

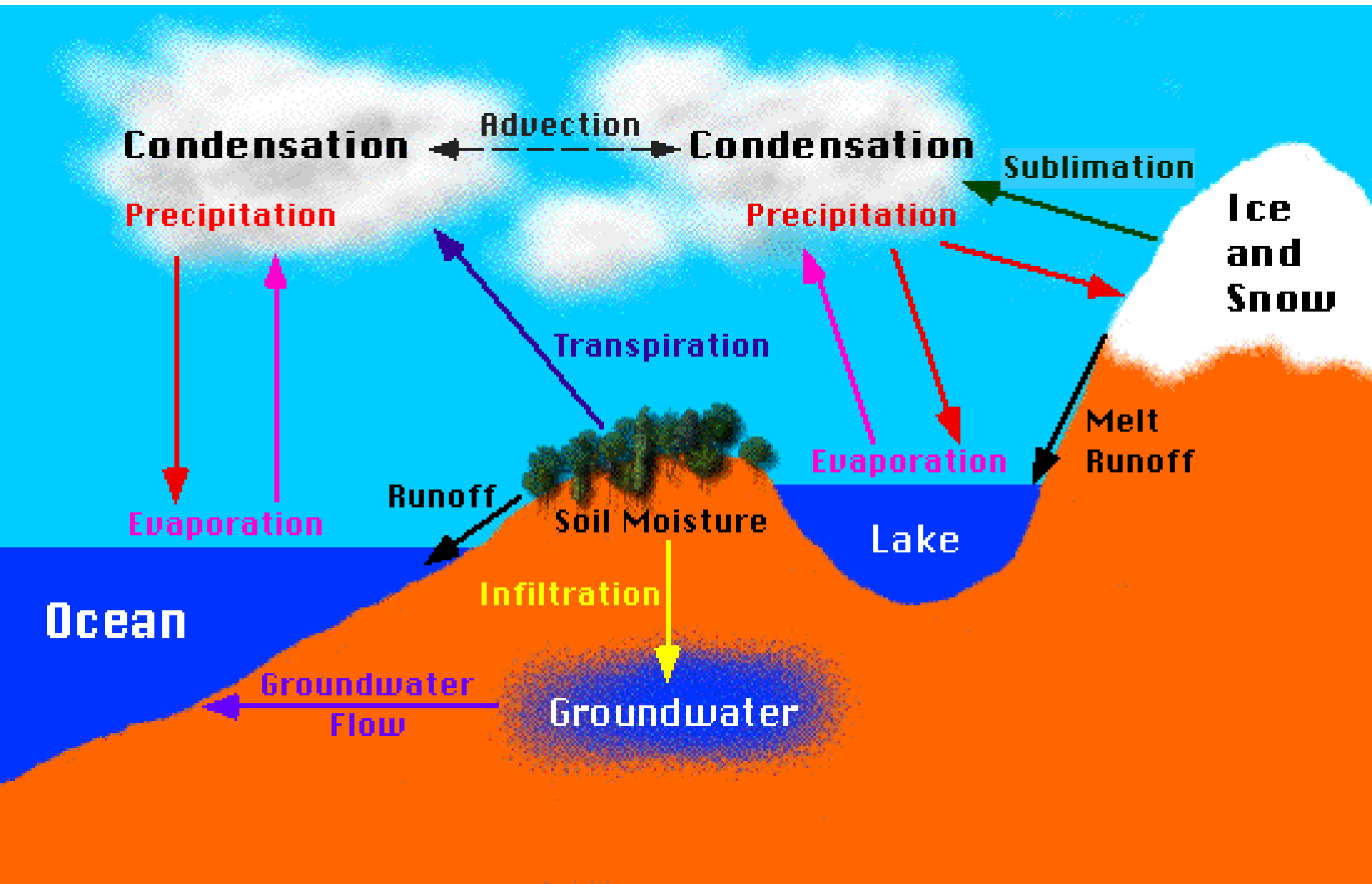


# The Hydrological Cycle

# What is the Hydrological Cycle?

- The sequence of condition through which water passes from vapour in the atmosphere through precipitation upon land or water surface and ultimately back into the atmosphere as a result of evaporation and transpiration.
- The hydrological cycle is the system which describes the distribution and movement of water between the earth and its atmosphere. The model involves the continual circulation of water between the oceans, the atmosphere, vegetation and land.

