



Engineer
Meligy

1st

Secondary

Integrated Science

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— 1st Term —





The Hydrosphere

Our planet Earth is often called the blue planet because most of its surface is covered with water. This water exists in oceans, seas, rivers, lakes, ice caps, underground, and even in the air as vapor. All of this together is known as the hydrosphere. The hydrosphere is not just important for the beauty of Earth—it is the very reason life exists. Without it, humans, animals, and plants could not survive.

Environment

A concept derived from the French word “Environ,” which means “surround,” or “everything that surrounds us.”



Environment Features

- 1- The environment is affected by a set of variables that surround human and other living organisms.
- 2- The environment is a complete connected system consists of:

Physical & Chemical Elements



Sun Light



Air



Water



Soil

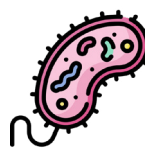
Biological Elements



Plants



Human



Micro-organisms



Animals



Note

The components of this system are **inseparable** (cannot be separated) due to close connection between its components (water, air, land, human, and other living organisms).

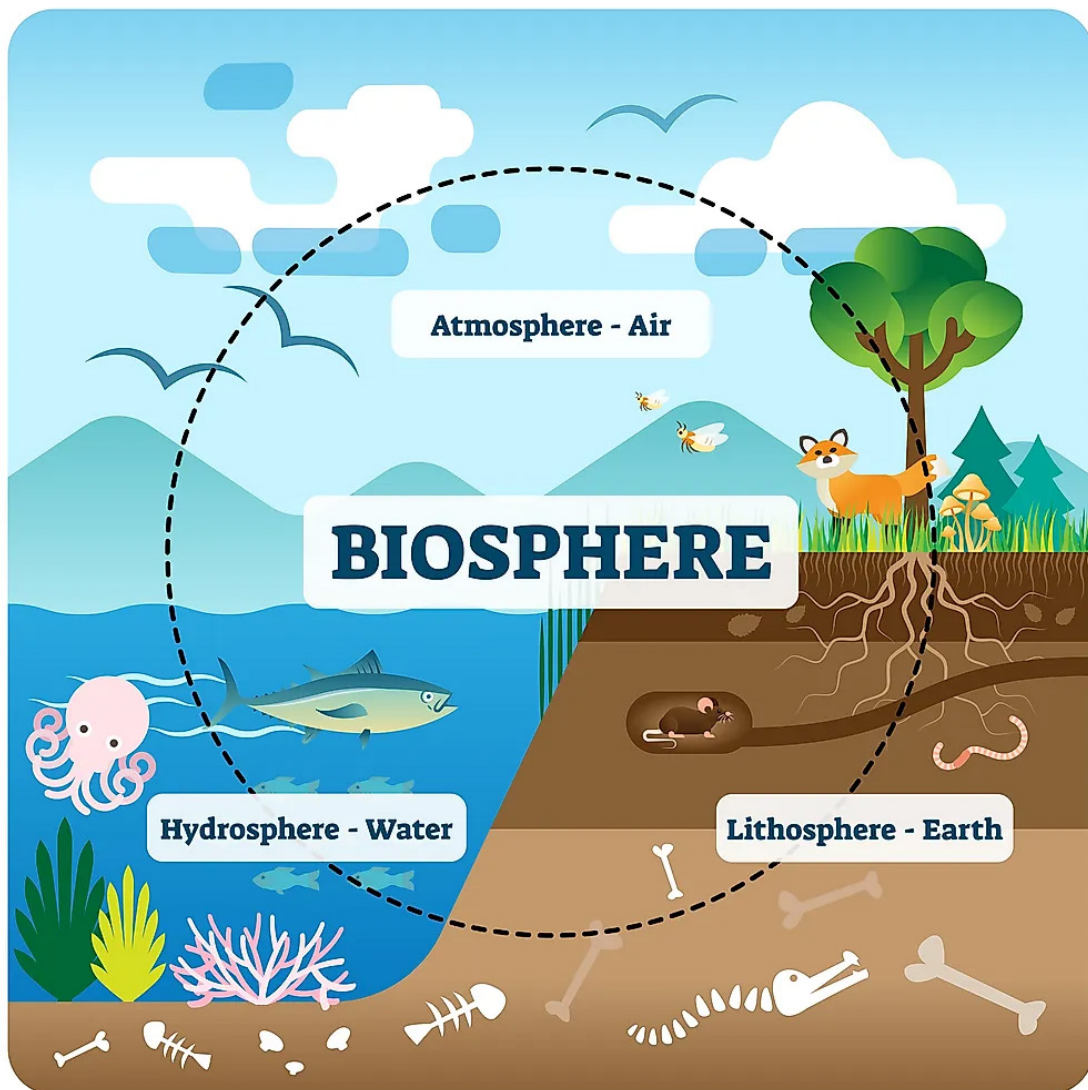
Ecosystem

It is a community of living organisms that interact with each other and with the non-living components of their surroundings in order to adapt to changing conditions. There are many types of ecosystems around us, such as **aquatic** ecosystems, **deserts**, and **forests** of different kinds.



The natural environment consists of four interconnected spheres, they are constantly interacting with one another, and they are also affected by—and have an effect on—human activities, those spheres are:

1. **Hydrosphere** (water on Earth)
2. **Atmosphere** (the layer of **air** surrounding Earth)
