



# The water cycle


Stage 1 lesson plans

Exploring the water cycle and how we manage it to meet our needs



Sydney  
**WATER**



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| <b>Stage 1 –The water cycle</b>  |   |  |
| <b>Aim</b><br>To develop students' understanding of how water moves through the water cycle. The suggested learning sequence will: <ul style="list-style-type: none"> <li>• explore how the natural water cycle works using multiple mediums</li> <li>• identify the processes of the natural water cycle</li> <li>• explore how we interact and manage the water cycle to meet our needs</li> </ul> Students will develop an awareness that all water on Earth is recycled and continuously moving from the Earth to the atmosphere and back again.   |   | <b>Time:</b><br>~ 120 mins  |
| <b>Key inquiry questions</b> <ul style="list-style-type: none"> <li>• Does water disappear? Is there ever new water?</li> <li>• What are the processes of the natural water cycle?</li> <li>• What are some ways we interact or change the water cycle to meet our needs?</li> </ul>   | <b>Background information</b><br><p>Does water really disappear? Is rain new water? How does water get in clouds? Water is a fascinating and critical part of Earth's processes called the natural water cycle.</p> <p>The water we have today, is all that we have. It's the same water that existed on Earth billions of years ago. It is used and re-used as it continuously moves from the Earth to the atmosphere and back again.</p> <p>During its journey through the cycle, water changes states as it falls as rain, snow, sleet or hail (<b>precipitation</b>). Water is heated by the sun, <b>evaporates</b> into the atmosphere as water vapour, condenses into tiny droplets and forms clouds (<b>condensation</b>). Eventually, it falls back to earth. Water seeps into the ground (<b>infiltration</b>) and moves slowly as groundwater (<b>percolation</b>) to nearby lakes, streams or oceans. Some groundwater is taken up by plants, travels through plants and evaporates back into the atmosphere as water vapour (<b>transpiration</b>) and the journey begins again.</p> <p><b>The urban water cycle</b> is when we change and manage the natural water cycle. We change the cycle to capture, collect and store water. This means we can stay in one spot (our home) and have enough clean, safe water delivered every day. We also remove and clean our used water to re-use or return to the environment.</p> <p>Together, the natural and urban water cycle can be called the water cycle.</p> <p>In Australia, and in many countries too, freshwater can be scarce. To meet the challenges of growing vibrant cities with a secure water supply, we rely on a mix of water supply options such as dams, rivers, rain water tanks and options which are less rainfall dependent including oceans, recycled water and groundwater.</p> <p>Our used water is removed through pipes to treatment plants where it is cleaned for reuse or returned to the environment as part of the water cycle. Our used water is a valuable resource, by applying technology we are speeding up nature's cleaning process and using our precious water wisely.</p> |   |
| <b>Syllabus outcomes</b><br><b>Science</b><br>ST1-1WS-S -Observes, questions and collects data to communicate and compare ideas.<br>ST1-2DP-T - Uses materials, tools and equipment to develop solutions for a need or opportunity.<br>ST1-10ES-S - Recognises observable changes occurring in the sky and on the land and identifies Earth's resources.<br><b>English</b><br>EN1-11D - Responds to and composes a range of texts about familiar aspects of the world and their own experiences.<br><b>Geography</b><br>GE1-1 - Describes features of places and the connections people have with places<br>GE1-3 - Communicates geographical information and uses geographical tools for inquiry<br><b>Creative Arts</b><br>VAS3.2 - Makes artworks for different audiences assembling materials in a variety of ways.<br>MUS1.1- Sings, plays and moves to a range of music, demonstrating an awareness of musical concepts. | <b>Syllabus skills</b><br><b>Science</b> <ul style="list-style-type: none"> <li>• Develop and apply skills in scientific inquiry through the process of working scientifically.</li> </ul> <b>English</b>   |   |

- Develop and apply skills in expressing themselves and their relationships with others and their world.
- Geography**
- Develop knowledge and understanding between people, places and environments.
- Visual Arts**
- Makes artworks informed by their investigations of the world as a subject matter and use of expressive forms.
- Music**
- Performs music of different styles and from different times and cultures by singing, playing and moving using musical concepts.

