



What makes water, water?

Stage 1 lesson plans


Exploring water as a unique and wonderful substance



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Sydney
WATER



Stage 1 – What makes water, water?		
Aim This module aims to develop students' observation skills to identify and explain water - its characteristics and properties. The suggested learning sequence will: <ul style="list-style-type: none"> • explore using physical senses to discover the characteristics of water • develop observation and communication skills to describe water • explore water's unique properties that dissolve substances • discover the three states of water. Students will explore and develop an appreciation for water's unique qualities. This module provides context to build a deeper understanding of concepts such as the water cycle, types of water and water treatment.		Time ~120 minutes
Key inquiry questions <ul style="list-style-type: none"> • What are some characteristics or properties of water? • What are the three states of water? • What can water dissolve? 	Background information Water is the most common substance found on Earth and is an important resource we depend on every day. But have you ever thought about what water really is? What makes water, water? We can describe water by its characteristics and properties. Characteristics are features that distinguishes one thing from another, for example hair and eye colour. To describe characteristics of water we look at many things like colour, odour, taste and clarity. Water can also do some amazing things. It has properties which include: <ul style="list-style-type: none"> • being the only substance that naturally exists in three different forms – solid (ice), liquid (water) and gas (water vapour) • holding and transferring heat which is great for maintaining temperature • ability to stick together and onto other surfaces • being an amazing solvent, this means it dissolves soaps to clean with, seasonings that flavour our food and even makes our favourite cup of cordial, tea or coffee. • ability, like many materials, to change when combined or mixed for a particular purpose. Without water's amazing properties we couldn't do the simplest things like cook, clean or even breathe. Water in its purest form is colorless, clear, odorless, and tasteless. But water is never really pure. Wherever it travels, water dissolves and carries chemicals, minerals and nutrients with it. This means water is more than what we can see and not all water is safe to drink. Sydney Water thinks about characteristics of water all the time – from the source, to our taps and throughout the water cycle. Our drinking water is some of the best in the world. It is filtered, cleaned and checked every day for characteristics like taste, clarity, odour and colour to ensure it's safe to drink straight from the tap and meets strict National standards.	
Syllabus outcomes Science ST1-1WS-S - Observes, questions and collects data to communicate and compare ideas. ST1-4LW-S - Describes observable features of living things and their environments. ST1-6MW-S - Identifies that materials can be changed or combined. English EN1-1A - Communicates with a range of people in informal and guided activities demonstrating interaction skills and considers how own communication is adjusted in different situations. EN1-12E - Identifies and discusses aspects of their own and others' learning	Syllabus skills Science <ul style="list-style-type: none"> • Develop and apply skills in scientific inquiry through the process of working scientifically. English <ul style="list-style-type: none"> • Communicate through speaking, listening, reading, writing, viewing and representing. 	

