

Kingdom plantae

Specific objectives

The learner should be able to

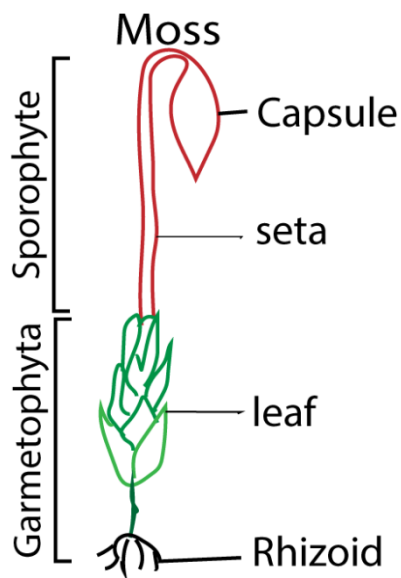
1. To identify lower plants and higher plants using structural features.
2. Name the plant groups to phyla
3. Outline the characteristic and structures of the named plant groups
4. State the role of the plants in environment

Characteristics

- Are made of more than one eukaryotic cell.
- Have cell wall containing cellulose
- Have chlorophyll as their main photosynthetic pigment.

Phylum Bryophyta(moss)

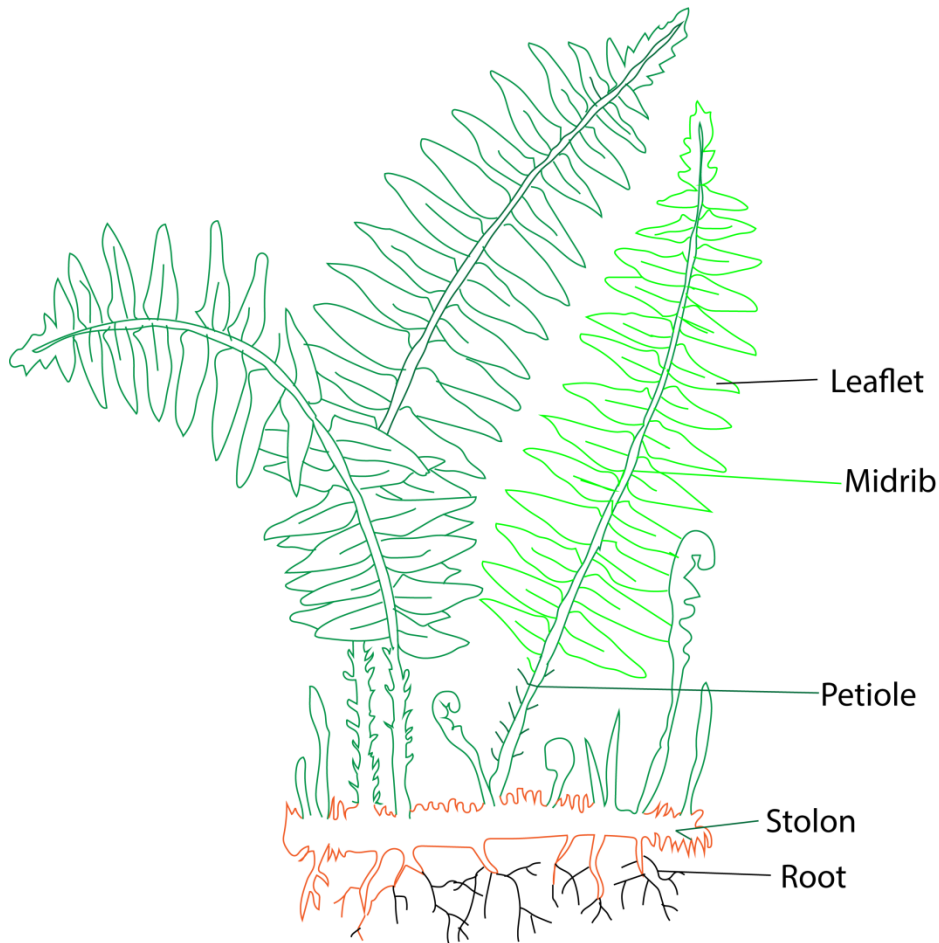
- a. It is made of small plants generally found in moist terrestrial habitats
- b. They have no root and no vascular tissue
- c. Show alternation of generation in which the sporophyte and gametophytes are almost equally conspicuous, although the sporophyte is attached to and depends on, gametophyte throughout life.



