PUPIL KS3

Water Cycle

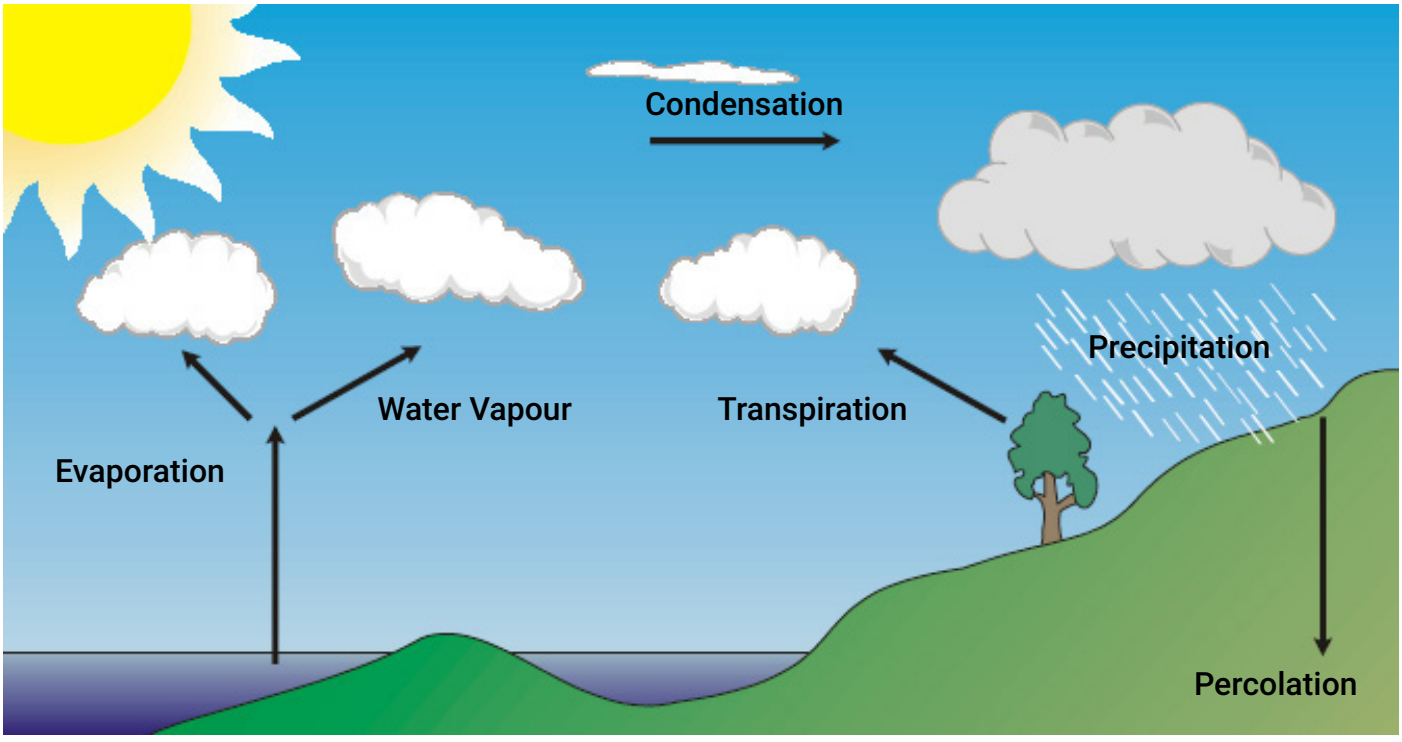
Where does our water come from?

We believe the amount of water on the earth is the same now as it was when the planet was created. So where did it come from? Scientists think it was released as clouds of steam when the earth was cooling over 4,000 million years ago. Since then, this water has been continually recycled.

The water cycle

Our water travels in a circle between oceans, the air and the ground. We call this the water cycle. This process is vital to life on earth because it keeps all creatures supplied with fresh water.

- 97% of the world's water is salty sea water
- 2% is frozen in the polar ice caps
- only 1% is available fresh water that humans can use - and this is all recycled



When it rains the ground becomes wet and you can see the water collect in puddles. During hot weather the puddles dry up relatively quickly. As the water heats up, molecules of water (H2O) break up and leave the puddle to become water vapour in the air. This evaporation happens when heat energy from the sun warms the water. Evaporation is faster when temperatures are higher, there is wind and humidity is low (ie the air is "drier").

The seas, lakes and oceans are like giant puddles which never dry up, even though huge amounts of water are evaporated from them every minute. The evaporated water, or water vapour, can be blown over land by the wind. If this damp air is caused to rise by hills or mountains, it will begin to cool down and we can then see this water vapour as it begins to form tiny water droplets again in the air. This is condensation. When many water droplets gather together in the same place we can see them in the form of clouds.

The process of condensation occurs because the air is cooler the higher up it is in the atmosphere. As the air holding the water droplets rises and cools further, the droplets grow and eventually become so large that they fall back to earth as rain. The rain can soak into the ground, or 'run off' to collect in streams and rivers and eventually return to the sea.

A lot can happen to the rain water that soaks into the ground. Some of it percolates deeper into the rocks where it can become trapped. Underground rocks which hold water are called aquifers. In time, some of these may form underground caves with lakes as the water drains away, Some water will be drawn up by the roots of plants and released back into the air through their leaves. When plants absorb water and release water molecules back into the air as water vapour, this is called transpiration.

Some of the water in rivers or underground aquifers is pumped out by the water companies and may join other sources of water on the journey to your sink or bath via your tap. This water will eventually be returned into the drains and sewers after fulfilling a multitude of roles, some important to life, others less vital. After travelling through the local sewage treatment works, the water will enter a river and eventually return to the sea.

South West Water gets its water from both surface stores (rivers, lakes and reservoirs) and groundwater stores.

Did you know?

The world has always had the same amount of water … so you are drinking recycled water that the dinosaurs drank!

Reservoirs and rivers

When rain falls on impermeable rocks (those which do not let water through), most of it runs off the land into lakes, rivers and reservoirs.

A lot of water can be taken from rivers and treated so it can be supplied as clean water. In some places it is possible to build a dam across the river to form a lake, sometimes called a reservoir. Water is released from the reservoir to keep the river below it at a certain level. Almost all the reservoirs above ground are manmade. These are surface water stores.

In the North of England there are more rivers and lakes because there is more rainfall over the mountains. Many large dams have been built to supply large northern cities such as Manchester and Leeds.

Did you know?

Kielder Water is a large lake formed by building a very large dam across the North Tyne Valley. The dam is three-quarters of a mile long and 52 metres high. The reservoir took two winters to fill and is the largest man-made lake in northern Europe.

Reservoirs and rivers

Rain falling on permeable rocks will make its way underground by seeping through the soil and rocks until it reaches a layer of impermeable rock. Some rain is stored in permeable rocks like a sponge while other water is stored in cracks and underground reservoirs. Underground layers of rock which store water are called aquifers. These are groundwater stores. To extract this water, we drill boreholes (deep wells) and use electric pumps to bring the water up. The water is then treated.

Springs are normally found in or near hills. A few remote villages, which are not connected to the water system, often rely on springs to supply their water. This water is usually pure and requires no treatment except disinfection.

The water from the spring may be fizzy if it contains calcium carbonate which breaks down into carbon dioxide gas, C02, giving the water its fizz. This water is often bottled and sold and as sparkling mineral water. Springs are a source of groundwater.

South West Water supplies drinking water to about 1.8 million people in Devon, Cornwall and the Isles of Scilly as well as small areas of Somerset and Dorset. This number increases significantly during the summer months because of all the visitors to the area.