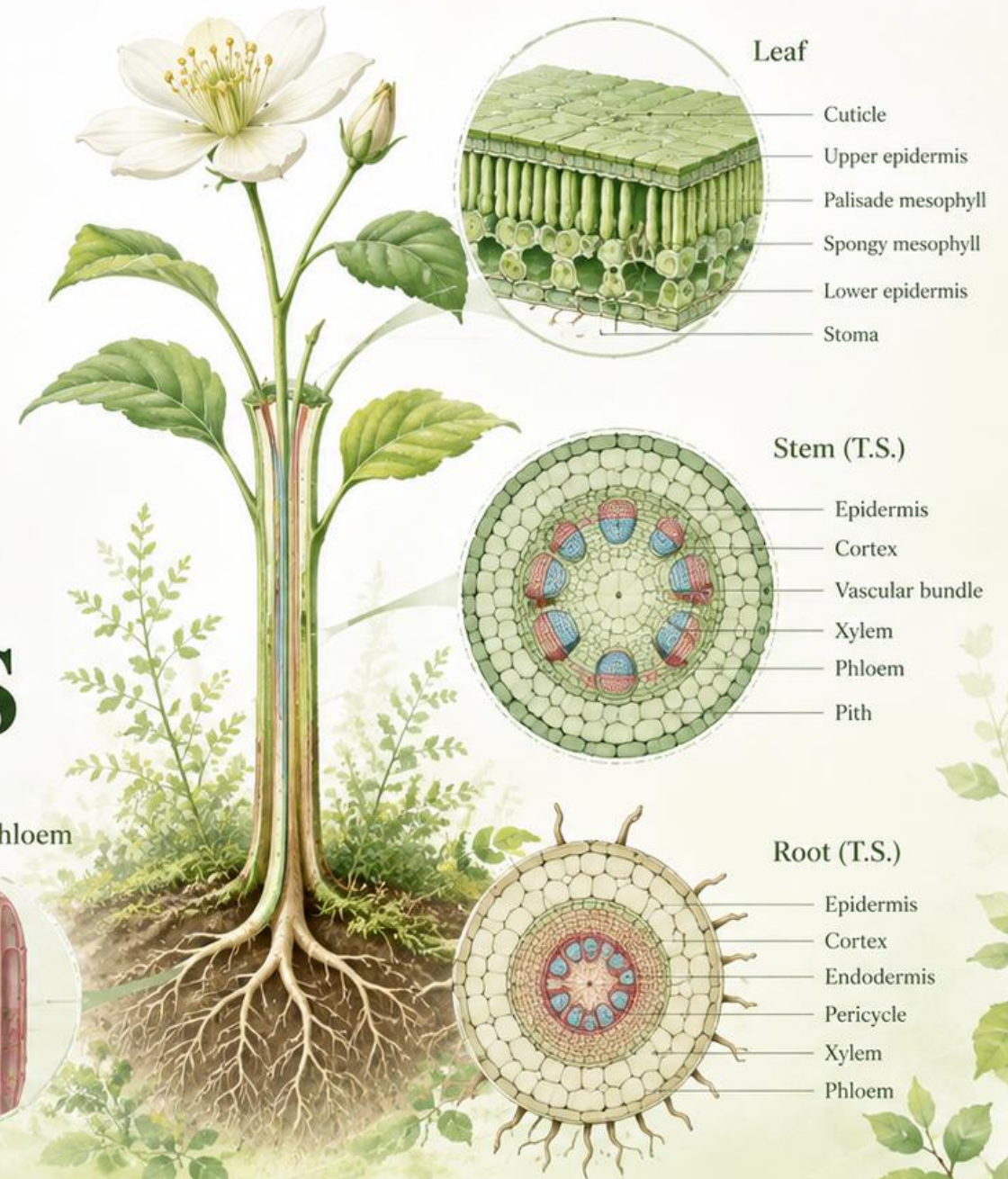
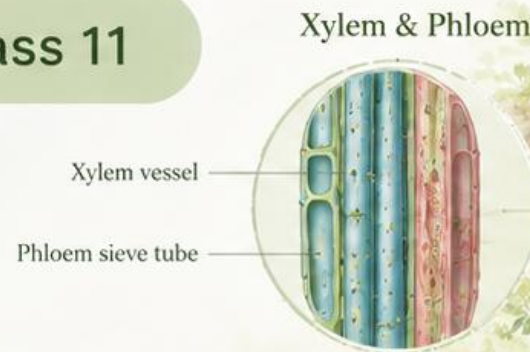


