Teacher Notes

Themes

- Water cycle
- Human water use

Key learning outcomes

- Learn the stages of the natural water cycle, including evaporation, condensation, precipitation, run-off and infiltration.
- Explore how water moves between the environment and living things in the natural water cycle, including through transpiration and groundwater.
- Understand how water is collected, stored, filtered and supplied for human use in the managed water cycle.

Key curriculum areas

- **Science:** Science Understanding (Earth and space sciences, Biological sciences); Science as a Human Endeavour; Science Inquiry
- **English:** Language; Literature; Literacy
- **Cross-curriculum Priority:** Sustainability

Publication details

This Drop of Water

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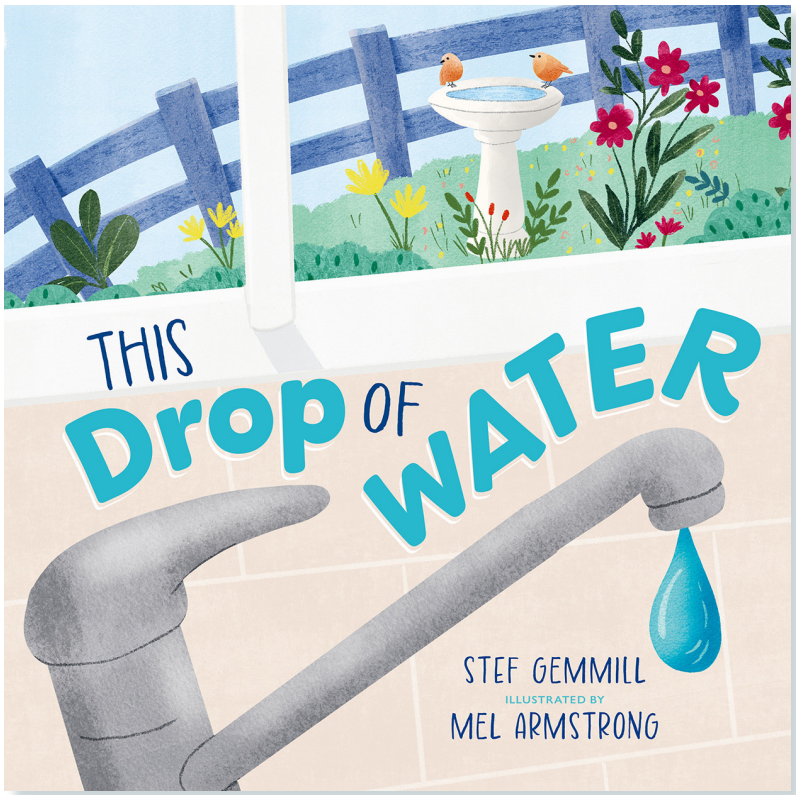
Teacher notes prepared by David Benton.

CSIRO Publishing
Private Bag 10
Clayton South, VIC 3169, Australia

Website: www.publishing.csiro.au
Tel: 1300 788 000 (local call in Australia)
Email: csiropublishing@csiro.au



This Drop of Water

Stef Gemmill and Mel Armstrong

About the book

Dive into the wonderful world of water!

Follow along as Drop changes form over and over – from an icy glacier to a misty cloud, from falling rain to drinking water. Watch Drop work hard to bring water and life to the world around us.

This Drop of Water brings the water cycle to life in a beautifully illustrated, fun-filled adventure.

Recommended for

Readers aged 5 to 9 (Years 1 to 4)

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About the author and illustrator

Stef Gemmill used to write music reviews about big kids in bands but now writes books for small kids with curiosity. She lives with her family and sleepy cat, Luna, the star of her award-winning book, *A Home for Luna*.

Mel Armstrong is an illustrator from New Zealand. She blends digital and traditional techniques to create charming children's books, drawing inspiration from nature and her lively home life. She is also the illustrator of *The World from Here* (CSIRO Publishing).

Pre-reading questions or activities

Where water comes from

Hold up a glass of water and ask the class:
Where do you think this water came from before it reached the tap?

Take a few answers, then ask:
Do you think this is the same water that dinosaurs drank?

(It might be! Water has been cycling around Earth for billions of years.) Tell students they're about to follow one drop of water on its journey.

Water mindfulness

Ask students to close their eyes and listen. Play 30–60 seconds of rain sounds (easily found on YouTube). Then ask:

What does rain feel like? What does it smell like? Where does the rain go after it falls?

Take a few answers before opening the book.

