Specimen Paper

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
Specimen Paper

Science B (Science in Context)

Unit 1 My World

F

Foundation Tier

For this paper you must have:
- a ruler.

You may use a calculator.

Time allowed
- 60 minutes

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 space 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.

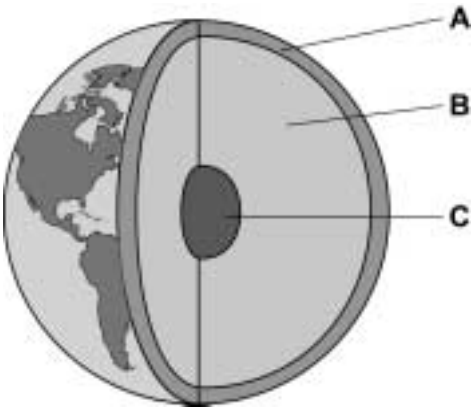
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You are reminded of the need for good English and clear presentation in your answers.
- Question 9(b) should be answered in continuous prose. In this question you will be marked on your ability to:
  - –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 Earth scientists have discovered that the Earth has three layers.

The diagram shows the three layers of the Earth.



1 (a) Complete the table by writing the letters, **A**, **B** or **C**, from the diagram in the correct box.

Layer of Earth	Letter
Core	
Crust	
Mantle	

(2 marks)

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

1 (b) (i) Earth scientists think that, since the Earth formed, the surface of the Earth has

- warmed up.
- stayed the same temperature.
- cooled down.

(1 mark)

1 (b) (ii) The outer layers of the Earth are cracked into pieces called

- crust
- mantle
- tectonic

plates.

(1 mark)

1 (b) (iii) These plates move because of

- conduction
- convection
- core

currents under the Earth's surface.

(1 mark)

1 (b) (iv) This movement can cause

- droughts.
- hurricanes.
- volcanic eruptions.

(1 mark)

Question 1 continues on the next page

1 (c) The table gives information on some gases in the Earth's atmosphere.

Gas	Percentage in atmosphere 2.5 billion years ago	Percentage in present day atmosphere
Nitrogen	29 %	78 %
Oxygen	9 %	21 %
Carbon dioxide	58 %	0.03 %

Calculate the increase in the percentage of oxygen in the atmosphere.

.....

.....

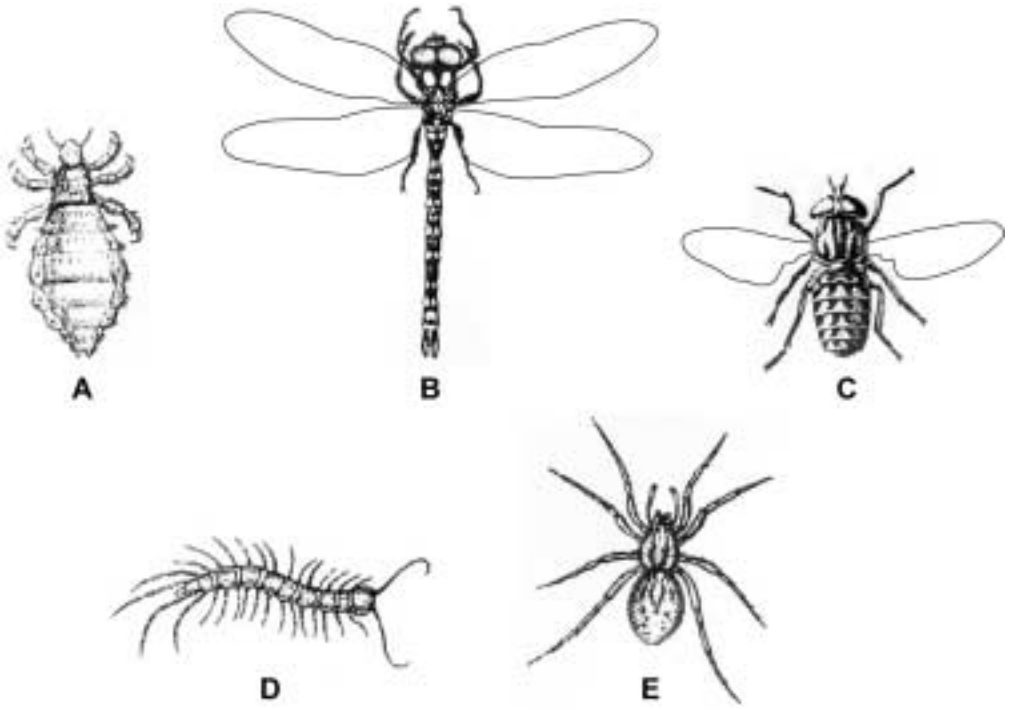
(1 mark)

