

Name:

Date:

C10 - Test 2
USING RESOURCES
Beginner

GCSE

CHEMISTRY

AQA - Combined Science

Mark

Grade

Materials

For this paper you must have:

- Ruler
- Pencil and Rubber
- Scientific calculator, which you are expected to use when appropriate

Instructions

- Answer all questions
- Answer questions in the space provided
- All working must be shown

Information

- The marks for the questions are shown in brackets

1.

This question is about drinking water.

- (a) Name **two** methods of treating water from rivers, lakes or the sea to produce drinking water.

Tick **two** boxes.

- Anaerobic digestion
- Cracking
- Desalination
- Electrolysis
- Sterilising

(2)

(b) The table below shows the amounts of dissolved ions in a sample of drinking water.

Dissolved ion	Mass in mg per dm ³
Cl ⁻	250
Na ⁺	200
NO ₃ ⁻	40

What is the name of the ion with the symbol Cl⁻?

Tick **one** box.

Calcium ion

Carbonate ion

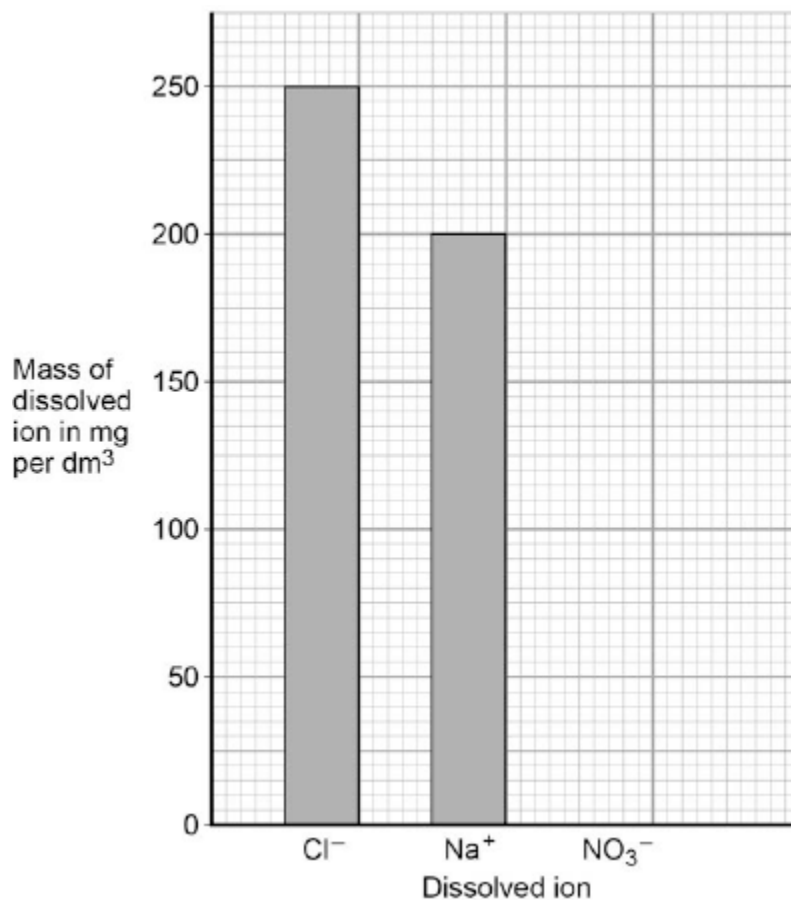
Chloride ion

Chlorine ion

(1)

(c) Use the information in the table above to complete the bar chart in **Figure 1**.

Figure 1



(1)

(d) Look at the questions labelled **A, B, C, D**.

A How many substances are there in drinking water?

B How much fluoride is in drinking water?

C Is fluoride soluble in drinking water?

D Should fluoride be added to drinking water?

Which **one** of the questions cannot be answered by science alone?

Tick **one** box.

A	
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B	
----------	--

C	
----------	--

D	
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(1)

(e) Give **two** reasons why the answer you have chosen cannot be answered by science alone.

1. _____

2. _____

(2)

(f) A sample of drinking water contains 1.5 mg of fluoride per dm^3 of water.
A person drinks 1 dm^3 of this water.

The recommended daily amount of fluoride is 4.0 mg.

Which calculation gives the percentage of the recommended daily amount of fluoride in 1 dm^3 of this water?

Tick **one** box.

$$\frac{1.5 \times 100}{4.0}$$

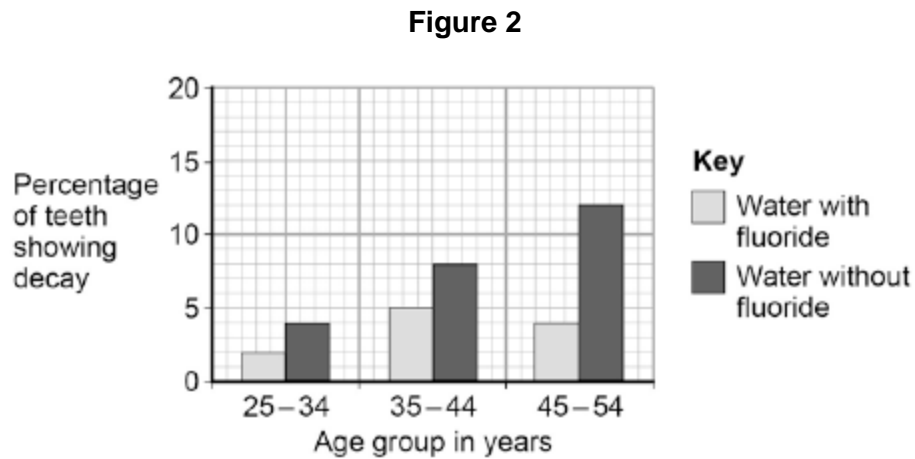
$$\frac{1.5 \times 4.0}{100}$$

$$\frac{4.0 \times 100}{1.5}$$

$$\frac{100}{1.5} \times 4.0$$

(1)

- (g) **Figure 2** shows the effect of fluoride in drinking water on tooth decay in different age groups.