Discussion questions

Science (Years 3–4)

1. Can you describe Drop's journey in order? What are the different stages it goes through?

   Students should try and identify the key stages: run-off → surface water → evaporation/ transpiration → condensation (→ drought) → precipitation → infiltration → groundwater → flood → water storage → filtration → water supply. Accept any reasonable ordering and use it as an opportunity to build the class's understanding of the water cycle together; mistakes could provide opportunity for some great discussion.

2. What is the difference between evaporation and transpiration?

   Evaporation is when the sun's heat turns liquid water into water vapour directly from water surfaces (rivers, oceans, puddles).

   Transpiration is when water is pulled up through a plant's roots and stems and released as vapour through tiny holes in the leaves (called stomata). Both put water vapour into the air to help form clouds.

3. Why does water vapour turn back into water droplets high up in the sky?

   The air is colder higher up. As vapour rises and cools, it condenses, clumping together to form tiny droplets that make up clouds. When droplets become heavy enough, they fall as precipitation (rain, snow or hail).

4. What happens to water after it falls as rain? Can you think of more than one path it might take?

   It can run off into creeks and rivers (run-off), soak into the ground (infiltration) to become groundwater, be absorbed by plant roots, collect in dams and reservoirs, or evaporate again. (The diagram on the second-last page of the book shows these different paths well.)

5. Why is only 1% of Earth's water available for us to drink?

   Most of Earth's water is saltwater in the oceans. Of the remaining freshwater, most is locked in glaciers and ice caps. Only a small amount is accessible as surface water or groundwater that can be treated for drinking.

Teacher Notes

English (Years 1–4)

1. The author uses words like ‘wriggles’, ‘jiggles’, ‘shivers’ and ‘shudders’ to describe Drop. Why do you think she chose these words? How do they make you feel as a reader?

   These are verbs, or action words, that give Drop a personality, making an invisible scientific process feel alive and relatable. This is called ‘personification’. They also help younger readers imagine what each stage of the water cycle feels and sounds like.

Follow-up question: Can you think of any other words that could describe Drop’s journey?

Sustainability

1. The book shows that Drop can pick up pollution and grime along its journey. What are some ways we could reduce the pollution that enters our waterways?

   Students might suggest not littering near rivers or beaches, using less plastic, supporting wetlands and vegetation along riverbanks, reducing chemical use in gardens and farms. Accept any thoughtful environmental response.

2. The back of the book mentions ‘reduce, reuse, recycle’ for water. Can you think of one example for each of how to reduce, reuse and recycle at home or in the community?

   Reduce: shorter showers, turning off the tap while brushing teeth. Reuse: using washing-up water on the garden, collecting rainwater. Recycle: recycled wastewater used on crops or in factories.

Activities

Activity 1 – Visit Melbourne Water’s website for some amazing resources

Areas: Science, Sustainability

Melbourne Water’s curriculum-aligned educational resources focus on water and the water cycle, Melbourne’s local waterways, and environmental conservation. You can also discover one of their treatment plants or wetlands by booking an excursion and let their experienced educators take you on a journey through the water cycle. For more information, see: https://www.melbournewater.com.au/education/school-resources

Explore a series of short videos that will help reinforce Drop’s journey. Episode 1 can be found here: https://www.melbournewater.com.au/teachertoolbox/episode-1-water-cycle

Activity 2 – Water cycle in a bag

Area: Science (Earth and space sciences)
A simple, visual experiment that recreates evaporation and condensation in a sealed bag. Can be done as a demonstration to reduce the number of plastic bags used.

Materials: resealable plastic sandwich bags (reuse if possible), water, tape, blue food colouring (optional).
Safety note: ensure bags are sealed firmly before taping to the window.

1. Fill a resealable plastic sandwich bag with water, about one-quarter full. Add a few drops of blue food colouring if available (optional, but makes the distinction between condensation and the 'sea' more visible).
2. Seal the bag tightly and tape it to a sunny window with the water at the bottom.
3. Leave it for a few hours or overnight. Ask students to predict what will happen before you check it.
4. Observe: droplets should form on the upper inside of the bag as water evaporates and then condenses on the cooler surface.
5. Discuss: which parts of the water cycle did we just see? What is the 'sun' in this experiment? What would the 'cloud' be?

Extension: ask students to draw and label what they observed, using the vocabulary from the book (evaporation, condensation, precipitation).

Activity 3 – Transpiration watch

Area: Science (Biological sciences)
A simple overnight investigation into how plants release water.

Materials: clear resealable plastic sandwich bags (reused), rubber bands or twist ties.
Safety note: if using an outdoor plant, ensure the bag is secured tightly and consider avoiding windy days to prevent losing the bag.

