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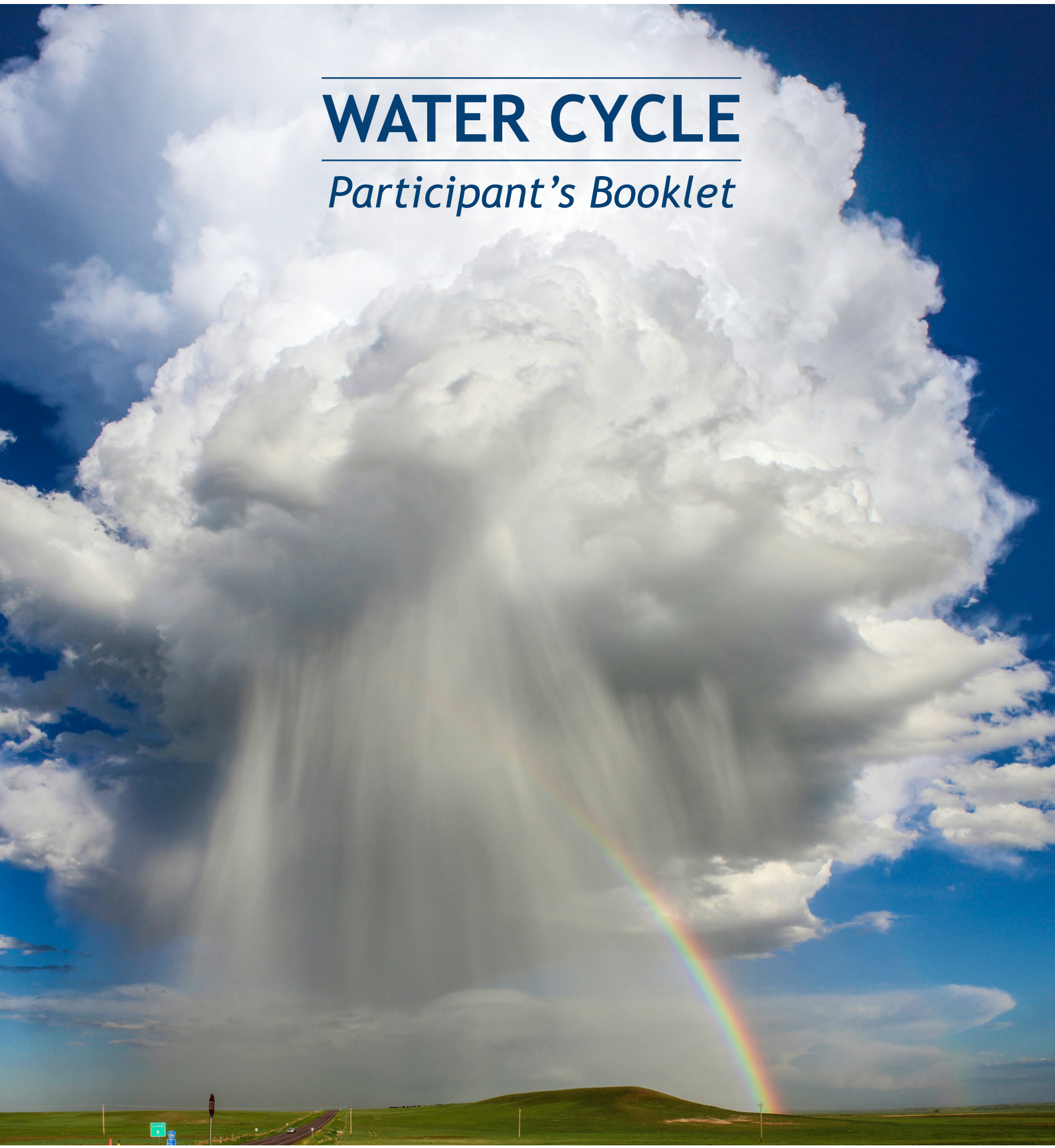
BioLearn

Black Sea
CROSS BORDER
COOPERATION

WATER CYCLE

Participant's Booklet



CROSS BORDER
COOPERATION

Common borders. Common solutions.

