

# BREAKING IT DOWN

with Dr. Michelle Dickinson



## WATER CYCLE

Welcome to **Breaking It Down** with Dr Michelle Dickinson.

This worksheet is to help you to support your teaching after students have watched the 'Water Cycle' episode. It contains a summary of the science knowledge, experiment instructions, topics for further inquiry, and links to the NZ curriculum at levels 3-5.

Use this sheet alongside the video for the Water Cycle episode of "Breaking It Down with Dr Michelle Dickinson" to help with your teaching around the interacting processes which make up the water cycle. During the episode, Dr Michelle Dickinson will outline the water cycle and how each aspect links in with other processes and natural resources. She will talk with Dr Susie Wood of the Cawthron Institute about her research, and conduct an experiment which students can follow along with.

For this session, your students will each need:

- **Large bowl**
- **Salt**
- **Warm water**
- **Small bowl (which fits inside the larger bowl)**
- **Spoon**
- **Plastic food wrap**
- **Notebook and pencil**

### Achievement Aims

**NZ Curriculum Strand:  
Planet Earth & Beyond**

**Interacting systems(L3-4):** Investigate the water cycle and its effects on climate, landforms and life

**Earth Systems (L5):** Investigate the composition, structure and features of the geosphere, hydrosphere and atmosphere

### Learning Outcomes

- Understand that the water cycle is a collection of interacting processes which move water around our planet
- Understand each process which makes up the water cycle, and be able to name and describe each one
- Understand the link between the water cycle and weather
- Conduct an experiment to demonstrate evaporation and condensation

### BREAKING IT DOWN:

Science of the Water Cycle

Earth is known as the blue planet as over 70% of its surface is covered in water (wai). Most of this water is in our oceans and only about 1% of the water on earth is drinkable freshwater. Water is constantly cycling through the stages of the 'water cycle' which are all happening at the same time somewhere on earth. The water cycle has many components including:

**Evaporation:** Liquid water warms, turns into gaseous water vapour in the air, and rises into the sky (rangi) with the heat of the earth.

**Condensation:** Water vapour in the atmosphere condenses into liquid water or ice crystals, which form clouds (kapua) in the atmosphere. When the clouds contain enough water, the heavy droplets fall to the ground as precipitation.

**Precipitation:** Water falling from the atmosphere down to the earth's surface. This can happen in two states of matter: liquid (as rain) or solid (as snow and hail).

**Runoff and Groundwater:** Precipitation, once on the ground, may be caught in snowfields or glaciers, or may infiltrate and run through soil, contributing to freshwater systems such as lakes (roto) and rivers (awa), and eventually ending up in the ocean (moana).

**Transpiration:** Groundwater taken up by plants and trees is released into the air through the leaves.

## EXPERIMENT INSTRUCTIONS

### Experiment: Water Cycle in a Bowl

- Pour 2cm depth of warm water into the larger bowl and stir in a spoon of salt to dissolve. Taste to check the water is salty.
- Place the smaller bowl in the centre of the larger one, then cover the large bowl with plastic wrap.
- Use the spoon as a weight, and place it in the centre of the plastic wrap.

- Observe the plastic wrap - can you see any condensation? Leave for an hour.
- Remove the spoon noting if any water drops have formed under it. Peel back the plastic wrap and taste the water in the small bowl. It should not taste salty.

## EXPLORE FURTHER

(Use these prompts to start a discussion or further inquiry on the topic of the water cycle)

- Which is the saltiest sea on earth?
- If all the snow and ice on earth melted, how much more liquid water would there be?
- Why does rainwater taste different to tap water?
- How did we first get oceans here on earth?
- What's the difference between water vapour and steam?
- What's the difference between snow and hail?
- Does the sea ever freeze?
- Why do rivers start underground?

## FURTHER EXPERIMENTS & INFORMATION

Check out the scientific resources from the Royal Society Te Apārangi

<https://bit.ly/3enXQES>



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