Phylum Filicinophyta (ferns)

Ferns have large leaves with chlorophyll called fronds which are coiled in bud.

Have roots and well developed vascular systems.



Phylum Angiospermophyta: Flowering plants

They are made of two classes, monocotyledoneae (monocotyledonous plants) and dicotyledoneae (dicotyledonous plants).

Comparison of monocotyledonous plants and dicotyledonous plants.

Monocotyledoneae	Dicotyledoneae
Embryo has one cotyledon	Embryo has two cotyledons
Narrow leaves with parallel venation	Broad leaves with net work veins
Scattered vascular bundles in stem	Ring vascular bundles
Rare cambium present and normally no secondary growth	Vascular cambium present which can lead to secondary growth
Many xylem groups in root	Few xylem groups in root

Flower parts in threes	Flower parts in fours or fives
Calyx and corolla not usually distinguishable	Calyx and corolla are distinct.
Often wind pollinated	Often insect pollinated
e.g. maize and rice	e.g. bean



Maize



Bean

Roots of flowering plants

This is the non-leaf, non-nodes bearing parts of the **plant's** body that usually grow into the ground.

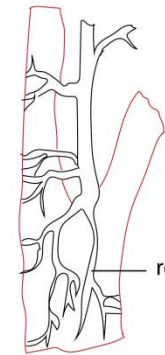
Primary functions of the root

1. Anchors the plant in the soil
2. Absorbs water and mineral salts

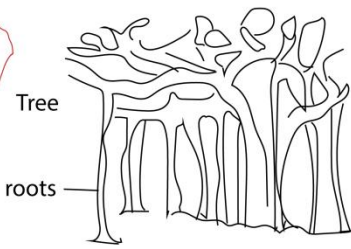
Secondary functions of modified root

3. Food storage e.g. cassava tubers, carrot (tap root)
4. Vegetative reproduction e.g. potato tubers
5. Breathing root for gaseous exchange especially for plants that live in water logged places
6. For support e.g. clasping root, prop roots, buttress root, stilt roots,

Types of modified roots



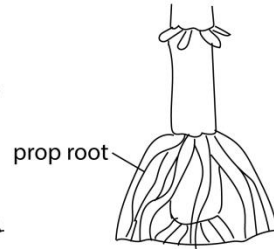
Epiphytic fig



Tree

roots

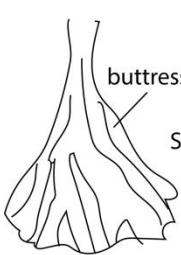
Prop root of banyan



prop root

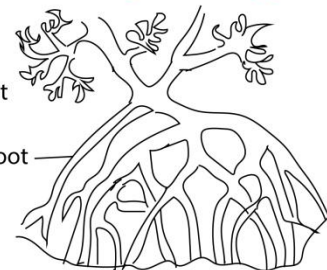
Maize

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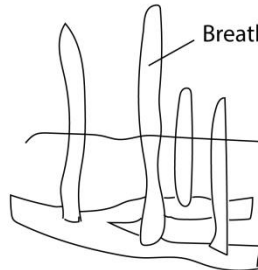
buttress root

