



Dripping a Drop

Lesson aims

How much water does a leaky tap drip?

Students will identify areas of water wastage and understand the importance of saving water. Students will undertake a measuring task to see how much water leaks from a tap. Students will look at how water is wasted around the school and home and what actions they can undertake to conserve more water.



Learning outcomes

As outlined in the National Profiles:

| | | | |
|------------------------------------|---------------------------------|--|--|
| Studies of Society and Environment | Place and Space | Features of places; People and places; Care of places | |
| | Resources | Use of resources; Management and enterprise | |
| | Natural and Social Systems | Natural systems; Economic systems | |
| Science | Life and Living | Living together; Structure and function; Biodiversity, change and continuity | |
| | Natural and Processed Materials | Materials and their uses; Structure and properties | |
| Mathematics | Chance and Data | Collecting data; Displaying and summarising data; Interpreting data | |



Background information

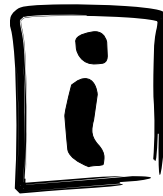
Australia is one of the driest continents on Earth, yet we use more water per person than anyone else in the world!

Australians use more than 1 million litres of freshwater per person each year. In an average Australian city, this means that the water we use **every day** in and around our homes would fill the equivalent of 1,000 Olympic swimming pools!

Nearly half of our household water use is in the bathroom. A person having a daily 10 minute shower uses over 91,000 litres of water each year. And all of this water ends up down the drain.

What can students do to save water?

- Keep a timer in the shower. Reducing your shower by five minutes can save around 50 litres of water at each shower.
- Remind your parents to only use the dishwasher and washing machine for full loads.
- Turn off the tap while you are brushing your teeth.
- Check if you have any taps leaking in your home and ask your parents to repair them.



Sources & further information

ACT Electricity and Water: Information from teachers and students.

www.actewagl.com.au

Hobart Water Authority: Information on water quality and catchment management.

www.hobartwater.com.au/

Melbourne Water: Facts about water, lesson plans, online games and quizzes.

www.melbournewater.com.au

Power Water: Northern Territory Water Authority provides simple ways for households to reduce their water consumption.

www.powerwater.com.au

Save Water: Information on why it is important to save water.

www.savewater.com.au

SA Water: A good list of water conservation tips.

www.sawater.com.au

Sydney Water: Heaps of useful information for homework and assignments and plenty of fun games to play.

www.sydneywater.com.au/

EnsuringtheFuture/WaterSchool/

Water Corporation of Western Australia: Have a look at the student and teacher section.

www.watercorporation.com.au

Classroom activities

1. Leaky Tap Experiment

- Divide the class into small groups. Each group will be responsible for checking the taps in a particular part of the school. Some areas could be:

Taps in garden and sports field areas

Bubblers

Toilets – girls and boys

Taps in classrooms

Kitchen

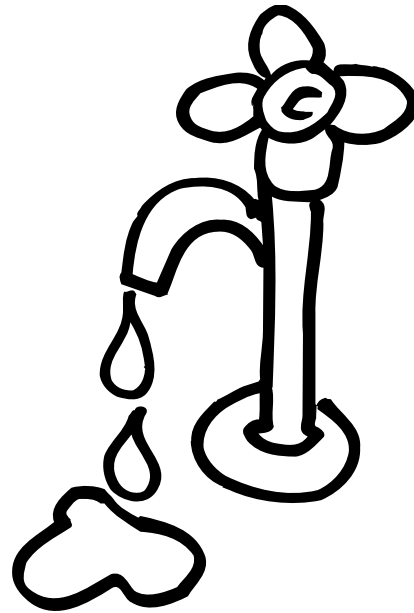
- Students should record how many taps are in their area and whether any are dripping. Students can use the *Worksheet: It's Just a Drop* to record their results.
- They need to measure a dripping tap for 1 minute by collecting the drips in a container and timing it with a watch. They also need to count the number of drops that fall in one minute.
- Students bring recorded information and container back to the classroom to measure the amount of water collected. This should be done in an accurate measuring beaker.

2. Leaky Tap Analysis

- Create a totals table (something like the table shown) on a white board, overhead projector or on a computer.
- Record each group's results.
- Ask students to work out the following totals or complete the exercise as a class.

Which tap leaked the most in a day?
How much water?

Which tap leaked the least in a day?
How much water?



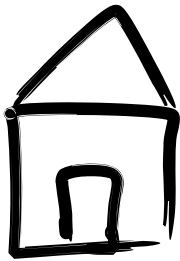
What was the average amount lost by a leaking tap in one day (24 hours)?

Based on this, how much water would be lost in one week, month, and year?

How much water would be wasted in one day if all the taps in the school were leaking? How much is this in a year?

