

9

END OF QUESTIONS



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