

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  
June 2012

## Science B

SCB2FP

### Unit 2 My Family and Home

F

#### Written Paper

Friday 15 June 2012 1.30 pm to 2.30 pm

**For this paper you must have:**

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

**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 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**

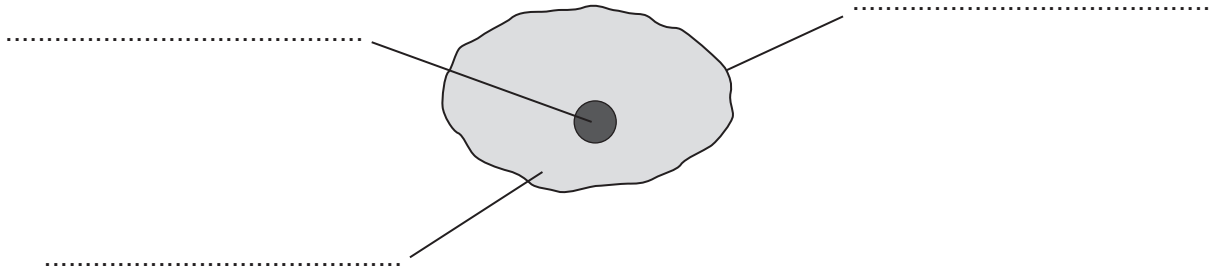
- In all calculations, show clearly how you work out your answer.



J U N 1 2 S C B 2 F P 0 1

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

- 1 The diagram shows an animal cell.



Use the correct words from the box to label the diagram.

cytoplasm

nucleus

cell wall

cell membrane

(3 marks)

3



2 The use of some energy sources has disadvantages.

Draw **one** line from each disadvantage to the energy source that has the disadvantage described.

**Disadvantage**

Using this source has the greatest effect on global warming.

Using this source produces radioactive waste.

Farmland may be flooded to set up this source.

This source is not always available.

**Energy source**

Nuclear

Hydroelectric

Wind

Wood

Fossil fuel

(4 marks)

4

**Turn over for the next question**

**Turn over ►**



**3** Draw a ring around the correct answer to complete each sentence.

**3 (a)** Limestone is mixed with clay and heated strongly to make

cement.  
quicklime.  
slaked lime.

(1 mark)

**3 (b)** The chemical name for quicklime is

calcium carbonate.  
calcium hydroxide.  
calcium oxide.

(1 mark)

**3 (c)** Cement, sand and water are mixed to make

concrete.  
glass.  
mortar.

(1 mark)

**3 (d)** Slaked lime is made when water is added to

calcium carbonate.  
calcium hydroxide.  
calcium oxide.

(1 mark)

4



**4 (a)** The stomach contains hydrochloric acid.

Give **two** functions of hydrochloric acid in the stomach.

1 .....

.....

2 .....

.....

(2 marks)

**4 (b)** Hydrochloric acid will damage living tissue.

A thick layer of alkaline mucus covers the lining of the stomach.

Suggest **two** ways the mucus protects the stomach lining.

1 .....

.....

2 .....

.....

(2 marks)

