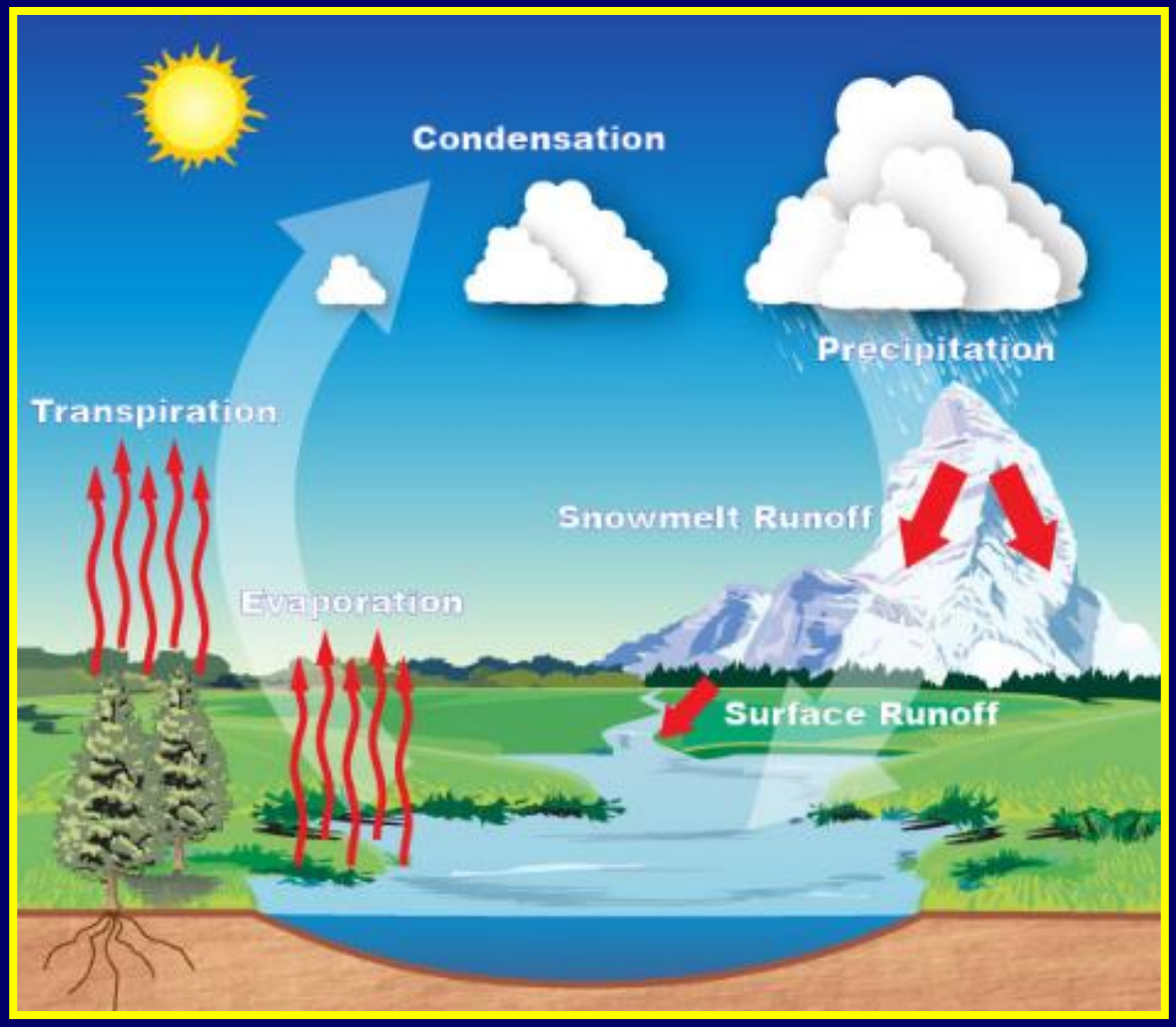
The Water Cycle



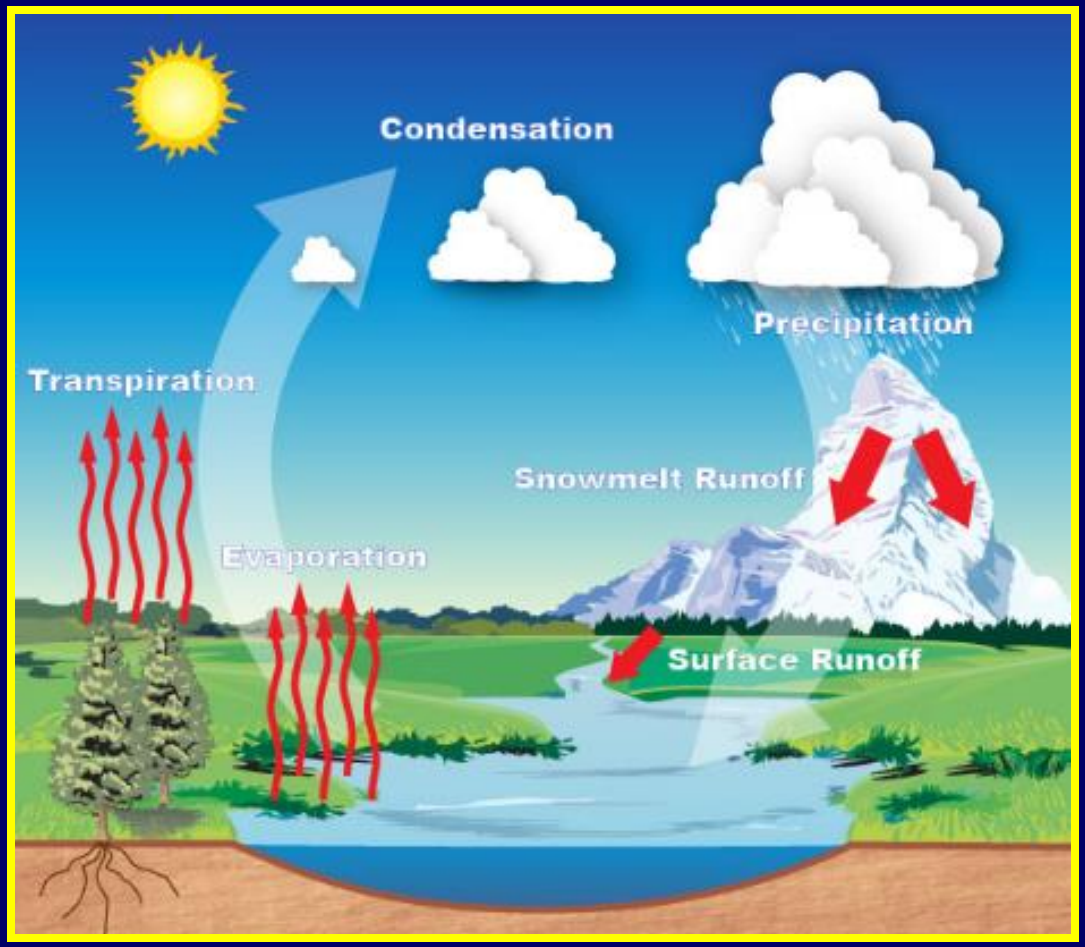
I Can Statements

At the end of this lesson, you should be able to say, with confidence:

- I can describe how water is recycled and