Chapter 6 : Anatomy of Flowering Plants

Biology Notes | Class 11



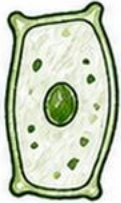
ANATOMY & THE THREE TISSUE SYSTEMS

Anatomy - study of the internal structure of plants.

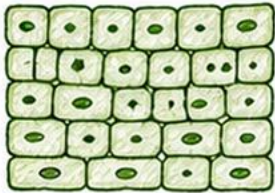
CELL → TISSUE → ORGAN → FUNCTIONAL PLANT BODY

Internal structure varies among organs and reflects both function and environmental adaptation.

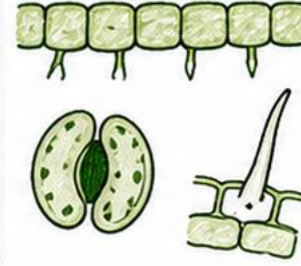
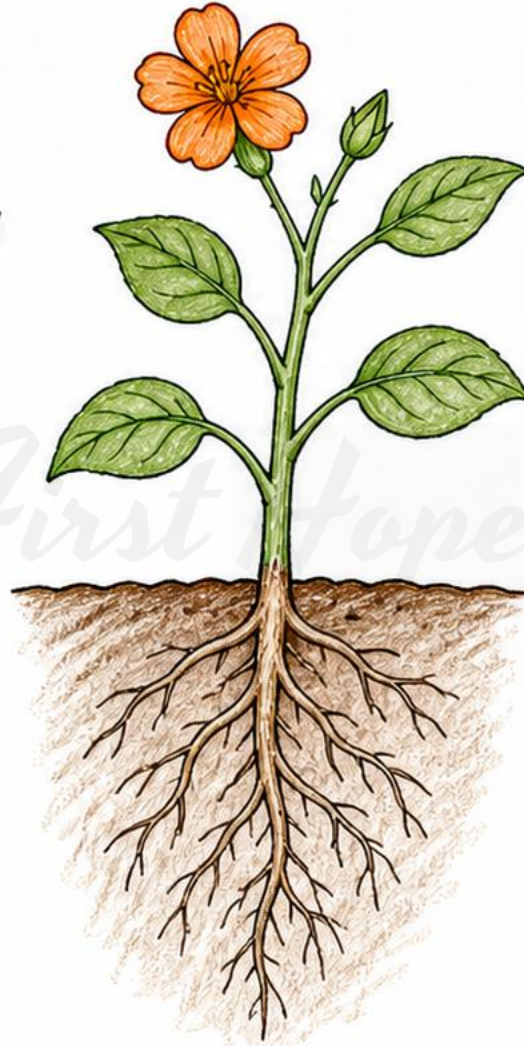
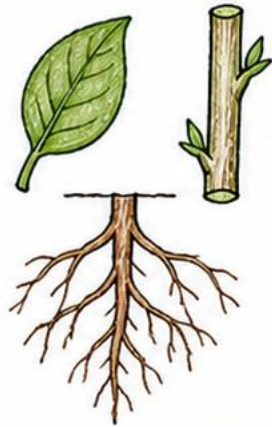
CELL