7

Turn over for the next question

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

2 (a) Organisms can be classified using features that can be seen. Organisms **A**, **B**, **C**, **D** and **E** below all belong to a large group called the arthropods.



2 (a) (i) Suggest **two** features you can see in the pictures that could be used to classify these organisms.

.....

.....

(2 marks)

2 (a) (ii) The arthropod group contains four smaller groups called classes. **Three** of the organisms in the pictures belong to one of these classes because of the features they share.

Draw a ring around the letters of these **three** organisms.

A **B** **C** **D** **E**

(1 mark)

2 (a) (iii) Explain your answer.

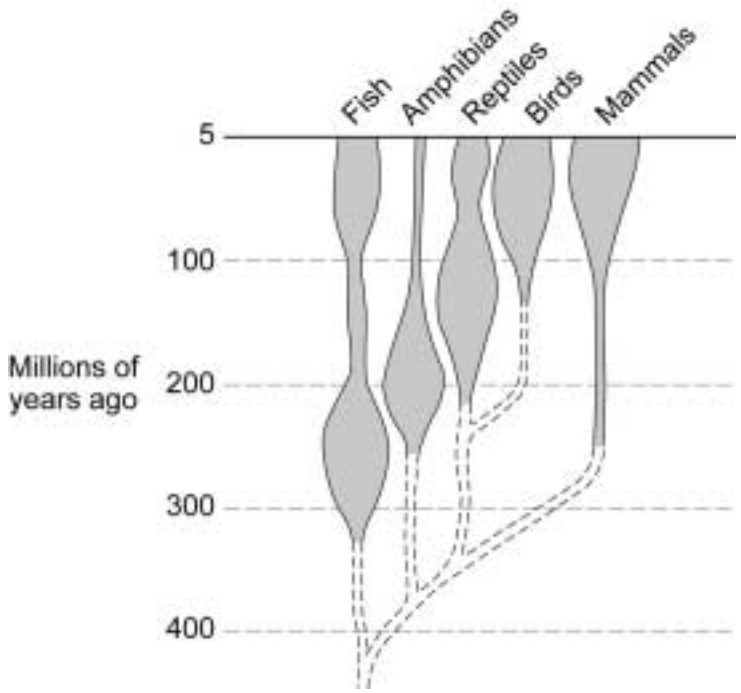
.....

.....

(1 mark)

2 (b) The diagram shows how the number of species in different groups changed between 400 million years ago and 5 million years ago.

The wider a block is, the more species there are.



2 (b) (i) Which group had most species 200 million years ago?

.....

(1 mark)

2 (b) (ii) To which group are birds most closely related?

.....

(1 mark)

2 (b) (iii) Complete the following sentence.

A study of fossils gives evidence for the theory of ..... .

(1 mark)

