AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.10.1.2

Potable water

Past-paper questions

Tier	**Foundation**
Question groups	**7**
Available paper years	**2018–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

5.10.1.2 Potable water

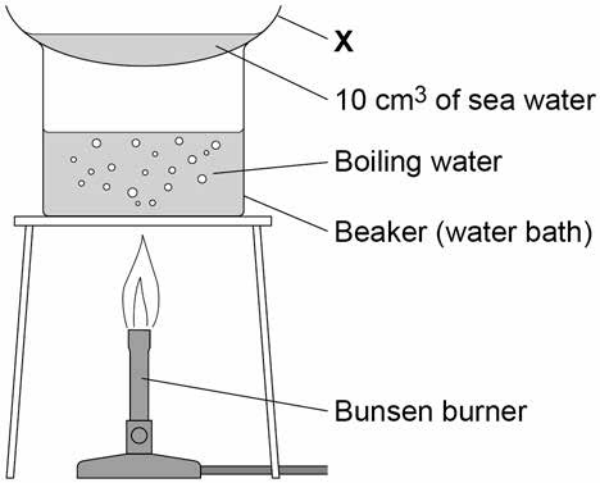
Question 01

June 2018 | 8464/C/2F | Original Q3

0 3 A student tested a sea water sample for dissolved solids.

Figure 6 shows the apparatus.

Figure 6



0 3 . 1 What is apparatus **X** on **Figure 6**?

[1 mark]

Tick **one** box.

- Boiling tube ☐
- Condenser ☐
- Funnel ☐
- Watch glass ☐

5.10.1.2 Potable water

Question 01 · continued

0 3 . 2 The student did the test four times.

The student calculated the mass of solid on apparatus **X** after heating.

Table 3 shows the student's results.

Table 3

	Test 1	Test 2	Test 3	Test 4
Mass of solid in grams	0.12	0.29	0.14	0.15

Calculate the mean mass of solid.

Do not include the anomalous result in your calculation.

Give your answer to 2 significant figures.

[3 marks]

Mean mass = _____ g

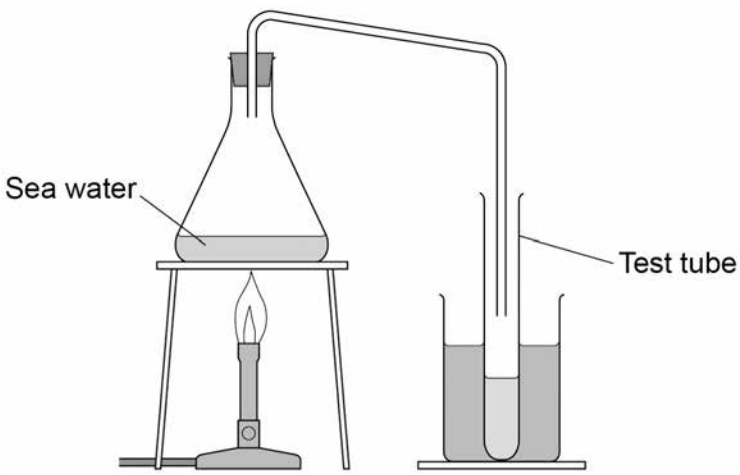
Question 3 continues on the next page

5.10.1.2 Potable water

Question 01 · continued

The student distilled a sample of sea water in the apparatus shown in **Figure 7**

Figure 7



0 3 . 3 What change of state is happening at the surface of the sea water in **Figure 7**?

[1 mark]

0 3 . 4 Describe how the water in the test tube in **Figure 7** is different from the sea water.

[1 mark]

0 3 . 5 Why does producing drinking water from sea water using distillation cost a lot of money?

[1 mark]

5.10.1.2 Potable water

Question 01 · continued

0 3 . 6 River water is filtered then sterilised to make drinking water.

Why are these **two** processes done?

