AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE
SCIENCE B

F

Foundation Tier Unit 1 My World

Tuesday 17 May 2016 Afternoon Time allowed: 1 hour

Materials
For this paper you must have:
- a ruler.

You may use a calculator.

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.

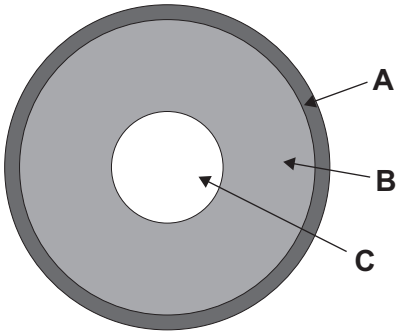
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.
- Question 9 should be answered in continuous prose.
  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) **Figure 1** shows a cross section of the Earth (not drawn to scale).

Figure 1



Draw **one** line from each letter to the correct name of the part of the Earth.

[3 marks]

Letter	Name of the part of the Earth
A	Atmosphere
B	Core
C	Crust
	Mantle

1 (b) Which part of the Earth is the hottest?

[1 mark]

Draw a ring around the correct answer.

the core **the crust** **the mantle**

1 (c) The Earth is surrounded by a mixture of gases. What is the name of this mixture of gases?

[1 mark]

Draw a ring around the correct answer.

atmosphere **nitrogen** **oxygen**

5

Turn over for the next question

2 Scientists have found out a lot about our changing universe.

2 (a) (i) What instrument do scientists use to look at distant objects?

[1 mark]

Tick (✓) **one** box.

Kaleidoscope ☐

Microscope ☐

Telescope ☐

2 (a) (ii) What is the name of the theory scientists use to explain how the universe began?

[1 mark]

Tick (✓) **one** box.

The big bang ☐

The big crunch ☐

The big explosion ☐

2 (a) (iii) The dark lines in the spectrum of a distant star have moved compared with the dark lines in the spectrum of sunlight.

What is this movement called?

[1 mark]

Tick (✓) **one** box.

The black shift ☐

The green shift ☐

The red shift ☐

2 (a) (iv) What causes the movement of the dark lines in the spectrum of distant stars?

[1 mark]

Tick (✓) **one** box.

Stars moving away from us ☐

Stars moving towards us ☐

Stars spinning round ☐

4

Turn over for the next question

3 (a) Sodium hydroxide (NaOH) reacts with hydrochloric acid (HCl) to make sodium chloride (NaCl) and water (H_2O).

The symbol equation for the reaction is:

$$NaOH + HCl \longrightarrow NaCl + H_2O$$

3 (a) (i) Use the correct word from the box to complete the sentence.

[1 mark]

balanced	**equal**	**level**

The number of each type of atom on each side of the equation is the same.

This means that the equation is _____ .

3 (a) (ii) Use the correct word from the box to complete the sentence.

[1 mark]

calcium	**carbon**	**chlorine**

The name of the element with the chemical symbol 'Cl' is _____ .

3 (a) (iii) Use the correct word from the box to complete the sentence.

[1 mark]

two	**three**	**four**

There are _____ different types of atom in one molecule of sodium hydroxide (NaOH).

3 (b) The equation shows what happens to sodium chloride when it dissolves in water.

$$NaCl \longrightarrow Na^{+} + Cl^{-}$$

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

[1 mark]

atoms	**ions**	**molecules**

Charged particles such as Na^{+} and Cl^{-} are called _____ .

4

Turn over for the next question

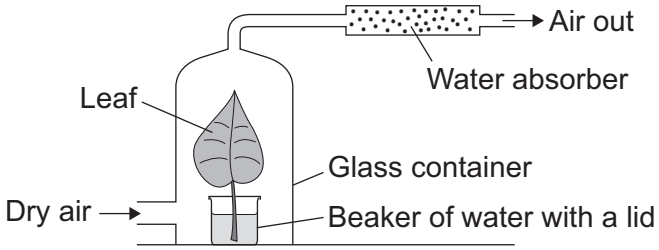
4 A student did the experiment shown in **Figure 2** to compare the loss of water from two different types of leaf, leaf **A** and leaf **B**.

In the experiment:

- leaf **A** stands in a beaker of water with a lid
- dry air is pumped into the container.