Teaching and learning	Resources								
<p>Lesson 1: Characteristics of water (40 min)</p> <p>Inquiry question: What are some characteristics of water? How can we describe characteristics of water?</p> <p>Students explore and answer questions through a guided scientific investigation using their senses. They will use their observation skills to describe and record water’s key characteristics.</p> <p>Activity 1: Wondering about water (10 min)</p> <p>Preparation: Download lessons, worksheets and PowerPoint.</p> <p>Using a wonder wall and What makes water, water PowerPoint get students thinking, questioning and sharing to understand their level of knowledge and interests. Pause on slide 3 and let students reflect on the following questions:</p> <ul style="list-style-type: none"> • Have you ever tried to describe water? What is it? What makes water, water? • What does it feel like or look like? • Does water change or is it always the same? • Can you drink any water? <p>Either the teacher or students record statements and questions on cards and place on the wonder wall.</p> <p>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.</p> <p>Activity 2: Practical investigation – What are characteristics of drinking water? (20 min)</p> <p>Using the PowerPoint, Plan an investigation template and Water senses worksheet encourage students to consider how we experience and describe water’s characteristics using our five senses.</p> <p>Practical investigation:</p> <p>Safety first: <i>Remind students that in Sydney, we have some of the best water in the world and it’s safe to drink straight from the tap. Not all clear liquids are safe and they should ask before drinking.</i></p> <ol style="list-style-type: none"> 1. Use the PowerPoint to help explain the term <i>characteristics</i> and explore words to describe water. 2. Display the Plan an investigation template in the PowerPoint to help students think and work like a scientist. 3. Using a show of hands, ask students prompting questions to predict what their 5 senses will tell them about tap water. 4. Record students’ predictions, materials, risks and safe choices to conduct the investigation. 5. Hand out cups of tap water to selected volunteers or each student. 6. Using the PowerPoint and Water sense worksheet, step through the 5 senses to help students identify and draw or describe water’s characteristics. 7. Record students’ observations, conclusions and questions in the Plan an investigation template. <p>Additional questions:</p> <ul style="list-style-type: none"> • What do you want your drinking water to be like? Clear or cloudy? With or without colour? What should it smell or taste like? • Do people have different preferences? Who likes water warm, cool or ice cold? 	<p>Sydney Water resources</p> <p>Primary school resources</p> <p><i>Wondering about water</i></p> <p><i>Module 2 What makes water, water</i></p> <ul style="list-style-type: none"> • What makes water water lesson plans • What makes water water PowerPoint • What makes water, water worksheets <ul style="list-style-type: none"> – <i>Water senses</i> – <i>Think, pair, share</i> • Plan an investigation <p>Materials</p> <ul style="list-style-type: none"> • Scissors • Poster paper • Blank cards • Sticky tack or tape • Markers • Cups for each student • Tap water <p>Vocabulary</p> <table border="1" data-bbox="1525 901 2148 1476"> <thead> <tr> <th data-bbox="1525 901 1646 949">Sense</th> <th data-bbox="1646 901 2148 949">Words</th> </tr> </thead> <tbody> <tr> <td data-bbox="1525 949 1646 1133">See</td> <td data-bbox="1646 949 2148 1133"> <p>Clear? Clear, see-through, muddy, cloudy, milky, sandy, chunky...</p> <p>Colour? Blue, green, brown, grey or no colour (colourless)...</p> <p>How much? Ocean, river, lake, tank, bucket, cup, drop...</p> </td> </tr> <tr> <td data-bbox="1525 1133 1646 1260">Smell</td> <td data-bbox="1646 1133 2148 1260"> <p>Smells? Nothing, like a pool, fishy, funky, fresh, flowery...</p> <p>How much? Light, faint, strong, heavy, weak, a lot, a little...</p> </td> </tr> <tr> <td data-bbox="1525 1260 1646 1476">Hear</td> <td data-bbox="1646 1260 2148 1476"> <p>Sounds? Rippling, bubbling, splashing, whooshing, rushing, gushing, dribbling, dripping, deep, high...</p> <p>How loud? Very loud, quiet, soft, silent...</p> </td> </tr> </tbody> </table>	Sense	Words	See	<p>Clear? Clear, see-through, muddy, cloudy, milky, sandy, chunky...</p> <p>Colour? Blue, green, brown, grey or no colour (colourless)...</p> <p>How much? Ocean, river, lake, tank, bucket, cup, drop...</p>	Smell	<p>Smells? Nothing, like a pool, fishy, funky, fresh, flowery...</p> <p>How much? Light, faint, strong, heavy, weak, a lot, a little...</p>	Hear	<p>Sounds? Rippling, bubbling, splashing, whooshing, rushing, gushing, dribbling, dripping, deep, high...</p> <p>How loud? Very loud, quiet, soft, silent...</p>
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<p>Optional</p> <p>Activity 3: How would you describe your perfect drinking water? (10 min)</p> <ol style="list-style-type: none"> Using the Think, pair, share worksheet ask students to describe, share and compare with a partner. Working in pairs, each student takes a turn, listens and write or draw the other's thoughts. Each student then compares and records what is similar and what is different. As a class, students share their share findings. 	<table border="1"> <tr> <td data-bbox="1525 92 1648 188">Feel</td> <td data-bbox="1648 92 2145 188">Feels? Slimy, slippery, soapy, oily, sticky, sharp, dry, wet... Temperature? hot, cold, warm, cool.</td> </tr> <tr> <td data-bbox="1525 188 1648 347">Taste</td> <td data-bbox="1648 188 2145 347">Tastes? Refreshing, clean, sweet, sour, salty, bitter, metallic, soapy, fresh, plain... How much? Strong, a lot, weak, a little...</td> </tr> </table>	Feel	Feels? Slimy, slippery, soapy, oily, sticky, sharp, dry, wet... Temperature? hot, cold, warm, cool.	Taste	Tastes? Refreshing, clean, sweet, sour, salty, bitter, metallic, soapy, fresh, plain... How much? Strong, a lot, weak, a little...
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<p>Lesson 2: Discover a property of water (40 min)</p> <p>Inquiry question: What are some properties of water? What can water dissolve?</p> <p>Students discover through a guided investigation into one of water's unique properties, its ability to dissolve and carry substances.</p> <p>Activity: Practical investigation – What can water dissolve? (30 min)</p> <p>Preparation:</p> <p>Prepare the following items as a class demonstration or in groups.</p> <ol style="list-style-type: none"> Fill up five clear cups halfway with water, label “water only”, “water + oil”, “water + salt”, “water + colour”, “water + sand”. Set out containers with oil, salt, sand, and small food colouring bottles with plastic dropper. Place teaspoons with each of the items. <p>Practical investigation:</p> <ol style="list-style-type: none"> Using the PowerPoint and Discussion notes explore the concepts of properties of water and what it means to dissolve substances in water. Ask students to reflect on these questions: <ul style="list-style-type: none"> What dissolves and what doesn't. How do we observe this change? Can we think of other things that do and don't dissolve in water? Display the Plan an investigation template in the PowerPoint to help students think and work like a scientist. Choose one substance to complete the worksheet. Using a show of hands prompt students to predict what will happen before each substance is added. Will it dissolve or not? Record students' prediction. fill the materials, method, risks, and safe choices to conduct the investigation. Stir one or two spoons of each substance or a drop of the colouring into the labelled cups. Complete the Plan an investigation template and record students' conclusion and any further questions. Using the PowerPoint as a prompt, consider other things that dissolve in water and the benefits. Use the See, think, wonder worksheet for individual reflection on the investigation. <p>Optional</p> <p>Demonstration:</p> <p>What happens if we mix water, oil and food colouring together? Create 'Water fireworks' as a fun class demonstration.</p> <ol style="list-style-type: none"> Reuse the “water + oil” cup. Pour enough oil to create a layer at least 1 cm thick. Ask students to predict will the food colouring dissolve or not in the mixture. Add multiple red and yellow food colouring drops on top of the oil. Watch it sink and dissolve into water. 	<p>Sydney Water resources</p> <ul style="list-style-type: none"> What makes water water PowerPoint Plan an investigation See, think, wonder worksheet <p>Materials</p> <ul style="list-style-type: none"> Water Oil, salt, sand, food colouring Dropper or pipettes Cups Biodegradable straws <p>Vocabulary</p> <p>Mix, combine, change, dissolve, observe, predict. Optional – material, mixture, solution, property.</p> <p>Discussion notes</p> <p>Simplified definitions:</p> <ul style="list-style-type: none"> Dissolve: when something melts or disappears and mixes into a liquid to form a solution. Solution: a liquid with two or more substances that stays evenly mixed. Mixture: when you mix or combine two or more things together and each part remains unchanged just mixed and is often easy to separate. 				

