# Looking after our water (Years 3 and 4)

Lesson plan

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| Victorian Curriculum F–10[[1]](#footnote-1) links:  **Geography**  **Levels 3 and 4**  **Geographical Knowledge**  **Diversity and significance of places and environments**  Types of natural vegetation and the significance of vegetation to the environment, the importance of environments to animals and people, and different views on how they can be protected; the use and management of natural resources and waste, and different views on how to do this sustainably  **Science**  **Levels 3 and 4**  **Science Understanding**  **Science as a Human Endeavour**  Science knowledge helps people to understand the effects of their actions  **Chemical sciences**  Objects are made of materials that have observable properties |

## Introduction

This lesson plan provides simple hands-on activities that build student understanding about the water cycle, alternative water sources such as water recycling and the importance of using water wisely.

A guided activity featuring Water Recycling Model is available at the Western Treatment Plant. This model helps students better understand where our water comes from and the ways that recycled water can be used in horticulture, agriculture, industry and recreation. Real water flows over the model's catchment landscape with sound effects and track lighting showing different features of the model in action.

For information about tours of the Western Treatment Plant, go to **Visit the Western Treatment Plant** at <<http://www.melbournewater.com.au/getinvolved/education/programs/WTPtours/Pages/Visit-the-Western-Treatment-Plant.aspx>>

### Activity 1: Where does water come from?

Students explore the ideas of evaporation and condensation through a set of simple activities to better understand the water cycle and where our water comes from.

### Activity 2: Water in our community

Students identify where water is collected for use in their home and local community and create a ‘Rain to tap’ storyboard.

### Activity 3: Wise water users

Students consider the importance of using water wisely and use a set of water saving cards to develop an action plan for using water wisely at home.

## Activity 1: Where does water come from?

Students explore the ideas of evaporation and condensation through a set of simple activities to better understand where our water comes from.

### Duration

One double session to conduct experiments with one session for follow up. (Note: The Appearing water activity needs to be left overnight.)

### Equipment

Mysterious handprint experiment (per student): plain paper towel, water, texta pen

Disappearing puddle experiment (per pair of students): piece of chalk or piece of string, plastic cup, water

Inside out experiment (per group): cans with label removed (no sharp edges), ice

Appearing water experiment (per group): large bowl or 2 L ice cream container, small bowl or plastic cup, plastic film, masking tape, blue-tac, small stone

### Preparation

Students will need a notebook or paper and pencils for recording their observations during the activity.

The experiments focus on the key ideas of evaporation and condensation. It is recommended that you select a minimum of one experiment from each of the focus areas. Students could work through the experiments sequentially as a class or students could rotate through work stations in groups.

Students are required to set up the experiment and make observations over a period of time. Some experiments require a sunny day and access to the outdoors. The important outcome of these experiments is the follow-up discussion based on students’ observations.

Ensure that all safety requirements are followed.

### Activity steps

1. Explain that students will be doing a number of experiments about water and that they will need to record their observations from the initial setting up of the experiment to the conclusion. Students should include labelled drawings, comments and measurements (where appropriate). Ask them to predict what they think will happen before conducting each experiment.

**Evaporation experiment 1: Mysterious handprint**

Each student has a piece of paper towel. They wet one hand and place it on the paper towel. They draw around the hand with a pen, leave it for an hour and observe what happens. Students record their observations.

**Evaporation experiment 2: Disappearing puddle**

This activity needs to be done outside on a sunny day. Organise students into pairs and provide each pair with a small piece of chalk and a cup of water. Students find a hard surface area (e.g. asphalt) in the schoolyard and pour a small amount of water onto the surface. Students use chalk to mark the perimeter of the puddle. Students visit the puddle at set times such as at half-hourly or hourly intervals. At each visit, students mark the perimeter of the puddle and record their observations. They could use string to measure the perimeter.

**Condensation experiment 1: Inside out**

Working in pairs, students fill a can with ice and observe what happens on the outside of the can.

**Condensation experiment 2: Appearing water**

Working in groups, students quarter-fill a large bowl (or ice cream container) with water and carefully place a small, empty bowl (or plastic cup) in the middle of the large bowl. You may need to blu-tack the bowl to the base of the large bowl. Students cover the large bowl with plastic film and secure it firmly with masking tape or an elastic band. Students place a small stone on the plastic film so that it dips into the middle over the inner bowl.

Students leave the bowl in the direct sun for a minimum of an hour. The length of time depends on the intensity of the sun on a given day. (Over a period of time the heat of the sun will cause water to evaporate. Eventually, the water vapour will condense appearing as water droplets inside the plastic wrap and drip into the small bowl.) Students observe and draw a picture of what is happening. They carefully move the bowl (without splashing) to a cool and shady place, which may well be inside the classroom.

