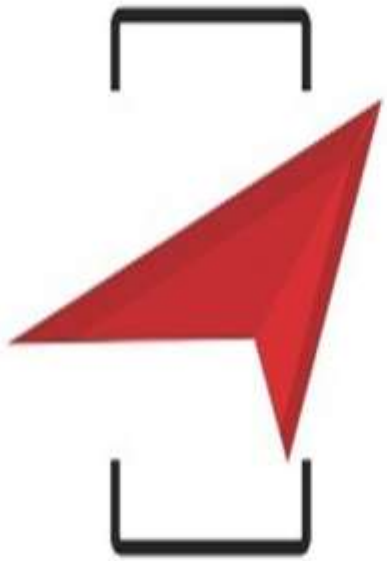

SAFALTA CLASS™

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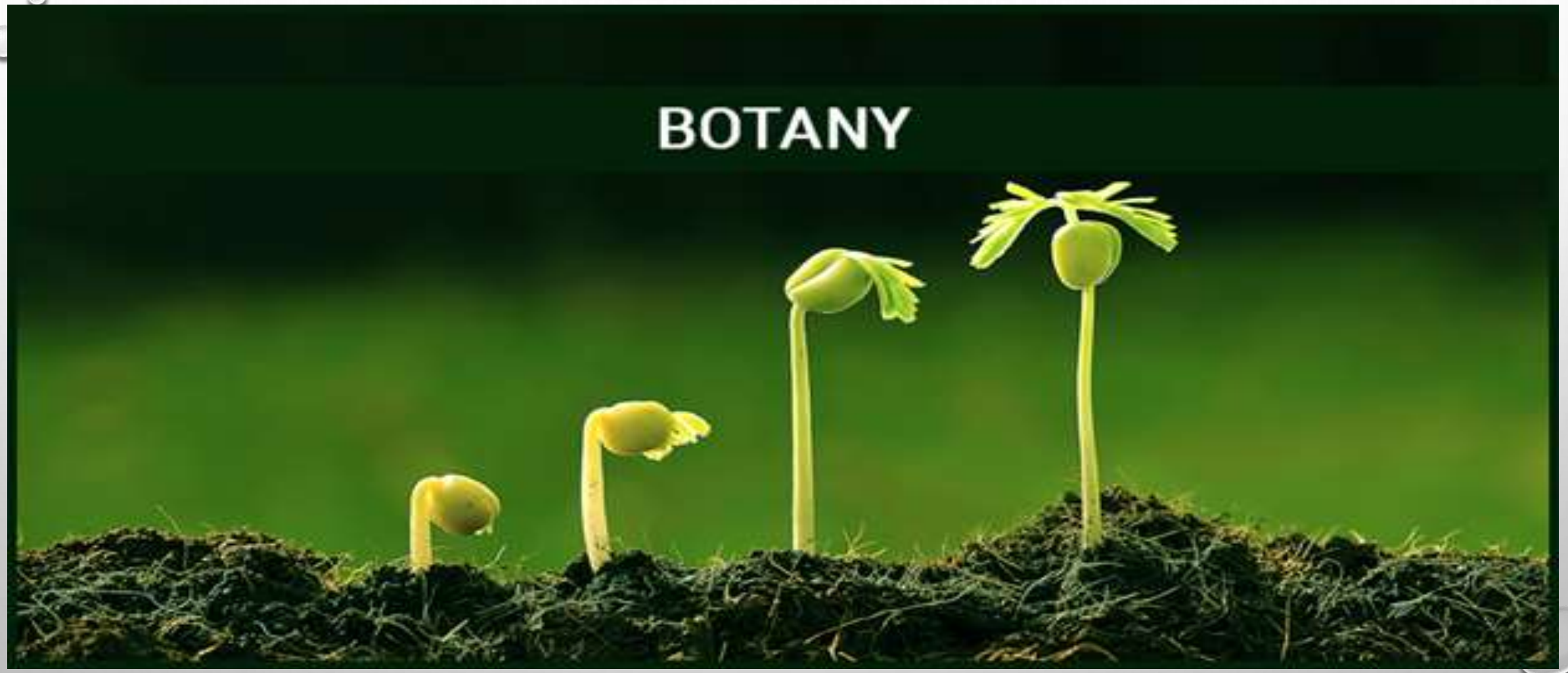


1. PHOTOSYNTHESIS:

Photosynthesis, the process by which green plants and certain other organisms transform light energy into chemical energy.

Wavelength needed for photosynthesis: Visible light (4000-7000)Angstrom.

