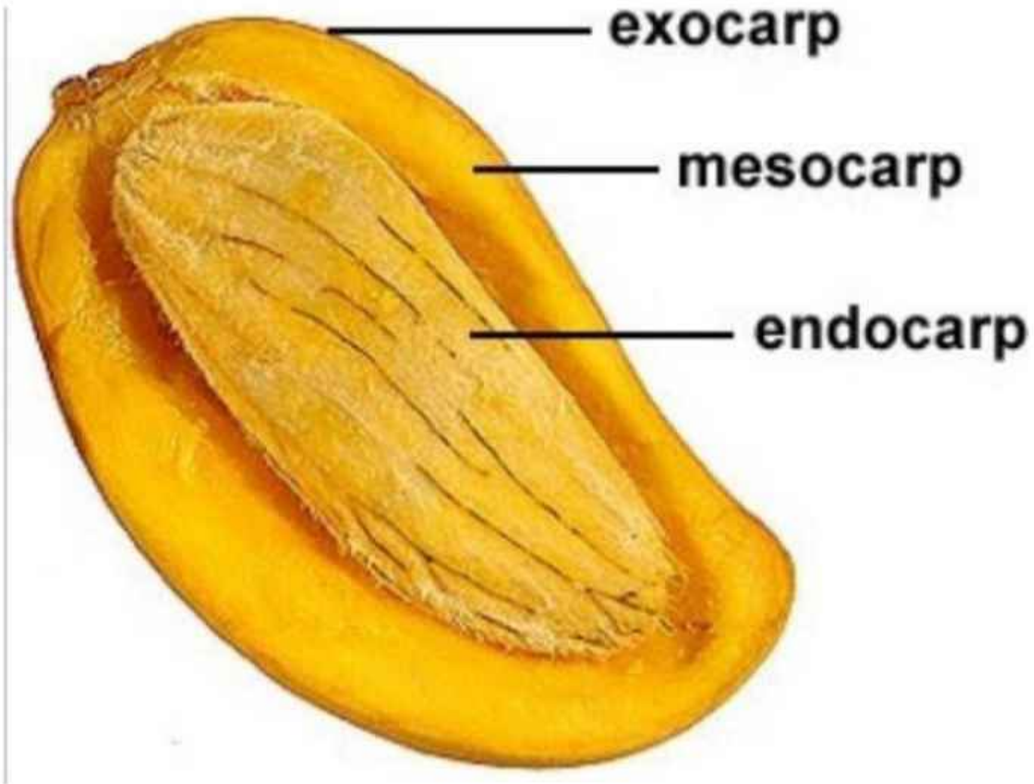
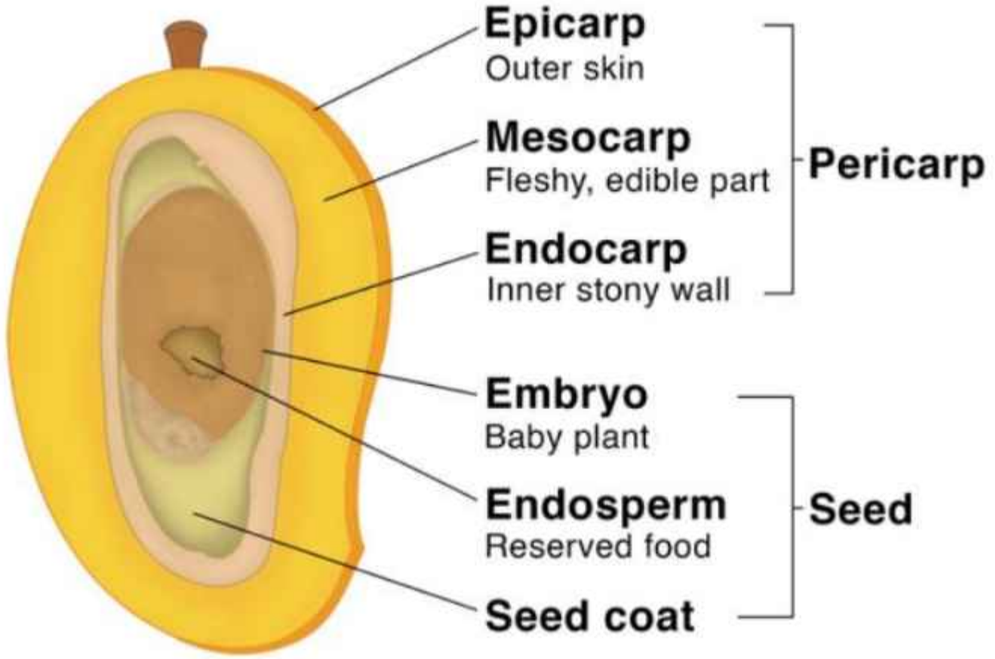
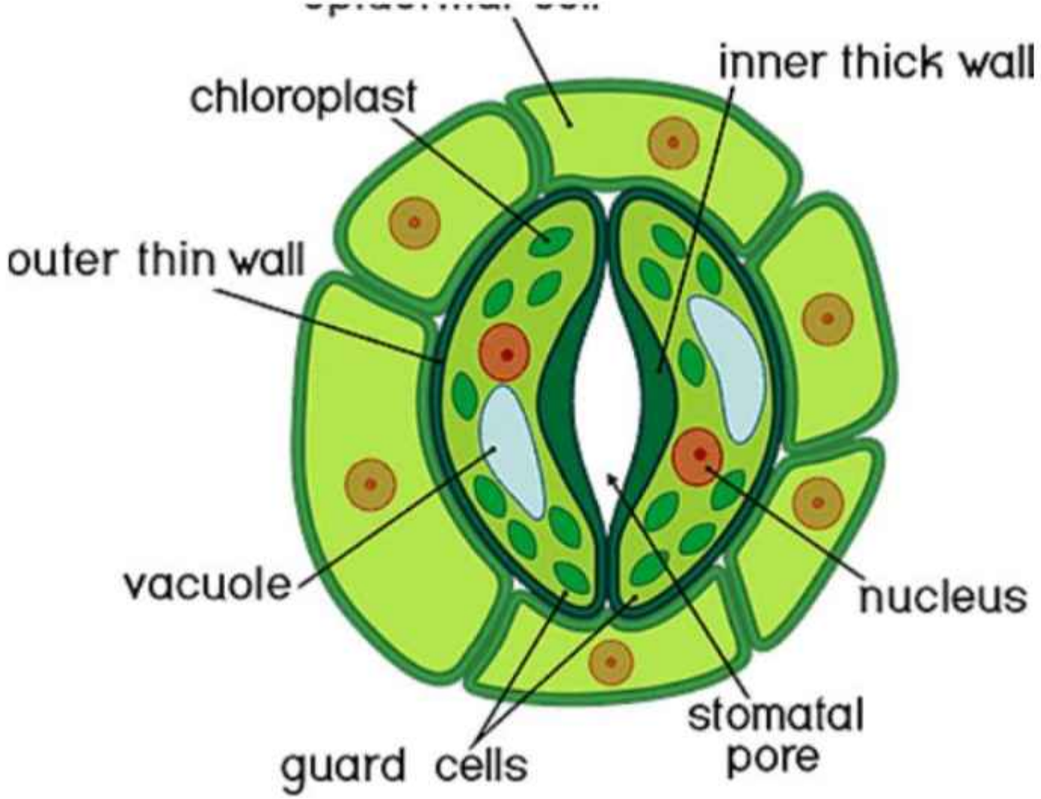

