

The global impacts of how we use water

Student's Workbook



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Overview

Water is essential for sustaining the natural world and human life and activities. Ireland is fortunate to enjoy a temperate climate that buffers us from the impacts of extreme droughts and floods that other parts of the world regularly experience. However, climate change is beginning to alter this. The quality of water in our rivers and lakes has been changing for the worse, because of human impacts. This means that our rivers and lakes cannot sustain the rich variety of life they once did, and we can no longer assume an unlimited clean water supply for human use.

The purpose of this module is to enable students develop their understanding and knowledge of water availability and how water is used. It supports students and teachers to investigate the water resources, the water cycle, and how people can practice water conservation. It will allow students to discover their impact on water resources locally and globally how they can change their own habits to limit water pollution and save freshwater. The Sustainable Development Goals aim to make sure every human has access to safe drinking water and sanitation services. These will be explored as well as the complexity of achieving Sustainable Development.

**Water is essential for all nature,
economic development and human
social well-being.**



Lesson 1

Water is essential for all life and global water supply

In this lesson you will explore how we use water and how much freshwater is available globally.

Task 1.1 - Introduction - How do we use water?

After your classroom discussion is complete, list how water is used:

At home

At school

In the community

In agriculture

In industry

Task 1.2 - Freshwater v Saltwater

1. During your teacher's presentation write down the percentages of the following:

Saltwater

Freshwater

Total Freshwater subdivided into different stores

Ground ice & permafrost

Swamps, marshes & bogs

Atmosphere

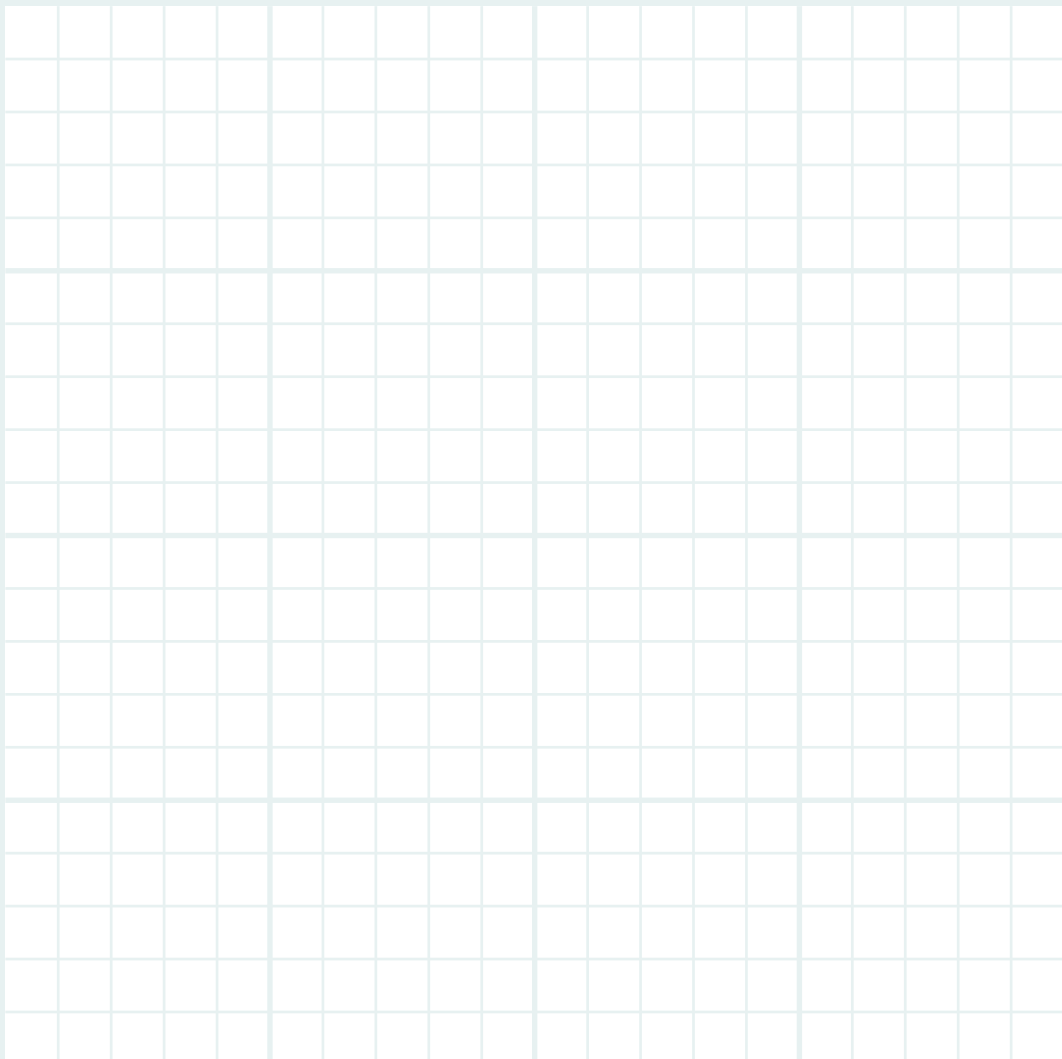
Soil moisture

Living things

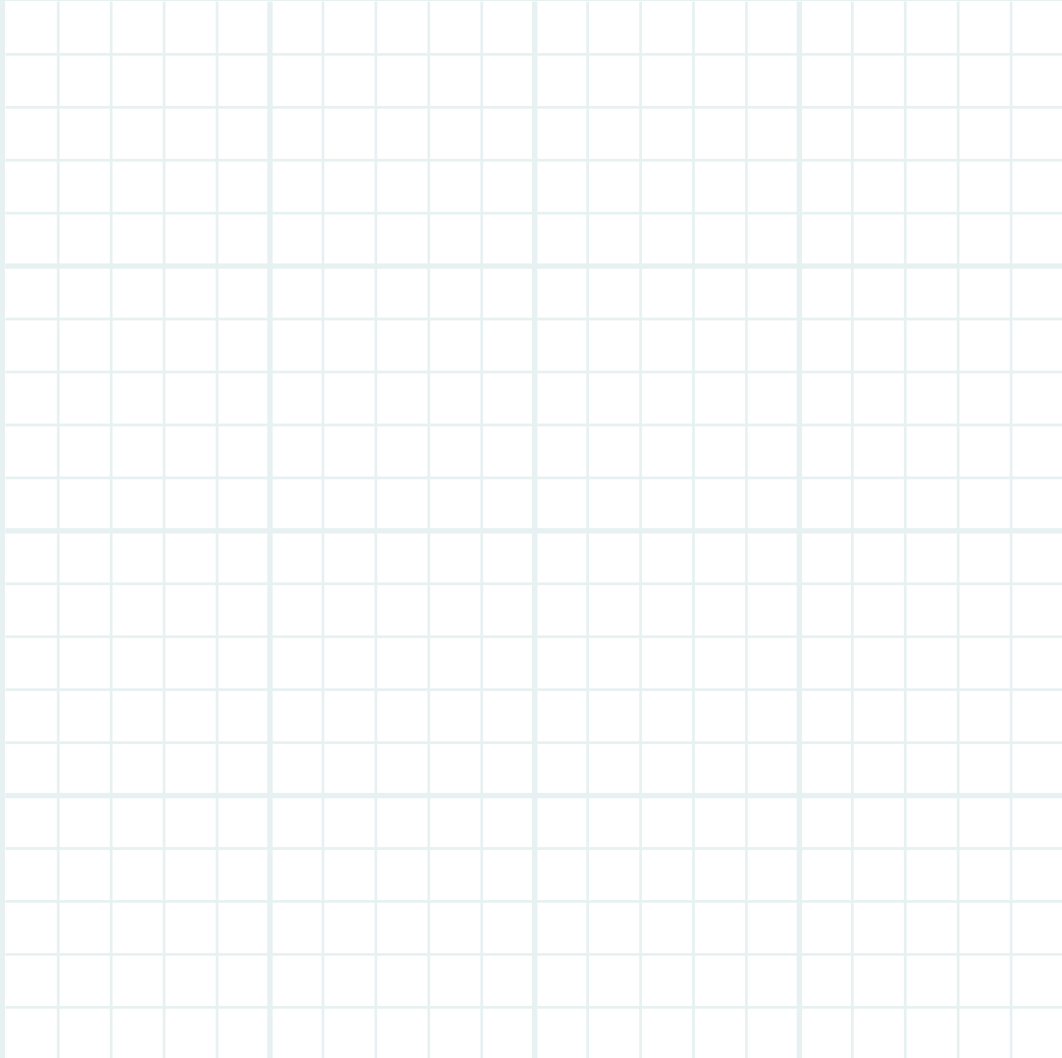
Rivers

Lakes

2. Using the grid below, draw a bar chart to show the proportion of freshwater versus saltwater available to all life on earth.




3. Draw a column around ten squares stacked vertically to represent all the freshwater on earth, using the values from the table above (pg3), subdivide the squares to show the proportion of the different freshwater stores and label each section.



Task 1.3 - If you did not have enough water?

Write down how you would feel if you did not have enough water.