[2 marks]

Filtering _____

_____

Sterilising _____

_____

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Turn over for the next question

5.10.1.2 Potable water

Question 02

June 2019 | 8464/C/2F | Original Q6

0 6 Water that is safe to drink contains dissolved substances.

0 6 . 1 What do we call water that is safe to drink?

[1 mark]

Tick (✓) **one** box.

Desalinated ☐

Filtered ☐

Fresh ☐

Potable ☐

0 6 . 2 Describe a test for pure water.

Give the result of the test if the water is pure.

[2 marks]

Test _____

Result _____

_____

_____

Question 6 continues on the next page

5.10.1.2 Potable water

Question 02 · continued June 2019 | 8464/C/2F | Original Q6

0 6 . 3 Describe a method to determine the mass of dissolved solids in a 100 cm^3 sample of river water.

[4 marks]

0 6 . 4 A sample of river water contains 125 mg per dm^3 of dissolved solids.

Calculate the mass of dissolved solids in grams in 250 cm^3 of this sample of river water.

Give your answer to 2 significant figures.

[4 marks]

Mass of dissolved solids = _____ g

5.10.1.2 Potable water

Question 02 · continued

0 6 . 5 A water company allows a maximum of 500 mg per dm^3 of sulfate ions in drinking water.

A sample of drinking water contains 44 mg per dm^3 of sulfate ions.

Calculate the percentage (%) of the maximum allowed mass of sulfate ions in the sample of drinking water.

[2 marks]

Percentage (%) of the maximum allowed mass = _____ %

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Turn over for the next question

5.10.1.2 Potable water

Question 03

November 2021 | 8464/C/2F | Original Q1

0 1 Fresh water contains low levels of dissolved salts.

Water reacts with anhydrous copper sulfate in a reversible reaction.

The word equation for the reaction is:

water + anhydrous copper sulfate ⇌ hydrated copper sulfate

0 1 . 1 How does the equation show that the reaction is reversible?

[1 mark]

_____

_____

0 1 . 2 Complete the sentences.

Choose answers from the box.

[2 marks]

blue	**green**	**orange**	**white**	**yellow**

The colour of anhydrous copper sulfate is _____ .

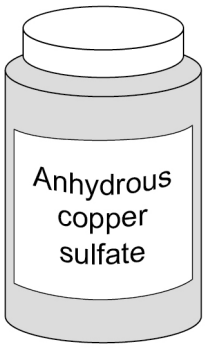
The colour of hydrated copper sulfate is _____ .

5.10.1.2 Potable water

Question 03 · continued

0 1 . 3 **Figure 1** shows anhydrous copper sulfate in a sealed container.

Figure 1



Suggest **one** reason why anhydrous copper sulfate is kept in a sealed container.

[1 mark]

Question 1 continues on the next page

5.10.1.2 Potable water

Question 03 · continued

Sodium chloride dissolves in water to form sodium chloride solution.

0 1 . 4 Draw **one** line from each substance to the description of the substance.

[2 marks]

Substance	Description of substance
	Compound
Sodium chloride solution	
	Element
	Hydrocarbon
Water	
	Mixture

0 1 . 5 Name the process used to obtain solid sodium chloride from sodium chloride solution.

[1 mark]

_____

5.10.1.2 Potable water

Question 03 · continued

0 1 . 6 Two processes used to obtain potable water from fresh water are:

- filtering
- sterilising.

Give **one** reason why each process is used.

[2 marks]

Filtering _____

_____

Sterilising _____

_____

0 1 . 7 Which type of water is the easiest to obtain potable water from?

[1 mark]

Tick (✓) **one** box.

Ground water ☐

Salt water ☐

Waste water ☐

0 1 . 8 Which of the following is the first stage of waste water treatment?

[1 mark]

Tick (✓) **one** box.

Aerobic biological treatment of effluent ☐

Anaerobic digestion of sewage sludge ☐

Screening and removal of grit ☐

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5.10.1.2 Potable water

Question 04

June 2022 | 8464/C/2F | Original Q7

0 7 . 1 Water that is safe to drink is called potable water.