exocarp
mesocarp
endocarp

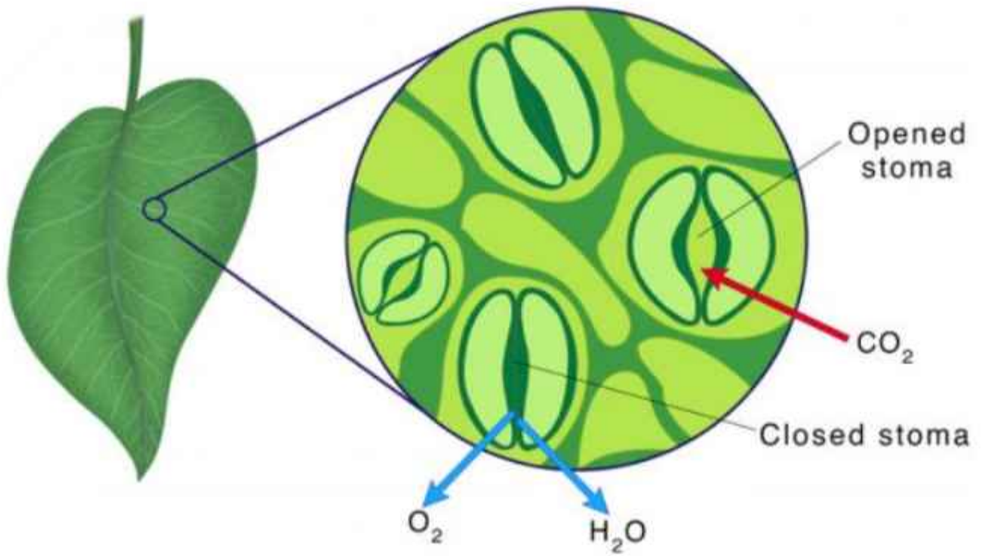
Parts of a Fruit

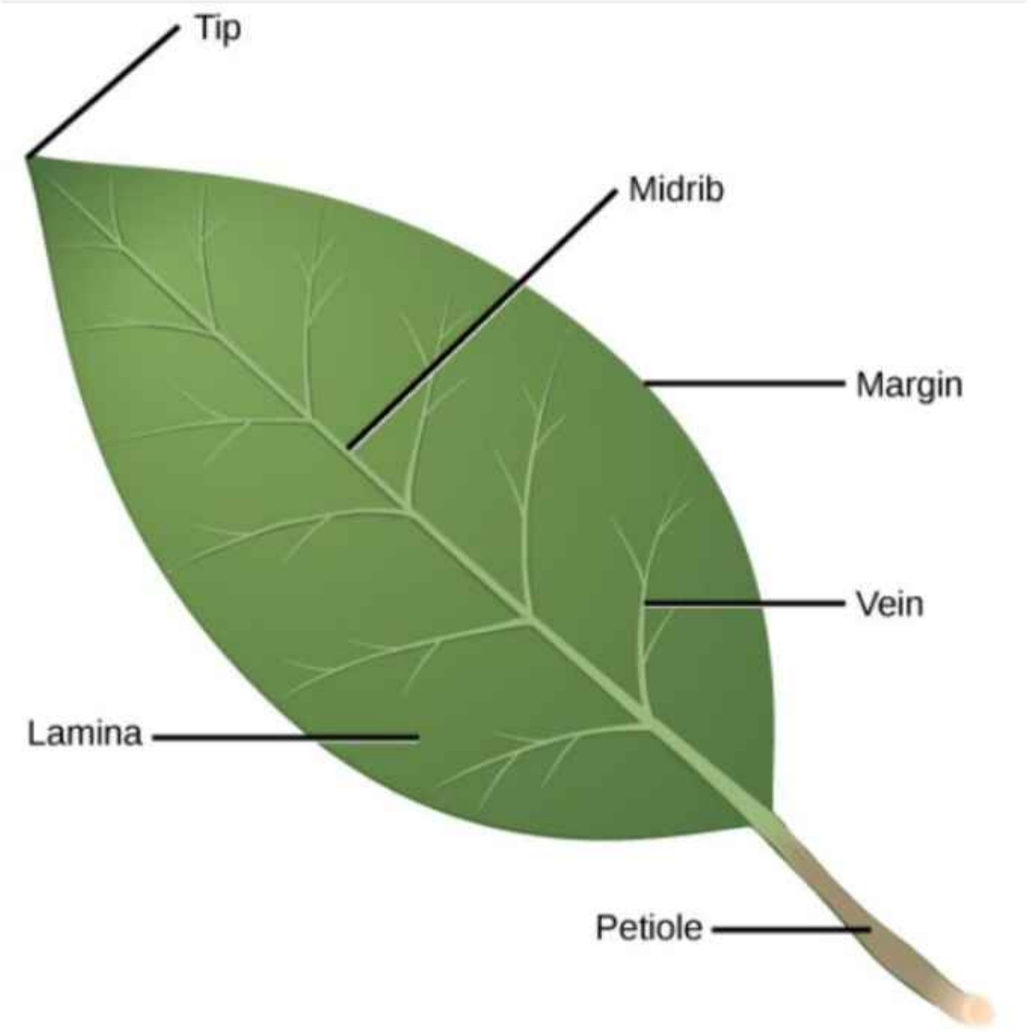



inner thick wall
chloroplast
outer thin wall
vacuole
nucleus
stomatal pore
guard cells

stoma open

Stomata




Tip
Midrib
Margin
Vein
Lamina
Petiole

PLANT MODIFICATION

Modification of Root

To perform special functions the roots change their size and shape.



STORAGE OF FOOD
e.g. Beet root



MECHANICAL SUPPORT
e.g. Banyan tree



GASES EXCHANGE
e.g. Avicennia



SUCKING ROOT
e.g.Cuscuta

Modification of stem

Stem modified for storing the food materials and for vegetative propagation.



AERIAL MODIFIED
e.g. Cactus



SUB-AERIAL MODIFIED
e.g. Eichhornia



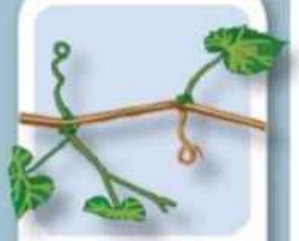
UNDERGROUND STEM
e.g. ColoCasia

Modification of Leaf

Leaves have changed themselves to adopt to their environment



SPINES
e.g.Opuntia



TENDRILS
e.g.Pisum



PHYLLODE



TRAPS
e.g. Nepenthus

Tendril: These types of stems are slender, spirally coiled, which help a plant to climb. Example: Passiflora, Grapevine etc.

Bulbil: These are modified axillary buds which become fleshy and swollen due to the storage of food. They help in vegetative propagation to form a new plant. Example: Dioscorea.

Thorn: These are hard, woody, and pointed structures that protect plants from grazing animals. It originates from the axillary or terminal bud. Example: roses, citrus, bougainvillea, duranta etc.

Cladodes: These are non-fleshy and cylindrical that contain only one internode. Example: Asparagus, butcher's broom.

Phylloclade: These are green, fleshy, and flattened or cylindrical branches containing chlorophyll and photosynthesis. This modification is found in xerophytic plants and stores water. Example: Opuntia, Casuarina,

Aerial stem



Passiflora (Tendril)



Dioscorea (Bulbil)



Bougainvillea (Thorn)



Asparagus (Cladodes)



Opuntia (Phylloclade)

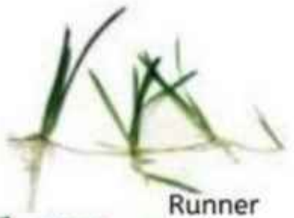
Runner: It is a creeper that runs horizontally along the surface of the soil. Runners have long internodes. The nodes have scale leaves, adventitious roots, and auxiliary buds. An underground runner is known as sobole. Example: Grass, Cynodon, Oxalis.

Offset: These are shorter and thicker than the runner with a single internode. It originates from the leaf axis and grows horizontally. Offsets are often found in aquatic plants like water lettuce, water hyacinth, etc.