Students leave it for a few hours or overnight. Students observe what has happened. At this point students can remove the plastic film and look inside the small bowl.

1. When students have completed the experiments, ask them to review their observations. Use the following questions to probe their understanding of what happened. Encourage them to use their observations to support their responses.

* Where did the water go?
* What happened to the water in the puddle?
* What helped the water disappear?
* What is happening on the outside of the tin? Where did the water come from? Why do you think this is happening?
* Where did the water in the small bowl come from? Why did we place a stone on the plastic film?
* What helped the water appear?

1. Ask students to think about the weather and invite them to connect the ideas from the experiments with the weather. Students may be familiar with the natural water cycle and include this in their explanations. Take this opportunity to discuss and clarify:

* Evaporated water is water vapour.
* Water is evaporating all the time from many sources such as pools, creeks and oceans, as well as through the leaves of plants and from the soil.
* You cannot see water vapour because it is a gas, but when it cools down it becomes a liquid: water droplets. You can see water droplets as clouds or fog or as dew on the grass.
* The water that appears in the **Inside out** and **Appearing water** experiments is from water vapour in the air that has condensed: that is, the water vapour has cooled and turned back to water droplets.
* Rain is water vapour that has cooled and condensed in the sky to form water droplets. The water droplets bump into each other and join together to form bigger drops. When these get too heavy the water falls back to Earth, like the water in the small bowl in **Appearing water**.

1. Invite students to think about the natural water cycle and contribute to a discussion on the importance of looking after our water supply. Some suggested prompts:
   * How might evaporation change in different months of the year?
   * How do seasons affect our rainfall?
   * In what ways does our water use change over the year?
   * Where does the water come from that we use every day?
   * Why is it important to look after the water that we use?

### Resources

The natural water cycle, Melbourne Water <<http://melbournewater.com.au/getinvolved/education/Pages/Natural-water-cycle.aspx>>

## Activity 2: Water in our community

Students identify where water is collected for use in their home and local community.

### Duration

Two sessions

### Equipment

Interactive whiteboard or data projector

### Preparation

For this activity you will need access to an interactive whiteboard or computer and data projector. Information about Melbourne’s water supply system can be found at <<http://www.melbournewater.com.au/whatwedo/supply-water/Pages/Water-supply-system.aspx>> and the free Melbourne Water app (Apple and Android) has current and historical water storage and catchment rainfall information.

### Activity steps

1. Begin by explaining that in the natural water cycle, water is recycled over and over again by evaporating and condensing and falling back to Earth. However, most of the water on the planet is salty ocean water and not fresh water that we can drink or use to grow land plants. Of the small amount that is fresh water, most is frozen in the ice caps and glaciers. That leaves only a tiny amount of all the water on Earth that is available to use. Humans take water from the natural water cycle for drinking, cooking and recreational purposes, and this is part of the urban water cycle. It is recommended that students have an understanding of ‘urban’ referring to being situated in a city or town.
2. Ask students where they think the water comes from when they turn on the tap in their home or at school. Ideas may be listed.
3. Explain that, as a class, students will find out about where Melbourne’s water is stored and how it gets to taps at school and home. Information about water storage reservoirs can be found at <<http://www.melbournewater.com.au/whatwedo/supply-water/reservoirs/Pages/water-storage-reservoirs.aspx>> and the Melbourne Water app.
4. Ask students to identify which of the major reservoirs is nearest to where they live. Select the link for your reservoir and display the information to the class. View its location on the map. Discuss the key features of the reservoir such as:

* Where does the water come from?
* Where does the water go? Which parts of Melbourne does it supply? What else is the water used for?

1. Use the Water storage reservoirs web page to explore the other reservoirs that supply Melbourne. Discuss the fact that much of Melbourne’s water supply travels a long way across the city.
2. Ask students why they think there are so many service reservoirs and why they are important for getting water to their home and local community.
3. Students create a ‘Rain to tap’ storyboard to show the sequence of how water is collected and how it reaches their tap at home and in the local community. The storyboard should include key information from the class investigation using the Melbourne’s water supply system information. You could use a four-box sequence with arrows to connect boxes.

### Resources

The natural water cycle, Melbourne Water <<http://melbournewater.com.au/getinvolved/education/Pages/Natural-water-cycle.aspx>>

## Activity 3: Wise water users

Students consider the importance of using water wisely and plan for action.