<p>Water colour art:</p> <ol style="list-style-type: none"> 1. Hand each student their own paper and biodegradable straw. Hand out cups of coloured water and droppers. 2. Ask students to draw a cup on the paper and recreate what they observed. 3. Use droppers to squeeze coloured water onto the paper and blow with their straws. 4. Share what they learnt and display their work. <p>Clean up tips – Did you know that you shouldn't pour oil down sinks or drains. This can form fatbergs and block pipes. Pour oil on compost or put in the bin.</p>	
<p>Lesson 3: States of water (40 min)</p> <p>Inquiry question: What are some properties of water? What are the three states of water?</p> <p>Students explore and discover another one of water's unique property – it's ability to exist in three different states.</p> <p>Activity 1: Demonstration – What are the states of matter? (10 min)</p> <p>Explain the words 'matter' and 'states' use the <i>Discussion notes</i> to help with the definition.</p> <p>Using the PowerPoint and everyday objects describe the characteristics that define each state – solid, liquid, gas (save water for the practical investigation).</p> <ul style="list-style-type: none"> • Solids – a wooden block or toy, keeps and holds their shape. • Liquids – oil, syrup, soap or sanitizer takes the shape of their container. • Gases – blow up a balloon, bubbles or light a match or an incense stick (consider allergies) to see smoke spread and move around freely. <p>Activity 2: Are ice and steam water? (10 min)</p> <p>Using the PowerPoint, <i>Discussion notes</i> and <i>Think, pair, share worksheet</i>, discuss the different forms (states) of water.</p> <p>Water isn't always "wet", sometimes it's frozen into ice or snow. Other times it's can be invisible and float away as water vapour. They're all water, but they're different from each other. Water is an amazing substance. It can exist in all three states on Earth. This makes water quite special!</p> <p>Activity 3: Practical investigation – What are the states of water? (20 min)</p> <p>Preparation:</p> <p>Prepare the following for a class demonstration or in groups.</p> <ol style="list-style-type: none"> 1. Fill one container halfway with water and secure the lid. 2. Fill a second container halfway with ice cubes and secure the lid. 3. Place a lid on the third empty container. <p>Practical investigation:</p> <p>Use the demonstration to identify the different states and how each state fills and react with space.</p> <ol style="list-style-type: none"> 1. Pass the containers around the class. Ask students to consider: Do all the containers contain water? Decide which contains– solid, liquid or gas. 	<p>Sydney Water resources</p> <ul style="list-style-type: none"> • What makes water water? PowerPoint • Think, pair, share worksheet • Plan an investigation <p>Materials</p> <ul style="list-style-type: none"> • Household items to represent states of matter – solid, liquid and gas • Clear plastic containers with lids • Water and ice cubes <p>Vocabulary</p> <p>Matter, states, change, solid, liquid, gas, water vapour, ice, steam, cool, heat, melt, freeze.</p> <p>Discussion notes</p> <p>Everything we can see is made of matter. Matter is something that takes up space. Matter can have different 'states' such as solid, liquid or gas. These states of matter have different physical characteristics in how they fill and react with space.</p> <p>Simplified definitions:</p> <ul style="list-style-type: none"> • Solids: matter that keeps or holds their shape. • Liquids: matter that likes to stick together and takes the shape of a container. • Gases: are like air and can spread, move around freely, and don't have to stick together.