the various processes involved in the water cycle
- I can explain how transpiration works

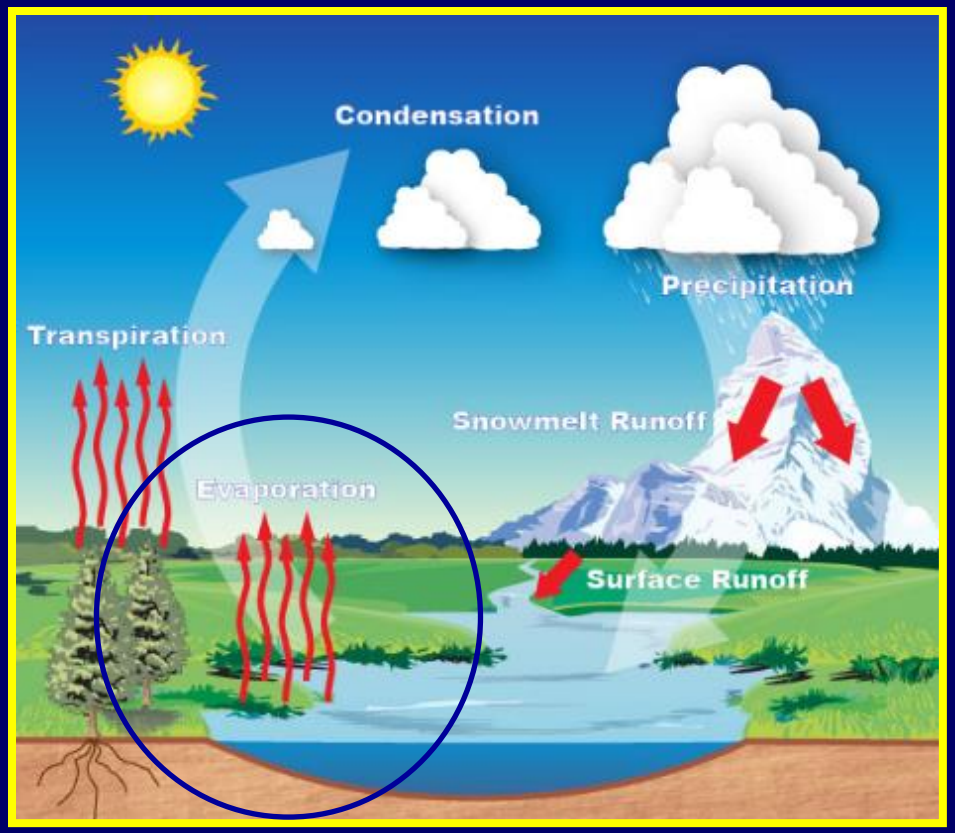
Water Cycle

Earth's fresh water supply is continuously recycled in a process called the Water Cycle.



