

# Aqua Audit

## How much water are you eating?

<b>Year Level:</b>	7-8	<b>Subject:</b>	Food technology (Design and Technologies)	<b>Topic:</b>	Water footprints
<b>Duration:</b>	2 x 50 minute lessons  <b>Lesson 1</b> - Introduction and recipe selection  <b>Lesson 2</b> - Cooking	<b>Curriculum:</b>	<b>Content description codes:</b> <ul style="list-style-type: none"> <li>• <a href="#">VC2TDE8C02</a>: analyse how food and fibre are produced in managed environments and how these can become ethical</li> <li>• <a href="#">VC2TDE8C03</a>: strategies and responses to manage and improve the liveability and environmental sustainability of Australia's cities, and to adapt to climate change</li> </ul>	<b>Climate Topics:</b>	<ul style="list-style-type: none"> <li>• Resource depletion and vulnerability (water)</li> <li>• Food security</li> <li>• Sustainability</li> </ul>

### Brief Overview

Students find a recipe for their favourite meal (using either hardcopy recipe books or online). Using the Water Footprint of Food Guide, students calculate the amount of water required to produce that meal. This task encourages students to think about the resources required to make our food. Students then select a low-water-use meal to cook together.

### Learning outcomes

#### Learning Intention

Students will explore the vital role of water in food production. By analysing the water footprint of different foods, they will examine how dietary choices affect water use, sustainability and the ethics of food production.

### Success Criteria

- Identify and compare the amount of water required to produce different foods
- Explain how water consumption in food production affects environmental sustainability
- Suggest ways to reduce water use through informed, sustainable meal choices that support both people and the planet

Introduced climate science concepts	Presumed knowledge
<ul style="list-style-type: none"><li>• Water as a resource</li><li>• Extreme weather events (drought, flood, and rainfall)</li><li>• Food security</li><li>• Sustainability</li></ul>	<p><b>VC2TDE6C02:</b> explain how and why food and fibre are produced in managed environments</p> <p><i>Overlap with Year 7-8 Geography:</i></p> <p><b>VC2HG8K03:</b> the distribution and variability of Australia's water resources and the forecasted impacts of climate change on them</p>

Teaching materials and resources				
Tool ID	Student/teacher	Tool and link	Overview	Source
R0	Teacher	<a href="#">Glossary of climate terms</a>	This document provides teachers with a glossary of key terms relevant to this lesson plan	Monash Climate Change Communication Research Hub
R1	Teacher	<a href="#">Lesson PowerPoint</a>	PowerPoint slides with lesson content and activity instructions for students to follow, includes speaker notes	Monash Climate Change Communication Research Hub
R2	Student	Recipe books/online access	For students to source a recipe to use/cook	n/a
R3	Student	Example recipes	Three example recipes for students to use when calculating the	Monash Climate

		<a href="#">‘Regular recipes’</a>	water footprint, if you wish to skip sourcing their own	Change Communication Research Hub
R4	Teacher + student	<a href="#">Water Footprint Ingredient List</a> <i>Can be printed</i>	This table shows the average amount of water needed to produce 1 kg of different ingredients to help calculate the water footprint of students’ recipes.	Monash Climate Change Communication Research Hub
R5	Student	Calculator	To enable students to calculate their water footprint totals	n/a
R6	Teacher + student	<a href="#">Waterwise recipe example</a>	Cook this recipe with the class or select your own	Monash Climate Change Communication Research Hub
R7	Teacher + student	Cooking supplies/facilities	Ingredients, utensils and facilities to be able to make the meals	n/a

Lesson outline				
Stages	Description	Tool ID	Slide Number	Time
<b>Part 1: Learning introduction</b>	<p><b>Teacher:</b> Begin the lesson with powerpoint slides 1-10, introducing students to ‘water footprints’</p> <ul style="list-style-type: none"> <li>• <b>Slide 1 (Optional to show to students):</b> Learning goals</li> <li>• <b>Slide 2:</b> Title slide</li> <li>• <b>Slide 3:</b> ‘Every meal needs water’ – the ‘hidden’ water cost of food</li> <li>• <b>Slide 4:</b> ‘Water footprint’ definition</li> </ul>	R1	1-10	5min

	<ul style="list-style-type: none"> <li>● <b>Slide 5 (interactive question):</b> How much water is needed to produce one tomato? <ul style="list-style-type: none"> <li>○ <b>Slide 6 answer:</b> D (45L)</li> </ul> </li> <li>● <b>Slide 7 (interactive question):</b> How much water is needed to produce one cup of coffee? <ul style="list-style-type: none"> <li>○ <b>Slide 8 answer:</b> C (140L)</li> </ul> </li> <li>● <b>Slide 9 (interactive question):</b> Which meat needs the most/ least water? <ul style="list-style-type: none"> <li>○ <b>Slide 10 answer:</b> Beef → Pork → Chicken</li> </ul> </li> </ul> <p><b>Students:</b> Participate in class discussion, no need for note taking.</p>			
<p><b>Part 2:</b> <b>Activity introduction + recipe selection</b></p>	<p><b>Teacher:</b> To start the activity, go through <b>slide 11</b> that gives a brief overview of the activity:</p> <p>Students are to choose a recipe to cook and calculate its total water footprint using the <i>Water Footprint Ingredient List</i> spreadsheet (<b>R4</b>)</p> <p>Try to select recipes that uses grams/litres (not cups/tsp) to help with calculations</p> <p>Split students into pairs or groups and review/approve their selected recipe before they begin any calculations.</p> <p>A scope can be set to guide recipe choices, for example:</p> <ul style="list-style-type: none"> <li>● Personal choice – e.g. a favourite meal, what they had for dinner last night</li> <li>● By cuisine or region – e.g. Italian, Japanese, or local Australian dishes</li> <li>● By type of dish – e.g. breakfast, lunch, or dinner</li> </ul>	<p>R1, R2, R3, R4, R5</p>	<p>11-12</p>	<p>20min</p>

