

# When Water Lost Her Way

## Lesson Plan Year 3 - 4 Exploring the Water Cycle

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### Learning Objective

Understand the way water can change between a solid and liquid in response to changes in temperature. Explore the properties of water and how these unique properties can influence the environment in different ways.

### Curriculum Links

Year	Australian Curriculum/Victorian Curriculum Science Understanding	Australian Curriculum Science Inquiry Skills	
Year 3	A change of state between solid and liquid can be caused by adding or removing heat <a href="#">ACSSU046</a> / <a href="#">VCSSU059</a>	Heat can be produced in many ways and can move from one object to another <a href="#">ACSSU049</a> / <a href="#">VCSSU063</a>	Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends <a href="#">ACSIS057</a> With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge <a href="#">VCSIS065</a>
Year 4	Earth's surface changes over time as a result of natural processes and human activity <a href="#">ACSSU075</a> / <a href="#">VCSSU062</a>	Natural and processed materials have a range of physical properties that can influence their use <a href="#">ACSSU074</a> / <a href="#">VCSSU060</a>	Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends <a href="#">ACSIS057</a> With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge <a href="#">VCSIS065</a>

# *When Water Lost Her Way*

## Lesson Plan Year 3 - 4 Exploring the Water Cycle

### Lesson Summary

Read *When Water Lost her Way* and explore the water cycle presented in the story using an inquiry based thinking routine (think-puzzle-explore). Begin with gathering the collective understanding of water and the water cycle from the class. Use the story to stimulate further discussion and identify questions or puzzles about the water cycle, focusing on the different states that water can change between. Collectively work out how this can occur (focusing on changes in temperature). Follow with exploring an identified interest/puzzle area from the group or use one of the suggested exploration activities. Collectively summarise and reflect on what everyone has learnt about water and the water cycle and why it is important that water in our environment is managed appropriately.

### Cross Curriculum Links

Critical & Creative Thinking	Inquiring – identifying, exploring and organising information and ideas; Generating ideas, possibilities and actions
Literacy	Comprehending texts through listening, reading and viewing; Word Knowledge - Understand learning area vocabulary
Numeracy	Using measurement - Estimate and measure with metric units
HASS- How people, places and environments interact, past and present (Yr .4)	Examine the concept of sustainability, and its application to resource use and waste management, past and present, by different groups

# When Water Lost Her Way

## Lesson Plan Year 3 - 4 Exploring the Water Cycle

Lesson Plan

### THINK:

(Engage, Question, Predict) What do students think or know about the water cycle?

What do you know about water and the water cycle?

What are the different forms of water?

What do you think this story will be about? (Clues: Illustrations, title, author background, etc.)



Collate all the information from the room on a white board

Read the story *When Water Lost Her Way*

Discuss with the group what everyone thought of the story



### PUZZLE:

What questions or puzzles do you have from the story?

Optional suggested questions to stimulate conversation are below

- Looking at the list from earlier, can you find all the forms of water in the story?
- What do you think can cause water to change between these different forms/states?  
*Focus on temperature.*

The mountain says 'you are a sculptor of mountains. You are stronger than me. You can and carve my hard rock all the way to the ocean.'

- How can water be harder than rock? What are the properties of ice that allow it to break up and transport rocks great distances?

The reed in the lake notes "I eat the nutrients that you carry down the river and in turn this makes you clean again...'

- How do you suppose water can carry nutrients? *This will be further explored in activity- explore properties of water*
- What puzzles do you have about water from the story? (*refer activity sheet page 6*)



### EXPLORE:

Explore any puzzles identified from the group/class.

A summary of some optional explorative activities are provided below

Build your own Water Cycle <i>Refer page 4</i>	Explore the properties of water <i>Refer page 4</i>	Water Quality and Water Management <i>Refer page 5</i>	Global Water Issues <i>Refer page 5</i>
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### REFLECT/COMMUNICATE:

Some suggested summary questions for the class/group are provided below

- What did you learn about water and the water cycle?
- Can you explain the different forms/states that water can occur in & how this can change from different temperatures?
- Do you have any other puzzles to explore about water and the water cycle?