Silk cotton



Stilt root

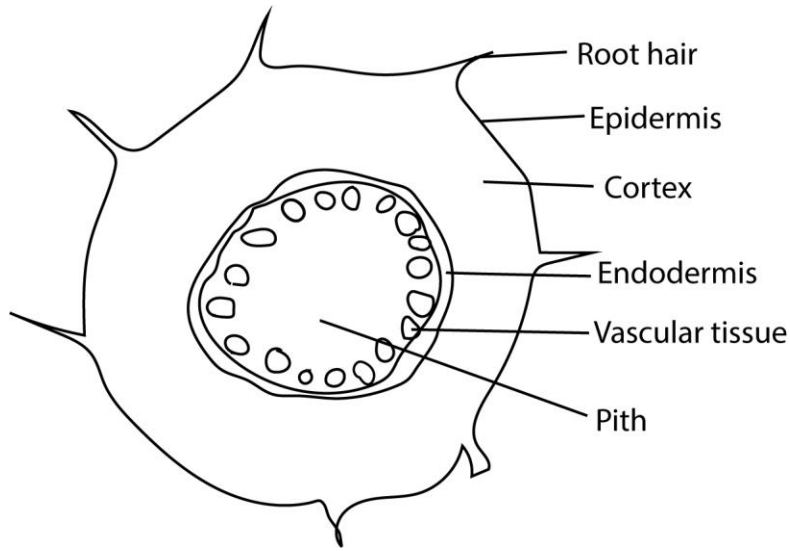
Red mangrove



Breathing root

White mangrove

Section through monocotyledonous root



Root hair

Epidermis

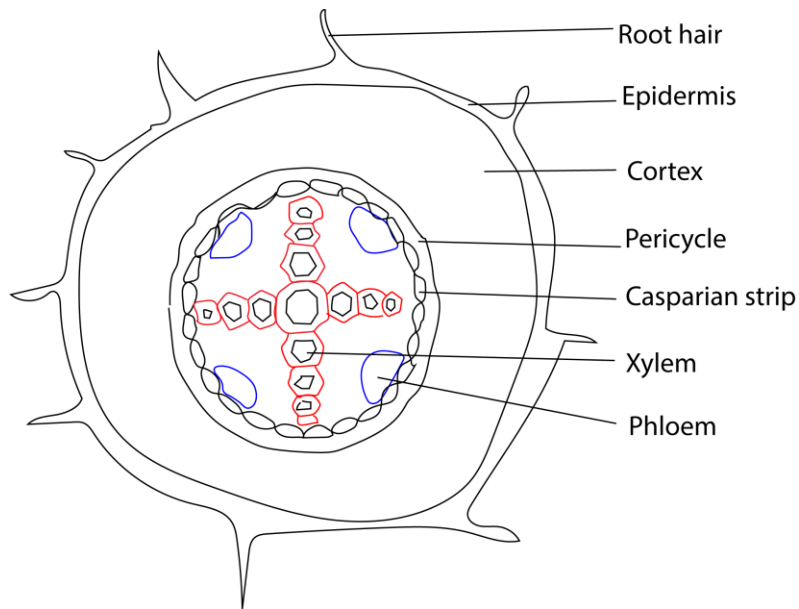
Cortex

Endodermis

Vascular tissue

Pith

Section through dicotyledonous plant root



Differences between monocot and dicot roots

	Monocot root	Dicot root
1.	Xylem polyarch	Xylem tetrarch
2.	Pith is present	Pith absent
3.	Has a limited number of Xylem and Phloem	Has a higher number of Xylem and Phloem
4.	Conjunctive tissue is sclerenchymatous in maize	Conjunctive tissue is usually paranchmatous
5.	There is no secondary growth	Secondary growth is present
6.	Pericycle gives rise to cork cambium, parts of the vascular cambium, and lateral roots	Gives rise to lateral roots only
7.	Cambium absent	Cambium present
8.	Cortex wide	Cortex wide
9.	Older roots are covered by an Exodermis	Older roots are covered by a Cork

