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	
9	
TOTAL	

General Certificate of Secondary Education
Foundation Tier
March 2012

Science B

SCB1FP

Unit 1 My World

F

Written Paper

Thursday 1 March 2012 1.30 pm to 2.30 pm

For this paper you must have:
- a ruler.

You may use a calculator.

Time allowed
- 1 hour

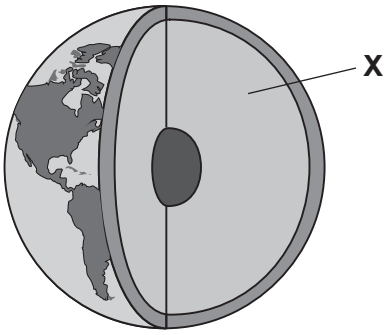
Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work 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 8(a) 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.

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

1 (a) The diagram shows some of the layers of the Earth.



1 (a) (i) What is the name of the layer of the Earth that is labelled **X** on the diagram?

Draw a ring around the correct answer.

Core **Crust** **Mantle**

(1 mark)

1 (a) (ii) Since the Earth formed, plants have changed the percentage of gases in the atmosphere by photosynthesis.

Name the gas that is produced by photosynthesis.

Tick (✓) **one** box.

Carbon dioxide ☐

Nitrogen ☐

Oxygen ☐

(1 mark)

1 (b) Draw a ring around the correct answer in the box to complete each sentence.

During the first billion years of the Earth's existence there was

a lot of

fossil fuel formation.
plant growth.
volcanic activity.

This released the gases that formed the early

atmosphere.
clouds.
land.

(2 marks)

1 (c) (i) Draw a ring around the correct answer in the box to complete the sentence below.

Scientists once thought that mountains were formed because the Earth had

cooled,
expanded,
heated,

making the crust shrink.

(1 mark)

1 (c) (ii) Choose the correct answer from the box to complete each sentence.

crust	**ocean**	**mountain**	**convection**	**tectonic**

Scientists have found that the Earth's crust is broken into a number of large pieces.

These pieces are called ..... plates.

The movement of these plates is caused by ..... currents.

(2 marks)

7

Turn over for the next question

2 (a) Astronomers study the universe.

Use the correct answers from the box to put the objects from the universe in the correct order of size.

The Solar System	**The Earth**	**The Moon**	**The Milky Way Galaxy**

One has been done for you.

Smallest

.....

.....

The Sun

.....

.....

Largest

(3 marks)

2 (b) The Sun and distant galaxies give out light.

Compared with the light from the Sun, the light from a distant galaxy is moved towards one end of the spectrum.

2 (b) (i) Give the name of this movement.

.....

(1 mark)

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

Light from a distant galaxy seems to move towards one end of the spectrum. This gives scientists evidence that

the universe is shrinking.
the universe is changing colour.
the universe is expanding.

(1 mark)

2 (c) Scientists have a theory that the universe began from a very small point.

What name is given to this theory?

Draw a ring around the correct answer.

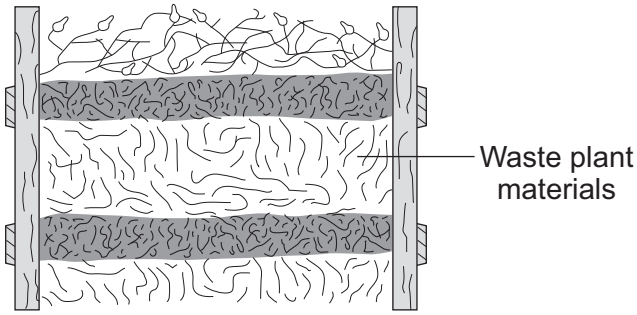
Big bang **Black hole** **Doppler effect**

(1 mark)

6

Turn over for the next question

3 Compost heaps are used to recycle waste plant materials.



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

Microorganisms break down waste plant materials by a process

called

decay.
growth.
photosynthesis.