3. **Lithosphere** (the solid outer layer of Earth, including **rocks and soil**)
4. **Biosphere** (all **living organisms**)





The Hydrosphere on Earth

The hydrosphere is what makes planet Earth unique compared to the other planets in the solar system. The term hydrosphere refers to **all the water found on Earth**.

- Water covers about **70%** of Earth's surface, while land makes up the remaining **30%**.
- About **97%** of this water exists as **salt water** in oceans, seas, and salt lakes. This water is not **directly** suitable for human use because of its high salt content.
- Only about **1%** of Earth's water is fresh water available in rivers, lakes, streams, reservoirs, and groundwater. This is the type of water that humans can use for drinking and daily life.
- Around **2 %** of Earth's water is found **frozen** in the polar ice caps and glaciers.



Think With Mr. Meligy

1. Which of the following is biological element of environment?

- a) Sun
- b) Air
- c) Light
- d) Plants

2. List 3 examples of ecosystems:

- 1)
- 2)
- 3)

3. List all spheres of the planet Earth:

- 1)
- 2)
- 3)
- 4)

4. What is the percentage of salt water on Hydrosphere?

- a) 1%
- b) 70%
- c) 97%
- d) 30%



The Water Cycle in Nature

- Water on Earth is always changing between its **three states of matter**: solid, liquid, and gas, within the normal temperature range found on the Earth's surface.
- This water is constantly moving from one place to another through many different pathways. Together, these movements form a nearly **closed system** called the **water cycle** (or the **hydrological cycle**).
- The water cycle describes the **continuous movement** of water all around the globe. It is a powerful natural system that can change the Earth's surface in **three ways**:

Physically

(By shaping land-forms through erosion and deposition)

