

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 2013

Science B

SCB3FP

Unit 3 Making My World a Better Place

F

Written Paper

Thursday 13 June 2013 9.00 am to 10.00 am

For this paper you must have:

- a ruler.
- You may use a calculator.

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 6 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 3 S C B 3 F P 0 1

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

- 1 (a)** Many people in the UK are allergic to substances which pollute air. One common pollutant in the home is dust.

Draw a ring around **two** common symptoms people experience when pollution in the home is high.

bruising **dizziness** **toothache** **itchy nose**

(2 marks)

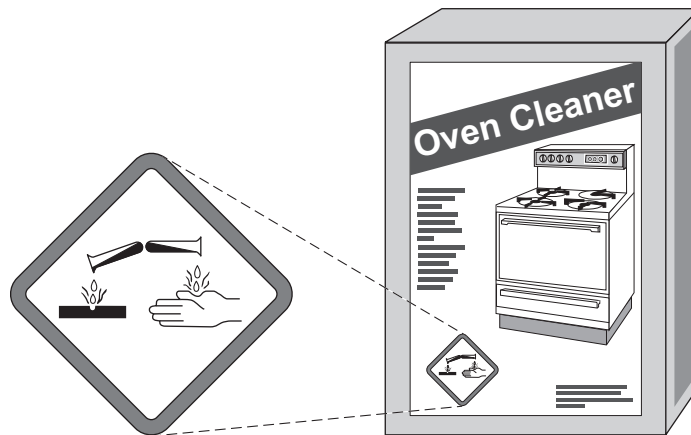
- 1 (b)** One way to reduce pollution in the home is to use cleaning products that do **not** produce fumes.

- 1 (b) (i)** Suggest **one** other way people can reduce pollution in the home.

.....
(1 mark)

- 1 (b) (ii)** A man buys some oven cleaner to use in his house.

The diagram shows the oven cleaner he buys.



Draw a ring around the correct answer to complete the sentence.

The hazard symbol on the box shows that the oven cleaner is

corrosive.

flammable.

toxic.

(1 mark)



1 (b) (iii) The man has young children at home so he keeps the oven cleaner locked in a cupboard.

When he uses the oven cleaner to clean the oven he must protect himself.

Give **two** ways the man can protect himself from the hazards of using the oven cleaner.

1

2

(2 marks)

1 (b) (iv) The man wants to reduce his impact on the environment.

The oven cleaner box is made of cardboard.

Suggest **one** way the man could dispose of the oven cleaner box to reduce his impact on the environment.

.....

.....

(1 mark)

7

Turn over for the next question

Turn over ►



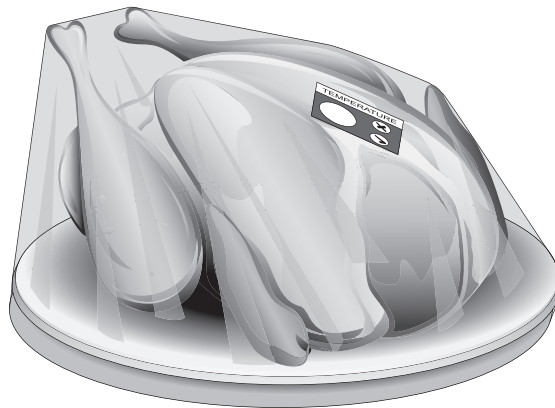
2 Smart materials are designed to improve our health and lifestyle.

2 (a) Draw **one** line from each of the smart materials to the correct use.

Smart material	Use
Photochromic	Coating on cars
Smart paint	Spectacle lenses
	Thermometer strip

(2 marks)

2 (b) The diagram shows a smart material label on a frozen chicken in a supermarket.



The smart material label changes colour if the frozen chicken gets too warm and defrosts.

2 (b) (i) What type of smart material is the label made of?

..... (1 mark)



2 (b) (ii) Supermarket freezers have thermometers to show if the temperature of the freezer is too high.

If the frozen chicken gets too warm and defrosts the smart material label changes from blue to red. The colour **cannot** change back.

