SUPER SPLASH HEROES

ESSEX&SUFFOLK WATER living water

The Water Cycle resource pack

LEARNING OBEJCTIVE

- To revise or introduce the principles behind the water cycle
- Explain how the water cycle works

SUCCESS CRITERIA

- Pupils are able to explain the water cycle
- Pupils are able to explain what happened in their recording

TEACHERS NOTES

The purpose of this resource pack and activities is to introduce the water cycle. Ideally these activities should be completed prior to the water saving resource pack. There are a number of activities and follow-up experiments that can be used to develop pupils understanding of different concepts of the water cycle.

Younger children can colour a picture of the water cycle using Resource Sheet 2 (pdf on www.nwl.co.uk/savewater)

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The Water Cycle

THE WATER CYCLE

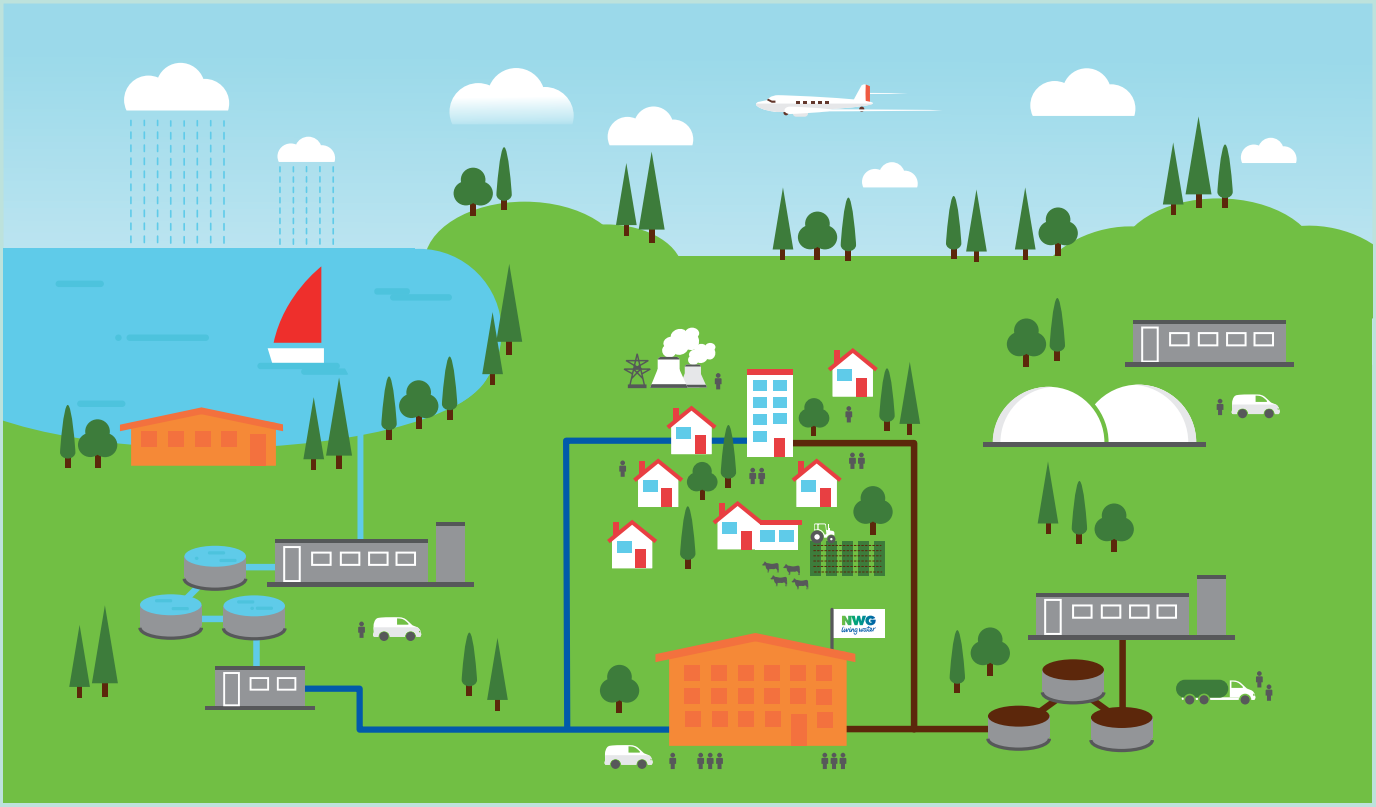
The pull of gravity, electromagnetic forces and the sun's energy keeps water moving continuously around the world. We call this the water cycle.