Max Rate: Red/ Blue Color

Min Rate: Green Color

Max Photosynthesis takes place in Leaves because leaf consists of an organelle Chloroplast.

Chloroplast absorbs Sun light.

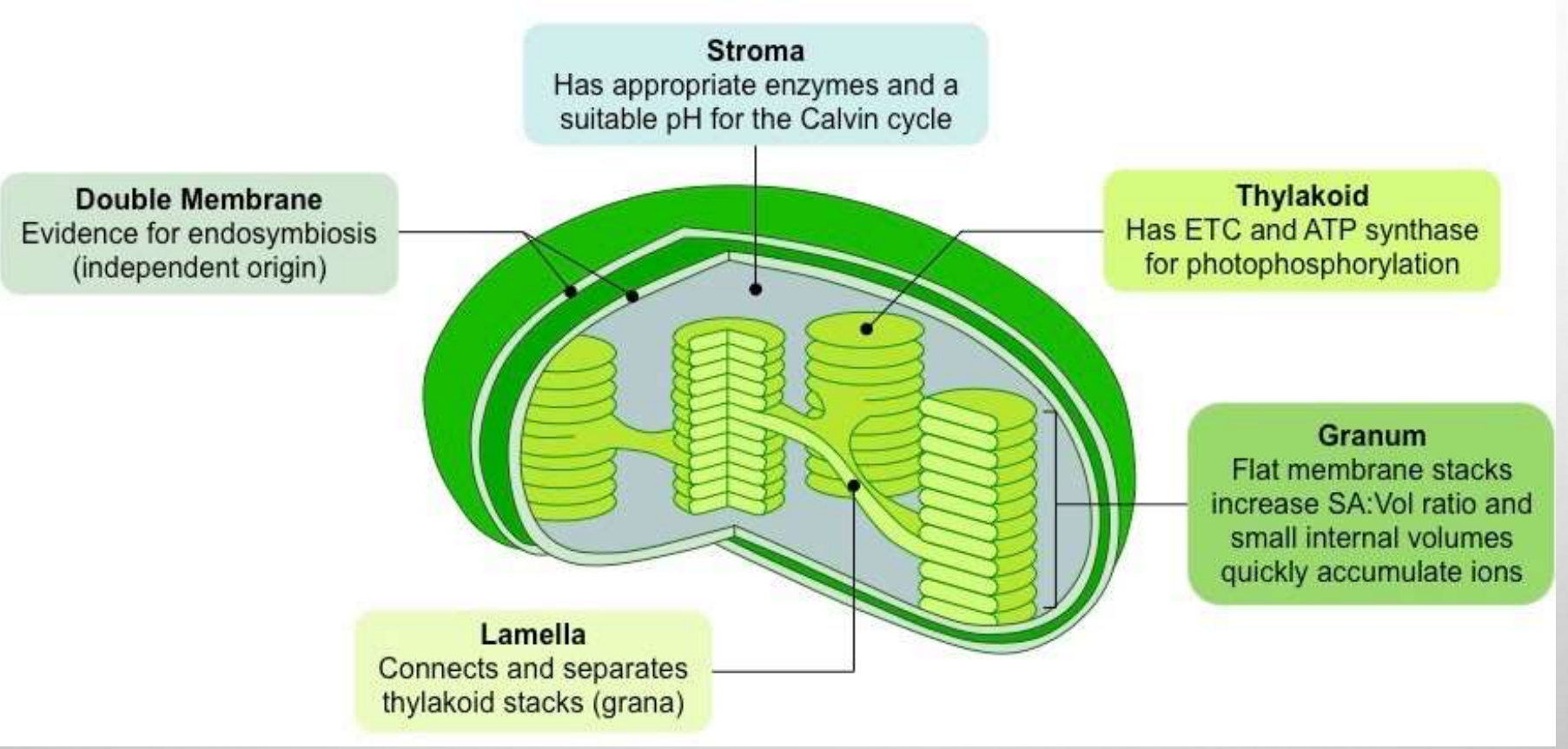
Chloroplast has 3 pigment which absorb light and these pigments are:

1. Chlorophyll A: It absorbs **Red, Violet and Blue light.**

2. Chlorophyll B: It absorbs **Blue and Indigo light.**

3. Carotenoids: It absorbs **Yellow and Orange light.**

***** Central metal of Chlorophyll: Magnesium


Stroma
Has appropriate enzymes and a suitable pH for the Calvin cycle
Double Membrane
Evidence for endosymbiosis (independent origin)
Thylakoid
Has ETC and ATP synthase for photophosphorylation
Granum
Flat membrane stacks increase SA:Vol ratio and small internal volumes quickly accumulate ions
Lamella
Connects and separates thylakoid stacks (grana)

