



# General Botany

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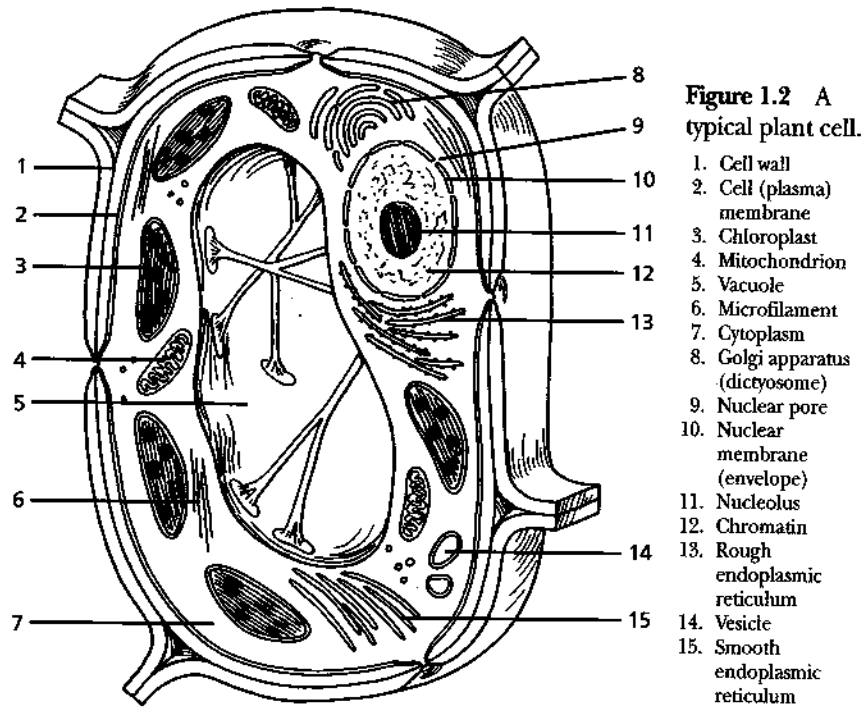