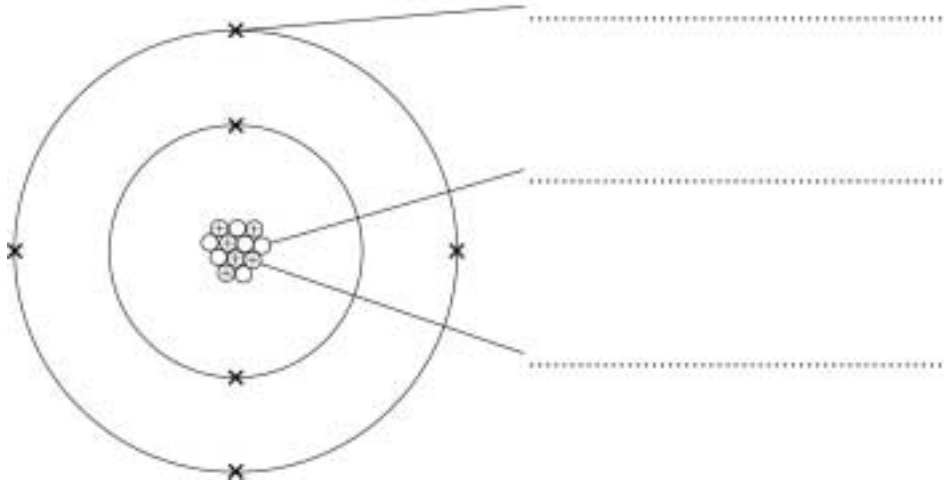
7

Turn over for the next question

3 Carbon is an important element in maintaining life.

3 (a) Use words from the box to label the diagram of an atom of carbon.

proton	neutron	electron	nucleus



(3 marks)

3 (b) Use the diagram to work out the atomic number and mass number of carbon.

Atomic number .....

Mass number .....

(2 marks)

3 (c) Carbon can combine with oxygen gas to form carbon dioxide gas.

Oxygen and carbon dioxide are found in the atmosphere.

Green plants use **two** processes that alter the amounts of these gases in the atmosphere.

Name the **two** processes, and describe how they change the amounts of these two gases in the atmosphere.

Process 1 .....

.....

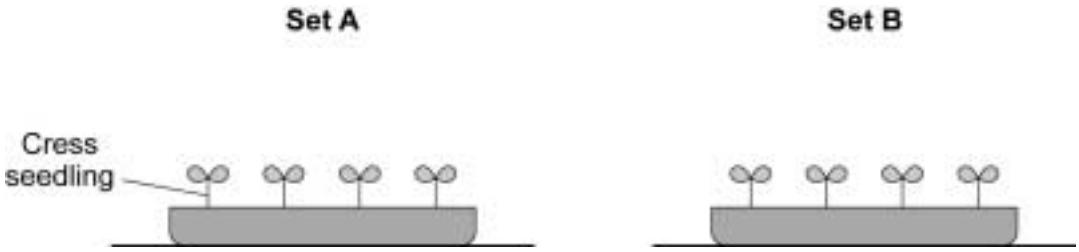
Process 2 .....

.....

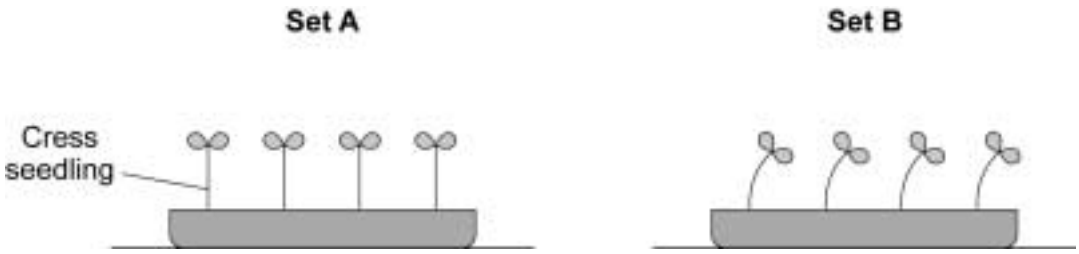
(4 marks)

9

4 A student grew two sets of cress seedlings.



The student changed **one** condition for Set **B**. After two days, the seedlings looked like this.



4 (a) Complete the sentences.

The condition that was changed is ..... .

The response in Set **B** is caused by an unequal distribution of the hormone

called ..... across the stem of the seedlings.

This causes unequal ..... in the stem of the seedlings.

(3 marks)

4 (b) What is the name of this response?

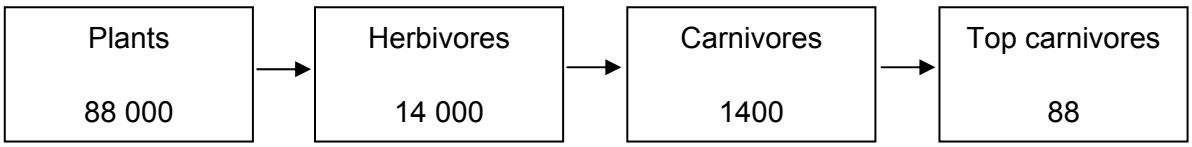
.....