# When Water Lost Her Way

## Lesson Plan Year 3 - 4 Exploring the Water Cycle

### Exploration Activities

Build your own water cycle		
<p><b>Time</b> 10 min &amp; 4-5 hours wait time then 10-15 minutes</p>	<p><b>Materials</b> 1 large bucket, 1 small container, glad wrap, 1 litre of water &amp; a measuring jug, table salt</p>	<ul style="list-style-type: none"> <li>Place the small, empty container inside the large bucket (or a known/measured amount of water to cover the base of the container)</li> <li>Fill a 1 litre jug with water- observe it together then add 5-6 table spoons of salt - stir up the water with the salt, observe its colour &amp; taste</li> <li>Empty the salty water into the large bucket covering its base (this is like the ocean), record the measured volume emptied</li> <li>Ensure the small bucket has no water in it and sits in the middle of the large bucket</li> <li>Cover the large bucket with glad wrap and place outside in the sun for 4-5 hours</li> <li>Go back and check on the experiment and see how much water has dripped down and filled the small container- measure this with your measuring jug</li> <li>Taste the water in the small container - is it salty? If not, where is the salt- discuss how on a relative basis salt will accumulate in oceans (the large container) due to evaporation which leaves the salts behind</li> <li>Discuss together how much water evaporated, then condensed on the glad wrap and fell into the small container- what would happen if it was a much hotter or colder day?</li> <li>Discuss as a group the role that heat / temperature plays in changing water between a solid, liquid or gas.</li> </ul>

Explore properties of water		
<p><b>Time</b> 20 min</p>	<p><b>Materials</b> ice cubes, plastic bucket, boiled water in a furnace or kettle, clear plastic cups or glass jars, soils- (mud/clay and sand), olive oil</p>	<ul style="list-style-type: none"> <li>Observe ice on liquid water - what does it do? <i>Observe that it floats, it is cold &amp; hard. Explore how water expands when in solid ice, how this allows it to float and how the expansion of ice can break apart rocks.</i></li> <li>Boiling water- although hard to see, watch in the sunlight as water vapour moves off a hot mug</li> <li>Put a bit of dirt (compare mud/clay/sand) in water filled plastic bottle/jar and mix thoroughly</li> <li>Observe what changes- does the water look dirty or clean and why do you think this is (Comparing clays &amp; sands)?</li> <li>Drop a couple of teaspoons of oil in water. What happens? Does it mix? Why/ Why not?</li> <li>Discuss how the experiments show water can be easily polluted and what this means for water management</li> </ul>

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## Lesson Plan Year 3 - 4 Exploring the Water Cycle

Water quality and water management		
Time 20 min	Materials Computer/ iPads for group work, butchers paper and coloured textas for writing observations	<ul style="list-style-type: none"><li>• Look at the last page in the book showing how much water is stored in different places on earth</li><li>• Can you work out which water stores are salty and fresh?</li><li>• What does this mean for managing our water resources?</li><li>• Research your local water retailer and where the water from the tap comes from</li><li>• Drawing on learnings from Activity 'Explore properties of Water', if water is easy to pollute what does this mean for management of our fresh water resources?</li><li>• How can water be polluted and what can you do at school and/or at home to maintain clean water in our environment?</li></ul>

Global water issues		
Time 20 min	Materials Computer/ iPads for group work, butchers paper and coloured textas for writing observations	<ul style="list-style-type: none"><li>• In most parts of Australia we are lucky to have access to safe drinking water and sanitation (toilets)</li><li>• Investigate some of the challenges other countries face that do not have these services</li><li>• Drawing on our learnings about how soluble water is, discuss as a group what happens when communities rely on using untreated water directly from streams/rivers or groundwater and how this can impact on their health and survival</li><li>• Explore the role women and girls play in managing water and growing food crops and the great measures some people have to go to get access to such a fundamental requirement for our survival</li></ul>

*For simplicity these activates describe the actions to take for further exploration. You can follow a 'predict- activity- reflect' routine or an alternative thinking routine that focuses on predicting and reflecting.*

The layout of this lesson plan was based on Visible Thinking for inquiry based learning (Think-Puzzle-Explore), for further reading on this topic follow the link below:

[http://www.visiblethinkingpz.org/VisibleThinking\\_html\\_files/03\\_ThinkingRoutines/03d\\_UnderstandingRoutines/ThinkPuzzleExplore/ThinkPuzzleExplore\\_Routine.html](http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03d_UnderstandingRoutines/ThinkPuzzleExplore/ThinkPuzzleExplore_Routine.html)

# When Water Lost Her Way


## Lesson Plan Year 3 - 4 Exploring the Water Cycle

### Activity Hand Out

Q1. What do you think the annotated images below are trying to show? What is puzzling about them?