# What is botany?

- The biological science of plants
- The plant life of a particular area

# The Cell

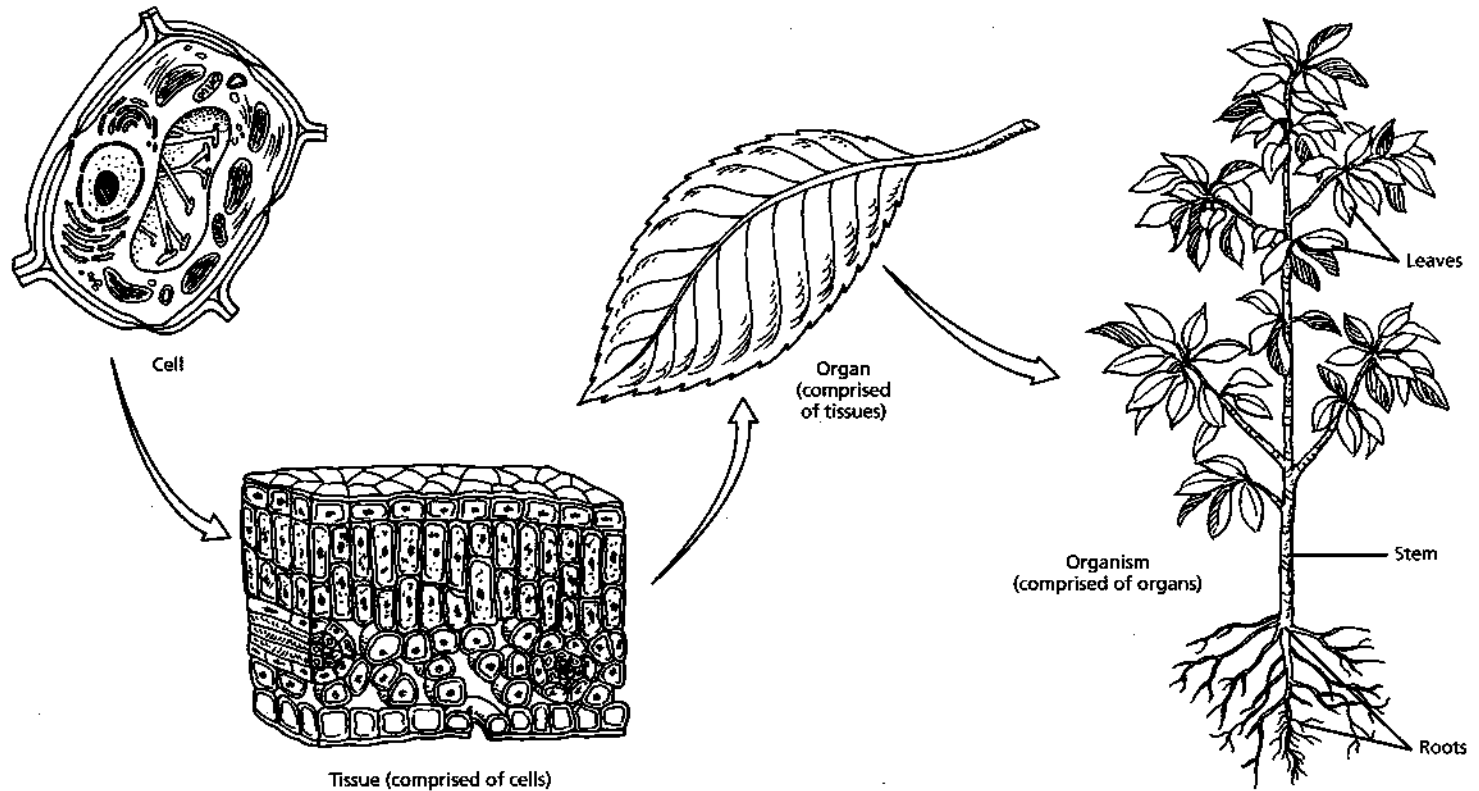


# Tissues

- Groups of similar cells that perform specific functions
  - Meristematic tissue
    - Apical
    - Lateral
    - Secondary (vascular cambium; cork cambium)
  - Dermal tissue
    - Epidermis
    - Cuticle
    - Stomata
    - Lenticels
  - Ground tissue
    - Parenchyma
    - Collenchyma
    - Sclerenchyma
  - Vascular tissue
    - Xylem (Tracheids and vessel elements)
    - Phloem (Sieve tube elements and companion cells)

# Organs

- Two or more tissue systems that carry out specific functions together
  - Roots
  - Stems
  - Leaves
  - Flowers

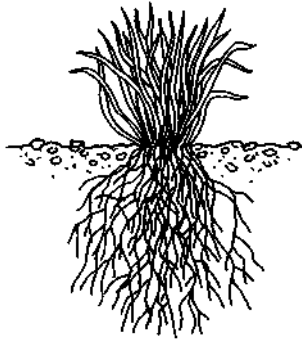




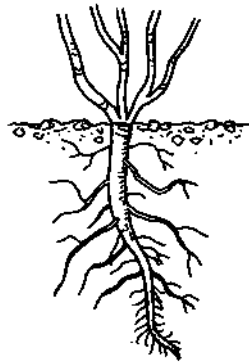
# Roots

- Root cap
- Meristematic region
- Elongation region
- Maturation region

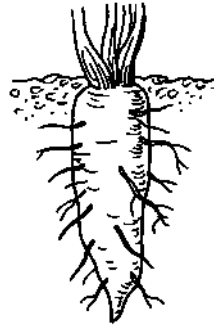
# Roots



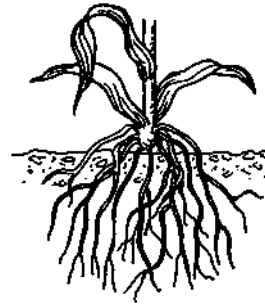
Fibrous root system  
(grass)



Taproot  
(shrub)



Modified taproot  
(carrot)



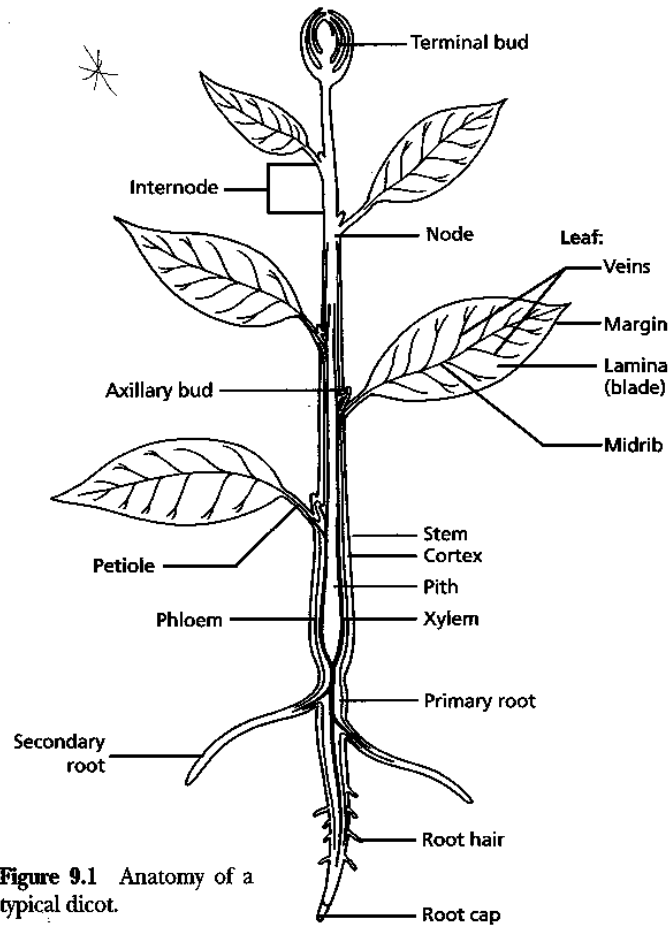
Prop roots  
(corn)



Aerial roots  
(orchid)



