

## Lesson Planner

- I can apply my knowledge of how water changes state to help me understand the processes involved in the water cycle in nature over time. SCN 2-05a

### Optional Flipped learning

What is the water cycle? Watch this clip to find out more <https://www.bbc.co.uk/bitesize/clips/zmwybdm>

### In school Learning

#### In the classroom

See Attached lesson

#### Outside

Track the movement of water - Puddle tracking

#### You will need –

water, chalk, measuring tape or string

#### What you do

1. find, create a puddle on a hard surface
2. trace around its outline in chalk
3. lay a piece of string on the tracing and measure the string using a ruler or measure with a measuring tape
4. repeat several times through the day and record on sheet
5. what has happened to the puddle and suggestions for why

Follow the water

#### You will need –

recording sheet, camera, pencil and clipboard

#### What you do

1. find where water collects or is collected (drains, puddle, drainpipes)
2. record on sheet where the water has come from (rain, waste..) where it goes to the drain
3. pupils repeat at intervals.

### Out of School Learning

#### At home or in the community

Make your own model of the Water Cycle

#### You will need –

one or more empty 2L bottles, tray (food tray, seed tray), soil/sand/ compost, shallow container for water – jar lid or small dish, lamp or sunny window sill/outdoor space

#### What you do

1. using the tray as your base, create a mini landscape
2. add water by watering the compost or filling the dish with water
3. cover with plastic bottles making sure that everything in the landscaped is sealed in
4. place in a sunny spot and leave for few hours
5. return and note – evaporation from water soil/dish, condensation on inside of bottles perhaps falling as rain.

#### Online learning

#### What is the Water Cycle?

<https://www.bbc.co.uk/bitesize/topics/zgwxfg8/articles/zjq3rj6>

## Learning at School Outdoors

<p><u>Experience and Outcomes</u> I can apply my knowledge of how water changes state to help me understand the processes involved in the water cycle in nature over time. SCN 2-05a</p> <p><u>Learning Outcome</u> Pupils can describe how surface water is moved around the Water Cycle in different ways including evaporation and by travel along natural and man-made water courses.</p>	<p><u>Resources</u></p> <p><b>Activity 1 Puddle Tracking</b></p> <ul style="list-style-type: none"> <li>• Water (in bottles or a watering can)</li> <li>• Chalk</li> <li>• measuring tape or metre stick</li> <li>• string</li> <li>• Puddle Tracking sheet</li> </ul> <p><b>Activity 2 Follow the Water</b></p> <ul style="list-style-type: none"> <li>• recording sheet</li> <li>• pencil and clipboard</li> <li>• camera</li> </ul>
<p><u>Activity</u>      <b>Water Tracking</b></p> <p><b>Activity 1 Puddle Tracking</b></p> <ol style="list-style-type: none"> <li>1. Find or create a puddle on a hard surface.</li> <li>2. Trace around its outline in chalk.</li> <li>3. Lay a piece of string on the tracing and measure the string using a ruler or measure with a measuring tape.</li> <li>4. Repeat several times through the day and record on sheet – Puddle Tracking</li> <li>5. Pupils describe what has happened to the puddle over time and make suggestions as to what has been happening.</li> </ol> <p><b>Activity2 Follow the Water</b></p> <ol style="list-style-type: none"> <li>1. Find places where water collects or travels (drains, puddle, drainpipes...). When water travels (flows) on or below the surface it is in a "water course".</li> <li>2. Use recording sheet to make a note of the places where water is found and complete with suggestions for where water goes next.</li> </ol>	<p><u>Assessment</u></p> <p>Teacher assessment of pupil suggestions at end of Activity 1 and Activity 2.</p> <p>Extension: Use the back of the Follow the Water sheet to draw a simple diagram (with captions) of what you have seen happening to water and what you have suggested (or hypothesised) is going to happen to the water.</p> <p>Follow Up Activity/Homework: Can you find out where our drinking water comes from?</p>

## WATER COLLECTION AND USE

I can apply my knowledge of how water changes state to help me understand the processes involved in the water cycle in nature over time. SCN 2-05a

I can report and comment on current scientific news items to develop my knowledge and understanding of topical science. SCN 2-20b

**List** daily activities that use water. Include water use for drinking and food preparation, for sanitation/hygiene and for other domestic purposes such as washing clothes and dishes, and watering your garden.

