

Specimen Paper

Centre Number						Candidate Number					
Surname											
Other Names											
Candidate Signature											



General Certificate of Secondary Education
Foundation Tier
Specimen Paper

Science B (Science in Context)

Unit 3 Making My World a Better Place

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.

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
TOTAL	

F

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

1 It is important for our health to have a clean environment in our homes.

1 (a) Which **one** of these is a common pollutant in the home?

Draw a ring around **one** answer.

carbon dioxide

pollen

steam

(1 mark)

1 (b) High levels of carbon monoxide in the home can be dangerous.

Which of these is **not** a common symptom of exposure to carbon monoxide?

Draw a ring around **one** answer.

headache

a rash

dizziness

tiredness

(1 mark)

1 (c) The picture shows two cleaning products used in the home.



Product A



Product B

1 (c) (i) What hazard does the symbol on **Product A** show?

.....
(1 mark)

1 (c) (ii) If you were using **Product B** what precaution should you take?

Tick (✓) **one** box.

Wash hands before using.

Turn off electricity.

Keep the room well ventilated.

(1 mark)

1 (d) Sometimes the fuel in a domestic boiler does not burn completely.

Which **two** statements about incomplete combustion in boilers are correct?

Tick (✓) **two** boxes.

Incomplete combustion reduces the energy output.

The products formed are not harmful.

Incomplete combustion has no effect on the efficiency of a boiler.

The products of incomplete combustion can be toxic.

(2 marks)

6

Turn over for the next question

Turn over ►

2 Radiographers work in hospitals to produce images using X-rays.
These images help doctors to diagnose what is wrong with a patient.

2 (a) Which **two** statements about X-rays are correct?

Tick (✓) **two** boxes.

X-rays pass through dense material.

X-rays are used to diagnose broken bones.

X-rays are stopped by dense material.

X-rays can be used to view soft tissues.

(2 marks)

2 (b) What type of film is used to detect X-rays?

.....
(1 mark)

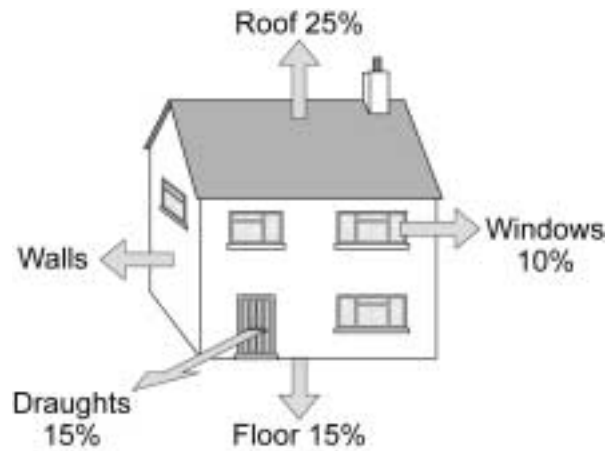
2 (c) X-rays can cause harm if a person is exposed to them for long periods of time.

How do radiographers monitor their exposure to X-rays?

.....
(1 mark)

- 3** Energy consultants tell their customers how to save money. They explain how people can reduce energy loss from their homes.

This picture shows the percentage energy loss from different parts of a house.



- 3 (a)** Heat can be transferred through materials in different ways.

- 3 (a) (i)** What is the main way heat is transferred around a room in a house?

.....
(1 mark)

- 3 (a) (ii)** What is the main way heat is transferred through the walls of a house?

.....
(1 mark)

- 3 (b)** Calculate the percentage energy loss through the walls of the house.

.....
.....
(1 mark)

- 3 (c)** Suggest the **two** most effective methods of reducing heat loss for this house.

1

2

(2 marks)

4 The table contains information about some new materials.

Complete the table by writing in **one** advantage of using each new material.

New material and its property	Use of material	Advantage of using this new material
Thermochromic plastic – changes colour permanently when temperature rises	Frozen food packaging
Memory metal – returns to original shape when warmed	Spectacle frames
Smart paint – heals after scratching	Painting cars
Photochromic glass – darkens reversibly in sunlight	Spectacle lenses

(4 marks)

4

5 Some objects can be electroplated (coated with metals).

The table shows information about some metals that are used for electroplating.

Metal	Properties of the metal
Zinc	Resistant to corrosion, poisonous.
Cadmium	Excellent corrosion resistance, can be dyed many colours, very toxic.
Tin	Resistant to corrosion, ductile, malleable, non-toxic.
Silver	Attractive, expensive, very good electrical conductor, does not cause allergies.
Chromium	Attractive, hard, durable, reduces friction and wear, toxic.

5 (a) Electroplating is used for many different reasons. Use information from the table and your own knowledge of nickel and steel to answer the questions.

5 (a) (i) Explain why nickel jewellery is electroplated with silver.

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

(2 marks)

5 (a) (ii) Explain why steel food cans are electroplated on the inside with tin.