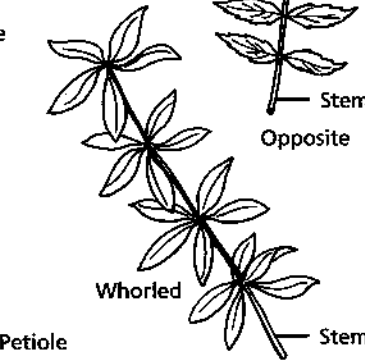
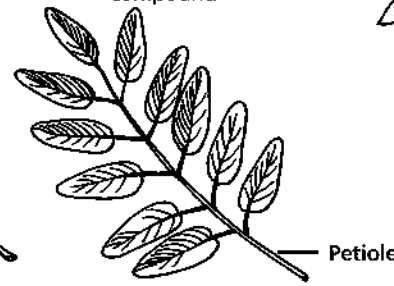
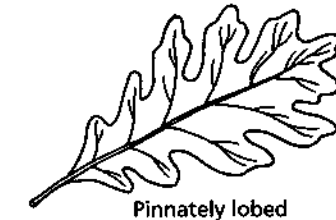
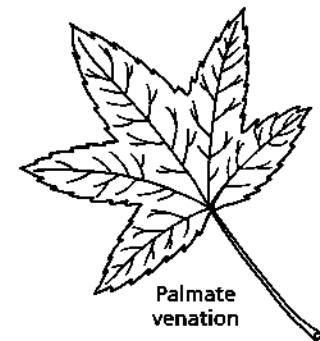
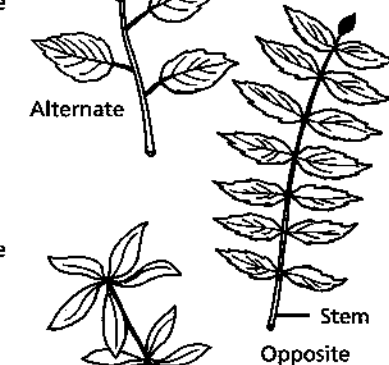
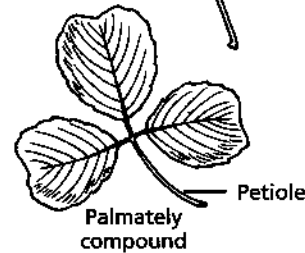
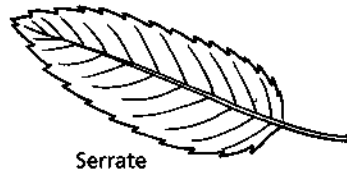
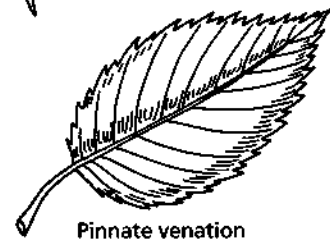
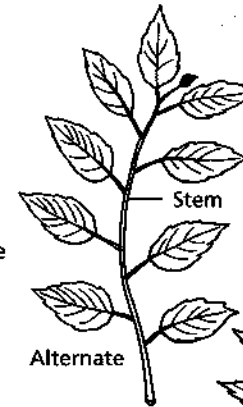
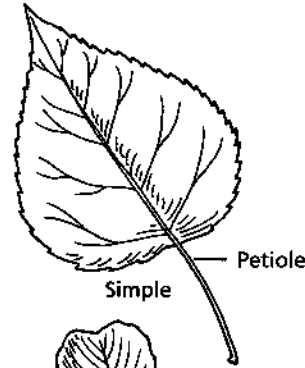
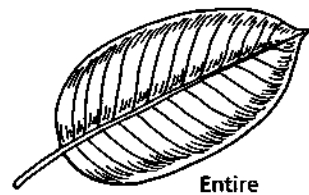
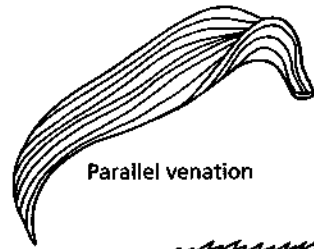
# Terminology



**Figure 9.1** Anatomy of a typical dicot.

# Leaves

## Leaves of Angiosperms



**Venation**

**Margins**

**Complexity**

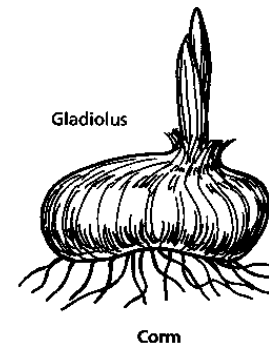
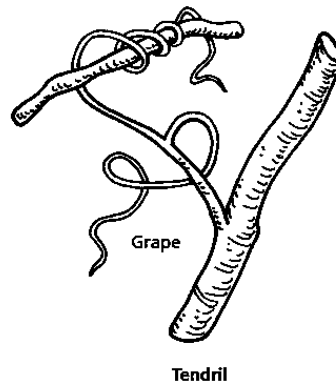
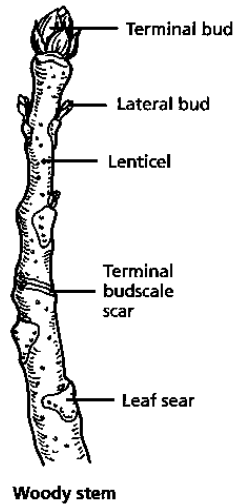
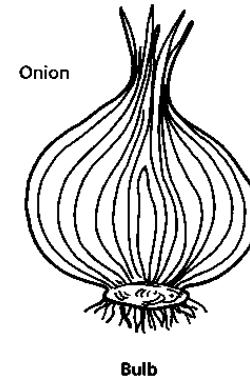
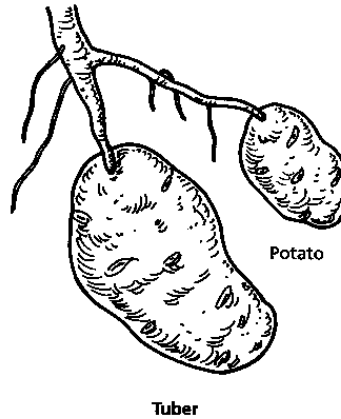
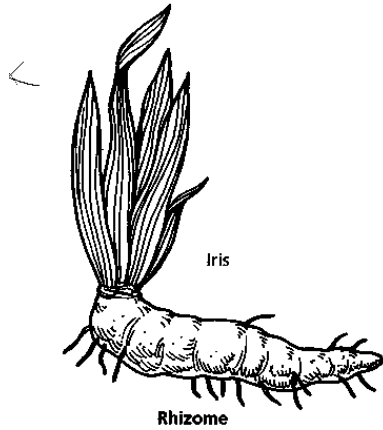
**Arrangement on stems**