4

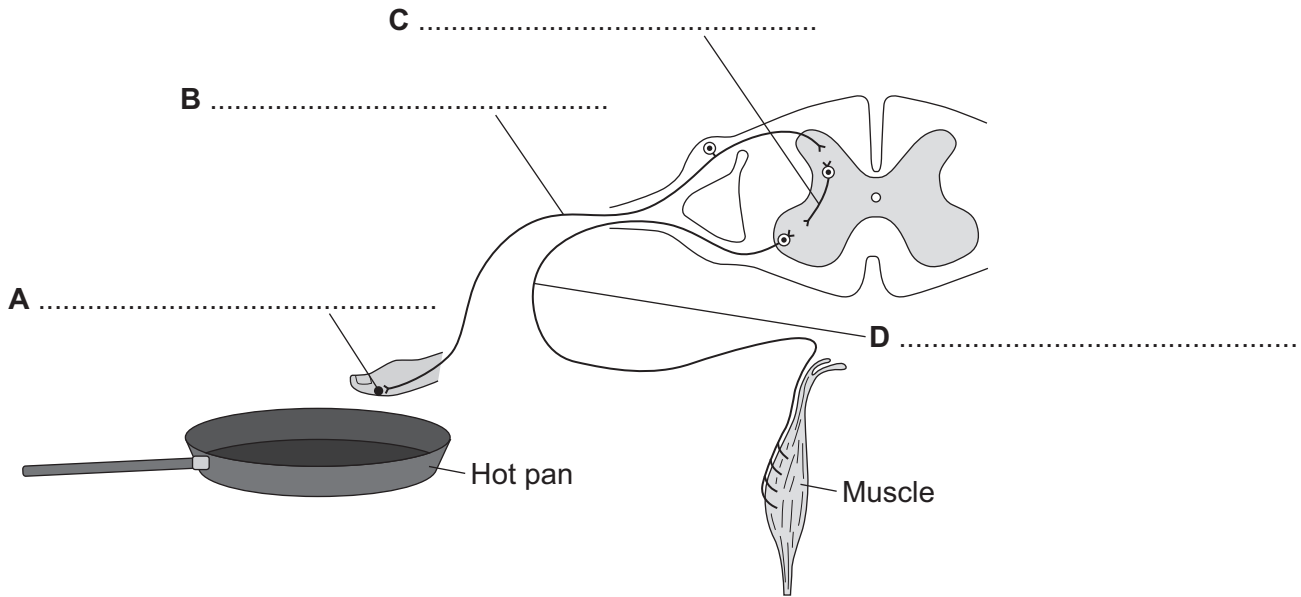
**Turn over for the next question**

**Turn over ►**



**5 (a)** The nervous system is one control system in the body.

The diagram shows part of the nervous system that allows a rapid automatic response when a finger touches a hot pan.



**5 (a) (i)** Use the correct words from the box to label **A**, **B**, **C** and **D** on the diagram.

relay neurone    receptor    motor neurone    effector    sensory neurone

(4 marks)

**5 (a) (ii)** The sentences describe how the response happens when the finger touches the hot pan. Complete the sentences.

The heat from the hot pan is the .....

The nerve impulse is made by the .....

The finger is moved when the .....

(3 marks)

**5 (a) (iii)** What is the name given to a rapid automatic response?

.....

(1 mark)



**5 (b)** Another control system in the body uses chemicals.

Complete the sentences.

Chemicals, such as insulin, that control body processes

are called .....

The chemical is secreted by a gland and is carried to the organ it affects by

the .....

The organ that the chemical affects is called the ..... organ.

(3 marks)

11

**Turn over for the next question**

**Turn over ►**



**6 (a)** Some disorders are caused by the genes we inherit.

Which disorder in the list can be inherited?

Draw a ring around the correct answer.

**Typhoid**

**Haemophilia**

**Malaria**

(1 mark)

**6 (b)** Polydactyly is a genetically inherited disorder. It is caused by an altered gene.

The picture shows the hand of someone with polydactyly. The picture was made using photographic paper.



**6 (b) (i)** Draw a ring around the correct answer to complete the sentence.

The picture was made using

infrared rays.
radio waves.
X-rays.

(1 mark)





**6 (b) (ii)** The radiation used to make the picture turns photographic paper black.

Suggest why the bones are a paler colour than the rest of the hand in the picture.

.....  
 .....  
 .....

(1 mark)

**6 (b) (iii)** What effect does the altered gene have on the hand shown in the picture?

.....

(1 mark)

**6 (c) (i)** Different forms of a gene are called alleles.

The allele that causes polydactyly is dominant, **G**.

The allele that does not cause polydactyly is recessive, **g**.

A man has polydactyly but his wife does not have polydactyly.

The man and his wife want to know the chances of their children inheriting polydactyly.

Complete the Punnett square for the man and his wife by writing the correct letter or letters in the spaces.

		<b>Wife</b>	
		g	g
<b>Man</b>	G	.....	.....
	.....	gg	.....

(3 marks)

**6 (c) (ii)** What is the chance of one of their children having polydactyly?

.....

