








Water: the source of life

-  10-14
-  10 x 50-60 min.
-  board/flip chart; copies of exercises;
-  This module explores the relationship between people and water, the right to water and the availability of water around the world.
-  **Social Studies/Civic Education** **Geography** **Biology** **Ethics/values education**



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Introduction

Background information and didactical perspective

Water is essential to life. It is the birthplace of life, and life without water is not possible. Water covers three quarters of the Earth's surface; it makes up a large proportion of all living organisms. Because water is everywhere, it could seem as if it is infinite. In reality, however, water is a limited resource; how we use and manage water has an impact on people and on all other living beings on the planet.

This module combines the approaches of 'philosophy for children' and 'global learning' to research the use, misuse, availability and pollution of water from various different points of view. The exercises encourage us to reflect on our own consumption of water and that of humanity as a whole and on the relationship between the causes and effects of water pollution; they are also intended to support pupils in researching topics such as the availability of water to children around the world and the water footprint of everyday items.

This module includes 10 lessons. You can work through the module as a whole, select only "global learning" lessons (the first two lessons) or only "philosophy for children" lessons or you might decide to pick only specific topics and lessons that are important to your class.

Learning outcomes

Competencies

- Communication skills: formulating arguments and sharing them within a group, dialog
- Social skills: Ability to switch perspectives, developing empathy
- Forming judgements and opinions that draw on sound evidence
- Acquiring knowledge about global interconnections
- Critical thinking, creative thinking

Topics / National curriculum

Water, water pollution, fishing, human rights, use and stewardship of resources and commodities, production of goods, life and economic activity on earth, sustainability, consumption, understanding and critical thinking in relation to water

Lesson plan

Abbreviations:

A = Activity

D = Discussion

GW = Group work

IW = Individual work

HW = Homework

PW = Partnerwork

PTS = Previous Teacher's Study

PO = Pupils opinions

PP = Pupil's presentations

TP = Teacher's presentation

Lesson No 1 : Water lottery

Phase	Content	Media, Material
Introduction (10 min.) TP	Preparation <ul style="list-style-type: none"> • Prepare/provide the following: Bucket/bowl of water, numbered pebbles/small stones (1- 28), large Peters world map, Post-It notes. • Print out M2 (Water stories) and M3 (Exercise 'A step ahead'). Execution <ul style="list-style-type: none"> • The teacher gives a short introduction to the topic of access to water/the human right to water. 	M1 Water: a human right
Activity (5 min.) TP	<ul style="list-style-type: none"> • The teacher places a bowl or bucket of water in the centre of the circle in which the pupils are sitting. As well as the water, the bowl or bucket contains pebbles/small stones labelled with the numbers 1 to 28. The teacher explains that whether people's access to water is good or poor is a twist of fate – a lottery – and that the class is now going to recreate a 'water lottery', each drawing out a number corresponding to the story of a young person from another country. Each pupil takes a small stone out of the water. They then find the 'water story' that corresponds to the number on their stone. (These stories are in a pile next to the bowl or bucket). Note <p><i>It is important to explain that the 'water stories' are fictitious accounts created especially for this exercise. Their intent is to cover a range of water-related topics and exemplify possible real-life situations in various countries. Teachers should also emphasise that pupils should avoid reading these fictional stories as descriptions of how all people in the country in question live; people's circumstances will vary.</i></p>	M2 Water stories
Work phase (10 min.) A	<ul style="list-style-type: none"> • All pupils now read silently through their 'water story', asking the teacher for help with anything they do not understand. Pupils write the names of the child/young person from their story on a Post-It note, find the young person's home country on the world map and stick the Post-It on that country. 	M2 Water stories
Group work (15 min.) GW	<ul style="list-style-type: none"> • In groups of 3, pupils share information about their 'water stories', using the following points/questions as prompts (the teacher will have written these on the board): <ul style="list-style-type: none"> ◦ Tell the other members of the group something about your young person. ◦ Where does the young person come from? Who do they live with? Where do they get their drinking water and water for washing, brushing teeth, doing laundry, or cleaning? ◦ Are there any notable similarities or differences among your stories? What are they? 	M2 Water stories

Activity
(20 min.)

A

- This activity requires a generous amount of physical space; teachers may choose to conduct it outside in the schoolyard.
 - Pupils line up alongside one another.
 - The teacher now reads out a list of statements about water (**M3**). Pupils take a step forward if the statement applies to the young person from their 'water story' (i.e. the young person would be able to respond to the statement with 'yes'). If the statement does not apply to 'their' young person, the pupil stays where they are.
 - If the information needed to answer the question is not available from the story, pupils should make assumptions from what the story has told them about the young person, their circumstances and their community.

M3
Exercise: A step
ahead

Reflection
(20 min.)

D PO

- Questions the teacher can ask:
 - How many steps forward could you take? Could some of you briefly describe why you are standing where you are in comparison to the others? How do you feel about your position?
 - What are the reasons for injustice in access to clean, safe water? What threats are there to people's water supply in your story (economic interests, climate change, pollution, etc.)?
 - If you made assumptions about your young person's access to water, what images did you have in your mind? Where did these images come from? Would other assumptions have been possible?
- To visualize the reasons for unfair water distribution, you can create a mind map together.

Lesson No 2 : Virtual water

Phase	Content	Media, Material
Activity (15 min.) A	<p>Preparation</p> <ul style="list-style-type: none"> Print out M4 for each group of 4. Print out M6 (pictures of foodstuffs and 'bathtubs' for every group; a different recipe and the list of ingredients for each group). <p>Execution</p> <ul style="list-style-type: none"> How many baths? How much water is hidden in our food? Pupils get together in small groups of about four. Each group is given the same two sets of pictures: pictures of nine different foods and nine corresponding pictures with bathtub symbols to illustrate the amount of water needed to make them. How much water is needed to make each of these foods? Each group arranges the pictures in accordance with the amount of water they think is needed to make one kilogram of the food. They do this by placing the pictures in order, starting with the food that they consider uses the smallest amount of water and ending with the one they think needs the most water. Guided by the teacher, the groups compare their results with one another and adjust them if required, in accordance with the solution to the exercise in M3. 	M4 How many baths?
Input (10 min.) TP	<ul style="list-style-type: none"> The teacher gives a brief overview of what 'virtual water' means, covering: <ul style="list-style-type: none"> green, blue and grey water regional differences in water footprints virtual water of plant products versus animal products virtual water in other products The class may watch a video on 'How much water do we use every day?' (2:12). 	M5 Background information: Water footprints/virtual water
Work phase (20 min.) GW	<ul style="list-style-type: none"> Calculating the water footprint of popular dishes: <ul style="list-style-type: none"> Pupils now calculate the water footprint of some of their favourite meals. They again work in small groups. Each group is given a recipe for a dish and a table showing the virtual water consumption of the various ingredients. Now the groups have to work out the water footprint of their meal. They do this by converting the amount of virtual water per kilogram of each foodstuff included in the recipe to the amount of virtual water in the quantity of the foodstuff needed to make the dish. They then add up the virtual water in each ingredient to calculate the total water footprint of the dish (see M6 for solutions). 	M6 Recipes
Presentation (10 min.) PP	<ul style="list-style-type: none"> Pupils share their results from the work phase with the class. 	

Reflection

(15 min.)

D PO

- Pupils share and discuss the personal conclusions they have drawn from working out the water footprint of popular meals.
- Pupils collect ideas about how they could take action to reduce their own water footprint in their day-to-day lives (there are two aspects to this: 1. reducing virtual water consumption and thinking more carefully about virtual water in the products they use; 2. reducing their direct household water consumption).
- The teacher and pupils create a mind map for the topic on the board.

Lesson No 3 : Water is essential for life

Phase	Content	Media, Material
Introduction (5 min.) PTS TP	<p>Previous activity</p> <ul style="list-style-type: none">The teacher studies previously M7 (Leading Idea “Water is essential for life”) in order to stimulate students’ reflection connected to the exercise. <p>Preparation</p> <ul style="list-style-type: none">Prepare a circle of chairsPrepare a flip chartHand out a copy of each exercise to each student <p>Execution</p> <ul style="list-style-type: none">The teacher hands out a copy of the exercise M8 to each pupil and introduces the subject asking students to consider each of the judgements contained in the exercise M8 and to think if they are referred to causes or to reasons. While the pupils are engaged in the work phase, the teacher writes the information about the activity contained in M8 on the flip chart to stimulate the following discussion.	<p>M7 Leading Idea “Water is essential for life”</p> <p>M8 Exercise “Distinguishing causes and reasons”</p>
Work phase (10 min.) PO	<ul style="list-style-type: none">The students think individually about the judgements in M8 giving reasons for each of them.	
Discussion (40 min.) D	<ul style="list-style-type: none">The teacher stimulates the discussion among students about the judgments contained in M8. The judgments should create philosophical dialogue and the teacher as facilitator should ask for good reasons to facilitate critical thinking about the relations between the parts and the whole.	