1. Find a leafy plant or tree branch (ideally outdoors or a classroom plant).
2. Place a clear resealable plastic sandwich bag over a cluster of leaves and seal it around the stem with a twist tie or rubber band, trapping air inside.
3. Leave it overnight (or for a full school day in direct light).
4. Observe the condensation that forms inside the bag. Ask: where did this water come from? Prompt to see if anyone can remember the word 'transpiration'.
5. Connect back to the book: this is exactly what the trees in *This Drop of Water* are doing, releasing water vapour through their leaves.

Extension: try the same activity with different plant types or in sun vs shade and compare results.

Activity 4 – Be Drop: write your own water journey

Areas: English (Literacy), Science
Students write a short first-person narrative from Drop's point of view, choosing their own path through the water cycle.

Materials: paper and pencils (or devices for digital writing).

1. Read the book together, then show students the diagram on the second-last page illustrating the different paths Drop can take.
2. Ask each student to choose one path that is different from the ones in the book (e.g. a Drop that gets absorbed by a plant root and transpires into a cloud, or a Drop that ends up in a glacier).

   Or

   Ask each student 'Imagine you are Drop. Where do you see yourself right now?'. This can then be the starting point for their narrative.
3. Students write 1–2 paragraphs as Drop, describing what they see, feel and do at each stage. Encourage them to use action verbs and descriptive language, as the author does.
4. Share with the class and compare the different journeys.

Extension: students could illustrate their journey as a comic strip or annotated diagram. Encourage students to choose a path from the book, but to expand on this and take Drop's journey further if they want to.

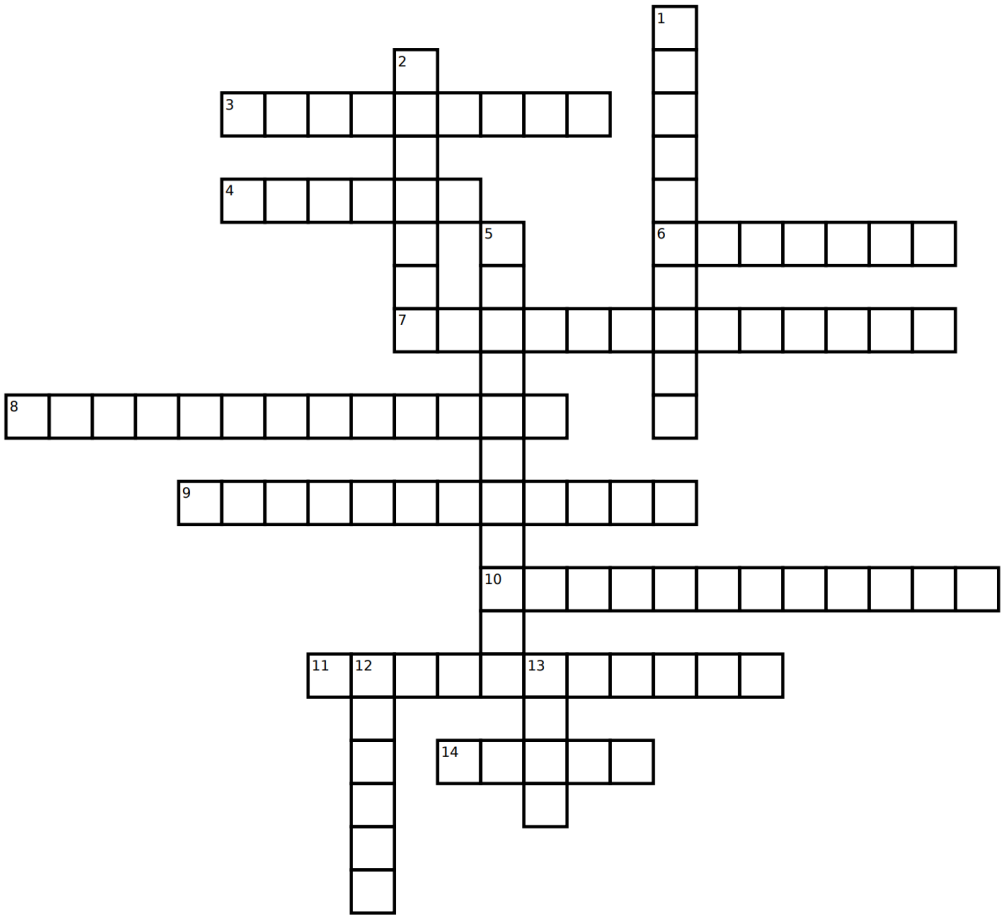
Activity 5 – Our water audit

Areas: Sustainability, Science (Science as a Human Endeavour)
Students investigate how much water their household uses and identify ways to reduce it.

