

SECTION FIVE:

How much water are we using?

Students measure how much water is used at school on a daily basis and explore how it is used.





Section 5: How much water are we using?

The purpose of this section is to help students to:

- Understand how much water they use every day
- Measure water use in their school
- Use graphs and data to obtain information about water use

Overarching concepts for Section Five:

- Water is used in many different ways at school and at home
- We can all use less water by using it more efficiently

Section 5: How much water are we using?



Learning experiences – Section Five

| Learning experiences | Learning intentions Students will . . . | Curriculum links (Achievement objectives) | Content |
|---------------------------------------|---|---|---|
| 1. Household water use in New Zealand | <ul style="list-style-type: none"> Compare water use in New Zealand with water use in other countries Examine patterns or trends about household water use | Mathematics: Level 3 and 4 Statistics: <i>Statistical investigation</i> <ul style="list-style-type: none"> Identifying patterns and trends in context, within and between data sets; Communicating findings, using data displays | Students compare household water use in New Zealand to use in other countries |
| 2. Using water at school | <ul style="list-style-type: none"> Investigate the water outlets/uses in their school environment Represent water outlets with symbols on a map | Science: Level 3 and 4 Nature of Science: <i>Investigating in Science</i> Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations Mathematics: Level 3 Geometry and Measurement: <i>Shape</i> Represent objects with drawings and models | Students record where the water outlets are located in their school |
| 3. Measuring water use: Water meter | <ul style="list-style-type: none"> Investigate how much water is used at school using the water meter on their school's water supply pipe | Mathematics: Level 3 and 4 Statistics: <i>Statistical investigation</i> <ul style="list-style-type: none"> Conduct investigations using the statistical enquiry cycle: gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions Identifying patterns and trends in context, within and between data sets | Students learn how to read a water meter and examine the results of the readings to find an average amount of water used per school day |
| 4. Measuring water use: Water survey | <ul style="list-style-type: none"> Investigate how much water they use at school in a day | Mathematics: Level 3 and 4 Statistics: <i>Statistical investigation</i> <ul style="list-style-type: none"> Conduct investigations using the statistical enquiry cycle: gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions | Students record their daily water use on tally chart. Results are then combined to find how water is used during a school day |
| 5. Our water future | <ul style="list-style-type: none"> Reflect on how much water is used at school Recognise that their water use will have an effect on the future environment and community | Science: Level 3 and 4 Nature of Science: <i>Participating and contributing</i> Use their growing science knowledge when considering issues of concern to them Explore various aspects of an issue and make decisions about possible actions | Students reflect on how much water is used at school each day. They examine how their water use could influence future water issues |



5:1 Household water use in New Zealand – teacher notes



Curriculum links

Mathematics: Level 3 and 4

Statistics: *Statistical investigation:*

Conduct investigations using the statistical enquiry cycle; gathering, sorting and displaying multivariate category and whole number data and simple time-series data to answer questions: identifying patterns and trends in context, within and between data sets

Other curriculum links: Level 3 and 4

Social Sciences, Science: *Nature of Science:*
Investigating in Science



Education for sustainability concepts

Equity: respect for all life, social justice, intergenerational equity, finite resources.

Responsibility for Action/ Kaitiakitanga: If we want to use taonga, we must look after the taonga.

Background knowledge

Most people in New Zealand rely on a town supply for their water. It takes time, effort, money and resources to deliver water to households.

Water withdrawal

Almost 110,000 km³ of rain falls over planet earth each year. This is equal to about 1800 times the volume of Lake Taupo. About $\frac{2}{3}$ of this amount evaporates or is transpired through plants and other organisms. The remaining $\frac{1}{3}$ of water provides surface water and groundwater¹³. Some of this surface water is withdrawn for human use (water withdrawal). We use this water for our industries, agriculture and for domestic use.

New Zealand's household water use

New Zealand's domestic (household) water use is high in proportion to our industrial and agricultural use when compared to other countries. Our household water use makes up approximately 22% of our country's total water use, compared to an average of 10% worldwide. However, in our cities, domestic water use is a much higher percentage. In the Wellington region, domestic water use is approximately 60% of the four cities total water use.