# The Hydrological cycle



# Describing the Cycle:

- **Evaporation**

Solar energy powers the cycle. Heat energy from the sun causes evaporation from water surfaces (rivers, lakes and oceans)

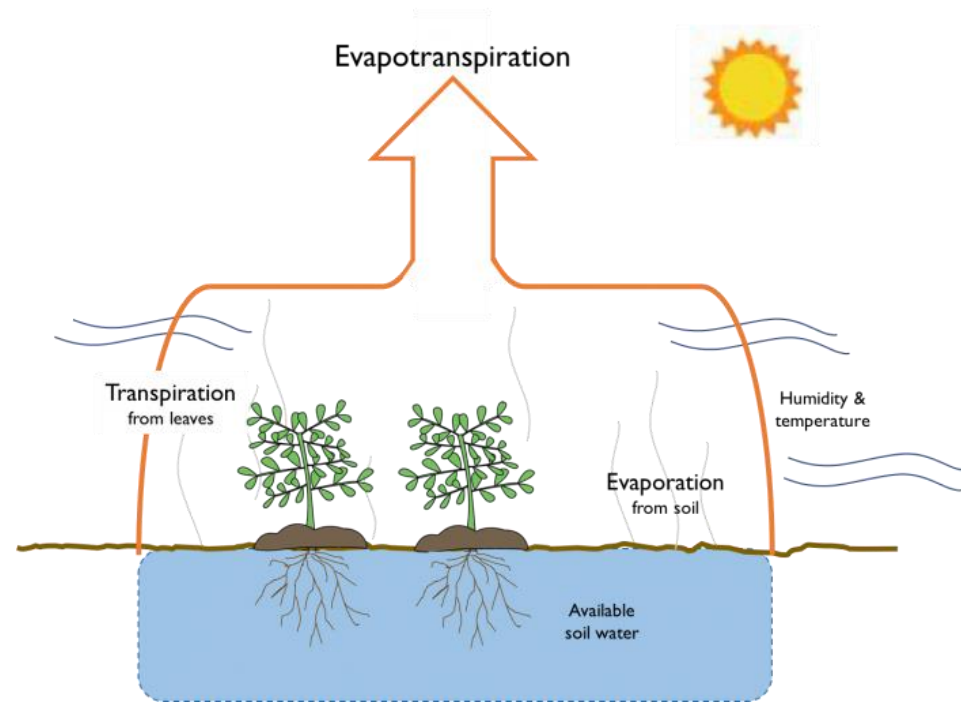
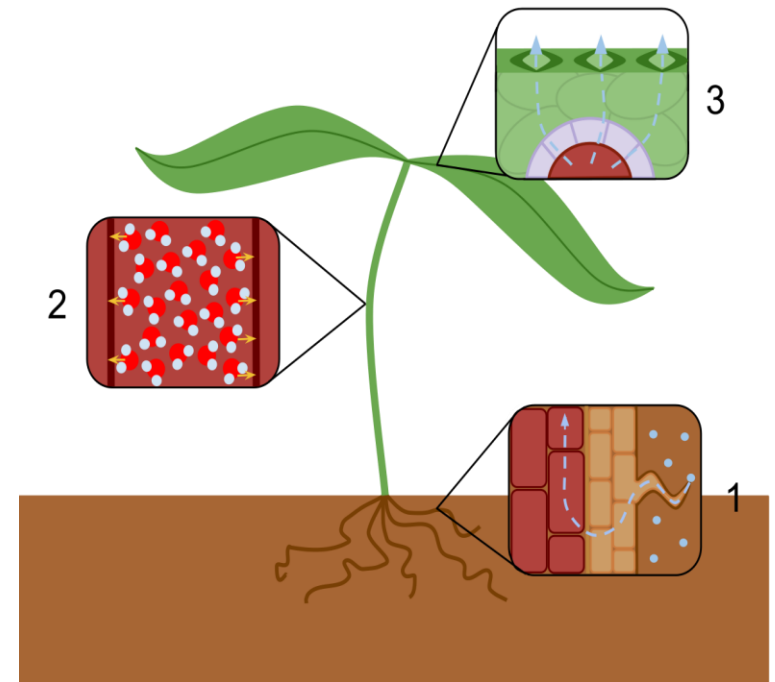


