A bath or a bucketful?

UNIT A3

This unit gives practice in computation whilst pupils think about the value of the water we use every day.

Using the unit

It is suggested that a 10 litre bucket is available in the classroom as a visual aid. The lesson could begin with a discussion of how necessary water is to human life. Pupils could be asked to consider what they would need most urgently on a desert island or in setting up a base on the moon. Water is likely to be high on the list. The human body is approximately 70% water and we need to drink around three litres per day just to survive. The World Health Organisation estimates that 80% of all sickness and disease in developing countries is due to unsafe water. Ten people die every minute in the Third World from diseases caused by unsafe water. Traditionally, women in Africa and Asia collect water for the whole family, carrying it several miles on their heads or backs. They each carry on average 20kg (the weight of one person's airport luggage allowance). Section 2 could begin with a discussion of any places in the world known to any of the pupils where people have to walk to get clean, safe water. Section 3 ends with questions for discussion which invite suggestions of ways in which we could conserve our water. The unit ends with a reflection.

This unit was inspired Youth Topics issue 27: Water works, produced jointly by the development agencies Christian Aid, CAFOD and SCIAF, which publish a number of resources for schools and young people. For further information, write to: Schools and Youth Team, Christian Aid, PO Box 100, London SE1 7RT.

Differentiation
The mathematics is fairly straightforward and can be tackled by students of differing abilities. The use of a calculator should make it accessible even to those who find calculation difficult.
More able pupils could be asked to draw a pie chart for Task 3, question 1 (c) to show the proportion used in each category.

Mathematical content

Number and algebra (AT2)
- **Using addition and subtraction (level 3)**
- **Multiplying and dividing by 10 (level 4)**
- **Approximating decimals when solving numerical problems (level 6)**

Handling data (AT4)
- **Constructing a bar chart (level 3)**

Work can be calculator or non-calculator.

Spiritual and moral development

This unit aims to encourage pupils to appreciate and be thankful for the plentiful supply of water which we enjoy and to think of others who have less.

TEACHER'S NOTES

Resources needed
A copy of the worksheet for each pupil.
Paper on which to answer the questions.
Squared paper for the bar chart in Task 3.
Possibly a calculator (see differentiation above).

Answers

This table gives answers to Task 1, questions 2 and 3 for households of size 2 to 7.

Q 1.	2	3	4	5	6	7
Q 2.a)	270 litres	405 litres	540 litres	675 litres	810 litres	945 litres
Q 2.b)	1890 litres	2835 litres	3780 litres	4725 litres	5670 litres	6615 litres
Q 2.c)	189 buckets	283.5 buckets	378 buckets	472.5 buckets	567 buckets	661.5 buckets
Q 3.a)	20 litres	30 litres	40 litres	50 litres	60 litres	70 litres
Q 3.b)	140 litres	210 litres	280 litres	350 litres	420 litres	490 litres
Q 3.c)	14 buckets	21 buckets	28 buckets	35 buckets	42 buckets	49 buckets
Q 3.d)	175 buckets	262.5 buckets	350 buckets	437.5 buckets	525 buckets	612.5 buckets

Subsequent answers will vary with lifestyle and the differences should lead naturally to discussion of our use of water.

TEACHER'S NOTES

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UNIT A3

1

Water is one of the basic requirements for life. We use water everyday.

Have you ever been short of water? If so, think about when it was and what impact it had on your life.

Here is a list of things around the home that use water. Maybe you can think of a few others. Put your list in order of importance with what you need most at the top of the list and what you need least at the bottom.

Bath/shower	**Cooking**
Washing machine	**Garden**
House plants	**Drinking**
Flushing the toilet	**Dishwasher**
Car washing	**Cleaning the house**

In Britain, a person uses an average of 135 litres of water per day.

1. How many people live in your house?

2. If each person in your house used 135 litres of water a day:
   a) How many litres of water would your household use in a day?
   b) How many litres of water would your household use in a week?
   c) A bucket holds approximately 10 litres of water. How many buckets of water would your household use in a week?

In many parts of the world it is not easy to get clean and safe water. In some countries, a person only has about 10 litres of clean water per day.

3. If each person in your house only had 10 litres of water per day:
   a) How many litres of water would your household use in one day?
   b) How many litres of water would your household use in a week?
   c) How many buckets of water would your household use in a week?
   d) Compare your answer to 3(c) with your answer to 2(c). How many fewer buckets of water would your household use in a week?

2

There are many homes in the world with no water at all. Some people might have to walk to the end of their street to get clean safe water. These are the lucky ones. In some parts of the world, people have to walk miles every day to get water. For these people the task of just collecting the water can take around 6 hours every day.

Imagine you had to carry all your water from the end of your street or road. How long do you think that might take every day? How do you think that would affect your life?

1. The table below shows approximately how much water certain items in the home might use.

   a) Using the information in the table, work out roughly how many buckets of water each item uses. Remember a bucket holds about 10 litres. Write your answers in the table.

   b) Work out how many times you think each item is used in your house in a week.