Do New Zealanders use a lot of water?

Yes, we use a relatively large amount of water when compared to people in most other countries. The volume of water that the four cities in the Wellington region currently use in a week would fill the Westpac stadium. The United Nations says that people need a minimum of 50 litres per person per day to survive – however some countries use far less than this¹⁴.

People who live in Porirua, Lower Hutt, Upper Hutt and Wellington are estimated to currently use about 240 litres per person per day (L/p/d) in their homes alone¹⁵. Having enough water for everyone in New Zealand in the future will rely on more water efficient appliances and water conservation and fair distribution between households, industry, agriculture and the environment.

13 http://www.fao.org/nr/water/aquastat/water_use/index.stm

14 <http://www.newint.org/issue354/facts.htm>

15 Greater Wellington Regional Council Water Supply Annual Report for the year ended 30 June 2010. pg 5



Gross vs net water use per person

Figures about our water use can vary according to the source. Our *net* water use (water used at home) is estimated to be about 240 L/p/d but *gross* water use is about 380 L/p/d¹⁶. Gross water use includes domestic, commercial and industrial water use, fire fighting, pipe maintenance and leakage from pipes. Net figures are based on water use *in homes only*.

Our net water use can only be estimated as homes in the Wellington region are not metered.

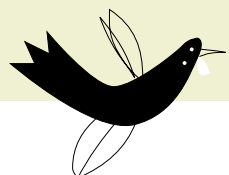
Summer vs winter water use

Our water use increases over summer, with watering gardens, filling swimming pools and greater demand for water to drink and wash with. Unfortunately, water is less plentiful in summer as there is less rainfall. In winter there is more rain but demand is lower. Water providers must plan for seasonal variations in water availability and use.

Answers to BLM 5b

1. United Kingdom.
2. High, reasons will vary but could include; we are not very careful with using water in our homes, we use a lot of water in the garden and bathroom compared to other countries.
3. 234L in winter.
251L in summer.
4. In the bathroom – probably for showers and baths.
5. 'Unaccounted for' means other uses which don't fit into another category. This includes leaks in water pipes.
6. People need to water their gardens, fill pools and wash more often in summer.
7. Answers will vary, e.g. Take shorter showers, less baths, flush toilet only when necessary etc...

¹⁶ Greater Wellington Regional Council Water Supply Annual Report for the year ended 30 June 2010. pg 4



5:1 Household water use in New Zealand – learning experience

Learning intentions



Students will:

Compare water use in New Zealand with water use in other countries

Examine patterns or trends about household water use

Success criteria



Students can:

Answer questions about household water use in New Zealand from information in graphs

Describe patterns of water use in our homes

Learning experience

- Share the learning intentions and success criteria
- Explain that we will examine how an average New Zealander uses water at home and what proportion of New Zealand's total water is used in homes
- Revisit the concept of one litre of water. Show students examples of different quantities of water (e.g. a standard bucket = around 10 litres)
- Ask how much water (in litres) students think we use every day in our homes? Share ideas. *Clarify what is meant by litres per person per day. Revise the statistics in section one, learning experience 3*
- Hand out BLM 5a and 5b. Ask students to examine Graph 1 on BLM 5a. Compare proportions of water used for farming/agriculture between countries. Discuss reasons for differences (e.g. *some countries are developing or industrialised*). Explain the meaning of terms used in the graphs
- Ask students what percentage of New Zealand's water use is used for households in NZ? (*approximately 22%*)
- Ask students to answer the questions on BLM 5b
- Discuss answers and reflect on findings

As an extension, create other graphs of this data or investigate other data about water use e.g. <http://www.gw.govt.nz/water-use-3/>

Resources



BLM 5a Water use in New Zealand

BLM 5b Water use in NZ worksheet

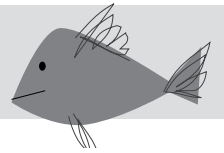
Reflection questions

- How do you think your own water use changes between summer and winter? *Answers will vary*
- Is water available in summer in as large amounts as it is in winter? *No, less rainfall means there is less water available in summer*