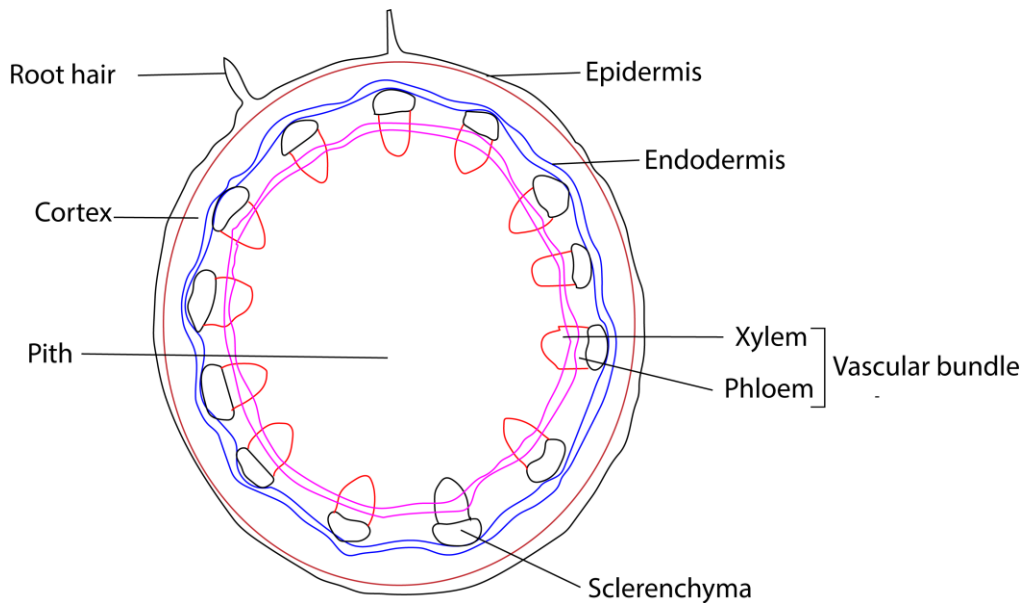
Stem

A stem is the plant axis that bears buds and shoots with leaves and roots at its basal end.

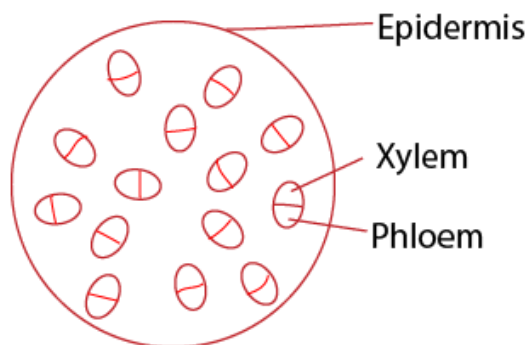
Function of stem

- (i) Conducts water and mineral salts from roots to leaves.
- (ii) Conducts manufactured food from leaves to other parts of the body
- (iii) Supports leaves to receive enough light
- (iv) Stores food e.g. sugar cane
- (v) For vegetative reproduction
- (vi) Supports flowers in space for fertilization

Section through dicotyledonous plant stem



Section through monocotyledonous plant stem



Similarities between monocot and dicot stem

1. Epidermis is made of a single layer
2. Have thick cuticle
3. Ground tissue parenchymatous
4. Xylem and phloem are organized in vascular bundle.

Differences between monocot and dicot stem




















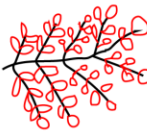



	Dicot stem	Monocot stem
1.	Endodermis present	Endodermis absent
2.	Vascular bundles are arranged in a ring	Vascular bundle scattered in ground tissue
3.	Vascular bundles are few in number 4-8	Vascular bundle numerous
4.	Xylem elements polygonal	Xylem elements are circular
5.	Pericycle present	Pericycle absent
6.	Pith present	Pith absent
7.	Medullary rays present	Medullary rays absent
8.	Undergo secondary growth	No secondary growth
9.	Bundle sheath absent around the vascular bundles	Vascular bundles are surrounded by sclerenchmatous bundles sheath
10.	Vascular bundles open	Vascular bundles closed
11.	Hypodermis is made of collenchymatous cells	Hypodermis is made up of sclerenchymatous cells
12.	Ground tissue is differentiated into cortex, endodermis, pericycle and pith.	Ground tissue is not differentiated
13.	Starch sheath present	Starch sheath absent

Leaves

Functions of leaves

1. **Photosynthesis.**
2. **Transpiration**
3. **Floral induction:** the plant leaves synthesize and translocate the flower- inducing hormone called florigen to buds.
4. **Food storage**
5. **Have tendrils for support**

Characteristics of leaves

Venation	Shapes of simple leaves	Shapes	Margins	Arrangement on stem
 Pinnate	 Linear	 Simple	 Entire	 alternative
 Parallel	 Obovate	 Compound palmate	 Crenate	 Opposite
 Palmate	 Ovate	 Pinnately lobed	 Dentate	 Whorled
	 Palmately lobed	 compound pinnate	 Serrate	
	 Lanceolate	 Compound bipinnate	 Lobed	
	 reniform			
	 Sagittate			

Coniferous plant



conifer

Economic importance of plants

1. For decoration
2. For food, timber, medicine, raw materials for industries (fruits juices), fibre producing plants (sisal, hemp, cotton)