

Guidance for Teachers

Sustainability first

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UN CLIMATE CHANGE CONFERENCE UK 2021
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Great Science Share for SCHOOLS

Overview

The wonder of water explores healthy water systems, why we need them and how we use them. The workshop considers the impacts of the climate crisis on water systems and supports pupils to make changes to ensure preservation of water systems. Activities encourage care for oceans, lakes, rivers and even sewer systems with simple ways to take action now against the climate emergency.

The workshop is comprised of presentations and art and writing activities, including making fish postcards and writing from the perspective of a marine animal. Curriculum-linked presentations and activities will support pupils to consider how we can preserve and improve water systems and protect them from the climate crisis.

The following document provides guidance on each activity and presentation including equipment needed, curriculum links and main concepts covered.

We recommend watching the presentations and completing the activities in the suggested order below. Please feel free to also pick and choose which activities you would like to do and which presentations you would like to watch.

We will be holding a pupils' assembly on June 15th, 1pm-2pm to celebrate and share pupils' art and writing. The assembly will also feature a panel of experts and leaders, considering how to take forward the ideas of pupils.

If you and your pupils would like to attend and share art, writing and/or climate pledges, please email Sonya Peres at sonya.peres@sustainabilityfirst.org.uk or register here.

Presentations and Activities

Presentation 1: Wonder of Water
Activity 1: Posctcard from a Fish
Presentation: How can we create healthier water systems?
Presentation 2: Creative Writing Activity
Resources

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The United Nations Global Goals for Sustainable Development were developed in 2013 to provide an agenda for the future of sustainability. The Goals are used across member states and sectors to assess and understand progress and have developed into a common language to discuss sustainability. Many teachers across the globe use the SDGs to embed sustainability within education.

The following workshop series supports the realisation of various Global Goals, including:









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The Wonders of Water

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Equipment:

- Device to share video
- Pencils, paper and/or computers for pupils' to write questions, comments, concerns etc.

Main concepts:

- Exploring water cycles and water systems
- Exploring how water gets to our homes
- Understanding the impacts of the climate crisis on water systems

Curriculum Linking:

- England

Key Stage 2: Science, pupils recognise that environments can change and that this can sometimes pose dangers to living things.

- Scotland

Social Studies (People, place and environment): I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally- responsible way. SOC 2-08a

- Wales

Science: Pupils should use and develop their skills, knowledge and understanding by investigating how animals and plants are independent yet rely on each other for survival. They should be given the opportunity to investigate:
-the environmental factors that affect what grows and lives in those two environments, e.g., sunlight, water availability, temperature.
-how humans affect the local environment, e.g., litter, water pollution, noise pollution.

Step by Step Guidance:

- Watch the video with pupils
- Afterward, encourage pupils in groups, or as a class, to consider the following questions:
- What do they value most about water?
- How might the climate crisis impact their daily lives and how they use water?
- Submit questions, comments and/or concerns in the uploader form here.



Share with us so we can learn with you!

Make sure to upload your work here so we can learn with you and share your work widely with waste experts at our June 15th pupils' assembly!

DISCLAIMER: This activity sheet was written for The Great Science Share for Schools, Sustainability First, their sponsors (National Grid) and the Great Science Share for Schools are not liable for the actions of activity of any persons who uses this resource or in any of the suggested further resources. We assume no liability with regard to injuries or damage to property that may occur as a result of using this information. These activities are designed to be carried out by children working with an adult. The adult is fully responsible for ensuring the activity is carried out safely. You can access further H&S advice from www.cleapss.org.uk

Wonder of Water Presentation Transcription

Planet earth is big – it has to be, to provide a home for nearly 7 billon people.

Oceans, rivers, lakes and other bodies of water make up almost three quarters of planet earth – and when we consider how big the earth is – that's a lot of water! Water is what makes life possible. When we look for signs of life on other planets, we first look for signs of water.

Every living thing needs water to survive – from the tiniest microorganism to an Antarctic blue whale – water is the reason we're all alive, and here today, learning together.

As humans, we need water for a number of reasons:

Firstly, water makes sure all our organs work properly by delivering oxygen to all parts of our body.