## Transpiration from plants.

Transpiration is the process of water movement through a plant and its evaporation from aerial parts, such as leaves, stems and flowers.

- **Evapotranspiration**

The process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces by transpiration from plants.



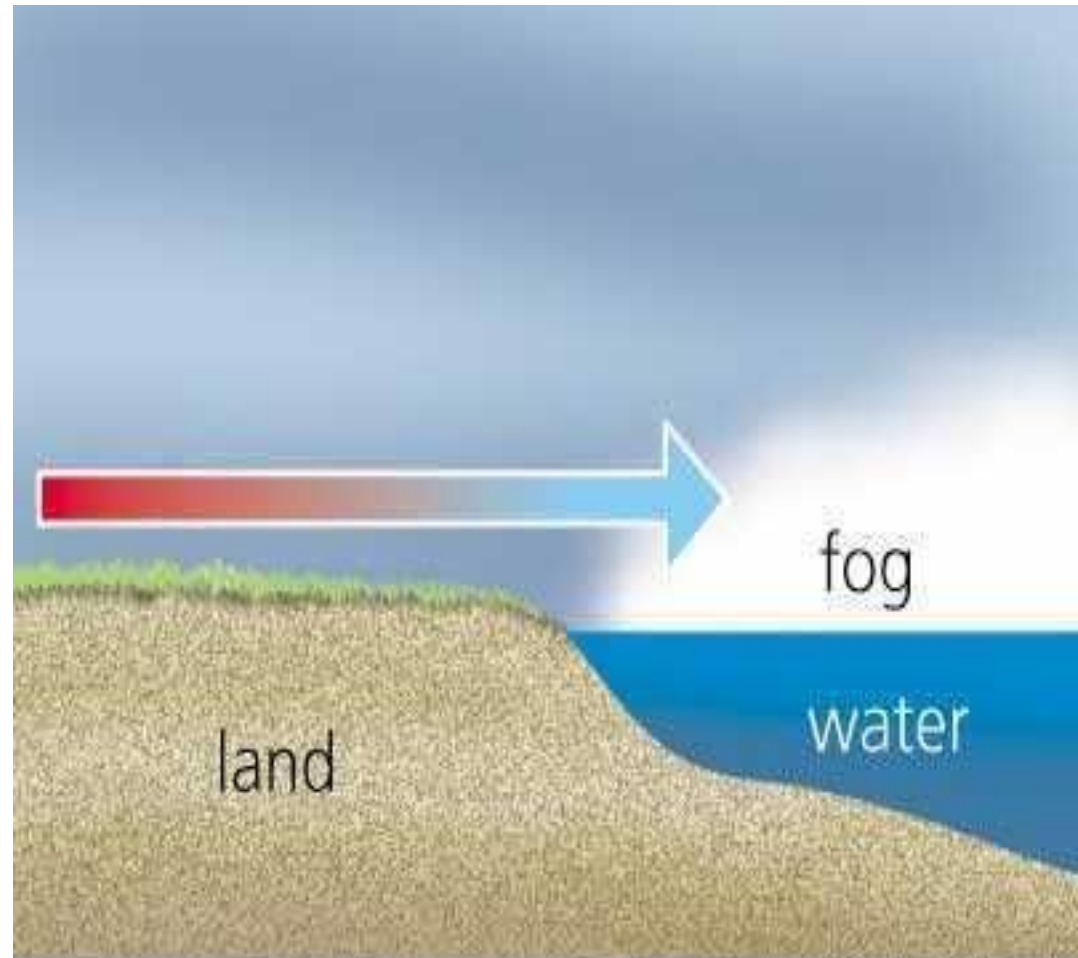
# Condensation

- The conversion of a vapour or gas to a liquid
- Water which collect as a droplets on cold surface when humid air is in contact with it.
- Is the change of the physical state of matter from gas phase into liquid phase, and is the reverse of vapourisation



# Advection

- The transfer of heat or matter by the flow of a fluid, specially horizontally in the atmosphere or the sea





