Topic 2: Where does our water come from?

Introduction

In Topic 2, students will learn about the water cycle and participate in an activity to explore the composition of the Earth's water (e.g. salt, fresh, frozen). This will show students that, while there is a lot of water on the surface of the Earth, not all of it is in a form that we can use.

This topic will be delivered in two parts, each of which may take several lessons.

Topic 2 is part of six topics that can be taught indiviually or together to form a complete unit of work. Visit the 'For educators' section of the website to access the other topics.

Learning outcomes

- Students will be able to describe the stages of the water cycle using correct terminology.
- Students will realise that the Earth's water supply is not all the same (some is salt water, some is fresh, and some water is frozen).

Resources

Part 1

- Interactive whiteboard
- **'Water cycle animation'** (available in the 'Interactives' section of the website)
- **'The water cycle explained'** fact sheet
- **'Water cycle puzzle – level 1'** activity sheet
- **'Water cycle puzzle – level 2'** activity sheet
- **'Mini water cycle'** activity sheet (the resources required are listed on the sheet)

There are numerous songs and raps available on YouTube that explain the water cycle. Some examples to search for are provided below, however, you should select ones appropriate for your students.

Younger students

- The Magic School Bus Wet All Over (book or video available)
- The Water Cycle: Collection, condensation, precipitation, evaporation

Older students

- The Water Cycle (by the National Science Foundation)
- Earth's Water Cycle NASA GSFC Space Earth Science Weather Video

Part 2

- World map or globe (or access to Google Earth)
- Three clear containers (e.g. measuring jugs or beakers) that can hold one litre of water
- One litre of water
- Sticky labels or masking tape
- Textas

Lesson steps

Part 1

Ask students if they know where water comes from. They may answer with ideas such as taps, waterholes, bores, etc. Ask them to think about how it gets into the waterholes, rivers, lakes, rainwater tanks, etc.

What do students know about the water cycle?

Explain that all the water on Earth is the only water we have ever had. We do not get any new water, it just cycles around and around in what is known as the 'water cycle'.

Show the **'Water cycle animation'** on the interactive whiteboard. This animated version brings the cycle to life, but should be viewed in conjunction with **'The water cycle explained'** fact sheet as this explains the cycle in more detail.

To further explore the cycle, select a book or video (listed in 'Resources') that demonstrates/explains it and read or watch it as a class. From the listed videos, select the ones that are relevant/appropriate to your class.

Discuss the cycle, focusing on the correct terms for each part. Add these terms to a word wall (you may have started one already in Topic 1).

If the day is cloudy, take the students outside to look at the clouds and discuss their role in the cycle.

As a class (or in pairs if appropriate) make your own mini water cycle. The instructions and resources required for this are available on the **'Mini water cycle'** activity sheet. There is space for students to record their predictions about what they think will happen to the water.

This experiment will show how water evaporates (students will see the water level lower slightly). Condensation will appear on the plastic wrap and then fall back into the bowl and mug (precipitation).

If possible, this activity should be conducted in a sunny, outside area as this will make the process quicker and more obvious.

Once students have finished the activity, ask them to complete the **'Water cycle puzzle'** activity sheet to demonstrate their understanding of the cycle.

There are two levels of this sheet. Select the one that is suitable for your students.

Part 2

Display the world map or globe so all students can see it. Ask students to look at the map/globe and decide how much of the Earth's surface they think is covered with water (it is around 71 percent).

Where do we find water on the Earth's surface (e.g. in lakes, rivers, dams, oceans, glaciers, ice caps, soil)?

Let students find the oceans, rivers and lakes on the map/globe. Google Earth is also a great resource to show the Earth's surface.

Place the three plastic containers on a table. Explain to students that water takes three forms on Earth. Do they know what they are?

Using sticky labels or masking tape, label one container as 'salt water', one as 'ice' (fresh water) and one as 'fresh water'. The only form that is really useable for humans (for drinking, irrigation, etc.) is fresh water.

Show students the one litre of water and explain that this represents all the water on the Earth. Ask students to have a go at pouring this water into the various containers to show how much of each form they think we have (for example, they may pour half the water into the fresh water container and a quarter each into ice and salt water).

You may wish to mark students' guesses on each container with a piece of masking tape or using a texta.

Once students have finished guessing, show them the actual result:

- Salt water (97%) – pour 970 mls of water into that container
- Ice (2%) – pour 20 mls of water into that container
- Fresh water (1%) – just 10 mls of water is poured into that container

This demonstrates that 97 percent of the Earth's water is salt water and is not suitable for drinking or most types of irrigation; and three percent is fresh water, but 2 percent of that is frozen (or in the soil) and therefore inaccessible.

Discuss students' reactions to this:

- Are your students surprised?
- What do they think this means for the way we use water?
- How can we survive on such a small amount of water?
- What sort of water is available in your community?