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
June 2015

Science B

SCB1FP

Unit 1 My World

F

Friday 5 June 2015 1.30 pm to 2.30 pm

For this paper you must have:
- a ruler.

You may use a calculator.

Time allowed
- 1 hour

A

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 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) Rock salt is a mixture of salt and sand.

Rock salt is found in the ground.

Name **one** method of getting rock salt out of the ground.

[1 mark]

.....

1 (b) Salt is separated from rock salt.

There are a number of stages in the separation of salt from rock salt.

Draw **one** line from each stage to the reason for the stage.

[4 marks]

Stage	Reason
The rock salt is crushed	to remove the sand.
Water is added to the rock salt	to evaporate the water and leave salt.
The rock salt and water mixture is filtered	to dissolve the sand.
The liquid that is collected after filtration is heated	to speed up dissolving.
	to dissolve the salt.

1 (c) Some substances are used straight from the ground.

Which **two** substances are used straight from the ground?

Draw a ring around each correct answer.

[2 marks]

Aluminium **Gold** **Iron** **Sodium** **Sulfur**

7

Turn over for the next question

2 (a) (i) Light can have an effect on the direction that a plant stem grows.

What is the name of this effect?

[1 mark]

Tick (✓) **one** box.

Name of effect	**Tick (✓)**
Gravitropism	
Hydrotropism	
Phototropism	

2 (a) (ii) The roots of plants grow downwards.

What is the name of this effect?

[1 mark]

Tick (✓) **one** box.

Name of effect	**Tick (✓)**
Gravitropism	
Hydrotropism	
Phototropism	

2 (a) (iii) A chemical causes tropisms.

What is the name of the chemical that causes tropisms?

[1 mark]

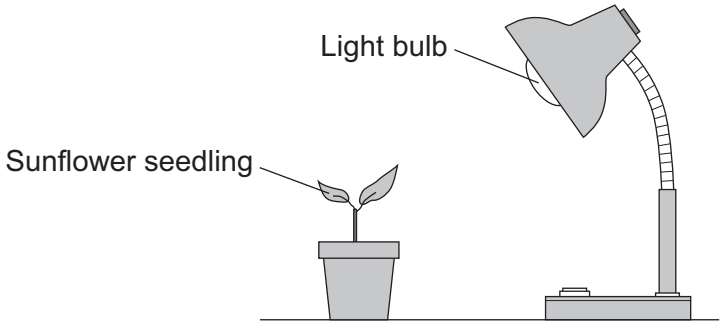
Tick (✓) **one** box.

Name of chemical	**Tick (✓)**
Adrenalin	
Auxin	
Glucose	

2 (b) (i) A student investigated the effect that white light has on the way a plant grows.

Figure 1 shows a sunflower seedling in a pot. The **only** light comes from the light bulb.

Figure 1

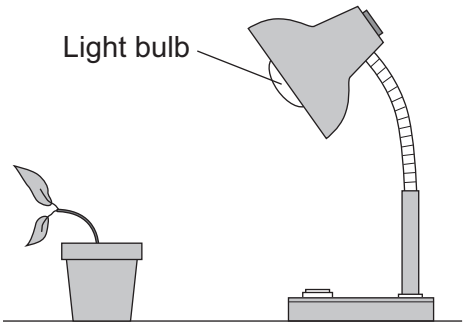


The light bulb was left on for two days.

What would the sunflower seedling look like after two days?

[1 mark]

Tick (✓) **one** box.



