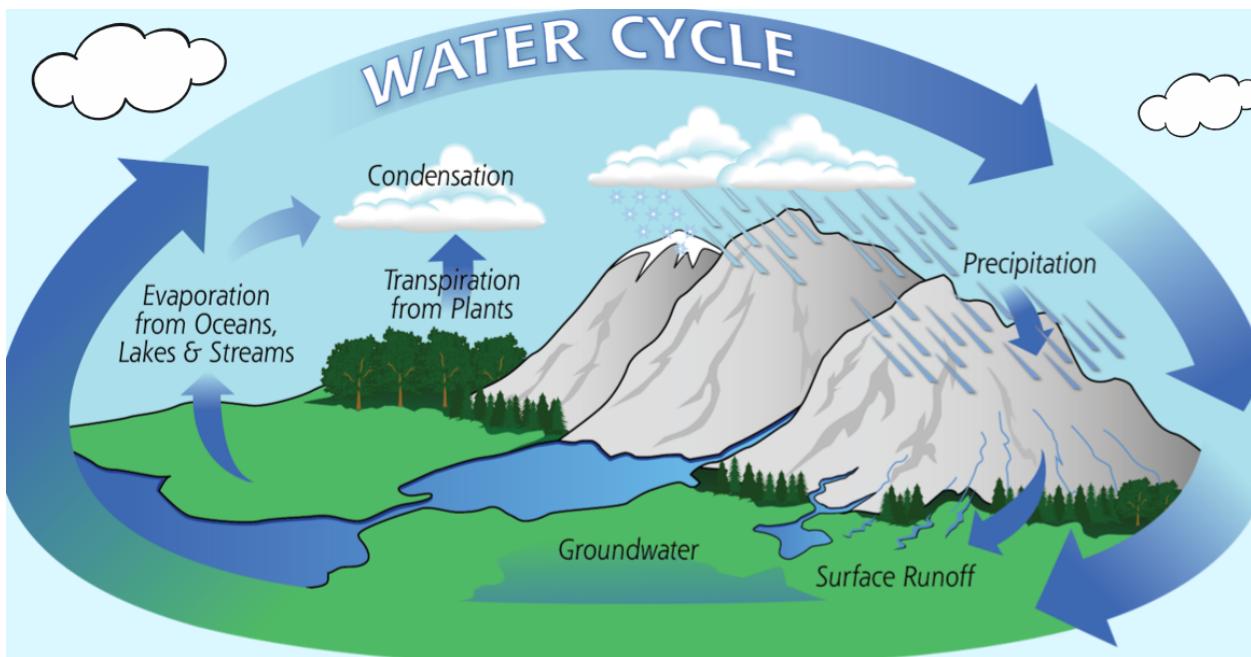




The Water Cycle

The water cycle, also known as the hydrological cycle, is a continuous process that describes how water moves and circulates through the Earth's atmosphere, land, and oceans. It involves the various stages of water, transitioning between liquid, vapour (gas), and solid (ice) states as it completes its journey.

Here is an image that briefly encapsulates how the water goes around in a natural ecosystem:



Terminology Needed



Water Vapour: Water vapour is the gaseous form of water. It is an invisible gas that we cannot see with our eyes, but it exists all around us in the Earth's atmosphere.

Water **continuously cycles** between its three states: **solid, liquid and gas**.

Liquid water is found as lakes, rivers, rain and oceans.

Solid water is found as **snow or ice**, and is found in snowdrifts and glaciers.

Gaseous water is steam. After water has evaporated into steam, it condenses again, forming **water vapour**. Water vapour is found in mist and clouds.



Humidity is a measure of the amount of **water vapour in the air**. Humidity levels are directly influenced by the water cycle!

Precipitation

Precipitation occurs when so much water has condensed that the air cannot hold it anymore. The clouds get heavy and water falls back to earth in the forms of sleet, hail or snow. Those three are all forms of water.

Evaporation

Evaporation is a process by which water changes from its liquid state to water vapor (gas) when it is exposed to heat or warmth.

When the Sun shines on bodies of water, such as oceans, lakes, rivers, or even wet surfaces like puddles, the heat from the Sun's rays provides energy to water molecules at the surface. As these water molecules gain energy, they become more active and move faster. Eventually, some of these water molecules have enough energy to break free from the surface and turn into water vapor, rising into the atmosphere. This transformation from liquid water to water vapor is called evaporation.

Condensation

Condensation is the process in which water vapour (gas) changes back into the liquid state.

When water evaporates from bodies of water or wet surfaces and rises into the atmosphere as water vapor, it eventually cools down as it gets higher into the air. As the

water vapor cools, it loses energy, and its molecules slow down. When the water vapor molecules slow down enough, they start coming closer together and sticking to each other.

When this happens, the water vapor changes back into tiny water droplets. These water droplets come together to form clouds in the sky. Clouds are like collections of billions of these tiny water droplets. This transformation from water vapor to liquid water is called condensation.

Fun Snippet - Clouds

Clouds are visible because of the condensation process. When water vapour in the air cools down and condenses into tiny water droplets, these droplets come together to form clouds. Clouds are like collections of these water droplets, and when billions of them gather together, they become large enough for us to see them with our eyes.

The water droplets in clouds are so tiny that they are suspended in the air. They are incredibly small and light, but when billions of them gather, they become visible as a cloud. The size and shape of the cloud depend on various factors, such as the amount of water vapor present, the temperature, and the air currents in the atmosphere.

