

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

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Forename(s)

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Candidate signature

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## GCSE SCIENCE B

# F

Foundation Tier Unit 2 My Family and Home

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Thursday 19 May 2016

Morning

Time allowed: 1 hour

### Materials

For this paper you must have:

- a ruler
- a calculator
- the Equations Sheet (enclosed).

### 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(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.
- 



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

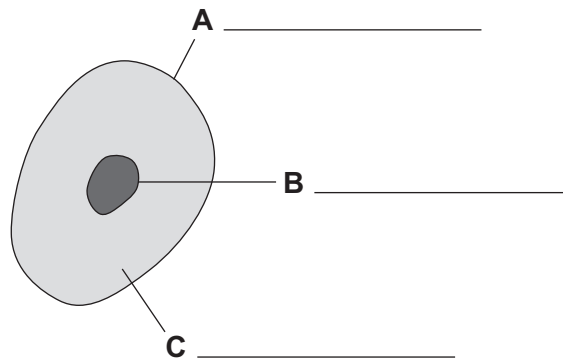
**1 (a) (i)** Cells are the building blocks of living organisms.

Use words from the box to label the parts of the animal cell in **Figure 1**.

[3 marks]

cell membrane	cell wall	chromosomes
cytoplasm	nucleus	

**Figure 1**



**1 (a) (ii)** Which part of the animal cell, **A**, **B** or **C**, in **Figure 1** contains the genes?

[1 mark]

Draw a ring around the correct answer.

**A**

**B**

**C**

4



- 2 **Figure 2** shows two sisters. The sisters are similar in appearance but not identical.

**Figure 2**



- 2 (a) What word describes the differences between the sisters?

[1 mark]

Draw a ring around the correct answer.

**breeding**

**inheritance**

**variation**

- 2 (b) The differences between the sisters can be caused by genetics, the environment or a combination of both genetics and the environment.

Draw **one** line from each cause to the difference between the sisters it affects.

[3 marks]

Cause	Difference between the sisters
The environment only	Age
Genetics only	Eye colour
Genetics and the environment	Scars
	Weight



**3** A homeowner has a fish pond in his garden.

The fish pond needs a pump so the fish have enough oxygen.

The pump chosen by the homeowner uses mains electricity at 230 V and draws a current of 0.8 A.

**3 (a) (i)** Calculate the power of the pump.

Use the Equations Sheet to help you answer the question.

**[1 mark]**

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Power of the pump = \_\_\_\_\_

**3 (a) (ii)** Give the correct unit of power.

**[1 mark]**

Tick (✓) **one** box.

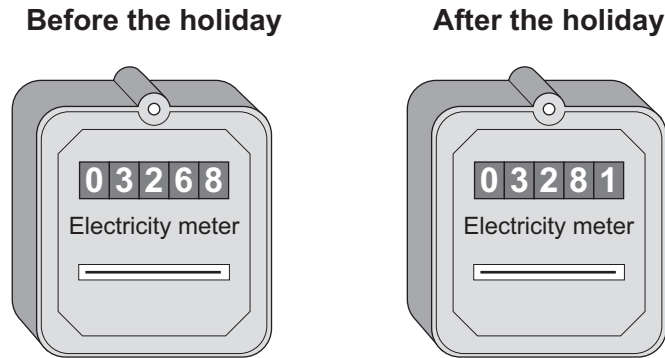
Unit	Tick (✓)
J	
m/s	
W	



- 3 (b)** The homeowner goes on holiday for a few days. Before leaving, the homeowner turns off all the electrical items except for the pump.

**Figure 3** shows the electricity meter readings before the holiday and after the holiday.

**Figure 3**



- 3 (b) (i)** How many units of electricity were used during the holiday?

Use the information in **Figure 3** to help you.

[1 mark]

Draw a ring around the correct answer.

**13**

**17**

**23**

- 3 (b) (ii)** The electricity company charges the homeowner 14p for each unit of electricity used.

Calculate the cost of using the pump during the holiday.

[1 mark]

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Cost = \_\_\_\_\_ p

- 3 (b) (iii)** Electricity companies charge for electricity by the 'unit'.

What 'unit' do electricity companies use?

[1 mark]

Draw a ring around the correct answer.