**Estimate** and/or measure the amount of water used in each activity. Discuss which activities rely on water that is a suitable quality for drinking. (See information sheets attached, although this could be researched by pupils)

**Calculate** the total daily usage.

### Discuss:

- Where does your water come from?
- What problems would you and your community face if access to safe and sufficient water was difficult or limited?
- Why can water be considered a human right? (Consider Article 25 of the United Nations Universal Declaration of Human Rights, which begins, 'Everyone has the right to a standard of living adequate for the health and wellbeing of himself and of his family . . .' How is water an essential part of health and wellbeing?)

**Examine** the photographs and captions relating to water storage, access and collection. Pay particular attention to the way water is being collected and transported and who is doing the work.

### Discuss:

- What are these people doing?
- Why do you think they need to do this work?
- How do you think access to water would affect the amount of water people in these areas use each day?
- What effect would this have on their health?
- What do you notice about the people performing the work of collecting and transporting water?
- What impact might this task have on women and children's lives (eg, social interaction, educational opportunity, ability to obtain sufficient food)?

## Teacher notes - Quick facts

- World Water Day is 22 March and World Toilet Day is 19 November.
- Water and sanitation are fundamental human rights. Everyone should have sufficient, affordable, physically accessible, safe and acceptable water for personal and domestic uses.
- Every person needs 20–50 litres of clean fresh water a day for drinking, cooking and cleaning.
- Someone living in a country like Australia consumes 30–50 times more water than someone living in a developing country.
- The largest numbers of people who do not use improved sanitation facilities live in Sub-Saharan Africa and Southern Asia.
- In 2012, 11% of the global population (783 million) did not have access to safe fresh water.
- 2.5 billion people live without basic sanitation.
- Food and water tainted with human waste causes diseases that lead to about 1.5 million deaths of children a year.
- 70% of the world's fresh water is used in agriculture, which highlights the link between access to water and food security.
- Over the last 60 years there have been more than 200 international water agreements and only 37 cases of reported violence between states over water.

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## THE RIGHT TO WATER

Water is the source of life – vital for health, food and economic development. Without sufficient and affordable clean water and access to adequate toilet and washing facilities, people suffer a range of illnesses. As a result, they may be unable to work or attend school. Without water to grow crops people may go hungry. Without health and education people have less chance of earning an income and become trapped in a brutal cycle of illness and poverty.

Every person has a right to sufficient water for personal and domestic uses (between 50 and 100 litres of water per person, per day), which must be safe, acceptable, affordable (water costs should not exceed 3 per cent of household income), and physically accessible (the water source has to be within 1,000 metres of the home and collection time should not exceed 30 minutes).

## ACCESS TO WATER

People's ability to obtain enough water for their needs is dependent on many overlapping factors. Crucially, where people live affects how much water is available. Climate and physical factors such as landform and soil types determine the rainfall and the amount of water that can be collected. The number of people who need to share the water and the amount of infrastructure required to collect and distribute it also influences the amount and quality of accessible water.

Water may be available through rain collected in rivers, lakes, dams or tanks and distributed by pipelines. It may be drawn or pumped from underground in wells or standpipes. Wastewater may be collected and treated for reuse (recycled). It may be delivered in bottles and, increasingly, it may be created from sea water (through the process of desalination).

The cost can affect people's ability to obtain sufficient water for their needs. Governments need resources to maintain the infrastructure through which water is distributed. People living in areas of higher rainfall with the money and resources to harvest water have better access than those in drier and poorer places.

As the population of the world increases and people become richer they use more water for hygiene and eat foods that take more water to produce. It is estimated that in the next two decades, water use will increase by 40%. By 2025 about 1,800 million people are expected to be living in countries or regions with 'absolute' water scarcity (less than 500 cubic metres per person, per year), and two-thirds of the world population could be under 'stress' conditions (between 500 and 1,000 cubic metres per person, per year).













Older washing machines can use 150 – 170 litres of water per load, new efficient models use between 53-95 litres per load.



A bath can hold 80 litres, while a conventional electric shower uses 62 litres of hot water



Hand-washing dishes typically uses about 63 litres per session

Can you calculate how much water your household uses every day or week?

<b>Activity which uses water</b>	<b>Estimate of how much water activity uses</b>	<b>Daily</b>	<b>Weekly</b>