Lesson No 4 : How to change water waste behaviours

Phase	Content	Media, Material
Introduction (5 min.) PTS TP	Previous activity <ul style="list-style-type: none">The teacher studies previously M7 (Leading idea “Water is essential for life”). Preparation <ul style="list-style-type: none">Prepare a circle of chairs Execution <ul style="list-style-type: none">The teacher asks the students to interview their family members to investigate how they are committed to modifying behaviours related to wasting water M9.	M7 Leading Idea “Water is essential for life” M9 Activity “Interview your family”
Homework HW	<ul style="list-style-type: none">Each student interviews their family members on the basis of the indications contained in the activity M9.	M9 Activity “Interview your family”
Work phase (20 min.) PP	<ul style="list-style-type: none">Students research for information about behaviours, attitudes, and activities regarding the subject of the interviews.	
Discussion (15 min.) D	<ul style="list-style-type: none">The teacher invites the pupils to discuss about what behaviours, attitudes and activities they implement to avoid wasting water.	
Work phase (15 min.) GW	<ul style="list-style-type: none">At the end of the discussion, the teacher invites the students to draw up a list of the best behaviours, attitudes and activities to implement to avoid wasting water.	

Lesson No 5 : Describe the water

Phase	Content	Media, Material
Introduction (5 min.) PTS TP	<p>Previous activity</p> <ul style="list-style-type: none">The teacher studies previously M7 (Leading idea “Water is essential for life”). <p>Preparation</p> <ul style="list-style-type: none">Prepare a circle of chairsHand out a copy of each exercise to each student <p>Execution</p> <ul style="list-style-type: none">The teacher distributes photocopies of the discussion plan M10 to each student and encourages them to reflect.	<p>M7 Leading Idea “Water is essential for life”</p> <p>M10 Discussion plan “How to describe the water?”</p>
Discussion (50 min.) D	<ul style="list-style-type: none">The teacher invites students to share their thoughts, discuss and reflect together.	

Lesson No 6 : Water, a good in danger

Phase	Content	Media, Material
Introduction (5 min.) PTS TP	<p>Previous activity</p> <ul style="list-style-type: none">The teacher studies M11 (Leading idea “Water, a good in danger”). <p>Preparation</p> <ul style="list-style-type: none">Prepare a circle of chairsHand out a copy of each exercise to each student <p>Execution</p> <ul style="list-style-type: none">The teacher hands out a copy of the exercise M12 to each pupil asking them to read the introduction of the exercise.	<p>M11 Leading Idea “Water, a good in danger”</p> <p>M12 Exercise “Working with means-ends relationships”</p>
Work phase (15 min.) PO	<ul style="list-style-type: none">Students work individually to analyse the cases in the exercise M12 and indicate which is mean and which is the end. Then they consider if the mean is appropriate to get the end and give reasons for their ideas.	
Discussion (40 min.) D	<ul style="list-style-type: none">The teacher invites students to share with classmates their own explanations of the word “understanding” and to see which of the sentences, contained in the exercise M12, introduce the moral dimension, and which refer only to the explanation.	
Homework GW	<ul style="list-style-type: none">Students in groups should gather information from the City Council of their city on what means they promote to avoid water pollution and to save water. Then they have to present it in class.	<p>M12 Exercise “Working with means-ends relationships”</p>

Lesson No 7 : Saving water

Phase	Content	Media, Material
Introduction (5 min.) PTS TP	Previous activity <ul style="list-style-type: none">The teacher studies M13 (Leading idea "Saving water"). Preparation <ul style="list-style-type: none">Prepare a circle of chairsHand out a copy of each exercise to each student Execution <ul style="list-style-type: none">The teacher divides the class in small groups and hands out a copy of the exercise "Estimating consequences" M14 and asking them to read the introduction of the exercise.	M13 Leading Idea "Saving water" M14 Exercise "Estimating consequences"
Work phase (20 min.) GW	<ul style="list-style-type: none">Every group completes the exercise M14 inserting the data that are missing in the statements.	
Work phase (15 min.) GW	<ul style="list-style-type: none">The teacher invites the groups to find what other means exist to reduce the excessive consume of water and to compare their research with their classmates to reflect all together on the questions contained in exercise M15.	M15 Exercise/Activity "How the reduce the excessive consume of water"
Discussion (20 min.) GW	<ul style="list-style-type: none">The teacher invites the groups to discuss together about their opinions emerged from the exercise M15 and encourage them to give good reasons.	M15 Exercise/Activity "How the reduce the excessive consume of water"

Lesson No 8 : The rain

Phase	Content	Media, Material
Introduction (10 min.) PTS TP	<p>Previous activity</p> <ul style="list-style-type: none">The teacher studies previously M16 (Leading idea “The rain”). <p>Preparation</p> <ul style="list-style-type: none">Prepare a circle of chairsHand out a copy of each exercise to each student <p>Execution</p> <ul style="list-style-type: none">The teacher hands out a copy of activity contained in M17 to each pupil. Then S/he introduces the subject asking students to read the indications contained in the copy of the M17.	<p>M16 Leading idea “The rain”</p> <p>M17 Exercise “Detecting cause and effects relationships”</p>
Work phase (20 min.) A	<ul style="list-style-type: none">Each pupil completes the activity M17 writing the word CAUSE or EFFECT in relation to the water cycle.	<p>M17 Exercise “Detecting cause and effects relationships”</p>
Discussion (25 min.) D	<ul style="list-style-type: none">The teacher stimulates the discussion among pupils about the activity contained in M17 inviting them to discuss with classmates the issues that they think are more relevant. Students do not need to answer all of them. The questions should create a philosophical dialogue and the teacher should always ask for the reasoning behind students’ answers (not allowing “yes” or “no” answers) to facilitate a critical thinking about cause and effects relationships linked to the water cycle.	

Lesson No 9 : Kinds and degrees of the rain

Phase	Content	Media, Material
Introduction (10 min.) PTS TP	<p>Previous activity</p> <ul style="list-style-type: none"> The teacher studies previously M16 (Leading idea "The rain"). <p>Preparation</p> <ul style="list-style-type: none"> Prepare a circle of chairs Hand out a copy of each exercise to each student <p>Execution</p> <ul style="list-style-type: none"> The teacher hands out a copy of the exercise to each pupil. They build pairs and the teacher introduces the subject asking students to read the instructions for the exercise M18 ("Classifying: kinds and degrees"). 	<p>M16 Leading idea "The rain"</p> <p>M18 Exercise "Classifying: kinds and degrees"</p>
Work phase (45 min.) PW	<ul style="list-style-type: none"> Each pair works for indicate what kind of differences has been taken into account in the exercise M18. 	<p>M18 Exercise "Classifying: kinds and degrees"</p>
Work phase PW	<ul style="list-style-type: none"> After doing the previous exercise, the teacher asking them about the difference between rain and acid rain, as indicated in the exercise M19 ("Rain and acid rain"). 	<p>M19 Exercise "Rain and acid rain"</p>
Discussion D	<ul style="list-style-type: none"> The teacher stimulates the discussion on the base of the indications contained in the first part of the activity M19, inviting the students reflect all together on which are the consequences of acid rain for the subjects indicated in the exercise M19. 	<p>M19 Exercise "Rain and acid rain"</p>

Lesson No 10 : Fish

Phase	Content	Media, Material
Introduction PTS TP	<p>Previous activity</p> <ul style="list-style-type: none">The teacher studies previously M20 (Leading Idea "Fish"). <p>Preparation</p> <ul style="list-style-type: none">Prepare a circle of chairsHand out a copy of each exercise to each student <p>Execution</p> <ul style="list-style-type: none">The teacher hands out a copy of M21 to each pupil and introduces the subject asking them to read the introduction of the exercise.	<p>M20 Leading idea "Fish"</p> <p>M21 Exercise "Detecting ambiguities"</p>
Work phase (15 min.) PO	<ul style="list-style-type: none">The students work in groups discussing about meanings and make notes on M21 what meanings it has in each sentence contained in M21 and making notes about them.	<p>M21 Exercise "Detecting ambiguities"</p>
Work phase (40 min.) PO	<ul style="list-style-type: none">The teacher invites the pupils to reflect on the question contained in the exercise M22 ("What would happen if all the fish in the world die?") and ask them to share their opinions.	<p>M22 Exercise "What would happen if all the fish in the world die?"</p>
Homework HW	<ul style="list-style-type: none">The students have to think which behaviours, attitudes and activities can prevent all the fish from dying. They will present their reflections and discuss it in class together.	

M1 Water: a human right

Access to clean water is a human right.

On 28 July 2010, the United Nations General Assembly adopted, by a large majority, a resolution that recognised 'the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights'. The resolution stated that drinking water and sanitation should be safe, clean, accessible and affordable.

Source:

<https://www.ohchr.org/en/water-and-sanitation/about-water-and-sanitation>

When the UN's member states adopted the 2030 Agenda for Sustainable Development in 2015, access to water was one of the issues the global community set itself the objective of tackling: '[e]nsur[ing the] availability and sustainable management of water and sanitation for all' is the sixth of the UN's Sustainable Development Goals (SDGs).

Source:

<https://sdgs.un.org/goals/goal6>

Many people are still denied their human right to water.

Despite all political commitments, around two billion people worldwide still do not have regular access to clean water. About 771 million people do not even have a basic supply of clean drinking water. Climate change will further exacerbate this dramatic and unacceptable situation.

Proper sanitation is fundamental to hygiene, health and clean drinking water, and many people remain without access to it. About 494 million people do not even have basic toilet facilities, and consequently have to defecate in the open.