(1 mark)

3 (b) Use the correct word from the box to complete each sentence.

cool	**decay**	**dry**	**grow**	**moist**	**warm**

The process in 3(a) releases substances that other plants can

use to ..... .

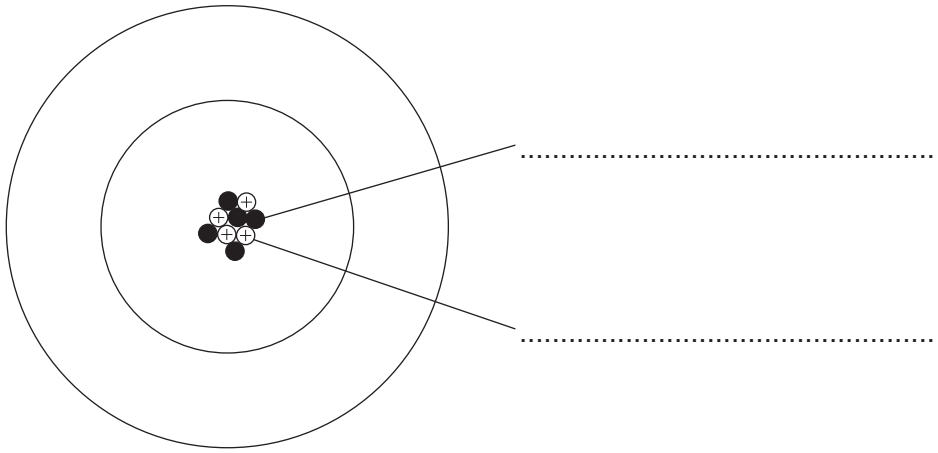
The waste plant materials break down faster when the conditions are

..... and ..... .

(3 marks)

4

4 The diagram shows a model of an atom of beryllium.



4 (a) Complete the labels on the diagram.

(2 marks)

4 (b) (i) How many electrons are there in an atom of beryllium?

.....

(1 mark)

4 (b) (ii) Complete the diagram to show the positions of the electrons.

Show the electrons as crosses (x).

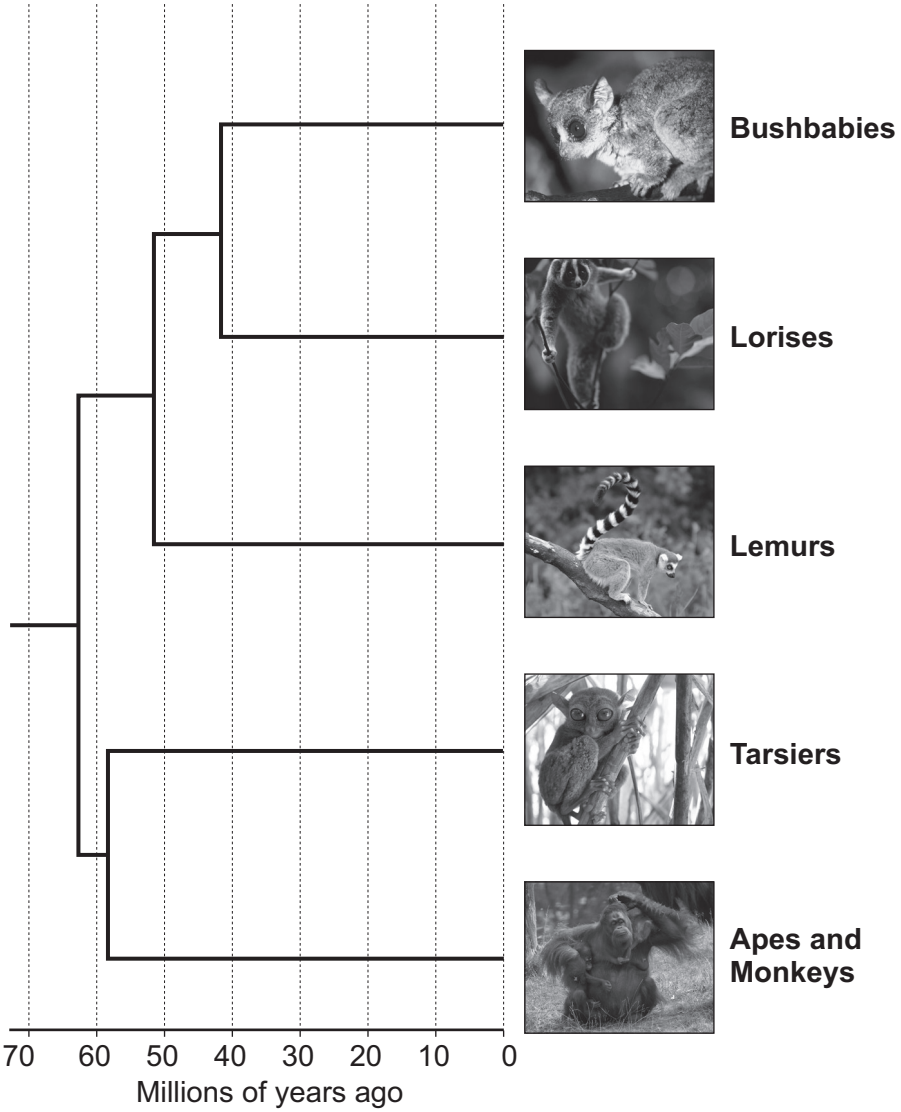
(2 marks)

