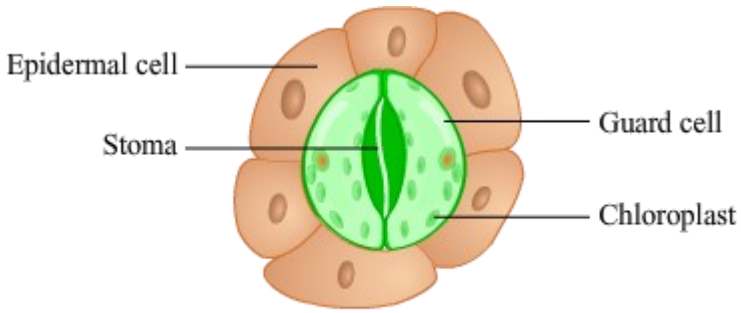
Transpiration

Loses 95% of the water absorbed by the plant is vaporized by a process called transpiration result difference water potential between the air and the surface of the plant.

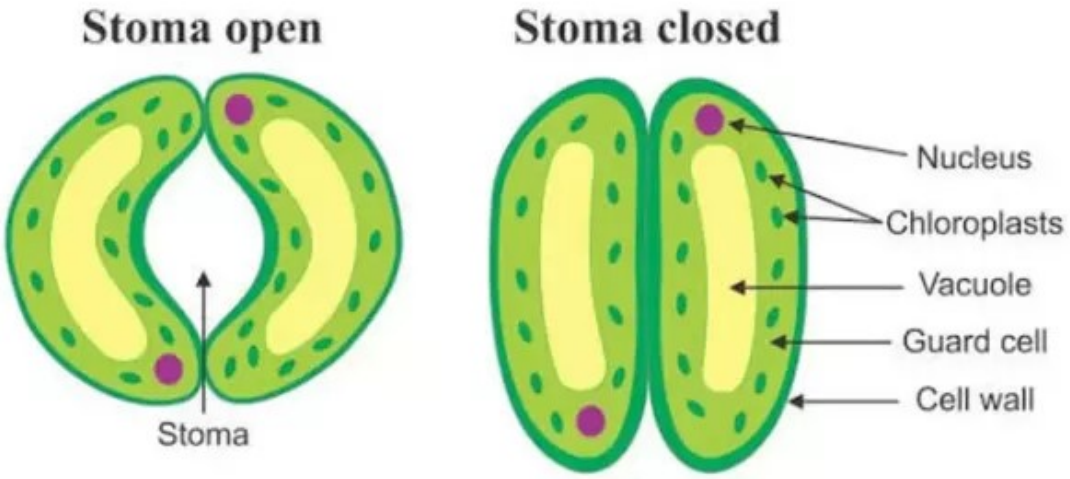
Transpiration divides into three types according to the way the water is lost:

2. Stomatal transpiration
3. Cuticulal transpiration
4. Lenticular transpiration

That change the water potential in the guard cells plays an important role in the process of transpiration in the opening and closing the stomata and that full extinction of the guard cells leads to the opening of the stomata while the contraction of guard cells to close the stomata.



Stomatal Apparatus



Environmental factors affecting the process of transpiration:

1. Light
2. Concentration of carbon dioxide
3. Temperature
4. water content of plant

Of the internal factors affecting the structure of stomatal apparatus:

1. Distribution of stomata.
2. Number of stomata.
3. Ratio of root to vegetative.
4. Surface area of leafe.

The first experiment: Structure of stomatal apparatus

Used materials: Leaves of plants dicotyledon and monocotyledon , Microscope, Glass slides with their covers.

The method of work:

1. Remove part of the lower epidermis for *vicia faba* leaves and another part of the lower epidermis of grasses .
2. check the epidermis using low power 4x and observe the distribution of stomata in both plants.
3. Draw a certain area of the epidermis, indicating a spread accurately of stomata and their relationship with ordinary epidermal cells in both plants.
4. use the high power after that and draw in detail stomatal apparatus an indicator of the parts and an illustration and a clear shape of the sguard cells tow plants.

The second experiment: The importance of stomatal appartus

Used materials: Leaves of hollyhock (*Althaea officinalis*), barafin, stand.

The method of work:

1. paint the three leaves are similar and equal in size as possiblein barafin on the on the upper surface for one of the leaves and lower surface for the second and the tow surface for the third leaf, and make fourth leaf for comparion.

2. Attach the leaves to a stand by thread and make them low.
3. Note the wilt of leaves, any leaf wilt faster? Any of them second and third? And the latter? Tell the reason.

The Third experiment: Mechanism of stomatal opening and closing

Used materials: Leaves of any plant , Microscope, Glass slides with their covers, food sugar solution concentrate 1M .

The method of work:

1. Remove part of lower epidermis for one leaf of a particular plant check it under high power of the microscope and draw it.
2. Add a few drops of food sugar solution concentrate 1M to the edge of the cover slides from the left side, then by filter paper removed the water from the right sideof the cover slide to enter the sugar solution to the epidemis.
3. Check the epidermis again under the microscope and notice the shape of the guard cells and the changes that occur at the top of the stomata.
4. Add a few drops of distilled water and pull the sugar solution, in the same way you are repeat the process several times to be sure the sugar solution is remove completely.
5. Re – check the slide again in a few minutes of using distilled water then note the change in stomatal pore.