The experiment is repeated with leaf **B**.

Figure 2



4 (a) The student made sure that leaf **A** and leaf **B** had the same surface area.

Give **three** other variables the student should keep the same to make the experiment valid.

[3 marks]

Tick (✓) **three** boxes.

Variable kept the same	**Tick (✓)**
The amount of dry air used for each leaf	
The amount of light on each leaf	
The colour of the leaves	
The shape of leaf **A** and leaf **B**	
The temperature	
The volume of water in the beaker	

4 (b) The water lost by each leaf was collected by the water absorber. The student measured the mass of the water absorber at the start, and the end of the experiment.

She calculated the percentage increase in mass of the water absorber. Some of her results are shown in **Table 1**.

Table 1

Leaf	Mass of water absorber at start in grams	Mass of water absorber at end in grams	Increase in mass of water absorber in grams	Percentage (%) increase in mass of water absorber
A	150		15	
B	150	159	9	6

4 (b) (i) Calculate the mass of the water absorber at the end of the experiment for leaf **A**.

[1 mark]

Mass of the water absorber at the end = _____ g

4 (b) (ii) Calculate the percentage increase in mass of the water absorber for leaf **A**.

Use the equation to help you.

[2 marks]

Percentage increase in mass = increase in mass ÷ mass at start × 100

_____

_____

Percentage increase in mass = _____%

4 (b) (iii) The student concluded that leaf **A** came from a plant living in conditions with plenty of water, and leaf **B** came from a plant living in very dry conditions.

Give the reason for the student's conclusion.

[1 mark]

_____

_____

7

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

5 **Figure 3** shows a food chain.

Figure 3

cabbage ⟶ **caterpillar** ⟶ **chicken** ⟶ **fox**

5 (a) (i) Name a producer in the food chain shown in **Figure 3**.

[1 mark]

_____

5 (a) (ii) Name a consumer in the food chain shown in **Figure 3**.

[1 mark]

_____

5 (a) (iii) What do the arrows in a food chain show?

[2 marks]

_____

_____

_____

5 (b) Give **three** ways the energy in the food eaten by the chicken is lost.

[3 marks]

1 _____

2 _____

3 _____

7

6 Farmers pack eggs in cartons like the one shown in **Figure 4**.

Figure 4

Egg cartons can be made from a number of different materials.

Table 2 gives some information about the materials used to make egg cartons.

Table 2

Type of carton	Material used to make the carton	Strength of carton		Cost of cartons	Disposal of carton after use
		Dry	Wet		
Fibre	Waste paper	Very good	Poor	120p for 100 cartons	Easily composted
Foam plastic	Petrochemicals	Good	Good	35p for 25 cartons	Difficult and may cause pollution

Use **Table 2** to answer the following questions.

6 (a) (i) Which egg carton is the cheapest to buy?

Use calculations to explain your answer.

[2 marks]

6 (a) (ii) Some people think that fibre cartons are better than foam plastic cartons.

Suggest **three** reasons why.

[3 marks]

1 _____

2 _____

3 _____

6 (a) (iii) Give **one** disadvantage of using fibre egg cartons.

[1 mark]

_____

_____

6

Turn over for the next question

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

7 Carbon is found in many chemical compounds in living organisms.

7 (a) (i) Name the process used by green plants to make carbon compounds (food).

[1 mark]

_____

7 (a) (ii) What do green plants use to make carbon compounds (food)?

[2 marks]

_____

_____

_____

7 (a) (iii) Green plants make sugar and starches. Sugar and starches contain carbon.

Name **two** other types of compounds plants make that contain carbon.

[2 marks]

1 _____

2 _____

7 (a) (iv) Name the process in animals and plants that releases a carbon containing gas back into the atmosphere.

[1 mark]

_____

7 (b) (i) Dead organisms contain nutrients.

Describe how these nutrients are returned back to the environment.

[2 marks]

_____

_____

_____

7 (b) (ii) Why is it important to return the nutrients back to the environment?

[1 mark]

_____

_____

_____

9

8 **Figure 5** shows some of the elements in a reactivity series.