Water hydrates us so we can feel well-rested and comfortable.

You know when you play football outside and start to sweat? That's your body using water to make sure your body doesn't get too hot!

When we eat food, we use saliva, or our spit, to make sure we can swallow and properly digest our food.

We need water to flush out waste from our bodies, like when we use the loo.

We also need water to cook our food so that we can remain strong and healthy! Think about pasta – we need boiling water to cook pasta! And what about when we make a warm bowl of soup on a cold day? We need water to make to make it!

We also use water to clean our homes and our schools. When we spill something, we can use water to clean up the mess. In our bathrooms, we use water to brush our teeth and to clean ourselves after a long day playing outside.

That's just a few of the ways we use water! We need to keep drinking water to make sure our bodies can support us to run, eat and be happy! We need water to cook our food and clean our homes.

These are the wonders of water!

Wonder of Water Presentation Transcription Continued

But how do we get this water? Where does it come from?

All water on earth is a part of something called the water cycle. The water cycle explains how water moves around our earth in different forms, including as a solid, liquid and gas.

The water cycle occurs when water from lakes, rivers, and oceans heats up and rises, or evaporates into the atmosphere. Plants also contribute to the water cycle: when plants sweat out water from their stems and leaves, water also goes into the atmosphere. This is called transpiration. The water in the atmosphere becomes a gas, travelling higher and higher up into the sky until it becomes liquid in a rain or snow cloud, this is called condensation. Then, when the cloud is full and heavy, the water falls back down to earth in the form of snow, or rain – sometimes even hail - this is called precipitation! The water falls into lakes, rivers, the soil and underground and into oceans. The cycle then starts up again when water rises from these bodies of water into the air!

An ecosystem is all the living things in nature, such as in a river or lake. In an ecosystem, all living things rely on one another and work together to create a suitable place to live - they create a wonderful community that allows them to live happily and also makes our lives better! How so? When we drink water from rivers, lake and even streams that water has passed through fish, tree branchess, bacteria which can clean the water from pollutants and other things we wouldn't want to drink.

Even though the earth is made up of 71% water – we can't drink most of this water because it is too salty! I'm sure many of you have gone swimming in the ocean and tasted the saltiness of the sea! Human beings need water without salt because our bodies cannot have too much salt otherwise we'll get sick. It costs a lot of money, and uses a lot of energy to take salt out of seawater and so most of the water we drink comes from freshwater sources like rivers where there isn't much salt.

So where does the water in our homes come from?

In the UK, a lot of the water we drink, or use to cook and clean, comes from lakes, rivers or reservoirs (which are lakes used for storing water). Some of the water we use comes from water under the ground, like from an aquifer, which is a layer of rock under the ground that is a bit like a sponge that holds water. Water from rivers, lakes and aquifers isn't salty, which is why we're able to use it.

Water companies across the UK, take water from rivers, lakes, reservoirs and underground, and clean the water to make sure it is safe for us to use and to drink - this means cleaning out branches and other waste as well as making sure there are no dangerous germs or bacteria in the water that can make us ill.

Wonder of Water Presentation Transcription Continued

Once all the water is clean and safe for us to drink and use, it is stored in a manmade lake, called a reservoir. Then, a system of underground pipes and pumps brings water from the reservoir into our homes! Isn't that neat?

In the UK, we're lucky to be able to access clean water so easily. In other countries, access to clean water may be difficult because people don't have underground pipes and pumps like we do, or they don't have the ability to clean water as quickly as we do. Sometimes, even within a city in some other countries, communities have different access to clean water, where richer people are able to access clean water, and poorer neighborhoods are unable to.

While we've mostly been talking about drinking water, let's think how water we are unable to drink is also important to life on earth. Saltwater in oceans is home to many living things that are very important in making planet earth a home for us.

For example, plants and tiny living things called plankton in the ocean breathe out oxygen – which we also need to breathe! In fact, ocean ecosystems contribute to over half of the oxygen we need to live. This is just one reason why oceans are so incredible!

The Climate Crisis

It's amazing that water, in all its forms, helps all life on earth in so many ways.

Unfortunately, like much of the earth, water systems are suffering due to things that people do that are bad for the planet.

