

Water Challenge

Activity 3.2: Clean

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.

Treatment plant

Let's create a treatment plant for your wai network.

You'll need:

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

Using a ruler, measure 10cm up from the base of your bottle.

Healthy wai, healthy hapori. Create a treatment plant for your network to turn wai

As wai travels through Te Hurihanga Wai (the water cycle), it can come into contact with lots of different things that might make it wai paru (dirty water) - like pollutants and natural debris.

paru, pollutant-free.

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

Step 5

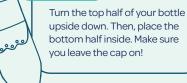
Help your treatment plant stand on its own by placing it in a stand, or stabilising it with a box.

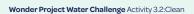
Step 1

Then, mark that spot with a pen.

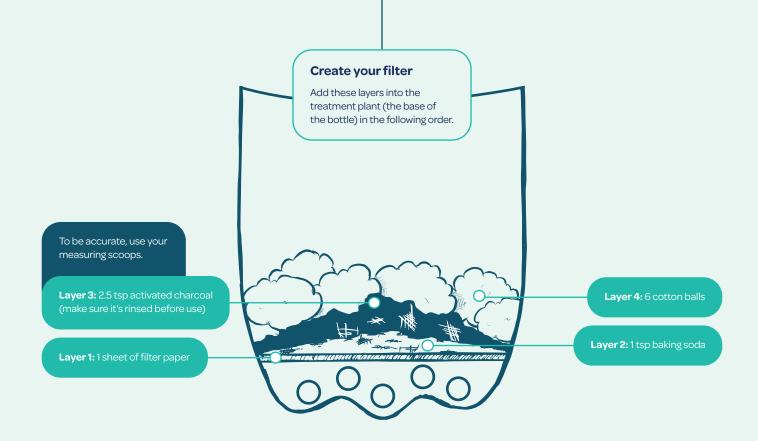
the bottom of the bottle.

Step 4









I wonder what the purpose of each layer is? Write your ideas in the box below.

Test the waters

See if your new 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 strips
- Torch (optional)

Step 1

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

Step 2

Using your pH strips, test the wai to check whether it's acidic or basic.

Wai is safest for nourishing the hapori when it's neutral at pH level 7

pH:

Step 3

Test the water's turbidity using your observation skills or a torch.

Turbidity:

Step 4

Make sure the water reservoir has its cap on, and that it's underneath your treatment plant. Then, slowly pour the wai paru through your treatment plant.

Tip! Improve your treatment plant by changing the amount of lemon juice, or the amount of baking soda.

Step 5

Collect quantitative data by measuring the pH of the wai, and qualitative data by measuring its turbidity and using your observation skills. Write your results in the test tracker.

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

Step 6

Analyse your results to decide if your treatment plant or the pH of wai could be improved. Then, improve it, and test again!

Test tracker

Quantitative data Qualitative data Data analysis Are your results better or worse? Why? What improvements could Test Amount of lemon juice Amount of baking soda number **Turbidity pH Level** (1-14) What observations you make? (clear/ can you make? turbid) (tsp) pH is slightly less acidic. 6 There were some Example 1tsp 1/8 tsp Turbid The wai is less turbid. (acidic) dirt particles in the wai. Add more baking soda. Test 1 Test 2 Test 3 Test 4

Analysis

What did you learn from your tests? What ratio of lemon juice to baking soda resulted in a neutral pH?	What improvements worked well? What didn't work well?	What does your final improved treatment plant look like?