



# THE PUPIL PIPELINE RESOURCES

## KS2: SCIENCE AND GEOGRAPHY

### WHAT IS THE PUPIL PIPELINE?

WaterAid provides clean water, sanitation and hygiene education to some of the world's poorest people. Just one of the communities WaterAid will be reaching is a primary school near **Finote Selam, Ethiopia**. The school and the surrounding village have no access to water. There's no working toilets in the school building either.

The Pupil Pipeline is a fun and educational water delivery challenge for schools that will help bring clean water to communities around the world, like Finote Selam's primary school.

**The challenge?** Pupils need to work together to transport water with as little waste as possible. 10 litres, over 50 meters, within 20 minutes, without anyone leaving their spot! Anything goes: buckets, bottles, jars, cups or even wellies.

**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

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.

### 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

## RESOURCES AND MATERIALS



- Clear plastic jars
  - Cling film or sheets of clear plastic
  - Rubber band
  - Soil
  - Birdseed
  - Measuring cup
  - Water
- 
- The water cycle starter cards
  - The water cycle diagram

## KEYWORDS



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

## 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.

## ACTIVITY: WHAT IS THE WATER CYCLE?



**Starter:** Print and cut out **the water cycle keywords and images**. On each table place the jumbled up cards. The pupils need to match the picture to the word.

- 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 means that we drink the same water that the dinosaurs drank millions of years ago!
- The way that water is recycled is called **the water cycle**. Without the water cycle, 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 and 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 **the four main stages in the water cycle** (evaporation, condensation, precipitation and collection):

**Evaporation** happens when warmth from the sun causes water from the sea, lakes and rivers to rise into the air and turn to vapour.

**Condensation** happens when water vapour turns back into liquid, and forms clouds in the sky.

**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.

**Collection/run off** happens when much of this water flows into lakes and rivers, and gets carried back to the sea.

- Ask pupils to look at the keywords and images on their table again. Tell them to work together to see if they have matched them correctly. Once they have done this, go through the answers again as a class to make sure each group has matched the images and keywords correctly. Finally, give pupils a printed copy of the water cycle diagram which has the labels missing. Ask pupils to fill in the gaps and label the diagram with the key stages of the water cycle. They can use their own knowledge of the water cycle, the diagram on the board and the card sort activity on their tables to help them.

## ACTIVITY: 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 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?

## ACTIVITY: MAKING A DRAMA OF THE WATER CYCLE



• Recap the **main stages of the water cycle** and what each of the following words mean:

1. Evaporation
2. Condensation
3. Precipitation
4. Collection/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 they can't see or others can't 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 they are representing.

• Each group should then teach the action to the rest of the class to create a **dramatized water cycle**. Why not use it to kick start your Pupil Pipeline activity?

## ASSESSMENT



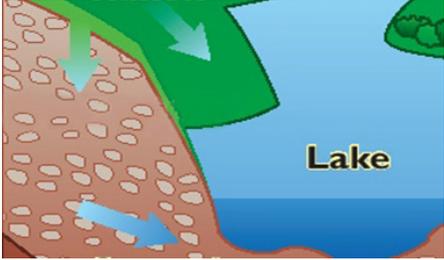
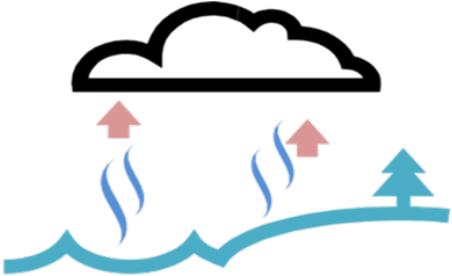
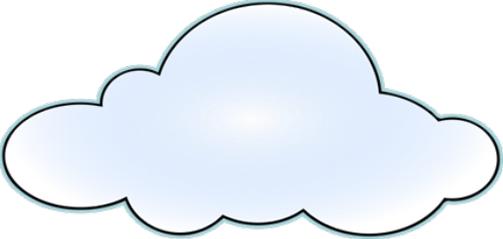
- Using their observations, the pupils should draw their jars and **explain the processes** using the **correct keywords** from the water cycle.
- They should take time to think about what they have learnt, then **pair up with another pupil** and share their ideas.
- They can then **assess** each other's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