A large, empty rectangular box with a light blue border, intended for the student to write their response to the task. The box is currently blank.

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Task 1.4 - Do you think you have role to play in water conservation?

Write your thoughts below.

If you haven't had time in class to watch the "Water Matters at Home" video, here is the link

<https://www.youtube.com/watch?v=Vu-QNR6Zp1s> - or search [Water Matters at Home - An Fóram Uisce \(thewaterforum.ie\)](#), Education Resources.

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Lesson 2

Water cycle

The water that was around before dinosaurs is the same water we have now. Water is naturally recycled on Earth. It is constantly cycling between different states of **liquid, gas/vapour & solid/frozen** for over 4 billion years, i.e. the Water Cycle or Hydrological Cycle.

Task 2.1 - The water cycle

Draw a labelled water cycle diagram showing the following features and processes.

Sea

Land

Freshwater

Groundwater


Evaporation

Condensation

Transpiration

Precipitation

Infiltration / Percolation



Lesson 3

Water footprint

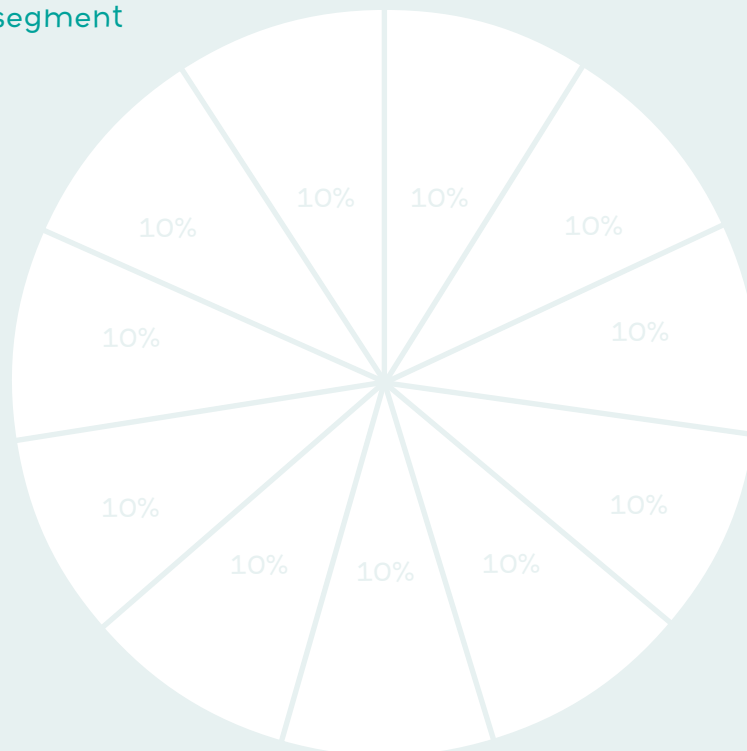
In this lesson you will learn about freshwater use, water footprints and real and virtual water. You will use water calculators.

