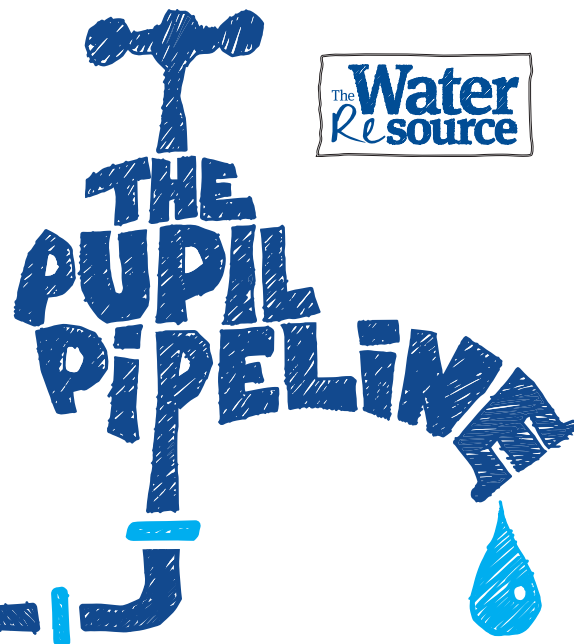


## Science/Geography



### What is the Pupil Pipeline?

WaterAid provides safe water, sanitation and hygiene education to some of the world's poorest people. In the next year millions of people will experience the transformative effect of having clean, safe water and sanitation for the very first time.

It costs just £2 for one meter of pipeline needed to transport clean, safe water across the developing world. The Pupil Pipeline challenge is a fun and educational challenge for schools to help raise these vital funds for WaterAid.

Pupils need to pass one or more buckets, bottles, jars, cups or even wellies filled with water along the line without dripping a drop. Or can they design their own water carrying device or pipe.

These teaching materials add context to the Pupil Pipeline to ensure that pupils have a broad understanding of the importance of water and a foundation from which to begin exploring wider global issues associated with water.

### The water cycle lesson plan

The water cycle is vital to supporting all life on earth. Without it, nothing would grow or survive. This set of activities introduces the stages of the water cycle to pupils so they can see all the different processes at work. The activities can be used as preparatory work before taking part in the Pupil Pipeline to enable the pupils to gain a broader picture of why water is essential to life.

### Key words

- Water cycle
- Evaporation
- Water vapour
- Condensation
- Precipitation
- Run off

### Aims

- To learn or recap the key aspects of the water cycle.
- To recreate the water cycle using actions.
- To make a model water cycle in order to observe the process in action.

# Curriculum links

**KS2 Science: States of matter** Identify the part played by evaporation and condensation in the water cycle.

**KS2 Geography: Human and Physical Geography** Describe and understand key aspects of the water cycle.

## Activities

### Starter

Print and cut out the water cycle key words and images. Place the jumbled up cards on each table. The pupils need to match the picture to the word.

### What is the water cycle?

- Explain that all of our water moves continuously and is recycled over and over again. The water we drink today has been around for as long as the Earth has!
- This is called the water cycle. Without it, nothing would grow and we would not survive. Explain that the pupils' starter activity cards and words are all related to the water cycle. By the end of the water cycle lessons pupils will be able to check to make sure that they have matched the correct word to the correct picture, and be able to put the water cycle pictures and words in the correct order to show how the water cycle works.
- Talk through the different stages of the water cycle with the class. As you describe each part, choose a volunteer to draw it on the board. For example the sea, the sun, vapour and so on, until you have the water cycle drawn up as a diagram. You can guide where each drawing should go to ensure that the water cycle is depicted correctly.
- Explain four main stages in the water cycle (evaporation, condensation, precipitation and collection):

1. **Evaporation** happens when warmth from the sun causes water from the sea, lakes and rivers to rise into the air and turn to vapour, which then merge together to form clouds.
2. **Condensation** happens when water vapour turns back into liquid, and forms clouds in the sky.
3. **Precipitation** is when water (which could be rain, snow, hail or sleet) falls from clouds in the sky. This falls on the land and enables plants to grow and provides us with drinking water.
4. **Run off** happens when much of this water flows into lakes and rivers, and gets carried back to the sea.