TISSUE

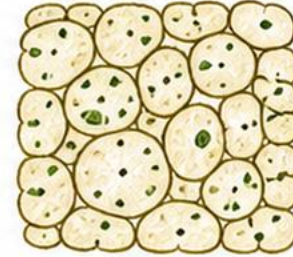


ORGAN



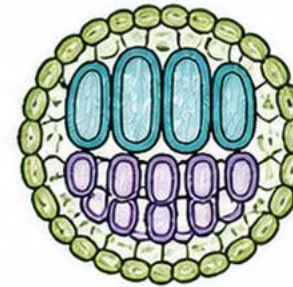
EPIDERMAL TISSUE SYSTEM

- epidermal cells, stomata, root hairs and trichomes
- outer protection and exchange



GROUND / FUNDAMENTAL TISSUE SYSTEM

- all tissue except epidermis and vascular bundles
- bulk, storage, photosynthesis and support



VASCULAR / CONDUCTING TISSUE SYSTEM

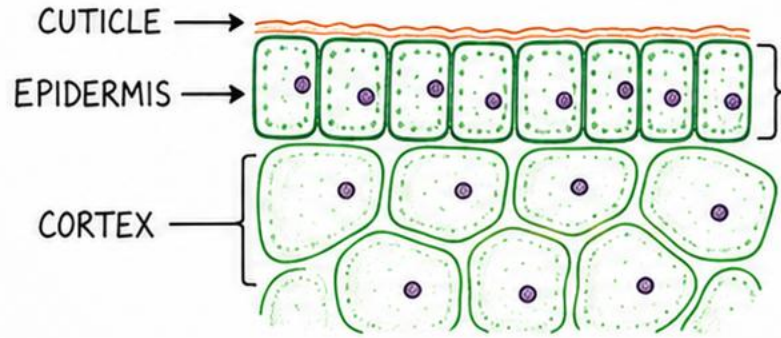
- xylem + phloem in vascular bundles
- transport and internal continuity



Structure + location determine tissue function.

EPIDERMAL TISSUE SYSTEM & APPENDAGES

Epidermal tissue system - outermost covering of the primary plant body.

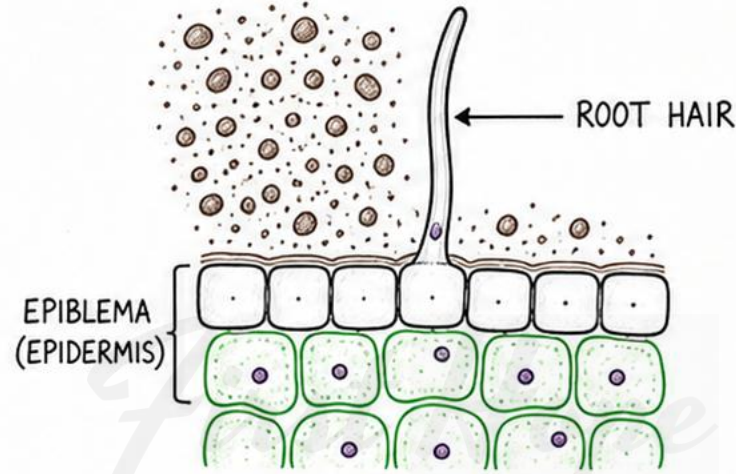


EPIDERMIS

- usually one continuous layer of compact parenchymatous cells
- little peripheral cytoplasm + large vacuole
- generally no intercellular spaces