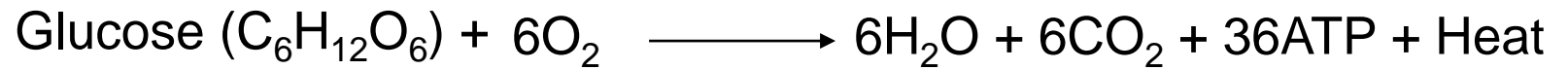
# Stems

- Herbaceous
- Woody
  - Bark
  - Wood

# Stems

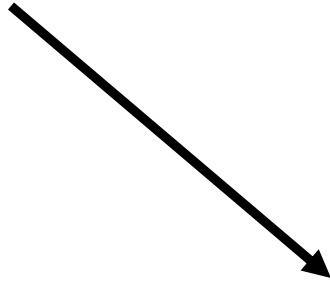


# Respiration



# Photosynthesis

Sunlight



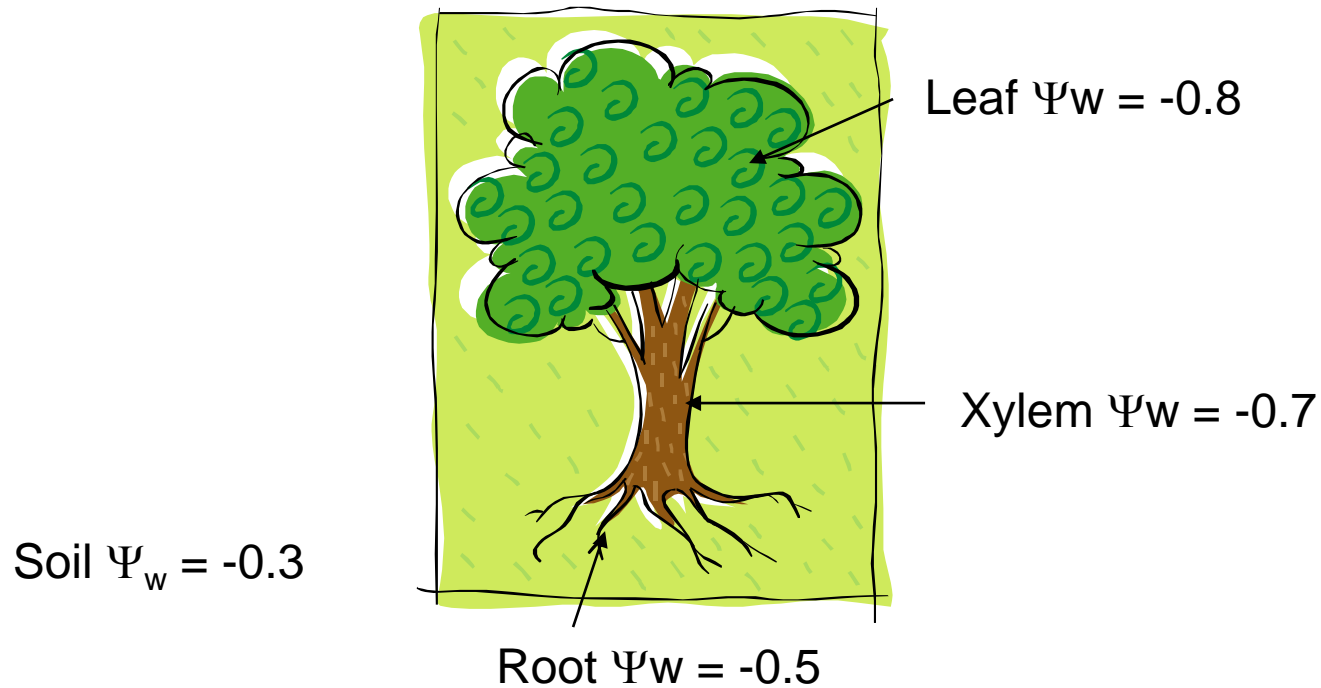
Captured by leaves (ATP)



