

Q1. Good quality water is needed for a healthy life.

In the United Kingdom, obtaining safe water for drinking is as simple as turning on a tap. The water is made safe to drink by water companies.

However, in many parts of Africa and Asia, water used for drinking is contaminated and untreated. It is estimated that 2.2 million people die each year as a result of drinking contaminated water.



DADA DANESHANANDA, Man with filtered water from the Mafi-Zongo water project. www.amurt.net/africa/ghana/2005

Efforts are being made to solve this problem and more water is being treated.

Describe how water in the United Kingdom is treated.

Explain how this makes it safe to drink.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total 3 marks)

Q2. In the United Kingdom, water companies supply drinking water to our homes. However, some people are concerned about the taste and quality of the water that is supplied.

Describe one method that people can use at home to improve the taste and quality of the tap water supplied. Explain how this method works.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

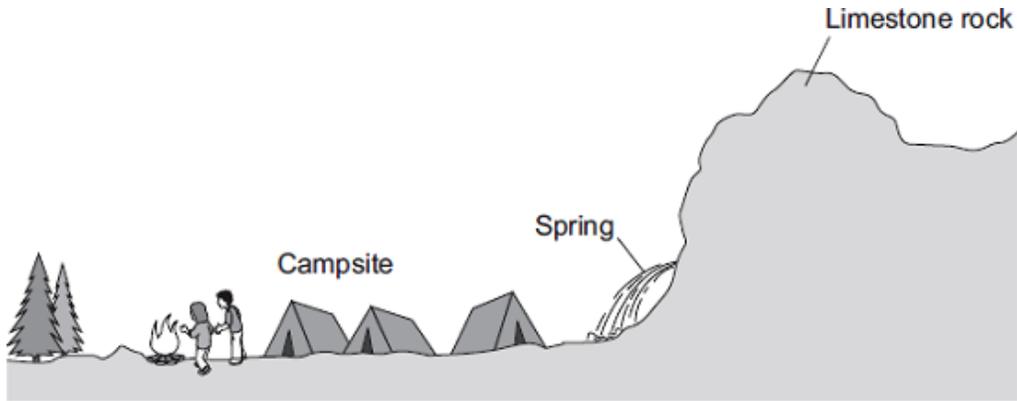
.....

.....

.....

(4)
(Total 4 marks)

Q3. (a) A campsite has a spring, where hard water flows out of limestone rock.



A student compared the hardness of the spring water with two other samples of water.

The student measured 20 cm³ of water into a boiling tube.

The student then:

- added a drop of soap solution
- shook the boiling tube for 10 seconds
- looked to see if a permanent lather had formed.

The student repeated the procedure until a permanent lather formed.

The results are shown in the table.

Water sample	Number of drops of soap solution needed to form a permanent lather			
	Test 1	Test 2	Test 3	Mean
Spring water (from the campsite)	13	11	6	
Tap water	7	5	6	6
Distilled water	1	1	1	1

(i) Calculate the correct mean for spring water.

.....

Mean = drops

(2)

(ii) What conclusion could the student make from her results?

Use the results in the table to give a reason for your answer.

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

(2)

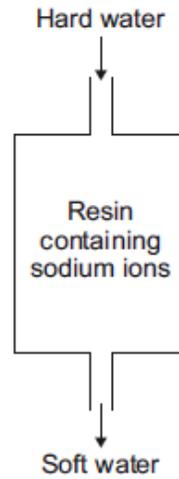
(iii) Another student at the campsite boils some of the hard spring water in a pan. The inside of the pan becomes coated with a white solid.

Explain how the white solid is produced.

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

(3)

(b) Ion exchange columns can be used to soften hard water.



(i) Describe how an ion exchange column softens water.

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

(3)

(ii) An ion exchange column is used for a few weeks.

Sodium chloride solution now needs to be passed through the ion exchange column.

Suggest why.

.....
.....

(1)

- (c) Tap water in the UK is safe to drink because water companies add chlorine to sterilise the water.

Suggest **one** argument for and **one** argument against water companies adding chlorine to sterilise water.

.....

.....

.....

.....

.....

.....

(2)
(Total 13 marks)