Vocabulary

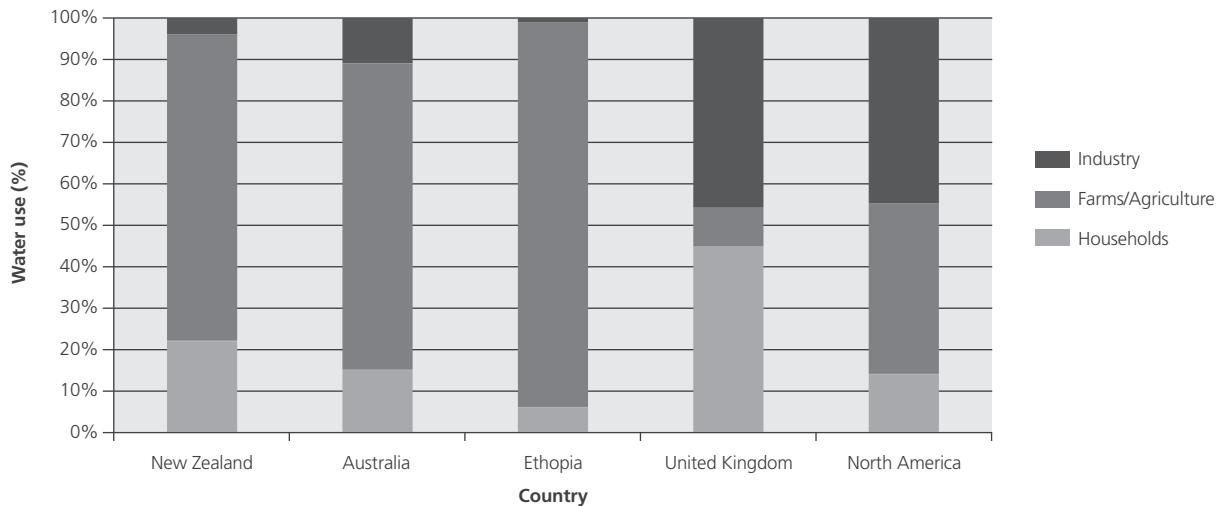
- households
- proportion
- agriculture
- industry/industrial

BLM 5a: Water use in New Zealand



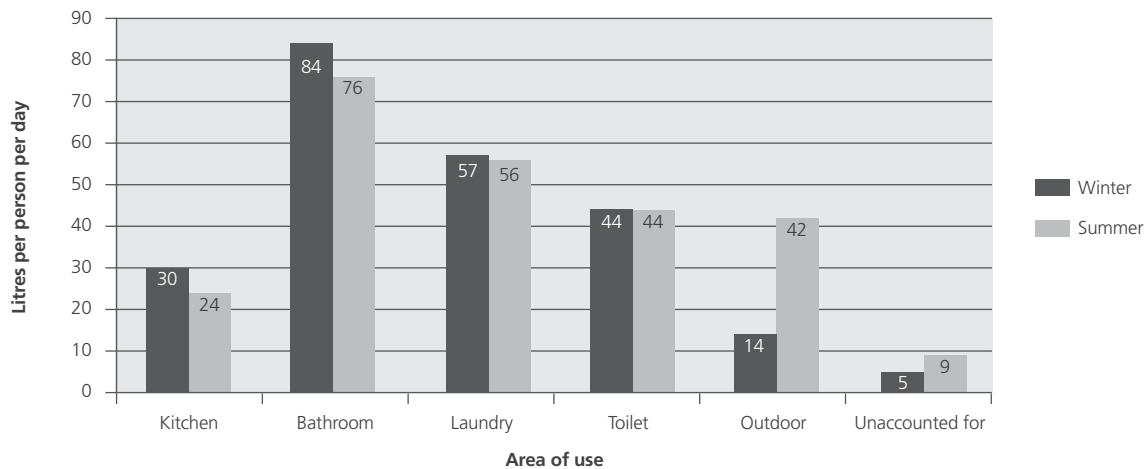
Graph 1: World water use in households, farms and industry

(data sourced from <http://www.fao.org/nr/water/aquastat/main/index.stm>)



Graph 2: Estimated household water use in Wellington

(data adapted from BRANZ EC1356)





BLM 5b: Water use in New Zealand worksheet



Answer the following questions using BLM 5a:

1. Which country has the highest proportion of household water use?

2. Is New Zealand's household water use high or low compared with other countries? Why do you think this is?

3. How much water do Wellington residents use at home on an average day?

In winter:

In summer:

4. What is most of the water in Wellington homes used for?

5. What do you think 'unaccounted for' means? Why do we need this option?

6. Why is 'outdoor' water use so much greater in summer?

7. When you look at graph two, what obvious ideas come to mind about reducing your water use?

5:2 Using water at school – teacher notes



Background knowledge

Water is used by all schools and households in New Zealand. We all play a part in using the large amount of water that our country uses.