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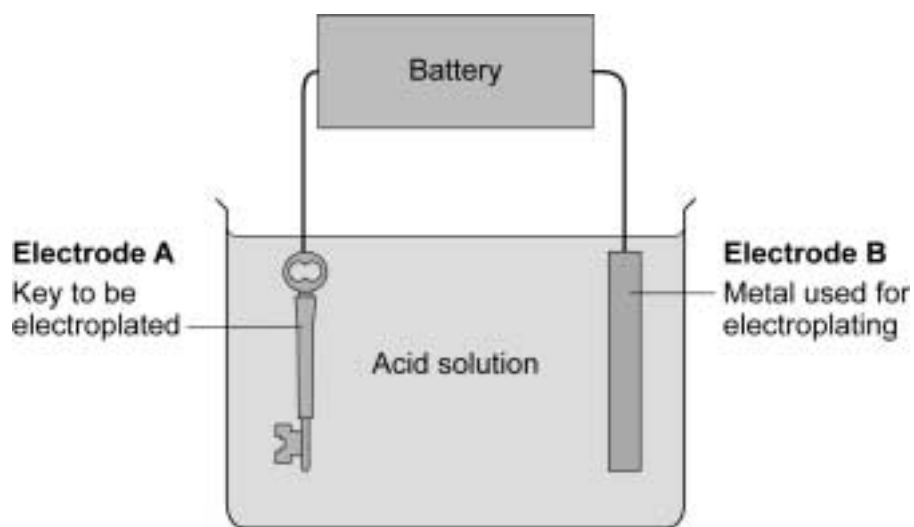
(2 marks)

Question 5 continues on the next page

Turn over ►

5 (b) The diagram shows how a key can be electroplated.

The key and the metal used for electroplating are used as the electrodes.



5 (b) (i) What is the name given to a positive electrode?

.....
(1 mark)

5 (b) (ii) What electrical charge is given to the key?

.....
(1 mark)

5 (c) Cadmium is used to coat parts of spacecraft, even though cadmium is extremely hazardous.

This is a page taken from some European Union guidance on using cadmium.

The European Union gives clear guidelines on the use of cadmium.

Working with cadmium is very dangerous because:

- breathing in cadmium can lead to lung problems and even death
- cadmium can cause many types of cancer
- eating food or drinking water contaminated with cadmium can damage the bones and kidneys.

Use the information to suggest the safety precautions that an electroplater should take when working with cadmium.

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(3 marks)

9

Turn over for the next question

Turn over ▶

6 This is part of a report on genetically modified (GM) cotton from a science journal.

Is GM cotton the way forward?

More than half (68%) of China's cotton production is genetically modified (GM) to produce a substance called Bt toxin. Cotton plants used to be treated by spraying them with artificial pesticides. Bt cotton has now enabled Chinese farmers to dramatically reduce artificial pesticide use.

Organic cotton is grown from non-GM seed and no artificial substances are used during the growing process.

6 (a) What is an artificial pesticide?

.....
.....
(1 mark)

6 (b) Suggest **two** reasons why reducing pesticide use on fields may benefit the environment.

1

.....

2

.....
(2 marks)

6 (c) What does 'genetically modified' mean?

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

6 (d) Suggest **two** reasons why the genetic change to the cotton plants increases the yield of the crop.

1

.....

2

.....

(2 marks)

7

Turn over for the next question

Turn over ►

7 Environmental scientists study the levels of pollution in lakes and rivers. They decide how dangerous the pollution is to organisms living in or around the water.

7 (a) Water pollution is often caused by chemicals used as fertilisers.

Complete the sentences.

When it rains, fertilisers wash off fields and into rivers or lakes.

This is called These fertilisers make water plants grow rapidly. The plants become overcrowded and die.