## Teaching and learning

### Lesson 1: The natural water cycle (40 min)

**Inquiry question:** What are the processes of the natural water cycle?

Explore how water moves from the Earth to the atmosphere and back again and the stages of the natural water cycle.

#### Activity 1: Wondering about water (10 min)

**Preparation:** Download lessons, worksheets and PowerPoint.

Using a wonder wall and **The water cycle PowerPoint** get students thinking, questioning and sharing to understand their level of knowledge and interests. Let students reflect on the following questions. Have you ever wondered...

- Does water disappear? Have you ever seen a puddle dry? Where did the water go?
- How are clouds made? How does water get in clouds?
- Is rain new water?
- How does water move from the Earth to the clouds and back?

Either the teacher or students record statements and questions on cards and place on the wonder wall.

Throughout the lessons, encourage students to reflect, ask questions and look for questions that have been answered. Use a word wall to capture any new vocabulary.

#### Activity 2: What is the natural water cycle? (30 min)

1. Using the **PowerPoint** and **Background information**, introduce and explore the natural water cycle and capture the vocabulary on the word wall. Prior learning: water can change states and exist as liquid, solid or gas.
2. Sing and act out the **Water Cycle Song** by Monica Sheba. This song is based on the traditional folk song "She'll be coming 'round the mountain". The song can be repeated throughout the lessons.
3. Watch the **Sydney Water Cycle Animation**.
4. Students complete the **Natural water cycle worksheet**.

## Resources

### Sydney Water resources

[Primary school resources](#)

*Wondering about water*

*Module 4 The water cycle*

- [The water cycle water lesson plans](#)
- [The water cycle PowerPoint](#)
- [The water cycle worksheets](#)
  - *Natural water cycle worksheet*
  - [Water cycle song](#)
- [Sydney Water Cycle Animation](#)

Find out more on our *Natural water cycle* webpage via our *Primary school resources*.

### Other resources

- [Water cycle adventure play script - Enchanted Learning](#)

### Materials

- Scissors
- Poster paper
- Blank cards
- Sticky tack or tape
- Markers
- Colouring pencils