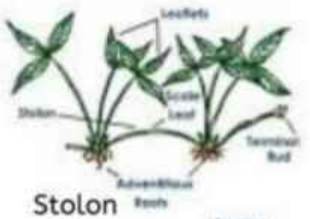
Stolon: It grows above ground for some time and then bends towards the ground until it touches the ground. Stolon arises from the lower part of the main axis. Example: Jasmine, colocasia, etc.

Sucker: The sucker stem is very similar to the stolon, but it grows obliquely upwards and gives rise to a new plant. Example: Garden chrysanthemum, strawberry, pineapple, mentha, etc.

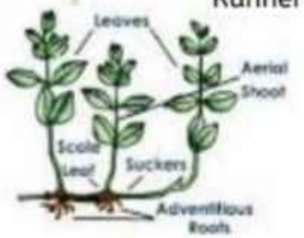
Sub-Aerial Stem



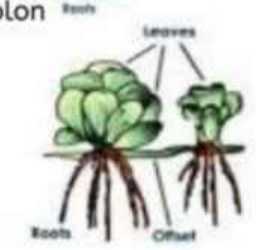
Runner



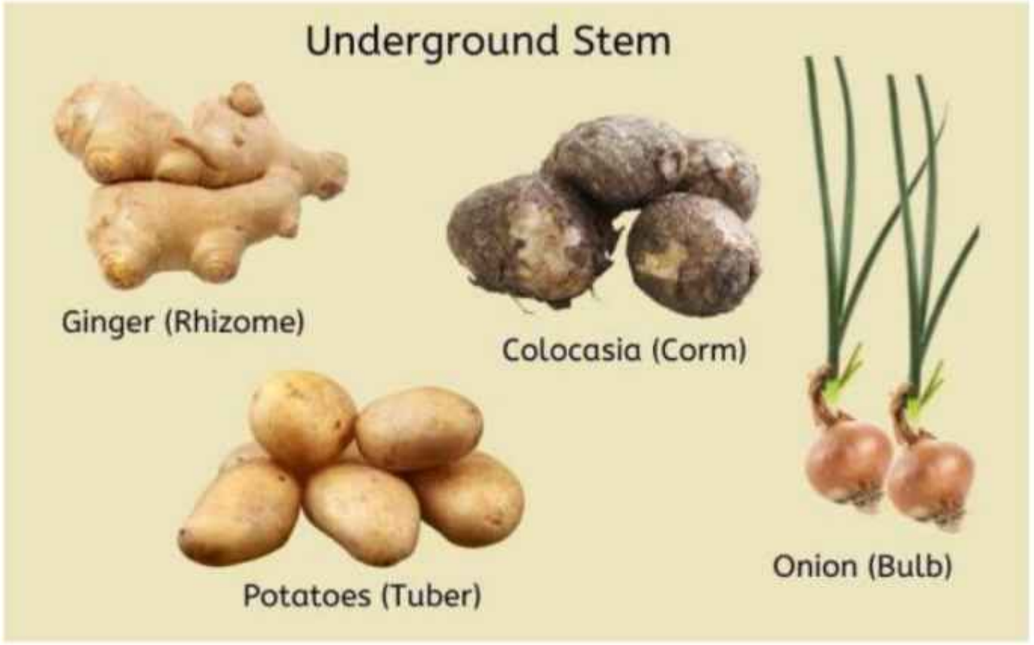
Stolon



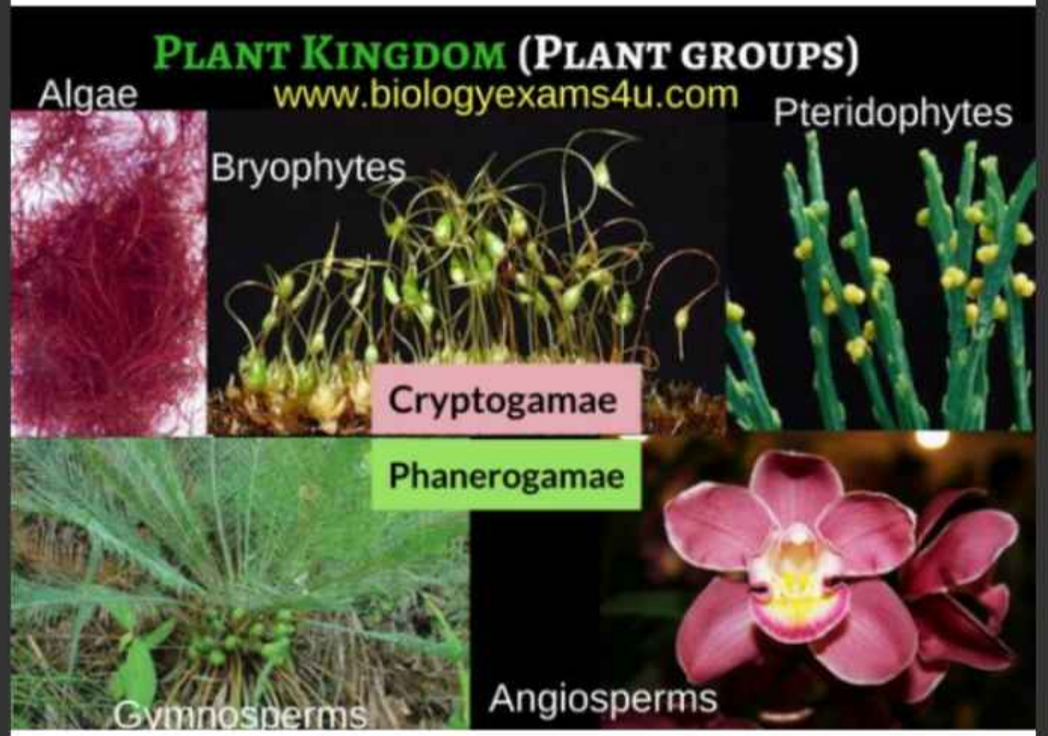