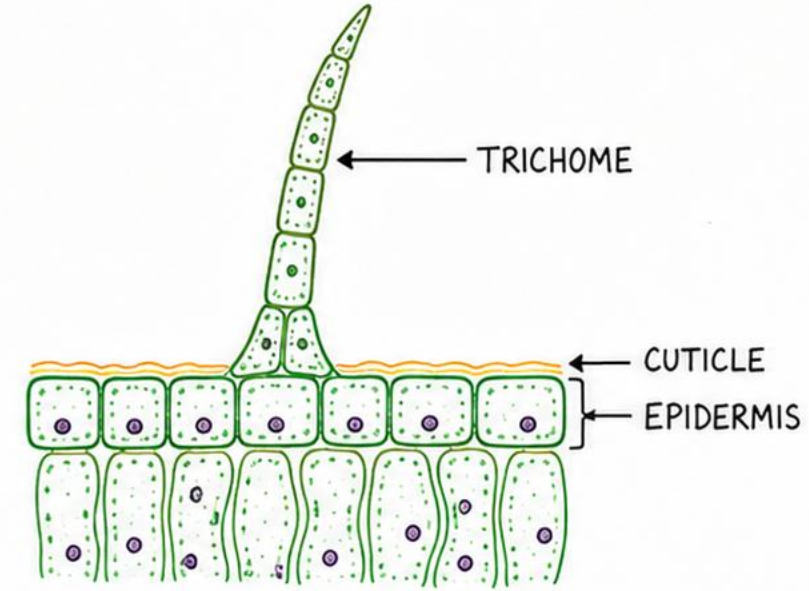
CUTICLE

- waxy layer outside aerial epidermis
- reduces water loss
- absent on absorbing roots



ROOT HAIR

- unicellular extension of an epiblema / epidermal cell
- absorbs water + mineral ions from soil



TRICHOME

- usually multicellular shoot epidermal hair
- branched or unbranched; soft, stiff or secretory
- can reduce transpiration



root hair
below soil



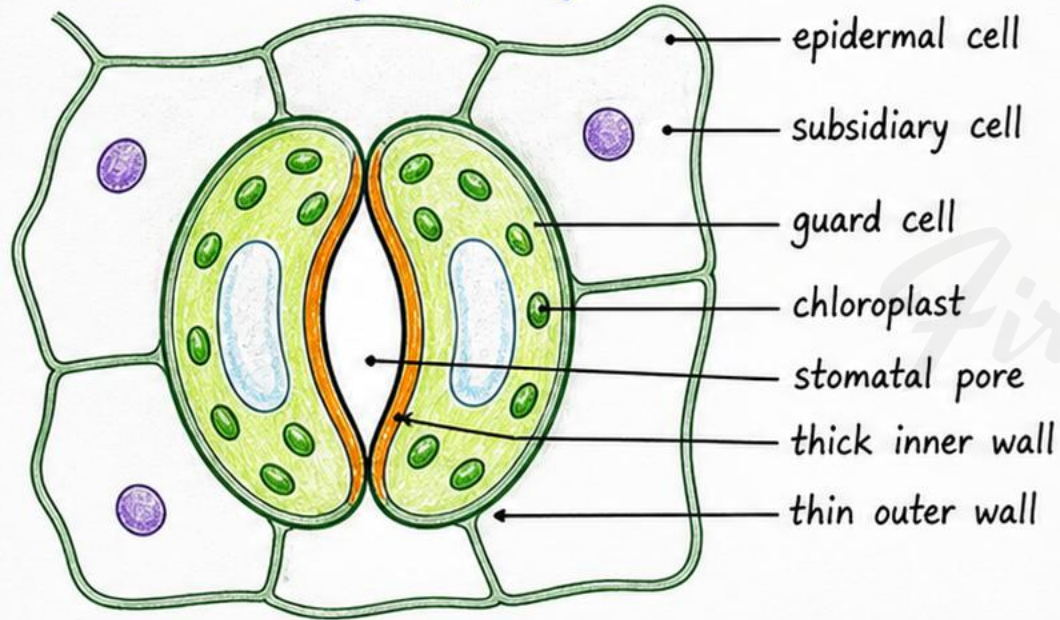
trichome + cuticle
above soil

stomata → next plate

STOMATAL APPARATUS & PORE CONTROL

STOMATAL APPARATUS = stomatal pore + two guard cells + surrounding subsidiary cells