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| <p><b>Optional</b></p> <p><b>The water cycle adventure play</b></p> <p>View the 'Water cycle adventure play script'. The play follows the adventures of two water drops as they pass through the water cycle. Make copies of the play, assign roles and read the play in class. After reading the play, students could illustrate the journey of the water drops through the water cycle.</p>  | <p><b>Vocabulary</b></p> <p>Natural water cycle, recycle, liquid, gas, water vapour, water droplet, hail, snow, evaporation, condensation, precipitation, atmosphere, transpiration, run-off, infiltration and percolation.</p>  |
| <p><b>Lesson 2: Water cycle experiments (40 min)</b></p> <p><b>Inquiry question:</b> Does water disappear? Is there ever new water?</p> <p>Use a hands-on practical investigation to investigate processes in the natural water cycle. Explore how clouds are made and how water evaporates.</p> <p><b>Activity 1: Demonstration – Can you make a cloud? (20 min)</b></p> <p><b>Preparation:</b></p> <p>Using the <b>Make a cloud</b> brochure, prepare your materials for a class demonstration. Watch the <b>Make a cloud experiment video</b> to see how it's done.</p> <p><b>Demonstration:</b></p> <ol style="list-style-type: none"> <li>Using the <b>PowerPoint</b> as a prompt, ask students to discuss as a class or in pairs: <ul style="list-style-type: none"> <li>What are clouds? How are they made? What are they made of? Why does rain fall from clouds?</li> <li>Can you make a cloud?</li> </ul> </li> <li>Recall the water cycle by singing the <b>Water Cycle Song</b>.</li> <li>Perform the demonstration with your students.</li> <li>Using the <b>See, think, wonder worksheet</b> students' record their thoughts. Ask students prompting questions: <ul style="list-style-type: none"> <li>What happened? Why?</li> <li>Why did we warm the water? What makes water warm on Earth?</li> <li>Why did we use ice cubes?</li> <li>Why did we see condensation, a cloud?</li> </ul> </li> <li>Watch the <b>Make a cloud experiment video</b> and use the <b>PowerPoint</b> and <b>Discussion notes</b> to help answer some of their questions and describe what happened. Students can revise their worksheet if needed.</li> </ol> <p><b>Activity 2: Practical investigation – Does water disappear? (20 min)</b></p> <p><b>Preparation:</b></p> <p>Using the <b>Water evaporation experiment</b> brochure prepare your materials for two sets or more. Watch the <b>Water evaporation experiment video</b> to see how it's done. Note: The results of this experiment will take a few days.</p> <p><b>Practical investigation:</b></p> <ol style="list-style-type: none"> <li>Watch the <b>Water Evaporation Experiment</b> video. Ask students to reflect on these questions: <ul style="list-style-type: none"> <li>Does water disappear?</li> <li>Why are there jars, one with a lid and one without a lid?</li> <li>What changes will we see? How can we compare the differences?</li> </ul> </li> </ol> | <p><b>Sydney Water resources</b></p> <ul style="list-style-type: none"> <li><a href="#">The water cycle PowerPoint</a></li> <li><a href="#">Water cycle song</a></li> <li><a href="#">Make a cloud brochure</a></li> <li><a href="#">Make a cloud experiment video</a></li> <li><a href="#">See, think, wonder worksheet</a></li> <li><a href="#">Water evaporation experiment brochure</a></li> <li><a href="#">Water evaporation experiment video</a></li> <li><a href="#">Plan an investigation</a></li> <li><a href="#">Measure and compare worksheet</a></li> </ul> <p><b>Optional</b></p> <p><a href="#">Primary school resources</a></p> <ul style="list-style-type: none"> <li><a href="#">Make a water cycle model instruction sheet</a></li> <li><a href="#">Make a terrarium brochure</a></li> <li><a href="#">Water cycle and terrarium experiment</a></li> </ul> <p><b>Materials</b></p> <p><i>Make a cloud demonstration</i></p> <ul style="list-style-type: none"> <li>1 x Large glass jar with a metal lid</li> <li>Boiling water</li> <li>Blue food colouring</li> <li>Ice cubes</li> <li>Matches</li> </ul> <p><i>Water evaporation experiment (per group)</i></p> <ul style="list-style-type: none"> <li>4 x Glass jars</li> <li>2 x Lid (or aluminium foil or plastic wrap)</li> <li>Permanent marker</li> <li>Ruler</li> <li>Blue food colouring</li> <li>Jug of water</li> </ul> |

2. Display the **Plan an investigation template** in the PowerPoint to help students think and work like a scientist.
3. Record students' predictions, materials, risks and safe choices to conduct the investigation.
4. Set up a set of jars or multiple sets, placing one set in a windowsill with sunlight and one set in the shade. This will help with the concept of heat or sunlight driving evaporation.
5. Ask students to predict which one they think will evaporate most.
6. Use the **Measure and compare worksheet** for students to record observations over several days.
7. Discuss their findings in the **Measure and compare worksheet**.
8. (Optional) Graph the class data to visualise how much water each jar lost and how fast.
9. Record students' observations, conclusions and questions in the **Plan an investigation template**.

An alternative experiment is to pour a small amount of water on pavement, some in the shade and some in direct sunlight. Draw a chalk line around each puddle and measure and record how quickly the water evaporates over time.

### Optional

#### Make a water cycle model

Using the **Make a water cycle model instruction sheet** each student, or in groups, can create their own water cycle in a plastic sandwich bag.

#### Water cycle terrarium

Make a mini Earth and discover the water cycle in action using the **Make a terrarium** brochure and **Water cycle and terrarium experiment** video.

### Discussion notes

**The make a cloud experiment** replicates the condensation process by speeding up the natural water cycle.

In the experiment, heated water causes the water to **evaporate**, changing water to **water vapour**. The sun does this job in nature.

**Water vapour** is mostly invisible. In this case, we used smoke to help see the vapour. As the water vapour rises and the air cools the air, droplets are formed and stick to the smoke particles and to each other to form bigger droplets (**condensation**). This makes a visible cloud.

In nature the atmosphere does this job. Think of a mountaintop, the higher it is the colder it gets.