(1 mark)

8
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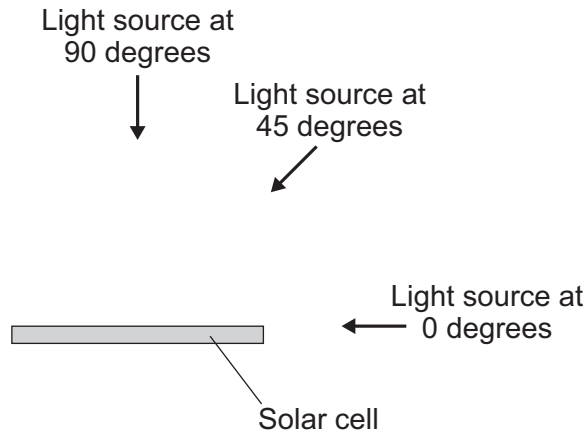
Turn over ►



- 7 A scientist did an experiment to find out how the position of a light source affects the voltage produced by a solar cell.

The scientist moved the light source to change the angle between the light and the solar cell.

He kept the distance between the light source and the centre of the solar cell the same each time he moved the light source.



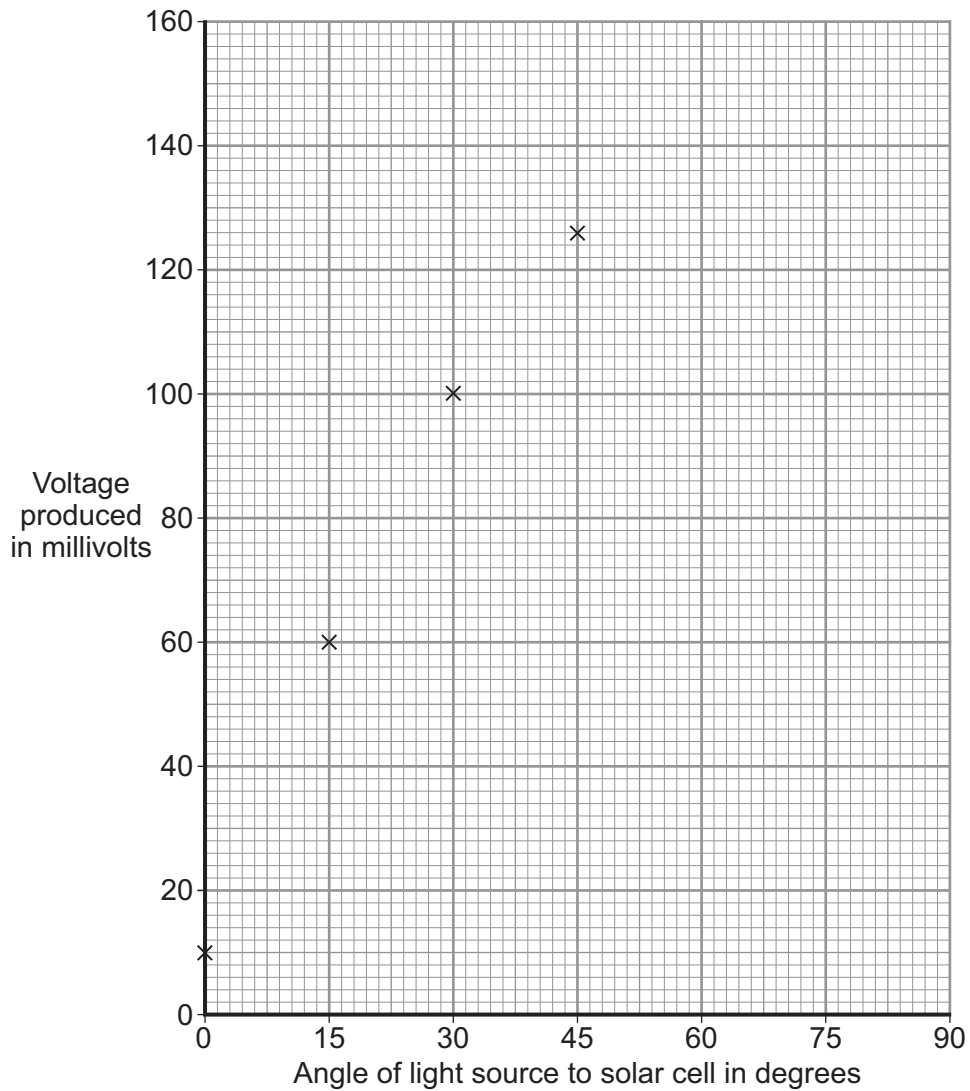
The scientist measured the voltage produced by the solar cell for each angle.