Map of the school

Prior to the activity, photocopy a school map for each group. To allow enough room to record all water outlets **enlarge the map to an A3 size.**

Water outlets in schools

Water outlets are objects or appliances which we obtain water from. Sometimes these are known as fixtures. Examples of water outlets include; taps, drinking fountains, water tanks, toilets, urinals and watering equipment. Students will become more aware of the uses of water in their school through this activity.

Water collection

In some schools there will also be areas of water collection e.g. rainwater tanks or greywater recycling. Include these on your map as well and explain how they work. You could use a different colour to indicate that these objects save or re-use water instead of using it up.

Timing and organisation

This activity involves students investigating water outlets around the school. Make sure that your survey is conducted at a quiet time of the day when other classes are not using water outlets. If possible involve the caretaker, other school staff or parents in the investigations.

Disruption of other classes

Try to be considerate of other classes. To avoid students interrupting teachers, you could give students information about taps located inside or near classrooms. Discuss how students could get the information they need with the minimum disturbance to other classrooms.

Groups for surveying

Ensure that there are both female and male members of each group so that they can accurately survey all toilets and bathrooms.

Curriculum links

Science: Level 3 and 4 **Nature of Science:**

Investigating in science:
Ask questions, find evidence, explore simple models, and carry out appropriate investigations to develop simple explanations

Mathematics: Level 3 **Geometry and**

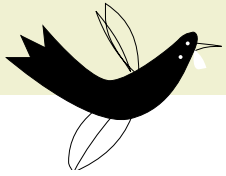
Measurement: *Shape:*
Represent objects with drawings and models

Other curriculum links:
Level 4 Mathematics,
Geometry and measurement
Position and orientation

Education for sustainability concepts

Sustainability/Hauora:
The choices we make today affect choices we will be able to make in the future

Responsibility for Action/Kaitiakitanga:
If we want to use taonga, we must look after the taonga



5:2 Using water at school – learning experience

Learning intentions



Students will:

Investigate the water outlets/uses in their school environment

Represent water outlets with symbols on a map

Success criteria



Students can:

Identify water outlets in their school environment

Label water outlets on a school map using symbols

Learning experience

- Share the learning intentions and success criteria
- Revisit the graph of household water use around the world. Explain that you will be investigating where water is used in their school every day
- Provide students with a map of the school. Discuss the water outlets/uses at the school. These may be taps, water tanks, drinking fountains, toilets etc...
- Explain that students are to draw symbols on the map for each type of water outlet/use. Discuss and decide on appropriate symbols for each outlet, making sure that each symbol is distinctive and easy to draw
- Divide students into several groups. Assign each group of students to an area of the school to investigate. *You may need to organise adult supervision at certain locations e.g. bathrooms adjacent to classrooms. Remind students to be quiet and considerate of other classes*
- When students have labelled the water outlets in the area of the school they investigated, they can come together to share results. Each student or pair should end up with a map detailing all water outlets in the school
- After labelling maps, construct a table describing the outlets found. For example:

| Type of water outlet | People who use it | Total number | What this water is used for |
|----------------------|--------------------|--------------|--|
| Classroom taps | Students and staff | | Washing hands, washing art equipment, filling up containers etc... |
| Toilets | | | |
| Drinking fountains | | | |
| Etc... | | | |

- What other water uses/outlets are at home which are not used at school?
For example: washing machines, baths etc...

As an extension, students could find places in the school where there are leaks or where water is not being used efficiently.