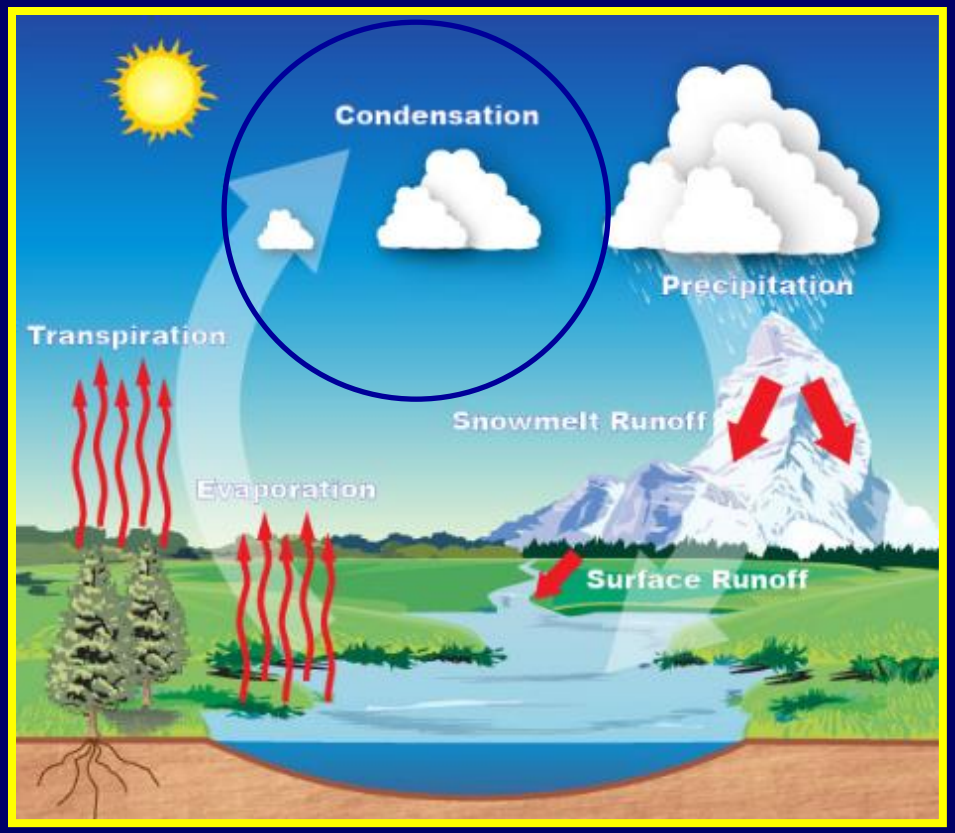
Evaporation

Powered by radiation from the Sun, water changes from a liquid into water vapor in the atmosphere, during evaporation.



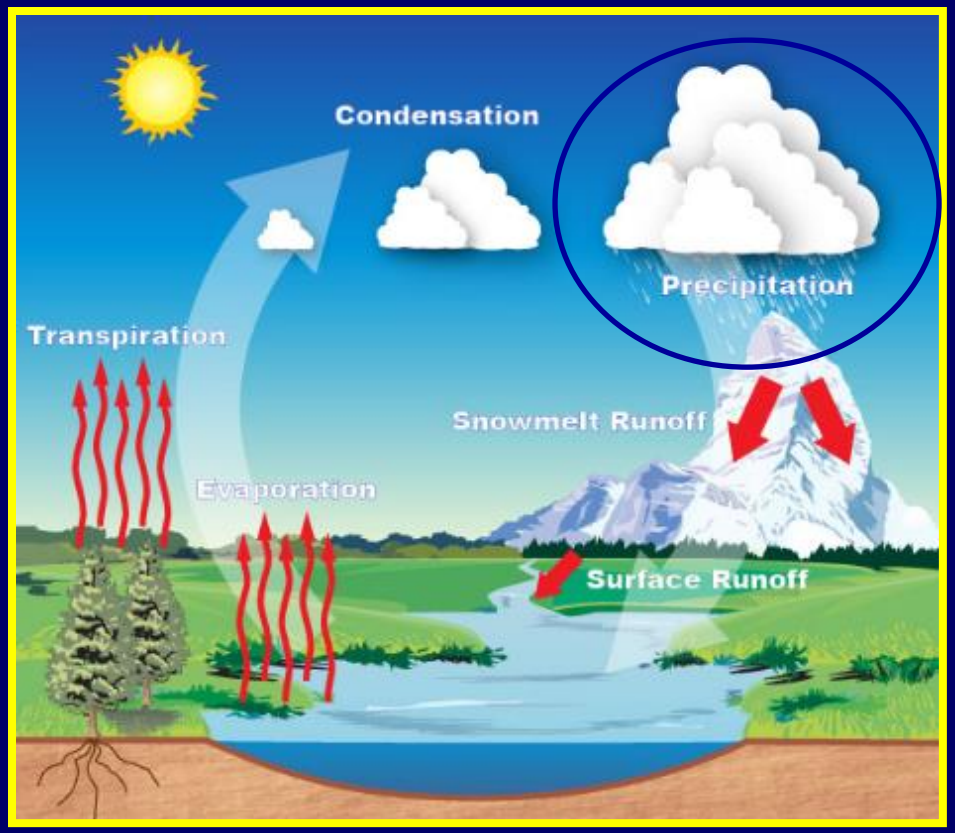
Condensation

High in the atmosphere, the water vapor cools and condenses into water droplets to form clouds in a process called condensation.