Sucker



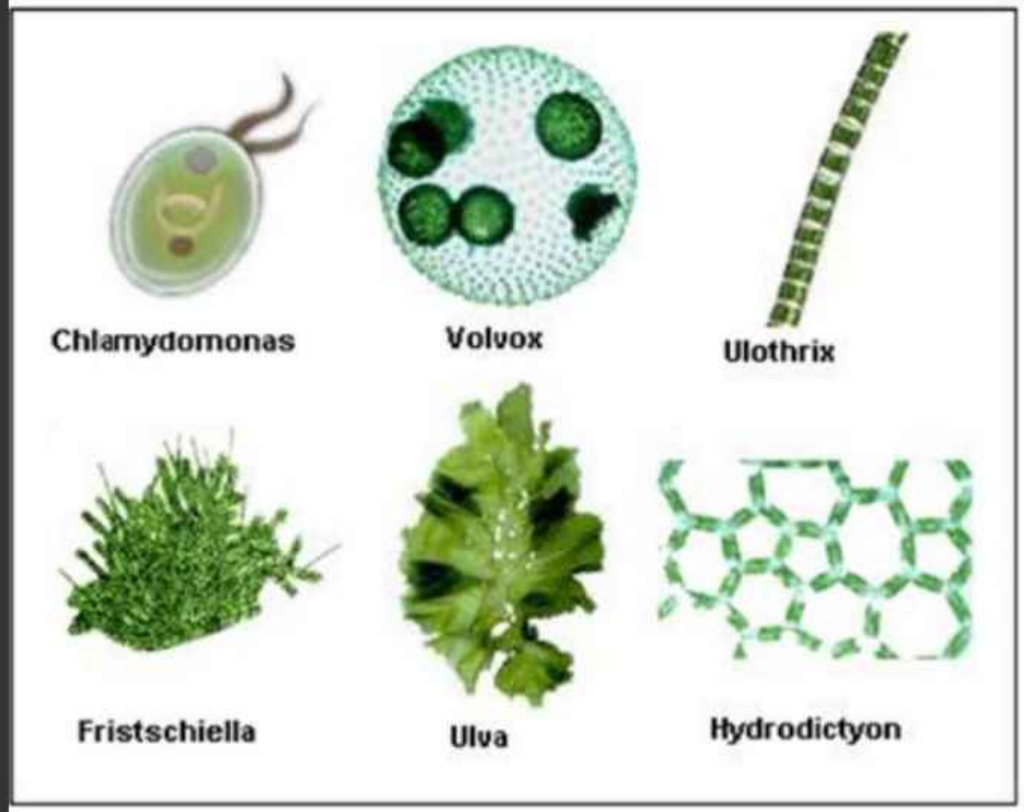
Offset


Underground Stem
Ginger (Rhizome)
Colocasia (Corm)
Potatoes (Tuber)
Onion (Bulb)


Underground Stem
Aerial Stem
Sub-Aerial Stem
Rhizome
Corm
Bulb
Tuber
Phylloclades
Cladodes
Thorns
Runner
Stolon
Sucker
Offset


PLANT KINGDOM (PLANT GROUPS)
www.biologyexams4u.com
Algae
Bryophytes
Pteridophytes
Cryptogamae
Phanerogamae
Gymnosperms
Angiosperms


PHAEOPHYCEAE
Ectocarpus
Tilopteris
Cutleria
Desmarestia
Laminaria
Sphacelaria
Sporochnus
Dicotyota
Sargassum
www.plantscience4u.com


Chlamydomonas
Volvox
Ulothrix
Fristschiella
Ulva
Hydrodictyon

WHAT ARE BRYOPHYTES?