Task 3.1 - How much freshwater is used by different sectors

Watch <https://www.youtube.com/watch?v=b1f-G6v3voA&t=37s> in class or at home and complete the following activities.

3.1a Divide and label this pie chart to represent the percentage of freshwater used by different sectors.

As a guide each segment represents 10%



Agriculture

Industry

Domestic use

3.1b What do you understand by these terms?

Green water

Blue water

Task 3.2 - Understanding Real and Virtual

What do you understand by these terms?

Real / Direct / Visible water

Virtual / Indirect / Invisible water

Task 3.3 - Calculating the water footprint of products

The Water Footprint Network has created a range of interactive tools to show how much green, blue and grey water is used to produce different products.

Using the Water Footprint calculator: <https://waterfootprint.org/en/resources/interactive-tools/product-gallery/> calculate the footprint of foods you eat.

Task 3.4 - Calculating how much water a family consumes weekly

3.4a Go to: <https://www.water.ie/conservation/home/water-conservation-calculator/> and calculate your home water consumption by answering the 15 online questions.

3.4b Once you have calculated your water footprint, scroll down and make a few notes from your online report.

Where are you saving the most water - Kitchen / Bathroom / Out in the garden?

What is the national average for a household similar to your family?

What is your family's usage?

Where and how could you save/conserve more water at home?



Lesson 4

Sustainable Development Goals and water

‘Sustainable’ development uses resources to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations.

In the lesson you will learn about what sustainable development means and the goals that have been set by the United Nations for all nations to aim for and what our responsibilities are as Irish people and Europeans.



SDG 6 Clean water and sanitation is broken down into subsections and by 2030 the United Nations wants to:

- 6.1** Achieve universal and equitable access to safe and affordable drinking water for all.
- 6.2** Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.
- 6.3** Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
- 6.4** Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.
- 6.5** Implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.
- 6.6** Protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

Q. Once you have calculated your water footprint, scroll down and make a few notes from your online report.



Task 4.1 - Can you name potential SDG 6 conflicts, and how would you resolve them?

All development uses resources of one type or another, i.e. water, land, raw materials and labour. However, even within sustainable development goals, because they are so wide-ranging and inter-connected, some conflicts arise.

For example:

To make our rivers clean again (SDG 6 & 15) would require us to reduce nutrient pollution from agriculture ...

... but that would mean that farmers would have to cut back on production, thus reducing economic growth in farming (SDG 8).