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BioLearn

Black Sea CROSS BORDER COOPERATION

BIOLEARN-BSB142
ECO-CONSCIOUS MINDS TO STOP POLLUTION
IN THE VALUABLE WETLANDS OF BLACK SEA BASIN

WATER CYCLE

Participant's Booklet

Target Audience: 8-14 years old

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www.bio-learn.org

Contents

About The Project

BIOLEARN (Eco-Conscious Minds to Stop Pollution in the Valuable Wetlands of Black Sea Basin - BSB142), which was initiated on 01.01.2020 within the scope of the first call for proposals of "Joint Operational Programme Black Sea Basin 2014-2020" where the Directorate for EU Affairs is the national authority, is led by District Government of Enez.

Representatives of the following partners are as follows:

1. District Government of Enez-Turkey
2. Division Directorate of Edirne under First Regional Directorate under General Directorate of Nature Protection and Nature Parks of Ministry of Agriculture and Forestry - Turkey
3. Foundation Caucasus Environment - Georgia
4. Agricola NGO - Ukraine
5. Green Balkans / Stara Zagora NGO - Bulgaria
6. Management Body of Evros Delta and Samothraki Protected Areas - Greece

The overall objective of the project is to provide information, experience transfer and capacity building training between partners and develop a common environmental protection and education approach, methodology and organizing campaigns that will raise awareness in the society to reduce pollution in important wetlands in the Black Sea Basin.

The main activities to be carried out within the scope of the26-monthsproject are as follows:

1. Establishment of a total of 4 environmental protection and training centres, one of which is on the shores of Gala Lake, and providing environmental protection training to visitors and especially to students. By providing equipment for the other 6 existing centres, there will be a network of 10 activity and training centres.
2. Workshops to be held in Bulgaria and Greece, focusing on discussions about examples of

successful training and awareness-raising campaigns for the protection of wetlands, sharing experiences and preparing the materials to be used in training which will be applied in all centres. Capacity building training for trainers.

3. Organizing massive and synchronized cleaning campaigns to reduce pollution in wetlands.
4. Award-winning photo contest and exhibition focused on wetland protection.
5. Organizing a wetland pollution-based painting contest and exhibition in primary and secondary schools.

Outputs of the Project:

1. "Stop Pollution" and "Save Nature" environmental education and activity centres, one of which is mobile, will be established in 5 countries and will sustainably carry out training and awareness-raising activities.
2. A report will be prepared on the nature and rate of pollutants in 5 wetlands in the Black Sea Basin.
3. A guide with examples of good practices consisting of training and campaigns focused on protecting wetlands will be prepared.
4. A wetland protection training set consisting of 12 sections will be prepared especially for students. Training sets will also be shared on the internet.
5. After 10 people from 2 each partner country received trainer's training, they will train 25 people in each region (totally 125 people) and the sustainability of training activities will be ensured in the established centres.
6. A painting competition on environmental protection will be held in at least 15 primary and secondary schools and paintings selected by the jury will be exhibited.
7. Pictures taken in 5 regions with the participation of professional photographers will be exhibited. With the mobile 'Stop Pollution' vehicle, the exhibition will travel to 5 countries.
8. An environmental cleaning campaign will be held simultaneously with the participation of 1500 people in 5 regions.
9. With the international conference to be held in Georgia, the outputs of the project and future action plans will be shared with the public.

For more information, you can visit the project website: www.bio-learn.org

Water Cycle

The water cycle is extremely important for the health of living and non-living beings on our planet.

What Is the Water Cycle?

Water is the source of our life and the most fundamental thing to survive. Such that, when astronauts travel to other planets, they try to find water as their first mission. They think that if there is water, there would be living beings. Just like our world!