The scientist's results are shown in the table.

Angle of light source to solar cell in degrees	Voltage produced in millivolts
0	10
15	60
30	100
45	126
60	140
75	148
90	150



7 (a) (i) Plot the missing values on the graph and draw a smooth curve through all the points.



(3 marks)

7 (a) (ii) Describe the relationship between the angle of the light source to the solar cell and the voltage produced.

.....

.....

.....

.....

.....

(2 marks)

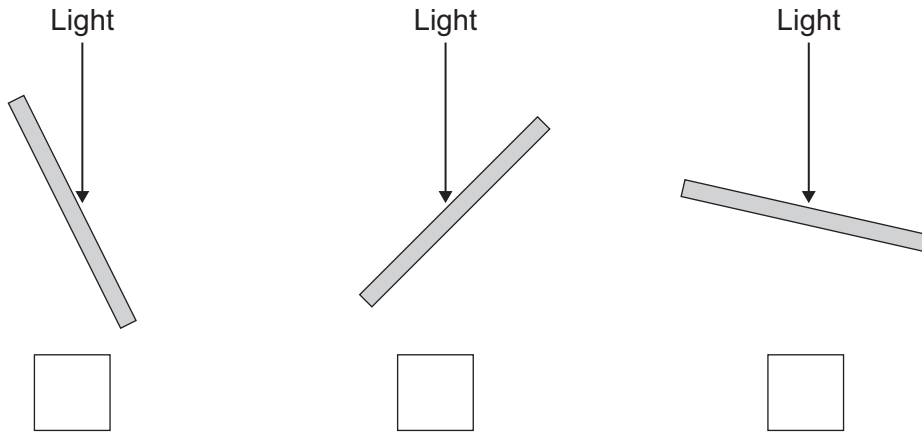
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**7 (b) (i)** The diagrams show a solar cell at different angles to a ray of sunlight.

Which diagram shows the best position for the solar cell?

Tick (✓) the correct answer.



(1 mark)

**7 (b) (ii)** Explain why you chose your answer for **7 (b) (i)**. You should refer to the graph on page 11 in your answer.

.....

.....

.....

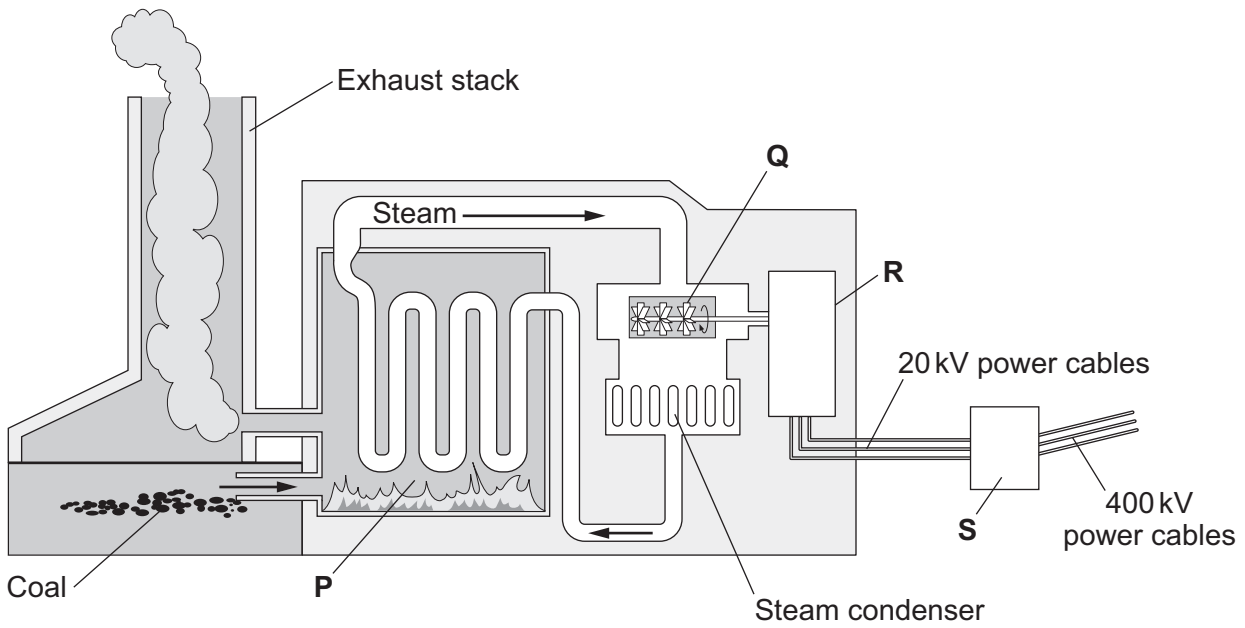
.....