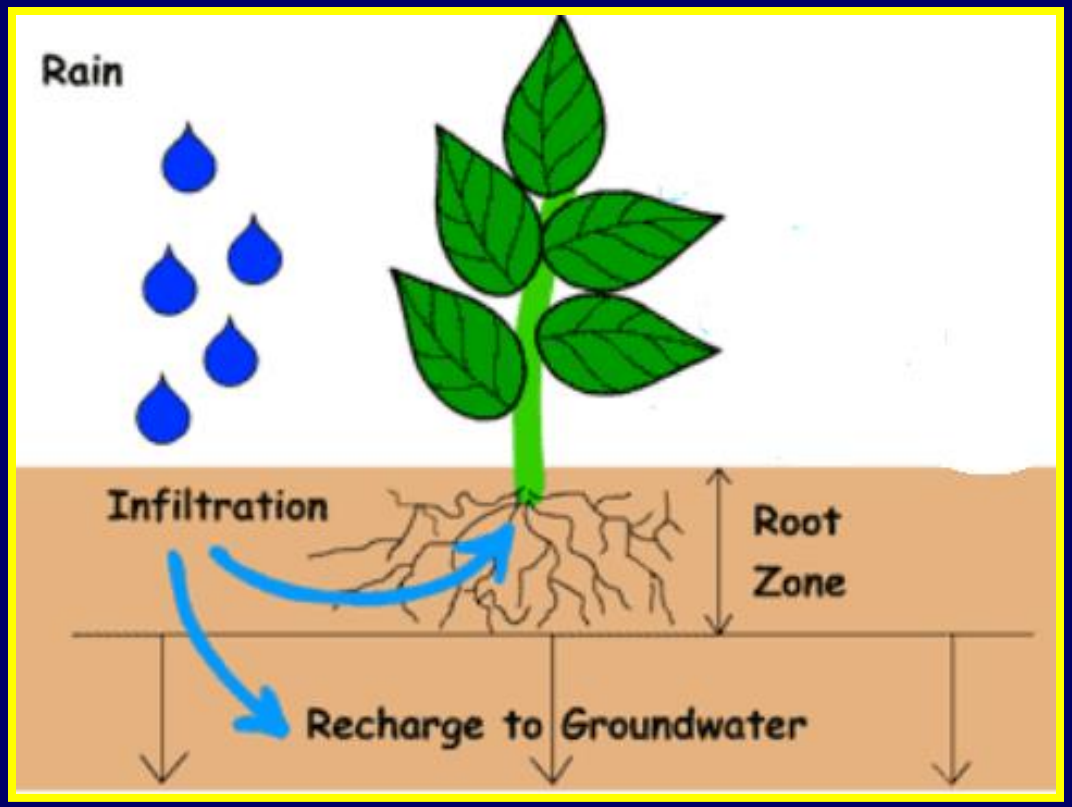
Precipitation

When the clouds become full of water droplets, the water falls to Earth in the form of rain, sleet, hail, or snow in a process called precipitation.



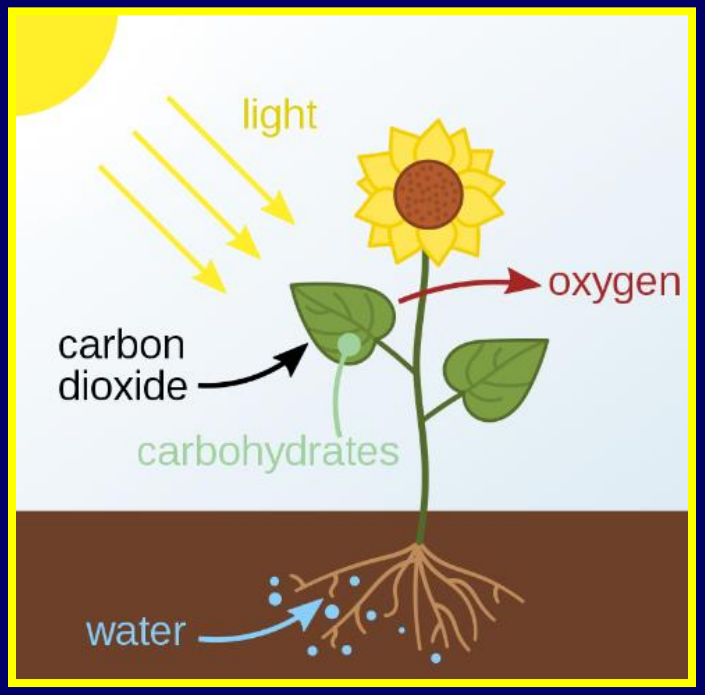
Infiltration

When water falls on the ground or melts from snow, most of it soaks into the ground to become groundwater in a process known as infiltration.



Photosynthesis

During photosynthesis, plants absorb water from the soil and use the energy from sunlight to chemically combine the water with carbon dioxide gas to produce carbohydrates and oxygen gas.



