WATER WATER EVERYWHERE

AGES 7-11

Curriculum resource pack for water and the water cycle

WWT is one of the UK's leading providers of outdoor learning. We welcome over 50,000 learners per year to our Wetland Centres where we provide unique opportunities for learners of all ages and abilities to interact with wetland wildlife from the UK and across the world.

We are open all year round with sessions for every season. Whether you're looking for curriculum-linked learning or simply a fun day out, there really is something for everyone. To find out more about our school visits programme please visit **learningzone.wwt.org.uk.**

Why wetlands?

WWT works across the UK to save, restore and build wetlands for wildlife and people. Wetlands are one of the most important habitats on earth – storing huge amounts of CO_2, providing a natural way of stopping flooding and serving as a home for huge numbers of different creatures. Spending time in wetlands is also proven to improve mental health and wellbeing!

Using this resource pack

This resource pack contains activities designed to cover key curriculum content as well as outdoor activities designed to promote nature connection and a love of the natural world. This is accompanied by supporting resources that can be printed or used on screen with your pupils. At the end of the pack you will find a short quiz that can be used to reinforce and assess pupils' learning.

CURRICULUM LINKS

England

KS2: Science

- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

KS2: Geography

- Describe and understand key aspects of physical geography including...the water cycle

Northern Ireland

KS2: The world around us

- The effect of people on the natural and built environment over time
- The effects of positive and negative changes globally and how we contribute to some of these changes

Scotland

Second: Sciences

- I can apply my knowledge of how water changes state to help me understand the processes involved in the water cycle in nature over time
- I am aware of the properties and uses of water

Second: Social studies

- I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally responsible way

Curriculum continued...

Wales

KS2: Science and Technology

- I can understand how my actions and the actions of others impact on the environment and living things

KS2: Humanities

- I can describe how people and the natural world may impact on each other
- I can recognise the distinct physical features of places, environments and landscapes in my locality and in Wales, as well as in the wider world
- I can recognise the distinctive features of places, environments and landforms, and how these may change
- I am beginning to appreciate and care for living things and my own environment
- I can take care of resources and not waste them, and I am conscious of the importance of creating a sustainable future
- I can recognise that my actions and those of others impact upon communities and the environment
- I can describe and give simple explanations about the impact that physical processes have had on people, places and landscapes in the past and present
- I can describe spatial patterns of places, environments and landforms in my locality and in Wales, as well as in the wider world
- I can give simple descriptions of the processes that lead to change in the natural world

INDOOR ACTIVITIES

YOU WILL NEED:

Water cycle visual (one per pupil/group)

Watering can (or other container)

Drinking glasses (one per group – may want to use plastic)

Bottom halves of clear plastic bottles (one per group)

Rulers

Chalk

Ice cubes (4–5 per group)

(For all accompanying resources see the end of this pack)

Other relevant resources

Activities:

- Make a water cycle in a jar

School visits:

- We have sessions for KS2 focusing on the water cycle. Visit our Learning Zone to find out more **learningzone.wwt.org.uk.**

NOTE: **Where you see a Q this indicates a question to ask your pupils.**

Activity 1: What do we use water for?

Q **Can you think of anything that humans and other animals can't live without?**

- Pupils might come up with air, oxygen, food etc. If they haven't come up with water, tell them that all animals need water to survive. Without water there would be no life on earth.
- Split the class into small groups and challenge each group to come up with as many uses of water they can think of.
  - > ... in the **kitchen.**
  - > ... in the **bathroom.**
  - > ... in the **garden.**
- Ask each group to report back and use their ideas to produce a class list – add any others that you can think of.
- These might include:

Uses of water in the kitchen	Uses of water in the bathroom	Uses of water in the garden
- Washing up - Dishwasher - Washing machine - Cooking - Drinking - Cleaning	- Having a bath - Having a shower - Washing hands / face - Brushing teeth - Flushing the toilet	- Watering plants - Having fun (e.g. water fights, paddling pool etc) - Putting water out for wildlife

Activity 1 continued...

Q **Where do you think water comes from?**

- A reservoir (a man-made lake specially built to collect water)
- A river
- Beneath the ground (this is called groundwater)
- It is cleaned at a water treatment works before it is transported to our homes and schools through pipes beneath the ground.
- After we have used it, it goes down our toilets, sinks and drains and is transported to a sewage treatment works where it is cleaned before being put back into a river or the sea.

Activity 2: Changes of state

Preparation stage:

- For these activities, you will need to carry out some preparation and then come back to the activities a few hours later. You could complete the saving water activity (see below) between times.
- Give each group the bottom half of a clear plastic bottle.
- Ask each group to fill their bottle to about halfway and mark the level of the water using a marker pen.
- Leave these in a window or other warm place.