liverworts

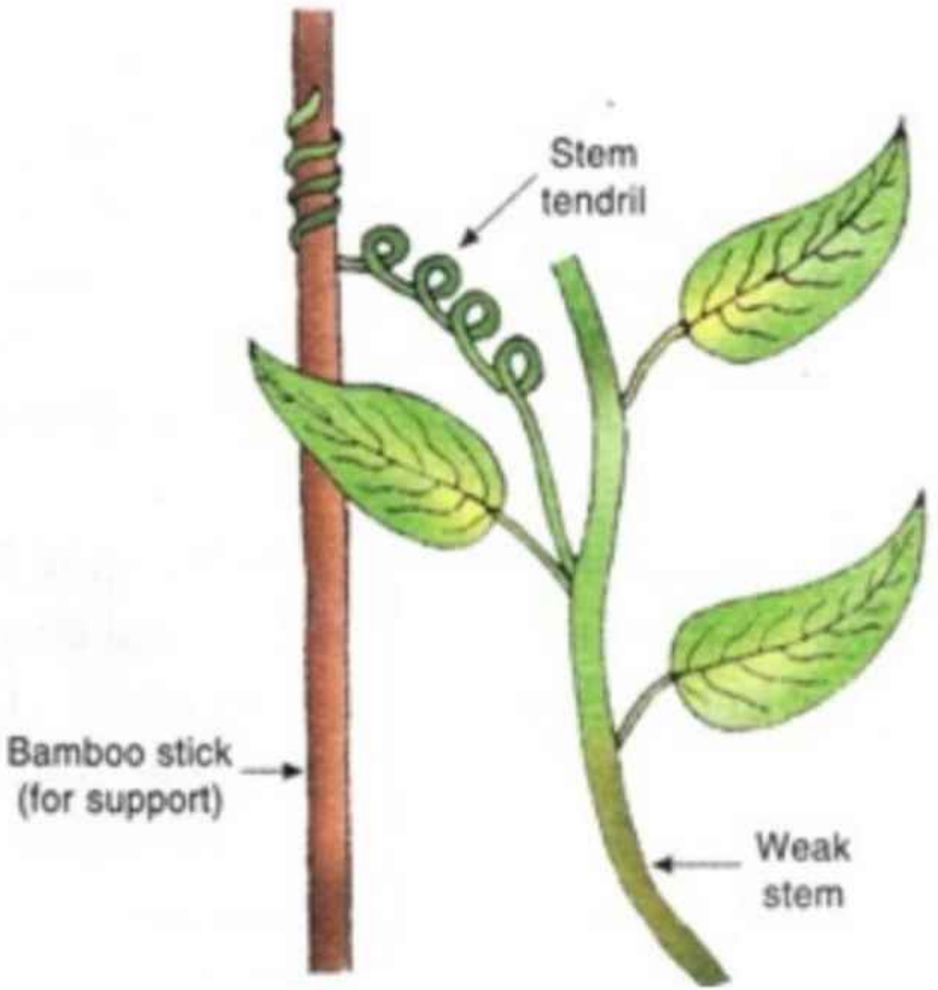


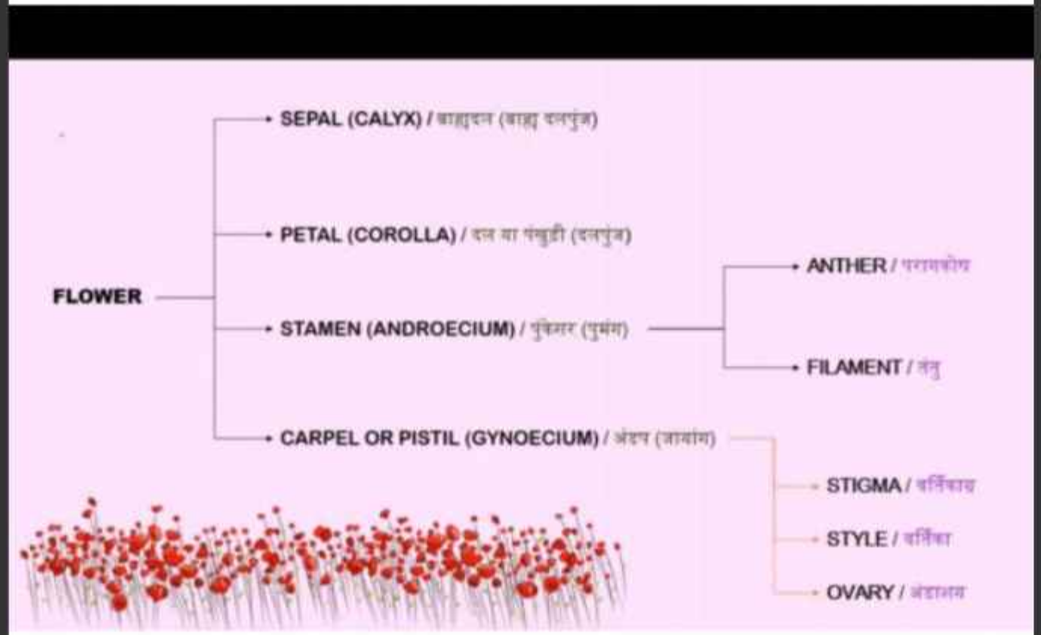
hornworts



mosses




Stem
tendril
Bamboo stick
(for support)
Weak
stem


FLOWER
SEPAL (CALYX) / बाह्यदल (बाह्य दलपुंज)
PETAL (COROLLA) / दल या पंखुड़ी (दलपुंज)
STAMEN (ANDROECIUM) / पुंकेसर (पुमंग)
ANTHER / परागकोष
FILAMENT / तंतु
CARPEL OR PISTIL (GYNOECIUM) / अंडप (जायांग)
STIGMA / वर्तिकाग्र
STYLE / वर्तिका
OVARY / अंडाशय

अनावृतबीजी Gymnosperm

⇒ No flower पुष्प नहीं बनते हैं

⇒ Naked seed नग्न बीजी कहते हैं

⇒ Seeds are not under fruit बीज फल के अन्दर नहीं होते हैं

⇒ Needle like leaves पत्तियां नुकली होती हैं

⇒ Colded Areas ठंड प्रदेशों में मिलते हैं

⇒ directly pollination by Air सीधे हवा द्वारा परागण

Xylem (जाइलम)
दारु

→ मिट्टी से जल व खनिज पदार्थों का स्थानान्तरण करते हैं

transportation of water & mineral

Phloem (फ्लोएम)
पोषवाह

पत्तियों से भोजन का स्थानान्तरण

transportation of food from leaves.