CO<sub>2</sub> → Glucose

# Transpiration

Outside air  $\Psi_w = -95.2$





# Plant allies

- Bacteria
- Algae and slime molds
- Fungi
  - Fungi, yeasts, molds, mushrooms, rusts, lichens
- Bryophytes
  - Liverworts and mosses
- Ferns

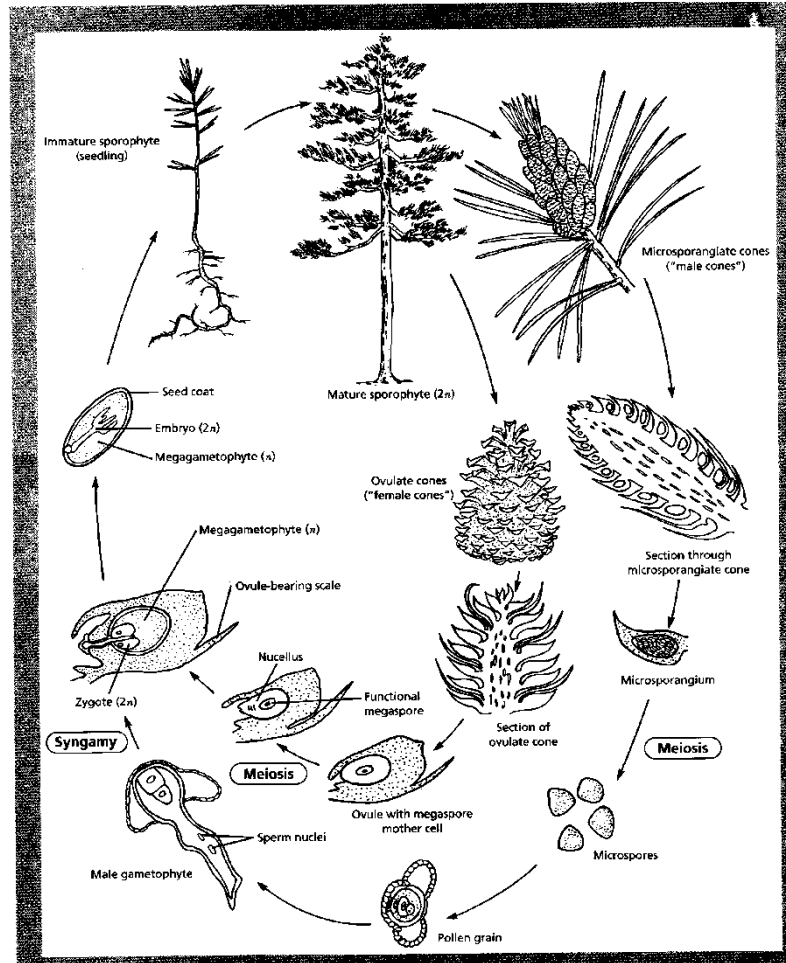


# Gymnosperms

- A plant class (Gymnospermae) having exposed seeds
  - Cycads
  - Gingko
  - Conifers

# Conifers

DIVISION CONIFEROPHYTA (conifers)



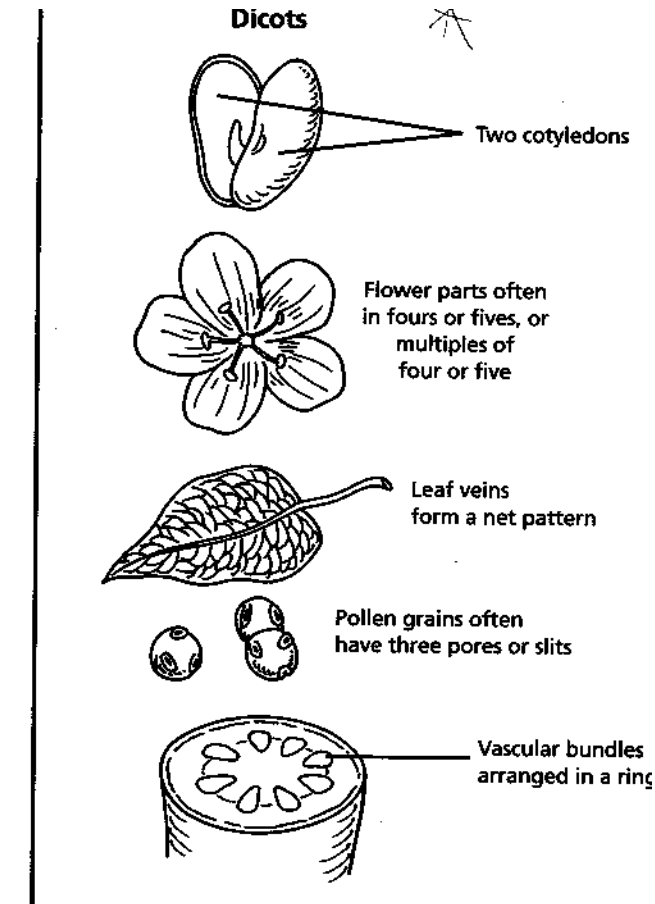
Van De Graff, K.M., S.R. Rushforth, and J.L. Crawley. 1995. *A Photographic Atlas for the Botany Laboratory, 2<sup>nd</sup> Edition* Morton Publishing Company, Englewood, CO.