5

Turn over for the next question

5 The diagram shows an evolutionary tree for a group of animals called primates.

The photographs show animals that are alive today.



The table shows names of geological periods and when they existed.

Geological period	Millions of years ago
Pliocene	2–5
Miocene	6–24
Oligocene	25–37
Eocene	38–54
Palaeocene	55–65
Cretaceous	66–144

5 (a) (i) How many million years ago did Lorises first appear?

..... millions of years ago.
(1 mark)

5 (a) (ii) Name the geological period when the Tarsiers began to evolve.

.....
(1 mark)

5 (a) (iii) Which group of primates alive today are the closest relatives of Lorises and Bushbabies?

.....
(1 mark)

5 (b) Scientists use a standard naming system to classify organisms.

Suggest why.

.....

.....

.....

.....
(2 marks)

5

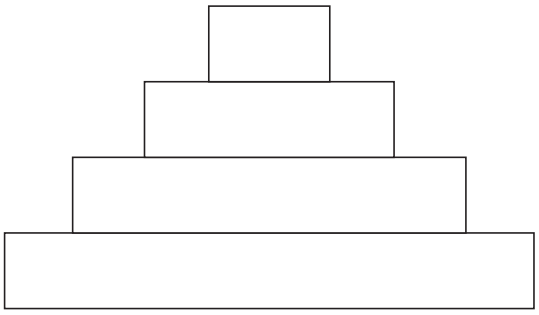
Turn over for the next question

6 This is a simple food chain.

Cabbage → Caterpillar → Blackbird → Sparrowhawk

6 (a) The diagram shows a pyramid of biomass for this food chain.

Label the pyramid of biomass using the organisms from the food chain.



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(1 mark)

6 (b) What is the source of energy for the cabbage?

.....

(1 mark)

6 (c) (i) Caterpillars ate some cabbage plants that contained 1620 kJ of energy.

The caterpillars use only 15% of this energy for growth.

Calculate how much energy the caterpillars use for growth.

Show clearly how you work out your answer.

.....

.....

.....

Amount of energy = ... kJ

(2 marks)

6 (c) (ii) 85% of the energy in the food eaten by the caterpillars is **not** used for growth.

What happens to the energy that is **not** used for growth?

.....

.....

.....

.....

.....

.....