① वाहिका tracheids ✓

② वाहिनिका vessels ✗

③ जाइलम तंतु Xylem fiber ✓

④ जाइलम पैरनकाईमा Xylem Parenchyma ✓

जाइलम Xylem = अनावृतबीजी ✓ Gymnosperm



① Sieve tube चलनी नलिका ✗

② Compion cell सहचर नलिका ✗

③ Phleom Parenchyma फ्लोएम पैरनकाईमा

④ Phleom fiber फ्लोएम तंतु

Phleom
फ्लोएम
= अनावृतबीजी Gymnosperm

अनावृतबीजी ⇒ उदाहरण
Gymnosperm Ex

⇒ Pine चीड़ का वृक्ष (Cone शंकु)

⇒ Cycas साइकस ⇒ जड़ों को कोरालोइड जड़ कहते हैं Coralloid Roots

⇒ Ginkgo जिन्कों

जीवित जीवाश्म Living Fossil



आवृतबीजी पौधे

Angiosperm

⇒ पादप जगत का सर्वोच्च विकसित वर्ग है

More developed part of plant kingdom

⇒ फल, फूल, बीज सभी बनते है

formation of fruit, flower & seed.

⇒ 80% भाग पाया जाता है 80% part present on earth.

Note ⇒ सर्वाधिक O2 देते है = शैवाल Algae

⇒ द्विनिषेचन होता है Double fertilization

Double fertilization
द्वि निषेचन

२ शुक्राणु
२ sperm

१-शुक्राणु
sperm → केन्द्रक के साथ निषेचीत होता है
Fision with Nucleus

१-शुक्राणु
sperm → ध्रुवीय केन्द्रक के साथ निषेचित होता है
fision with poller Nuclei