Process of Photosynthesis

Photosynthesis

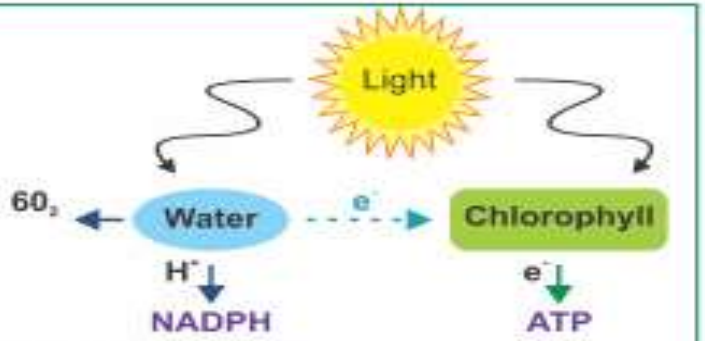
Light reaction or photochemical reaction or Hill reaction - light dependent reaction

Dark reaction or Calvin cycle or Bio-synthetic reaction - light independent reactions

Light Reaction or Hill Reaction : Discovered by Hill. Takes place in the presence of light in thylakoids

Steps in Light Reaction

- Absorption of Light Energy by Chlorophyll : Chlorophyll on exposure to light gets activated by absorbing photons
- Photolysis of Water : Absorbed energy is used in splitting of water into hydrogen and oxygen, releasing electrons



$$2H_2O \xrightarrow{\text{Energy of 4 photons}} 4H^+ + 4e^- + O_2$$

- Reduction of NADP : Hydrogen ions released (photolysis) taken up by NADP (Nicotinamide adenine dinucleotide phosphate) is reduced to $NADPH_2$

$$2\ NADP + 4e^- + 4H^+ \longrightarrow NADPH_2$$

- Photophosphorylation : Formation of ATP (adenosine triphosphate) from ADP(adenosine diphosphate) and inorganic phosphate in the presence of sunlight.

$$ADP + P_i \longrightarrow ATP$$

2. PIGMENTS OF PLANTS:

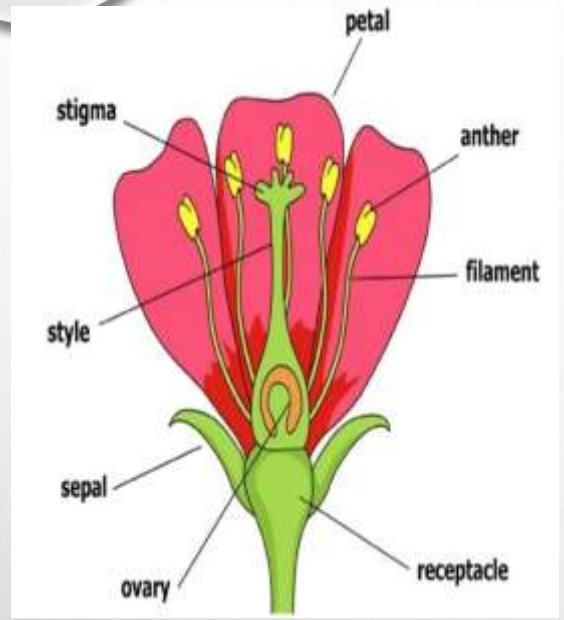
PIGMENTS	COLORS	EXAMPLES
FLAVANOIDS	YELLOW, LIGHT GREEN	LEMON, NUTS, PULSES, CABBAGE
CHLOROPHYLL	DARK GREEN	GREEN LEAFY VEGETABLES
CAROTONOIDS	ORANGISH YELLOW	CARROT, MANGO, PAPAYA
ANTHOCYANIN	PINK+ PURPLE+BLUE	ONION, BRINJAL
LYCOPENE	BRIGHT RED	TOMATO, BLACK GRAPES, WATER MELON,
BETALENE	PURPLE+ VIOLET	JAMUN, BEET ROOT

3. EDIBLE PARTS OF PLANTS:

PARTS OF PLANTS	EXAMPLES
ROOT	BEET ROOT, TURNIP, CARROT, RADISH, SWEET POTATO
STEM	ONION, POTATO, GARLIC, GINGER, SUGAR CANE, TURMERIC
LEAVES	GREEN LEAFY VEG, CABBAGE
SEED	PULSE, WHOLE GRAINS, BEANS, PEA, OIL SEED, NUTS, ALMOND
FLOWERS	CAULIFLOWER, BROCCOLI, CLOVES, SAPHRON