Reflection questions

- What are your thoughts about how we use water at school?
Answers will vary
- Could any of these water outlets/activities re-use greywater instead of using drinking-quality water? *Yes – toilets, hoses, urinals etc...*

Vocabulary

- outlet
- symbol

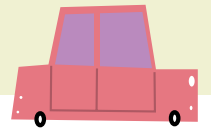
Resources



Map of the school (A3)

Pens/pencils

Books/clipboard



Example of labelled school map:





5:3 Measuring water use: Water meter – teacher notes

Curriculum links

Mathematics: Level 3 and 4

Statistics:

Statistical investigation:

- Conduct investigations using the statistical enquiry cycle: gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions

- Identifying patterns and trends in context, within and between data sets

Other curriculum links at Level 3 and 4:

Mathematics – *Geometry and measurement*: measurement.

Social Sciences, Science – *Nature of Science*:

Investigating in Science

Background knowledge

School water use

A school's water use will differ depending on which water fixtures you have and your school roll. For example, a school with a swimming pool uses far more water than one without a pool and the more students at your school, the more water you will use.

The water meter

A water meter is a device which measures the volume of total water used by a property. It measures water directly and accurately.

What is a cubic metre?

A cubic metre is a volume of water 1 metre x 1 metre x 1 metre. This volume is equal to 1000 litres (L). Large volumes of water are measured in cubic metres (m³). Water meters measure water in cubic metres (black digits) and litres (red digits).

What does a water meter look like?

Your school water meter will be in the ground, shielded by a metal or plastic cover which is able to be lifted off in order to read it. Meters are usually located somewhere near the front boundary of the school.

Your caretaker will be aware of the location of the water meter. You may need assistance to lift off the lid. There may be a cover on the meter numbers or debris which needs to be cleared off to see the reading.

The meter may look similar to the example below.

When should we read the meter?

You will need to read the meter at the same time every day to record your results. This will ensure consistency.

We suggest that you read the meter first thing in the morning and last thing before students go home.

The water bill

Look at previous school water bills to obtain more data about your water use. A water bill displays the actual amount of the water used at your school during a certain time period. Readings to calculate the amount owing are taken from your school water meter, therefore past water bills will give you reliable information about the history of water use in your school.



Education for sustainability concepts

Responsibility for action:

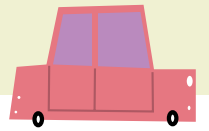
If we want to use taonga, we must look after that taonga

Sustainability/Hauora: The choices we make today affect choices we will be able to make in the future



Water meter

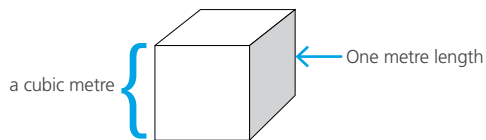
5:3 Measuring water use: Water meter – learning experience



Learning experience

This activity should be completed in short intervals over several days.

- Share the learning intention and success criteria
- Explain that you are going to read the school water meter to find out exactly how much water is used per day at the school
- Introduce the idea of a cubic metre of water. To show what a cubic metre looks like, use a metre ruler, newspaper and tape to construct lengths of rolled newspaper one metre long. Tape them together into a square or use more to make a cube. Explain that a cubic metre is 1m x 1 m x 1m (see *teacher notes*). One cubic metre is equal to 1000L



- Discuss when the water meter should be read to determine total water use in a school day. Agree on a procedure for obtaining the meter readings
- Visit the water meter and complete BLM 5c. Explain the units of measurement of water and relate these to everyday examples
- Continue reading the meter over the next several days to get an average daily use. Compare this to the students' prior estimates
- After reading the meter over several days take all of the results to find an average amount of water used per day
- *As an extension, examine several school water bills and compare to your other results. Graphs of the results may allow more comparison.*

Reflection questions

- What surprised you about the meter reading results?
- Was there a difference between the afternoon reading on day one and the morning reading on day two? If so, give reasons for the difference. *The difference will be the amount of water used after students leave school and at night. This will include water used in school cleaning and any leaks in school water pipes or taps*

Vocabulary

- meter
- measurement
- reading
- estimate

Learning intentions



Students will:

Investigate how much water is used at school using a water meter

Success criteria



Students can:

Gather water use data from the school water meter

Find the average amount of water used per day at school

Resources



Metre rulers

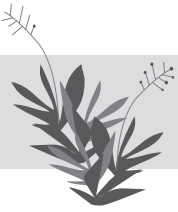
Newspaper

Tape

BLM 5c Reading the school water meter

Clipboard

Pen/ pencil



BLM 5c: Reading the school water meter

How to read the meter

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 7 | 4 | 6 | 2 | 8 | 5 |
|---|---|---|---|---|---|---|

- The black-on-white digits show the number of **cubic metres** of water used since the meter was installed, in this case 3746 cubic metres
- The three white-on-red digits show litres, in this case 285 litres (therefore the total reading is equal to 3,746,285 litres)
- A fourth white-on-red digit to the far right would show tenths of litres (that is, amounts of 100 millilitres)

Use the empty grids below to record your school's meter readings first thing in the morning and then again in the afternoon just before you leave school.

Meter readings

Day 1:

Morning reading

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | | |
|--|--|--|--|--|--|--|

Afternoon reading

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | | |
|--|--|--|--|--|--|--|

Total water used by our school on day 1: (Afternoon reading – morning reading) = _____

Day 2:

Morning reading

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | | |
|--|--|--|--|--|--|--|

Afternoon reading

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | | |
|--|--|--|--|--|--|--|

Total water used by our school on day 2: (Afternoon reading – morning reading) = _____

Average water use per day = _____

(Average water use per day = (total water use day 1 + total water use day 2) ÷ 2)

5:4 Measuring water use: Water survey – teacher notes



Background knowledge

Measuring water use

Water is measured in cubic metres (m³), litres (L), or millilitres (mL). 1000mL equals one litre and 1000L = one cubic metre. Water is used extensively every day in schools, by both staff and students. It is important to include staff use in your survey as well as students use.

Accuracy of results

The table included is based on average water use for each outlet. Amounts have also been rounded for ease of calculation for the activity. Appliances can vary hugely depending on age and technology, for example, a dishwasher can use between 10 and 40 litres of water per cycle.

If you wish to measure water use more accurately, you can investigate your water outlets and appliances to get more exact figures for how much water they use. This could be done by measuring the actual amounts of water used or looking in associated manuals or records.

Urinals and toilets

Toilets and urinals will make up a large proportion of the students' water use at school. Water use of toilets and urinals also varies, depending on age and condition.

Automatic flushing of urinals can waste a large amount of water; they are programmed to flush after a certain amount of time. Urinals use between 3.8L (new) and 19L (20+ years old) per flush. Urinals which flush after each use are more water efficient than those which flush automatically. Half flush toilets use about 3L if they are new. Older toilets can use 11-13L for a full flush.

Leaks or wastage?

Dripping taps or leaking appliances waste a lot of water but are often fairly quick, cheap and easy to fix. You may want to teach students how to change a washer in a tap or discuss how you would manage finding a leak as part of the activity.

Swimming pools

Pools can use a very different amount from one day to the next. To find a rough estimate of water used by a pool per day, multiply the capacity (width x length x depth) by the number of times you fill the pool each year and then divide by 365 (days).

Curriculum links

Mathematics: **Level 3 and 4**

Statistics:

Statistical investigation:

Conduct investigations using the statistical enquiry cycle: gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions

Other curriculum links at Level 3 and 4:

Mathematics –

Geometry and measurement:

measurement, **Social Sciences,**

Science – Nature of Science:

Investigating in Science

Education for sustainability concepts

Responsibility for

Action/Kaitiakitanga:

If we want to use taonga, we must look after the taonga

Sustainability/Hauora:

The choices we make today affect choices we will be able to make in the future



5:4 Measuring water use: Water survey – learning experience

Learning intentions

Students will:

Investigate how much water they use at school in an average day

Success criteria

Students can:

Gather data about their water use for the day

Identify how they contribute to water use during a school day



Learning experience

If possible, the day before this activity, get students to use a tally chart similar to the one below to record how many times they use each water outlet in a day. Each time they use a water outlet they should record it on the chart.