# Precipitation

- precipitation is any product of the condensation of atmospheric water vapor that falls under gravity. The main forms of precipitation include drizzle, rain, sleet, snow, graupel and hail.
- The action or process of precipitating a substance from a solution.





- **Stem flow**

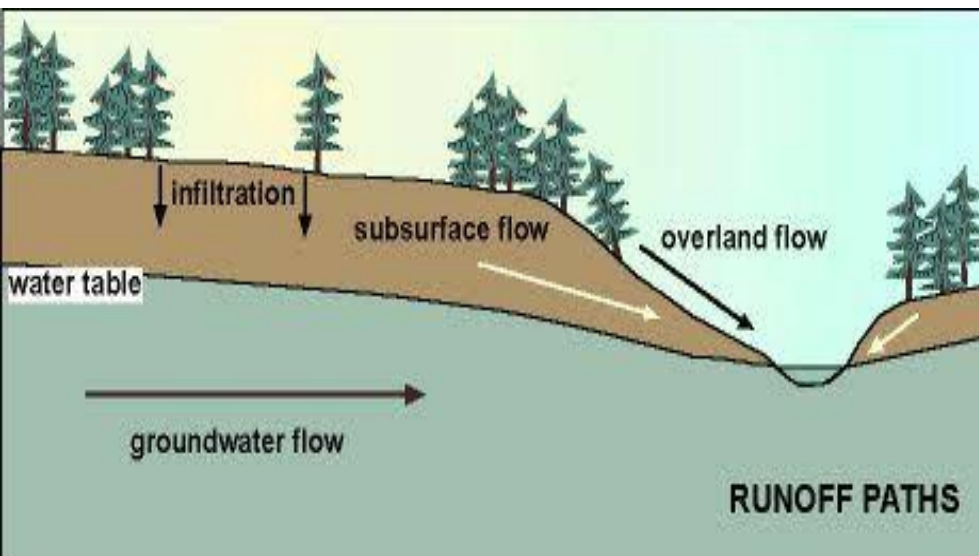
Stem flow is the flow of intercepted water down the trunk or stem of a plant. Stem flow, along with through fall, is responsible for the transferral of precipitation and nutrients from the canopy to the soil.

- **Through flow**

the flowing of liquid or air through something.