Figure 5

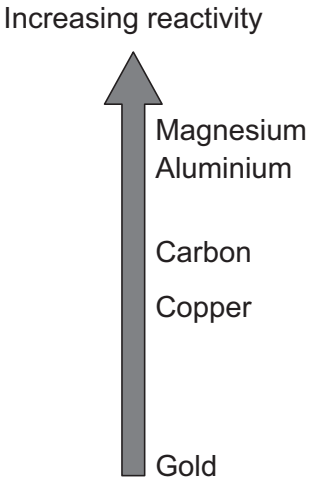


Table 3 gives some information about metals.

Table 3

Metal	Energy needed to extract the metal in MJ per kg	Percentage (%) of the Earth's crust made of the metal	Value of the metal in £ per kg
Aluminium	100	8.0	1.40
Copper	70	0.0068	4.15
Gold	0	0.0000007	26 500.00
Magnesium	103	2.1	1.75

8 (a) Use **Figure 5** and data from **Table 3** to answer the following questions.

8 (a) (i) Explain why no energy is needed to extract gold.

[2 marks]

8 (a) (ii) Describe the trend for the reactivity of the metals listed in **Table 3** and the amount of energy needed to extract each metal.

[1 mark]

8 (a) (iii) Describe the trend for the value of the metals listed in **Table 3** and the percentage of the Earth's crust made of the metal.

[1 mark]

8 (b) (i) Aluminium **cannot** be extracted by heating aluminium ore with carbon.

Give the reason why.

Use **Figure 5** to help you.

[1 mark]

8 (b) (ii) Name the method used to extract aluminium.

[1 mark]

6

Turn over for the next question

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

Figure 6 gives information from the periodic table about the element beryllium.

Figure 6

$^{9}_{4}Be$

Use the information in **Figure 6** to give a **written** description of the structure of a beryllium atom.

[6 marks]

Extra space

6

10 (a) **Figure 7** shows a rock pocket mouse that has light brown fur.

Figure 7

Most rock pocket mice live on light coloured sandy soil, and have light brown coloured fur as shown in **Figure 7**.

1000 years ago volcanic eruptions produced isolated areas of black volcanic sand.

As a result of evolution, rock pocket mice now living on the black volcanic sand have black fur on their back.

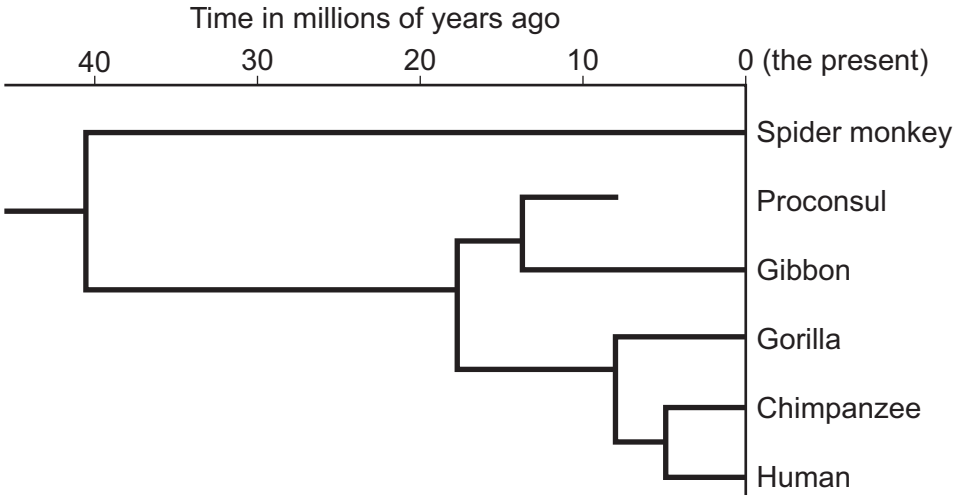
Describe how the black fur colour of these rock pocket mice has evolved by natural selection.

[3 marks]

Question 10 continues on the next page

10 (b) Primates include monkeys and apes. **Figure 8** shows an evolutionary tree for some primates.

Figure 8



The evolutionary tree shows that spider monkeys are very different from other primates.

Give **three** other facts about the evolution of primates that are shown in **Figure 8**.

[3 marks]

1 _____

_____

_____

2 _____

_____

_____

3 _____

_____

_____

6

END OF QUESTIONS