Wonder Project **Water Challenge**

Activity 3.2: **Clean**

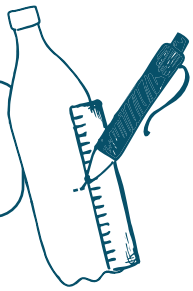
Create a treatment plant for your network to turn wai paru, pollutant-free.

In Aotearoa New Zealand's wai network, collected water passes through a treatment plant that removes any pollutants and debris. This helps protect its mauri before it continues its journey.

Prepare your treatment plant

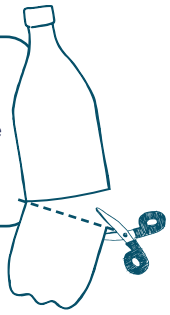
Step 1

Using a ruler, measure 10cm up from the base of your bottle. Then, mark that spot with a pen.



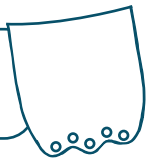
Step 2

Starting from your marking, cut off the bottom of your bottle. The bottom half will become your treatment plant, and the top half will become your water reservoir. Label them so you don't forget.



Step 3

Pierce some large holes into the bottom of the bottle.



Step 4

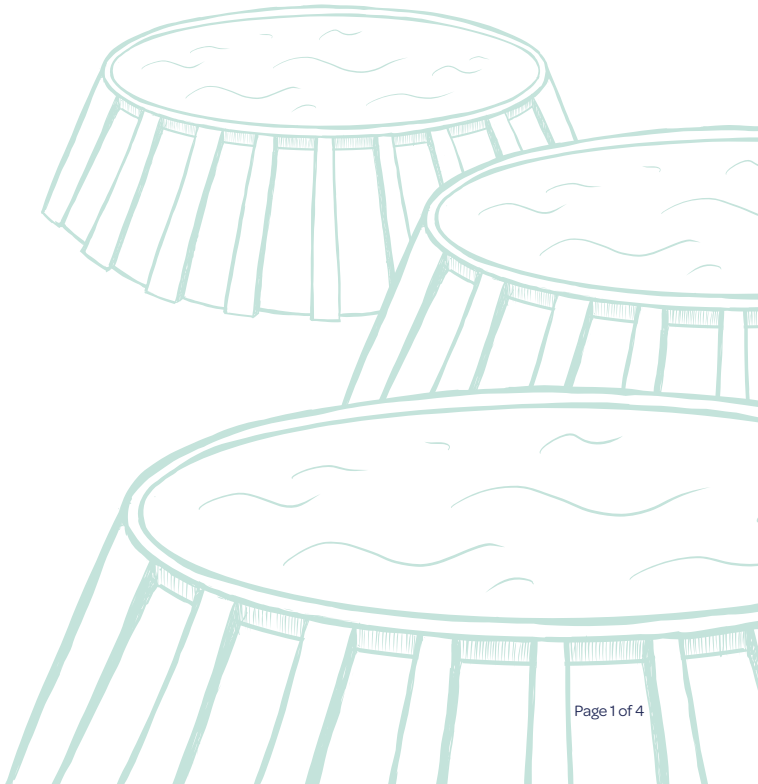
Turn the top half of your bottle upside down. Then, place the bottom half inside. Make sure you leave the cap on!

Step 5

Place your treatment plant in a stand or stabilise it with a box so it can stand on its own.

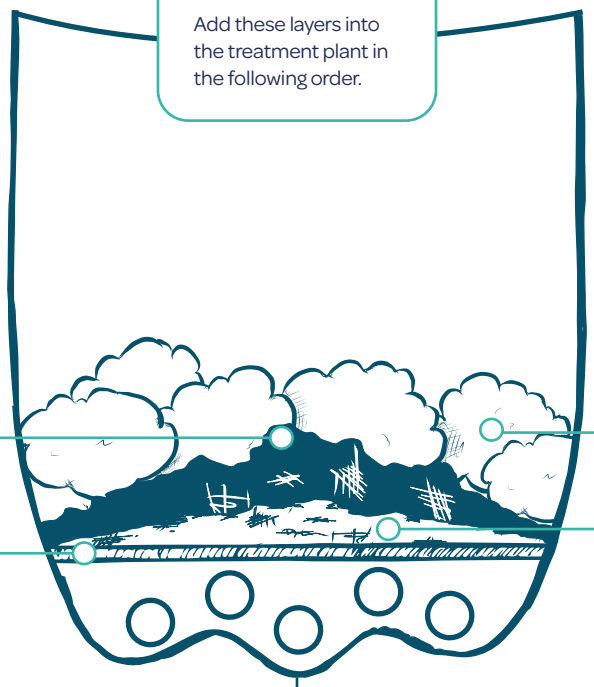
You'll need:

- 1 x clear, recycled 1.5L bottle (label removed)
- Cotton balls
- Activated carbon (rinsed)
- Filter paper
- Baking soda
- Measuring scoops
- Scissors
- Ruler
- Sharpie/ felt pen
- Resources to stabilise your treatment plant (boxes or a stand)



Create your filter

Add these layers into the treatment plant in the following order.



To be accurate, use your measuring scoops.

Layer 3: 2.5 scoops activated charcoal (make sure it's rinsed before use)

Layer 1: 1 sheet of filter paper

Layer 4: 6 cotton balls

Layer 2: 1 scoop baking soda

I wonder what the purpose of each layer is?

Write your ideas in the box.

Test the waters

See if your treatment plant can turn wai paru, pollutant free!

You'll need:

- 500ml of wai
- Measuring jug
- Measuring scoops
- Lemon juice
- Natural debris (dirt, bark, grass, leaves)
- pH strip
- Torch (optional)

Step 1

Measure out 500ml of wai. Add some natural debris and 1 scoop of lemon juice.

Step 2

Test the wai with a pH strip to check whether it's acidic or basic. Then, test the water's turbidity using your observation skills or a torch.

Starting pH

Starting turbidity

(clear/turbid)

Step 3

Place the water reservoir underneath your treatment plant and make sure it has its cap on. Then, slowly pour the wai paru through your treatment plant.

Step 4

Wait 1-2 minutes to allow the acids and bases to mix through the wai. Then, measure its pH and turbidity. Write your results in the test tracker.

Step 5

Analyse your results to decide if your treatment plant could be better at neutralising pH or reducing turbidity.

Step 6

Research ways to improve your treatment plant. Write your ideas in the box:

Step 7

Then, improve it, and test again with new wai paru!

Return wai that's passed through your treatment plant to Ranginui by spreading over grass.

Test tracker

Test number	Quantitative data	Qualitative data	Analysis
	pH Level (1-14)	**Turbidity** (clear/ turbid)	**What can you improve? How?**
Example	*6*	*Turbid*	*pH is slightly less acidic. The wai is less turbid. Add another layer of cotton balls.*
Test 1			
Test 2			
Test 3			
Test 4			

Qualitative data is information you observe by using your senses. Quantitative data is information in the form of numbers or quantities.

Analysis:

What did you learn from your tests?

What improvements worked well? What didn't work well?

What does your final improved treatment plant look like?