### Making a drama of the water cycle

- Recap the main stages of the water cycle and what each of the following words mean:
  - **Evaporation**
  - **Condensation**
  - **Precipitation**
  - **Run off**
- Explain to the class that they will be acting out the water cycle. Split the class into four groups. Each group should be allocated one stage of the water cycle. Make sure that the other groups don't know what stage it is – you could write each stage on a card and put it in an envelope, so that other groups can't see or hear what has been given to them.
- Each group should then think of actions they could use to represent the stage. Once they have decided on their actions, they should share them with the rest of the class who have to guess what stage of the water cycle the group is representing.
- Each group should then teach the action to the rest of the class to create a dramatised water cycle. They could perform their water cycle in an assembly or at the start of your Pupil Pipeline event.

# Build a model water cycle

Now that your pupils are all water cycle experts, explain that they are going to make their own models of the water cycle to see it in action. For the models, you will need the following for each child:

- **A clear plastic jar (they should label their jars so that they can observe and record what is happening)**
- **Cling film or sheets of clear plastic**
- **Rubber band**
- **Soil**
- **Birdseed**
- **Measuring cup**
- **Water**

Go through the following instructions step by step with the pupils:

1. Ensure that the plastic jar is clean and dry.
2. Add a layer of soil to the bottom of the jar. The layer should be about 2 cm deep.
3. Sprinkle about half a teaspoon of birdseed over the soil.
4. Cover the bird seed with another layer of soil that is also about 2 cm deep.
5. Measure 60 ml of water using the measuring cup. Slowly pour this over the soil. Make sure the water is poured evenly over the soil's surface.
6. Cover the top of the jar with cling film or plastic and secure it with a rubber band.
7. Place the jars on a window sill or other place where it can remain in direct sunlight.

Over the next few days, the pupils should examine their jars and record what they can see. They should then use their observations to answer the following questions:

1. How did the appearance of the jar and plastic cover change?
2. Did droplets appear on the inside or outside of the jar?
3. Where do you think the water droplets came from?
4. What happened to the birdseed?
5. What role did sunlight play in the change from liquid water to water vapour?

## Assessment

Using their observations, the pupils should draw their jars and explain the processes using the correct key words from the water cycle. They should take time to think about what they have learned, then pair up with another pupil and share their ideas. They can then assess each other's understanding of the key words and processes and amend if necessary through feedback.

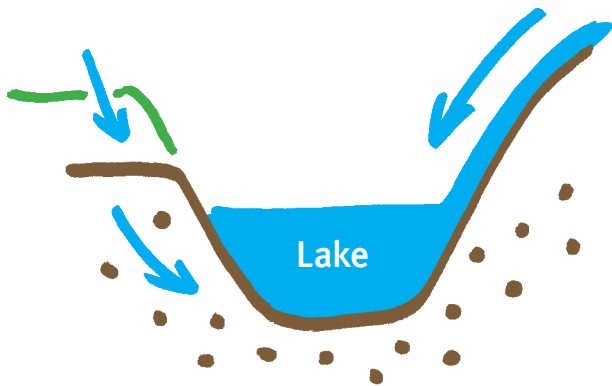
## Plenary

Print off water cycle quizzes for each pupil to complete. Share the answers as a class and review each stage of the water cycle. Use questions to ensure that the pupils understand why the water cycle is vital to life on earth. For example the fact that, without the water cycle, rain would not fall to enable plants and crops to grow.



# Water cycle starter cards

Print and cut out the water cycle key words and images. On each table place the jumbled up cards. The pupils need to match the picture to the word.



**Run off**



**Evaporation**



**Condensation**



**Precipitation**



# Plenary true or false quiz

Circle either true or false for each question.

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- 1. When heat from the sun heats up the sea, it turns the water into vapour.**

True or false

- 2. Condensation creates rain.**

True or false

- 3. The wind blows the clouds over land and the clouds drop their water as rain, sleet or snow.**

True or false

- 4. Evaporation creates water vapour.**

True or false

- 5. Run off is the excess water that runs back into rivers and lakes.**

True or false