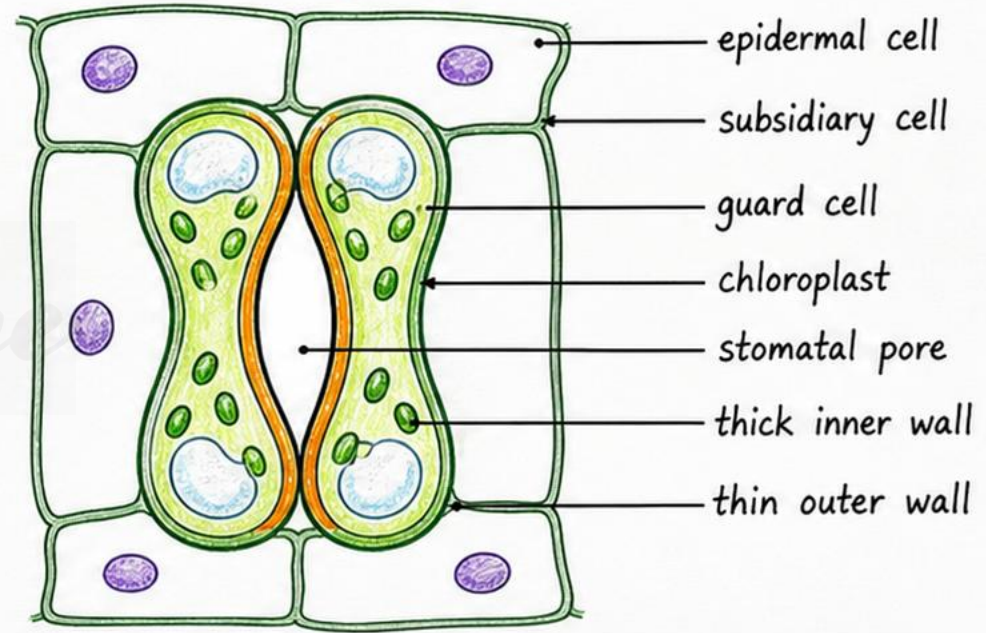
REPRESENTATIVE DICOT
bean / kidney-shaped guard cells



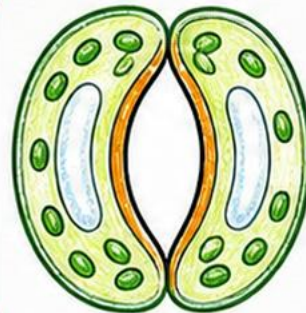
Guard cells contain chloroplasts and regulate pore width.

Controls gaseous exchange and transpiration.

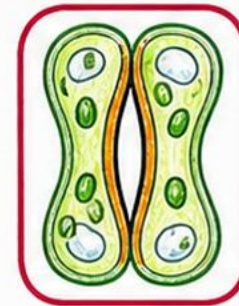
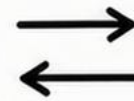
GRASS
dumb-bell-shaped guard cells



- Guard cells contain chloroplasts and regulate pore width.
- Controls gaseous exchange and transpiration.