**The water evaporation experiment** is evaporation as it happens in real-time.

Evaporation is mostly an invisible process. Evaporation is happening everywhere all the time. Every time clothes dry, after the rain when a puddle disappears or when wet paint dries

The experiment allows students to scientifically gather evidence that evaporation is happening, and that heat drives these changes.

### Lesson 3: The urban water cycle! (40 min)

**Inquiry question:** What are some ways humans interact or change the water cycle?

Explore why we modify and manage the water cycle to meet our needs.

#### Activity 1: What is the urban water cycle? (20 min)

Using the **PowerPoint** and **Background notes** explore how we change our environment to suit our needs. Ask students to consider:

- Do we change our environment?
- Why do we change our environment?
- Where does our water come from?
- Is the water that comes to us clean? How does it get to our homes?
- Can we drink it straight from our taps?
- Where does our used water go? Does our used water get cleaned?
- Where does water outside our homes go?

### Sydney Water resources

- [The water cycle PowerPoint](#)
- [My urban water cycle activity sheet](#)

Find out more on our *Urban water management*, *Water sources* and *Water network* webpage via our *Primary school resources*.

#### Materials

- Scissors
- Glue
- Colour pencils or markers



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| <p><b>Activity 2: What's my urban water cycle? (20 min)</b></p> <ol style="list-style-type: none"> <li>1. Visit our <b>Water network</b> find out where your schools' drinking water comes from.</li> <li>2. Highlight or circle which of the sources are relevant for your school, show students where they can do this on their worksheet.</li> <li>3. Using the <b>My urban water cycle activity sheet</b> students can build their own urban water cycle.</li> </ol> <p><b>Optional</b></p> <p><b>3D water cycle diorama</b></p> <p>Split the students into small groups. Students are to create a 3D diorama the water cycle. It could feature:</p> <ul style="list-style-type: none"> <li>• clouds and rain, water flowing into rivers, into a dam or ocean</li> <li>• pipes leading from the dam or ocean to a water filtration plant then to peoples' houses, schools or other buildings</li> <li>• pipes leaving houses, schools or other buildings going to a water recycling plant then going to creeks, ocean and recycled.</li> </ul> | <p><b>Optional</b></p> <p><i>3D diorama</i> (per group)</p> <ul style="list-style-type: none"> <li>• 1 x Large cardboard box cut with 3 faces (2 sides and a base) - per group</li> <li>• Collection of recycled materials such as food packaging or natural materials</li> <li>• Scissors</li> <li>• Glue</li> <li>• Coloured markers or poster paint</li> <li>• Modelling clay, toy building blocks.</li> </ul> <p><b>Vocabulary</b></p> <p>Urban, urban water cycle, natural environment, built environment, pipes, drinking water, wastewater, stormwater, store, dam, source, recycled water.</p> |
| <p><b>Summative task: What I learned about water</b></p> <ul style="list-style-type: none"> <li>• Direct students to write or draw their answer to one of the inquiry questions on a water droplet.</li> <li>• Droplets can be attached to a ribbon or string and hung from the ceiling, wall, or across the room.</li> <li>• The water droplets can be used towards assessment.</li> </ul>  | <p><b>Sydney Water resources</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Water droplets worksheet</a></li> </ul>  |
| <p><b>Reflection</b></p> <p>Revisit the wonder wall and reflect on concepts covered in the lesson. Allow students time to share with each other and compare thoughts and questions. As a group look for questions that have been answered and adjust on the wonder wall. Either the teacher or students record new statements and questions and place on the wall.</p>   |  |
| <p><b>Homework Task</b></p> <p><b>Water cycle game</b></p> <p>Test students' understanding of the water cycle by playing the <b>Natural water cycle game</b> and <b>Urban water cycle interactive</b>. Write or draw what happened in the game in a presentation.</p> <p><b>Extension Activity</b></p> <p><b>Write a new water cycle song or dance</b></p> <p>Challenge students to write their own water cycle song or come up with new dance to teach other how the water cycle works.</p>   | <p><b>Other resources</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Natural water cycle game – South East Water</a></li> <li>• <a href="#">Urban water cycle interactive – South East Water</a></li> </ul>  |