

# What's happening to the Chao Phraya?

For students aged 14+

## Introduction

The Water Warrior Toolkit takes students on a journey of discovery about our most vital natural resource. They find out how scarce and threatened water resources are, inspiring them to conserve water and develop a sense of empathy for people around the world who live in areas of water scarcity.

In this learning activity, students use data sources including maps and film, to learn about water scarcity, explore how toxic pollution contributes to it, build empathy with communities in Thailand living with polluted water, and think about the future for our global fresh water supplies.

## Learning Objectives

- Examine water scarcity and the inequalities in access to fresh water.
- Find out what's happening in SE Asia where water is threatened by toxic chemicals.

- Build empathy with people who are affected by polluted water.
- Think about the future for fresh water and why it will need to be conserved carefully

## Key Questions

- What are water stress and water scarcity?
- What is it like to live in an area where water is polluted?
- What effects can toxic pollution have on people?
- How might water scarcity patterns change in the future?
- What needs to change to avoid water scarcity, and who can take action?

## Learning Links

- Students can ask **geographical** questions, use geographical vocabulary and interpret secondary data sources, focusing on the core theme of water.

- Students build their knowledge of **environmental** change and sustainability through learning about a locality different to where they live, at a global scale.
- Students learn how the way resources can be allocated affects individuals, communities and the **sustainability** of the environment, and express opinions about this.
- Students build their understanding of our global **interdependence** and acknowledge the roles that individuals, government and corporations can have in preserving natural resources.

**Activity lasts about 50-70 minutes, with an activity for home.**

### Preparation

Students may need paper and coloured pens.

- Print and cut up the **What's happening to the water? – key facts** sheet.
- Prepare two maps – one showing current water availability and the other predicted water scarcity in 2025.

Existing examples online are listed below.

- Prepare the **Thailand PowerPoint** (if using).
- Cut out a set of **Suwimon's Mystery Cards** for each group of 4-6 students.
- Prepare the **Water pollution in the Chao Phraya film**.
- Copy the **Water pollution in the Chao Phraya film Quiz** for each student.

### Starter (10-15 minutes)

Ask for eight volunteers to come to help demonstrate the fact that 1 in 8 people in the world doesn't have access to safe water. How could they show this physically? One could sit down or do another action in a freeze frame to demonstrate the fact to the rest of the class.

If students have already completed some of the other Learning Activities in the Water Warrior Toolkit they will already have thought about what it would be like not to have a safe supply of water through the tap – if not, ask them:

- How important do they think water is?
- What parts of their life would a lack of water affect?
- What might life be like for people around the world who don't have safe water?

- Where do students think they might live?

Split students into groups of 4-6 and give each group a key fact from the **What's happening to the water? – key facts** sheet. Students spend a few minutes discussing and rehearsing a way to demonstrate their fact to the class through a freeze frame or short mime. They could use paper and coloured pens to help but should try to show their fact without speaking or writing. Groups share their performance and the class tries to interpret their fact. You could take photos of the students in their freeze frame and display them.

You could ask students to draw conclusions from the facts.

- What might be some of the reasons why water-borne diseases are so common?
- Who is responsible for polluting water?
- Why might fresh water become scarcer in the future?

### Main activity (30-40 minutes)

If students have already done some of the other Learning Activities in the Water Warrior Toolkit they will already understand some of the conflicts of interest that can arise over water. If not, explain to students that in some parts of the world, there isn't enough clean, fresh water for people, agriculture and industry. This can lead to *water scarcity*.

Use a **map** to show students current global patterns in water availability. The one at <http://maps.grida.no/go/graphic/freshwater-availability-groundwater-and-river-flow> is a good example.

Ask students to identify patterns in the availability of fresh water. Try to focus on patterns other than based on rainfall, e.g. economic development, population pressure, pollution.

- Which regions of the world have the most and the least fresh water available?
- Do these regions correspond with regions that students know have high or low rainfall?
- Are there any other patterns other than climatic ones?
- What might explain other patterns?

You could ask students to explain the situation in some countries that don't seem to fit into a pattern:

- The UK gets more rain than Australia and almost everyone in both countries has access to piped water and sewage systems. Why is there more scarcity in the UK than Australia?
- Some of the world's biggest rivers flow through China or India. Why is fresh water scarce there?
- Why are some islands in the Caribbean experiencing more scarcity than others?

Tell students that in some regions, even though there's plenty of water for everyone's needs, safe fresh water can still be scarce. *There are two types of scarcity – 'physical' and 'economic'.* Economic scarcity means that there is enough water, but either people can't reach it – for instance if there isn't any money to build wells - or it's not safe for people to drink – usually because it's been polluted. One place where this happens is Thailand. You could introduce students to Thailand with the **Thailand PowerPoint**.