3. Research and Discussion

- In their groups, students should list some water saving tips to help lower their total water use. Ask each group to look at one of the following areas: kitchen, bathroom, laundry, garden and school. Encourage students to contact their local water authority or visit their websites to develop the list.
- Ask the groups to report back to the class on their water saving tips. They could present the information on a poster to be displayed in the classroom.
- Use the *Worksheet: How Do You Measure Up?* to encourage students to think of ways they can reduce their water use.



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Extension / Home-based activities

How much water do you use when you take a shower? Wash a load of clothes? Flush a toilet? Use the dishwasher? Even brush your teeth?

Instructions

1. Fill in the form below about how often or how long you use water in one day. Students may need the assistance of their parents to complete the form.
2. Once you have filled in the amounts on the form, multiply it by the water used column to find out the total amount of water used by this activity.

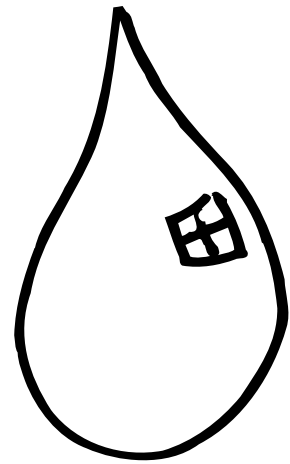
Enter your answers in the boxes below:

| Activity | Amount or Minutes | Water used | Total water used |
|-------------------------|-------------------|-----------------------------------|------------------|
| Example: Water garden | 15 mins | Hose uses 10 litres per minute | 150 litres |
| Baths taken | | 200 litres | |
| Average shower length | | 10 litres per minute | |
| Teeth brushing | | 3 litres | |
| Hand/face washing | | 3 litres | |
| Dishwashing loads | | 70 litres | |
| Dishwashing by hand | | 18 litres/load | |
| Clothes washing loads | | 35 litres/load | |
| Toilet flushes | | 10 litres | |
| Total water used | | | |

Worksheet: It's Just a Drop

My area is:

1. How many taps are in this area?
2. How many of those taps are leaking?
3. Pick one of your leaking taps or make one drip.
Have one member of your group time one minute.
 - a) Collect the water that drips from the tap in one minute in a container.
 - b) Count the number of drops that fall in a minute.
 - c) Remember to turn off the tap!
4. Go back to class and find out how much water you collected in a minute by pouring the container into a measuring jar.
5. Fill out the table with the rest of your class



| Area | Number of taps | Number of leaking taps | How many drops of water per minute? | How much water is dripped in a minute? |
|------|----------------|------------------------|-------------------------------------|--|
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| | | | | |

1. Which tap leaked the most in a day? _____ How much water? _____
2. Which tap leaked the least in a day? _____ How much water? _____
3. What was the average amount lost by a leaking tap in one day? _____
4. Based on this, how much water would be lost in one week _____ a month _____ and a year? _____
5. How much water would be wasted in one day if all the taps in the school were leaking? _____ How much is this in a year? _____
6. What are two ways we can help stop taps leaking? _____

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Worksheet: How do you measure up?

Instructions

1. Fill out the checklist.
2. Ask your parents for help!
3. Add up the numbers you've circled as answers in each column to find your sub total.
4. Then use the information to see how you measure up.

| Do You...? (Please circle your answer.) | Never | Sometimes | Often |
|--|----------------------|------------------------|------------------------|
| Leave the tap running as you brush your teeth | 1 | 2 | 3 |
| Turn the sprinkler on during the middle of the day | 1 | 2 | 3 |
| Run the dishwasher and washing machine when it is not full | 1 | 2 | 3 |
| Use a dual flush toilet | 3 | 2 | 1 |
| Fix leaky taps | 3 | 2 | 1 |
| Clean the car or driveway by hosing it down with water | 1 | 2 | 3 |
| Leave the shower running to heat up the bathroom | 1 | 2 | 3 |
| Leave the tap running to wash dishes instead of filling the sink | 1 | 2 | 3 |
| Use a shower nozzle which is water efficient | 3 | 2 | 1 |
| Use a rainwater tank to collect water | 3 | 2 | 1 |
| Sub Total | <input type="text"/> | + <input type="text"/> | + <input type="text"/> |
| Total (add up the sub total columns) | = | <input type="text"/> | |

How Did You Score?

| Score | What your score says about you | What More Can You Do? |
|-------|--|--|
| 10-15 | You are to be complemented on your knowledge of water resource issues and your commitment to practising sound water conservation practices. | Keep it up! Educate your friends and family to follow your example. |
| 16-20 | You are generally aware of the need to conserve water, but need to be more consistent in your habits. Remember even small leaks result in a huge waste of water. | Conduct a home water use survey with your friends and family. Implement water conservation strategies wherever possible. |
| 21-30 | Unfortunately, like too many others, you could be contributing to severe water supply problems in your community. You need to think about the many ways you can change your habits to become part of the solution. | Call the local water authority or look on their website for more information about how to conserve water. |