   Remember to include everyone who lives in your house. Write your answers in the table.

   c) Now fill in the last column showing how many buckets of water your household uses on each item in a week.

   d) Add the last column up to work out the total number of buckets of water used by your household.

Item	**Amount of water used each time item is used**	**Number of buckets of water used each time (approx.)**	**Number of times item is used in a week**	**Number of buckets of water used in a week**
Shower	25 litres (5 minutes)			
Bath	80 litres			
Toilet	9.5 litres			
Washing machine	80 litres			
Dishwasher	35 litres			
			Total	

2

Task 2 continued ...

2. a) Think about other ways that water is used by a household (both in the house and outside). Write them in the first column of the table below. Use as many lines as you need. (If there is not enough space, you may find it helpful to make a copy of the table with extra spaces.)

   b) Write in the amounts in the other columns. It does not matter if you don't know exactly how many litres you might use for each item. Just think roughly how many buckets of water it might use.

   c) Work out the total number of buckets of water used in a week.

Item	Amount of water used each time item is used	Number of buckets of water used each time (approx.)	Number of times item is used in a week	Number of buckets of water used in a week
			Total	

3. a) Add together your totals from the two tables and write down how many buckets of water your household might use altogether in a week.

   b) Does your household use more or less water than the average household of your size in Great Britain? To answer this you will need to compare your last answer to the answer you worked out in Task 1, question 2 (c). Write down how many more (or fewer) buckets of water your household uses than the average household of your size.

3

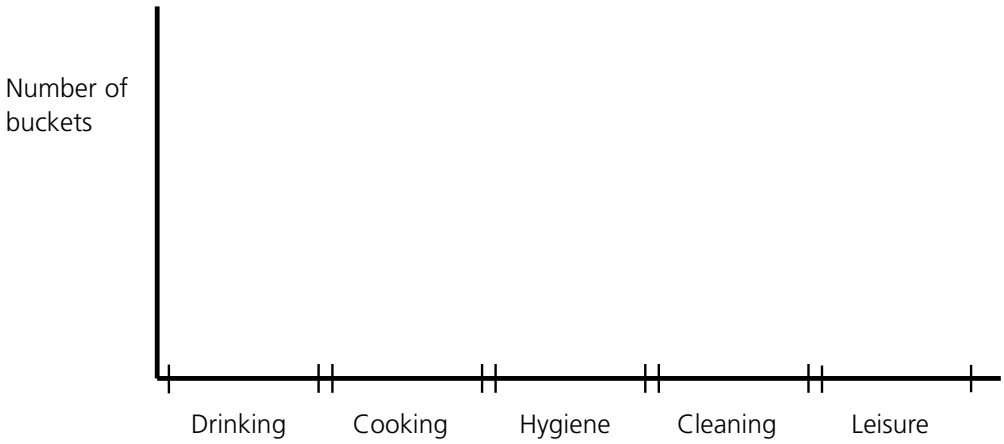
1. a) Sort all your items from the two tables in Task 2 into the following categories:

Drinking **Cooking** **Hygiene** **Cleaning** **Leisure**

(Under Hygiene, include all washing and cleaning needed to keep people healthy. Under Cleaning, include all other washing and cleaning.)

b) How many buckets of water are used for each category in a week?

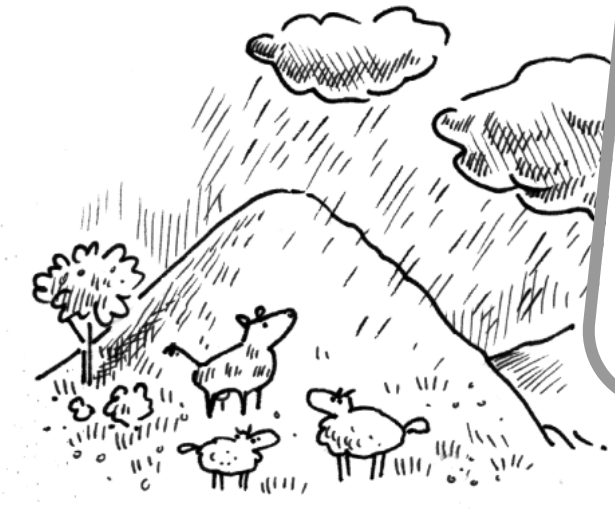
c) Use squared paper to draw a bar chart to show how many buckets are used for each category. Label it like this and choose your own scale for the vertical axis.



Do you think you and your family use too much water?

In what ways could you use less water?

If each person in your household had only one bucket of water per day, how would you use it?



Most of us are thankful that we have plenty of water but whom do we thank for it? The water company? The person in our household who pays the water bill? Fate? God?

One answer to this question comes from the Bible:

Sing to the Lord with thanksgiving; make music to our God . . .

He covers the sky with clouds; he supplies the earth with rain and makes grass grow on the hills.

He provides food for the cattle and for the young ravens when they call.

(Psalm 147 verses 7-9)