

WATER: THE LIQUID BROOM

Everyday people in homes, offices and schools use water for drinking, washing, flushing the toilet and preparing food. Industries also use water when making their products. All dirty, used water which goes down the plugholes, toilets or drains is called **sewage**. Many parts of the Durban Metropolitan Area are serviced by a **waterborne sewerage** system. This means that water is used as a 'broom' to sweep up and carry away some types of waste. The dirty water enters a system of underground pipes which direct it to a sewage treatment works. In a typical **metropolitan** area like Durban, 60 to 80% of all water used everyday goes down the sewage pipes. Sometimes sewage is also called 'wastewater'.





Now ask learners to think about how each characteristic of water helps to make it such an effective 'broom' for carrying away sewage from our homes. Their ideas should be written up. The format given on the blackboard may be useful.

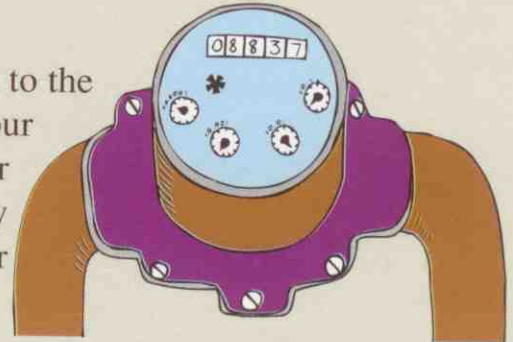
Hold a class discussion on how the Durban Metro area benefits from a waterborne **sewerage** system.



USING THE WATER-BROOM WISELY

It costs lots of money to produce clean water. Enough water-broom has to be used to ensure good hygiene and sanitation, but we should make sure that it is not wasted unnecessarily.

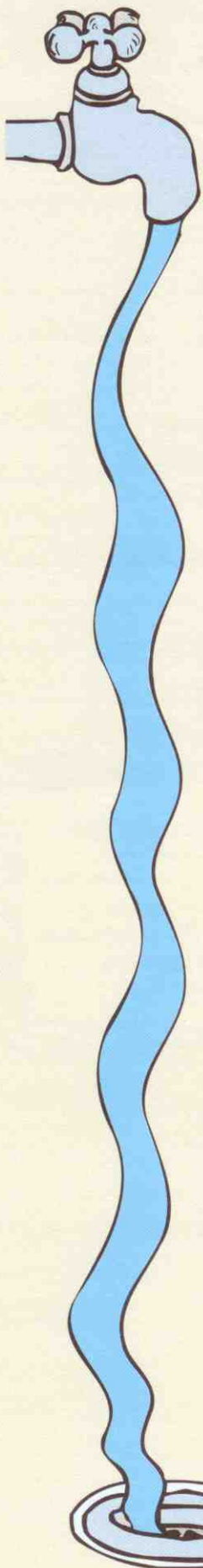
Find your school or home water meter. It is usually fitted to the place where the water pipes from the reservoir enter your school or house. Make sure that you can read the number on the meter. Read this number at the same time everyday for 6 days in a row. Record your readings on your 'Water-use record sheet'.



remember:
1 kilolitre = 1000 litres

Prepare your own Water-Use Record Sheet:

DATE	DAY	TIME	READING (in litres)	LITRES USED (in a day)
2 June	Mon	08:00	617730.68	
3 June	Tues	08:00	637730.68	20000
4 June	Wed	08:00		
5 June	Thurs	08:00		
6 June	Fri	08:00		
7 June	Sat	08:00		



- Each day work out how many litres have been used. Do this by doing a subtraction sum, for example:

$$\begin{array}{r} 63\,7730.68 \\ - 61\,7730.68 \\ \hline 20000.00 \text{ litres} \end{array}$$

- To find out the average amount of water you use in a day, first add up the litres you used each day. Divide this total by the number of days you have recorded, for example:

$$148\,000 \text{ l} \div 6 = 24\,666 \text{ l per day}$$

- **60 - 80% of the water used each day goes down the sewer as sewage.** Work out how much water your school or home uses each day as a 'liquid broom'. This is done by working out 60% of your daily average, for example:

$$\frac{60}{100} \times 24\,666 \text{ l} = 14\,799.6 \text{ l per day}$$

$$\frac{80}{100} \times 24\,666 \text{ l} = 19\,732.8 \text{ l per day}$$

Do this for 60%, 70%, 75%, 80%

- In South Africa water is a scarce and precious resource. It also costs lots of money to clean it up and pipe it to homes and schools. By working more carefully, less of the watery-broom needs to go down the drains each day. How much water could your school or home save if you worked towards allowing only 60% instead of 80% of the daily amount of water used at present to flow down the drain as sewage? Do a subtraction sum to work this out, for example:

$$\begin{array}{r} 19\,732.8 \\ - 14\,799.6 \\ \hline 4\,933.2 \text{ l per day} \end{array}$$





DIRT DETECTIVES

•Ask Learners to observe and draw up lists of all the matter that flows, together with water, down the sewage pipes in their homes and at their school. This can take place over a number of days. The final list should show the place where the sewage enters the **sewerage** system. See the table below.

HOME				SCHOOL			
BATHROOM	KITCHEN	LAUNDRY	OUTSIDE SINK	KITCHEN	TOILETS	HOME-ECON ROOM	SCIENCE LAB
Toothpaste •soluble •non-living •biodegradable							

•Draw up a list on the blackboard, combining all the information from learners' lists. This is also an opportunity to introduce some of the more formal synonyms (such as faeces or urine) for a variety of common terms that will no doubt be used.

Expect lots of giggling and blushing!
Remind the learners that everybody has to 'go' - including the headmaster and the state president!

•Explain and discuss the characteristics of the terms **living** and **non-living**; **soluble** and **insoluble**; **biodegradable** and **non-biodegradable** (refer to the glossary if necessary). Where possible, learners should match the relevant terms to the 'dirty' items which are listed in their table.

•Explain to learners that matter that does not float or get suspended will settle to the bottom of sewer pipes and lead to a blockage. Ask learners to circle items on their lists which should not be put into waterborne sewage systems. Ask learners to discuss other ways of getting rid of wastes that should not go down the sewage pipes.