Suggest **one** advantage and **one** disadvantage of using the smart material label as well as the freezer thermometer.

Advantage

.....

Disadvantage

.....

(2 marks)

5

Turn over for the next question

Turn over ►



3 (a) (i) Children can get many different childhood diseases.

Draw **one** line from each disease to the organisms that cause the disease.

Disease	Organisms
Cholera	Bacteria
Measles	Fungi
	Viruses

(2 marks)

3 (a) (ii) Draw a ring around the correct answer to complete each sentence.

Viruses that cause diseases like influenza are called

decomposers.
pathogens.
pollutants.

Influenza viruses can enter the body through the

breathing
excretory
nervous

system when we mix

with

healthy
infected
injured

people.

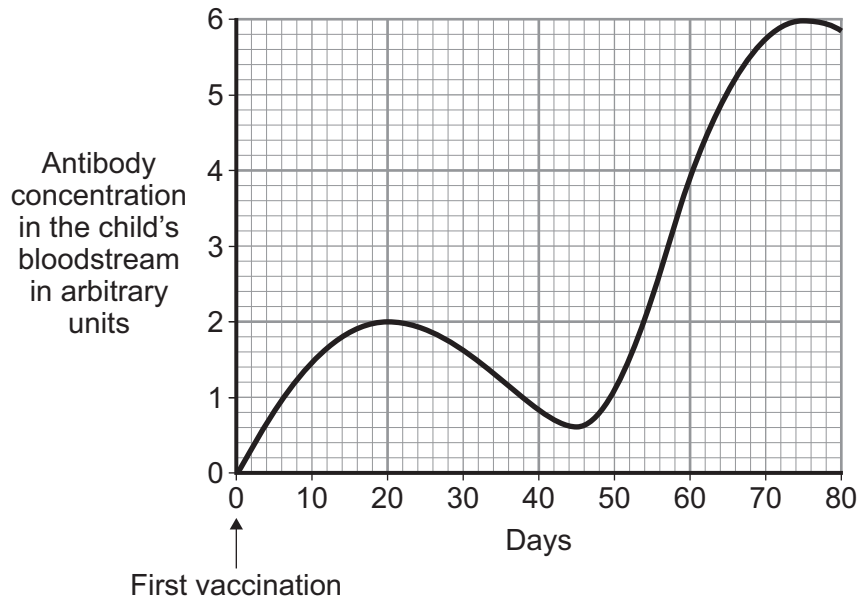
(3 marks)



3 (b) Vaccinations help our bodies resist infections.

Children in the UK have two vaccination injections against meningitis.

A child is vaccinated against meningitis. The graph shows how the concentration of antibodies in the child's bloodstream changes after each vaccination.



Use data on the graph to answer the following questions.

3 (b) (i) The graph shows when the first vaccination was given.

Suggest what day the second vaccination was given.

.....
(1 mark)

3 (b) (ii) What is the highest concentration of antibodies produced by the first vaccination?

..... arbitrary units
(1 mark)

3 (b) (iii) By which day is the child's ability to fight meningitis at its peak?

.....
(1 mark)

Question 3 continues on the next page

Turn over ►



3 (c) Suggest how the number of children getting meningitis will change as more children are vaccinated against meningitis.

Give a reason for your answer.

.....

.....

.....

.....

(2 marks)

10



Turn over for the next question

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ANSWER IN THE SPACES PROVIDED**

Turn over ►



4 Many items in our houses are electroplated with a metal, such as silver.

4 (a) Companies electroplate household items for many reasons.

Tick (✓) **two** reasons why companies electroplate household items.