Source:

<https://www.unicef.de/informieren/aktuelles/blog/-/weltwassertag-2023-zehn-fakten-ueber-wasser/275338>

Share of income spent on water

In many countries of the Global South, people have to spend up to one-fifth (= up to 20 %) of their income on drinking water. As a comparison, people in Austria need less than 1 % of their income to pay for their water supply.

Changing lifestyles and demand for water

Humankind's demand for water has increased 35-fold in the last 300 years, and rose sixfold between 1930 and 2002 alone. There are many reasons for this. Alongside the growth in the world's population, people's lifestyles, particularly in the richer Global North, are a significant factor, as they entail much higher water consumption than in the past.

Source:

<https://www.bpb.de/kurz-knapp/zahlen-und-fakten/globalisierung/52730/wasserverbrauch/>

Especially in water-scarce countries, many products and foodstuffs require large amounts of water for their production. There is therefore a direct relationship between our patterns of consumption and the threat to – or continued denial of - the human right to water in other places.

M2 Water stories

Please note that the stories are fictitious and do not describe real people. They do give an idea of real-life conditions and situations that may occur in the countries in question; you should not assume, however, that they describe the lives and circumstances of all people in that country. Images are stock photographs.

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My name is **Leabua** and I live in **Lesotho**, in the south of Africa.

My name, Leabua, means 'one who speaks'. I come from the highlands of Lesotho. The Kingdom of Lesotho is a small country that lies within South Africa, but is an independent country. Alongside diamonds, water is our treasure.

Unfortunately, I no longer live in the beautiful highlands of Lesotho, because a few years ago people came to build a dam and told us we had to move away. Because of this Katse dam, 17,000 people had to leave their homes.

In the highlands, we had almost everything we needed to live, such as fresh vegetables and good water. But now things are different. My mother and I have to go to a water tap every day with our canisters and fill them up. For a year now, we have needed a card to fill our canisters, and to get it we have to pay a lot of money. This is why we can't fill up our canisters at the water tap so often. When we can't afford it, we get water from the nearest river. But this water is not so good and unfortunately often polluted. My brother got quite sick from this water once.



© Göhde Foundation

My name is **Mokabi** and I live in **Kenya**, East Africa.

I come from a Maasai family. Water is very important to us. As nomads, we move from place to place with our cattle, which are our livelihood, stopping where there is water. Lake Naivasha is one of these important places for us.

However, for a few years now there has been a lot of conflict around Lake Naivasha, and my parents are worried about our future. The reason for the conflict is the many huge flower farms that are located around the lake and use its water to irrigate their flowers. Just imagine - it takes five litres of water to irrigate just **one** rose growing on these flower farms! Many thousands of roses grown here on the flower farms are harvested and flown to Europe, because people there like to give roses as gifts. Lots of adults in our country are worried that the rose farms will cause the lake to have less and less water. Chemicals from the flower farms also get into the water. This is bad for our animals, that drink the water from the lake.

Last week my uncle went to a meeting where many people - farmers, herders, flower growers and fishermen - talked together about the lake's future.

We mostly get our drinking water from the Malewa River. This is the river that supplies Lake Naivasha with water. But the river is also polluted. I wish that people would take better care of the rivers and lakes and not pollute them with chemicals and other poisons.



© Wilhan José Gomes (wjgomes/Pixabay)

Hello, my name is **Yuran**.

I live in Beira, an important port city with half a million inhabitants on the coast of Mozambique. We live in a high-rise building; from our living room there is a great view of the Chiveve River. The river is super beautiful and also important because it is the waterway to the port, but now and then it also causes quite devastating floods. To prevent this, they have built a barrage whose gates you can close when there is too much rain inland. This has already made the situation much better, but when the weather is too extreme, even that doesn't help.

In 2019, the situation was catastrophic because Beira was hit by a cyclone and almost the entire city was destroyed. Almost everything was under water. My family was very lucky because we live on the sixth floor of a modern building; the flood only washed away our car. But a lot of people lost everything, and many houses are left in ruins. Nevertheless, the weeks after the cyclone were also hard for us - there was neither electricity nor tap water and we had to fetch water for drinking and washing from outside every day and carry it up the six floors.

In school, they taught us that the rise in sea levels and these strong cyclones are related to climate change. Some people claim that climate change doesn't exist. But in Mozambique, I think it's obvious.

Beira is still being rebuilt - and is now to become a 'sponge city'! This means that we will get quite a lot of green spaces, spread across the city, so that they can soak up floods like sponges and hopefully prevent a disaster like 2019 from happening again. I think it's a cool idea - it's expensive but pretty smart and forward-thinking!



© Mario Léveillé (Pixabay)

Hello, my name is **Nzikobankunda** and I come from the east of **Rwanda**. In the picture you can see me with my friends.

In my language, Kinyarwanda, my name means 'I know they love me!' It is very long, so my friends and family just call me Nzi. I live by a river called the Kagera River. Its water comes from the Akanyaru River near a very large lake, Lake Coghoha.

There are many hills in our area. My family has a field where we grow fruit and vegetables. It does rain in our area, but the rain comes very irregularly compared to the way it came in the past. When it does come, the rain is often much too heavy. This is not good for our soil because it can't absorb so much rain and the plants can't grow well. My parents have explained to me that this has to do with climate change and that agriculture will probably become more and more difficult in the next few years. They are often very worried about this.

For a few years now, we have had water pipes in our village from which clean drinking water flows. This means we are not sick as often as we were before.

In our village, as in other countries, more and more electricity is needed. For some time now, there has been a small hydroelectric power plant on our river that produces electricity. We are very happy about this. But at the same time we have the problem of our rivers having less water than before and a lot of sand getting into the reservoir of our hydroelectric power plant. This situation is very difficult for us, because we need water for both the hydroelectric power plant and our fields. Will we have enough water for both? I wish that everyone in the world would do what is needed to combat climate change, so that it doesn't keep getting drier here. We ourselves have recently started trying to help, by planting trees around our school.



© Tanja Rohweder

Hello, I am **Selima** and I live in **Tunisia**.

Tozeur, my hometown, is located in an oasis in the middle of the desert. Actually, there is almost no water here. But under the oasis there are groundwater deposits that are many thousands of years old. Groundwater is water deep in the earth. The wells in our oasis give us water and allow vegetation to grow in our area. A few hundred years ago, travellers journeying through the desert passed through here with their caravans. Imagine struggling through the desert for weeks and then coming to this beautiful green oasis where there is cool, fresh water. It must be a wonderful feeling. And that's how our little town came to be.

My family, like most of the farming families here, makes its living from selling the dates that grow on our date palms. But unfortunately, it's happening more and more often that date palms die. Many say, 'It's the golf course's fault!'

A few years ago now, a large golf course opened for tourists from Europe, and they built many hotels around it. The grass on the golf course needs watering every day and the hotels also use a lot of water. Imagine - they wash the guests' towels every day! Many farmers are quite upset. They say that the groundwater from our wells is not enough for the golf course and the hotels as well as their trees. And everyone is afraid that more and more date palms will dry up as a result. What are we supposed to live on then?

Every day I fetch water from the well that is in our street. There is still enough water – for now. But for how much longer?



© kone kassoum (Pixabay)

Hello, my name is **Madeleine**. I live with my family in a village near Yaoundé, the capital of **Cameroon**.

We just recently moved here from the city so my father can take better care of our family land here and so we can live in our own house. In the city we got water from the tap, now we get it from our own well. My father had a deep hole dug on our property and we use an electric pump to get to the groundwater. Of course, our neighbours are allowed to get water from the well too.

Water is an important resource in Cameroon, because a large proportion of our electricity is generated by hydroelectric power. Last year, I visited the huge Nachtigal Dam with my family and my father explained to me that it produces the electricity we used in the apartment we lived in at the time. In our new house we have a normal power connection, but because we have power cuts every now and then, we have four solar panels on the roof so that we are always well supplied. We have our own solar farm on the roof, so to speak, which we also use to run our water pump. Our neighbours don't have this, so they sometimes come to watch TV with us.



© flickr/randomix

My name is **Annchi** and I live in **China**, more precisely in Yunnan province. Yunnan is bigger than Germany and is located in the south-west of China. In the picture you can see me playing with my school friends.

I live with my little brother, my parents and my grandfather. We live in the countryside, in an old house, and do a little farming. We grow herbs that are used as medicine here in China, and we have buffalo.

Yunnan province is actually rich in water. We have enough rain and there are many rivers that rise from our mountains. But from 2009 to 2012, there was an extreme drought. Just think – it didn't rain for months! Our herb harvest failed completely several times and two of our buffaloes died because of polluted water. This is because the water level of the river from which we take our water every day has dropped, meaning the river does not flow as fast – and when the river flows more slowly, it can't clean itself so well.

Many people here in Yunnan have suffered great hardship from the drought, because most of them make their living from agriculture. We farmers cannot live without water. Our fields and animals need water.

But because there are still large rivers in our mountains, many hydroelectric power plants are being built in Yunnan. China's big cities are far away and need a lot of electricity. This is why there is now a very long high-voltage power line that brings the electricity from Yunnan's hydroelectric power plants directly to the distant cities.