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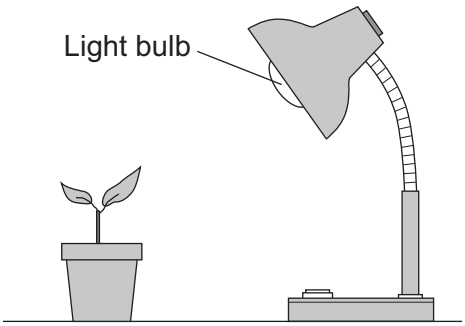

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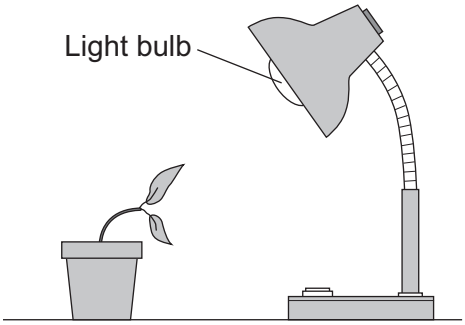


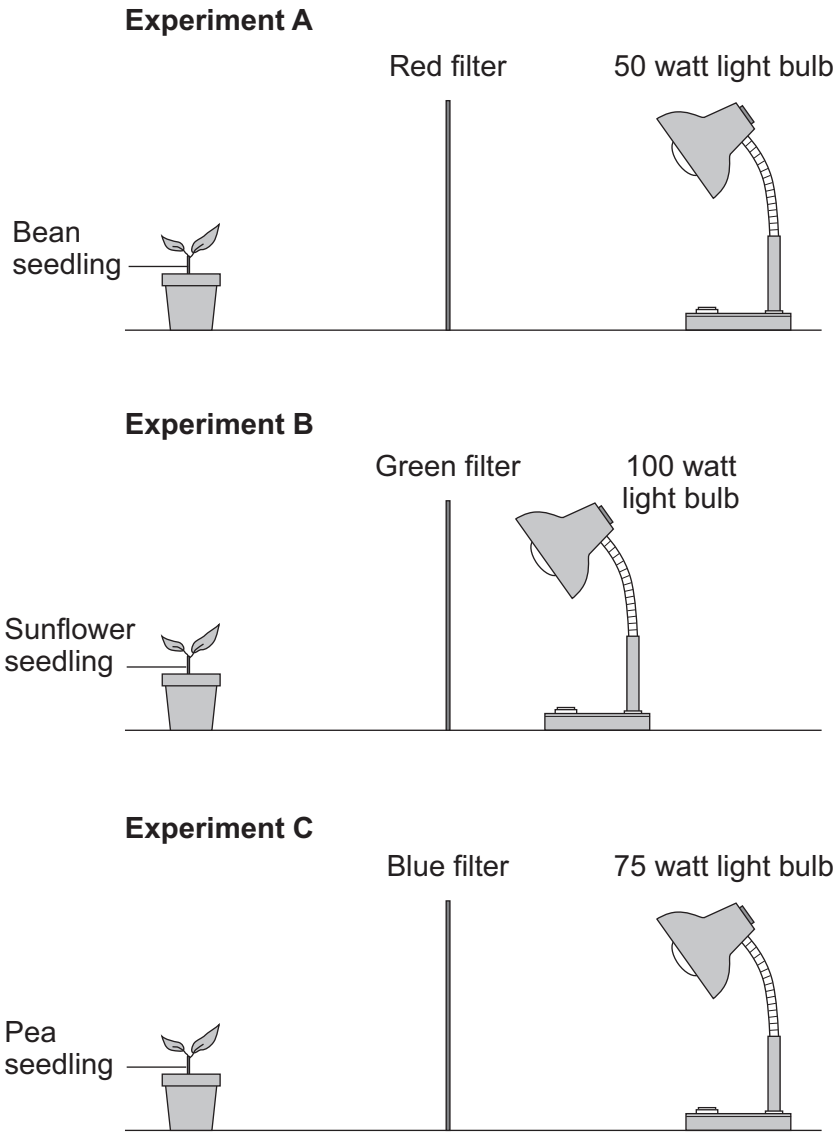
☐

2 (b) (ii) The student then designed three experiments to find out if different colours of light have the same effect as white light on the growth of seedlings.

In each experiment the **only** light comes from the light bulb.

The light bulb was left on for two days. The experiments are shown in **Figure 2**.

Figure 2



Look at **Figure 2** and give **three** improvements that the student could make so that the results of the experiments are valid.

[3 marks]

Improvement 1 .....

.....

Improvement 2 .....

.....

Improvement 3 .....