<p>2. Ask for volunteers to place the containers on a table from solid (left), liquid (middle) to gas (right) and the class vote on the correct order. This could serve as a quick assessment.</p> <p>3. In this order, students draw or describe why they classified the containers as a particular state or using See, think, wonder worksheet to scaffold their discussion. In pairs or as a class, discuss, share and compare.</p> <p>4. Using the PowerPoint explore how water can exist in three different states and discuss how the empty container represents water too. Optional - show water is in the air using a kettle or breathing onto a mirror.</p> <p>Additional questions:</p> <ul style="list-style-type: none"> • What happens when water is poured into different containers? • How does water change states? Water changes forms depending on temperature changes. • Can other object change states? Most things stay as a solid, liquid or gas naturally. 	<p>Water can exist in three states, liquid, gas and solid. Water can change physically by changing the temperature. When we cool water enough it freezes, turning to solid ice and heat changes liquid water into to a gas (water vapour).</p> <p>Water continuously changes states as it moves through the water cycle.</p> <p>Properties of water</p>
<p>Summative task: What I learned about water (15 min)</p> <ul style="list-style-type: none"> • Direct students to write or draw their answer to one of the inquiry questions on a water droplet template. • Droplets can be attached to a ribbon or string and hung from the ceiling, wall, or across the room. • The water droplets can be used towards assessment. 	<p>Sydney Water resources</p> <ul style="list-style-type: none"> • Water droplets template
<p>Reflection (10 min)</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>Extension Activity</p> <p>‘Find those Watery words’ Use vocabulary words from the word wall to create your own word search, crossword, or word snake.</p> <p>Make your own delicious infusions How can water dissolving things change the characteristics of water? Try the Water infusion recipe card for a healthy and hydrating drink. Using the Water senses worksheet record how the water has changed and see if you can smell and taste the difference.</p>	<p>Sydney Water resources</p> <ul style="list-style-type: none"> • Water infusions recipes • Water senses worksheet
<p>Teacher reflection/evaluation</p> <p>Consider what worked, what didn’t and changes for future delivery</p>	