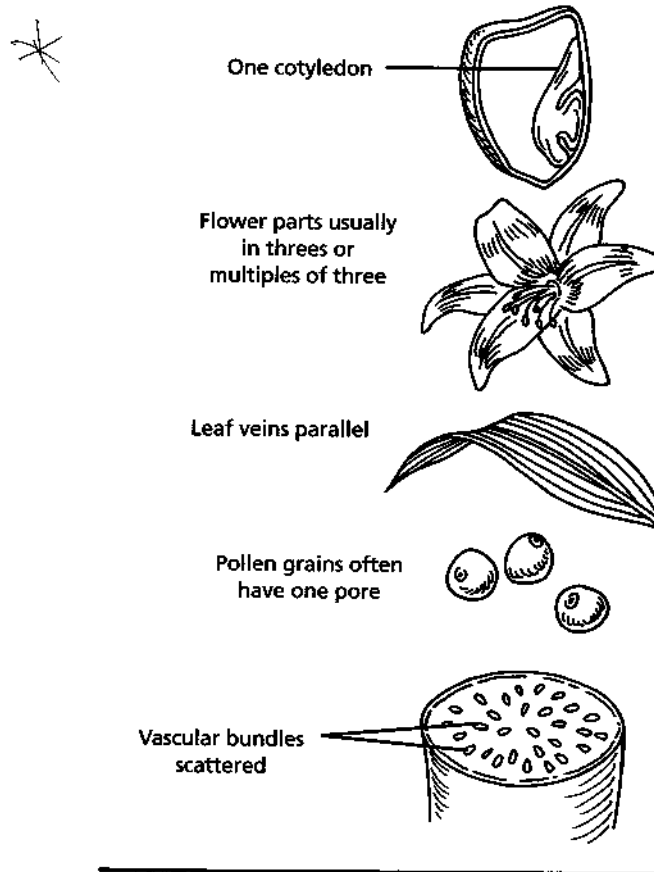
# Flowering Plants

- Angiosperms
  - Dicotyledon
  - Moncotyledon

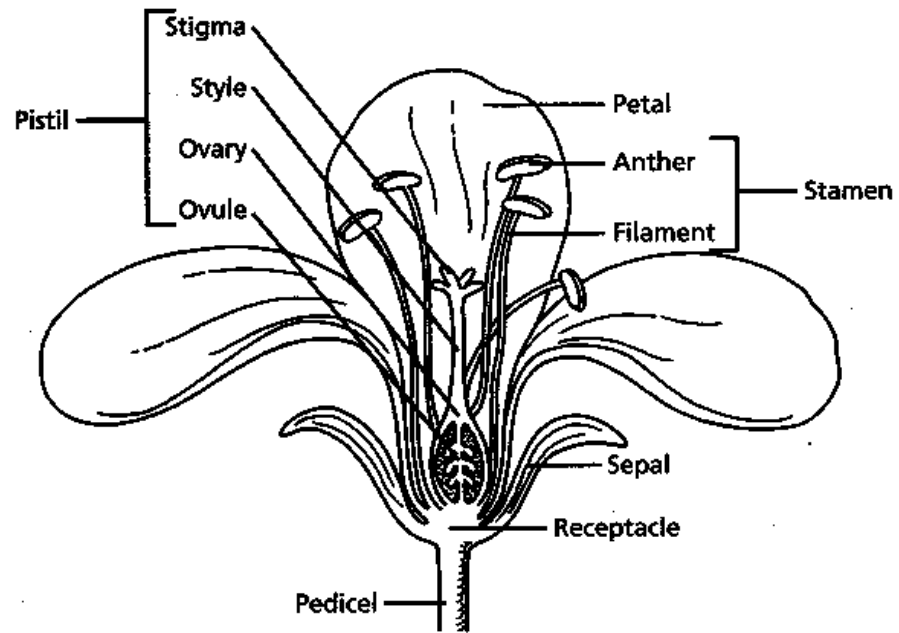
# Dicotyledons



# Monocotyledons



# Flowers

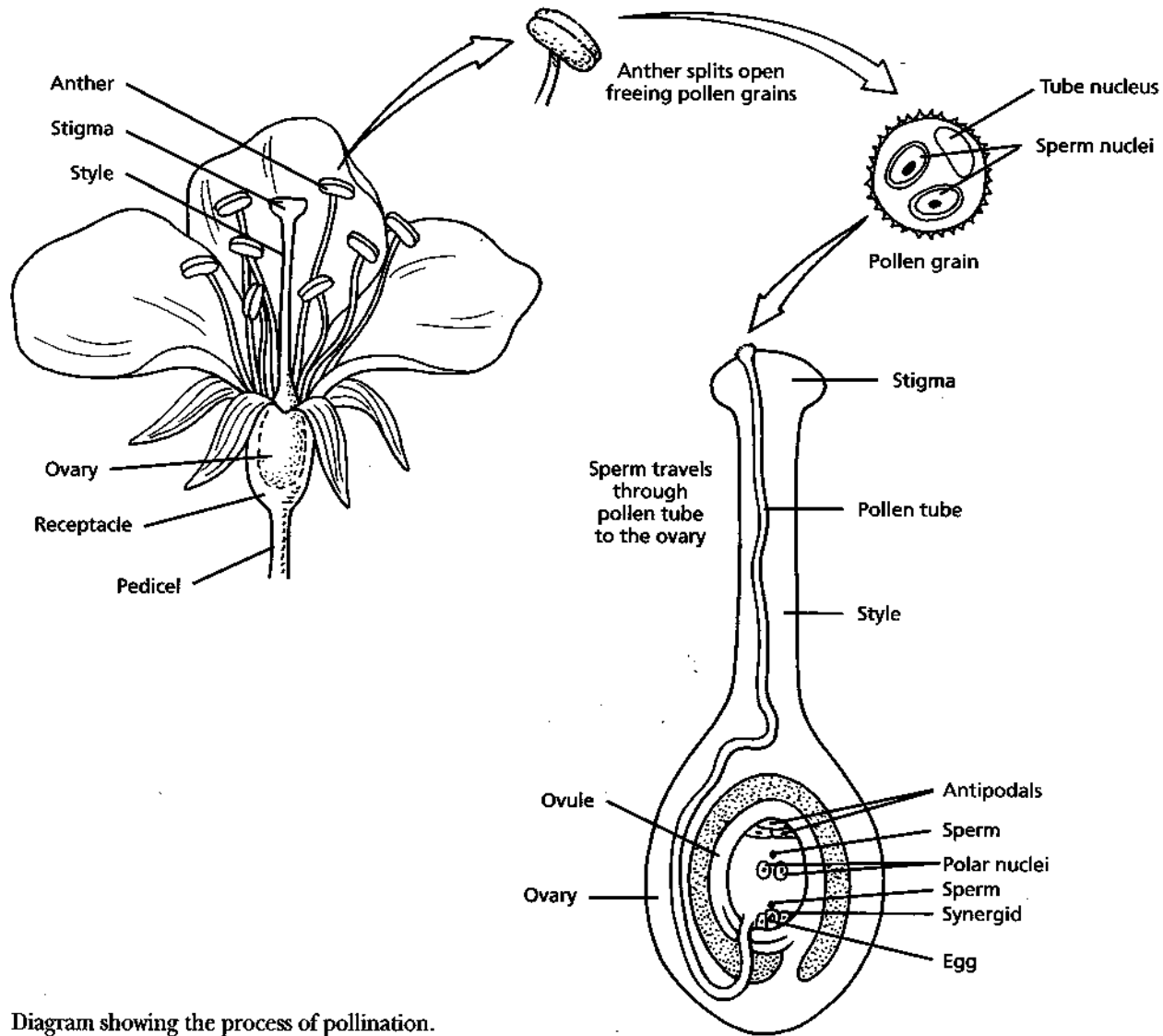


**Structure of a Flower**



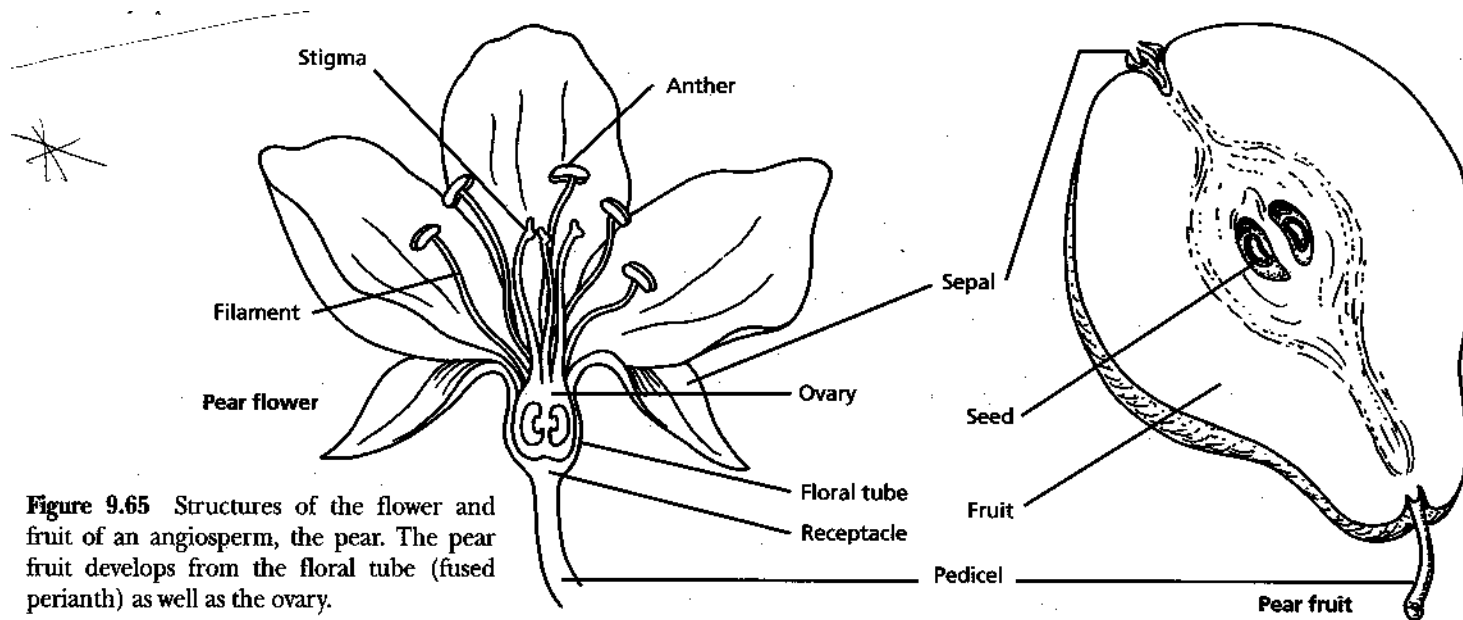
# Terminology

- Complete flower
- Incomplete flower