4. DIFFERENCE BETWEEN TRUE FRUITS AND FALSE FRUITS:

	False Fruit	True Fruit
DEFINITION	False fruits arise from floral parts other than the ovary.	True fruits arise as a result of fertilization where the fertilized ovary wall becomes the fleshy fruit.
FERTILIZATION PROCESS	Not involved	Involved
PARTS INVOLVED IN FORMING THE FRUIT	Floral parts such as thalamus, peduncle and perianth, parts other than the ovary.	Fertilized ovary
EXAMPLES	Apple, pears, jackfruit, pineapple, strawberry.	Mango, kiwi fruit, watermelon, cherry.



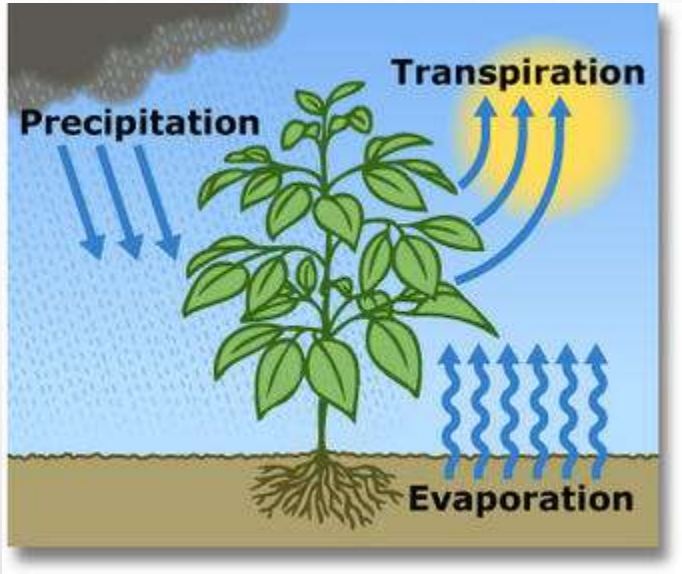
5. DIFFERENCE BETWEEN XYLEM AND PHLOEM:

Xylem	Phloem
1) It transports water and minerals from roots to the apical parts of the plant.	1) It transports food material from the leaves to growing parts of the plant.
2) Xylem consists of tracheids, vessels, xylem fibres and xylem parenchyma.	2) Phloem consists of sieve tubes, sieve cells, companion cells, phloem fibres and phloem parenchyma.
3) Only xylem parenchyma is living.	3) Sieve tubes, sieve cells, companion cells and phloem parenchyma are living.

Xylem	Phloem
4) Tracheids, vessels, xylem fibres are dead tissues.	4) Phloem fibres are dead tissues.
5) Xylem gives mechanical strength to the plant.	5) Phloem does not give mechanical strength to the plant.
6) Conduction of water by xylem is unidirectional i.e., from roots to apical parts of the plant.	6) Food material conduction is bidirectional i.e., from leaves to storage organs or growing parts or from storage organs to growing parts of plants.
7) Xylem is star shaped.	7) Phloem is not in star shaped.
8) Xylem occupies the center of the vascular bundle.	8) Phloem occurs on outer side of the vascular bundle.
9) Tubular with hard walled cells.	9) Tubular with soft walled cells.