### Duration

Two sessions

### Equipment

For each group:

One set of water saving cards

One copy of **Student worksheet: Using water wisely**

### Activity steps

1. Students re-visit their ‘Rain to tap’ storyboard from the **Activity 2: Water for our community** session.
2. [Using the information on Melbourne Water’s Alternative water sources web page at <http://www.melbournewater.com.au/whatwedo/Liveability-and-environment/Pages/Alternative-water-sources.aspx](http://www.melbournewater.com.au/whatwedo/Liveability-and-environment/Pages/Alternative-water-sources.aspx)>, explain how water is reused to save high quality water for its special uses. Talk about other sources of water such as recycled water and stormwater harvesting, what the recycled water is used for and how the water is returned to the natural water cycle after its time in the urban water cycle.

Ask students why it is important to use water wisely? Guide the discussion with a focus on reasons why it is important to use water wisely for the environment and for our future.

**Teacher tip**

Organise the water saving cards so that there is one set among three or four students.

1. Organise students into groups of three or four. Explain that each group will receive a set of water saving cards. Each student randomly takes four cards from the set and has time to consider why the water saving idea is important for the environment, our future or both. Encourage students to think about:

* the water cycle and how this idea links to it, for example, mulch reduces evaporation and keeps moisture in the ground
* rivers and creeks which flow to reservoirs and to the sea
* animal and plant life in their waterway environment
* reservoirs which store our drinking water
* recycled water: for example, treated water for use in parklands, golf courses and farms; water from the laundry and shower for use in the garden.

1. Students take turns to present their cards to the group and explain why they think it is important for the environment or our future. It is recommended that one card is presented at a time and students rotate taking turns until all the cards have been presented.
2. Groups sort the cards into different collections—water saving ideas for the environment, for our future or for both. Groups can share their ideas with the class.
3. Distribute the **Student worksheet: Using water wisely** and explain that they will use the ideas from the water saving cards discussion to complete it. Students refer to the water saving cards for ideas and prompts, recording:

* reasons for using water wisely for the environment and our future
* their favourite water saving ideas from the water saving cards.

1. Students choose a favourite idea to develop into a plan that they think their family could do.
2. Students take their plan home and discuss it with their family.

### Optional activity

To provide a community perspective, invite an officer from the local council or water authority to speak to students about what they are doing to use water wisely.

### Resources

Natural water cycle, Melbourne Water <<http://melbournewater.com.au/getinvolved/education/Pages/Natural-water-cycle.aspx>>

Urban water cycle, Melbourne Water <<http://melbournewater.com.au/getinvolved/education/Pages/Urban-water-cycle.aspx>>

•Water supply system, Melbourne Water <<http://www.melbournewater.com.au/whatwedo/supply-water/Pages/Water-supply-system.aspx>>

Using and saving water at home, Melbourne Water <<http://www.melbournewater.com.au/getinvolved/saveandreusewater/Pages/Save-water-at-home.aspx>>

Using and saving water at school, Melbourne Water <<http://www.melbournewater.com.au/getinvolved/saveandreusewater/Pages/Save-water-at-school.aspx>>

**Local water retailers**

City West Water, <[www.citywestwater.com.au/residents/saving\_water.aspx](http://www.citywestwater.com.au/residents/saving_water.aspx)>

Yarra Valley Water, <[www.yvw.com.au/Home/Inyourhome/Savingwaterathome/index.htm](http://www.yvw.com.au/Home/Inyourhome/Savingwaterathome/index.htm)>

South East Water, <<http://southeastwater.com.au/Business/PWUR/Pages/PWUR.aspx>>

**Student worksheet: Using water wisely (Activity 3)**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Why is it important to use water My favourite ideas for My plan of what I think my family

wisely for the environment? using water wisely at home. can do to use water wisely.

Draw and write about your plan.

**WISE WATER USE**

Why is it important to use water wisely  
for our future?

**Water saving cards (Activity 3)**

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| **Reduce your shower time to 4 minutes** | **Install aerators or flow restrictors on all your taps** | **Install a cistern weight, if you have an old single flush toilet** | **Cut one load of washing each week** | **Check for leaking taps, shower heads and toilets** |
| **Mulch the garden** | **Prepare the garden soil with water-storing agents** | **Check your outdoor taps and hoses for leaks** | **Use a cover on your pool and check the pool for leaks** | **If planting new plants, choose drought-tolerant ones** |
| **Don’t cut the lawn too short** | **Install a rainwater tank** | **Turn the tap off while brushing your teeth or shaving** | **Keep bathwater to a minimum and divert to the garden if possible** | **Don’t wash your dishes under running water** |
| **Only wash with a full load of clothes** | **Make sure the dishwasher is full before turning it on** | **Divert your washing machine water to your garden** | **Repair leaking taps immediately** | **Get a FREE water-saving showerhead** |

The water saving cards were developed from the Target 155 suggested actions for saving water at home.

1. Creative Commons Licence Victorian Curriculum and Assessment Authority (VCAA) <<http://victoriancurriculum.vcaa.vic.edu.au/>> Accessed 14 August 2016. [↑](#footnote-ref-1)