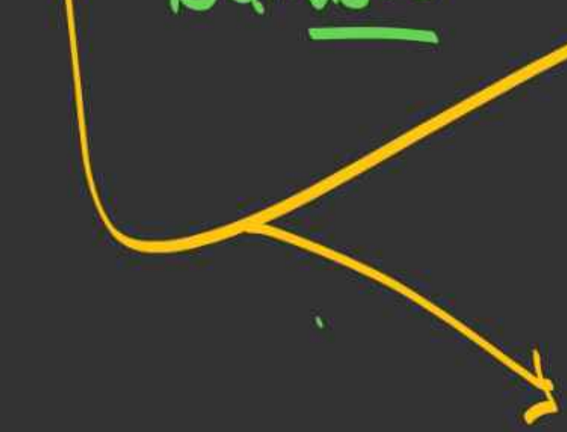
आवृतबीजी ⇒ उदाहरण

Angiosperm

Ex

आम, केला, सन्तरा, सेब, तमाटर, घास, फास

Bamboo



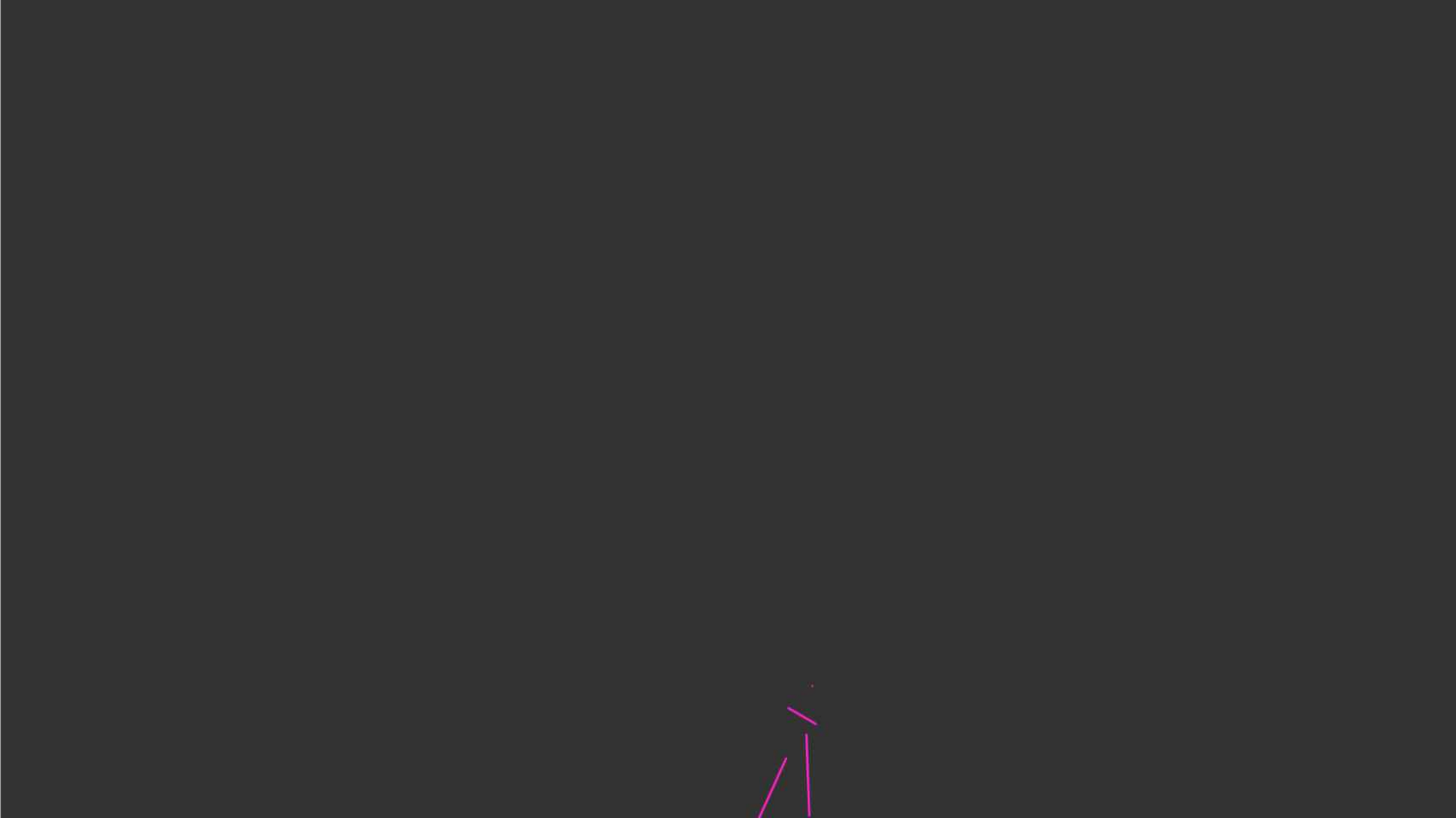
आवृतबीजी
Angiosperm

Monocot
एकबीजपत्री

↳ एक बीजपत्र पाया जाता है
Single cotyledon

Dicot द्विबीजपत्री

दो बीजपत्र पाये जाते है
Two cotyledon



एकबीजपत्री
Monocot

- जड़ें Roots → रेशेदार जड़ Fibrious Root



- शिरा विन्यास Venation (पत्तियां) समानान्तर Parallel

द्विबीजपत्री
Dicot