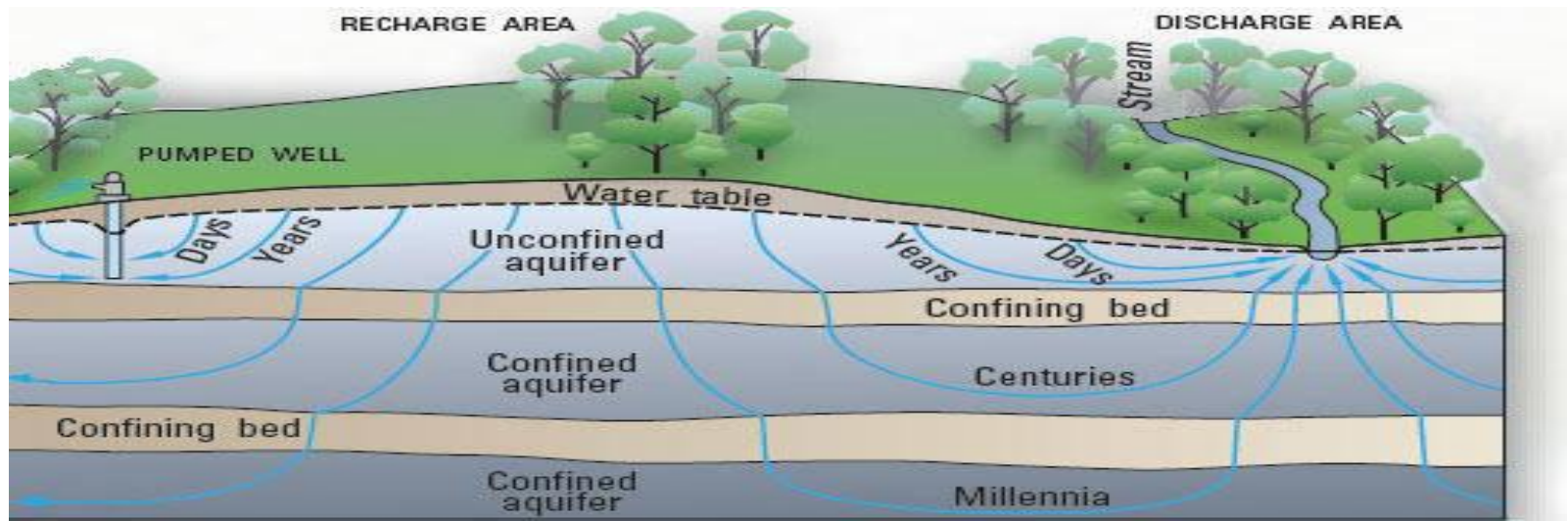
# Run off / Overland flow

- Overland flow is the movement of water over the land, down slope toward a surface water body.