© waterdotorg

Hello, I'm **Bithi** from **Bangladesh**. The picture shows me and my brother on our way to fetch water.

There is a lot of water in Bangladesh, in fact almost too much water. We have a lot of rivers that flood the country again and again. Many of the rivers originate in the Himalayan mountains. At the foot of the Himalayas, in our neighbouring country India, many forests have been cut down over the last few decades. The forests had absorbed large amounts of water. Because of the deforestation, the rivers now have much more water, leading to frequent floods here in Bangladesh. To make matters worse, we also have a lot of water coming from above: the monsoon rains often submerge whole swathes of land. Many people lose their homes in these floods.

To the south of our country lies the sea. As Bangladesh is very low-lying, we need dykes to protect the land from coastal flooding. In school, we learned that due to global climate change, the sea level will probably rise. What will happen to us then? Will we be completely submerged by water?

You probably think that the abundance of water in our country means we have a lot of good and clean water to drink. Unfortunately, this is not the case. Barely 40% of the population has access to healthy water. Many people fetch water from rivers and lakes. Others use water from public wells. But not all public wells have water that is actually safe to drink.



© flickr/digitalain

My name is **Erdem** and I come from **Kazakhstan**.

I live with my father and sister in a town called Aral. Perhaps you have heard of the Aral Sea? It is a huge lake between Kazakhstan and Uzbekistan. My hometown, Aral, used to be a port city right on the lakeside. But over the last few decades, because of all the cotton that is grown in Kazakhstan and Uzbekistan, the Aral Sea has become smaller and smaller. This is because cotton needs a lot of water to grow. Because we don't get enough rainwater to meet this need, a lot of water from the lake has been used to irrigate the cotton fields.

Large parts of the lake have dried up as a result. These dried-up parts are now a desert of salt and dust. My father is a fisherman and now has to travel 12 km to the lake to work for a fishing company. Unfortunately, the water that's left is also very salty and dirty because so much toxic fertiliser and sewage flows into it. This means that there aren't so many fish living in the Aral Sea anymore.

In recent years, the Aral Sea has not shrunk so much and there are organisations trying to care for our local environment, to preserve what is left of the lake.

At home we drink water from the tap, but it tastes very strongly of chlorine. Because of this, we often have other drinks at home, like cola and lemonade.



© <http://www.flickr.com/photos/71015487@N03/6426643087/>

I am **Li** and I come from Wuhan, a city in the middle of **China**.

A lot has changed in our vast country in recent years. When I look out from our living room, I have a direct view of the Yangtze River - the longest river in China. This mighty river has its source in Tibet. On its 6300 km-long journey to Shanghai and the East China Sea, it flows past mountain ranges, through deep valleys and numerous cities.

I want to tell you about the last river dolphins of the Yangtze. This small, almost blind white dolphin is called *baji* or 'the goddess of the Yangtze'. Until recently, these dolphins had been around for 20 million years - can you imagine? They lived only in the Yangtze River. Fewer than 100 dolphins were counted in the mid-1990s, and the last alleged sighting of a *baji*, claimed by a fisherman, took place in 2004. Scientists have been hopefully searching for these white dolphins, but have not found a single one. They are now considered extinct. Why does an animal become extinct after 20 million years? Because of overfishing, huge dams, pollution, and the thousands of ships that travel on this river. A researcher recently said on television, 'When you are on the river and you see all the ships, you realise that an animal like this dolphin has no chance of survival.'

For the past year, I have been part of a small group of environmentalists that meets regularly at our school. The group is part of CYAN, the Chinese Youth Climate Action Network. We are trying to make people in our district in Wuhan aware of the threat to the species living in the Yangtze River. We can't return the *baji* to the river, but we will try to fight for the other endangered species.



© Al Jazeera English

Hello, I'm **Ojuna** and I live in **Mongolia**.

I'm sure you have heard of the famous Gobi Desert. This is where I live with my family, in the south of Mongolia in a part of the Gobi Desert that is actually a semi-desert. Our land is a dry grass steppe and we make our living from the animals we keep – sheep and goats – whose wool and meat we sell. From the milk of our horses, my mother makes a refreshing drink that we call {1}airag{/1}. Many people around here make their living from the animals they keep. They have camels and cows as well as goats, sheep and horses. Our water sources are very precious to us because they keep our animals and therefore us alive. My siblings and I fetch water from the springs every day and we lead our animals there so they can drink.

Mongolia is very rich in natural resources. You might think that we would be happy about this? In fact, we're not - because many people here are still very poor. Near us there is a very large copper mine, the Oyu Tolgoi mine. The copper mined here is exported all over the world: Copper is needed for the production of power cables, electrical appliances and many other things that are used all over the world.

Unfortunately, the copper mine needs a lot of water. It uses more than twice as much water as all the cattle herds in the whole area put together! Many people are upset about this. After all, in a dry grassy steppe, water is scarce anyway. Our government has allowed mining companies to mine copper here. But who in our distant capital cares about us and our animals?



© waterdotorg

I come from Varanasi in **India** and my name is **Pawan**. In the picture you can see me and my brother going to the well to get water.

Varanasi is located in the north-east of India on the holy river Ganges. It is an important and very old site of pilgrimage, because we Hindus believe that it is important to have bathed in the Ganges at least once in life.

Our city has about 1.6 million inhabitants, so it is quite large. The city has a drinking water network. But not all neighbourhoods are connected to it and some of the pipes are very old. The water that flows in these pipes is partly purified river water and partly groundwater. Groundwater is water that is pumped out of the earth from deeper layers.

Unfortunately, the water is not really clean. Why? Because our city does not have an adequate sewage disposal system – the existing one covers only one-third of the city. In the rest of the city, wastewater just somehow ends up in the ground and then it all somehow ends up in the groundwater. This means the drinking water is contaminated with bacteria. Unfortunately, the Ganges is no longer a clean river either. Toxic wastewater from factories and other untreated waste water gets into the river. And then thousands of pilgrims bathe in the river! So it is no wonder that many people get sick: diarrhoea, cholera and hepatitis are common. My dad had cholera once, but fortunately he recovered.



© Joanna Egger (Südwind)

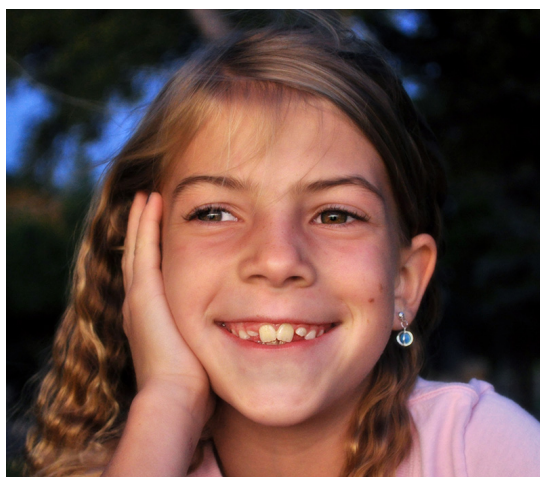
My name is **Rashida** and I live in Baluchistan, in the south of **Pakistan**.

My family and I live in a semi-desert on the border with Iran. But living in a desert doesn't mean that we don't have running water. We have piped water in the house and a shower. We also have a deep hole with groundwater in the courtyard, that we use for playing.

We know that some children have to fetch their drinking water from holes of this kind. But as my mother is a teacher, we have enough money to buy clean bottled water. Most of the time we buy Nestlé products, because it's the best-known water brand in Pakistan and there are billboards advertising it in all the bigger cities.

Many other children at my school live in huts. They have to fetch water from a well and carry it a long way. Some of my friends have frequent stomach aches from this groundwater and have to take special pills.

We often eat rice and chicken, because here very little fruit or vegetables grow in our area. But sometimes we buy mangoes at the market - they come from other parts of Pakistan where there is more water. A few years ago, there were extremely heavy rains in Pakistan that caused a big flood.



© Carissa Rogers

Hello, my name is **Catherine**. I live in the Riverland in the south-east of **Australia**.

Australia is the driest continent on earth. Here in the Riverland it's not quite as dry as in other parts of the country, thanks to the Murray River, an important river in our area. Most people in the Riverland make their living from agriculture. Grapes, citrus fruits and other kinds of fruit grow here. My parents are wine growers. Australian wine is popular all over the world and sells well.

Nevertheless, my parents are worried, because the water for our irrigation systems is getting more and more expensive. Because it doesn't rain enough here, we have to irrigate our vines – we get the water to do this from the Murray River. As there is so much agriculture here and water is scarce in Australia, the government has introduced strict rules for water use. Each farmer is allocated a certain amount of water that they have to make do with. The water is also very expensive. Those who use more than they have been allocated have to pay heavy fines. This means that everyone tries to use water as sparingly as possible. We have new, more economical irrigation systems and we have grown new grape varieties that use less water. I've heard that some farmers are now purifying used water in a special way so they can reuse it for irrigation. Scientists are doing a lot of research to try and figure out how to get by with less water. I hope that they have a lot of new ideas, so that we will still have enough water in the future, because I want to be a wine grower when I'm older.



© Arno Gasteiger (laif)

Hello, I'm **Temuera** and I live in **New Zealand**.