.....

(2 marks)



8 The diagram shows a power station.



8 (a) The parts of the power station are listed below. Name each part and describe what it does.

8 (a) (i) Part P is .....  
 What Part P does .....  
 .....  
 (1 mark)

8 (a) (ii) Part Q is .....  
 What Part Q does .....  
 .....  
 (1 mark)

8 (a) (iii) Part R is .....  
 What Part R does .....  
 .....  
 (1 mark)

8 (a) (iv) Part S is .....  
 What Part S does .....  
 .....  
 (1 mark)

Turn over ►



**8 (b)** Some students sharing a house were worried about their electricity bill.

The students decided to record how much electricity they used.

The students found that they used 133 units in one week.

One unit of electricity costs 12p.

**8 (b) (i)** Calculate the cost of the electricity that the students used in the week.

.....  
.....

Cost ..... p  
(1 mark)

**8 (b) (ii)** During the week the students used an electric oven.

The oven used a total of 42 units.

What percentage of the total electricity used in the week did the oven use?

.....

..... %  
(1 mark)

**8 (b) (iii)** Cooking using the electric oven costs the students £5.04 a week.

The students found that if they did the cooking using a microwave they would use only 3.75 units in the week.

They bought a microwave for £91.80.

How many weeks did it take for the saving on the electricity bill to cover the cost of the microwave?

.....  
.....  
.....  
.....

..... weeks  
(4 marks)



**8 (c)** The students used a kettle for a total of 30 minutes each day.  
The kettle used 7 units in the week.  
Calculate the power of the kettle.  
Use the Equations Sheet to help you work out your answer.

.....  
.....  
.....

Power ..... kilowatts  
(2 marks)

12

**Turn over for the next question**

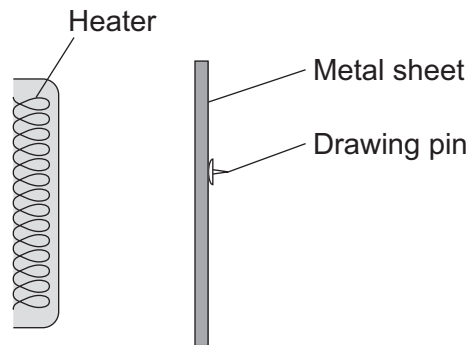
**Turn over ►**



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

A student did an experiment to investigate heat conduction by five different metals.

The student used the apparatus shown in the diagram.



The student stuck the drawing pin onto the metal sheet using wax.

The student turned on the heater. The heat melted the wax so the drawing pin fell off.

The student recorded the time taken for the pin to fall off.

The student's results are shown in the table.

Metal	A	B	C	D	E
Thickness of metal	5	5	4	6	5
Area of metal surface	100	100	100	100	100
Surface of metal	black	orange	silver	grey	black
Distance from heater	20	20	20	20	20
Mass of drawing pin	1.1	1.1	1.2	1.3	1.0
Time taken to fall off	9.3	11.1	12.2	8.0	13.2







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