- Share the learning intention and success criteria
- Explain that the tally chart records how many times they use each water outlet each day. They will use it to work out how much water they use each day at school
- Revisit the maps of the school the students created with water outlets on them. Examine all of the water outlets on the map. Ask students to estimate how much water they think would be used at the school each day considering all of these outlets
- After the students have completed the tally charts for one day, combine results together to get the average number of times each water outlet is used. Use these averages to complete BLM 5d
- Adjust the use of BLM 5d according to your students' abilities. Those who are struggling may only complete the student use section
- Using BLM 5d, find how much water is used at your school each day
- *As an extension, survey water wastage in your school by measuring how efficient your appliances are and if there are any leaks. See <http://www.thameswater.co.uk/wisepuptowater/pdfs/water-use-survey.pdf> for ideas.*
- For homework, ask students to complete a home survey

Resources

Tally chart

BLM 5d School daily water use



My tally chart of daily water use

| | Tally of number of times used | Total times used |
|--------------------|-------------------------------|------------------|
| Drinking | | |
| Drinking fountains | | |
| Drink bottles | | |
| Toilet | | |
| Half flush | | |
| Full flush | | |
| Urinals | | |
| Hygiene | | |
| Washing hands | | |
| Taps in classroom | | |
| Other | | |

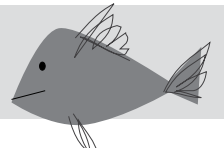
Reflection questions

- What surprised you about your survey results? *Answers will vary*
- How do you personally contribute to using water at school?

Vocabulary

- survey
- efficient
- average

BLM 5d: School daily water use



| Water use | Water used (L) (averages only) | | No. of times used a day (average) | | Total water used (per person) |
|--|-----------------------------------|---|--------------------------------------|---|----------------------------------|
| Student use | | | | | |
| Drinking | | | | | |
| Drinking fountains | 0.5L (500ml) | x | | = | |
| Drink bottles | 0.5L (500ml) | | | | |
| Toilet | | | | | |
| Half flush | 3L | x | | = | |
| Full flush | 6L | | | | |
| Urinals | 10L per flush | | | | |
| Hygiene and cleaning | | | | | |
| Washing hands | 1L | x | | = | |
| Taps in classroom | 10L per minute | | | | |
| Total water use per student | | | | | |
| x number of students | | | | | = |
| Total water use: students | | | | | |
| Staff use | | | | | |
| Staffroom | | | | | |
| Staffroom taps | 10L per minute | x | | = | |
| Drinking water | 2L per person | | | | |
| Hot water: kettle | 2L per jug | | | | |
| Dishes: in sink | 6L | | | | |
| Dishwasher | 30L | | | | |
| Staff toilets | 6L | | | | |
| Total water use: staff | | | | | |
| Other | | | | | |
| | | x | | = | |
| | | | | | |
| Total water used at school per day | | | | | |
| (total water use: students + total water use: staff + other) | | | | | |



5:5 Our water future – teacher notes



Curriculum links

Science: Level 3 and 4
Nature of Science:

Participating and contributing: Use their growing science knowledge when considering issues of concern to them

Explore various aspects of an issue and make decisions about possible actions



Background knowledge

The future of Wellington's water supply

Wellington's current water supply is sometimes stretched, especially in summer, when demand for water increases and there is less rainfall. A major, new water source will probably be needed in the next few years unless water use per person can be reduced as the population grows.

This activity encourages critical thinking to examine how students' actions and behaviours can influence the future environment.

Will conserving water really make a difference?

Yes. If we reduce our water use by 15% then a new water source may not be necessary until about 2040.

Conserving water will also reduce our energy and resource use and decrease our waste. Every litre of tap water produced and distributed uses resources and energy.

What is wrong with creating new water sources?

When we interrupt natural water sources to create a new dam, lake or weir, the natural pathways of water are changed forever. Animal habitat is lost and water movement within that catchment is irreversibly altered. This may have serious consequences for land and water around the affected area. The effects vary depending on the type of structure being built and how it is built. The clean water we need for drinking water is often found in the most pristine environments. One potential site for a new dam is the Whakatikei River in the Akatarawa Forest.

Won't we always need more water as the population grows?

We will eventually need more water as the population grows and demand increases. But, water conservation and informed action can make a large difference to when new sources will be needed. If we can delay a new water source the local environment will benefit.