(3 marks)

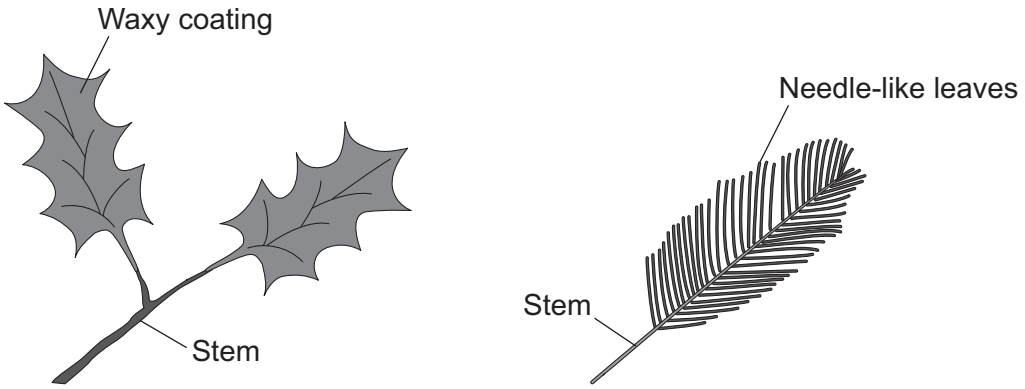
7

Turn over for the next question

7 Animals and plants are adapted to live in their environment.

7 (a) Some plants are adapted to survive in dry conditions.

The diagrams show leaves from two different types of plant that are adapted to survive in dry conditions.



Holly **Spruce**

Explain how each leaf is adapted to help the plant survive in dry conditions.

.....

.....

.....

.....

.....

(2 marks)

7 (b) Lots of animals are camouflaged.

Suggest **two** advantages of being camouflaged.

1 .....

.....

2 .....

.....

(2 marks)

7 (c) The photograph shows a polar bear, which lives in the Arctic, where it is very cold.

Explain how thick fur helps a polar bear to keep warm in cold conditions.

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(3 marks)

Question 7 continues on the next page

7 (d) The table gives some data about the surface area to volume ratio for some animals.

Animal	Surface area to volume ratio
A	6:1
B	5:1
C	8:1

Which animal, **A**, **B** or **C**, do you think would survive best in cold conditions?

Explain why.

.....

.....

.....

.....

.....

.....

(3 marks)

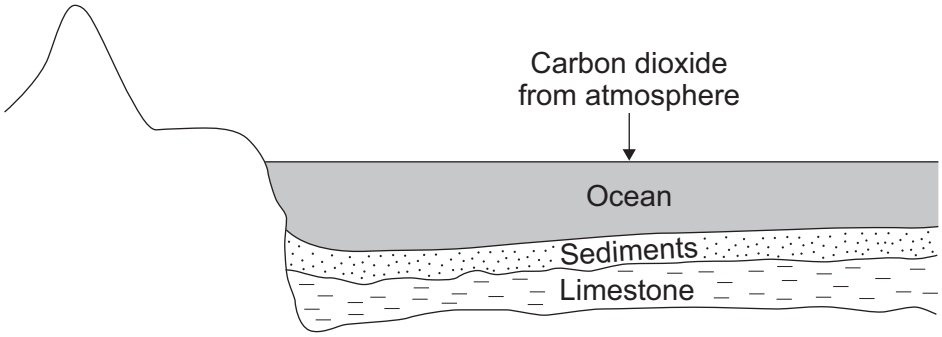
10

Turn over for the next question

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

8 (a) *In this question you will be assessed on using good English, organising information clearly and using scientific terms where appropriate.*

The diagram shows one way carbon dioxide is removed from the Earth's atmosphere.



Describe how carbon dioxide gas is removed from the atmosphere and is used to form limestone rock. Use the diagram to help you.

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(6 marks)

8 (b) Carbon dioxide is a greenhouse gas.

What are the main ways that human activity releases large amounts of carbon dioxide into the atmosphere?