**joules per second**

**kilowatt-hours**

**volts**

**Question 3 continues on the next page**

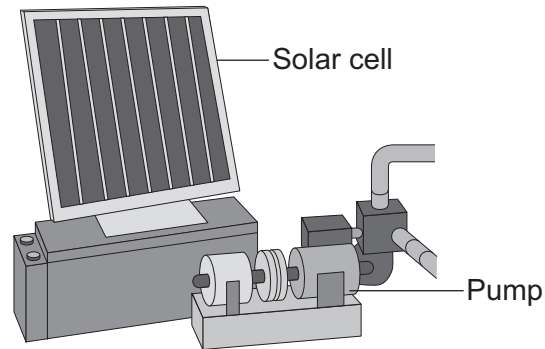
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- 3 (c)** The homeowner decides that using mains electricity to power the pump is too expensive.

He decides to use a solar powered pump as shown in **Figure 4**.

**Figure 4**



Give **one** advantage and **one** disadvantage, other than cost, of using a solar powered pump rather than a mains powered pump.

**[2 marks]**

Advantage \_\_\_\_\_

\_\_\_\_\_

Disadvantage \_\_\_\_\_

\_\_\_\_\_



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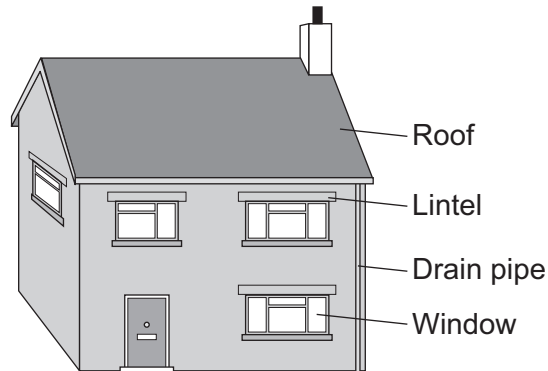
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0 7

4 **Figure 5** shows a house.

**Figure 5**



Many materials are used to build a house.

4 (a) Draw **one** line from each material to the correct use of that material in the building of the house shown in **Figure 5**.

[3 marks]

Material	Use of material
Glass	Drain pipe
Plastic	Lintel
Reinforced concrete	Roof
	Window

4 (b) Limestone is used to make the different materials that are used in the building of a house.

4 (b) (i) How is limestone removed from the ground?

[1 mark]

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**4 (b) (ii)** Limestone is used to make cement.

Describe how cement is made using limestone.

[2 marks]

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**4 (b) (iii)** To make concrete the cement is mixed with water.

State **two** other materials that must be added to the mix to make concrete.

[2 marks]

1 \_\_\_\_\_

2 \_\_\_\_\_

**4 (c) (i)** Copper is used for electrical wiring in houses.

Give **one other** use of copper in the building of houses **and** the property that makes copper suitable for this use.

[2 marks]

Draw a ring around the correct answer.

Use of copper:                    **guttering**                    **water pipes**                    **window frames**

Property \_\_\_\_\_

\_\_\_\_\_

**4 (c) (ii)** Suggest why steel would not be a suitable material for the use you chose in part (c)(i).

[1 mark]