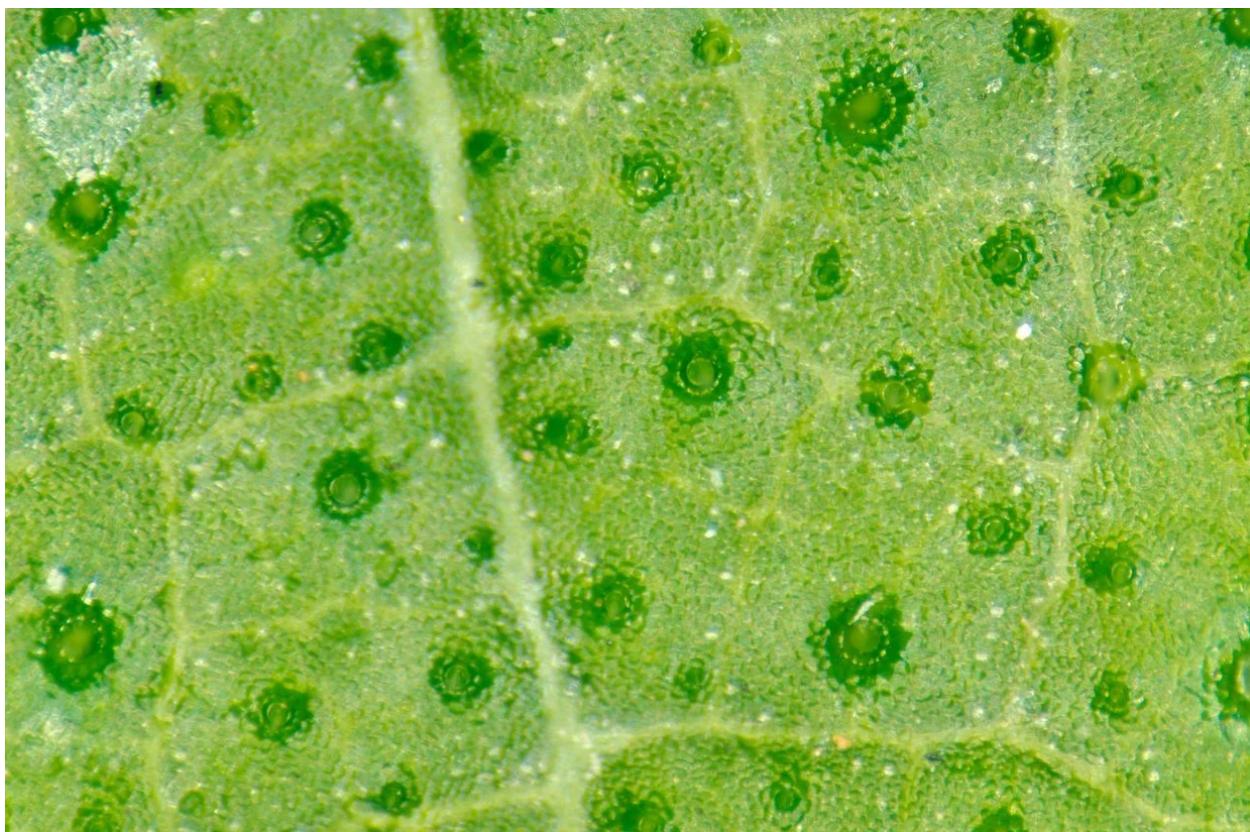
Clouds come in many shapes and forms, like fluffy cumulus clouds, thin and wispy cirrus clouds, and thick and gray stratus clouds. They are not solid like objects we can touch, but they are visible as they scatter and reflect sunlight, giving them their characteristic appearance in the sky. Clouds are an essential part of our atmosphere, influencing weather patterns and playing a crucial role in the Earth's climate system.

Transpiration

Transpiration is a natural process through which plants release water vapor into the atmosphere. Just like humans sweat to cool down, plants "sweat" too, but instead of liquid sweat, they release water vapor through tiny openings called stomata on their leaves, stems, and other parts.

During transpiration, water is taken up by the roots of the plant from the soil and transported through the plant's vascular system (xylem) to reach the leaves. Once in the leaves, the water evaporates through the stomata into the surrounding air as water vapor.

Transpiration serves multiple important functions for plants and the environment. It helps plants cool down, maintain their internal temperature, and prevent overheating. It also plays a crucial role in the absorption of nutrients from the soil and the movement of water through the plant, enabling the transport of minerals and other substances to different parts of the plant.



Close up image of a plants Stoma

Runoff

Runoff refers to the movement of water over the Earth's surface, typically as a result of precipitation, such as rain or snow, that exceeds the land's capacity to absorb it. When it rains or snows, some of the water is absorbed by the soil and used by plants (infiltration), while the excess water flows over the surface, collecting in streams, rivers, and eventually making its way back to the oceans.

Runoff plays a crucial role in the water cycle by transporting water from higher elevations to lower elevations, helping to replenish rivers, lakes, and groundwater sources. It is an essential mechanism for distributing water across the landscape, sustaining aquatic ecosystems, and providing a source of freshwater for human and animal consumption.

Perlocation

The water can **sink** so far into the ground that it enters the **water table**, which is an area below the ground that is saturated with water. This process is known as **percolation**.

IN SUMMARY...

THE WATER CYCLE