What would you like to know more about or explore?

#### Circles of water through our world



**Evaporation**  
When water in oceans & lakes is heated by the sun, it changes from a liquid to a gas - water vapour. Even though we can't see water vapour it is almost always rising in the air around us.


**Condensation**  
When water vapour cools, it condenses back into tiny water droplets. The condensed water floats through the air and collects together to make clouds. The wind transports the clouds around the earth.

**Precipitation**  
When the tiny droplets of condensed water become too heavy to stay in the air, the water falls as a liquid - rain. When it is very cold, the water will freeze, forming a solid, falling as snow or hail.

**Accumulation**  
Most of the precipitated water will runoff over the land and accumulate in rivers, lakes and oceans where the cycle can start again.

**Transpiration**  
Some of the precipitated water will be taken up by plants or soak into the ground. This water can also be transformed back into water vapour through a plant's leaves or flowers.

#### Where is all the water on Earth?



**An Estimate of the Water Stored on Earth**

96.54%	of water is stored in the oceans, seas & bays	0.013%	of water is stored in rivers & lakes
1.74%	of water is stored in ice caps & glaciers	0.001%	of water is stored in soils
1.69%	of water is stored in groundwater	0.001%	of water is stored in clouds & atmosphere
0.022%	of water is stored in ground ice & permafrost	0.0001%	of water is stored in living things

For more information visit: The USGS Water Science School - <https://water.usgs.gov/edu/>

I think the image on the left is

about: \_\_\_\_\_

I think the image on the right is

about: \_\_\_\_\_

What is puzzling about the image on the left

is: \_\_\_\_\_

What is puzzling about the image on the right

is: \_\_\_\_\_

I want to find out more

about: \_\_\_\_\_

\_\_\_\_\_

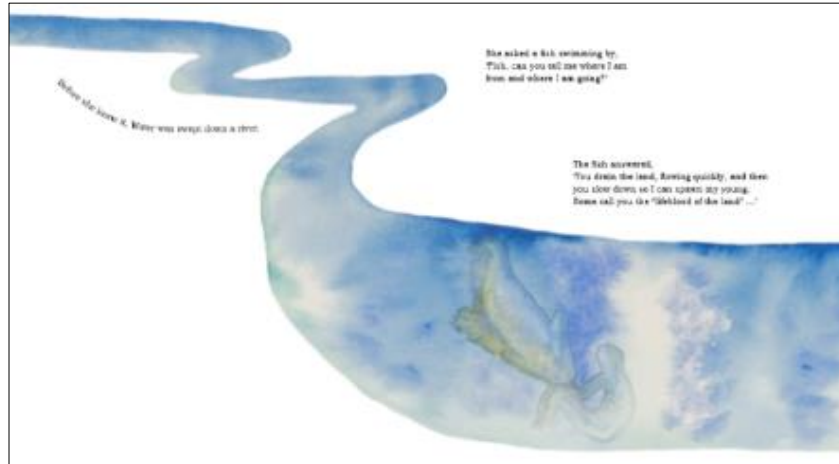
\_\_\_\_\_

\_\_\_\_\_

# When Water Lost Her Way

## Lesson Plan Year 3 - 4 Exploring the Water Cycle

Q2. Identify water in the images below and whether water is in the form of a solid, liquid or gas