1

Chemically

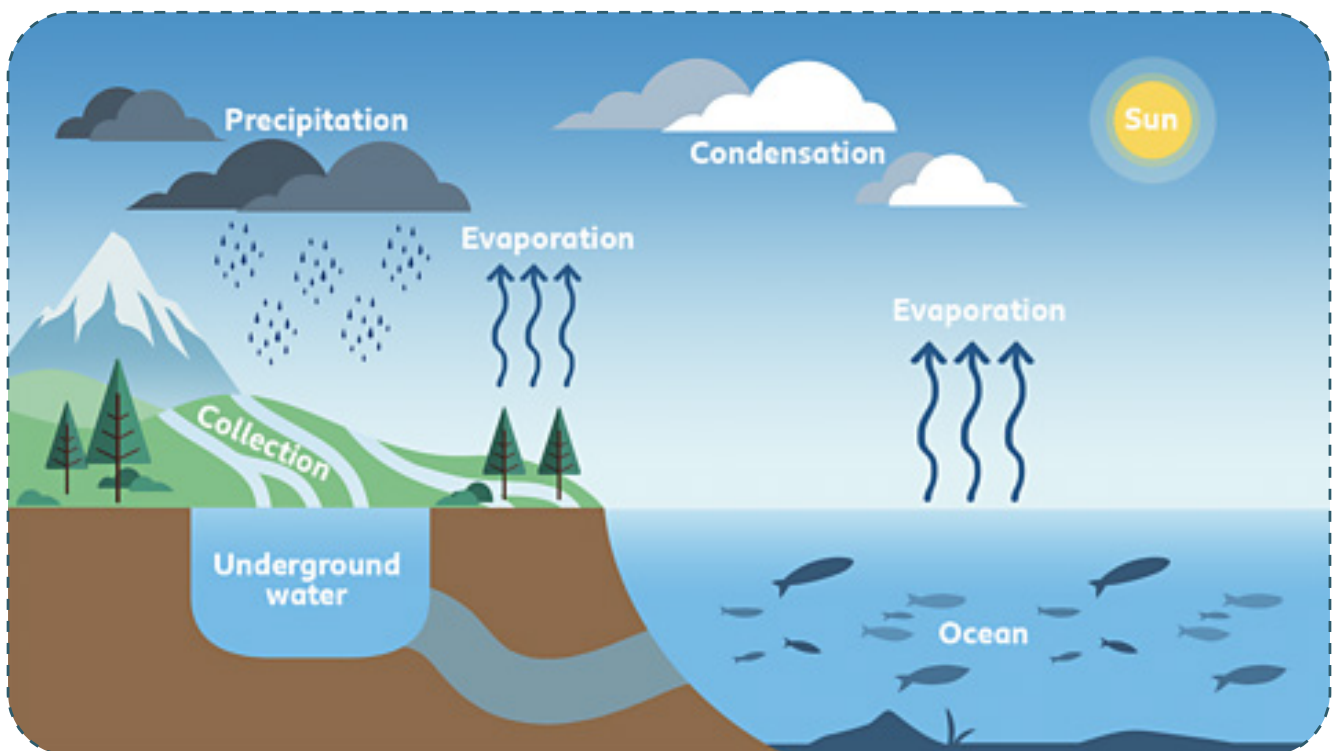
(By dissolving and transporting minerals)

2

Biologically

(By supporting life and ecosystems)

3



- The water cycle in nature includes several connected processes:

Evaporation

Water evaporates from oceans, seas, rivers, lakes, and other water bodies, turning into water vapor.

1

Condensation

Water vapor rises into the atmosphere, cools, and changes back into tiny water droplets, forming clouds.

2

Precipitation

When the water droplets in clouds become heavy, they fall back to Earth as **rain, snow, or other forms of precipitation.**

3

Infiltration

Also known as (Seepage), some of the water seeps through the **pores of soil and sedimentary rocks**, forming **groundwater.**

4

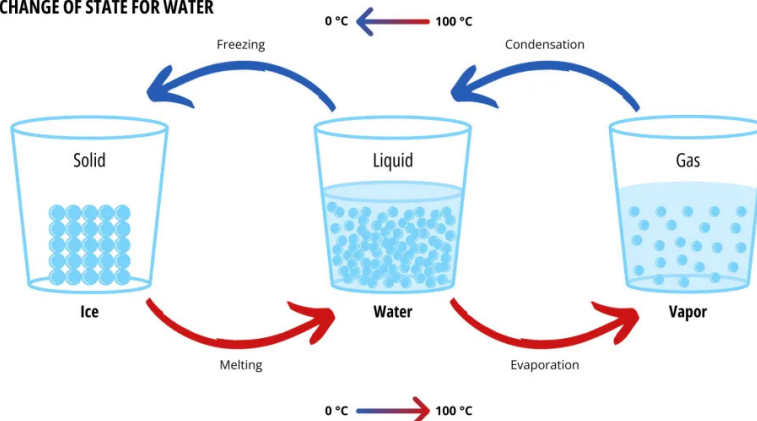
Biological Processes

* Living things also contribute to the cycle:

- In **plants**, water is lost through **transpiration.**
- In **animals, plants and humans**, water is released through **respiration** and **excretion.**

5

CHANGE OF STATE FOR WATER



Think With Mr. Meligy

1. What is the continuous movement of water all around the globe?

- Ecosystem
- Environment
- Water cycle
- Seasonal wind

2. Mention the 3 ways of changes that water does on Earth's surface:

-
-
-

3. Write the scientific term:

It's the seepage of some water through the tiny pores of soil and sedimentary rocks forming ground water. (.....)

4. Animals and humans contribute to the water cycle by what process?

- a) Transpiration
- b) Respiration
- c) Infiltration
- d) Precipitation

5. Which of the following can do respiration?

- a) Animals only
- b) Plants only
- c) Both plants and animals
- d) None of the above



Transpiration & Excretion in Plants

Transpiration

It is the process by which a plant gets rid of **excess** water in the form of **water vapor** from the parts of the plant exposed to air.

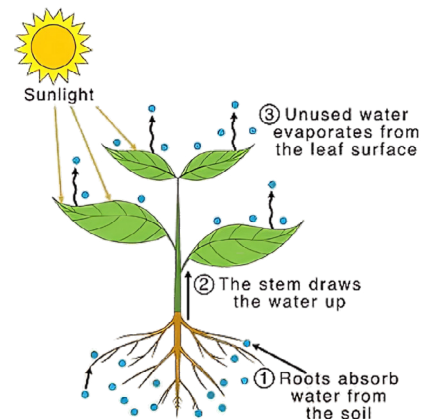


- Most of transpiration processs takes place through **tiny microscopic openings** on the surfaces of leaves and green stems. These openings are called **stomata**.
- Transpiration, which helps lower the plant's body temperature.
- Transpiration also creates a pulling force that draws water and dissolved salts **upward** through the **xylem**, allowing them to **move** from the roots to the upper parts of the plant.

Steps of water movement in plant:



- 1- **Roots** absorb water from the soil.
- 2- **Stem** draws (pull) water upward through the **xylem**.
- 3- **Leaves** release water vapor into the air by **transpiration**.



Excretion

It is the process by which organisms get rid of waste products resulting from **metabolic** activities.



These wastes include:

- Carbon dioxide
- Water vapor
- Nitrogenous wastes such as ammonia, urea, and uric acid





Think With Mr. Meligy

1. The continuous change between the states of matter on Earth's surface through a nearly closed system that repeats in cycles is called the ... cycle.

- a) Nitrogen
- b) Carbon
- c) Oxygen
- d) Water

2. The percentage of Earth's surface covered with water is about ...

- a) 1%
- b) 3%
- c) 30%
- d) 70%

3. Which of the following processes, if it stopped, would lead to a disturbance in the water cycle balance on Earth's surface and the atmosphere?

- a) Surface runoff
- b) Evaporation
- c) Seepage into soil
- d) Transpiration

4. An increase in the rate of transpiration in plants indirectly affects the water cycle in nature by:

- a) Decreasing rainfall
- b) Increasing water vapor in the atmosphere
- c) Reducing the rate of evaporation from water surfaces
- d) Fixing carbon dioxide in the leaves

5. What biological processes contribute to the water cycle in nature?

6. Why is the water cycle in nature considered a nearly closed system?