There is water in every corner of our planet from oceans to the atmosphere and this water is continuously moving in a never-ending cycle. Sometimes it exists in liquid form in oceans, rivers, lakes and underground waters and sometimes it is stored as snow and ice on the poles and mountains by freezing into a solid form. Sometimes it evaporates

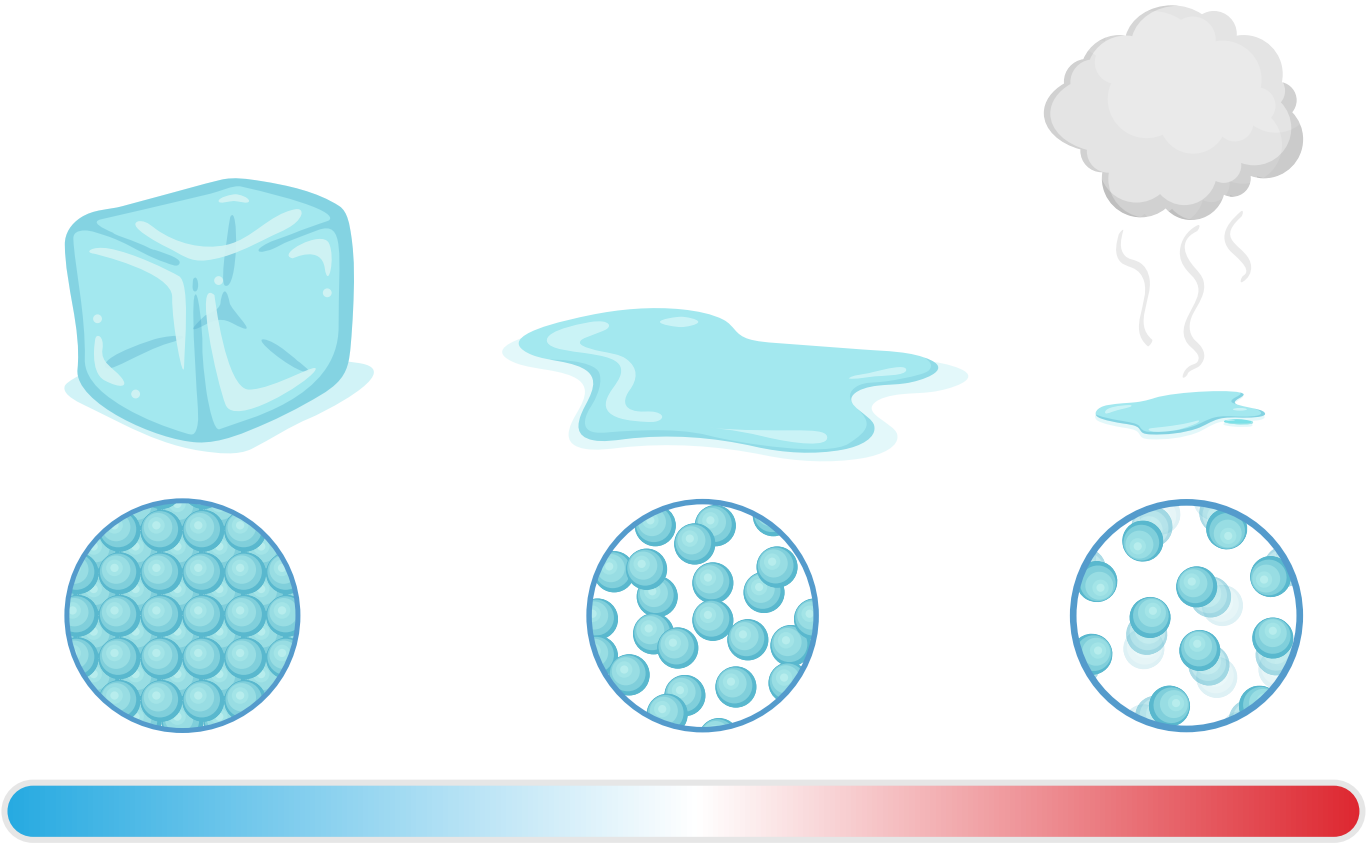
This photograph was taken from the Apollo 17 space shuttle in 1972. Due to the large size of oceans and seas, the astronauts call our planet "The Blue Planet" since the first day they have seen it from space.

and mixes to the atmosphere in gas form to create clouds. The entire movement of the water is called the **water cycle**. This cycle has been working for 4.5 billion years without any interruption. The water that we drink today might be the same water drunk by mammoths or dinosaurs that lived thousands of years ago! The water we put in our glass and drink might be 4.5 billion years old... Have you ever thought about it like that?