New Zealand consists of two islands in the southern Pacific Ocean. Our islands are a true natural paradise. There are clear springs, waterfalls, rainforests and extinct volcanoes.

I come from a Māori family. We Māoris are the Indigenous people of New Zealand. We try to preserve the traditions of our ancestors while leading a modern life like everyone else. I live with my parents and my sister at Lake Rotorua, which is a big lake on North Island. My parents make wooden masks according to the old Māori tradition and sell them to tourists.

A legend passed down by our ancestors says that the North Island of New Zealand was once a huge fish caught by a sailor. We Māoris distinguish two types of water: divine water (*waiaora*) and human water (*wai māori*). *Waiaora* is the water of life. It comes only from very special sources. It connects joy and sorrow, birth and death. *Wai ora* includes the water of our tears, the rain, the dew, the mist. It is sacred and used for religious celebrations. Human water, *wai māori*, we use for cooking, washing and drinking.

In our area there are also hot springs, called geysers. You can use them for bathing in some places, but we also use their heat for heating and cooking.

By the way, did you know that one of the most expensive types of mineral water in the world comes from New Zealand? It is exported all over the world and served in very posh restaurants. A bottle of it costs up to 60 euros! Strange, isn't it? Why do so many people in the world not simply drink the water from their area, but buy expensive water from far away?



© Michelle Raponi (Pixabay)

Hello, my name is **Toaripi**. I live in **Tuvalu**, which is a country consisting of nine islands located north of New Zealand.

I love being on the beach. Our beaches are beautiful, the water is very clear and if you snorkel out a bit you can see lots of colourful fish. After school and homework, I very often spend the rest of the afternoons at the beach with my friends. I can't really imagine my life without the sea.

But my parents worry a lot because it is becoming more and more dangerous to live in Tuvalu. Tuvalu is a very low-lying country. The highest point of our islands is only about four metres above sea level! Because of climate change, the sea is rising higher and higher. My parents say that there are storm surges with flooding much more often now than when they were children. The water also gets further inland than it used to. Again and again, many people's homes get flooded. Fortunately, this has not happened to us yet. But many others have already left Tuvalu because of this. My aunt and her family emigrated to New Zealand two years ago. Their house was flooded several times. They moved away so that my two cousins would be safe, even though it was really sad for everyone.

My parents and I are staying for now, and I'm very happy about this. However, we have problems with drinking water from time to time. Because the sea level is rising higher and higher, salt water keeps getting into our groundwater. Then we can no longer use the water from the tap, but have to buy bottled water, which is quite expensive.

I think all countries should help protect Tuvalu by doing more to fight climate change. Otherwise, more people will have to leave their homes.



© Ejup Lila (Pixabay)

I am **Arjona** and I live in Shkodra. Shkodra is a city in **Albania**.

I go to school here, and so does my little brother. My mum works as a cook. My father works in construction. Our big brother works in Italy because here in Albania things are not very good. There are few jobs and if you do have a job, you don't earn much, so many people emigrate to try their luck elsewhere. I think it's a pity, because actually Albania is beautiful. We have almost everything: high mountains, national parks, fertile land for agriculture, many lakes and rivers, and of course the Mediterranean Sea with its beaches.

After all the difficult years we have been through, now they are trying to make the city more beautiful again and to make sure everything works well. In the last few years, we have had frequent power outages and there have been days when there was simply no water coming out of the taps – even though we actually have enough water in Albania. The pipes were completely outdated and full of holes. This is getting better now, because the city is renewing all the water pipes. This costs a lot, of course. If less water seeps through leaky pipes, we can save more water – after all, water is precious, even though we have plenty of it here in Albania.



© liquene (flickr)

Me llamo Antonio - my name is **Antonio** and I'm from Lorca, a town in the south of **Spain**. This is me on my birthday.

We have water direct from the tap at home. We use it for brushing our teeth, showering and cleaning. It's a bit chlorinated, so it doesn't taste very nice. So my parents always buy mineral water from the supermarket, because it's better for drinking.

It's usually quite warm here, so we grow a lot of vegetables. Maybe you've heard of the 'plastic sea' in southern Spain. It's called that because of the huge plastic sheets under which the vegetables grow. The most famous place in this plastic sea is Almería – even further south than our city. In Almería, and in many other places in southern Spain, vegetables grow that supply half of Europe! Lots of people want to eat tomatoes in all seasons, and they grow well all year round in our country – although it actually doesn't rain enough for the endless tomatoes, cucumbers and peppers. Instead, it works like this: Deep down in the earth there is groundwater. And this groundwater is used to irrigate the fields. Because we grow so many vegetables and so much fruit, the groundwater level has dropped 250 metres in the last 50 years. 250 metres – that's almost as high as the Eiffel Tower in Paris! The sinking groundwater level is even causing the soil in our area to subside more and more – by about 10 cm every year!

When you buy fruit and vegetables in your local supermarket, check where they come from. I'm pretty sure you'll find a lot of vegetables from Spain!



© Joanna Egger (Südwind)

My name is **Julian** and I come from Tyrol in **Austria**.

Tyrol is a province in the Alps. Due to the many mountain springs here, we have very good drinking water that does not even need to be purified - that's how clean it is. Unlike in other countries, you can drink from most of our bodies of water without worrying about how clean the water is. And the water that comes out of the tap in our country is even better than mineral water!

Because we have so much water, it can also be put to good use for generating electricity. In Tyrol, 700 streams, rivers and lakes are already being used for energy generation. Hydroelectric power does not pollute the air, and that's a good thing. But at the same time, hydroelectric power plants disturb the habitats of many species of fish. This worries me, because I care about all animals.

I'm sure you've heard that there's a lot of tourism here. In winter, many people come here to ski. Unfortunately, there is not always enough natural snow for skiing – when this happens, the tourist areas make artificial snow using snow cannons. But the snow cannons need a lot of water. In many places, it has already happened that while the snow cannons are working, hardly any water comes out of the taps in people's houses. They've even created extra reservoirs to have enough water for the snow cannons in winter. I hope this doesn't mean we'll run out of water!



© Eric CHRETIEN/EXPLORER (laif)

I am **Rita** and I live in the far north of the world - in **Greenland**. To be precise, I live on the west coast of Greenland, in Ilulissat, a town with about 4600 inhabitants.

Ilulissat has lots of small houses painted in bright colours. Our home is located on the coast. A huge glacier pushes large amounts of ice towards the coast day in and day out. These chunks of ice then break off and fall into the sea as icebergs. As you may know, what you see of an iceberg is only 1/8 of it; the remaining 7/8 are underwater. Many of these icebergs are 25,000 years old.

Greenland's ice is one of the largest freshwater reserves in the world. Some glaciers in Greenland are between 100,000 and 200,000 years old. But they are melting more and more, because of global climate change. You've probably heard about this. Just think: the last few years have seen as much ice melt as was created in 5,000 years!

The melting of the ice is a major problem. Some settlements are threatened by it. You can hardly drive dog sleds anymore because the ice is too thin - the weight of the sleds would break the ice and they would fall through. Many fishermen used to go out fishing with dog sleds, but today most of them have switched to motorboats, which not everyone is happy about.

My both parents work in a fish factory. The fishing boats bring crabs and halibut to the factory, where they are processed, deep-frozen and packaged. Maybe you've eaten fish that comes from Ilulissat.



© Yves Lambert (fotopedia)

I am **Ana** and I come from a small town on the west coast of **Guatemala**.

We have good, clean drinking water in our town. Some people have water pipes running directly into their houses. My family shares a well on our street with several other families in the neighbourhood. In the countryside, unfortunately, it's not always so easy. There are many families who have to walk a long way to the nearest well. A lot of people also collect rainwater in large barrels.

When I'm not helping out at home, I like to go to the sea with my siblings and friends. I love the wild, shimmering water. We try to fish, collect shells on the beach and watch the giant turtles.

Last week something very sad happened: My aunt Gloria came home all upset and told us how she saw a big whale lying in the sand on the beach. The whale was no longer breathing. Later, a marine biologist examined it. In its stomach was a huge lump of plastic: hundreds of plastic bags and other stuff.

All over the world, whales, dolphins, turtles and other animals are dying because of the plastic rubbish floating around in the ocean. In the North Pacific, there is even a 'plastic island', a huge whirlpool of garbage made up of small pieces of plastic.

The death of the whale made us children so sad and thoughtful that we have now set up our own group to help protect the environment. So far we have collected rubbish on the beach, but we also want to write letters to politicians to tell them that the sea needs better protection.



© Frank (flickr)

My name is **Itzel** and I live in the province of Chiapas in **Mexico**.

Chiapas is a state in the south of Mexico. Half of the rain that falls across all Mexico falls here in Chiapas. Good, clean spring water is abundant here. But still, many families don't have good access to water. This is because most families here are poor farmers and live without water in their homes. My family lives in the city and we have good water direct from the tap.

Because water is so abundant in Chiapas, Coca-Cola has opened a factory here. Coca-Cola has cola bottling facilities in 194 countries around the world. Here in Chiapas, they can make use of our rich water resources for cola production, because it takes 2 litres of water to make 1 litre of cola. Coca-Cola is planning to build another cola bottling plant here in Chiapas. Many people are protesting against this. They say that Coca-Cola is using up all our water.