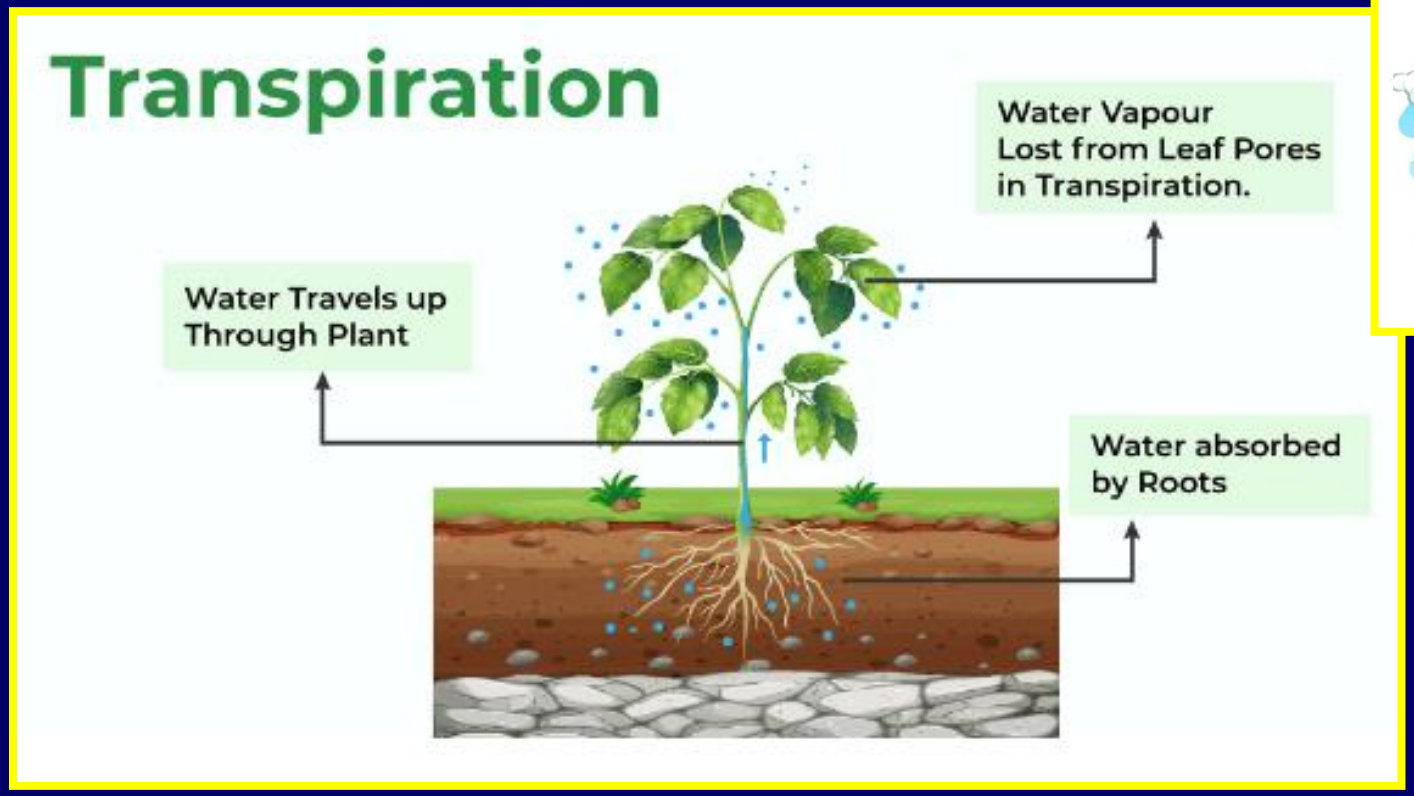
Photosynthesis takes place inside the green parts of plants.

Stomata

Plants breathe in carbon dioxide gas and breathe out oxygen gas through little openings on the underside of leaves called stoma (plural) or stomata (singular).