## PLENARY



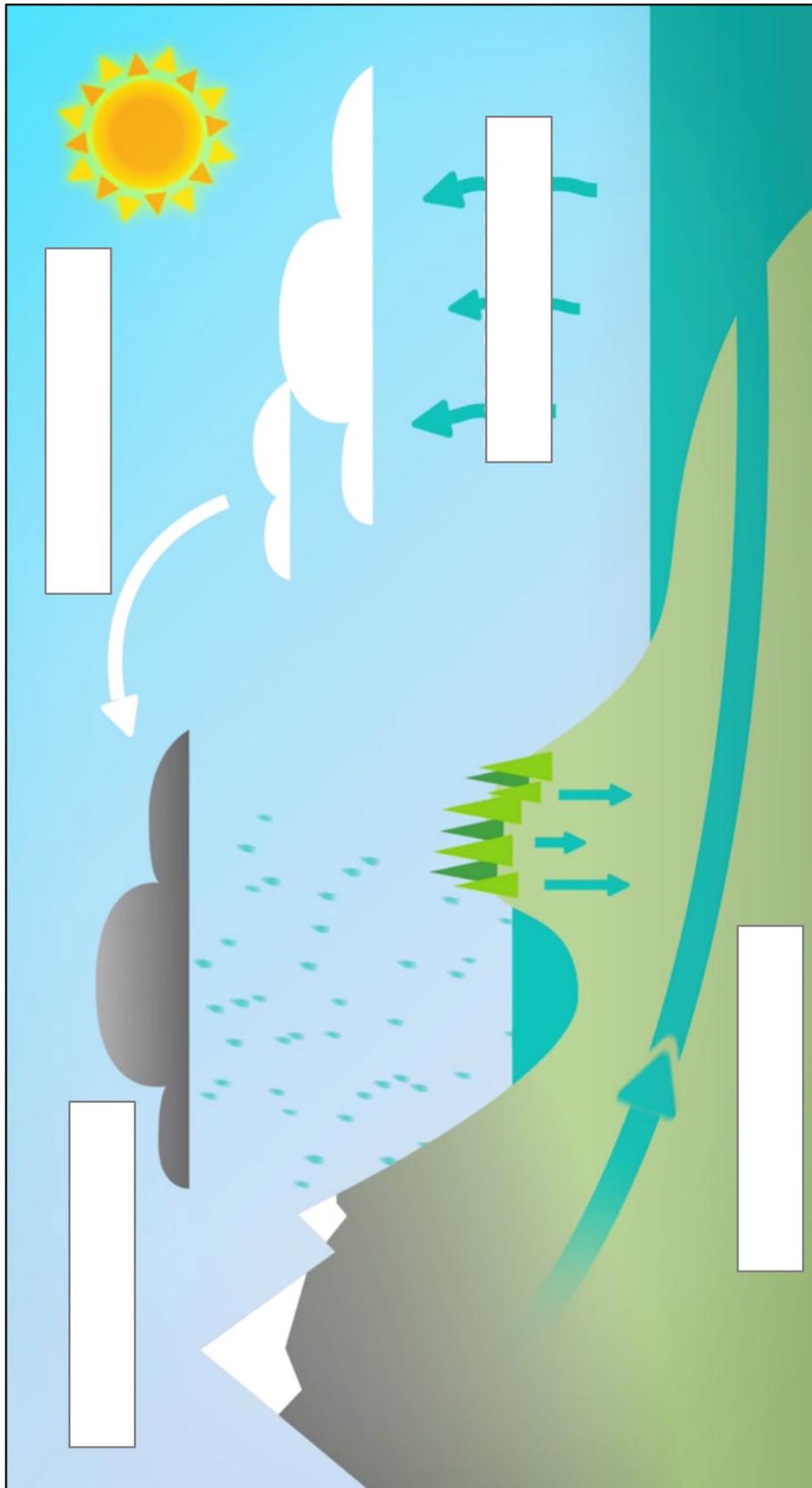
- Print off **water cycle quizzes (page 6)** for each pupil to complete. Share the answers as a class and review each stage of the water cycle.
- Use **questions** to ensure that pupils understand **why the water cycle is vital** to life on earth. For example, the fact that without the water cycle, rain would not fall to enable plants and crops to grow.

# THE WATER CYCLE STARTER CARDS

 A cross-section diagram showing water flowing over a green hillside into a blue lake. The word "Lake" is written in the water. Below the surface, blue arrows indicate water flowing through the brown, porous ground.	<p><b>Run off</b></p>
 A diagram showing blue wavy lines representing water. Two red arrows point upwards from the water surface. A blue tree is on the right, and a black cloud is above the water.	<p><b>Evaporation</b></p>
 A large, light blue, fluffy cloud with a white outline.	<p><b>Condensation</b></p>
 A white cloud with a black outline, with several blue raindrops falling from it.	<p><b>Precipitation</b></p>

# THE WATER CYCLE

Label the diagram below with the 4 key elements of the water cycle



# PLENARY: TRUE OR FALSE

Circle either true or false for each question.

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