- जड़ें Roots → Tap Root शंकु जड़



- शिरा विन्यास leaf venation → जालिकावत Reticulate
- फूल में पंखुड़ी Flower palels 3X

Monocot

गेहूं wheat

मक्का Corn

चावल Rice

घास Grass

(बांस Bamboo)

Banan केला

cm बढ़ता है

Dicot

सरसो Mustard

आम Mango

सेब Apple

बादाम Almond

मटर pea

दाल pulses

मूंगफली peanut

चना Gram

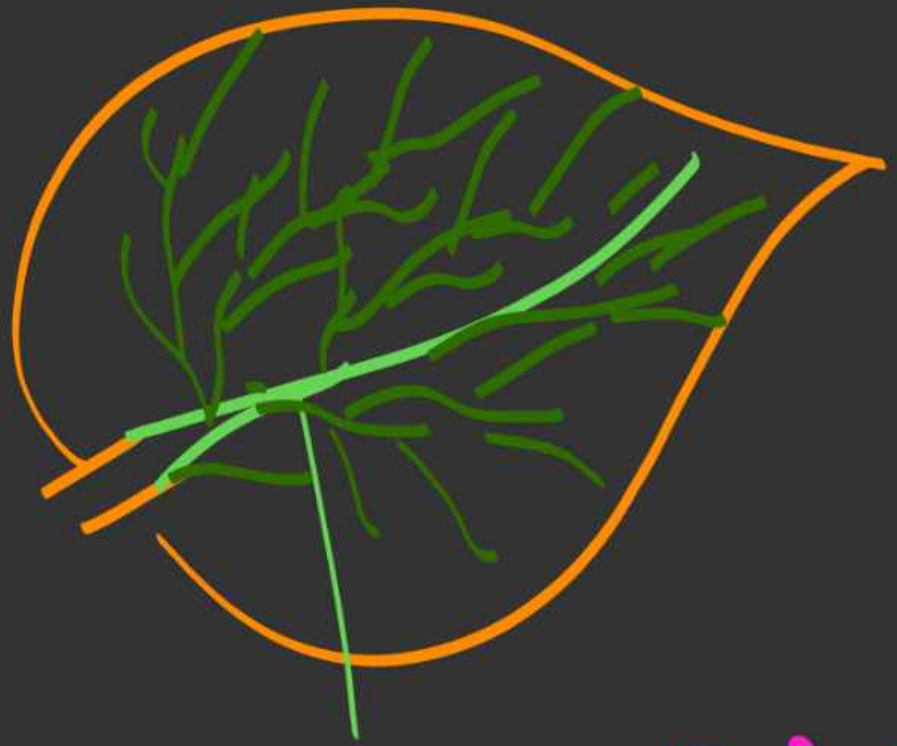
Plant Morphology
पादप आकारिकी



Vein शिरा

समानान्तर

Monocot Parallel



MidRib Dicot

Reticulate