Activity stage: Melting

- Give out a glass containing an ice cube to each group.

Q **What do you think will happen to the ice? Why?**

- Watch the ice beginning to melt and explain that it is changing from ice (solid) into water (liquid). This is called melting.

Key word

MELTING

When a material changes from a solid to a liquid.

Q **Can you think of any other examples of melting?**

- Examples might include chocolate, an ice cream or ice lolly.

Activity stage: Evaporation

- Get each group to collect the bottle with the water level marked on and take it back to their table.

Q **Has the level gone down? Why?**

- Explain that as water heats up, it changes from a liquid to a gas. This is called evaporation. Some of the water (liquid) has changed into water vapour (gas) and gone into the air.

Key word

EVAPORATION

When a material changes from a liquid into a gas.

Activity 3: The water cycle

- Explain that through the processes you have just investigated, water is constantly moving round the earth in what is called the water cycle.
- Give out a water cycle visual to each pupil or group.
- Use the following information to talk through each stage of the water cycle and get pupils to label the visual as you go to produce a water cycle diagram:

Step 1: Evaporation

- Look at the sun shining on the sea.

Q **What happens to water when it heats up?**

- It might be useful to get pupils to think about what happened to the water you left in the window.
- Explain that, just like the water you left in the window, it evaporates.
- Get each pupil/group to draw an arrow from the **ocean** to the **first cloud** and label it **'evaporation'.**

Step 2: Condensation

- Explain that some of this water vapour forms into clouds and some of these clouds move inland and when they reach hills or mountains they rise further into the sky. The higher you go into the sky, the colder it gets (if you've ever climbed a hill or mountain you will have noticed how it gets colder the further up you get).
- Get each pupil / group to drawn an arrow from the **first** cloud to the **second.**

Q **What happens to water when it heats up?**

- Explain that just like the water on the outside of the glass, the water vapour condenses and becomes liquid water again.
- Get each pupil / group to write the word **'condensation'** just above the **second** cloud.

Step 3: Precipitation

Q **What so you think will happen to this water once it's turned back into a liquid?**

- When the water vapour turns into water it falls out of the clouds as rain, snow, sleet or hail. We call this precipitation.

Key word
PRECIPITATION
When water falls from the sky.

- Get each pupil/group to draw an arrow from the **cloud** to the **river** and label this **'precipitation'.**

Step 4: Run off

Q **What do you think happens to the water now?**

- Some of this water travels into streams and rivers and makes its way back to the sea. This is called surface run off.

Key word
SURFACE RUN OFF
When water flows across the ground.

- Get each pupil/group to draw an arrow following the **river** all the way back to the **sea** and label it **'surface run off'.**

The Cycle

Q **What happens next?**

- The cycle then starts all over again with water being evaporated from the ocean and so on. This is why it's called the water cycle because just like the wheels of a bike the water keeps on going round and round.

How old is water?

Q **How old do you think water is?**

- Water has been on earth for 4.6 billion (4,600 million) years! The dinosaurs lived between 230 and 65 million years ago, so water was around long before the dinosaurs roamed the earth.
- We don't get any new water on earth. It is the same water that has been going round and round the water cycle for 4.6 billion years. This means that the water you drink may have passed through a dinosaur! Don't worry though, every time water evaporates all the nasty stuff in it is left behind so it naturally gets cleaned. Isn't nature amazing?

Activity 4: Wetlands and the water cycle

Q **What happens when it rains really heavy?**

- When we get really heavy rainfall we can get a flood. This is because the water travels into rivers really quickly and the rivers have more water than they can hold. This extra water spills out of the river and creates a flood.
- Wetlands can help prevent flooding because they store a lot of the extra water and release it gradually, so all of the water doesn't go into the rivers in one go.
- Ask pupils to look back at their water cycle visual. They will see a pond to the left-hand side of the river.
- Get each pupil/group to draw an arrow from the **pond** to the **river** and write **'wetlands release water slowly'.**
- Wetlands are also great at cleaning water before it goes back into rivers. The plants in wetlands absorb pollution (chemicals that can damage the environment) and store it safely.
- Get pupils to think about the pond on the water cycle visual.

Activity 4 continued...

Q **What would happen to the river if the pond wasn't there?**

- It would flood more often without the wetland slowing the water down and the water in the river would be dirtier (more polluted).

Q **Can you think of a way the pond might be destroyed?**

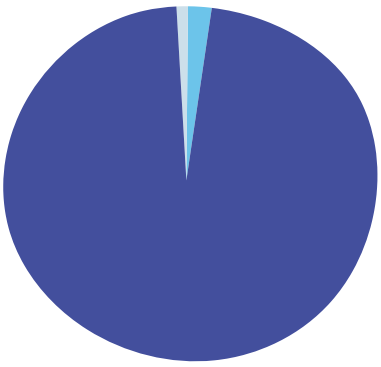
- It might dry up (possibly as the world heats up due to climate change).
- It might be drained by a farmer to make more space for animals or crops.
- It might be drained and houses or factories built on it.
- More than a million ponds have been lost in the UK in the last 100 years!