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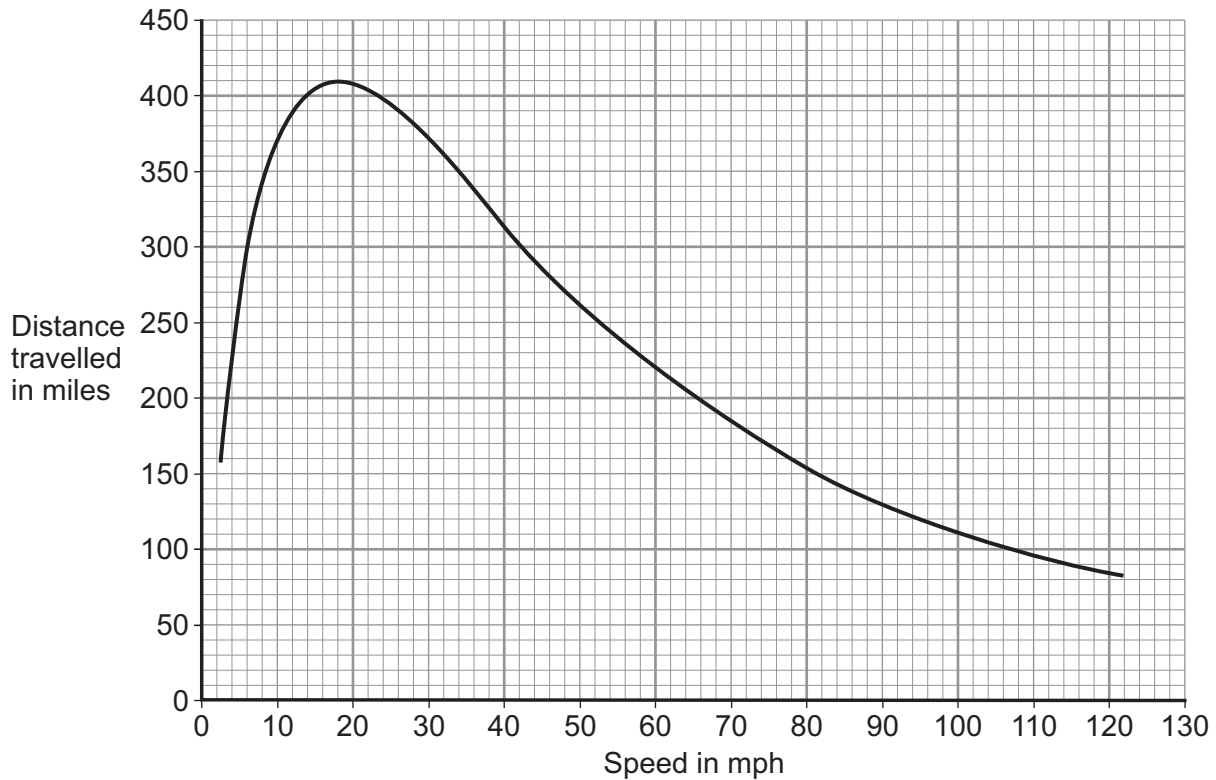
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- 5 Modern electric cars can travel over 400 miles before the car's battery needs recharging.

**Figure 6** shows how the distance travelled by an electric car before the battery needs recharging depends on the speed of the electric car.

**Figure 6**



- 5 (a) Describe the trend shown in **Figure 6**.

**[3 marks]**

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**5 (b)** Some people complain that electric cars are causing air pollution because they use electricity generated by burning methane.

**5 (b) (i)** Complete the word equation to show the burning of methane to generate electricity.

**[2 marks]**

methane + \_\_\_\_\_ → \_\_\_\_\_ + water

**5 (b) (ii)** Methane is a hydrocarbon.

What elements are in a hydrocarbon?

**[1 mark]**

Tick (✓) **one** box.

Elements	Tick (✓)
Carbon, hydrogen and oxygen	
Carbon, hydrogen and nitrogen	
Carbon and hydrogen only	

6

**Turn over for the next question**

**Turn over ►**



**6** The human body needs to control body temperature and to control blood glucose levels.

**6 (a)** Give **two** ways the body keeps cool on a hot day.

[2 marks]

1 \_\_\_\_\_

2 \_\_\_\_\_

**6 (b)** A person with diabetes is unable to control their blood glucose levels.

One way to control diabetes is to take drugs such as insulin.

Give **two** other ways to control diabetes.

[2 marks]

1 \_\_\_\_\_

2 \_\_\_\_\_

**6 (c)** Insulin can be made by genetically modified bacteria grown in a culture.

**Table 1** shows how the number of live bacteria in the culture changes over a 24-hour period.

**Table 1**

<b>Time in hours</b>	<b>Number of live bacteria in millions of cells</b>
0	5
4	15
8	140
12	180
16	160
20	70
24	0