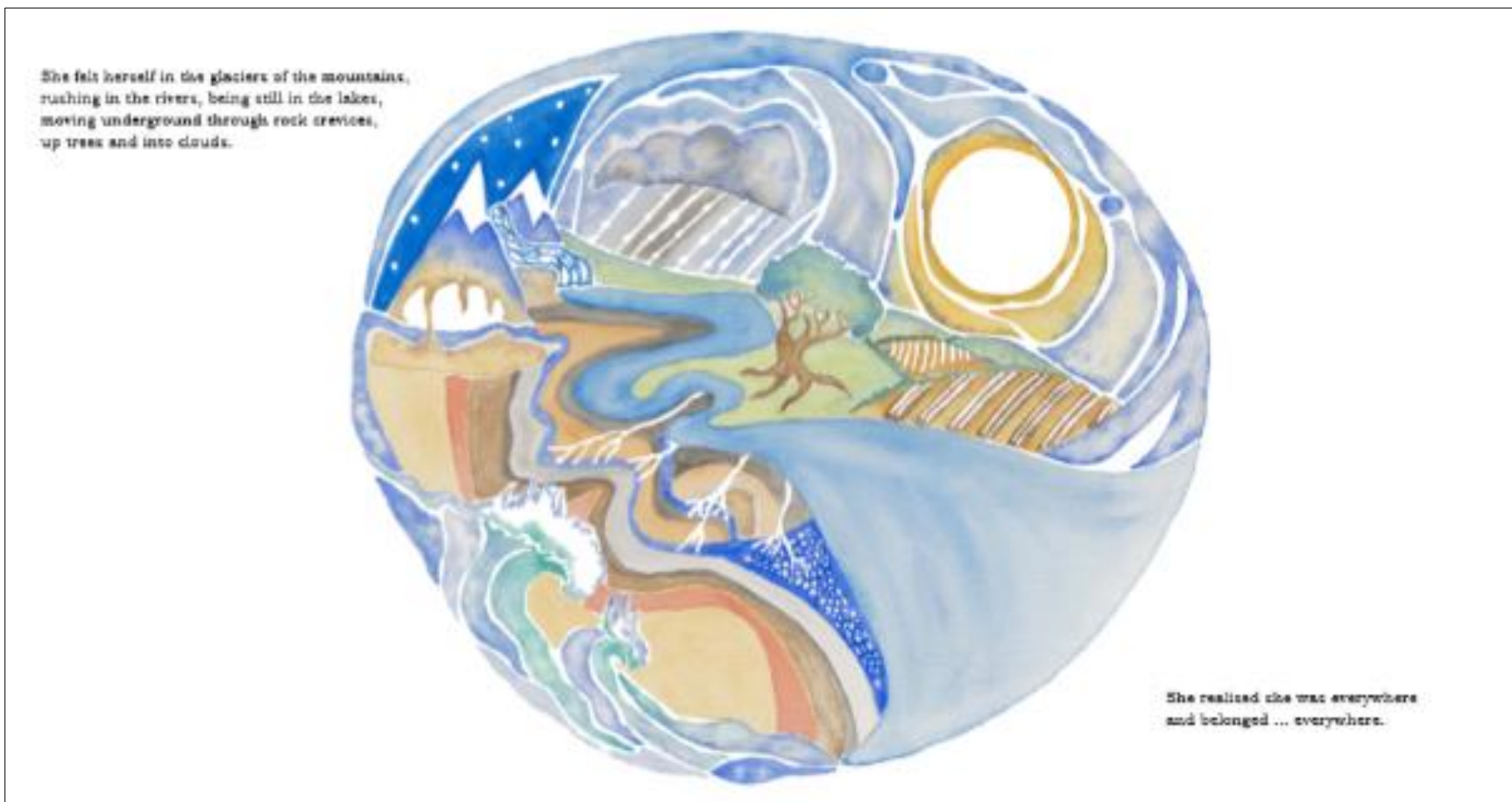


Q3. How does water change between the different forms/states above? (*Focus on temperature*) For each example above explain what would happen if you added or removed heat?

Add heat \_\_\_\_\_ Add heat \_\_\_\_\_

Remove heat \_\_\_\_\_ Remove heat \_\_\_\_\_

Q4. Identify the water you expect to be fresh and salty in the illustration below (*hint- refer to annotated image Q1*). Add the letter 'F' for fresh water stores and 'S' for salty water on the diagram below: (*teachers refer to appendix 1 for annotated image*).



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Q5. The mountain says *'you are a sculptor of mountains. You are stronger than me. You can move and carve my hard rock all the way to the ocean.'*

What does the mountain mean in this statement?

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How can ice break rock and transport it great distances?

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Q6. The reed in the lake notes *'I eat the nutrients that you carry down the river and in turn this makes you clean again...'*

How can water can carry nutrients? *This is further explored in 'Explore properties of water' optional extension activity*

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Q7. What did you learn about water from the story? What would you like to know more about?