For decoration

So that it is self-healing

To prevent corrosion

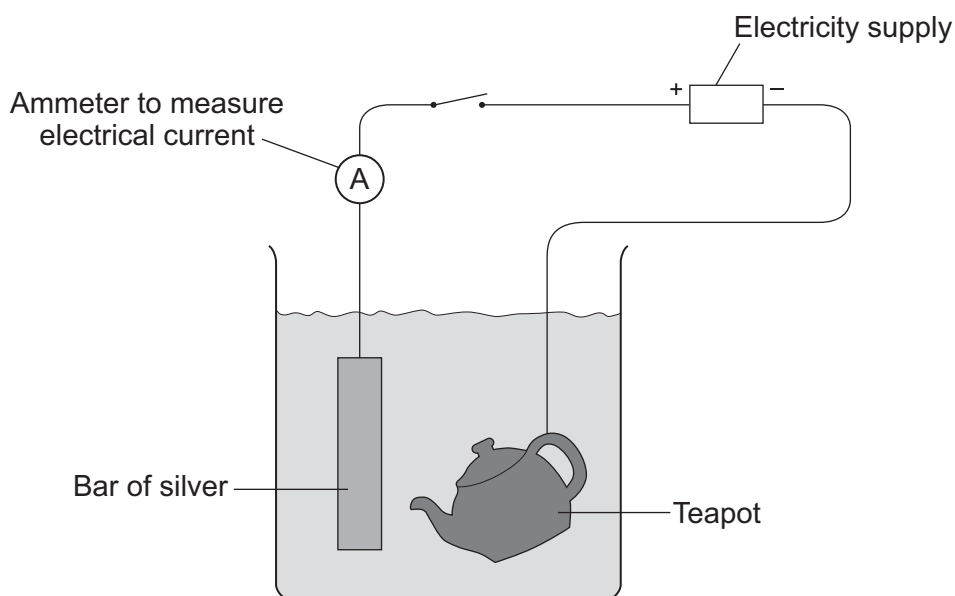
To stop it breaking

(2 marks)

4 (b) A company sells teapots. The company electroplates the teapots with silver before they are sold.

A scientist does an investigation to find out if the current used in the electroplating process affects how quickly the teapot can be electroplated.

The equipment he uses is shown in the diagram.



The scientist's results are shown in the table.

Electrical current in amps	Average time to electroplate one teapot in minutes
1	20.0
2	10.0
4	5.0
8	2.5

4 (b) (i) What is the name of the electrode attached to the positive terminal of the battery?

.....
(1 mark)

4 (b) (ii) The scientist suggests using a current of 16 A.

Use the table of results to suggest how long it will take to electroplate one teapot at a current of 16 A.

..... minutes
(1 mark)

4

Turn over for the next question

Turn over ►



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5 (a) (i) Many people are prescribed drugs each year.

These prescribed drugs are legal.

The drugs are prescribed for a number of reasons.

Tick (✓) **two** reasons why doctors prescribe drugs.

To cure a disease

To give the person hallucinations

To improve the person's quality of life

To stop antibiotics becoming resistant

(2 marks)

5 (a) (ii) Draw a ring around the correct answer to complete each sentence.

Penicillin is

an antibiotic.
an antidepressant.
a painkiller.

An example of an anti-inflammatory drug is

alcohol.
aspirin.
paracetamol.

Some drugs treat the symptoms of a disorder, but do not cure it.

One example of a drug used to treat symptoms of a disorder is

alcohol.
an antibiotic.
an antidepressant.

(3 marks)

Turn over ►



5 (b) It is claimed that over 25% of people smoke cigarettes.

Cigarettes contain tobacco.

Tobacco contains addictive drugs.

Name the main addictive drug found in tobacco.

.....
(1 mark)

5 (c) Many people are prescribed drugs by doctors to help them stop smoking.

The table shows how the number of prescriptions for drugs to help people stop smoking changed from 2007 to 2011.