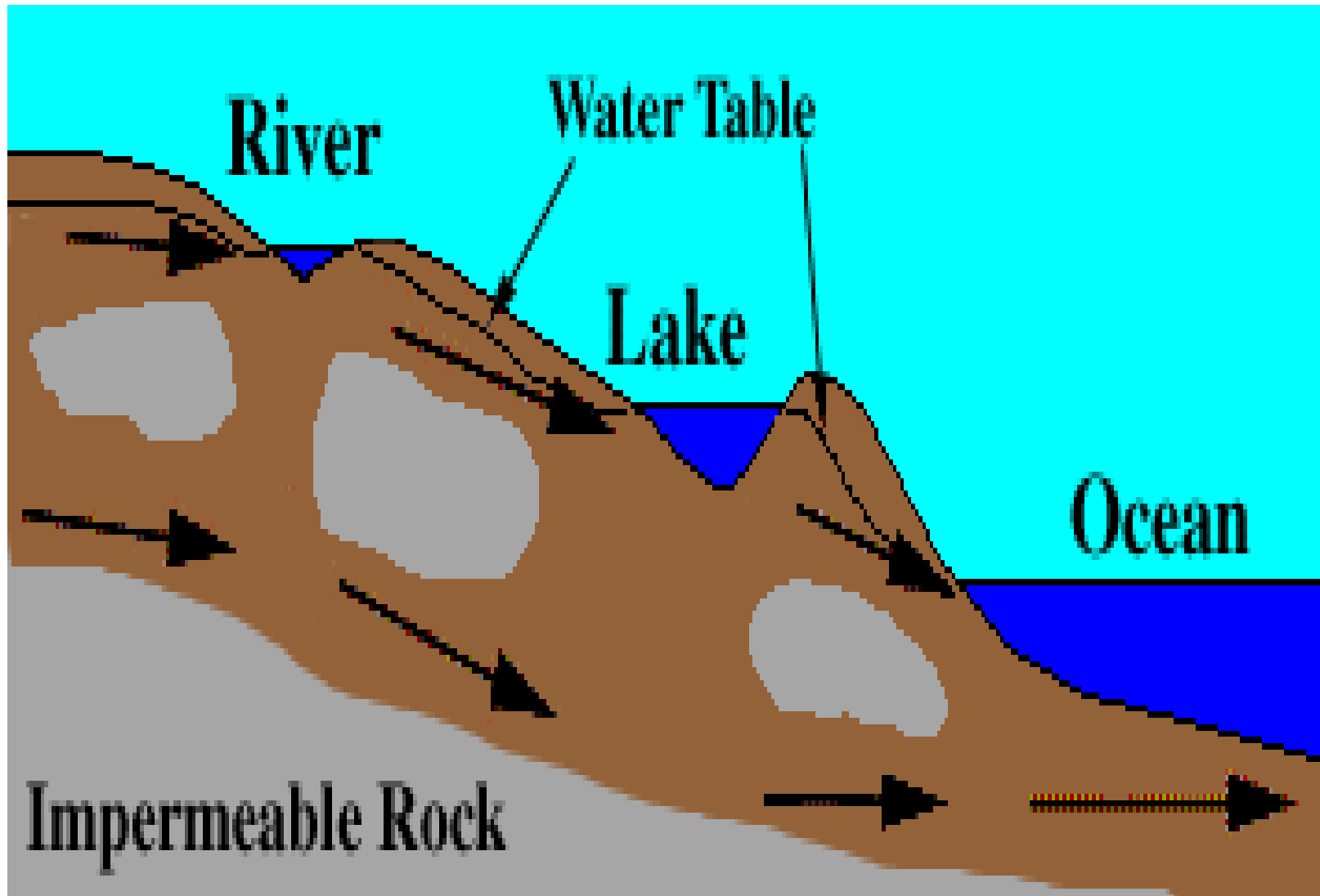


# Groundwater flow

- **Groundwater flow** is defined as the part of stream flow that has infiltrated the ground, has entered the phreatic zone, and has been discharged into a stream channel, or springs and seepage water infiltrates downwards through the soil and rocks where it is returned to the oceans through groundwater flow.



# Groundwater flow



# Hydrological Cycle

Split your page into 8 squares and write one word from the list below  
in the each square