The water cycle is extremely important for the health of living and non-living beings on our planet. First of all, water is the most fundamental thing for all living organisms to sustain their lives. For example, a human needs to drink 2-3 litres of water per day on average. In addition to humans, all other living beings need water as well. Water plays an important role in the climate of our planet. The formation of clouds, rain and snow or the formation of glaciers are the results of the healthy functioning of the water cycle.

Did You Know?

72% of the Earth's surface is covered with water. Most of this water is formed from seas and oceans and only 3% is freshwater. The majority of the freshwater is frozen in glaciers. Therefore, only 1% of the entire water on our planet is usable.



The water will transform from solid to gas as the temperature increases.

Did You Know?

The water can directly transform from solid to a gas without a liquid state. This is called sublimation. In this way, the icebergs evaporate without melting and mix with the atmosphere.

Solid, Liquid, Gas: The Three States of Water!

Water has 3 different states on our planet: solid, liquid, gas.

The snow and ice formed by water freezing at low temperatures represent the solid form of water. The glaciers and snow that cover the top of the mountains, giant glaciers in the North and South Pole are the main places where the solid form of water exists.

The most frequently encountered form of water which is liquid can be found in every corner of our planet. Oceans, lakes, rivers, streams, wetlands and even underground

water are the main places that store the water in liquid form.

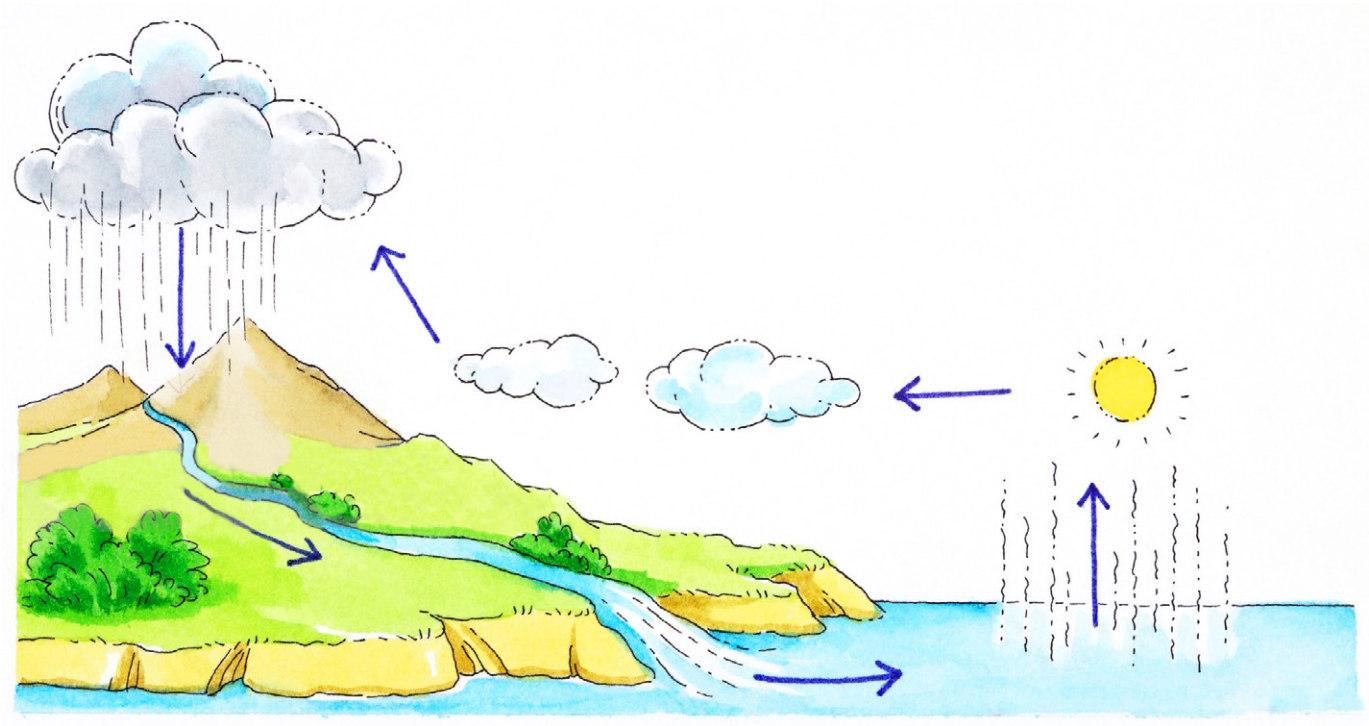
Lastly, there is the gas state of water. Water molecules, distributing to the atmosphere as water vapour, surround the entire planet. The atmosphere consists of approximately 4% water vapour. This ratio might change depending on the location and time. For example, while this ratio is almost 0% in a dry area, it could be 4% in a tropical region.