Compare how easily potable water can be obtained from:

- waste water (sewage)
- ground water (fresh water).

[6 marks]

Question 7 continues on the next page

5.10.1.2 Potable water

Question 04 · continued

A scientist produced potable water from 150 cm^3 of salty water.

0 7 . 2 Which process can be used to produce potable water from salty water?

[1 mark]

Tick (✓) **one** box.

- Distillation ☐
- Electrolysis ☐
- Filtration ☐
- Sterilisation ☐

0 7 . 3 The salty water contains sodium chloride.

The scientist collected 2.40 g of sodium chloride from 150 cm^3 of salty water.

Calculate the concentration of sodium chloride in grams per dm^3

[3 marks]

Concentration of sodium chloride = _____ g/dm^3

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5.10.1.2 Potable water

Question 05

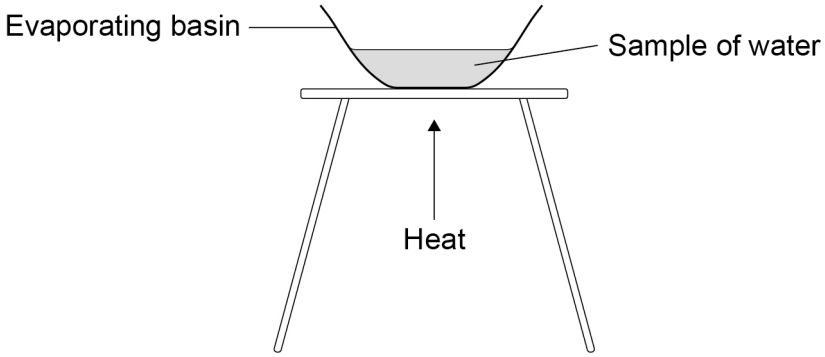
June 2023 | 8464/C/2F | Original Q3

0 3 Some types of water contain dissolved substances.

A student investigated the mass of dissolved solids in distilled water and in sea water.

Figure 5 shows the apparatus.

Figure 5



This is the method used.

1. Weigh an evaporating basin.
2. Add a sample of distilled water to the evaporating basin.
3. Weigh the evaporating basin and the water sample.
4. Heat the water sample.
5. Weigh the evaporating basin and contents.
6. Repeat steps 1 to 5 two more times.
7. Repeat steps 1 to 6 with sea water.

0 3 . 1 Give **one** safety precaution the student should take.

[1 mark]

Question 05 · continued

0 3 . 2 The method used did **not** give valid results.

Which **two** improvements could the student make to give valid results?

[2 marks]

Tick (✓) **two** boxes.

- Heat until the mass of the evaporating basin and contents does not change. ☐
- Leave some water in the evaporating basin after heating. ☐
- Record the results in a table and plot a bar graph. ☐
- Use 25 cm^3 of water for each experiment. ☐
- Use a beaker instead of an evaporating basin. ☐

0 3 . 3 A different student used a method which gave valid results.

Table 2 shows the results.

Table 2

	Mass of dissolved solids in grams		
Type of water	**Test 1**	**Test 2**	**Test 3**
Distilled water	0.00	0.00	0.00
Sea water	0.31	0.32	0.27

The student concludes that distilled water is pure.

Suggest **one** reason why.

[1 mark]

5.10.1.2 Potable water

Question 05 · continued

Tap water is potable.

One step in producing potable water is sterilisation.

0 3 . 4 Why is potable water sterilised?

[1 mark]

Tick (✓) **one** box.

To improve the taste ☐

To kill bacteria ☐

To remove dissolved solids ☐

0 3 . 5 Chlorine is used to sterilise water.

The reaction between chlorine and water is reversible.

Complete the sentence.

[1 mark]

Equilibrium is reached when the forward and reverse reactions

occur at the same _____ .

