Foundation
Lesson 1
The water cycle

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Learning Objectives

Students will be able to:

- observe the sky and predict specific weather conditions
- understand key concepts in the water cycle – such as evaporation and precipitation
- undertake activities to test predictions associated with evaporation and other water cycle processes.

Learning outcomes

Subject	Strand & content descriptors
Science	Science understanding • Daily and seasonal changes in our environment, including the weather, affect everyday life. (ACSSU004) Science as a human endeavour • Science involves exploring and observing the world using the senses. (ACSHE013) Science inquiry skills • Respond to questions about familiar objects and events. (ACSIS014) • Explore and make observations by using the senses. (ACSIS011)
Geography	Geographical knowledge and understanding • Changes in the weather influence people's activities. Geographical skills and inquiry • Pose questions about place, space and environment. • Share observations and ideas.

Important questions

- Where does water come from?
- Where does the water in puddles go?
- What can we learn about weather by observing the sky?

Background information

The amount of water on Earth does not change; rather it is continually recycled through the processes of the water cycle. Although over 70 percent of the Earth's surface is covered by water, most of it (around 97 percent) is salt water. Ice makes up two percent and only one percent is suitable for drinking.

As water moves through the water cycle it changes taste, shape and form. Three major processes drive the water cycle: evaporation, condensation and precipitation. Transpiration, the process of water loss through plants, is also important.

- Evaporation: when water is heated it changes from liquid to gas (water vapour) - the sun heating the ocean produces most of the water vapour in the atmosphere.
- Condensation: as water vapour rises, it cools and changes into tiny droplets of water which can be seen as clouds, fog or mist.
- Precipitation: rain, hail, snow or sleet - water vapour that has risen and condensed to become water drops, becomes heavier and eventually falls out of the air.
- Transpiration: water emitted by plants through pores in the leaves is evaporated and released into the atmosphere as water vapour.

A number of the processes associated with the water cycle can be simply observed, such as washing drying on a line (evaporation); or the gathering of storm clouds in summer (condensation), and may be used to predict or explain climatic conditions.

Lesson plan

Using examples or images of various clothes and accessories (rubber boots, scarves, and umbrellas) ask students to identify what the weather conditions might be like if they were wearing particular items.

Classify the clothes and accessories under images or labels for weather conditions, such as windy, sunny, rainy and cloudy.

Ask students to identify how observations of the sky and the weather can indicate if it is about to rain. Ask students if they know where rain comes from and where it goes.

Using a KWL chart or similar, gauge and collate students knowledge of the water cycle and associated weather phenomenon.

Using drawings or images of the key water cycle components (ocean; the sun; clouds; rainfall) illustrate how the cycle is linked. Explain the concept of a cycle and that the water on Earth is continually recycled and changes form (from liquid to gas to solid (ice)).

Observing evaporation. Use a puddle in the playground or shallow container of water. Mark the outline of the puddle in chalk or clearly mark the level of the water in the container and observe the level of water over a set period.

Using a Predict, Observe, Explain (POE) approach ask students to suggest where the water is going and what is causing the water to disappear.

Ask students to identify other situations where evaporation takes place (e.g. washing drying on a line; water in a swimming pool; rain on the footpath).

Return to the diagram of the water cycle and, using labels, introduce key terms - evaporation and precipitation.

Resource requirements

- Various clothes and accessories
- Images/graphics of water cycle components (line drawings are provided in Activity sheet 1 – The water cycle. You may also like to source photos from the internet).
- Chalk or shallow container.

Additional activities

Daily weather: each day record the weather placing images of the sun, cloud, rain etc. on a chart (use images from Activity sheet 2-Weather chart symbols.) Looking at the weather over a period, discuss with students if they think it is normal for this time of year.

Ice: using ice cubes or similar expand on water cycle concepts by observing the changing form (melting and eventual evaporation) of ice cubes by placing ice cubes in various places such as sun, shade, and holding in the hand. Students use a POE template to record aspects of the activity.

Condensation: to demonstrate condensation to students heat a kettle alongside a mirror or window and observe the condensation and subsequent change to liquid. Ask students to predict what will happen and explain their observations.