

Activity Support Document

The water cycle

Introduction


This session provides the opportunity for pupils to learn about the water cycle. Pupils will work collaboratively to create a model of the water cycle and explain the scientific processes involved.

This activity has been created for use by teachers and/or Environment Agency STEM Ambassadors and is part of a series on water which also includes:


- ✓ **A water working wall**
- ✓ **How much water do we waste?**
- ✓ **What's my job?**


These activities enable teachers to introduce the work of the Environment Agency into their lessons and deliver elements of the National Curriculum with the help of an Environment Agency STEM Ambassador if one is available.

Topic | Water

 **User** Environment Agency STEM Ambassador

 **Age group** Ages 7 - 11

 **Length of activity** 50 - 60 mins (but can vary)

 **Subjects** Science, Geography

At the end of this activity pupils should be able to do the following:

- ✓ Label the parts of the water cycle
- ✓ Create a model of the water cycle
- ✓ Use a model to describe each stage of the water cycle
- ✓ Explain evaporation, condensation and precipitation

> What is the activity about and how to organise it?

This is meant as a guide to running the activity, but please feel free to adapt it to suit your particular requirements.

The powerpoint presentation shows the full structure of the activity and there are guidance notes for some slides.

If you are a STEM Ambassador from the Environment Agency, please check with the class teacher how much of this activity they are asking you to do.

When you discuss the activity with the teacher let them know how confident you feel about coming into the classroom and any support you may need. It is recommended that the teacher introduces the water cycle to the pupils and teaches them about the scientific key concepts of evaporation and condensation in advance.

If you feel confident, you could run the session with the help of the teacher. Or it could be the teacher runs the session and your role could be to help the pupils build their water cycle models.

Remember to introduce yourself to the pupils. Inserting your name and a picture of you at your workplace in your work clothes into slide 9 can help pupils understand how your job might link to water, if it does.

Part 1 – Introduction to the water cycle

In this part of the activity slide 1 introduces the expression ‘water cycle’ and slide 2 gets students thinking about whether we are drinking the same water as the dinosaurs which will be revisited again at the end of the session. Slides 3 and 4 encourage pupils to think about where the term recycling is used and how this can also be used for water. Slide 5 is where the water cycle is discussed in more detail using the key words, precipitation, evaporation and condensation.

Part 2 – Building a model water cycle

In this part of the activity pupils work in twos or threes to create a very simplified version of the water cycle using a small transparent plastic bag, Sharpie style pens and coloured water (this can be just water if you have not got any blue food colouring available). Ask the children to draw an image on the outside of the bag, similar to the one on slide 5, with a sun, clouds, mountain/hills, sea and river.

You can support the pupils with their water cycle models, but do not tell the pupils exactly what to draw on their plastic bag, let them try and work it out for themselves. If a pair needs help, remind them of the water cycle poster. If you feel confident you might want to discuss with pupils how they link their models and their everyday observations to the water cycle diagram on slide 5. When doing this never tell a pupil they are wrong if they are incorrect, just ask some questions which might help them to come to the correct answer.

The next step is to fill the plastic bag with water until it is around 2-3 cm deep at the bottom of the bag. Each bag is then fixed to a window using Sellotape or masking tape. Over a period of time, which will vary depending on conditions, the water will begin to evaporate, and the children can observe the condensing water on the inside of the bag. At this point you can use slide 7 to link their model to the water cycle and to their own observations of the water cycle.

Plenary

Slide 8 revisits the dinosaur question from the start of the lesson. What do the pupils think now?



Support

Some pupils may need support with understanding the process of condensation. To explain this place a fizzy drink's can, which has been in the fridge/freezer for a while on a saucer; one on each table. Ask the children to observe closely and describe what they see. Ask them where the water droplets, known as condensation, on the outside surface of the can are coming from. Be ready to explain condensation as some of the children might think the explanation is that the can is leaking. Condensation forms on the outside of the cold can from the water vapour (gas) present in the classroom condensing into liquid water as it comes into contact with the cold can.

Extension

Put the plastic bags on different windows (if possible) or in different places. For example some near heaters or in the sunshine, and some in the shade. See how this affects the rate of evaporation by timing how long it takes for the condensation to appear in the bag. If you have temperature sensors pupils can take the temperature of the water in the bags in the different locations.

> Key words










water	solid	hail	sun	lakes	soil
condense	ice	sleet	evaporation	reservoirs	air
water vapour	condensation	snow	recycling	seas	atmosphere
gas	precipitation	clouds	streams	oceans	water cycle
liquid	rain	heat	rivers	flow	store

What to avoid

Avoid using specialised vocabulary such as the following words: percolation, surface flow, river discharge, transportation. Try and use the key words at the beginning of this activity which the pupils will be familiar with.



> Equipment needed for session

-  Powerpoint slides and accompanying notes
-  Water Cycle poster / image from water working wall
-  Small containers of water with added blue food colouring (if available)
-  Sellotape/ masking tape
-  Plastic bags - 1 per pair of children (zip lock bags are the best)
-  Marker pens in different colours suitable for use on plastic bags e.g. OHP marker pens, Sharpies or whiteboard pens.
-  Can of fizzy drink kept in fridge until required
-  Saucer / similar container
-  Cup of hot water to demonstrate evaporation - CAUTION - Keep out of reach of the pupils

> Where does this fit into the National Curriculum?

Science - Year 4 - States of matter

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

Geography - Key Stage 2 - Human and physical geography

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

Cross curricular links

Mathematics

- Measure the temperature of the water in the bag as it changes over time using a data logger. Plot a graph of temperature against time.
- Compare the temperatures of bags at different locations. At each location time how long it takes for condensation to appear.

English

- Write an explanation text about the process of the water cycle

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