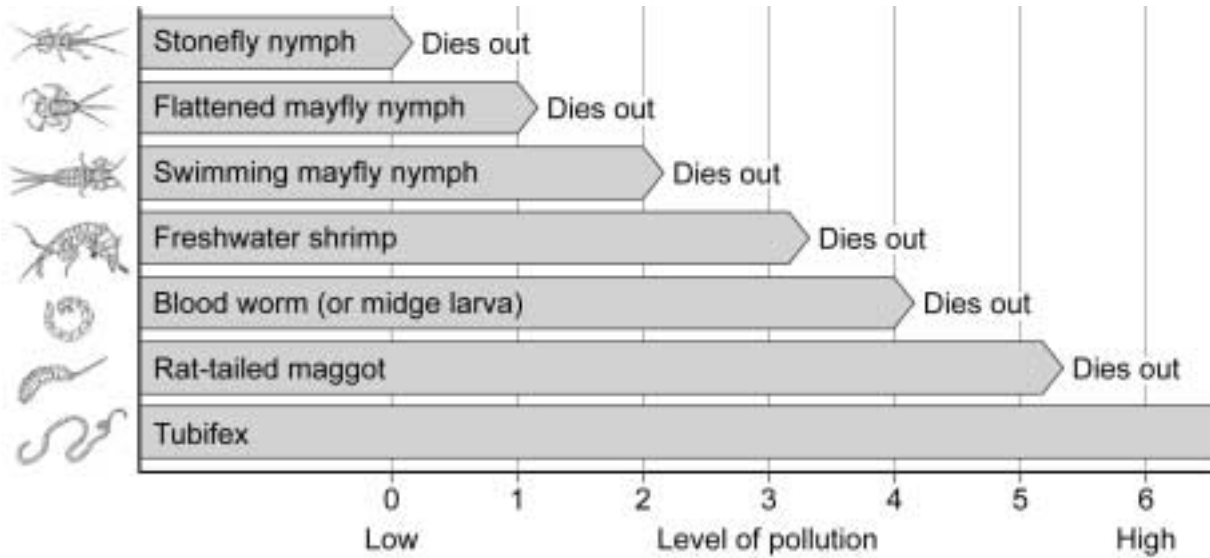
Bacteria cause the dead plants to decay and use up from the water.

This complete process is called

(3 marks)

7 (b) Some students were asked to study the pollution levels in a stream running through the school grounds.

They were given the chart shown below.



Describe how the students would use the information in the chart to determine how polluted the stream is.

.....

.....

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.....

(4 marks)

7

Turn over for the next question

Turn over ►

8 Some recreational drugs have harmful effects on the body.

8 (a) Name **two** harmful substances in tobacco smoke, and describe their harmful effect on the body.

.....

.....

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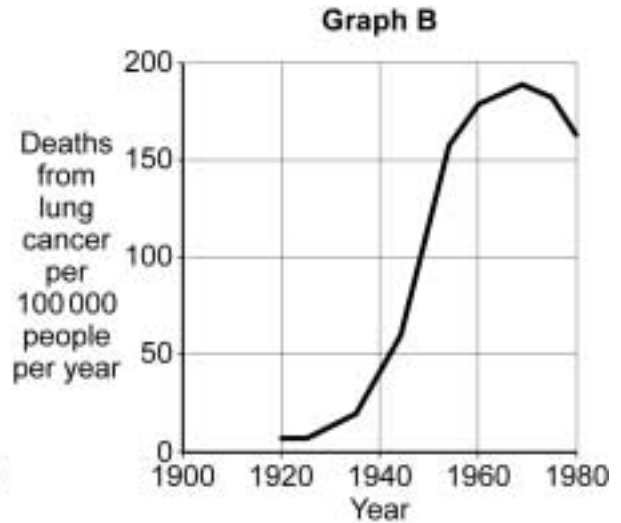
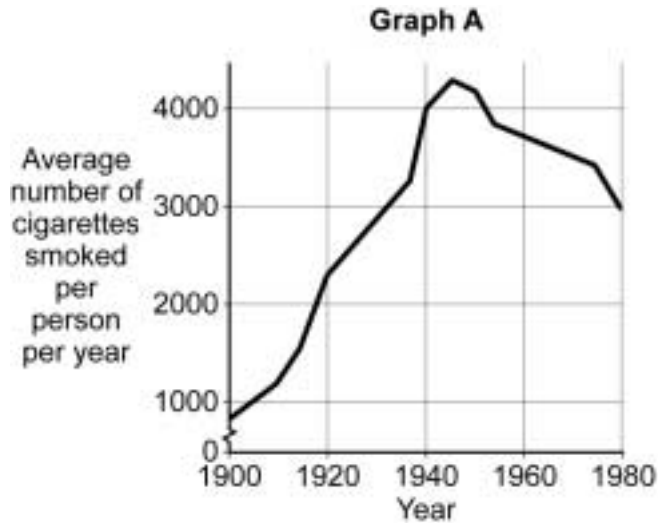
.....

.....

(4 marks)

8 (b) **Graph A** shows information about average numbers of cigarettes smoked in the UK.

Graph B shows information about numbers of deaths in the UK from lung cancer.



8 (b) (i) In 1920, the average number of cigarettes smoked per person was 2200.

How many more cigarettes per person were being smoked on average in 1940?

.....
.....

.....
(2 marks)

8 (b) (ii) What evidence is there in the graphs to suggest that smoking causes lung cancer?

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(3 marks)

Turn over for the next question

9

Turn over ▶

9 Medical scientists research microbes and the diseases they cause.

An important part of this research is identifying what type of microbe causes which disease.

9 (a) Many diseases in humans are caused by bacteria and viruses.

Tick (✓) the correct box in the table for each disease to show if the disease is caused by bacteria or viruses.

Disease	Caused by bacteria	Caused by viruses
Influenza		
Mumps		
Cholera		
Tuberculosis		

(3 marks)

There are no questions printed on this page

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