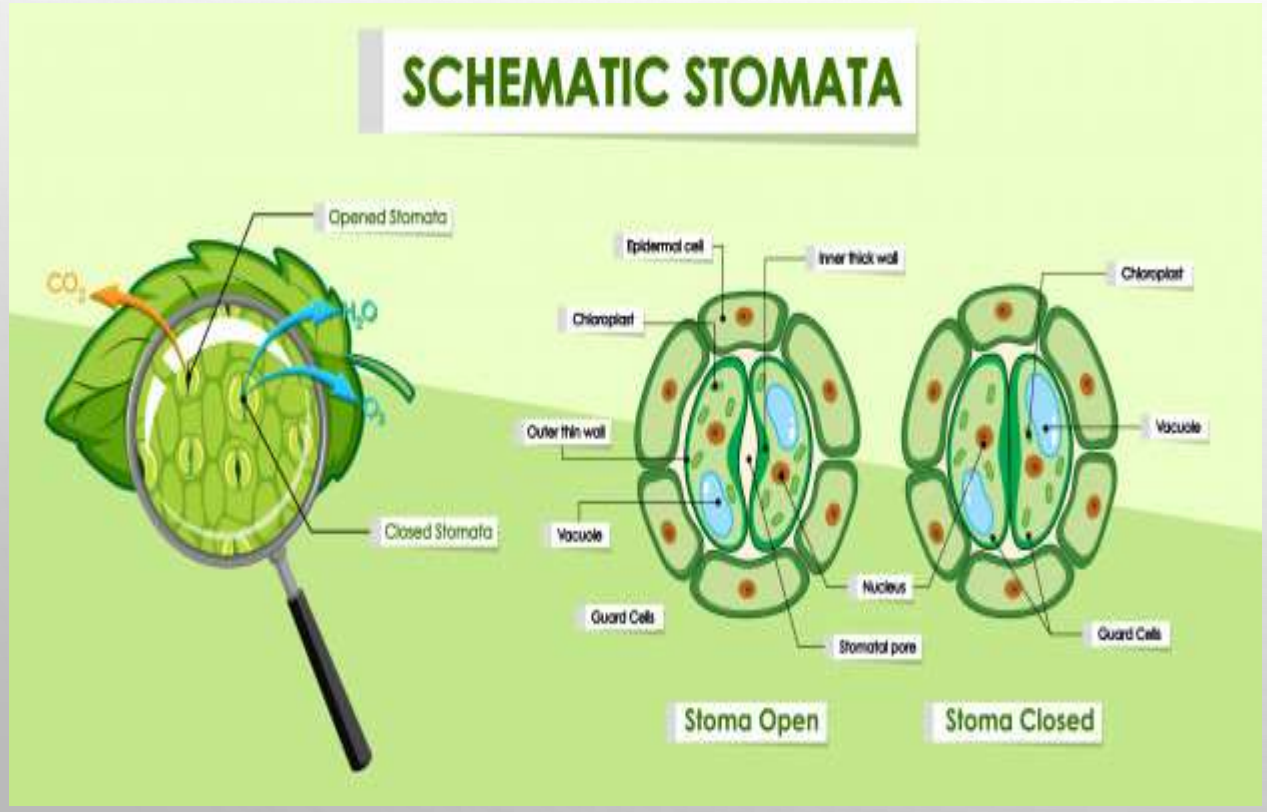
6. TRANSPIRATION:

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



Transpiration is the evaporation of water from plants. it occurs chiefly at the leaves while their stomata are open for the passage of co2 and o2 during photosynthesis.

The water, warmed by the sun, turns into vapor (evaporates), and passes out through thousands of tiny pores (stomata) mostly on the underside of the leaf surface. this is transpiration. it has two main functions: cooling the plant and pumping water and minerals to the leaves for photosynthesis.

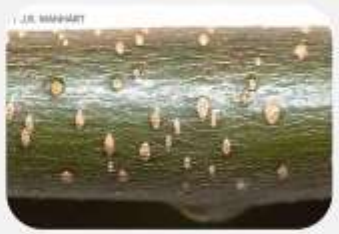


Types of transpiration

- On the basis of the passages through which plants give out water in the form of vapor transpiration is of three types:

Stomatal transpiration

Cuticular transpiration

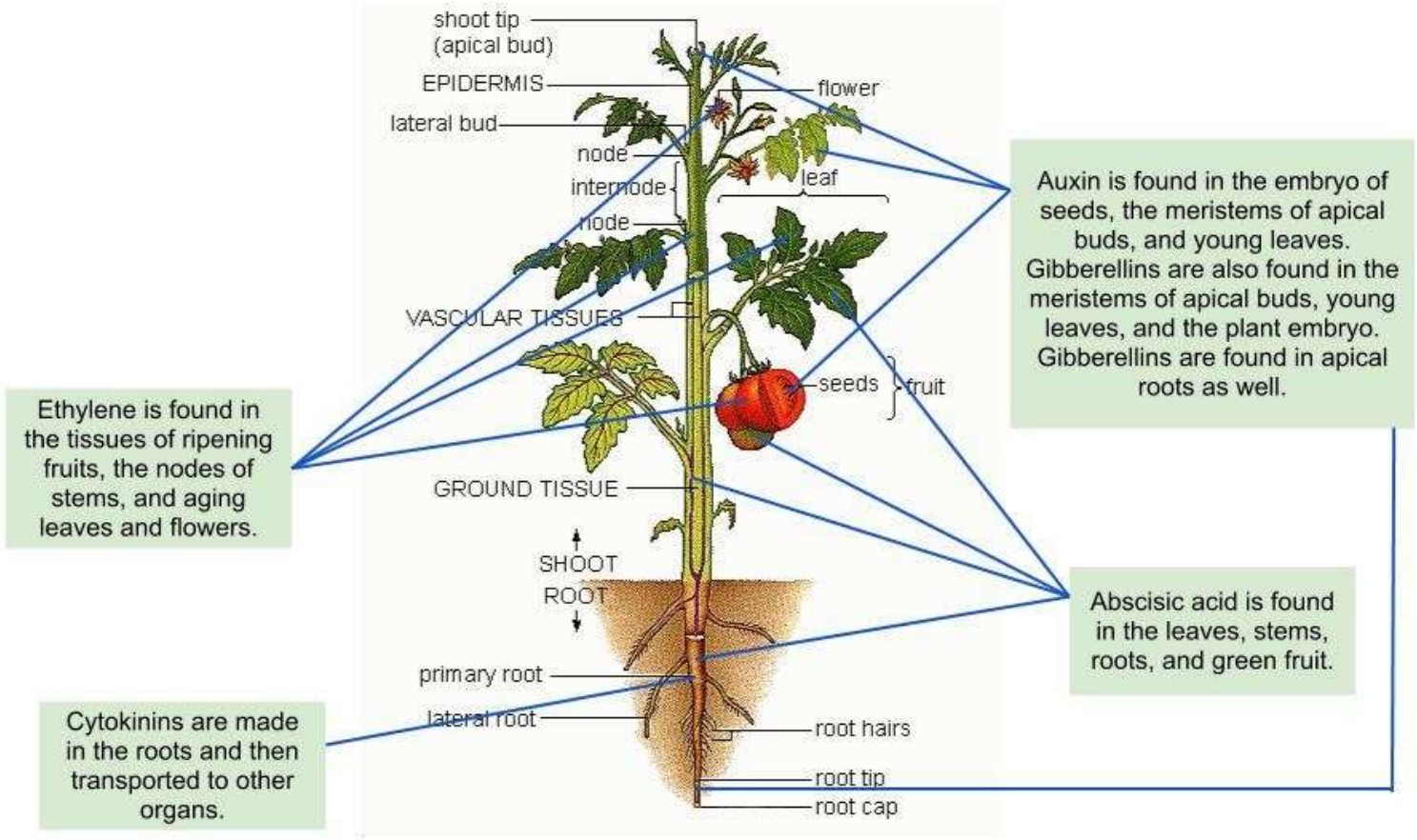


Lenticular transpiration

7. PLANT HORMONE:

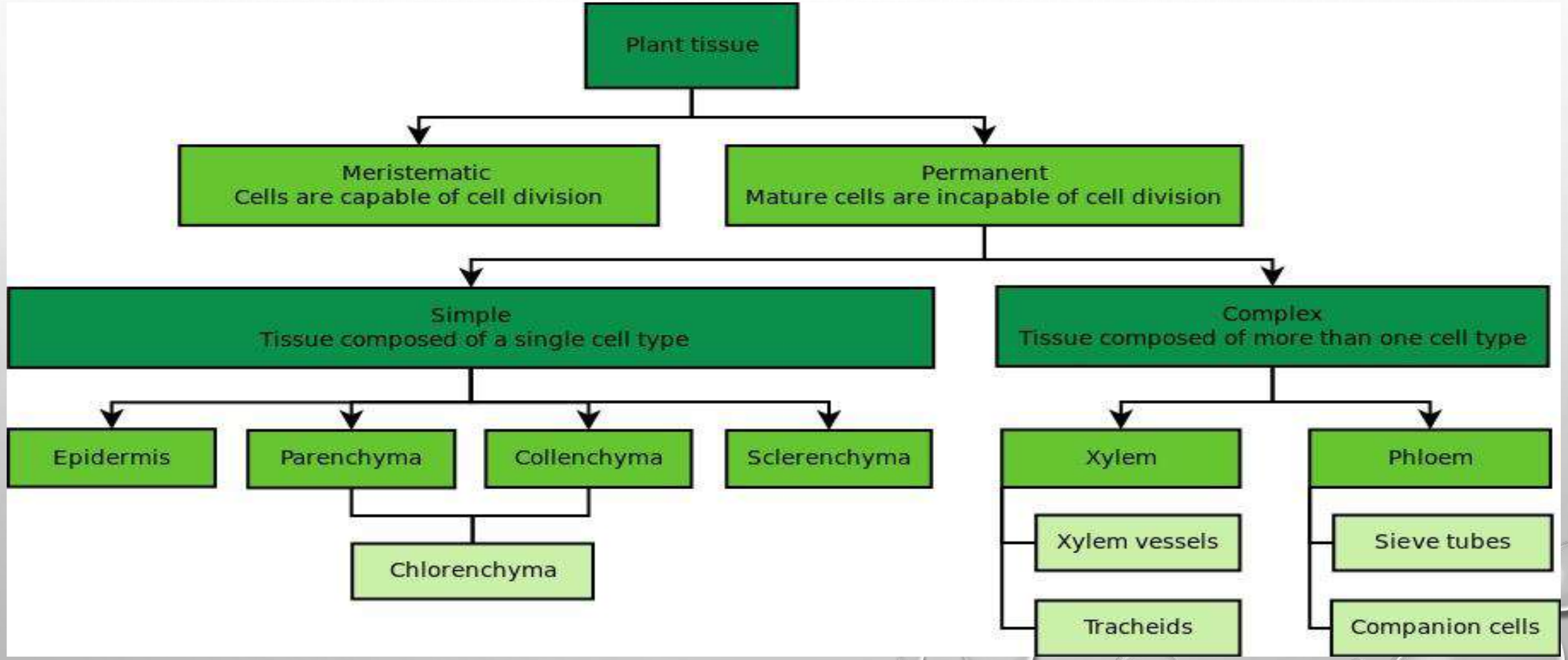
Plant Growth Hormones

HORMONE	TYPICAL ACTIVITIES
Abscisic acid	Maintains seed dormancy and winter dormancy; closes stomata
Auxins	Promote stem elongation, adventitious root initiation, and fruit growth; inhibit axillary bud outgrowth and leaf abscission
Brassinosteroids	Promote stem and pollen tube elongation; promote vascular tissue differentiation
