

### What is the water cycle?

**A natural process describing how water changes and moves through the Earth's land (lithosphere), air (atmosphere), waterways, and life (biosphere)**

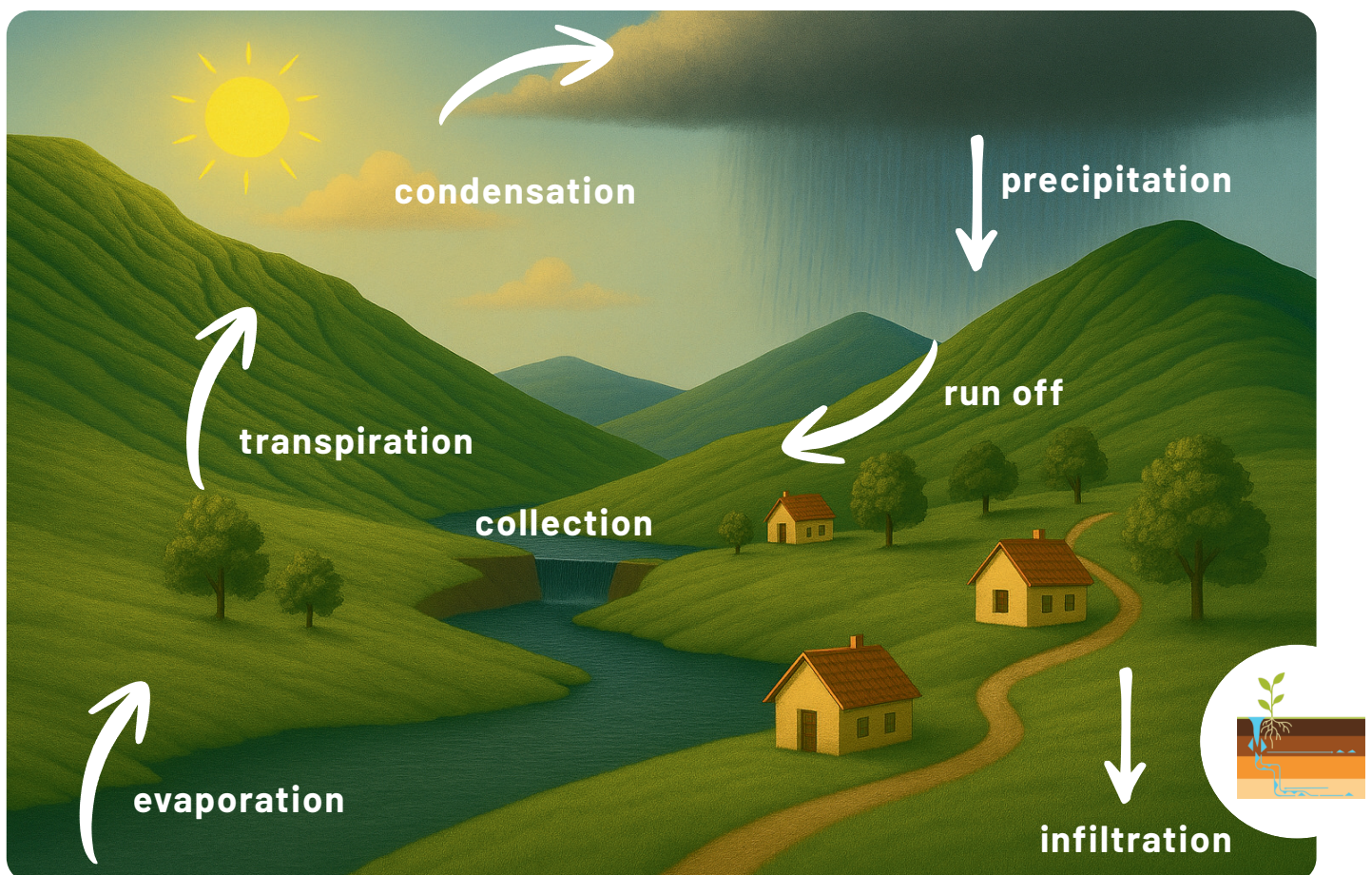
Water moves through the hydrosphere in a cycle. Rising, cooling water collects in clouds (condensation) and then falls as rain, snow or sleet (precipitation). Some of this water soaks into the soil and becomes groundwater (infiltration) or is taken up by plants. The remaining water flows along the surface from high to low places (run-off) until it reaches the catchment's lowest place - a river, lake or ocean (collection). The water warms and evaporates from the waterways (evaporation) or from the leaves of plants (transpiration) into the atmosphere and begins the cycle again.

The managed water cycle occurs when we interrupt the natural water cycle by building dams to control the flow of freshwater through catchments and to capture and collect the freshwater for our use.



DID YOU KNOW?

More than 60% of Earth's rivers have been dammed for human use.



### Why is the water cycle important?

We all need clean, fresh water to survive. Although three-quarters of the Earth's surface is covered with water, less than one percent of the water is freshwater that is available for us to use. In addition, Australia is the driest, permanently inhabited continent. This means that our freshwater is a limited, precious resource and we must consider how to care for, responsibly manage, and sustainably use it.



## Evaporation

Energy from the sun warms the water in oceans, lakes and rivers. The water changes from a liquid to a gas (water vapour). Water vapour rises into the air (atmosphere). 90% of our atmosphere's water vapour is from evaporation. The small amount of water vapour (and its energy) in the atmosphere greatly impacts our weather and climate.



## Transpiration

Plants in the biosphere take up water through their roots and the water moves internally through them to their leaves. At the leaves, the water evaporates from leaf cells and travels out of the leaves through tiny openings (stomata) as water vapour into the atmosphere.



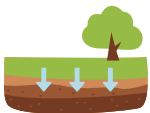
## Condensation

As water vapour from evaporation and transpiration rises in the atmosphere, it cools and turns from a gas into liquid water (water droplets). With the right weather conditions and particles present, the water droplets combine and form clouds.



## Precipitation

The water in clouds in the atmosphere falls back to the Earth's surface as rain or sleet (liquid water) or snow/hail (solid water). Precipitation affects temperature, humidity, air pollutant distribution/concentration, erosion, fires, and all living things in the biosphere.



## Infiltration

Precipitation falls on the ground and soaks into the soil and rock. The amount of water the soil takes in depends on the type of soil, the wetness of the soil, the type of groundcover, and the slope of the land. Some of this water is taken up by plants and some becomes ground water (percolation).



## Run off

Rainfall that doesn't soak into the ground or get taken up by plants, flows along the surface of the land and runs into creeks, rivers, lakes and oceans.



## Collection

Precipitation is stored in bodies of water, including oceans, waterways (creeks, rivers and lakes), groundwater, glaciers, and ice caps.



## Catchment

An area where water is collected by the natural landscape- the water moves from high places (mountains) to low places (valleys) and collects in the low places

# Managed water cycle



## Dam

A wall-like structure that is built across a river to block the flow of water through the landscape - when it rains, water builds up behind the dam, creating a reservoir



## Stormwater

Precipitation that runs off buildings and streets. It can pick up rubbish, animal waste, and chemical waste. It flows into gutters and drains and is discharged untreated into waterways.