In recent years, Sydney residents have reduced their water use despite population growth and the city is now using the same amount of water as it did in the early 1970s. http://www.sydneywater.com.au/annualreport/performance/water_efficiency.html



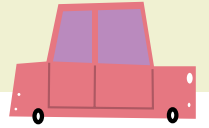
Education for sustainability concepts

Equity: respect for all life, social justice, intergenerational equity, finite resources

Sustainability/Hauora: The choices we make today affect choices we will be able to make in the future

Responsibility for Action/Kaitiakitanga:
If we want to use taonga, we must look after the taonga. Taking action, informed decision-making, citizenship, consumerism, enterprise, resilience and regeneration

5:5 Our water future – learning experience



Learning experience

- Share the learning intentions and success criteria
- Reflect on learning so far during this unit. Resources from section one could be used as a prompt for discussion
- Revisit the results from learning experiences 5.3 and 5.4 and discuss findings. Recap how water is used by students during a school day and how much is used
- Work out the average amount of water used per person per day from meter readings and audit results. Record this amount used on *BLM 5e*. Is the amount per person per day more or less than what the students expected? What is most of this water used for?
- Ask students if they think that reducing water use at school could have an effect on the environment. *Explain that how we use water now and in the near future will affect our future water sources and supplies in the long term. Explain that everyone in the community plays a part in protecting our water resources (see teacher notes and part 2 BLM 5e)*
- How could the total water use of the school be reduced? What are they doing already to conserve water? *Record ideas on BLM 5e*
- Discuss the different futures described in *BLM 5e* and the possible consequences of our actions. Ask students to add their ideas about reducing school water use to the column on the right of the table
- Share ideas and answers. Discuss the current situation at school and whether students would like anything to change to improve the situation. Are there any underlying issues?
- *As an extension, visualise a desirable water future for your community. This could take the form of an illustration, story, or map.*

Reflection questions

- How will we change our behaviour?
Answers will vary
- Which future from *BLM 5e* would you want to happen?
Water future 3 is most desirable

Vocabulary

- conservation
- long-term
- community

Learning intentions

Students will:

Reflect on how much water is used at school

Recognise that their water use will have an effect on the future environment and water supply

Success criteria

Students can:

Describe how much water is used per person per day at school

Explain how water use at school has an effect on the future water supply

Resources

BLM 5e Water use: now and in the future

Answers for *BLM 5e*

Part One: *Answers will vary*

Part Two: *example response:*

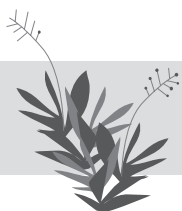
Water future 3 Water use decreases

Water conservation by everyone.

Less water used and wasted. More water re-use, rainwater collection and water efficient equipment used. Less water is needed.

Another water source **WOULD NOT** be needed in the near future.

Harsher water restrictions **WOULD NOT** be necessary.



BLM 5e: Water use: now and in the future

Part 1: Water Use: What is happening now?

| | |
|--|---|
| <p>How many litres per person per day do we use at school? (See BLM 5c, 5d)</p> <p style="text-align: center;">litres per person per day</p> | <p>Can we reduce our water use?</p> <p style="text-align: center;">Y/N</p> <p><i>If yes, how could we reduce the amount of drinking-quality water that we use?</i></p> |
| <p>What are we already doing to save water?</p> | |

Part 2: Water Use: What will happen in the future?

Complete the chart for water future three

| | Water future 1 <i>Water use increases</i> | Water future 2 <i>No change to water use</i> | Water future 3 <i>Water use decreases</i> |
|---|---|---|---|
| Water conservation | No water conservation | Some water saving | |
| Using water at school | Water use increases. More water is wasted. No water re-use or rainwater collection. | Water use stays the same. Some water re-use or rainwater collection | |
| <i>If every school and home did the same...</i> | | | |
| Water sources/collection to supply water | Another dam/lake/other source WOULD BE needed soon | Another dam/lake/other source WOULD BE needed in the near future | |
| Water restrictions | Harsher water restrictions WOULD BE necessary | Harsher water restrictions MAY BE necessary | |