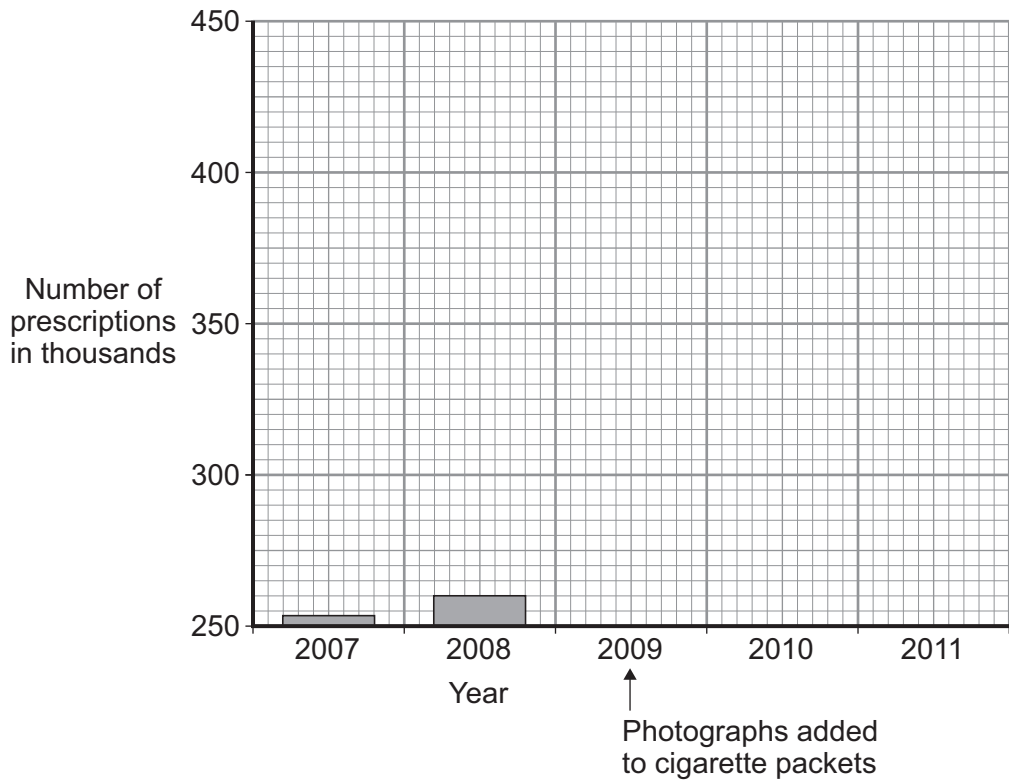
Year	Number of prescriptions for drugs to help people stop smoking in thousands
2007	254
2008	260
2009	340
2010	380
2011	420



5 (c) (i) The bar chart shows how the number of prescriptions for drugs to help people stop smoking has changed from 2007 until 2011.

Use the data from the table to complete the bar chart.

The first and second bars have been done for you.



(2 marks)

5 (c) (ii) In 2009 shocking photographs were added to cigarette packets.

What evidence is there in the bar chart to suggest that the photographs on cigarette packets had an effect on smokers wanting to stop smoking?

.....

.....

.....

.....

.....

.....

(3 marks)

Turn over ►



5 (c) (iii) Smoking has been discouraged over the last 20 years.

Suggest **two** ways, other than the addition of photographs to cigarette packets, that smoking has been discouraged.

1

.....

2

.....

(2 marks)

13



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

X-rays are used to treat **and** diagnose medical conditions, but they are also hazardous to people.



Explain how the properties of the X-rays allow treatment and diagnosis of medical conditions, and describe the possible disadvantages of the use of X-rays.

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(6 marks)

6

Turn over ►



7 Many people are concerned about the effect we are having on our environment.
Making and using products can increase greenhouse gas emissions.

7 (a) (i) Name **one** greenhouse gas produced from combustion of fuels in power stations.

.....
(1 mark)

7 (a) (ii) Name a different greenhouse gas that is made during decomposition in landfill sites.

.....
(1 mark)

7 (a) (iii) In 2008, 37 countries agreed to reduce greenhouse gas emissions by 2012.

What was the name of this agreement?

