Water cycle

Year: 3/4

Topic: Water Supply – Where does your water come from?

Aim:
To develop students' understanding on how water travels through the natural water cycle.

Victorian Curriculum

Science: VCSSU041, VCSSU046, VCSSU047, VCSSU059, VCSSU062
Geography: VCGGC082

Students will use the interactive map to:

- Investigate and explore the stages of the water cycle and where they occur across Melbourne.
- Follow the movement of water through different states
- Explore how we use water and how it's managed and the difference between the natural and urban water cycle

Guiding questions:

- What are the water cycle stages?
- Where does our (drinking) water come from?
- Where does our wastewater go?

Background

Water is essential to our way of life. It is a vital resource that makes all life on Earth possible, but what do we/you actually know about it? How does water fall from the sky? How does it get to your tap when you need it?

The water cycle, also known as the hydrological cycle, is the continuous movement of water across the Earth. This natural process recycles water and distributes it throughout the environment, which is later managed for our cities and industry. No new water is created or lost!

As the water cycle is exactly that, a cycle, we could begin at any point. The most logical is to start in a large water body where water is a liquid. Energy from the sun heats up the surface layer of this water and turns the liquid molecules into a gas, which rises into the atmosphere as water vapour. This is the process of **Evaporation.** Water is also converted from a liquid to a gas in plants through **Transpiration.** This is where water is absorbed through the plants roots and released as a gas via photosynthesis. These water molecules cool high up in the atmosphere and turn back into liquid droplets through the process of **Condensation.** Eventually, this water falls back to Earth as **Precipitation** (rain, sleet, hail, snow). This water is then percolates through the soil through **Infiltration** or runs over the surface as **Run-off.**

Water is then managed and distributed in urban areas through the Urban Water Cycle.

Educational videos:

ABC x Melbourne Water: Water Cycle Videos

- The Natural Water Cycle: An educational video made in collaboration with the ABC.
- Wastewater Treatment: The second episode in the series which explains part of the Urban Water Cycle and where, why and how our wastewater is treated.
- Stormwater: This video educates student on stormwater, surface run off, litter and where water ends up after going down the drain.
- Climate change: Gives students an overview of climate change, what it is and how it affects Australia.

Melbourne's drinking water

This video gives a quick explanation on where your drinking water comes from, how it gets to your house and what is being done to ensure there is enough water for the future for everyone and the environment.

Teacher- led exploration (20 min)
(This activity can also be carried out independently by the students on laptops)
Using a shared screen or whiteboard, open up Melbourne's World of Water – an Interactive Map. You will find a basic help guide here.

Guide the students through the water cycle (Natural and Urban) stages paying special attention to the location that these stages may occur in Melbourne.

Map tip: At the bottom of each content page there will be a link labelled "Next" that will take you directly to the next cycle stage.

Natural Water Cycle

1. Evaporation

1a. Transpiration

2. Condensation
3. Precipitation
4. Infiltration
5. Run off

Urban Water Cycle

1. Catchment/ Collection
2. Water Treatment
3. Distribution
4. Water Supply/Use
5. Sewage Treatment
6. Recycled Water
7. Stormwater
8. Climate Change (optional)

The Water Cycle

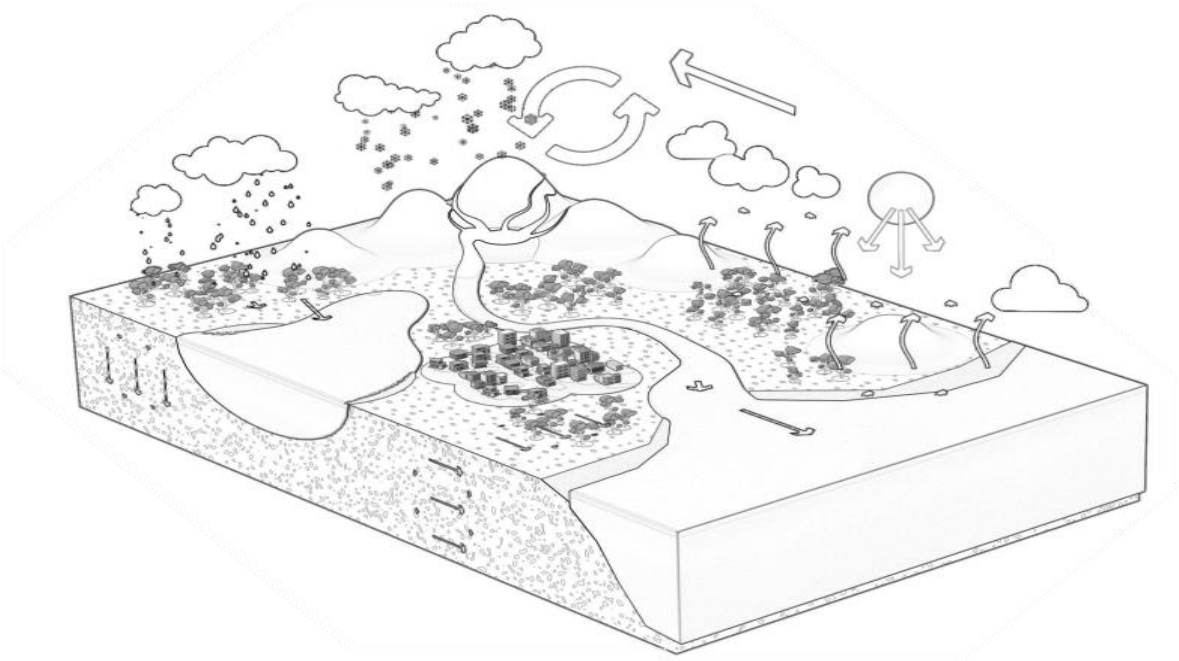
1. **Fill in the blanks**

Using the words below, complete the water cycle paragraph below:
Infiltration
Condensation
Transpiration
Run-off
Evaporation
Precipitation

