0 3 This question is about drinking water.

0 3 . 1 Name **two** methods of treating water from rivers, lakes or the sea to produce drinking water.

[2 marks]

Tick **two** boxes.

- Anaerobic digestion ☐
- Cracking ☐
- Desalination ☐
- Electrolysis ☐
- Sterilising ☐

Table 3 shows the amounts of dissolved ions in a sample of drinking water.

Table 3

Dissolved ion	Mass in mg per dm^3
Cl^-	250
Na^+	200
NO_3^-	40

0 3 . 2 What is the name of the ion with the symbol Cl^-?

[1 mark]

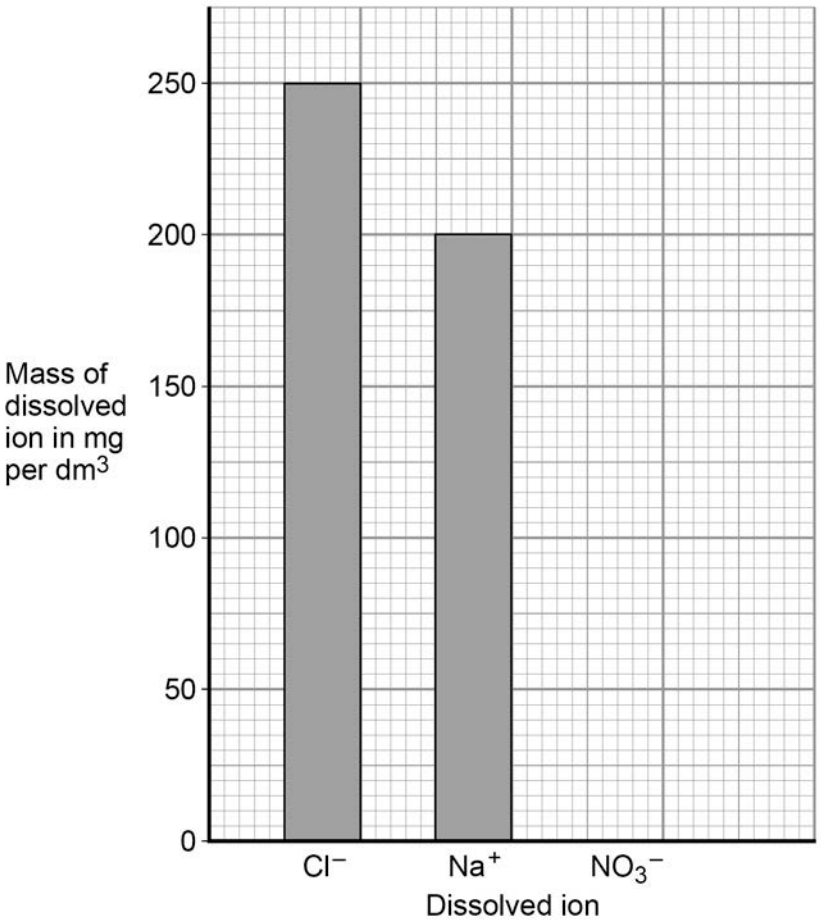
Tick **one** box.

- Calcium ion ☐
- Carbonate ion ☐
- Chloride ion ☐
- Chlorine ion ☐

0 3 . 3 Use the information in **Table 3** to complete the bar chart in **Figure 2**.

[1 mark]

Figure 2



Question 3 continues on the next page

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?

0 3 . 4 Which **one** of the questions cannot be answered by science alone?

[1 mark]

Tick **one** box.

A		**B**		**C**		**D**	

0 3 . 5 Give **two** reasons why the answer you have chosen cannot be answered by science alone.

[2 marks]

1 _____

_____

2 _____

_____

0 3 . 6 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?

[1 mark]

Tick **one** box.

$\frac{1.5}{4.0} \times 100$ ☐

$\frac{1.5}{100} \times 4.0$ ☐

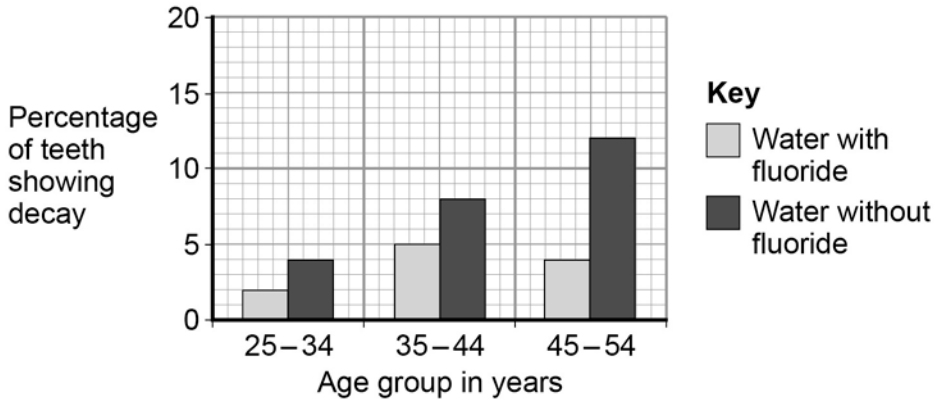
$\frac{4.0}{1.5} \times 100$ ☐

$\frac{100}{1.5 \times 4.0}$ ☐

Question 3 continues on the next page

Figure 3 shows the effect of fluoride in drinking water on tooth decay in different age groups.

Figure 3



0 3 . 7 Describe the pattern of tooth decay in **Figure 3** for water without fluoride.

Use data to justify your answer.

[2 marks]

0 3 . 8 Describe the effect of adding fluoride to drinking water for the age groups in **Figure 3**.

[2 marks]

Question 3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	Desalination Sterilising		1 1	AO1/1 5.10.1.2
03.2	Chloride ion		1	AO1/1 5.1.1.1 5.1.2.6
03.3	correct bar for NO_3^-		1	AO2/2 5.10.1.2
03.4	**D**		1	AO3/2a 5.10.1.2
03.5	any **two** from: • people have the right to choose (opinion) • ethical/moral question • cannot be tested by experiment		2	AO3/1b 5.10.1.2
03.6	$\frac{1.5}{4.0} \times 100$		1	AO2/2 5.10.1.2

Question 3 continues on the next page

Question 3 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.7	the percentage tooth decay increases with age by 4 % for each increasing age group		1 1	AO2/1 5.10.1.2
03.8	reduces tooth decay (for all age groups) greater reduction in older people		1 1	AO2/1 5.10.1.2
Total			**12**	