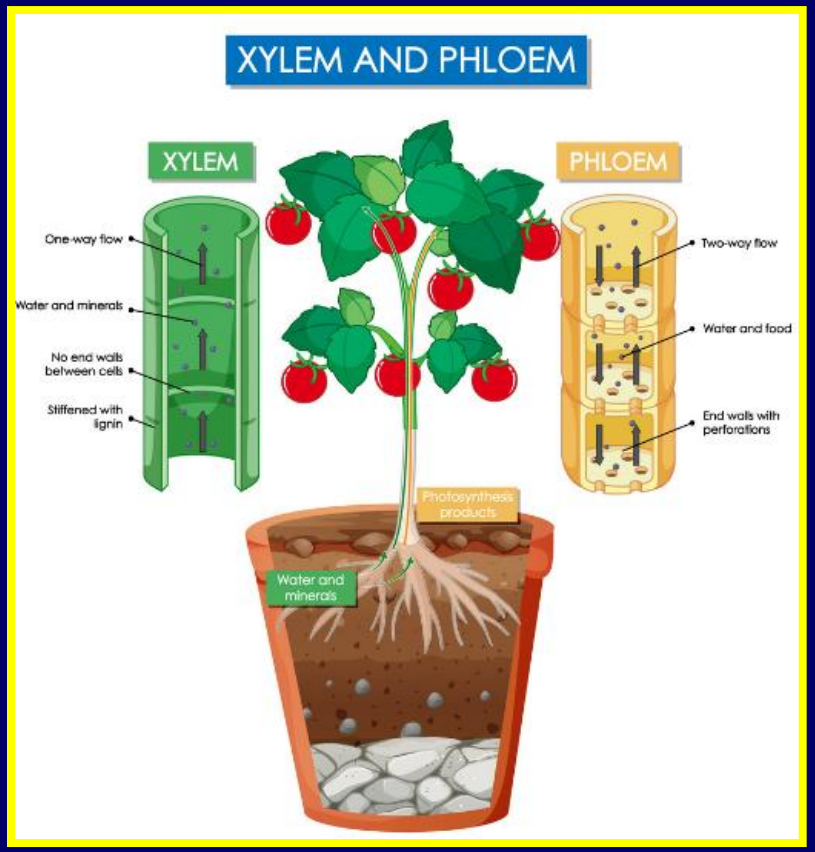
Transpiration

When the stoma are open for gas exchange, water evaporates out of the leaf cell in a process called transpiration.

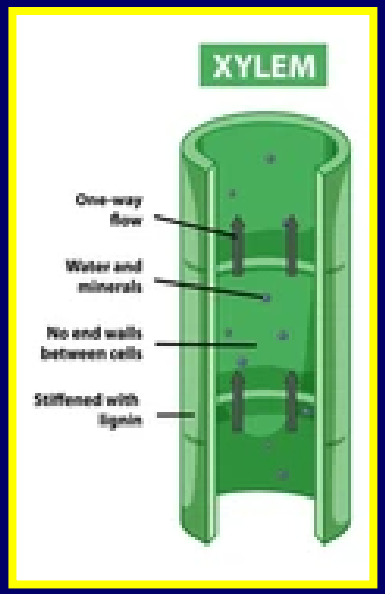


Plant Transport

Inside the stems of plants are long lines of cells that form two different tubes: Xylem and Phloem.

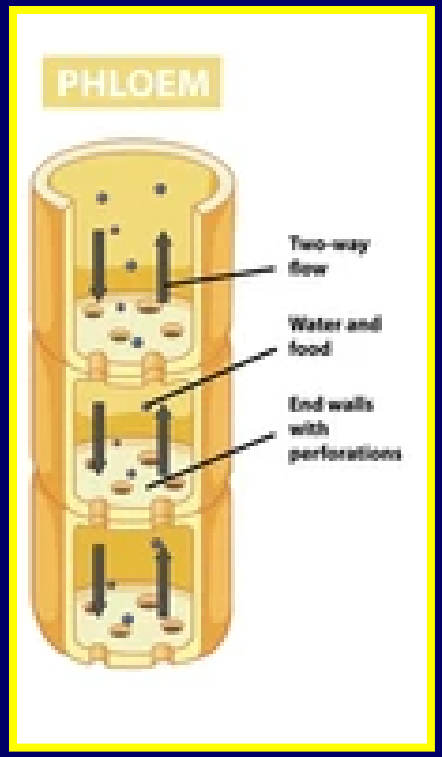


Xylem and Phloem



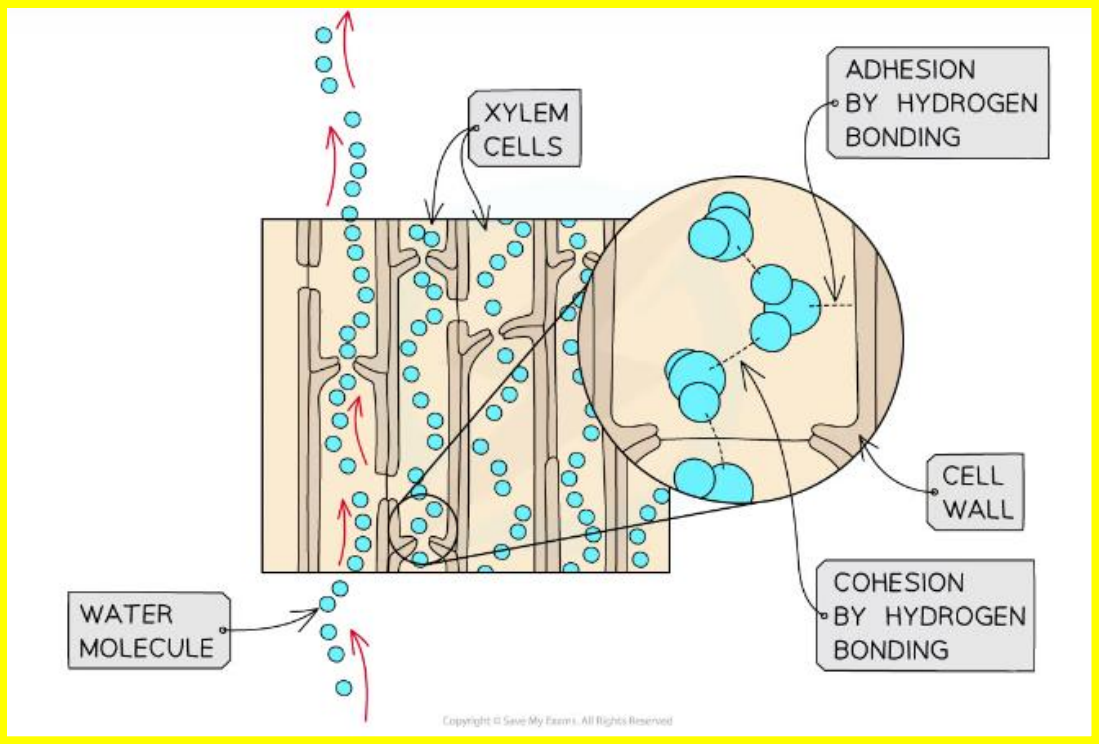
Water travels upwards through the xylem, from the roots to the leaves, to be used during photosynthesis.