(1 mark)

4

Turn over for the next question

5 The diagram shows a food chain in a pond. The figures show the amounts of energy in each type of organism, in kilojoules per m^3 of pond per year.



5 (a) In the space below, draw a pyramid of biomass for this food chain. Label your drawing with the names of the organisms.

(2 marks)

5 (b) (i) In the food chain, how much energy is lost between herbivores and carnivores?

.....

..... kJ/m^3

(1 mark)

5 (b) (ii) Suggest what happens to the energy that is lost.

.....

.....

(1 mark)

4

Turn over for the next question

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ANSWER IN THE SPACES PROVIDED

6 The maker of an electronic games player needs someone to supply the plastic case. Four companies have been asked to give details of the case they could make. These details are given in the table.

Company	Cost of each case in pence	Strength	Mass of plastic used to make the case in grams	Percentage of plastic wasted per case
A	230	8 out of 10	410	3
B	275	9 out of 10	550	2
C	400	6 out of 10	320	4
D	300	5 out of 10	250	5

6 (a) One observation that can be made from the table is that as the strength increases the percentage wastage decreases.

Suggest **two** observations that could be made about the **mass** of the cases.

1. .....

.....

2. .....

.....

(2 marks)

6 (b) Companies **A**, **B** and **C** use plastic made from crude oil to make their cases.
Company **D** uses a bioplastic made from sugar cane to make its cases.

Suggest **one** environmental advantage and **one** environmental disadvantage of using bioplastics.

Advantage .....

.....

Disadvantage .....

.....

(2 marks)

6 (c) Which company, **A**, **B**, **C** or **D**, would make the case that is the best value for money?

Explain why you have chosen this company.

Company .....

Explanation .....

.....

(2 marks)

6

Turn over for the next question

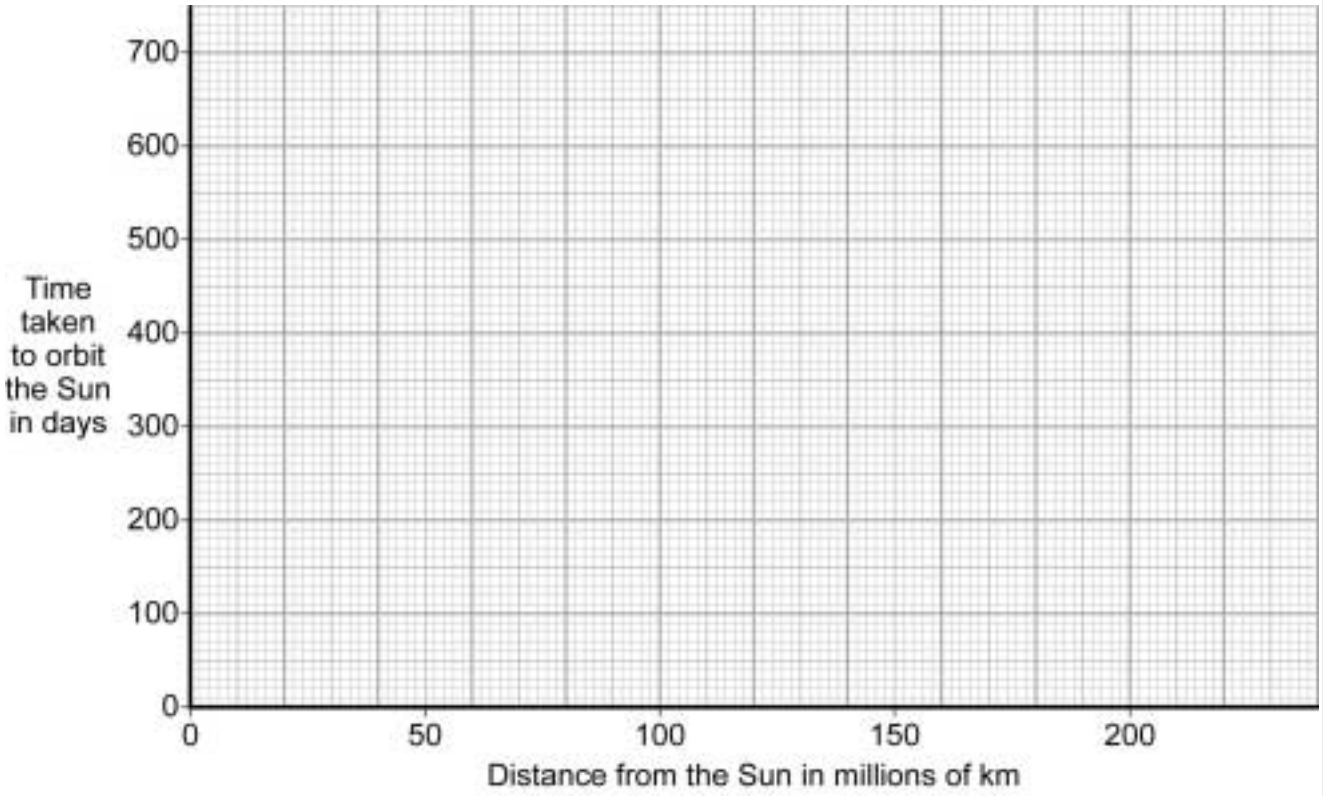
7 Astronomers use telescopes to observe the movement of planets and stars.