Most people here in Mexico love Coke. I've heard that no other country in the world drinks as much Coke as we do. But maybe that has something to do with the fact that although you can get Coke cheaply everywhere, even in many small remote village stores, fresh milk and good-quality water are hard to come by and expensive. Many poorer families can hardly afford water and milk and end up drinking Coke instead. Isn't that strange?



© kris krüg (flickr)

My name is **Daniel** and I come from Cochabamba, a city in **Bolivia**.

This picture shows me with my friends at a commemoration for the fifteenth anniversary of the Cochabamba Water War.

In my mother tongue, Quechua, water is called *yaku*. And *yaku* is more valuable than gold. I'd like to tell you now about the struggle for *yaku* in Cochabamba. In the year 2000, the year I was born, thousands of people took to the streets of Cochabamba to fight for their *yaku*. Tanks rolled in and many were injured, some died. The protests spread to all of Bolivia.

Why did all these people take to the streets? The government at the time had decided that in the future, private companies would supply people with drinking water. Before this, everyone had got their drinking water from their town or village and paid water charges to the town or village for it. Now the water pipes had been privatised – this means they were sold to private businesses, that now got to set the price for the water. Suddenly, drinking water cost three times more than it had before and many people could no longer afford the water. So lots of them joined forces and took to the streets to fight for their right to water. And they won! What an important success for the people of Cochabamba and Bolivia!



© CHICA

Hello, I'm **Maria Luisa** and I live in Managua, the capital of **Nicaragua**.

In the picture you can see me with my mum and siblings.

Managua originally means 'where there is a large surface of water', because the city is located by a very large lake, Lake Managua. The lake is huge - almost 60 km long. Our city's population is nearly 2 million. In the past, all wastewater from the city's households and factories went directly into the lake. No wonder the lake was heavily polluted. It was even considered 'biologically dead' because there were hardly any fish left in it. In 2009, a large sewage treatment plant opened, to clean our city's waste water. The lake doesn't stink so much now, but a second sewage treatment plant will have to be built so that the lake can fully recover.

In the fancier neighbourhoods of our city, water is piped into the houses. In most neighbourhoods, however, there are simply wells in the street that several houses share. This is how our house gets its water too. My mum always sends me to the well with a canister to fetch water.

In the neighbourhood where my aunt lives, there are not so many working wells. Instead, people put metal barrels by the side of the road. Twice a week, a tanker truck comes and fills the barrels with water using a large hose. Often the water is not completely clean and so it happens every now and then that people get sick, especially children.



© Cristina Mittermeier

My name is **Niopouti** and I live in a village in the Amazon rainforest in **Brazil**.

We – the people from our area – call ourselves *Mebêngôkre*, which means the tribe of water.

I live with my family on the east bank of the Xingu River. The Xingu is a tributary of the Amazon, which is one of the longest and largest rivers on earth.

My family makes its living from fishing and small-scale farming. Our main transport route is the river, which we use with our boat. Without water, we have no fish, no transport by boat, and no agriculture. This means we depend on water to live.

But a huge dam project is currently threatening our way of life. The Belo Monte dam, which is set to become the world's third largest hydroelectric power plant, would dry up much of our area, while flooding another part. It would cause unimaginable devastation to the rainforest. Many fish would become extinct. And us? We would have to leave the area, just like many other people here.

We are fighting to protect our rainforest and our river. Many people from all over the world support us.¹

¹ This piece was written in 2014. The first turbines of the hydroelectric power plant went into operation in 2016. Between 20,000 and 40,000 people (depending on the source of the figures) have lost their homes to the dam.



© Lewis Mulatero/Gallery Stock/laif

Hi, I'm **Tom** and I live in Las Vegas in the **US state of Nevada**.

Las Vegas is a very well-known city. Every year, about 40 million tourists come to Las Vegas, mainly because of its famous casinos. Today, around 2 million people live in the city and the surrounding area, even though Las Vegas is only around 100 years old. The city has grown rapidly because of the casinos and tourism. In the past, there was nothing but desert here, because Las Vegas is located in the middle of the Mojave Desert.

We get our drinking water from a reservoir near Las Vegas, Lake Mead. This reservoir dams the water of the Colorado River and is the largest reservoir in the US. The Colorado River is the most important river in south-western North America. It is used for irrigation, power generation and as a source of drinking water. Unfortunately, we have to be very frugal with the water because it rains very little. The water level of Lake Mead has already dropped by 30 metres in the last few years. You can see this in satellite images of the lake that show a white ring surrounding it. This means that the lake has only half as much water as it once did.

Because of this, Las Vegas now has very strict rules on water use. We are now only allowed to water our garden once a week. The city council has banned the building of swimming pools, and anyone who wastes water has to pay a heavy fine. My mom tells us off when we let the water run for too long. I think it's quite unfair, because all the casinos and huge hotels use much more water than we do!

I heard on the radio that the water in Lake Mead will last another 20 years. Nevertheless, every year lots of people move to Las Vegas and the city keeps growing and growing.



© mesaba (flickr)

Hello, my name is **Janet** and I live in Pennsylvania, a state in the north-west of the **US**.

I live in the countryside with my family and we have a farm. 'Feeding a family of five and saving for the children's college fees from farming is anything but easy', my father says. So he decided to lease part of our land to a natural gas company. Some time ago, people found out that there are enormous quantities of natural gas under our feet – but it isn't possible to extract it using the 'old', conventional methods. Instead, it needs to be done by fracking, which involves blasting layers of shale rock open at depths of one to five thousand metres using high water pressure. The gas then escapes through the small cracks. By leasing a plot of land for fracking, we were able to significantly improve our family's income. My little brother finally got braces for his teeth and my big sister is able to study at the University of Pittsburgh.

But fracking also has many disadvantages. Tankers come regularly and bring the huge amounts of water and chemicals that are needed for fracking. And once something bad happened: our water tasted funny, everyone got sick and my mom got a headache. They found out that the fracking wells were leaking methane into the groundwater. Since that happened, we've stopped drinking the water from our tap and always buy water from the supermarket instead. We're not the only ones who have leased land for fracking: there are now a total of 6,000 drilling points in Pennsylvania.



© Axelle de Russe/ Le Figaro Magazine/laif

Hi! I'm **Michelle** from New Orleans, a city in the south of the **US**.

Our city is located between a large lake, Lake Pontchartrain and the Mississippi River Delta, where the Mississippi River flows into the Atlantic Ocean. So we have quite a lot of water all around us.

To prevent water from the lake, river or sea from flooding our city, we have dykes and canals, and a pumping system that can drain the area again if there is a flood.

Unfortunately, we live in the middle of a hurricane area, and experience hurricanes every year. In 2005, we had the worst hurricane ever – Hurricane Katrina. It broke canals and levees that are supposed to protect our city, and the pumps failed. Then the waters of Lake Pontchartrain flooded the city! Many people lost their homes and all their belongings. The clean-up took months. We had to stay with relatives for a long time because our house was destroyed. The only one of my toys I could save was my frog, my favourite stuffed animal. Everything else was lost forever.

It took years for the city and the people to begin to recover. Then, in 2010, there was another disaster: far out to sea, there was an explosion on an oil rig. Unbelievable amounts of oil spilled into the sea. And a great deal of oil washed up on the shore off New Orleans. Everything was full of horrible traces of oil. Today our area looks beautiful again, but there is still a lot of oil in the sea, so we don't go to the beach to swim as much as we used to.

M3 Exercise: A step ahead

Instructions for carrying out the exercise: See lesson plan "Water Lottery".

Statements for the exercise:

- You can drink the water in your home straight from the tap.
- Your family does not necessarily use water carefully because you have plenty of water.
- Your family's income is **not** threatened by issues with water resources in your area (examples might be problems with fishing, farming etc. due to climate change, or businesses diverting water resources away from the local or regional population).
- You live close to a river, lake or beach where you can go swimming with your friends.
- You can use your water for playing.
- You can take a bath or shower every day.
- You have a toilet in your home.
- You don't have to worry about getting sick from your drinking water.
- You wash your clothes in a washing machine that is in your home.
- The running water in your home works 24 hours a day, seven days a week.
- The water you use to wash dishes or do laundry is drinking water.
- The bodies of water (rivers, lakes, sea) in your neighbourhood or region are relatively clean.
- Your community has a well-developed sewage and wastewater treatment system.

M4 How many baths?



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© Rainer Sturm (pixelio.de)



© Halina Zaremba (pixelio.de)



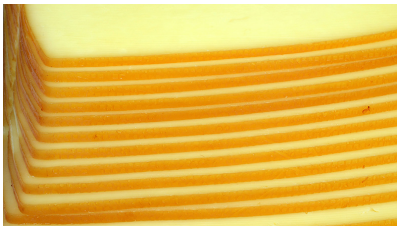
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© Icon by Good Ware

1 bathtub



© Icon by Good Ware

2 bathtubs



© Icon by Good Ware

3 bathtubs



© Icon by Good Ware

6 bathtubs



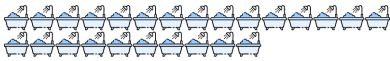
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10 bathtubs



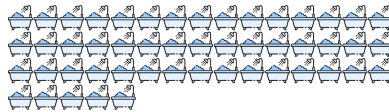
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10 bathtubs



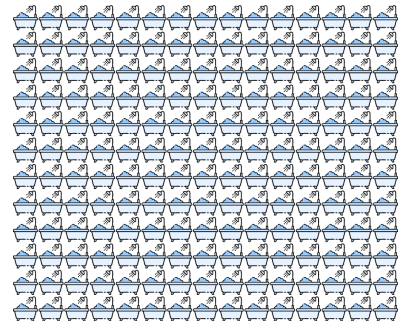
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25 bathtubs



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50 bathtubs



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150 bathtubs

Solution to ‘How many baths?’