From Water Drop to Rain Cloud

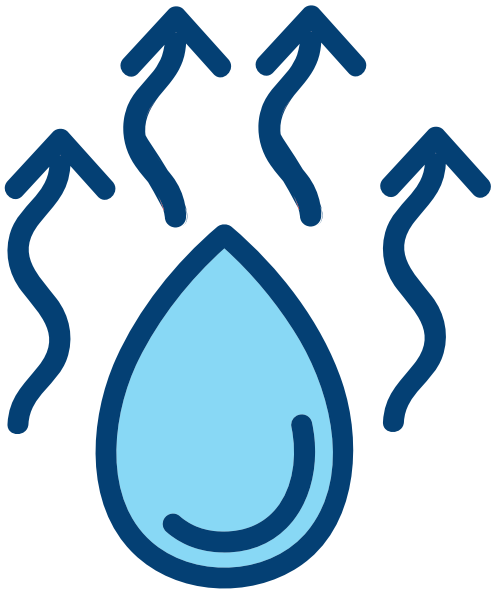
How can the glaciers on top of the mountain transform into the clouds in the sky?

The water cycle begins when the Sun rays reach the surface. These rays that reach our planet both provide light and radiate heat.

Water exists in every corner of our planet in solid, liquid and gas form and continuously changes place with the water cycle. The water cycle has continued for 4.5 billion years without any interruption.



Water cycle



In this way, the surface heats up slowly. As the water mass in the oceans, lakes and rivers heat up, the water **evaporates** and rises to the atmosphere in water vapour form. At the same time, plants and trees lose water from their leaves and this water is released to the atmosphere in water vapour form. This is called **transpiration.**

Water vapour reaching to the atmosphere raises to the upper layers. It gets colder as it goes higher and it transforms back to the liquid form to create the clouds. This is called **condensation.** The clouds formed by this event, which is the opposite of evapora-

tion, circles around the world in the sky. As the water amount in the clouds increases, the size and weight of the clouds increase. When the air cannot take any longer, the excess water drops to the ground as **precipitation** in rain, snow and hail form.

This precipitation that falls to the ground **flows** to oceans, seas, lakes, rivers, wetlands and underground. The melted snow from the peaks of the mountains reaches the streams and rivers. In the end, some of the water here evaporates with the sun and gets ready to become clouds. Thus, another cycle in the water cycle begins. This cycle uninterruptedly continues on our planet.

Wetlands play important roles in the water cycle. It both stores the water from precipitation and contributes formation of new precipitation with evaporation.

The Roles of Wetlands in the Water Cycle

Wetlands play important roles in the water cycle. First of all, the existence of wetlands decreases floods caused by precipitation and prevents destructive effects. Water that reaches the ground with precipitation is stored in wetlands such as marshes, bogs and swamps. Thus, they act as barriers in front of human settlements and prevent the destructive effects of floods.

Water masses in the wetlands enable cloud formations with evaporation and contribute to the functioning of the water cycle. On the other hand, wetlands act as a filter and send some of the stored water to the underground by filtering it. In this way, it feeds the underground water sources and the freshwater basins become always full.

