

Year 4 science

How my water travels

Australian Curriculum links: Year 4 Science

Earth's surface changes over time as a result of natural processes and human activity (ACSSU075)
Science knowledge helps people to understand the effect of their actions (ACSHE062)

Sustainability cross-curriculum priority

In this lesson sequence, students explore what happens as water soaks into or runs over the ground. They gain an understanding of a catchment from a sandpit model that show how water moves across the landscape. Students then trace the journey that their water takes every day, from catchment or aquifer to tap.

This lesson can be used with the **Where does rain go** activity in which students find out what happens when water falls on different surfaces in the schoolground.

Some ideas for this lesson sequence were adapted from [PrimaryConnections](#) Water works (year 2) unit published by the Australian Academy of Science.

Equipment

For the class

- transparent container
- washed coarse gravel
- food colouring
- container (jug, bottle, watering can) filled with coloured water
- long eye-dropper or plastic syringe
- access to a sandpit
- watering can and water
- map showing the extent of the local catchment for display
- access to Google Earth
- [The water cycle](#) poster
- [The total water cycle management](#) poster
- [Whizzy's incredible adventures pick-a-path book](#) family journey

Preparation

Put washed gravel into a transparent container. Add food colouring to a container filled with water.

Gather information on your water story from your local Council or water service provider. What is the source of your drinking water? Is it surface water or groundwater? How is it

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treated? How is it distributed to houses? Is the treated water stored in a water tower before distribution? See **Traditional sources of freshwater in Queensland** fact sheet for background information.

Lesson steps

Session 1 – Groundwater

1. Discuss surfaces (e.g. concrete, paved areas) where rain may not soak in. Explain that in this demonstration, students will observe how water soaks in.
2. Slowly pour the coloured water over the gravel in the transparent container. Ask students to observe and explain what the water is doing.
3. Discuss how this models the formation of groundwater by asking 'How is this like rain falling onto the ground and soaking in?'
4. Ask students how water could be retrieved from under the ground (wells and buckets, bores and pumps, windmills). Explain that in some places, groundwater comes to the surface naturally and flows back into rivers.
5. Demonstrate how water can be retrieved using a long eye-dropper or plastic syringe. Explain that this models groundwater extraction. Once it is treated, this water can be used as drinking water.

Session 2 – Surface water: making a catchment model

1. Discuss other sources of drinking water (reservoirs, desalination) then explain that students will be going out to the sandpit to see what happens when rain falls in an area.
2. Outside at the sandpit, wet the sandpit with water if it is dry. Ask students to make a tall hill in one corner of the sandpit and a gully in the middle of the sandpit. They could also make rivers and streams by scooping out tracks that lead to the gully. The middle should represent a reservoir.
3. Using the watering can, let the water fall on the top of the hill like gentle rain.
4. Make the link between the materials used in the model and the phenomena or landforms they represent. For example, 'The sand is like the surface of the land with mountains, hills, valleys and gullies. The water represents rain and either soaks into the ground or runs off the land to become creeks and rivers.'
5. Ask teams to describe the landforms in their model and the processes that are occurring – water soaking in (infiltration), running off (run-off) or drying up (evaporation), creating rivers.
6. Consider the following questions:
 - What would happen to the landscape over time? (erosion of banks; creation of gullies)
 - What else might cause erosion? (land clearing, stock using waterways to drink)
 - What would happen if it rained heavily or if there was a cyclone? (topsoil would be eroded and washed into waterways as sediment)
 - Where would this sediment end up? (in creeks, rivers, bays, estuaries, ocean)

- What affect could this have on the waterways? (sediment could smother water plants or seagrass; make the water cloudy so plants couldn't grow; creeks would silt up)
7. Explain that the sandpit model represents a catchment. See [What is a catchment](#) for more information. Show the area of the catchment on the model. Display a local map to show the area of the catchment that the school sits in. Use familiar landmarks to orient the students.
 8. Ask teams to look at their model and consider what would happen if there was a barrier built across one of the rivers to hold back water. Assist students to build understanding of a dam as an artificial barrier used to protect areas from flooding and to store water. Ask students where they would build a dam to collect water.
 9. Discuss the water cycle including infiltration, groundwater and run off using 'The water cycle' poster and the 'The total water cycle management' poster.
 10. Display Google Earth 3D view, students find their local reservoir and observe the landscape surrounding it. They comment on what surrounds it, how hilly or flat the landscape is.

Session 3 – How my water travels

1. Discuss how water flowing from the school taps once fell as rain.
2. Read 'Whizzy's incredible Journeys' pick-a-path book family journey. If your school or community is dependent on bore water also read the underground journey.
3. Brainstorm the stages that water might have gone through on its journey to the school and record ideas. Discuss the similarities and differences between surface water and ground water using a graphic organiser. For instance,

Surface water: Rain falls on land, runs off the land into creeks and rivers. The water in creeks and rivers can be collected in a dam or weir. The water is pumped through a treatment plant and then sent to houses, businesses and industries via pipes. Some rain can fall directly into creeks, rivers and dams.

Groundwater: When rain soaks into the soil, the water seeps down into the ground and is collected in an underground aquifer. Then it is pumped up to a treatment plant and sent to houses, businesses and industries via pipes.

The **Traditional sources of freshwater in Queensland** fact sheet provides additional teacher information.

4. Make a list of key elements in the water story as it travels from a cloud to your tap e.g. rain, soil, creek, river, dam, pump, treatment plant, pipes, tap (or rain, soil, aquifer, pump, treatment plant, pipe, tap)
5. Ask volunteers to role-play the different stages in the water supply system for surface water and groundwater.
6. Display the [Total water cycle management](#) poster and discuss the journey water can take before it gets to our taps.
7. Students use the list of key water story elements to create a storyboard of the journey water takes. Students can order their storyboard before adding notes to describe what is happening in each picture. Alternatively, students can create an illustrated flow chart (see **Creating a flow chart**).
8. Students share their storyboards or flow charts with the class.