The bathtubs show the amount of virtual water per kilogram in each foodstuff. One bathtub corresponds to roughly 100 litres of water.

Each ‘bathtub’ picture matches with one of the food pictures.

As an example, 1 kg of beef contains 15,000 litres of virtual water, i.e. 150 bathtubs.

Carrots	130 l/kg	1 bathtub
Tomatoes	214 l/kg	2 bathtubs
Potatoes	290 l/kg	3 bathtubs
Oranges	560 l/kg	6 bathtubs
Milk	1 020 l/kg	10 bathtubs
French fries	1 040 l/kg	10 bathtubs
Rice	2 500 l/kg	25 bathtubs
Cheese	5 060 l/kg	50 bathtubs
Beef	15 000 l/kg	150 bathtubs

M5 Background information: Water footprints/virtual water

People need water for drinking, cooking and washing. But we use even more water for the production or cultivation of:

- plant products such as fruit, vegetables, cereals;
- animal products such as meat, milk, cheese;
- industrial and manufactured products such as T-shirts, mobile phones, cars.

What is a 'water footprint'?

The cultivation or production of specific goods involves both the direct use of water and the indirect consumption of the 'hidden' water, often referred to as **virtual water**. A water footprint is the total amount of water consumed in the process of making a product or the total amount of water used by consumers, companies or nations – including both water used by a country's population and economy and water used or polluted abroad for the production of goods consumed domestically.

The water footprint of a product is made up of three parts:

- **Green water/precipitation:** This category is of relevance to agricultural products. 'Green water' is the proportion of precipitation that plants absorb while growing or that evaporates directly from the cultivated area.
- **Blue water/artificial irrigation:** 'Blue water' is groundwater or surface water that is not returned to a body of water after its use in the manufacture or cultivation of a product. In agriculture, blue water describes the amount of water artificially added to and subsequently evaporating from soil or plants. Water for irrigation is taken from surface water or groundwater.
- **Grey water/polluted water:** 'Grey water' refers to the amount of water that would be needed to dilute water pollution to such an extent that the quality of the water complies with legal requirements. In agriculture, this pollution comes from fertilisers and pesticides that enter surface water and groundwater sources.

Source:

<https://www.umweltbundesamt.de/themen/wasser/wasser-bewirtschaften/wasserfussabdruck#was-ist-der-wasserfussabdruck>

In Austria, the average water consumption of a private citizen (i.e. excluding commercial, industrial or large-scale consumers) is around 130 litres per day. This figure takes account of direct water consumption only; including virtual water increases it to about 4,700 litres of water per person per day.

Source:

<https://info.bmlrt.gv.at/themen/wasser/nutzung-wasser/wasserversorgung/Trinkwasser.html>

Regional differences in water consumption

The size of a plant's water footprint depends on the region in which it grows and on the climatic conditions that prevail there. Plants in hotter countries need more water because more water evaporates from them. The water footprint of an agricultural product is therefore not a fixed quantity, but varies with the crop's geographical location. In our temperate climate, for example, tomatoes require a comparatively low amount of water. Tomatoes grown in the Mediterranean region need many times more water because of the higher temperatures they are exposed to.

Water footprint of tomatoes: Germany and Spain compared:

- Germany: 35 litres/kg (22 l green water, 5 l blue water, 8 l grey water)
- Spain: 83 litres/kg (35 l green water, 23 l blue water, 25 l grey water)

Source:

<https://www.durstige-gueter.de/tomate/>

However, tomatoes need not only water, but also a lot of heat. In winter, we do not grow tomatoes outdoors. The tomatoes we grow in greenhouses need a lot of energy for heating and lighting in the colder months.

It's better to buy fresh tomatoes only in the summer months, and you should try and choose organic and locally grown ones. Tinned tomatoes (organic if possible) are a good substitute at other times of the year.

A cow's water footprint

As a general rule, animal products have a larger water footprint than plant products. This is not because the animals drink so much, but because of their feed. The water footprint of meat stems to a significant degree from feeding practices for intensively farmed livestock.

By the time a cow reaches its slaughter weight after three years of life, it has been fed about 1,300 kg of concentrated feed made from various grains (such as wheat, corn and soy), as well as 7,200 kg of roughage (gras, hay silage). The production of concentrated feed requires huge amounts of water. This practice is particularly questionable when the feed uses crops whose cultivation demands a lot of water, such as soybeans, which are grown in subtropical areas where natural rainfall is insufficient. The cultivation of fodder crops in some countries in South America and Asia, for example, entails the use of almost inconceivable amounts of groundwater and river water.

The water footprints of other products

Non-agricultural products such as clothing often have a large water footprint. The production of a pair of jeans, for instance, uses about 11,000 litres of virtual water, while estimates put the virtual water of a T-shirt at about 4,500 litres.

Source:

<https://klassewasser.de>

For the jeans, the cultivation of cotton consumes the most water, but the processes of washing, spinning, dyeing, weaving, softening, sewing and finally the transport of the finished article from (for example) India to Europe also use water. The jeans don't affect the water resources of the country where they're sold – but they do have a serious impact on those in the country of their production. Cotton in particular is a striking example, as it needs a lot of sun - and a lot of water – to grow well. When we import cotton, then, we also import a lot of virtual water, and leave the ecosystems of the countries that produce it polluted from intensive use of pesticides.

Electronic goods also contain a lot of virtual water. The production of a smartphone requires around 1,280 litres of water. Making a computer consumes 15 times that amount of water, or 20,000 litres. A car requires an average of around 400,000 litres of water, from raw material extraction to final assembly.

Source:

<https://klassewasser.de>

Links for further information:

- Water footprint of various products: <https://www.waterfootprint.org/resources/interactive-tools/product-gallery/>
- Calculate your own water footprint: <https://wfd.de/wasserampel>

M6 Recipes

List of ingredients for the recipes

1 kg = 1000 g; 1 l = 1000 ml

Amount	Foodstuff	Virtual water
1 kg	bread	1600 l
1 kg	butter	5550 l
1 l	cola drink	480 l
1	egg	200 l
1 kg	salad leaves	240 l
1 kg	cucumber	350 l
1	beefburger	2400 l
1 kg	carrots	130 l
1 kg	potatoes	290 l
1 kg	ketchup	530 l
1 kg	flour	1850 l
1 l	milk	1020 l
1 kg	spaghetti/other pasta	1850 l
1 l	sunflower oil	6800 l
1 kg	bell peppers	380 l
1 kg	French fries	1040 l
1 kg	beef	15000 l
1 kg	tomatoes	210 l
1 kg	beet sugar	920 l
1 kg	onions	280 l

The recipes serve 4 people.

Schnitzel



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600 g beef
3 eggs
100 g flour
100 g breadcrumbs
250 ml oil for frying
salt

Spaghetti Bolognese



© Joujou (pixelio.de)

500 g spaghetti
50 ml oil for frying
100 g onions
500 g minced beef
2 kg tomatoes
seasoning

Summer salad bowl



© Dieter Schütz (pixelio.de)

400 g salad leaves
200 g cucumber
200 g tomatoes
200 g bell peppers
50 ml oil
seasoning

Pancakes



© Michaela Schmidt-Meier (pixelio.de)

4 eggs
400 g flour
1 l milk
200 g sugar
100 g butter
salt

Carrot and potato soup



© Maja Dumat (pixelio.de)

50 ml oil for frying
100 g onions
300 g carrots
300 g potatoes
1 l water
seasoning

Burger with French fries and cola drink



© Thommy Weiss, Alexander Klaus, Petra Bork (pixelio.de)

4 beefburgers
500 g French fries
100 g ketchup
1 l cola drink

Solution:

Carrot and potato soup	495 l	5 bathtubs
Summer salad bowl	624 l	6 bathtubs
Pancakes	3 299 l	33 bathtubs
Spaghetti Bolognese	9 213 l	92 bathtubs
Burger with French fries and cola drink	10 653 l	107 bathtubs
Schnitzel	11 645 l	116 bathtubs

Carrot and potato soup

50 ml	oil for frying	340 l
100 g	onions	28 l
300 g	carrots	39 l
300 g	potatoes	87 l
1 l	water	1 l
	seasoning	
	Total	495 l

Summer salad bowl

400 g	salad leaves	96 l
200 g	cucumber	70 l
200 g	tomatoes	42 l
200 g	bell peppers	76 l
50 ml	oil	340 l
	seasoning	
	Total	624 l

Pancakes

4	eggs	800 l
400 g	flour	740 l
1 l	milk	1 020 l
200 g	sugar	184 l
100 g	butter	555 l
	salt	
	Total	3 299 l

Spaghetti Bolognese

500 g	spaghetti	925 l
50 ml	oil for frying	340 l
100 g	onions	28 l
500 g	minced beef	7 500 l
2 kg	tomatoes	420 l
	seasoning	
	Total	9 213 l

Burger with French fries and cola drink

4	beefburgers	9 600 l
500 g	French fries	520 l
100 g	ketchup	53 l
1 l	cola drink	480 l
	Total	10 653 l

Schnitzel

600 g	beef	9 000 l
3	eggs	600 l
100 g	flour	185 l
100 g	breadcrumbs	160 l
250 ml	oil for frying	1 700 l
	salt	
	Total	11 645 l

M7 Leading Idea “Water is essential for life”

Life had its origin and development in water millions of years ago. Three quarters of the Earth’s surface are covered by water. Water is essential for all live organisms. All of them contain a big quantity of water, which in human beings is between 65% and 75%. So, the loss of water, de- hydration, if accentuated, in live beings and in earth is synonym of death.