	<p>There are three example recipes provided (<b>R3</b>) if you wish to skip students sourcing their own</p> <p>Once the class has finished their calculations, change to <b>slide 12</b> to discuss everyone's results:</p> <ul style="list-style-type: none"> <li>● Which meal was the <i>most water-wise</i>?</li> <li>● Which meal used the <i>most water</i>?</li> <li>● <i>Which ingredients</i> had the largest water footprint?</li> </ul> <p><b>Students:</b> In their pairs/small groups, students are to:</p> <ul style="list-style-type: none"> <li>● Select a recipe and calculate its total water footprint</li> <li>● To do this, calculate the amount of water required for each ingredient using the the information from the <i>Water Footprint Ingredient List</i> spreadsheet (<b>R4</b>)</li> <li>● Write up their results clearly (water per ingredient and per serving of total meal)</li> <li>● Participate in the class comparison discussion</li> </ul> <p><u>Optional engagement strategy:</u> <i>Have students stand and arrange themselves in a line from the group with the largest to the smallest water footprint.</i></p>			
<p><b>Part 3:</b> <b>Why water matters and making sustainable swaps</b></p>	<p><b>Teacher:</b> After students have shared their results, move to <b>slide 13</b> to provide context on why being aware of how much water we consume matters (<i>speaker notes are included</i>).</p> <ul style="list-style-type: none"> <li>● <b>Slide 13:</b> How much water we really have</li> <li>● <b>Slide 14/15:</b> Threats to water security: <ul style="list-style-type: none"> <li>○ Climate change</li> <li>○ Overuse and waste</li> </ul> </li> </ul>	<p>R1, R3, R4, R5, R6</p>	<p>13-16</p>	<p>25min</p>

	<ul style="list-style-type: none"> <li>○ Pollution and contamination</li> <li>○ Population growth</li> </ul> <p>After the two theory slides change to <b>slide 16</b> for the next part of the activity.</p> <p>Help students adjust their recipes to be more sustainable and then ask them to line up again from lowest to highest water use.</p> <p>If lesson is split in two, have students vote to cook one of the 3 most water-wise recipes. Alternatively, see suggested waterwise recipe (<b>R6</b>).</p> <p><b>Students:</b> Listen to the presented theory, then complete the next part of the activity:</p> <ul style="list-style-type: none"> <li>● Adjust their recipe to be more sustainable and reduce the total water footprint</li> <li>● Students should try to do this by: <ul style="list-style-type: none"> <li>○ Substituting ingredients (e.g. meat for plant-based alternatives)</li> <li>○ Changing how it's prepared (e.g. grilling instead of boiling to save water)</li> <li>○ Sourcing things locally (e.g. from a home or school garden)</li> </ul> </li> <li>● They should <b>NOT</b> just shrink the portion size of the meal</li> <li>● Write down and record the changes made, then calculate the new total water footprint</li> <li>● Once the recipe has been modified, students should line up again from lowest to highest water use and see how the order has changed <ul style="list-style-type: none"> <li>○ If splitting into two single lessons, students can vote on which of the 3 most water-wise meals should be cooked next lesson</li> </ul> </li> </ul>			
Start of Lesson 2				
<b>Part 4: Cooking</b>	<b>Teacher:</b> Begin Lesson 2 with <b>slide 17</b> for students to start cooking their low-water meal.	R1, R6	17	45min

	<p>Remind students to use water wisely when cooking <i>and</i> cleaning.</p> <p>Conduct the cooking portion of this activity per the schools rules and regulations.</p> <p><b>Students:</b> In their pairs or groups, students are to cook the chosen revised recipe, following standard kitchen practices.</p>			
<b>Part 5: Reflecting on activity learning</b>	<p><b>Teacher:</b> Once cooking and clean up is completed, change to the final <b>slide 18</b> for a wrap up discussion (<i>answer prompts are included in the speaker notes</i>).</p> <ul style="list-style-type: none"> <li>• <b>Slide 18 (Discussion questions):</b> <ol style="list-style-type: none"> <li>1. Why is it important to be water-wise?</li> <li>2. What are 2 tips you can share with your family to help have more water-wise cooking at home?</li> </ol> </li> </ul>	R1	18	5min

### Links for further reading

- [Water Footprints 101](#) – EcoRise
- [Water in Your Food](#) – EcoRise
- [Making Every Drop Count: How Australia is Securing its Water Future](#) – National Geographic
- [Water in Australia](#) – Aus Gov National Water Grid
- [Australia's changing climate](#) – CSIRO