Describe the pattern of tooth decay in **Figure 2** for water without fluoride.

Use data to justify your answer.

(2)

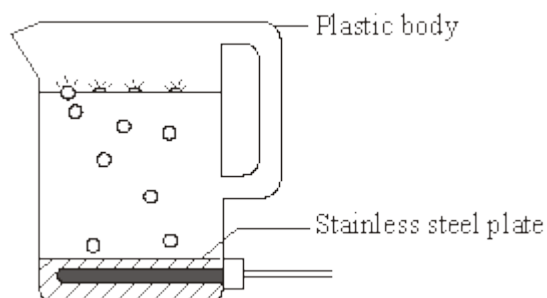
- (h) Describe the effect of adding fluoride to drinking water for the age groups in **Figure 2**.

(2)

(Total 12 marks)

2.

Plastics are used to make many everyday items, such as the body of the kettle.



(a) Complete the sentences by drawing a ring around the correct words.

(i) The plastic is made from many small molecules called

catalysts
monomers
polymers

(1)

(ii) Propene is produced by cracking some of the fractions that are

separated from

crude oil
limestone
metal ores

(1)

(b) After a few years the kettle no longer worked.

- Some parts of the kettle are made of plastic.
- Some parts of the kettle are made of stainless steel.
- The owner of the kettle disposed of it in a landfill site.

Consider these statements.

Suggest **three** reasons why the kettle should **not** be disposed of in a landfill site.

1. _____

2. _____

3. _____

(3)

(Total 5 marks)

3.

Water is important to all living organisms.

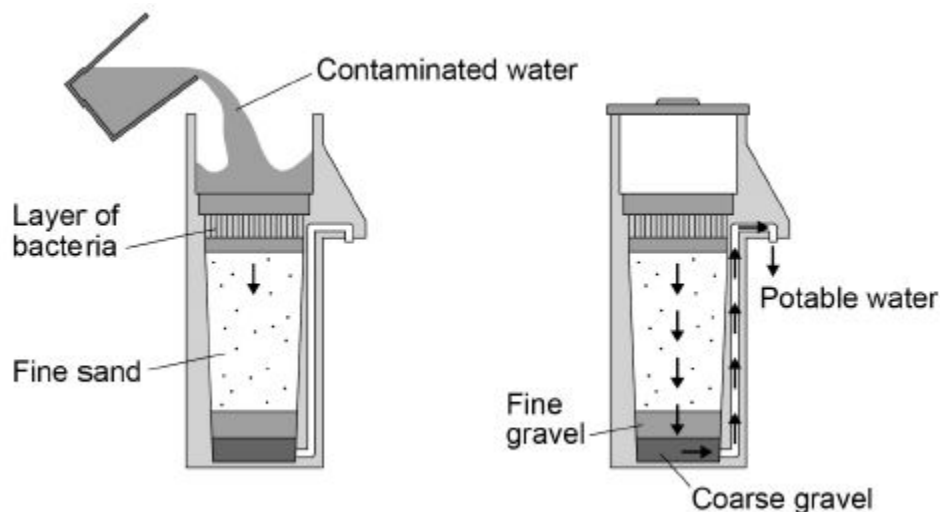
In some parts of Africa getting potable water may be difficult.

(a) What is potable water?

(1)

Biosand units are one method of purifying water used in some parts of Africa.

The diagram below shows a Biosand unit.



(b) Describe the role of the fine sand.

(1)

Another method of purifying water is Solar Disinfection (SODIS).

The table below gives some information about both methods.

Method	Description	Percentage reduction in pathogens that cause diarrhoea
Biosand unit	<p>Before use, it needs to be left for 2 weeks for the bacteria in the unit to grow.</p> <p>Can treat 40 litres of water per hour.</p> <p>Made of concrete.</p> <p>Needs replacing every 10 years.</p>	47
SODIS	<p>Plastic bottles are filled with water and left in sunlight. Ultraviolet (UV) kills bacteria.</p> <p>Bottles need to be left in sunlight for at least 8 hours.</p> <p>Bottles have to be replaced every 6 months.</p>	31

- (c) A 1 litre bottle for SODIS costs 29p. Each litre bottle needs replacing after 6 months.
A family uses 6 litres of potable water per day.
Calculate the cost per year of using SODIS for the family.

Cost per year = £_____

(2)

- (d) Other than cost, give **two** disadvantages of using the Biosand unit instead of SODIS.

1. _____

2. _____

(2)

- (e) Give **two** advantages of using the Biosand unit instead of SODIS.

1. _____

2. _____

(2)

- (f) SODIS uses UV light to sterilise water.

Give **one** other method of sterilising water.

(1)

(Total 9 marks)