0 3 . 6 The test for chlorine uses damp litmus paper.

Complete the sentence.

Choose the answer from the box.

[1 mark]

blue	**green**	**white**

When damp litmus paper is put into chlorine gas

the litmus paper turns _____ .

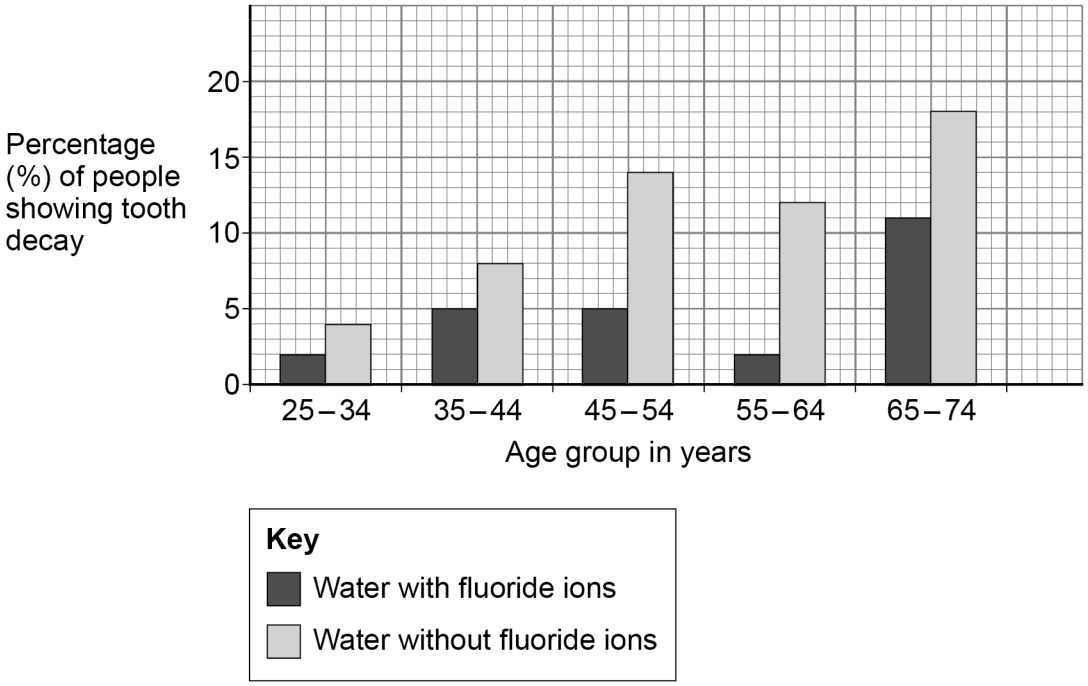
5.10.1.2 Potable water

Question 05 · continued

There is evidence that adding fluoride ions to drinking water reduces tooth decay.

Figure 6 shows the percentage of people showing tooth decay.

Figure 6



0 3 . 7 Compare the effects of adding fluoride ions to drinking water on tooth decay in people between the ages of 25 and 74.

Use data from **Figure 6**.

[4 marks]

5.10.1.2 Potable water

Question 05 · continued

0 3 . 8 Student **A** says that water companies should add fluoride ions to all drinking water.

Student **B** disagrees.

Suggest **one** reason why Student **B** may think that fluoride ions should **not** be added to all drinking water.

[1 mark]

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5.10.1.2 Potable water

Question 06

0 4 Tap water must be safe to drink.

0 4 . 1 What name is given to water that is safe to drink?

[1 mark]

Tick (✓) **one** box.

- Ground water ☐
- Potable water ☐
- Waste water ☐

0 4 . 2 Water is sterilised to make the water safe to drink.

Which **two** of the following are used to sterilise drinking water?

[2 marks]

Tick (✓) **two** boxes.