This is an ancient process as the water that we are using today is the same water that has always been here. The sun's energy heats water in oceans, streams, lakes, soil and vegetation and it evaporates into the atmosphere as water vapour. The sun also causes snow and ice to melt and evaporate. As the water vapour rises into the air its temperature falls and the water vapour condenses into tiny droplets that form clouds. When these get too heavy the water droplets fall as snow, rain, and hail (this is known as precipitation).

In Britain we have many hills and these help push the clouds upwards, so we have plenty of rain - in some areas! Some rain filters into the ground to form ground water and some collects as run-off, which enters into streams and rivers that flow back to the sea.

CLEAN SAFE WATER

Did you know there is a limited amount of fresh usable water on earth? Fortunately, this water is naturally recycled through the water cycle. At Northumbrian Water, we tap into this natural water cycle and clean the water so that it's safe enough for you to drink and after you have used it, we clean it again so that it can rejoin the water cycle.



Teachers facts

KEEPING WATER MOVING AROUND THE WORLD

Water is constantly travelling around our planet. It's so powerful it can carve landscapes in its path. Water is a vital part of our lives, we often forget that it's a gift of nature and a requirement for life.

WATER IS AMAZING

Water is one of the few substances on earth that can naturally be found in three different states:

- Solid – as ice and snow
- Liquid – as rivers, streams and oceans
- Gas – in the air all around us

THERE'S A LOT OF IT

70% of the earth's surface is covered by water, but most of it is salty and in the ocean. Only 3% of all water on the planet is fresh, with 2% of that locked in the polar ice caps. So drinkable water is a very precious resource.

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Suggested experiments

EVAPORATION EXPERIMENT

Follow the directions from Resource Sheet 3 to create an evaporation experiment. You do need a good sunny day for this, and a safe place to put the bowl. It works more quickly if you start with water that is not too cold. with older children you can discuss what is happening, and here the key terms evaporation, condensation and precipitation can be used. The pupils can be led to set up other experiments, with a number of bowls, such as:

- Keeping one of the bowls in the shade
- **Keeping one of the bowls indoors**
- **Putting a handful of ice cubes on the cling film**
- **Starting with freezing water**
- **Starting with warm water**

Before the experiments, the pupils could predict what they think might happen. Comparing these predictions with the actual results would lead to greater understanding of the process.

The results could be written up in the form:

- What we used (a labelled diagram)
- What we did
- What I thought would happen/ What really happened
- What I learned from this experiment

INDOOR EXPERIMENT

It is possible to do this experiment indoors, which might be necessary if it is not a warm, sunny day. Place bowl near window in the school kitchen (warm environment) and outside in shelter (undercover). Or, follow the instructions on Resource Sheet 4 to make rain, and explain that if the experiment were done outside, the sun would have warmed up the water.

Relate what is happening in the bowl in the evaporation experiments to what happens on a global scale. This is quite a step for some children, but there are some good video clips available to help, for example at http://www.bbc.co.uk/search/learning/?q=the%20water%20cycle

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Suggested experiments

WHERE HAS THE WATER GONE?

Puddles

Draw round puddles in the playground with chalk and notice what happens during the day. Ideally this would be after a night of rain and on a following sunny day. Alternatively, carry out the experiment on Resource Sheet 5. Photographs are a good way of recording this.

Being in the playground might well mean that chalk is rubbed off. Perhaps cone off an area of the playground. If the puddle is left a whole day, the children could end up with a series of concentric rings showing the puddle shrinking. At this stage, the children might come up with a variety of explanations about where the water has gone (soaked into the ground, birds drank it, it just got smaller, children splashed in it etc.), but hopefully they are beginning to understand that it can go into the air. Here, there might be an opportunity to mention clouds and how they are formed.

Collecting rain water

Children could also collect rain water in containers in the playground then take them inside, leave on window sill, and measure the water levels dropping as it evaporates.

Collecting condensation

On a cold day, let the children breathe onto the windows of the classroom (assuming an outside window) and notice what happens. Let each child mop up the water with a tissue and take it back to their seat.

Discuss what has happened: water that was inside each child is now on their piece of tissue. This is one reason why we need to drink water – to put back the fluid we breathe out.

Following this activity, carry out the activity as shown on Resource Sheet 6 and discuss the answers the children give. At this stage, they may only have a very hazy idea of where the water has gone. Through the week, there will probably be a time when the sealed jar has drops of condensation. This can be related back to what happened when they breathed on the windows.

Role play

To reinforce learning show the pupils the clip at www.bbc.co.uk/learningzone/clips/the-watercycle.11070.html and ask them to be a TV presenter; in other words, they need to come up with a commentary to go with the video. This works well in groups: kids' shows often have two or three presenters so that there can be some dialogue between them. Each group would really need access to a computer to play the clip. Just how far you take this is up to you.