Q **Imagine you are an otter living in the river. How would your life change if the pond was destroyed? How would this make you feel?**

- WWT work to protect wetlands so that this doesn't happen. We also build new wetlands that help prevent flooding, stop pollution and create places for wetland wildlife to live. Wetlands really are amazing!
- You might want to get pupils to write from an otter's perspective, describing how they feel after their pond has been destroyed.

Activity 5: Saving water

- Look through the following information with your class.



- You would think we would always have enough water to use.
- After all, over 70% of the earth's surface is covered in water.
- However, 97.5% of this water is **salty seawater** and more than 2% is **frozen in the ice caps and glaciers** (frozen rivers of ice).
- This leaves less than 0.5% for **us to use.**
- It also takes a lot of energy to clean water before and after we use it.
- This means that saving water is good for us and for the environment.

- Get each group to look back at the list of uses of water they created earlier.
- Get them to make a list of different ways of saving water. It might be helpful to think of saving water in the kitchen, bathroom and garden as before.

Saving water in the kitchen	Saving water in the bathroom	Saving water in the garden
- Wait until the dishwasher and washing machine are full before putting them on. - Wash fruit and veg in a bowl rather than under a running tap. - Have a jug of water in the fridge to save waiting for the tap to run cold.	- Don't leave the tap running while brushing your teeth. - Have a short shower rather than a bath. - Install a save-a-flush device in your toilet cistern. This is a bag that takes up some of the space in the cistern so that less water is flushed away each time. Many water companies provide these free of charge. Don't fit them to dual flush toilets though (those where you can choose a long or short flush) as these are already designed to save water and may not flush very well if you install one.	- Only water plants when they really need it. - Water plants first thing in the morning or in the evening when less of the water will evaporate. - Use a watering can rather than a hose. - Install a water butt to collect rain water from your drain pipes and use this water for your plants. - Plant drought-resistant plants.

OUTDOOR ACTIVITIES

Activity 6: Evaporation in action

- Find an outside area with a hard surface (e.g. tarmac or concrete).
- If it has rained recently find a puddle.
- If not create a puddle using water from a watering can or a container.
- Draw a chalk outline around your puddle.
- Every half an hour, go back to the puddle and again chalk the outline. You should see the puddle getting smaller over time.

Q **Where do you think the water has gone?**

- Explain that without plants animals wouldn't survive and there would be no life on earth.

Q **The water has evaporated and re-joined the water cycle. Eventually it may form part of a cloud, rain down, make its way into a river and flow back to the sea. Isn't nature amazing?**

Activity 7: Collecting rainwater

- As a class, explore a weather forecast website online and check when it is likely to rain next.
- Take an empty bucket or container outside and place it somewhere that won't be knocked over or moved.
- When it next rains, measure how deep the water gets in the container. A water butt is a way of collecting rainwater that runs off roofs (you may need to show learners an image). Imagine how much water we could collect if we all had water butts in our gardens and school grounds.

Q **What could the water collected in a water butt be used for in our schools?**

- For examples: water our plants, allotments, veg patches, play with, clean windows and wellies. This would mean we would not use fresh water from the tap unnecessarily.

Q **Where would be a good place in the school grounds to have a water butt?**

- Measure the school playground or estimate the roof size of part of the school or a house.
- Use this measurement to calculate how much rain fell on the whole playground or roof.

THE WATER CYCLE

QUIZ: WATER WATER EVERYWHERE

Round 1: Picture round

Q More than a million ponds have disappeared from the UK over the last 100 years. These animals all rely on ponds. Can you name them?

1 .....

2 .....

3 .....

4 .....

5 .....

If you get stuck, you could carry out a quick internet search.

Round 2: Changes of state

Q Can you match each **Word/phrase** with it's **Description?**

There's a new word that you might not have learnt yet. Can you work it out?

6	**Evaporation**	When water runs across the surface
7	**Condensation**	When water evaporates from the leaves of plants
8	**Precipitation**	When a liquid turns into a gas
9	**Run off**	When a gas turns into a liquid
10	**Transpiration**	When water falls from the sky

Round 3: Water cycle

Q Can you correctly label the different parts of the water cycle?

