Year 5
Lesson 2
How water gets to our houses

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Learning objectives

Students will be able to:

- Understand how water is collected and treated before it reaches our homes.
- Undertake an assessment of domestic water consumption through water meter readings.

Learning outcomes

Subject	Strand & content descriptors
Science	Science inquiry skills • With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be. (ACSIS231) • With guidance, select appropriate investigation methods to answer questions or solve problems. (ACSIS231) • Conduct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate. (ACSIS090)
Mathematics	Statistics & probability • Construct displays, including column graphs, dot plots and tables, appropriate for data type with and without the use of digital technologies. (ACMSP119)
English	Literacy • Navigate and read texts for specific purposes applying appropriate text processing strategies, for example predicting and confirming, monitoring, meaning, skimming and scanning. (ACELY 1702) • Use comprehension strategies to interpret and analyse information, integrating and linking ideas from a variety of print and digital sources. (ACELY 1703)

Important questions

- Where and how is water used in the home?
- How is water treated before it reaches our homes?
- How are charges for water determined?
- How did we get water before dams, pipes and taps?

Background information – dams, pipes and taps

Finding drinking water is as easy as turning on a tap, but it was not always so. It is no accident that most major cities are close to rivers, enabling water to be transported to towns or cities. Indigenous Australians had an intimate knowledge of their environment. Reliable water sources were critical and they made use of permanent rivers and water holes which were dug for groundwater.

In Australia we collect water from three main sources; groundwater, surface water and the ocean. Groundwater or bore water is rain collected underground in impermeable layers. It is drawn by using a pump attached to a drilled hole or bore.

Surface water is rain that drains into rivers or creeks or has been collected in dams or water tanks. Water from the ocean is treated by desalination, to remove salts and other minerals and transform it into drinking water.

Dams are strategically built in catchment areas to collect surface water. Their walls are made from concrete or earth fill and are often in an elevated position so water can flow by gravity to water treatment plants.

Before water can be used for drinking or washing it must be cleaned at a water treatment plant through a number of processes. Mixing alum (aluminium sulphate) with water and allowing it to settle will remove mud, dirt and other particles. Filters filled with sand or gravel removes tiny particles. Chlorine is added to kill bacteria.

Treated water is pumped to reservoirs for storage. Reservoirs are usually on high ground to help the water flow into underground pipes (water mains) and into the house when you turn on the tap.

A water meter measures the amount of water used by a house or business. As water moves through the water meter it turns a turbine (wheel) connected to a numerical readout measuring the water used.

Linking locally

Most of the water used by Logan residents comes from various source points. These include:

- Wivenhoe Dam treated at Mt Crosby water treatment plant,
- Hinze Dam treated at Mudgeeraba and Molendina water treatment plants,
- Leslie Harrison Dam treated at the Capalaba water treatment plant,
- Stradbroke Aquifer (not treated), and
- Seawater treated at the Gold Coast Desalination Plant at Tugun.

Water from these source points are supplied to the city through 6 water supply zones. These zones supply different suburbs in Logan. Logan City uses approximately 55 mega litres per day. This will change as seasons change.

The daily water demand for the city can be met in a number of alternative ways. This water is supplied to 270,000 residents of Logan City. Treated water is stored in 28 reservoirs and delivered to households through a 2,060 kilometre network of pipes.

Lesson plan – dams, pipes and taps

This lesson engages students in measuring and presenting data associated with water consumption in order to gain a better understanding of the processes and costs associated with water treatment and delivery.

Using the poster **'Our urban watercycle'** discuss how water is collected, cleaned and transported through your district.

Determine students' knowledge of treatment process such as filtration and disinfection. Similarly, gauge the level of understating associated with the role of dams and reservoirs and the treatment of wastewater.

Examining water bills students undertake an investigation of water consumption trends in their house; including identifying the volume of water consumed in the last billing period; the cost of water and how it is charged (i.e kilolitre).

Using this information students make predictions of the level of water consumption over a set period (e.g. days or weeks); students should consider any factors that may differ from the information presented on the bill – such as the time of year and the number of people living in the house.

Using **Activity sheet 10 'Reading a water meter'** explain how a water meter works and how to read one. Discuss where a water meter is likely to be located and emphasise the safety aspects associated with reading water meters.

Record the readings over an agreed period; wherever possible recording at the same time of the day (e.g. before school each day)

Students should be asked to identify opportunities to collect non demographic supporting data that may assist in clarifying water consumption trends or explaining differences in consumption across the class, this could include:

- The water efficiency of appliances such as washing machines (via water efficiency (WELS) stickers for example).
- Presence of water efficient fixtures such as low flow shower roses and flow restrictors in taps (measure flow by collecting and measuring the amount of water that comes from the tap or shower over a minute).
- How water from rainwater tanks is used (gardening; toilet flushing; top up swimming pools).
- Swimming pool covers or similar devices.
- Water efficient garden – Watersaver plants; reduced lawn areas.

Data should be plotted and displayed; incorporating a suitable graphical representation such as column or picture graphs. Associated information should compare and discuss results with student predictions.

Resource requirements

- Activity sheet 10 ‘Reading a water meter’.
- Poster – ‘Our urban watercycle’ (see appendices or online resources).
- Student self-evaluation sheet 2.

Additional activities

English: Using the information collected in the meter reading exercise, develop a persuasive text that would persuade members of their household to conserve water. Students should consider the audience and utilise appropriate text and graphic resources.

Important safety note: Reading water meters

Please exercise caution when removing water meter covers. They are homes for spiders and sometimes snakes. Ensure gloves are used by anyone involved in meter reading. Adult supervision is advised.