Students then work in groups to solve a mystery about Suwimon. They sort through the sets of **Suwimon's Mystery Clues**, discussing and sorting which clues they think can help them answer the mystery question, "*Why doesn't Suwimon like swimming any more?*" Groups then share their answer and how they worked it out with the rest of the class.

Students watch the **Water pollution in the Chao Phraya film** to see whether their answers were correct. Watch the film one more time and get students to fill in the answers to the **Water pollution in the Chao Phraya film Quiz**.

#### Quiz answers

1. Because it comes from a textile factory.
2. Smelly toxic fumes come in to her house, the air pollution makes her skin itchy, she gets flu-like symptoms, she often finds it difficult to breathe, gets a rash from the canal water.
3. It was clean, but it has changed since the factories were built.
4. Because of the harmful chemicals in it.
5. There are only half as many fish, the water is black, there are white bubbles and dead fish in it.
6. It takes no responsibility for the pollution - she's complained but no one takes any notice

#### Plenary (10-15 minutes)

Recap with students that Thailand is one country where even though there is enough water for everyone's needs, many communities have the same difficulties as Suwimon and Ms Lee. In the future, problems with fresh water are likely to get worse. Can students think of any reasons for this? They may come up with rising population, climate change, more industry or others.

An important part of the problem is that once harmful chemicals get into our water, they don't break down. They can stay there for thousands of years – more chemicals keep on being added. Marine animals eat the chemicals, and they can rise up the food chain. This is called *bioaccumulation*. Bioaccumulation is the reason we can end up eating harmful chemicals, as we eat the fish and animals that eat chemicals. Do students think bioaccumulation is a global or a local problem?

Show students a **map** of predicted water scarcity in 2025 and compare it with the map showing current patterns of availability. A good example is at <http://www.waternunc.com/gb/map2025.htm> or <http://maps.grida.no/go/graphic/water-supply-per-river-basin-in-1995-and-2025>

- Can students remember the fact about 2025 from the beginning of the lesson?
- What are the main differences now and in the future?
- Which regions are likely to have less water in the future?
- Can students think of any reasons why this prediction might not come true?
- What could be changed to improve the situation?
- Who can take action to improve the situation?

#### Home task

Students could:

- Imagine they are Suwimon and write a diary entry, focusing on what she has done during the day and reflecting about her hopes for the river she lives on.

## What's happening to the water? – key facts

<p>Every 20 seconds, a child dies from a water-related disease.</p>	<p>At any given time, half of the world's hospital beds are occupied by patients suffering from a water-related disease.</p>
<p>In developing countries, 70 percent of industrial wastes are dumped untreated into waters where they pollute the usable water supply.</p>	<p>It is estimated that by 2025, one in 3 people around the world will be living in areas where there are water shortages.</p>
<p>It takes 10 litres of water to make one sheet of paper, and 2,700 litres of water to make a shirt.</p>	<p>More than 20% of the world's 10,000 freshwater species have become extinct, threatened or endangered since 1970.</p>

## Suwimon's Mystery Cards

Why doesn't Suwimon like swimming any more?

Suwimon lives right by the Sam Rong canal.	Suwimon helps her mum before going to school.	The canal where Suwimon lives used to be surrounded by rice fields so it was a good place for fish to lay their eggs.
Suwimon used to swim all the time in the canal by her house.	After school, Suwimon helps the family earn money by selling fish in the market.	Wastewater pipes from factories along the canal are often hidden behind bushes or under the water.
The amount of fish in the canal where Suwimon lives has gone down recently.	Suwimon and her family bathe in the canal.	Suwimon is aged 13 and in Grade seven at school.
Suwimon's dad is a fisherman.	Sam Rong canal connects two very important rivers in Thailand, the Tha-Chin River and the Chao Phraya River.	Suwimon used to enjoy swimming and hopes that she'll be able to in the future.
Suwimon's family earns about half what they used to.	There are textile, steel and food processing factories along the Sam Rong canal.	People in Suwimon's community have complained about the factories hiding their wastewater pipes but no one takes any notice.
Making clothes, cars and paper involves a lot of chemicals, some of which can be really toxic and make people ill if they come into contact with them.	Suwimon's mum dries the fish that Suwimon's dad catches by putting it out in the sun.	Suwimon's family live in a wooden house which sits on stilts in the water.

Water pollution in the Chao Phraya film Quiz 14+

1. Why do you think the water that comes out of the factory near Ms Lee's house is multicoloured?
2. Ms Lee is affected in lots of ways by the factory. How many can you list?
3. What does Suwimon say about the canal water in the past? And why has it changed?
4. Why do you think Suwimon says she feels 'allergic' when she bathes in the canal?
5. According to Suwimon the water in the canal has changed in several ways since the factories were built. How many can you list?
6. What does Ms Lee think about the factory? And what makes her think this?