- Perfect flower
- Imperfect flower
  - Staminate or pistillate
  - Monoecious
  - Dioecious



1) Diagram showing the process of pollination.





**Figure 9.65** Structures of the flower and fruit of an angiosperm, the pear. The pear fruit develops from the floral tube (fused perianth) as well as the ovary.

**Seeds, Fruits, and Seed Germination of Angiosperms**

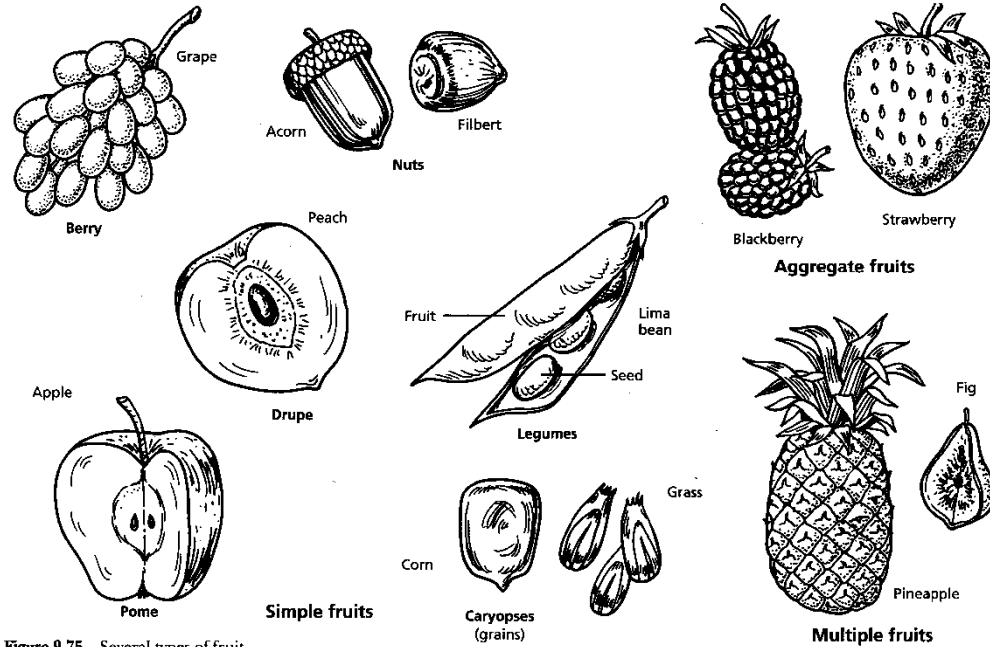