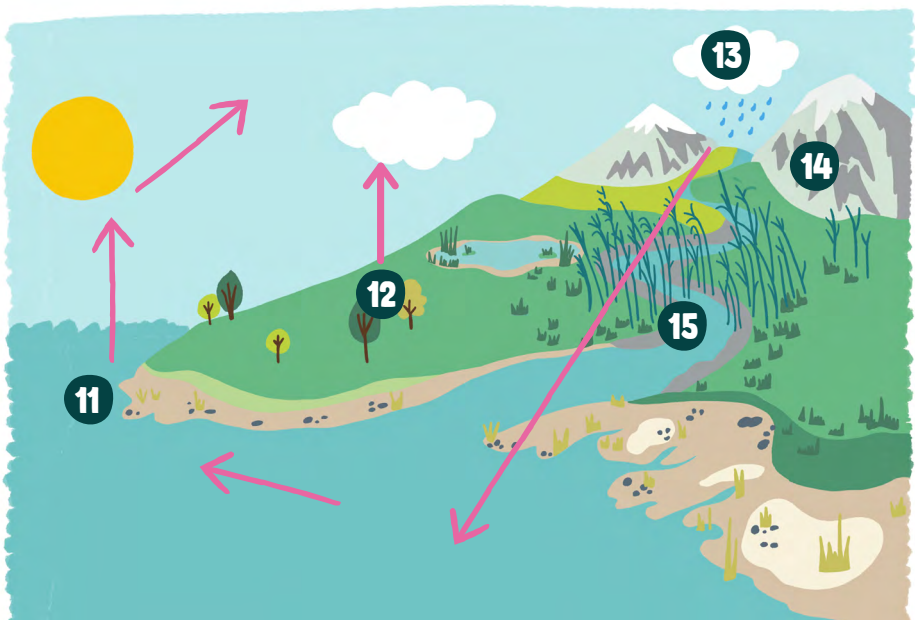
11 .....

12 .....

13 .....

14 .....

15 .....



Round 4: Uses of water

Q Can you match each **Activity** with the **Amount of water it uses?**

Draw lines to match them up. (all amounts are approximate - you might want to look at a litre or two-litre bottle to give an idea of how much a litre is).

10	**Having a bath**	**5 litres**
11	**Having a shower**	**12 litres**
12	**Leaving the tap running while brushing your teeth**	**45 litres**
13	**Flushing the toilet**	**80 litres**
14	**Using a garden hose or sprinkler for 15 minutes**	**250 litres**

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For wetlands. For life.

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Have fun and do share your score to our social media accounts

We'd love to find out how you got on!

ANSWERS: WATER WATER EVERYWHERE

Round 1: Picture round

Q More than a million ponds have disappeared from the UK over the last 100 years. These animals all rely on ponds. Can you name them?

1 Ramshorn snail

2 Cyclops

3 Leech

4 Daphnia or Water flea

5 Water hoglouse

If you get stuck, you could carry out a quick internet search.

Round 2: Changes of state

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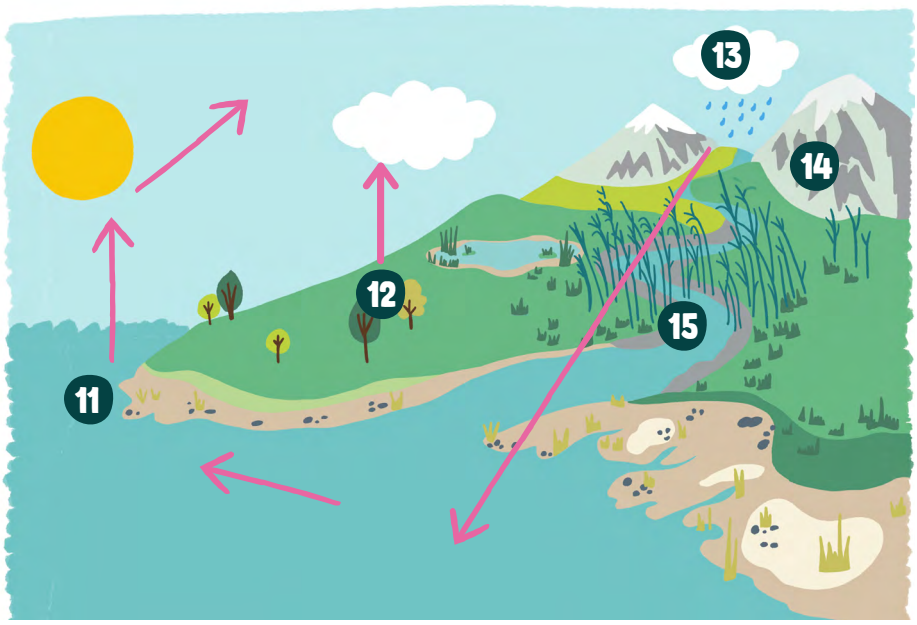

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5 litres

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