1. As homework, ask students to notice and record three ways their family uses water in one day (e.g. showers, dishes, garden, toilet flushing).
2. Back in class, pool the class's responses and group them into categories on the board (e.g. 'Drinking and cooking', 'Bathing and hygiene').
3. For each category, discuss: could we reduce how much water is used? Could we reuse this water for something else? Is there a smarter way to do it?
4. Each student then writes or draws one water-saving pledge – something they will try at home.

Tip: the back page of *This Drop of Water* lists several real-world water-saving technologies (low-flow taps, rainwater collection, recycled wastewater). Use these as discussion prompts.
Link: Melbourne Water's school resources also include curriculum-aligned materials on water conservation: https://www.melbournewater.com.au/education/school-resources

This Drop of Water crossword puzzle



Down:

1. Cleaning water by removing grime and pollutants.
2. A long dry period with too little water.
5. When sunlight turns water into vapour.
12. Excess water that flows into rivers and creeks.
13. The main character and hero of the story.

Across:

3. An artificial lake used to store water.
4. The invisible form water takes in the air.
6. Underground layer of rock that holds groundwater.
7. Water released into the air through plant leaves.
8. Rain, snow or hail falling from clouds.
9. When vapour cools and clumps into clouds.
10. Water soaking into the ground.
11. Water found beneath the surface.
14. When water overflows across dry land.

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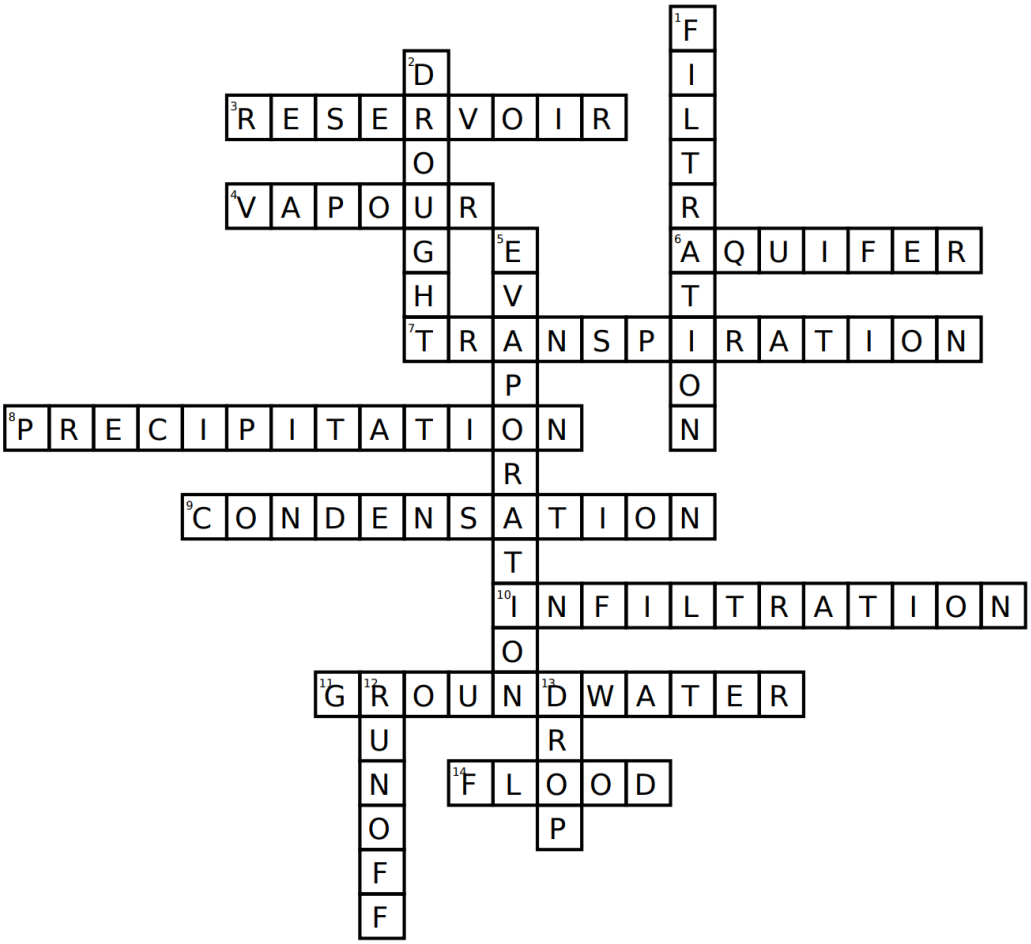
Teacher Notes