Energy from the sun heats up the surface layer of this water and turns the liquid molecules into a gas, which rises into the atmosphere as water vapour. This is the process of _____**.** Liquid water is absorbed through plants roots and released as a gas via photosynthesis, this is called _____.

Once these water molecules rise high up into the atmosphere they begin to cool and turn back into liquid droplets through the process of _____**.** Eventually, this water falls back to Earth as _____. This water then percolates through the soil through _____ or travels over the surface as _____.

2. Colour and label diagram below, using the words you used above.



Create your own water cycle! (30min)

Watch the Story of Water videos for background information on the water cycle:
The Natural Water Cycle

What you'll need:

- Small Ziplock bag
- Permanent marker
- Blue food dye
- 100ml of water

Instructions

1. **Let's Draw:** Grab your permanent marker, and let's get creative on the upper half of your bag. Create landscape with mountains, waves, clouds and a sun. You can also label your diagram with the water cycle stages.
2. **Colour The Water:** Take around 100ml of water and add a few drops of blue food colouring. Mix it up until it turns blue!

3. **Pour Water Into Bag:** Carefully pour the blue water into the ziplock bag and seal it up!
4. **Hang in Sunny Spot:** Find a window that receives a lot of sunlight and hang your bag with water up there. Use clear tape to secure the corners.

5. **Observation Time:** Keep an eye on the bag over the next few hours and then again after about a day. You'll notice tiny droplets forming and moving around. Some droplets will gather in the "clouds," while others will "rain" down. You've done it – you've created a mini-water cycle in a bag!

Observations:

1. Did you notice any changes in the water over the course of the day?
2. At what time of day was most of the water a liquid/gas?
    a. Why do you think this might be?
3. What would happen on a cloudy/sunny day?
4. Did you observe any precipitation? What colour was it?

What's going on?

Just like the real thing, the energy from the sun heats up the surface layer of the coloured water in the bag and turns the liquid molecules into a gas.
These tiny water gas molecules rise to the top of the bag (atmosphere) as water vapour. This is the process of **Evaporation.**
The gas water molecules begin to cool against the bag and turn back into liquid droplets through the process of **Condensation.** Eventually, the water will fall back into the bottom of the bag (ocean) as **Precipitation**.

Tip*: You can explore the other steps of the water cycle by adding sand or soil to the bottom of the bag. Try to see if you can figure out where* ***Infiltration*** *and* ***Run-off*** *may occur!*

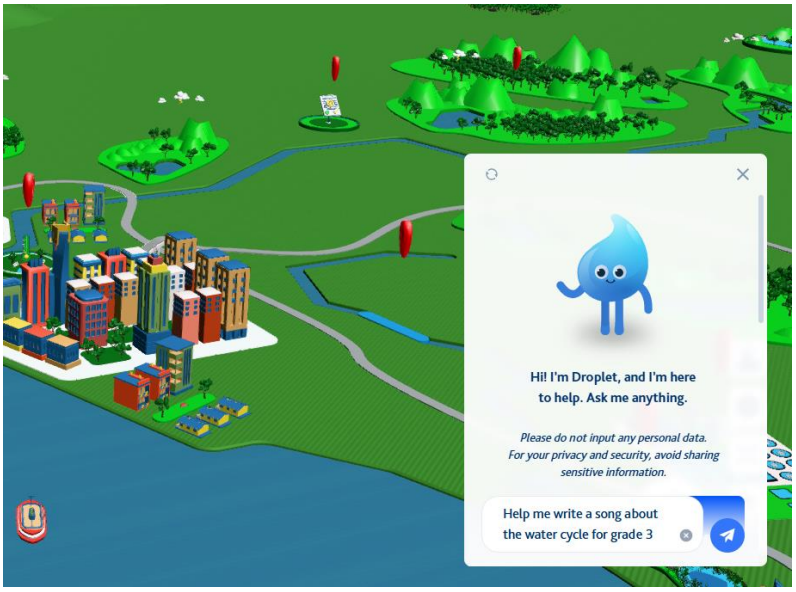
Water cycle song/rap (30-45min)

Watch The Natural Water Cycle video and Josh will guide you through the water cycle stages. During the video Josh will sing a "water cycle rap".

Split your class into groups and assign them a water cycle stage. Task them with creating their own song, rap, or dance to explain their stage in the water cycle. You can tie all the stages of the water cycle together by getting the students to perform their stages in order!

Suggested topics to include:

- Change of water state
- Importance of water (environment, life, human needs)
- Locations where these stages occur



Tip: If your class is struggling you can ask Droplet the chatbot for some help