M8 Exercise “Distinguishing causes and reasons”

In ethical inquiry it is very important to distinguish between explanation, through causes, and justification, through reasons. One difference is to restrict causes to natural events that take place without human deliberated intervention. Whereas we speak about reasons for what moves someone to make or say something. Therefore, a reason may be an aim, an intention, or a principle.

Consider each of the following judgements and think if they are referred to **Causes** or to **Reasons**:

	Causes	Reasons
1. We must save water because it is not endless.		
2. When there is a lack of water, there is a drought.		
3. Polluted water provokes mortal diseases.		
4. Some governments allow factories to pollute, if they pay an economical fine.		
5. If we don't want to pollute water, we shouldn't dirty it.		
6. The government has built a sewage farm to clean dirty water.		
7. The refuses from factories, fertilisers, insecticides from agriculture, and domestic water dirty rivers and subterranean water.		

M9 Activity “Interview your family”

Students are asked to interview their family members to investigate how they are committed to modifying behaviors related to wasting water. During the next lesson, the whole group shares information regarding the subject of the interviews. As a group, the students can ask themselves if the behaviors implemented by their families are actually useful to avoid waste, providing their motivations and opinions.

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M10 Discussion plan “How to describe the water?”

1. What adjectives can we use to describe water?
2. What can the taste, color and smell of water be like?
3. What is the water we use every day like?
4. Is water a public good or private property? Justify your answer.
5. Is water a right for everyone or a few? Justify your answer.
6. In what situations is water wasted?
7. Why is water essential for life?

M11 Leading Idea “Water, a good in danger”

Most of the drinkable water we consume comes from the subsoil. If the water under the earth is polluted by filtrations of rubbish from cities, from factories, and from fertilizers, soon we may have serious problems with the supply of water.

Water is a good and we mustn't dirty it nor throw it away. Apart from treating dirty waters, we should create other means not so expensive in terms of technology, economy and ecology.

M12 Exercise “Working with means-ends relationships”

An end is an aim, something to be achieved. The means are the ways we use to achieve them. Evaluating the relationship between means and ends is an important exercise in ethics. Many aspects of a situation have to be taken into account, for example: consequences, proportion, alternatives, etc. We also have to combine critical, creative and a caring dimension of thinking.

Analyze the following cases and indicate which is the mean and which is the end. Then consider if the mean is appropriate to get the end. Give reasons for your ideas.

1. I would close down all factories to avoid the danger of pollution.

2. A good way to eliminate refuses is to throw them into the sea.

3. Factories should treat sewage in order not to pollute rivers.

4. To keep clean the water of rivers, I would fine everybody who dirt it.

5. In order to avoid droughts, deforestation should be forbidden.

6. If we don't want to make the sea a rubbish container, we should treat sewage.

7. Governments should invest more money in research if we want to solve the problem of pollution.



In a subsequent lesson, students are invited to gather information from the City Council of your city on what means they promote to avoid water pollution and to save water. Then, the students discuss ideas for preventing water pollution.

M13 Leading Idea “Saving water”

Water is a limited good, although we think it is endless because it is always present in our lives. We find water in fountains, swimming pools, wells, etc. However, in some parts of the world or certain periods of time, the lack of water is provoking long droughts and eventually there is a danger of turning land into a desert.

The consciousness and the effort of each of us in everyday life can help and will make us become more responsible about this common value.

M14 Exercise “Estimating consequences”

When we reach a decision, we are not just solving things at the present, but also some decisions are related to our future and other people’s future. Then, before acting we should estimate the consequences that a decision can imply.

Did you know that...

- leaving the tap open while washing our teeth means to spend 20 liters of water approximately?
- doing the washing up with the tap open means an average of 100 liters of water?
- every time we flush the toilet, we use from 8 to 10 liters of water?
- washing a car with hose costs 500 liters of water approximately?

Whereas...

- If you just wet your teeth brush and rinse out your teeth, you use 1 liter of water. So, you save _____.
- If you full up the sink to do the washing up you spend 20 liters of water. So you save _____.
- If you use a WC of low consume, you can save the 50% of water. If you use the flush an average of 5 times every day, that means _____ liters per week. And for a family of four members, that means _____ liters saved per week.
- If you wash your car in a washing tunnel, only 20 or 30 liters are spent. If you wash it with a bucket of water and a sponge, you use approx. 50 liters. So, you save _____. And if you wash the car once a week or once a month, you save _____.

M15 Exercise/Activity “How the reduce the excessive consume of water”

Find out what other means exist to reduce the excessive consume of water.

Then, compare your research with your classmate and reflect all together on the following questions:

1. Why we should avoid to waste water?
2. What are the consequences of excessive water consumption?
3. What is your meaning about consuming excessive water?
4. What would happen if there was no more water to drink in your surrounding?

M16 Leading idea “The rain”

The rain is the result of the condensation of water drops in the atmosphere. When the water vapor ascends, due to the sun heat, it gets cold and forms clouds. If the drops go to the upper parts in the atmosphere, which are colder, or a polar air pocket comes in, the drops become more condensed, and as a consequence heavier, and fall as rain.

Acid rain

A great part of the polluting refuse that goes out from thermal factories and the smoke pipes of cars ascend to the atmosphere, where it is combined with the water vapor in the clouds, and forms acid (mainly sulfuric, and nitric). The rain which falls from these clouds will contain dissolved acids.

The refuses from industrialized countries may arrive to green and healthy parts of the planet, what provokes a polluting cycle.

M17 Exercise “Detecting cause and effects relationships”

We have a causal relationship when we can say that some event has been produced by another one. If someone throws a stone and breaks a window, we can say that the throwing of the stone caused the breaking of that window.

Finding out the causes that made something to happen is a way of finding an explanation to it.

Write the word **cause** or **effect** in relation to the water cycle:

1. The evaporation of water is _____ of the sun heat.
2. The condensation of drops is _____ of the formation of clouds.
3. The weight of the clouds is _____ of their falling as rain.
4. Low temperature is _____ of snowing.
5. Ice becomes liquid as _____ of an increase in temperature.
6. Heat is _____ for the snow to melt.

M18 Exercise “Classifying: kinds and degrees”

Differences of kind indicate differences between kinds or groups of things, whereas differences of degree indicate differences between things of the same kind or group. For example, the difference between the height of a table and the height of a house is a difference of degree. The difference between a table and a house, as things that belong to different groups, is a difference of kind. To know if a difference is of degree or of kind, we need the criteria on which we establish the difference. There are quantitative (the height, for example) or qualitative criteria (the use, for example).

In the following pairs, what kind of differences has been taken into account: differences of kind or differences of degree?

1. Rain and hail storm

2. Downpour and drizzle

3. Rain and snow

4. Storm and deluge

5. Blizzard and light snowfall

6. Rain and acid rain

M19 Exercise “Rain and acid rain”

After doing the previous exercise, reflect with your classmate about the difference between rain and acid rain. Then reflect all together on which are the consequences of acid rain for:

1. the soil
2. the seas
3. the rivers
4. the animals
5. the human beings

M20 Leading idea “Fish”

More than the 70% of the population in the world lives in a distance smaller than 80 km. from the sea. Their diet is very rich in fish. Fishing with means that do not allow the reproduction of the species, as well as the contamination of water, are big dangers for fish and for human beings.

M21 Exercise “Detecting ambiguities”

Some words have different meanings in the same context. The word “good” is one of these words. They are so important in ethics that students should distinguish their different meanings.

These sentences present different meanings of the word good. Could you say what meaning it has in each sentence?

1a. I think that fish is a good food because it contains mineral salts.

1b. He brought a good quantity of bait to fish the whole day.

2a. The day was very good for fishing.

2b. Fishermen live from the goods of the sea.

3a. I don't think it is good to fish baby fish.

3b. Because of pollution, the water was not in a good condition.

4a. He is a good fisherman.

4b. This fisherman is a good person.

5a. Give me a good reason to buy fish.

5b. They had a good fishing because they had good nets.

M22 Exercise “What would happen if all the fish in the world die?”

Reflect with your classmate on the following question:

What would happen if all the fish in the world die?

After sharing their opinions, the teacher divides the students into small groups, each of which will have to identify which behaviors can be implemented to prevent all the fish from dying. In a subsequent lesson each group will present its reflections and will discuss them in group.