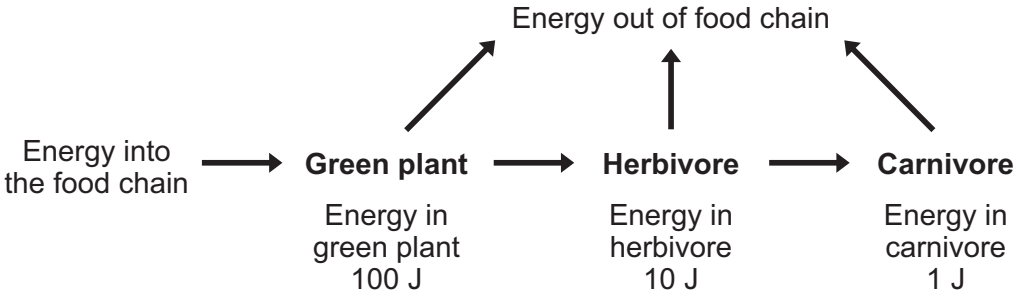
.....

7

Turn over for the next question

3 **Figure 3** shows the amount of energy flowing through a food chain.

Figure 3



3 (a) (i) The food chain in **Figure 3** is for organisms in a field.

Suggest the names of suitable organisms for this food chain.

[3 marks]

Green plant .....

Herbivore .....

Carnivore .....

3 (a) (ii) Complete the following sentences.

[3 marks]

Energy goes into the food chain as ..... energy.

Energy is stored in living things as ..... energy.

Energy goes out of the food chain as ..... energy.

3 (b) (i) Calculate how much energy (J) is lost between the herbivore and the carnivore.

Use the information from **Figure 3** to help you answer the question.

[1 mark]

.....

.....

..... J

3 (b) (ii) Calculate the percentage of the herbivore's energy lost between the herbivore and the carnivore.

Use information from **Figure 3** and your answer to part **(b)(i)** to help you.

[1 mark]

.....

.....

.....

..... %

3 (c) (i) Some of the energy in the food an animal eats cannot be used by the animal.

Give **one** reason why.

[1 mark]

.....

3 (c) (ii) Name the process animals use to release energy from the food that they have absorbed.

[1 mark]

.....

10

Turn over for the next question

4 **Table 1** shows some information about four planets in the Solar System.

Table 1

	Mercury	Venus	Earth	Mars
Average surface temperature in °C	350	400	8	–23
Distance from the Sun in millions of miles	58	108	150	228
Has the planet got an atmosphere?	No	Yes	Yes	No
Time taken in days to go around the Sun once	88		365.25	687

4 (a) (i) Use the information from **Table 1** to suggest how many days it takes Venus to go around the Sun once.

[1 mark]

.....

.....

4 (a) (ii) The average surface temperature of Mercury is higher than the average surface temperature of Mars.

Suggest why.

[1 mark]

.....

.....

4 (a) (iii) The average surface temperature of Venus is higher than the average surface temperature of Mercury.

Suggest why.

[1 mark]

.....

.....

4 (b) (i) The surface of the Earth is broken into pieces called tectonic plates.

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

[4 marks]

convection currents	**ocean currents**	**the crust**
the Earth's core	**the mantle**	**the Sun**

The surface of the Earth is called ..... .

The tectonic plates float on ..... .

The tectonic plates are moved by ..... .

Heat energy to move the tectonic plates comes from ..... .

4 (b) (ii) The movement of tectonic plates can cause natural disasters.

Name **two natural** disasters caused by the movement of tectonic plates.

[2 marks]

1 .....

2 .....

9

Turn over for the next question

5 There are plans to use fracking to get methane from underground rocks in the UK.

Holes are drilled into the rocks.

Water and toxic chemicals are pumped into the holes to break the rocks and release methane.

The statements in **Table 2** are about fracking and methane.

Table 2

Statement letter	Statement
A	Fracking for methane might pollute drinking water.
B	Methane is a hydrocarbon.
C	Methane is expensive to buy from other countries.
D	Methane is also called natural gas.
E	Fracking might cause earthquakes.
F	Methane is an important fuel.
G	Rocks below the UK contain a lot of methane.