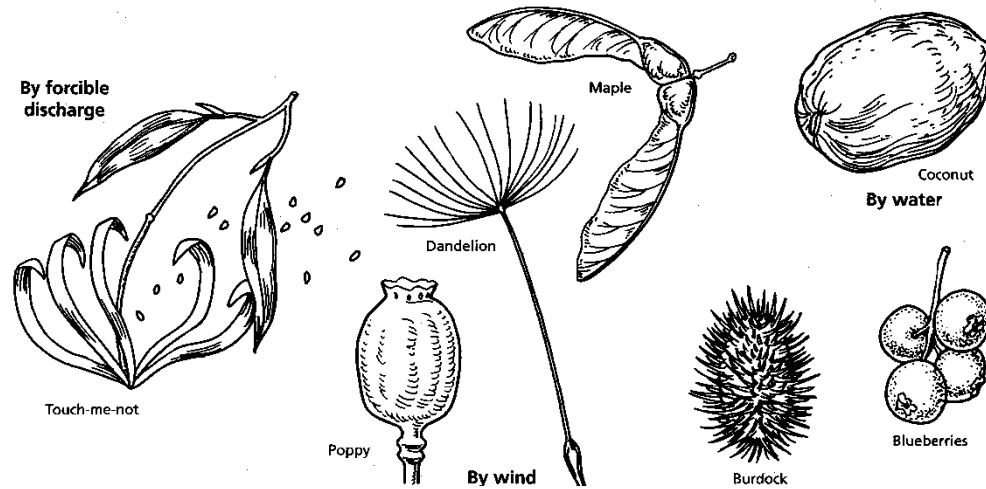


Figure 9.75 Several types of fruit.





# Factors affecting plant growth

- Abiotic (nonliving)

- Light

- Temperature

- Water

- Xerophytes

- Hydrophytes

- Mesophytes

- Soil



# Factors affecting plant growth

- Biotic (living)

- People
- Animals
- Fungi
- Bacteria
- Insects