Carbohydrates, produced during photosynthesis, travel down through the phloem to be used or stored within the plant.



Capillary Action

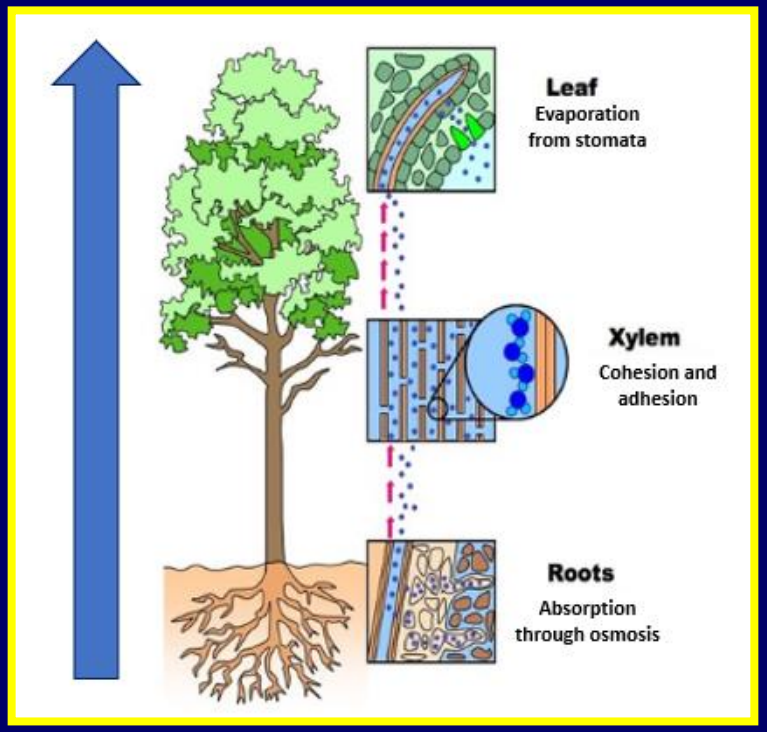
As water molecules evaporate out of the stoma, the cohesive and adhesive properties of water, allow more water molecules to be pulled upward, within the xylem tubes in the stems of plants.



The movement of water up a thin tube, due to cohesion and adhesion, is called capillary action.

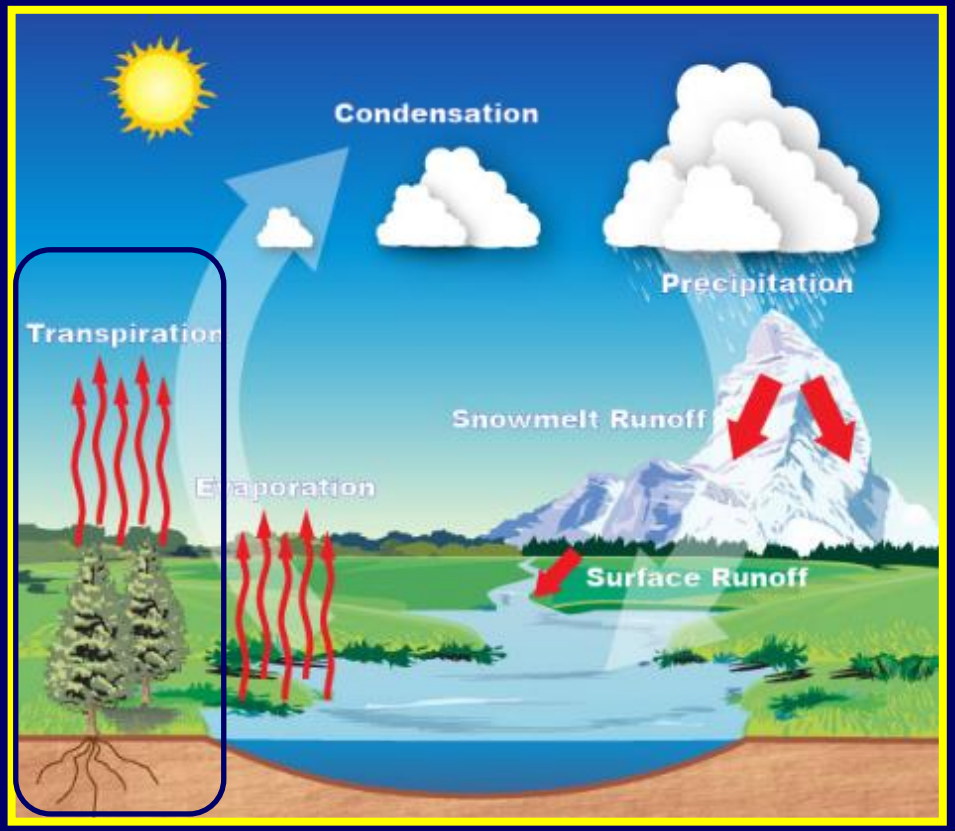
Capillary Action

Plants lose about 90% of all water absorbed to transpiration, but due the capillary action, the plant is able to pull water into the leaves without spending any energy.