5 (a) (i) Give the letters of **two** statements from **Table 2** that **support** the use of fracking in the UK to get methane.

[2 marks]

..... and .....

5 (a) (ii) Give the letters of **two** statements from **Table 2** that are **against** the use of fracking in the UK to get methane.

[2 marks]

..... and .....

5 (a) (iii) Does the information in **Table 2** support the use of fracking in the UK to get methane?

You must give a reason for your answer.

[1 mark]

.....

.....

.....

5 (b) (i) One molecule of methane contains one carbon atom and four hydrogen atoms.

What is the correct formula for methane?

Tick (✓) **one** box.

[1 mark]

Formula	Tick (✓)
C_4H	
C_4H_4	
CH_4	

5 (b) (ii) **Table 3** gives information about the reaction that occurs when methane burns in air.

Table 3

Chemical	Reactant	Product
Carbon Dioxide		✓
Methane	✓	
Oxygen	✓	
Water		✓

Use the information given in **Table 3** to write the word equation for burning methane.

[1 mark]

..... + ... ⟶ ..... + ...

7

6 (a) Marine animals, such as corals, form limestone from carbon dioxide.

Describe how limestone is formed from marine animals.

[4 marks]

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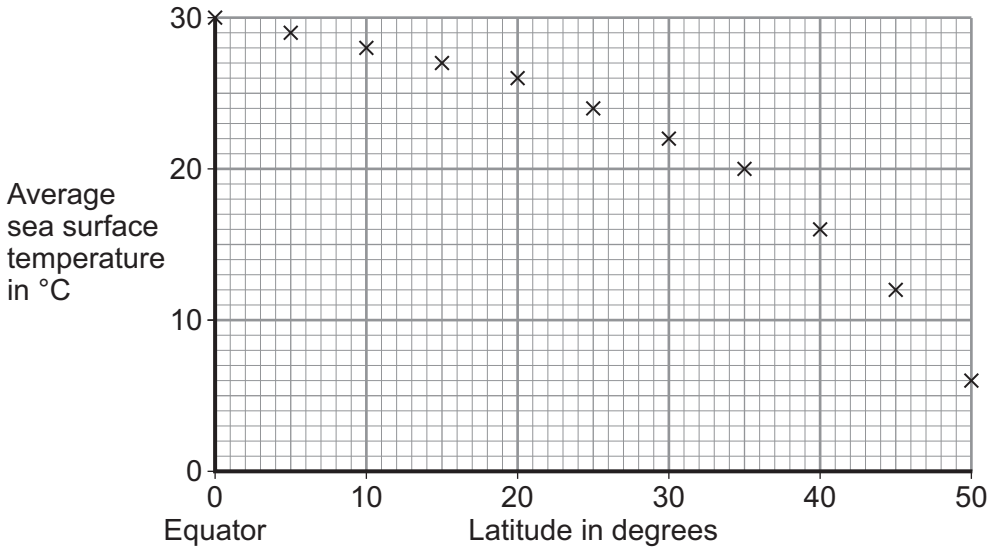
6 (b) **Figure 4** shows how the average sea surface temperature of the Pacific Ocean changes with the latitude.

Figure 4



6 (b) (i) Most corals are found between 0 degrees latitude and 30 degrees latitude.

Use the data given in **Figure 4** to suggest why.

[2 marks]

.....

.....

6 (b) (ii) Corals have algae living inside them.

The algae produce food by photosynthesis.

Corals cannot live without the food made by the algae.

Table 4 shows how the percentage of light penetrating sea water depends on the depth of the water.

Table 4

Depth of water in metres	Percentage (%) of light penetrating the sea water
20	70
40	45
60	18
80	8
100	1

Most corals cannot live at depths greater than 50 metres.

Suggest why.

Use the data given in **Table 4** to help you.

[2 marks]

.....

.....

.....

.....

8

Turn over for the next question

7 (a) Crude oil is a mixture of hydrocarbons.