Answers:



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This Drop of Water word search

V D R O U G H T G F
L V Y H A I L V L I
O C E A N E D A A L
C P Q S O C A P C T
L A K E T L M O I E
R A I N B O W U E R
C Y C L E U R R R D
X F L O O D Y M J R
R A I N R I V E R O
V F S N O W Z W Z P

DROUGHT
FILTER
RIVER
SNOW
DROP
RAINBOW
CLOUD
STORM
VAPOUR
LAKE
GLACIER
OCEAN
FLOOD
CYCLE
HAIL
RAIN
DAM

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Teacher Notes

Answers:

DROUGHT	RAINBOW	GLACIER	HAIL
FILTER	CLOUD	OCEAN	RAIN
RIVER	STORM	FLOOD	DAM
SNOW	VAPOUR	CYCLE	
DROP	LAKE		

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Australian Curriculum Links (Version 9.0)

Year level	Learning area: Science	Other learning areas
Years 1/2	**Science Understanding: Earth and space sciences** • Describe daily and seasonal changes in the environment and explore how these changes affect everyday life (AC9S1U02) **Science Understanding: Biological sciences** • Identify the basic needs of plants and animals, including air, water, food or shelter, and describe how the places they live meet those needs (AC9S1U01) **Science Inquiry: Planning and conducting** • Make and record observations, including informal measurements, using digital tools as appropriate (AC9S2I03) **Science Inquiry: Communicating** • Write and create texts to communicate observations, findings and ideas, using everyday and scientific vocabulary (AC9S1I06)	**English Language: Language for expressing and developing ideas** • Understand that words can represent people, places and things (nouns, including pronouns), happenings and states (verbs), qualities (adjectives) and details such as when, where and how (adverbs) (AC9E1LA07) **English: Language: Language for expressing and developing ideas** • Experiment with and begin to make conscious choices of vocabulary to suit the topic (AC9E2LA09) **English: Literacy: Creating texts** • Create and re-read to edit short written and/or multimodal texts to report on a topic, express an opinion or recount a real or imagined event, using grammatically correct simple sentences, some topic-specific vocabulary, sentence boundary punctuation and correct spelling of some one- and two-syllable words (AC9E1LY06)
Years 3/4	**Science Understanding: Earth and space sciences** • Identify sources of water and describe key processes in the water cycle, including movement of water through the sky, landscape and ocean; precipitation; evaporation; and condensation (AC9S4U02) **Science as a Human Endeavour: Use and Influence of Science** • Consider how people use scientific explanations to meet a need or solve a problem (AC9S3H02) **Science as a Human Endeavour: Nature and development of science** • Examine how people use data to develop scientific explanations (AC9S3H01) **Science Inquiry: Questioning and predicting** • Pose questions to explore observed patterns and relationships and make predictions based on observations (AC9S3I01)	**English Language: Language for expressing and developing ideas** • Understand how verbs represent different processes for doing, feeling, thinking, saying and relating (AC9E3LA07) **English Literature: Creating literature** • Create and edit imaginative texts, using or adapting language features, characters, settings, plot structures and ideas encountered in literary texts (AC9E3LE05) **English Literacy: Interacting with others** • Listen for key points and information to carry out tasks and contribute to discussions, acknowledging another opinion, linking a response to the topic, and sharing and extending ideas and information (AC9E4LY02)
All	**Cross-curriculum Priority: Sustainability – Systems** • All life forms, including human life, are connected through Earth's systems (geosphere, biosphere, hydrosphere and atmosphere) on which they depend for their wellbeing and survival (SS1) • Sustainable patterns of living require the responsible use of resources, maintenance of clean air, water and soils, and preservation or restoration of healthy environments (SS2)	

Related books from CSIRO Publishing

For younger readers:

- *A Shorebird Flying Adventure* (https://www.publishing.csiro.au/book/8006)
- *Oceans at Night* (https://www.publishing.csiro.au/book/8104)
- *Secrets of the Saltmarsh* (https://www.publishing.csiro.au/book/8101)
- *The World from Here* (https://www.publishing.csiro.au/book/8210)

For older readers:

- *Oceans of Plastic: Understanding and Solving a Pollution Problem* (https://www.publishing.csiro.au/book/7926)

Other CSIRO resources

CSIRO has developed and delivered a broad range of high-quality STEM education programs and initiatives for nearly 40 years. Our programs aim to inspire the pursuit of further STEM education among students and the community, to equip the emerging workforce with tomorrow's skill sets, and to strengthen collaboration between industry and classrooms across Australia. For more information visit: https://www.csiro.au/en/Education