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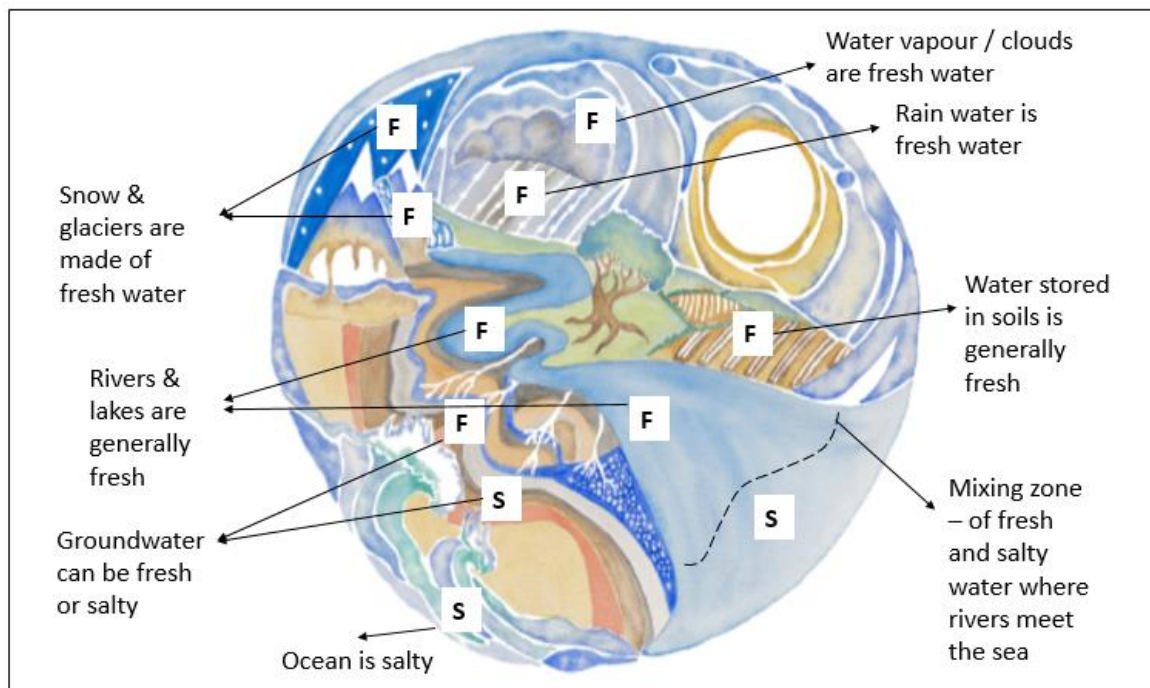


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### Appendix 1 – Teaching notes for activity hand out

Fresh water stores are shown with an 'F' and 'S' indicates salty water stores



# ***When Water Lost Her Way***

## **Lesson Plan Year 3 - 4** **Exploring the Water Cycle**

### External Resources on the Water Cycle:

Visible Thinking Routines- Lesson plan structure was based on thinking routines

[http://www.visiblethinkingpz.org/VisibleThinking\\_html\\_files/03\\_ThinkingRoutines/03d\\_UnderstandingRoutines/ThinkPuzzleExplore/ThinkPuzzleExplore\\_Routine.html](http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03d_UnderstandingRoutines/ThinkPuzzleExplore/ThinkPuzzleExplore_Routine.html)

Water cycle rap – Utube music video explaining the water cycle

<https://www.bing.com/videos/search?q=the+water+cycle+rap&&view=detail&mid=DF87D2F356DD4F07CE6CDF87D2F356DD4F07CE6C&rvsmid=FD42B5F7CA7BADCED556FD42B5F7CA7BADCED556&FORM=VDQVAP>

USGS Water Science School - the proportions of water stored on earth

<https://water.usgs.gov/edu/earthwherewater.html>

Natural Water Cycle Animation- animated breakdown of the water cycle by South East Water

<https://www.educationsoutheastwater.com.au/resources/natural-water-cycle-interactive>

FUSE Resources for Victorian Curriculum - including water cycle

<http://fuse.education.vic.gov.au/VC/Teacher?science>

Global Water Issues- supporting resources on global water & sanitation

<http://www.globaleducation.edu.au/global-issues/gi-water-and-sanitation.html>

Water Aid Organisation links

[www.water.org](http://www.water.org)

[www.wateraid.org.au](http://www.wateraid.org.au)