The properties of a hydrocarbon, such as boiling point and viscosity, depend on the number of carbon atoms that it contains.

Which row in **Table 5** shows the correct trend for the boiling point and viscosity of hydrocarbons?

Tick (✓) **one** box.

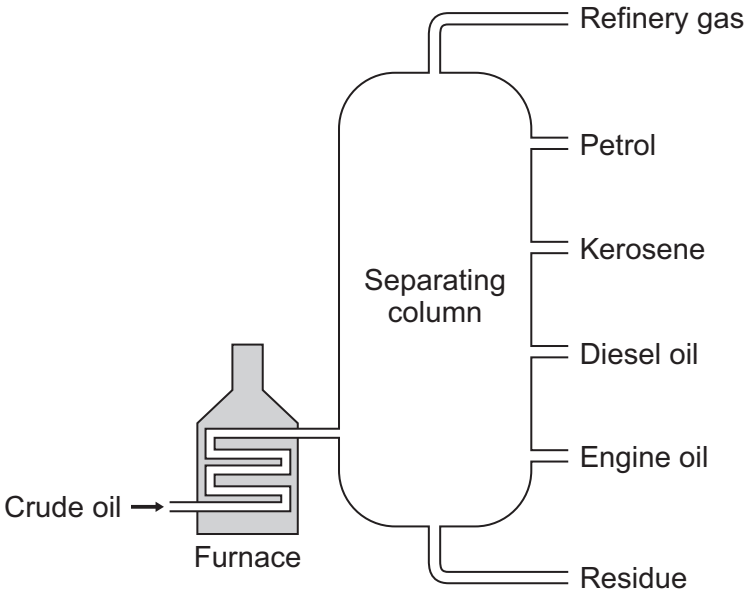
[1 mark]

Table 5

Number of carbon atoms in hydrocarbons	Boiling point of hydrocarbons	Viscosity of hydrocarbons	Tick (✓)
Increases	Decreases	Decreases	
Increases	Decreases	Increases	
Increases	Increases	Decreases	
Increases	Increases	Increases	

7 (b) **Figure 5** shows the equipment used to separate hydrocarbons in crude oil.

Figure 5



7 (b) (i) Describe **fully** what the furnace does.

[2 marks]

.....

.....

.....

.....

7 (b) (ii) Why do the different hydrocarbons condense at different distances up the separating column?

[1 mark]

.....

7 (b) (iii) What is the relationship between the number of carbon atoms in the hydrocarbon molecule, and the distance the hydrocarbon travels up the separating column?

[1 mark]

.....

.....

.....

7 (b) (iv) Some hydrocarbons, like methane, are gases.

Suggest the name of **one other** hydrocarbon that is found in refinery gas.

[1 mark]

.....

6

Turn over for the next question

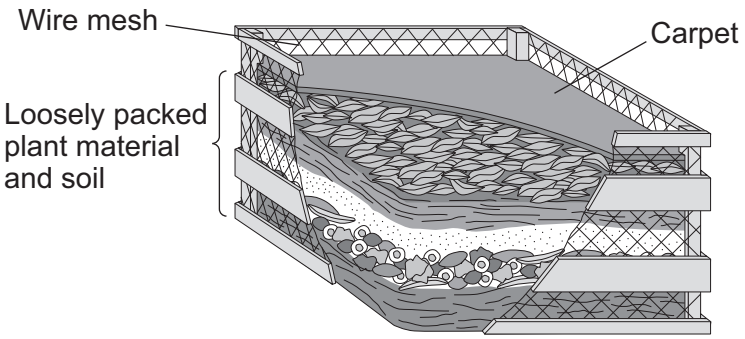
8 **In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.**

Compost is made when plant material decomposes.

A gardener made a compost heap. She filled a container, made of wood and wire mesh, with a mixture of loosely packed plant material and soil.

Figure 6 shows the features of the compost heap made by the gardener.

Figure 6



Describe the conditions needed to make compost and how the features of the compost heap made by the gardener, in **Figure 6**, helps to produce these conditions.

[6 marks]

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Extra space .....

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6

END OF QUESTIONS

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