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(2 marks)

8

Turn over for the next question

9 (a) Some students decided to investigate the chemistry of calcium carbonate.

The students started by adding hydrochloric acid to some pieces of calcium carbonate. The mixture fizzed and released a gas.

How could the students test to find out if the gas is carbon dioxide?

.....

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(2 marks)

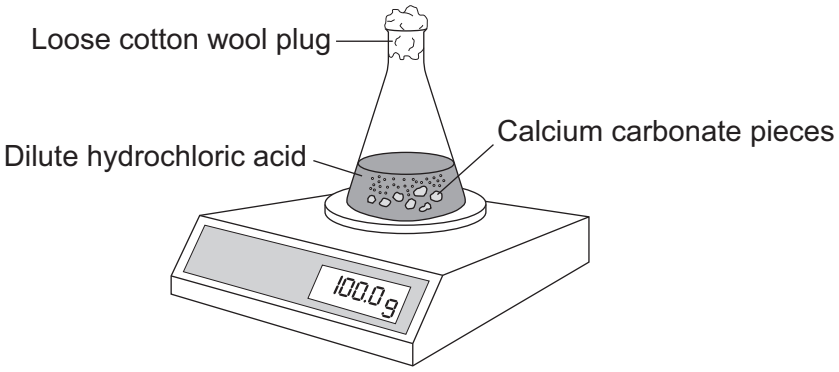
9 (b) The word equation for the reaction between calcium carbonate and hydrochloric acid is:

calcium carbonate + hydrochloric acid ⟶ calcium chloride + water + carbon dioxide

The students did an experiment to measure the mass change during the reaction of calcium carbonate and hydrochloric acid.

They measured the mass change every minute for 7 minutes.

They used the apparatus shown in the diagram.



9 (b) (i) Suggest why the flask is loosely plugged with cotton wool.

.....

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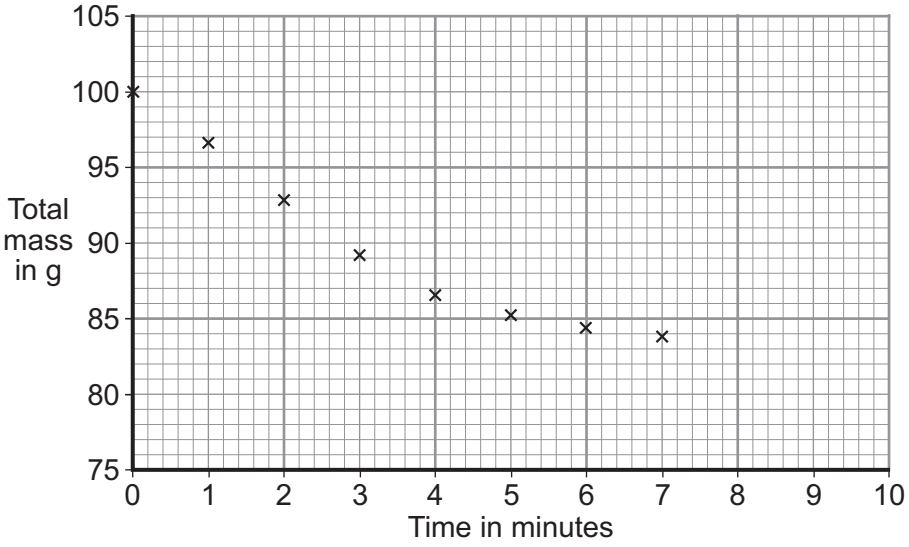
(1 mark)

The students plotted the results of their experiment on the graph shown below.



9 (b) (ii) On the graph, draw a line of best fit.

(1 mark)

9 (b) (iii) Use the graph to suggest when the reaction will be complete, and explain why you can't be sure.

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(2 marks)

9 (b) (iv) Explain why the mass changes during the reaction.

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(2 marks)

8

END OF QUESTIONS

There are no questions printed on this page

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