

Topic #15

**Plant Structure and Growth**

(Campbell and Reece 712-728)

**I. Objectives.**

- A. Recognize plant tissues.
- B. Learn why each tissue evolved.

**II. Important Adaptations of Plants to Land.**

- A. Water loss reduced
- B. Strength and water transport for height
- C. Reproduction

**III. Plant body.**

- A. Plant cells

**B. Hierarchy of cell organization.**

- 1. Tissue.
  
  
- 2. Organ (= parts in plants?).
  
  
- 3. System.



- C. Cells must stop dividing when conditions are not favorable for growth, such as in winter

**V. Two major groups of flowering plants**

- A. Monocots -
- B. Dicots -
- C. Tissue development differs between these groups.

**VI. Plant tissues and systems - Cell Types.**

- A. All of these tissues arise from the apical meristems
- B. Ground tissues - found in almost all tissue systems

- 1. Parenchyma.

- a) Cell structure.

- b) Functions.

- 2. Collenchyma.

- a) Cell structure.

- b) Functions.



2. Phloem - cell types and functions.

- a) Function -
- b) Sieve elements.

c) Companion cells.

- d) Parenchyma.
- e) Sclerenchyma.

D. Surface or dermal tissue.

- 1. Epidermis -
- 2. Cuticle -

## **VII. Plant tissues and systems - Primary Growth.**

A. Roots.

- 1. Function
  
- 2. Fibrous vs. taproot system.
  
- 3. Root cap

4. Apical meristem
5. Zone of cell division -
6. Zone of elongation -

7. Zone of maturation -
8. Epidermis

9. Stele

10. Endodermis

11. Cortex

B. Stems.

1. Function

2. Buds and nodes

a) Growing tip - location of apical meristem

b) Terminal bud

c) Nodes - "Junctions" on stem

d) Internodes –

e) Axillary buds

f) Apical dominance

3. Epidermis

4. Vascular bundles

5. Ground tissue

C. Leaves

1. Function

2. Blade -

3. Petiole -



2. Vascular cambium

3. Vascular tissue

a) Xylem and ray cells form on inside of vascular cambium

(i) Early wood

(ii) Late wood

(iii) Sapwood -

(iv) Heartwood -

b) Phloem

c) Rays



C. Leaves

D. Flowers

**X. Key Terms.**

cell wall  
secondary cell wall  
middle lamella  
tissue  
organ  
system  
root  
shoot  
leaf  
meristematic tissue  
indeterminate growth  
apical meristem  
primary tissue  
lateral meristem  
secondary tissue  
Dormancy  
Monocots  
Dicots  
ground tissue  
parenchyma  
collenchyma  
sclerenchyma  
fiber  
sclereid  
epidermis  
cuticle  
vascular tissue  
xylem  
tracheid  
vessel element  
border pits  
phloem  
sieve element  
companion cells  
fibrous roots  
taproot  
root cap  
Zone of cell division  
protoderm  
procambium

ground meristems  
Zone of elongation  
zone of maturation  
root hairs  
stele  
pericycle  
endodermis  
cortex  
terminal bud  
leaf primordial  
nodes  
axillary buds  
apical dominance  
vascular bundles  
pith  
blade  
petiole  
stomata  
guard cells  
mesophyll  
palisade layer  
spongy layer  
vascular cambium  
early wood  
late wood  
sapwood  
heartwood  
rays  
periderm  
cork cambium  
cork cells  
bark  
inner bark  
outer park  
lenticels