7 (a) Data for four planets is given in the table.

	Mercury	**Venus**	**Earth**	**Mars**
Approximate distance from the Sun in millions of km	60	110	150	230
Approximate time to orbit the Sun in days	90	220	370	690

7 (a) (i) Plot the data from the table onto the graph below.

Draw a smooth curve through the points on the graph.



(3 marks)

7 (a) (ii) Use your graph to describe the relationship between the size of the orbit of a planet and the time it takes to orbit the Sun.

.....

.....

(1 mark)

7 (b) An astronomer noticed that the light coming from distant galaxies appeared to be different from the light coming from our own galaxy.

7 (b) (i) How does the light coming from distant galaxies appear different?

.....

.....

(1 mark)

7 (b) (ii) Describe how the size of this effect on the light is related to the distance of a galaxy from the Earth. Give a conclusion from the evidence about what is happening to the universe.

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(2 marks)

7

Turn over for the next question

8 Crude oil contains many useful substances.

8 (a) What is the name of the process used to separate the useful substances from crude oil?

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(2 marks)

8 (b) **Table 1** gives some information about some of the useful substances obtained from crude oil.

Table 1

Substance	Number of carbon atoms	Boiling point (°C)	Viscosity (cP)
Refinery gas	1–4	< 30	0.009
Petrol	4–10	50	0.5
Naptha	6–11	130	0.9
Kerosene	10–16	200	2.5
Diesel fuel	16–20	260	6.2
Lubricating oil	20–40	310	22.7

Describe the trends shown in the table.

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(3 marks)

8 (c) The relative amounts of substances obtained from crude oil are given in **Table 2**.

Table 2

Substance	Relative % in crude oil	Relative % demand
Petrol	10	20
Kerosene	15	23
Diesel	20	25
Fuel oil	45	12

Suggest why petrol costs more than fuel oil.

.....

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.....

.....

(2 marks)

7

Turn over▶

9 We can get many important substances from the Earth's crust. Sometimes we can use these substances straight from the ground.

9 (a) Which **one** substance in the list can be used straight from the ground?

Draw a ring around the correct answer.

gold **iron** **lead** **calcium** **aluminium**

(1 mark)

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

Rock salt is a mixture containing salt (sodium chloride) that we get from the Earth's crust.

To get pure salt from rock salt we need to separate the pure salt from the other substances in the mixture.

Describe how you would obtain pure salt from rock salt in the laboratory. You should include in your answer the apparatus that you would use.

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(6 marks)

9 (c) (i) Name the elements in pure salt.

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(1 mark)

9 (c) (ii) What is the chemical formula for pure salt?

.....

(1 mark)

9

END OF QUESTIONS

There are no questions printed on this page

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