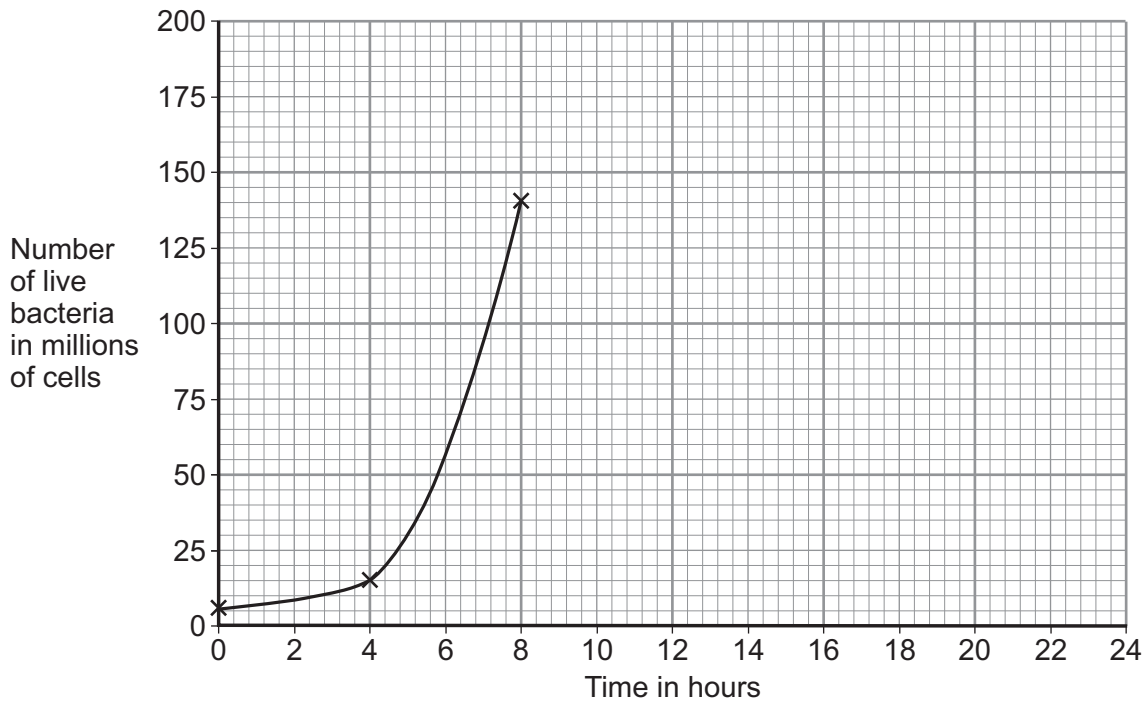


**6 (c) (i)** Plot the results from **Table 1** to complete the graph in **Figure 7**.

You should complete the line of best fit.

**[3 marks]**

**Figure 7**



**6 (c) (ii)** Scientists want to get the largest number of live bacteria.

Use **Figure 7** to suggest how many hours the bacteria should be left to grow to get the largest number of live bacteria.

**[1 mark]**

---

8

Turn over ►



**7 (a)** Give **one** property that is the same for all electromagnetic waves.

[1 mark]

Draw a ring around the correct answer.

**frequency**

**speed in a vacuum**

**wavelength**

**7 (b) (i)** **Table 2** shows some types of electromagnetic waves and some uses of electromagnetic waves.

Complete **Table 2**.

[4 marks]

**Table 2**

Type of electromagnetic wave	Use
Ultraviolet	
X-rays	
	Mobile phones
	Remote controls for televisions

**7 (b) (ii)** Energy is carried by electromagnetic waves.

Describe how the energy carried by an electromagnetic wave changes with the wavelength of the wave.

[1 mark]

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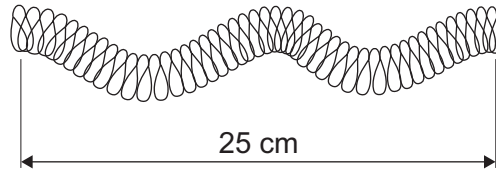
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**7 (c)** A teacher demonstrates how waves travel using a slinky spring.

The resulting wave is shown in **Figure 8**.

**Figure 8**



The wave produced has a frequency of 5 Hz.

**7 (c) (i)** How many complete waves are shown in **Figure 8**?

[1 mark]

Draw a ring around the correct answer.

2

4

5

**7 (c) (ii)** Calculate the velocity of the wave shown in **Figure 8**.

Use the Equations Sheet to help you answer the question.

[2 marks]

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Velocity of wave = \_\_\_\_\_ cm/s

9

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**8** A student planned to investigate the change in mass of the reaction mixture when different metal carbonates react completely with **excess** hydrochloric acid.

**8 (a) (i)** Name a piece of equipment the student should use to measure the volume of hydrochloric acid.

[1 mark]

---

**8 (a) (ii)** State **one** variable the student should keep the same in this investigation.

[1 mark]

---

**8 (b) (i)** The chemical reaction can be shown as a word equation.

hydrochloric acid + metal carbonate  $\longrightarrow$  salt + carbon dioxide + water

What type of chemical reaction is shown in the chemical equation?

[1 mark]

Tick (✓) **one** box.

	Tick (✓)
Displacement	
Neutralisation	
Oxidation	

**8 (b) (ii)** Why does the mass of the reaction mixture change during the reaction?

[1 mark]

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**8 (b) (iii)** What readings should the student take in this investigation?

[1 mark]

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**Question 8 continues on the next page**

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11

**END OF QUESTIONS**



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