Waitakere City Council
Te Taiao o Waitakere

4 WATER USE TEACHER'S NOTES

There are many ways to use the resource material provided in this package and the following day by day approach is just one suggestion. Please feel free to adapt and experiment with these ideas.

We are always keen to hear about how you are using this material and to receive your feedback about the resource.

EcoWater Solutions is developing a range of educational material relating to water and water use. A visiting speaker is also available to spend time with your class. Please contact us for further details.

Day One

- Revise the litre as a common unit of volume ... show students a variety of contexts e.g. 1 litre milk & soft drink bottles, kitchen measures, 2l car engines etc.
- Introduce students to the cubic metre (1,000 litres) as a unit of measure for larger volumes. (They may know about their parents buying firewood, sand and builder's mix by the cubic metre.) In the world of urban water supply, water is measured, and paid for in cubic metres. Within Waitakere City, all buildings on town supply have water meters which measure water flowing into a property in cubic metres.
- Work through activity sheets 1 to 3. The first activity on sheet 1 is a good way to get students involved in this topic.

Water Use

Activity Sheet 1 to 3

12, one metre rulers. Number line rulers are perfect!)

Notes

Activity Sheets 1 - 3 Research suggests that very few adults have a clear concept of how much water they actually use, and this is a factor in preventing them from changing their patterns of water use.
These activities are designed to help students visualise the large volumes of water which are commonly used in our modern lifestyle.
Activity Sheet 1 Estimates of how long it takes to use a cubic metre of water will probably vary considerably. Activity Sheet 3 will provide a more accurate figure for the students.
Activity Sheet 3 Students often miss the less obvious uses of water around the home, and may need some guidance here. The second activity is a good one for groups to solve, and a range of opinions will emerge. Any misconceptions are cleared up by Activity Sheet 4.

Day Two

- Continue discussion from Day 1 about how water is used around the home
- Work through Activity Sheets 4 & 5.
- Introduce Activity Sheet 6 as a homework activity to be completed next day at school. The idea of 'personal' water use and 'shared' or 'family' water use needs to be discussed.

Water Use

Activity Sheet 4 and 5

Water Use

Activity Sheet 6

Notes

Activity Sheet 4 To avoid possible confusion in the second activity between cubic metres and percentages, percentages have not been marked on the pie graph.
For Waitakere City, these are: Bathroom 28% Toilet 27% Laundry 21% Outdoor Activities 15% Kitchen 9%
Activity Sheet 6 This is really a simplified water use audit and makes a good home / school activity.
Students will need to ask parents about some things e.g. washing machine use. Note that it covers a 24 hour period only.

Day Three

Water Use

Activity Sheet 6

Bookings through Educational Adviser, EcoWater.

Telephone 836 9805

- Complete Activity Sheet 6 from yesterday and discuss results.
- This is a good time to schedule a visiting speaker from EcoWater who will use a range of visual aids to consolidate the work from days 1 & 2, and tell students about the hidden infrastructure (pipes & pumps etc) which delivers water to our homes and workplaces.

Day Four

Activity Sheet 7

- Water Walkabout' ~ take the class for a walk around some of the streets near the school to look for evidence of the water supply system. Start with the school's water meter. Out on the street, look for yellow fire hydrants. These mark the line of a water main. (On most streets there is another water main down the other side of the street too, but this will be less obvious.) You may also be able to see stop valves for the water mains, and perhaps reservoirs.
- Back in the classroom, do Activity Sheet 7.

Notes

Activity Sheet 7 It is unusual for a city to have such a high proportion of its water going to houses. The 71% going to domestic customers is evidence of Waitakere City's 'dormitory suburb' origins. Compare this to the average of 51% for the Auckland region. It does mean that individual families have a significant impact on overall volumes of water used in this city.
'Unaccounted for' water is a worldwide phenomenon. (It is arrived at by subtracting total metered sales from total bulk water purchased). Main causes are leaks, firefighting, pipe maintenance and theft via illegal connection). Our figure of 14% is relatively low. In many large overseas cities, the percentage of unaccounted for water is over 25%. Here in Waitakere City we have been steadily reducing this figure by pressure reduction and leak detection programmes. Tokyo has the lowest percentage of unaccounted for water in the world (7%).

Day Five

Educational Adviser, EcoWater

836 9805

The Mathematics of Water Use

A mathematics resource for years 5 to 8. Available from EcoWater

Activity Sheet 8

- Learning to read water meters ~ today's focus is on water meters and how to read them. EcoWater is able to provide a visiting speaker who will bring along a set of water meters and teach your class(es) how to read them. Advance booking is essential. (836 9805).
- Meter reading is a wonderful 'hands on' maths activity and there are many school and home based projects to involve students. Refer to EcoWater's resource package, *The Mathematics of Water Use*.
- Activity Sheet 8 shows students how to do a simple leakage test for their house, by meter reading. Although this activity mentions 'overnight' testing, the leakage test can be done at any time when water is not being used in the house, e.g. when all the family is away from home for a few hours.

Notes

Activity Sheet 8 Serious leaks in houses often go unnoticed, and can add hundreds of dollars each year to water bills. It is surprising how many leaks are detected by this easily done test.
A good follow up test in cases where water loss has been detected:- put a few drops of food colouring into the toilet cistern, then check the bowl ten minutes later to see if any colouring has leaked in. Cistern leaks are common and very hard to spot.
Many students will be capable of costing any leaks detected... e.g. leakage per hour in cubic metres x 8760 = leakage per year. ..... leakage per year x $1.41 = cost of leakage per year.

For further assistance, contact Sue Langton, EcoWater's Educational Advisor

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Sue has worked as researcher, information centre coordinator and a teacher in secondary schools. Her teaching skills are in Science, Biology and information skills. She is able to assist Waitakere City teachers in the following ways:

- participate in syndicate / departmental planning sessions
- provide professional development sessions for groups of teachers about NZCF linked learning opportunities within the themes of water and water use
- provide a 'helpdesk' service for student research enquiries about water and water use
- supply a range of resource materials with links to other relevant organisations such as Watercare Services and the Auckland Regional Council
- arrange for a visitor from EcoWater Solutions to work with your class as part of a about water / water use study