- Carbon dioxide ☐
- Electrolysis ☐
- Filtration ☐
- Ozone ☐
- Ultraviolet light ☐

Question 4 continues on the next page

5.10.1.2 Potable water

Question 06 · continued

A student investigated the mass of dissolved solids in samples of river water, sea water and tap water.

This is the method used.

1. Weigh an evaporating basin.
2. Measure 100 cm^3 of river water.
3. Pour the river water into the evaporating basin.
4. Heat the evaporating basin until all the water has evaporated.
5. Weigh the evaporating basin and dissolved solids.
6. Calculate the mass of dissolved solids in the water.
7. Repeat steps 1 to 6 with sea water and then with tap water.

0 4 . 3 Which is the most suitable equipment to measure 100 cm^3 of water?

[1 mark]

Tick (✓) **one** box.

- Beaker ☐
- Conical flask ☐
- Measuring cylinder ☐

0 4 . 4 **Table 3** shows the results.

Table 3

Type of water	Mass in grams		
	Evaporating basin	Evaporating basin and dissolved solids	Dissolved solids
River	112.1	113.1	1.0
Sea	110.5	114.0	**X**
Tap	115.3	115.4	0.1

Calculate value **X** in **Table 3**.

[1 mark]

X = _____ g

0 4 . 5 Identify the variables used in the investigation.

Draw **one** line from each variable to the example of the variable.

[2 marks]

Variable	Example of variable
	Mass of dissolved solids
	Mass of evaporating basin
Control	Room temperature
Dependent	Type of water
	Volume of water

5.10.1.2 Potable water

Question 06 · continued

Table 4 shows the mass of different types of ions dissolved in 1 dm^3 of sea water.

Table 4

Type of ion	Mass of type of ion dissolved in 1 dm^3 of sea water in grams
Calcium	0.4
Magnesium	1.3
Sulfate	2.7

5.10.1.2 Potable water

Question 06 · continued

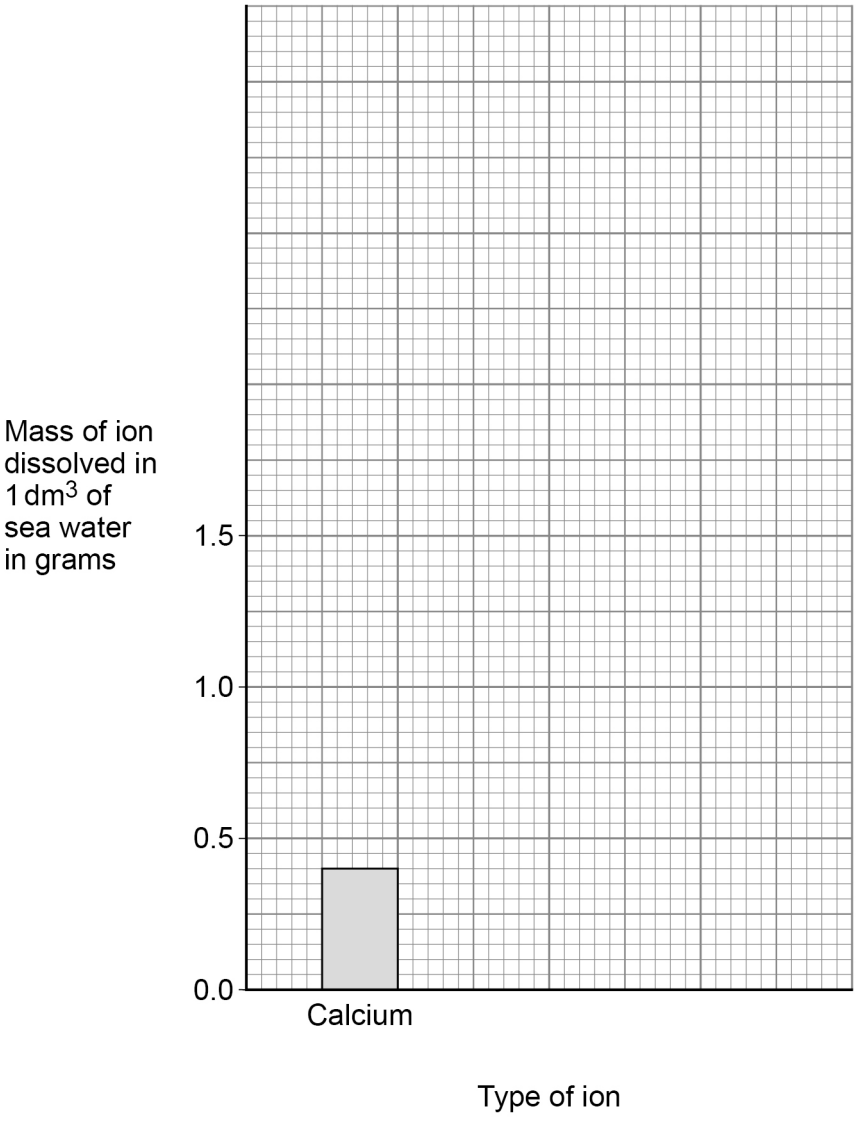
0 4 . 6 Complete **Figure 3**.