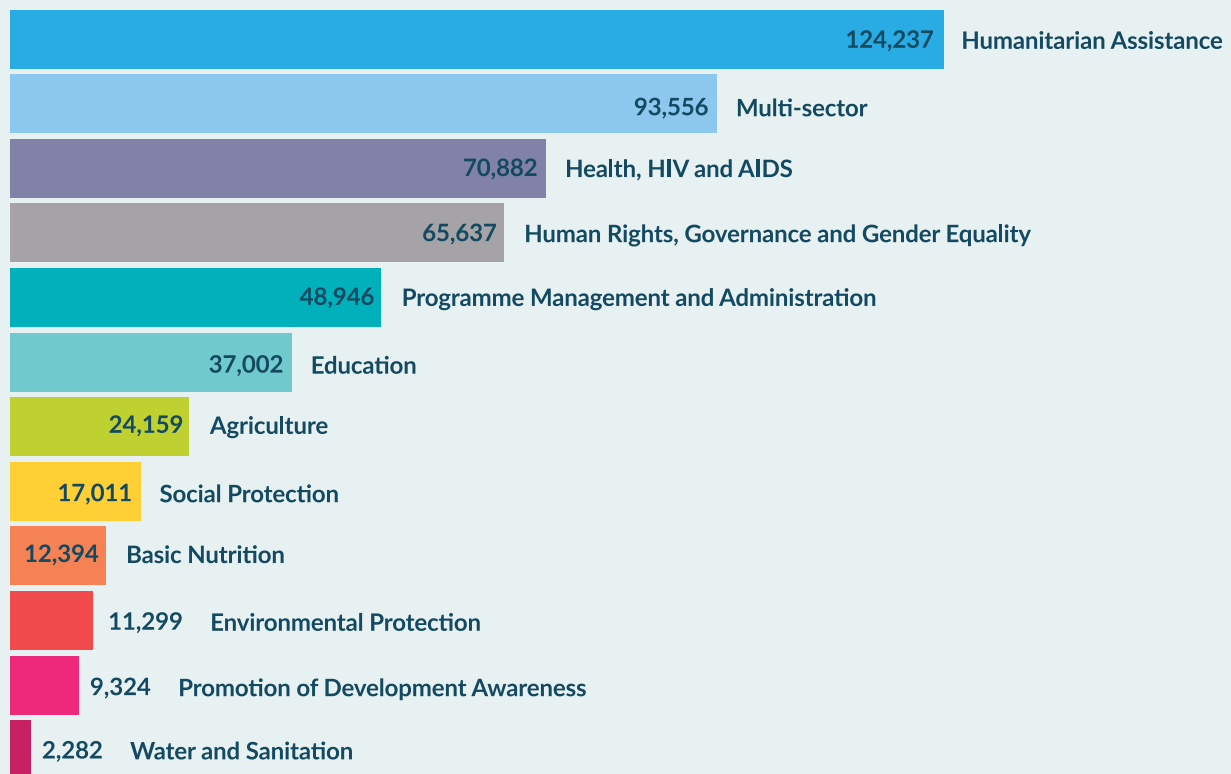
Q. Can you name other potential conflicts, and how would you resolve them?



Task 4.2 - Ireland's financial contribution to achieving the Global SDGs

In 2021, Ireland's Official Development Assistance (ODA) Budget allocation to different sectors was ~€516,729,000 (~1/2 billion). €2,282,000 was for Water & Sanitation.

Bilateral ODA by Sector €000's



Source: https://www.irishaid.ie/media/irishaid/IrishAid_AR_2021_WEB_V5-FA.pdf

In class, discuss Ireland's financial contribution to achieving the Global SDGs.

Q. Consider and discuss how the funding is allocated.

Q. Do you think the balance is right?

Lesson 5

Sustainable Development and Consumerism

Sustainable development allows for the satisfaction of human necessities without compromising the basis of that development, which is the environment.

There are three principles underlying sustainable development:



Task 5.1 - Discussion on the challenges of achieving sustainable development

Environmental Quality Humans are part of the natural world and are not distinct or apart from it.

- *Do you think nature should have equal rights to humans? Write down some key points.*

Social Justice / Fairness 20% of the world's population use around 80% of the world's resources.

- *Do you think this is fair or just? Write down key considerations.*

Economic Security / Prosperity Economic development and growth is needed in developing countries.

- *How can this be achieved when we are already beyond planetary boundaries? Write down key points.*

Task 5.2 - Reducing consumption - organise a class debate or information campaign on 'should we boycott fast fashion?'

In our modern lives we consume a lot more resources than previous generations. Many people are not willing to give up or reduce their creature comforts, change their diets, heating their homes or travelling less.

If we take the example of Fast Fashion, do you think your class should boycott fast fashion brands?



Source: CHEC, Commonwealth Human Ecology Council, 2022

Task 5.3 - Reducing consumption - class debate "should we eat meat"?

Q. Would you consider reducing your meat intake for environmental sustainability reasons?

1. If no, why?

2. If yes, why?

Class debate: In a climate emergency we should all stop eating meat.



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