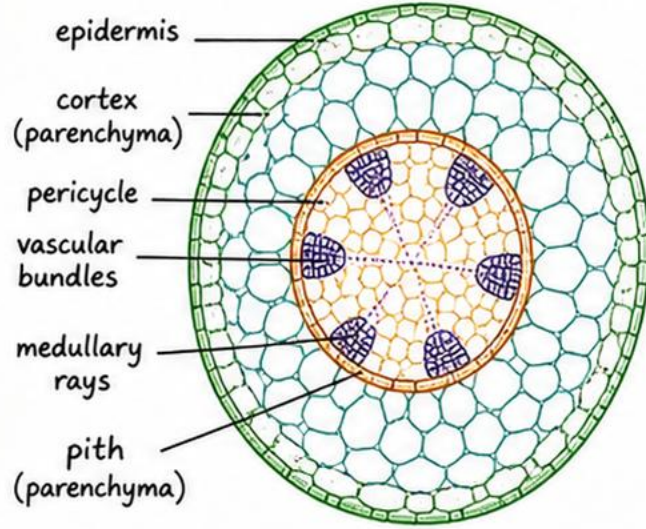
guard cells
turgid →
pore opens



guard cells
flaccid →
pore narrows /
closes

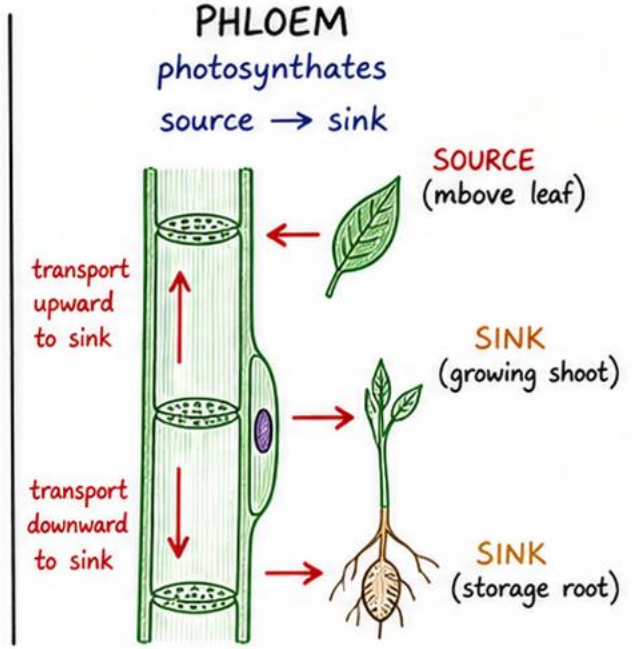
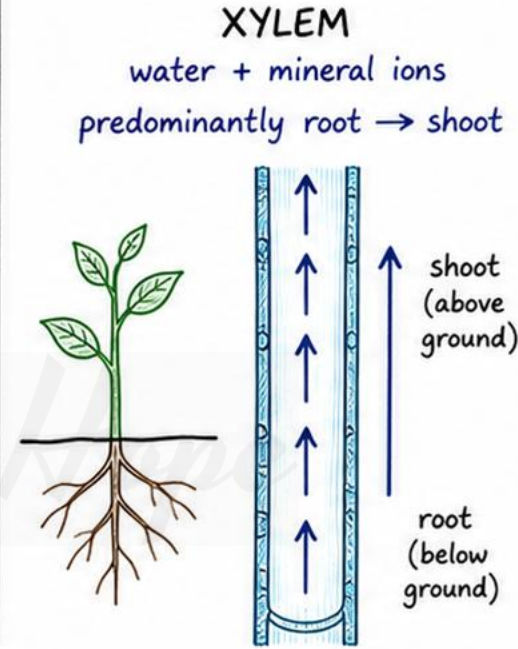
GROUND & VASCULAR TISSUE SYSTEMS

- **GROUND TISSUE** = all tissues except epidermis and vascular bundles



- parenchyma - storage / photosynthesis
- collenchyma - flexible support in growing parts
- sclerenchyma - rigid support at maturity
- primary roots + stems: cortex, pericycle, pith, medullary rays
- leaves: chloroplast-containing ground tissue = **MESOPHYLL**

- **VASCULAR TISSUE SYSTEM** = **XYLEM** + **PHLOEM** in vascular bundles



system	main components	typical location	principal role
GROUND TISSUE	• parenchyma • collenchyma • sclerenchyma	• cortex, pith, medullary rays • mesophyll of leaves • around vascular bundles (except epidermis and vascular tissues)	• photosynthesis, storage, secretion • support (flexible and rigid) • filling tissue; healing and repair
VASCULAR TISSUE SYSTEM	• xylem: tracheids, vessels, xylem fibre, xylem parenchyma • phloem: sieve tube elements, companion cells, phloem parenchyma, phloem fibres	• arranged in vascular bundles • in roots, stems and leaves (veins)	• xylem: transport water and mineral ions predominantly root to shoot; also support • phloem: transport photosynthates from source to sink (upward or downward depending on source and sink)

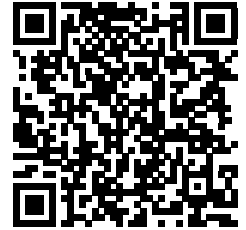


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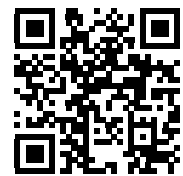


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