Wetlands have important tasks in the water cycle.

What did we learn?

Only 1% of the entire water on the planet is usable freshwater.

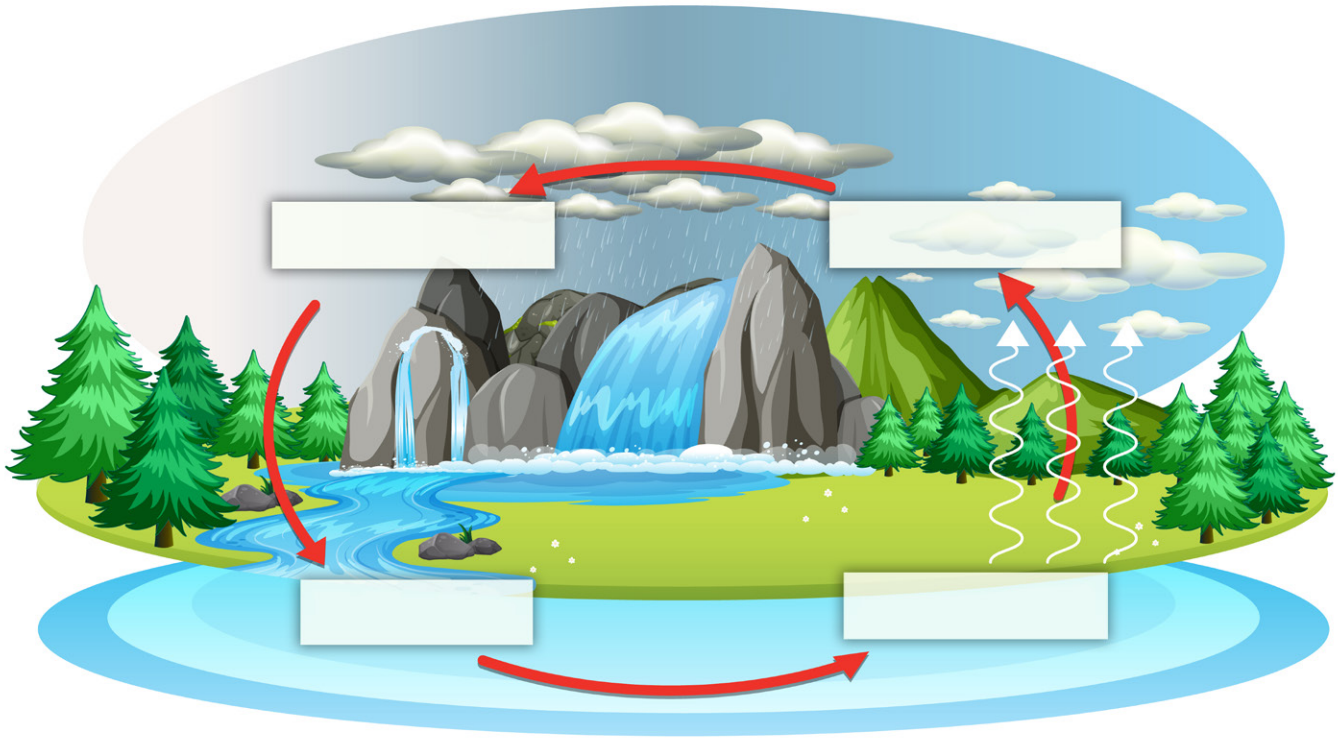
Water exists in every corner of our planet in solid, liquid and gas form and continuously changes place with the water cycle.

The water cycle has continued for 4.5 billion years without any interruption. The water that we drink today might be the same water drunk by mammoths or dinosaurs that lived thousands of years ago!

Wetlands play important roles in the water cycle. It both stores the water from precipitation and contributes formation of new precipitation with evaporation.

Worksheets

WATER CYCLE DIAGRAM



Answer Key:
Top left: Precipitation **Bottom left:** Flow **Bottom right:** Evaporation **Top right:** Condensation

Notes

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