You should:

- complete the scale for the *y*-axis
- plot the data from **Table 4** as a bar chart.

[3 marks]

Figure 3



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5.10.1.2 Potable water

Question 07

June 2025 | 8464/C/2F | Original Q4

0 4 Humans use many different resources.

Water is an important natural resource.

0 4 . 1 What is meant by 'potable water'?

[1 mark]

Tick (✓) **one** box.

- Water from the ground ☐
- Water that is pure ☐
- Water that is safe to drink ☐

0 4 . 2 Waste water needs treatment before the water is put back into rivers and the sea.

The first stage of waste water treatment is to pass the waste water through metal grids.

Why is the waste water passed through metal grids?

[1 mark]

Tick (✓) **one** box.

- To remove dissolved salts ☐
- To remove large solid objects ☐
- To remove microbes ☐
- To remove oxygen gas ☐

5.10.1.2 Potable water

Question 07 · continued

Clothes can be made from different materials.

Some clothes are made from wool and some clothes are made from poly(propene).

0 4 . 3 One sheep produces 4.5 kg of wool.

50 g of wool is needed to make a hat.

Calculate the number of hats that can be made from the wool of one sheep.

1 kg = 1000 g

[3 marks]

Number of hats = _____

5.10.1.2 Potable water

Question 07 · continued

0 4 . 4 **Table 4** gives information about poly(propene) and wool.

Table 4

	Poly(propene)	Wool
Source of material	Crude oil	Sheep
Level of insulation	High	Medium
Cost	Low	High
Durability	High	Medium

Explain the advantages of using poly(propene) and of using wool for clothing.

[4 marks]

Extra space

Question 4 continues on the next page

5.10.1.2 Potable water

Question 07 · continued

0 4 . 5 After being used, clothes can be:

- given to other people to wear
- used to make insulation blocks for buildings.

Complete the sentences.

Choose answers from the box.

[2 marks]

recycled	**reduced**	**released**	**reused**	**reversed**

When clothes are given to other people to wear,

the clothes are _____.

When clothes are used to make insulation blocks for buildings,

the clothes are _____.

5.10.1.2 Potable water

Question 07 · continued

Poly(propene) is made from an alkene.

Alkenes are produced by cracking alkanes.

0 4 . 6 A high temperature is used for cracking alkanes.

Which **two** of the following can also be used to crack alkanes?

[2 marks]

Tick (✓) **two** boxes.

- A catalyst ☐
- A solvent ☐
- Carbon dioxide ☐
- Steam ☐
- Sulfuric acid ☐

0 4 . 7 Which chemical is used to test for alkenes?

[1 mark]

Tick (✓) **one** box.

- Ammonia ☐
- Bromine water ☐
- Copper sulfate ☐
- Nitrogen ☐

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