Let's start with something called pollution:

Pollution means putting something into the environment that shouldn't be there, or that is harmful to the environment. There are many different types of pollution, let's start with plastic pollution:

People throw away a lot of stuff, and often, that stuff is plastic. You know when you buy food from the shop and it comes in a plastic bag, or when you buy some juice and it comes in a plastic bottle – what happens to all this plastic? Well, for most people, it is thrown away to sit in a landfill – a place where waste is collected - and sometimes it is thrown in rivers where pieces of plastic make their way to the sea – affecting plants and animals in both marine and river ecosystems when they eat plastic or get stuck in it.

Wonder of Water Presentation Transcription Continued

An organisation called the EarthWatch Institute made a list of the top 10 plastic items most commonly found in rivers. Do you want to hear what the top five are? While I read out the list, have a think about whether or not you use these things, and how you may throw them away.

Drumroll please!

The most common plastic item found polluting rivers is the …. plastic bottle!
Number two is food wrappers, like crisp packets
Number three are cigarette butts
Number four is takeaway containers from when you order food – such as the boxes you might get a burger or kebab in
Number five – cotton buds you use to clean your ears that have plastic sticks!
Are you surprised by this?

Another way we may contribute to polluting rivers is through what we pour down the kitchen sink or what we flush down the loo. For example, lots of people pour cooking oil down the kitchen sink, or flush wet wipes down the toilet, all of this contributes to big lump of waste that block pipes and make it really difficult for water companies to deal with the wastewater from our homes. We call these big lumps of waste fatbergs - like an iceberg but made of fat. “Fatty McFatberg” is a fatberg that was found under the streets in London – it was over twice the length of two Wembley football pitches. Parts of it are now on display in the Museum of London!

There are also other types of pollution that affect rivers, seas and lakes. There are many factories around the world that make all the plastic, cars, clothes and other items that we are encouraged to buy. Farmers can also use chemicals on the things they grow to make them grow bigger and faster. Sometimes, dangerous chemicals from these factories and farms find their way into rivers, lakes and oceans, which also affects all the living things in that ecosystems - including people!

For example, In the United States, in a town called Flint, river pollution from car factories nearby has contributed to dangerous drinking water which has affected the health of people living in the town. It has taken the government a long time to fix the issue – people living in Flint have had to deal with this very serious problem for over 6 years.

It is important we understand that access to clean water can differ amongst countries and even communities in the same country! Sometimes, poorer communities, or Black or Indigenous communities are treated differently by governments and may not be able to access clean water as easily as other communities are able to do.

Wherever we can, we need to help these communities by speaking about unequal access to water around the world and making sure other people know that this is happening.

Wonder of Water Presentation Transcription Continued

Our society at the moment relies on oil and gas to power our cars and planes, to run factories, to heat our homes and our water and for many other things. Oil and gas are found in very specific parts of the world, so often, ships are used to transport oil across the world .

And this is where another type of pollution comes in: oil spills. This type of pollution occurs when ships carrying oil spill oil into oceans. Have you ever heard of this happening?

There have been several really big oilspills in the past. When oil is spilt into oceans it is very hard to clean up. Birds and fish living in or near oceans can become covered in oil, which harms their feathers and skins.

Our use of oil and gas affects oceans in another way. When we use oil and gas, we release greenhouse gases into the atmosphere. Too many greenhouse gases contribute to the warming of our planet, which impacts people, plants, animals and ecosystems.

Ocean ecosystems for example, are affected by warming temperatures. When the earth's temperature increases, it means oceans are getting warmer. When ocean water gets warmer, oceans expand and they can flood cities and villages on the coasts. Warming oceans can also affect fish, plants and animals in the ocean.

Have you heard of the great barrier reef? The great barrier reef is in Australia and is home to 25% of all known marine species. It is so big, you can see it from space!! The great barrier reef is made up of coral reefs which provide shelter for different fish and marine animals. As temperatures rise and the ocean gets warmer, coral reefs will be affected and won't be able to act as habitats for fish.

Because we are releasing so many greenhouse gases, the ocean is becoming more acidic, which means it is becoming a more difficult place for animals and plants to live, like the Great barrier reef and all the fish that rely on it.