Cytokinins	Inhibit leaf senescence; promote cell division and axillary bud outgrowth; affect root growth
Ethylene	Promotes fruit ripening and leaf abscission; inhibits stem elongation and gravitropism
Gibberellins	Promote seed germination, stem growth, and fruit development; break winter dormancy; mobilize nutrient reserves in grass seeds



Original Image source: http://www.uic.edu/classes/bios/bios100/labs/plantbod.gif

8. PLANT TISSUE:

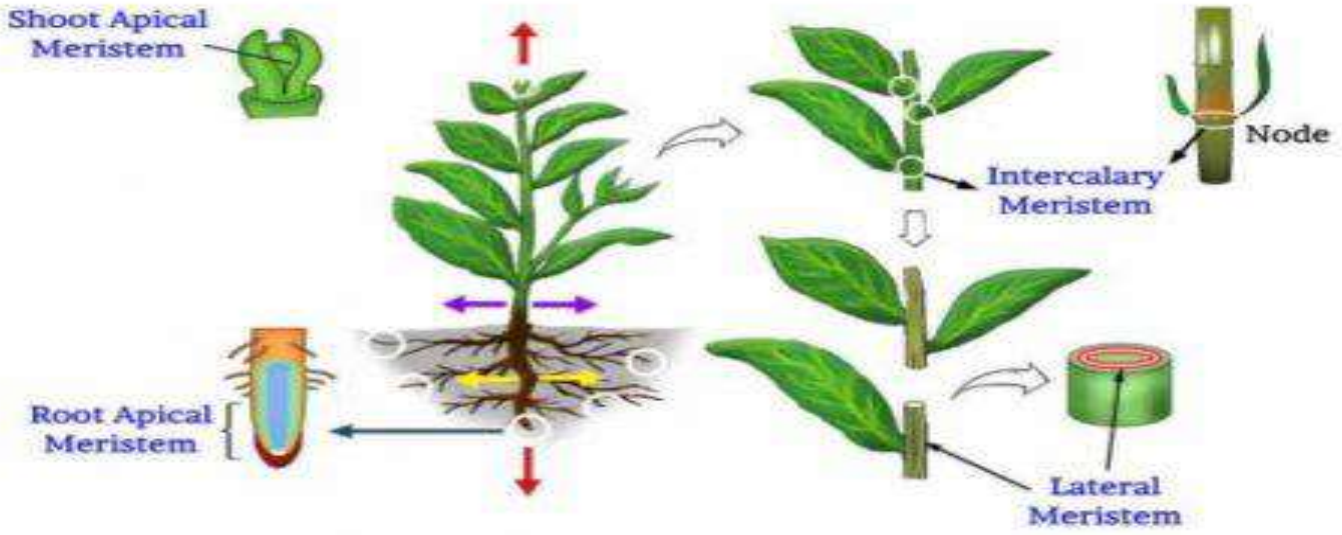


Meristematic tissue

Apical Meristem
- Present on root and shoot tips
- Responsible for growth of root and shoot