Transpiration

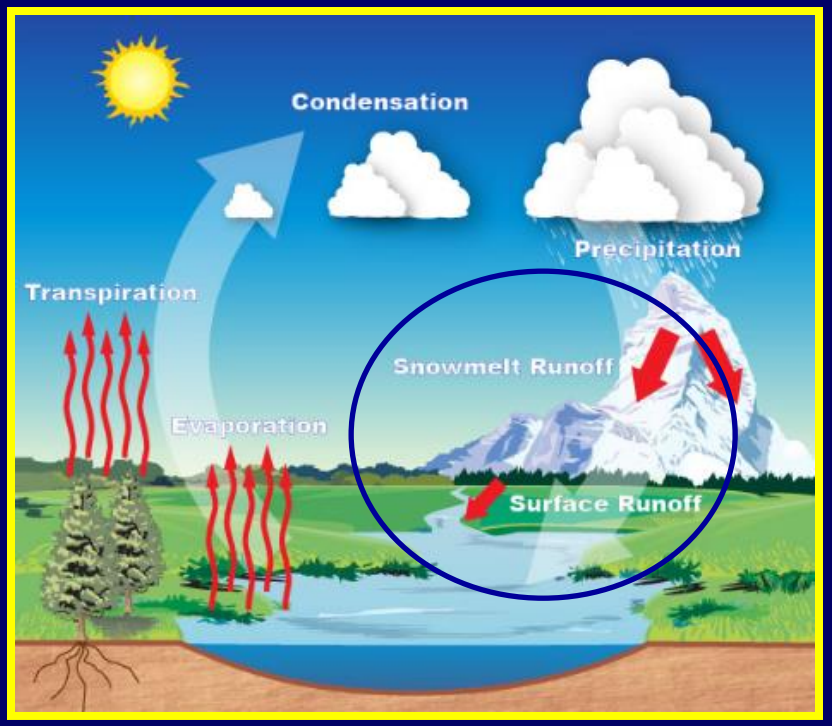
About 10% of all the water moisture in the atmosphere is from transpiration.



Transpiration over the Smoky Mountains

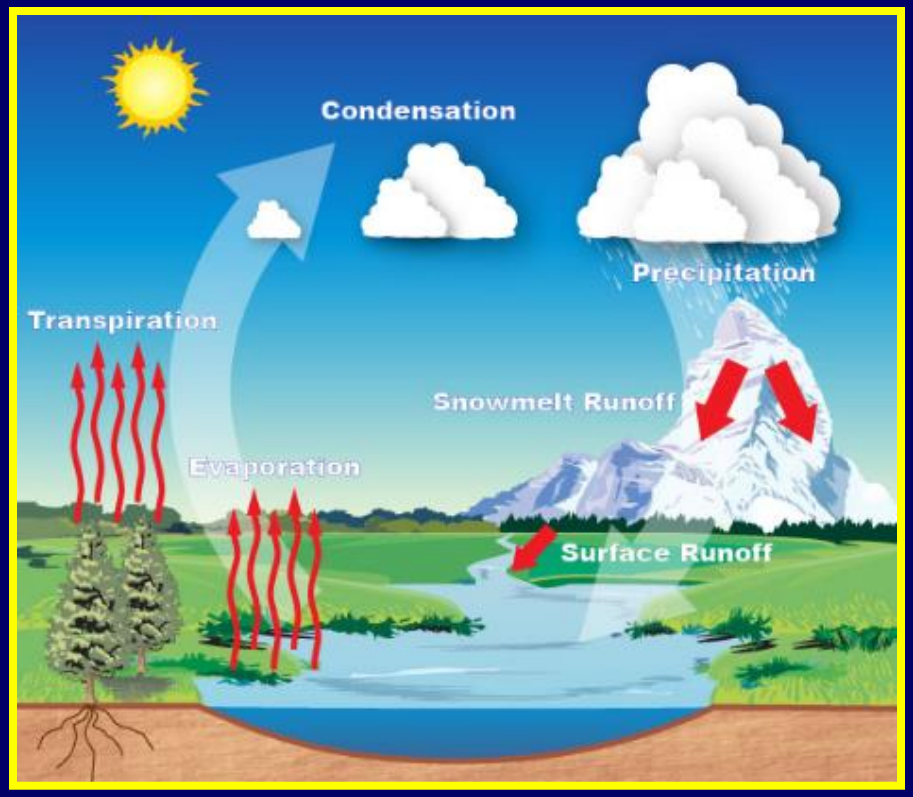
Surface Runoff

Once the ground is saturated or contains as much water as it can hold, the rest of the water from precipitation or snowmelt flows over the land as surface runoff.



Water flows Downhill

Both surface water and groundwater flows downhill until it enters a body of water and the cycle begins all over again.



The End