Wonder Project **Water Challenge**

Activity 3.1: Wai paru investigation

Investigate how to deal with sneaky pollutants in wai.

STEM superstars use lots of tools to discover how clean water is, and how to make it safe to drink.

Begin your own investigation by experimenting with physical and chemical changes in wai.

Physical changes

Experiment: Turbidity and flocculation

Remember! Turbidity is the clarity of water, or how well a light beam can travel through it. Flocculation is when tiny particles clump together to form larger chunks called flocs.

You'll need:

- A clear glass (or jar)
- Clean wai
- Small chunks of natural debris (dirt, bark, grass, leaves)
- Salt
- Measuring scoop
- Torch (optional)

Step 1: Turbidity

- Fill a clear glass with wai.
- Add a spoonful of natural debris and stir well.
- Shine a torch or simply look through the glass.

Observations

Step 2: Flocculation

- Add 3 scoops (1 tablespoon) of salt into the wai.
- Stir gently for about 30 seconds, then leave it to sit.

Observations

After 2 minutes:

After 20 minutes:

Physical changes

Experiment: pH

Remember! pH is the measure of how acidic or basic something is, from 0 (extremely acidic) to 14 (extremely basic). Neutral wai should have a pH of 7.

You'll need:

- Four clear glasses of wai:
  - Wai glass 1: Add 2 measuring scoops of lemon juice
  - Wai glass 2: Add 2 measuring scoops of salt
  - Wai glass 3: Add a spoonful of natural debris
  - Wai glass 4: Pure wai
- Baking soda
- pH strips
- Measuring scoops

Test 1: Observation

How can you tell which wai is paru? Use your senses and record your observations in the table.

Test 2: pH

Using your pH strips, test the pH level of each glass of wai. Record your results in the table.

Dip the pH strip in and out quickly and take the reading straight away to get accurate results.

Test 3: Neutralisation

See if you can neutralise each wai glass to a pH of 7 by adding an acid or base into the wai.

After letting it sit for 1-2 minutes, test the wai using your pH strips. Record your results in the table.

Continue making changes until you achieve a neutral pH.

Tests	Wai glass 1: Lemon	Wai glass 2: Salt	Wai glass 3: Natural debris	Wai glass 4: Neutral water
Test 1: Observation				
Test 2: pH				
Test 3: Neutralisation	Acid/base added: pH:	Acid/base added: pH:	Acid/base added: pH:	Acid/base added: pH:
	Acid/base added: pH:	Acid/base added: pH:	Acid/base added: pH:	Acid/base added: pH:
	Acid/base added: pH:	Acid/base added: pH:	Acid/base added: pH:	Acid/base added: pH:
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	Acid/base added: pH:	Acid/base added: pH:	Acid/base added: pH:	Acid/base added: pH:

Analysis

What did you learn from your data?
How do you think each experiment helped you investigate wai paru?

Return wai from this activity to Ranginui by spreading over grass.