Intercalary Meristem
- Present on leaf base and node
- Responsible for growth of plant from leaf and nodes

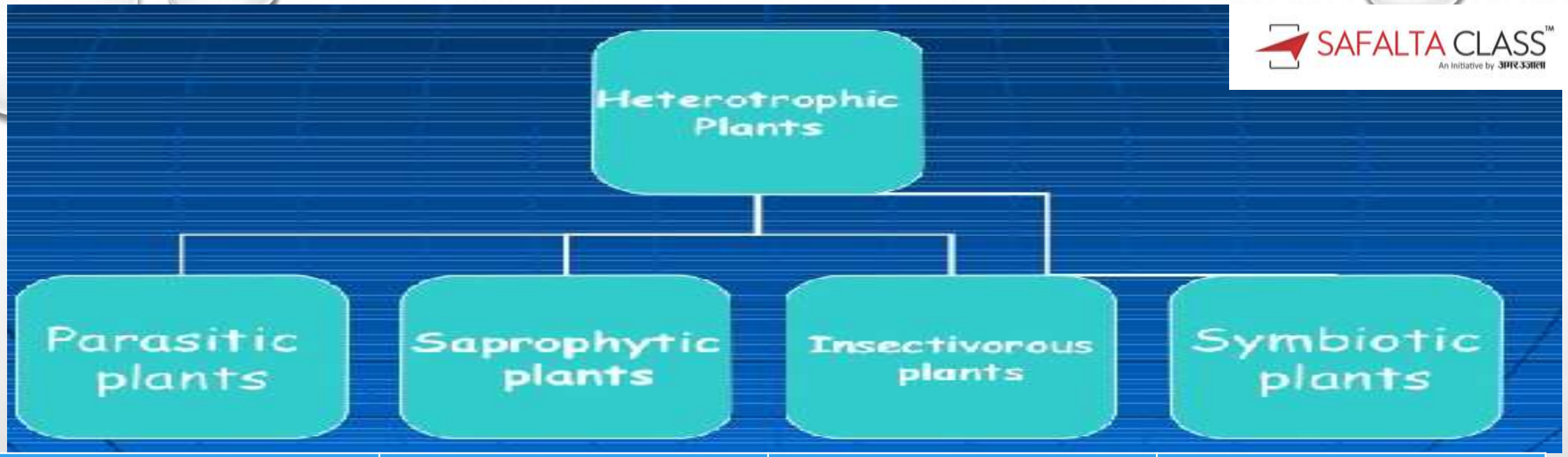
Lateral Meristem
- Present on side of stem and root
- Responsible for increase in diameter of stem and root



Parenchyma	Collenchyma	Sclerenchyma
Cells are thin walled. Only primary wall present	Thick primary wall at the corners.	Thick walled
Cells loosely arranged	Cells compactly arranged	Cells compactly arranged.
Cells are living, nucleus present	Cells living, nucleus seen	Cells dead, devoid of cellular contents.
Spherical, polygonal, oval, rectangular or rod shaped.	Shapes are variable.	Elongated
Many intercellular spaces.	Intercellular spaces absent	Intercellular spaces absent
Cells vacuolated	Vacuoles absent	Vacuoles absent

9. MODES OF NUTRITION IN PLANTS:

AUTOTROPIC NUTRITION	HETEROTROPIC NUTRITION
Plants are autotrophs, which means they produce their own food. They use the process of photosynthesis to transform water, sunlight, and carbon dioxide into oxygen, and simple sugars that the plant uses as fuel.	Some plants cannot produce their own food and must obtain their nutrition from outside sources—these plants are heterotrophic.
Eg: Green plants, Blue green algae, Cyanobacteria	Eg: Fungi



A parasitic plant is a plant that derives some or all of its nutritional requirement from another living plant	saprophyte is a plant that does not have chlorophyll, obtaining its food from dead matter	Insectivorous plants are plants that derive some of their nutrients from trapping and consuming animals or protozoan.	Symbiotic plants, or the process of symbiosis, is when two plants live closely together in harmony of one kind or another.
Eg: Cascuta Stinking Corpse lily	Eg: Mushroom Molds Mycorrhizal Fungi	Eg: Pitcher plant, Drossera, Lobster pot traps, sundews, butter wort, water wheel plant	Eg: Lichens