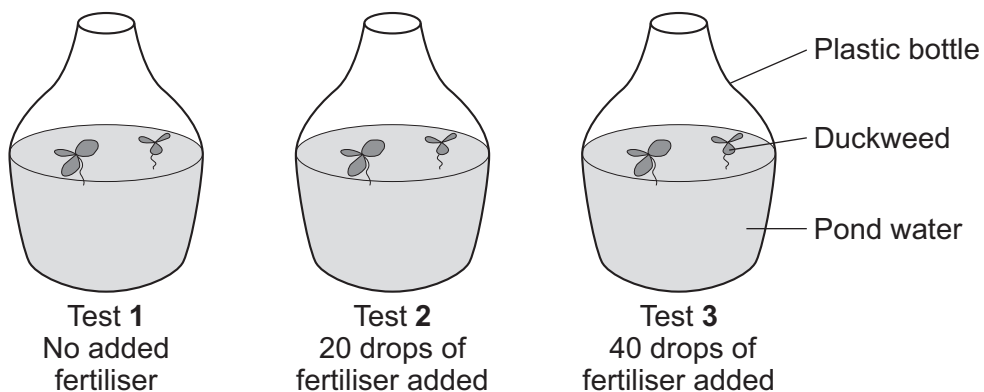
.....
(1 mark)

7 (b) Some greenhouse gases are released from the overuse of fertilisers.

Overuse of fertilisers also causes eutrophication.

A farmer wanted to investigate the possible effect of fertilisers on the health of the animals and plants in his pond.

The apparatus the farmer used is shown in the diagram.



Duckweed is a plant found on the surface of ponds. The farmer set up three tests:

- Test 1 – no fertiliser added
- Test 2 – 20 drops of fertiliser added
- Test 3 – 40 drops of fertiliser added.

The farmer counted the number of duckweed leaves in each test at the start of the investigation (Day 0).

He counted the number of duckweed leaves every 2 days.

His results are shown in the table.

Day	Number of duckweed leaves		
	Test 1	Test 2	Test 3
0	19	18	19
2	30	34	40
4	42	50	59
6	58	69	81
8	78	92	108

7 (b) (i) Why did the farmer set up Test 1?

.....
(1 mark)

7 (b) (ii) Describe the patterns shown by the data in the table.

.....
.....
.....
.....
(2 marks)

Turn over ►



7 (b) (iii) There was an accident on the farm and fertiliser drained in to the farmer’s pond.

Describe the effect the fertiliser could have on the pond.

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.....

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(4 marks)

10

8 Energy consultants give home owners advice about the efficiency and cost-effectiveness of energy-saving measures.

U-values measure the rate of energy loss through a substance.

The U-value of a single glazed window is 5.0.

The table gives information about the U-value and cost of adding different energy-saving measures to a single glazed window.

Energy-saving measure	Combined U-value	Cost of energy-saving measure in £	Payback time in years
Thermal curtain lining	3.2	100	2
Insulated shutters	1.6	1200	16
Roller blind	3.0	360	



8 (a) The roller blinds will save £40 each year.

Calculate the payback time for the roller blinds.

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

..... years
(2 marks)

8 (b) Use data in the table on page 20 and your answer to 8(a) to answer the questions.

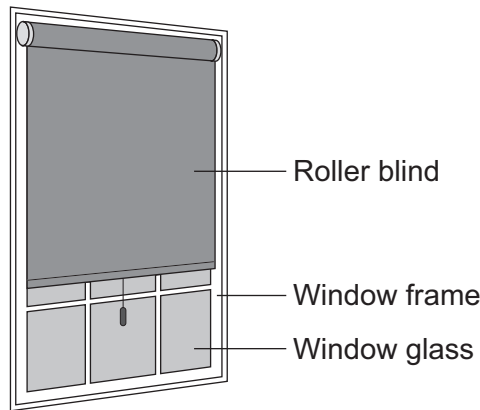
8 (b) (i) Which of the energy-saving measures is most efficient at reducing heat loss?

.....
(1 mark)

8 (b) (ii) Which of the energy-saving measures is most **cost-effective** over a 10-year period?

.....
(1 mark)

8 (c) The diagram shows a roller blind fitted to a window frame.



Suggest how the roller blind reduces heat loss through the window.

.....
.....

(1 mark)

END OF QUESTIONS

5



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