Condensation Ground Water

Infiltration

Evaporation

Precipitation

Percolation

Run off

Evapotranspiration

Interception

Saturation

The Hydrological Cycle

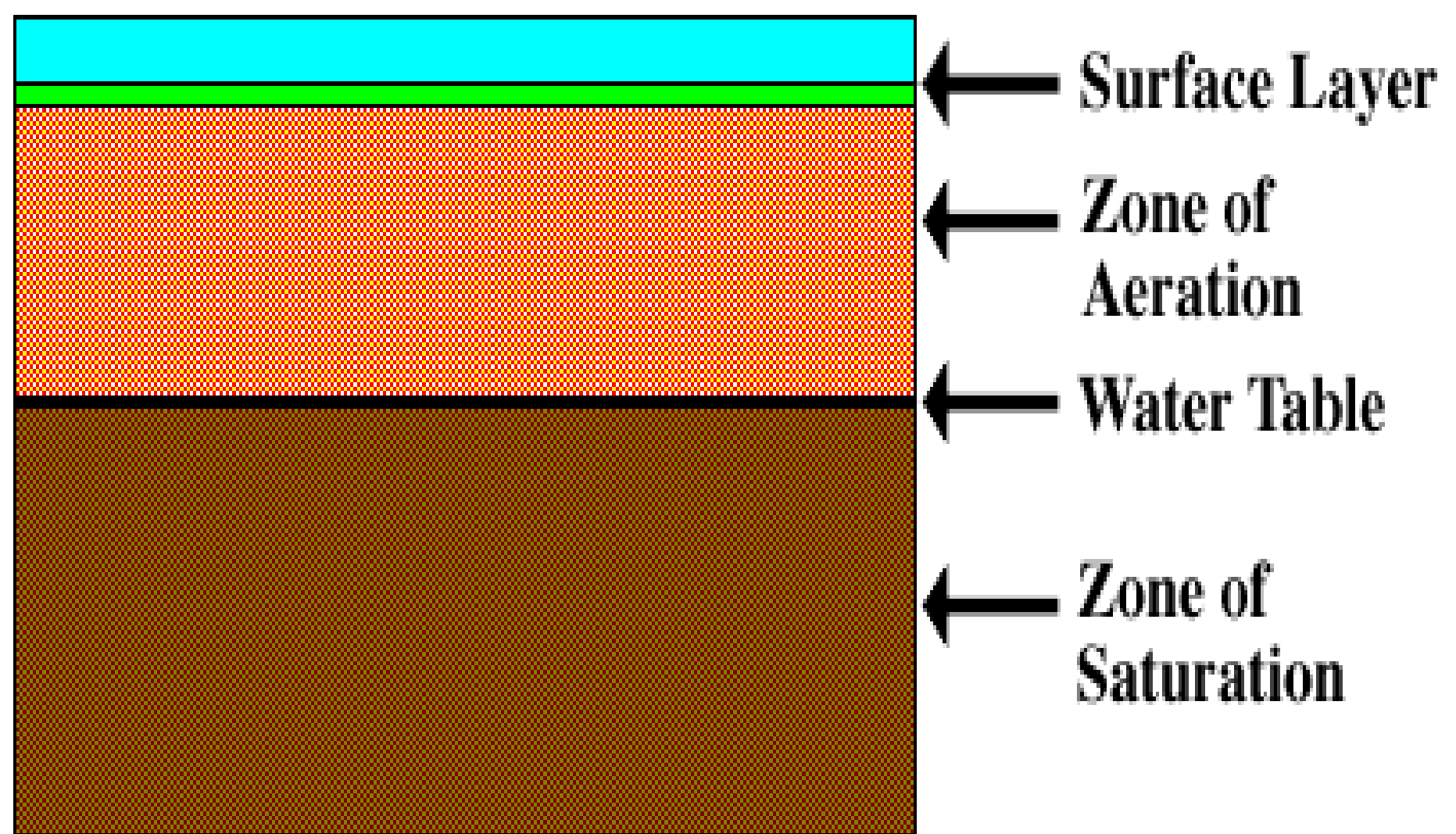
The water table

**Also called the hydrological cycle**

# The water cycle balance

- Usually the water cycle is in balance, and the amount of precipitation falling will slowly soak into the ground and eventually reach the rivers.
- However, if rain falls for a long period of time or if the ground is already soaked or saturated with water then the chance of flooding is increased.

# Under the ground





# A closed system

- The hydrological cycle is a good example of a closed system: the total amount of water is the same, with virtually no water added to or lost from the cycle.
- Water just moves from one storage type to another.
- Water evaporating from the oceans is balanced by water being returned through precipitation and surface run off.

# Human Inputs to the Cycle

- Although this is a closed system there is a natural balance maintained between the exchange of water within the system
- Human activities have the potential to lead to changes in this balance which will have knock on impacts.
- For example as the earth warms due to global warming the rate of exchange in the cycle (between land and sea and atmosphere) is expected to increase.

# Human Inputs

- Some aspects of the hydrologic cycle can be utilized by humans for a direct economic benefit
- Example: generation of electricity (hydroelectric power stations and reservoirs)
- These are effectively huge artificial lakes and this will disrupt river hydrology (amount of water in a river)



# Other Human Activities

- Paving, compacting soils, and altering the nature of the vegetation (including deforestation)
- The mining of ground water for use in agriculture and industry
- Large amounts of water vapour released into the atmosphere from industrial activity
- Large changes in vegetation by wildfire, logging, clearance for agriculture





# Impacts

- These human activities can lead to increase chances of flooding
- Increases in soil erosion
- A cooling effect on the north west of Europe (climate change)
- Possible higher precipitation levels in the Arctic but less in the Tropics



