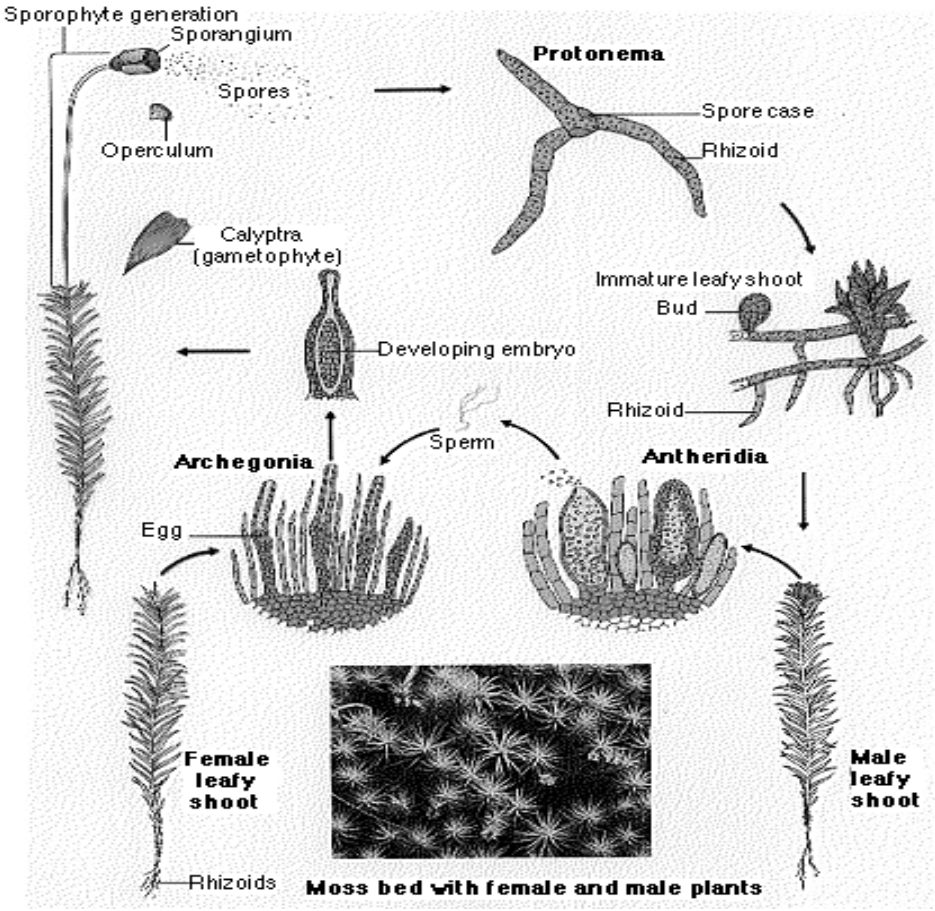
Plants Part I

I. Characteristics of Plants
   A. What is a Plant?
      1. Grass, Trees, Ferns, Mosses and Forbs
      2. 285,000 + species
      3. Characteristics of plants
         a) All plants are many celled
         b) Almost all contain chlorophyll
         c) Have cell walls made of cellulose
         d) Most held in place by root like structures
   B. Adaptation of land plants that allow them to live on land
      1. Protection and Support
         a) Support themselves by cellulose
            1) Cellulose is an organic compound made of a chain of simple sugars
         b) Protect themselves from water loss by a waxy cuticle
            1) The cuticle is a waxy layer on the stems and leaves
      2. Reproduction by methods that do not require water or only require water for a short time
   C. Classification of plants
      1. Phylum Bryophyta (Bryon means moss) (Phyta means plant)
         a) Includes mosses and liverworts
         b) They have no conductive tissue (vascular) for transporting food & water
         c) Live in damp areas because they are nonvascular
      2. Phylum Tracheophyta – vascular plants that do have vessels for conduction water and nutrients

II. There are two main groups of seedless plants
   A. Seedless nonvascular plants
      1. Do not have true roots stems and leaves
      2. Do have root like, stem like, and leaf like structures
      3. They include mosses and liverworts
         a) Root like structures called rhizoids
         b) Liverwort – wort means herb
      4. Moss life cycle
         a) Alternation of generation

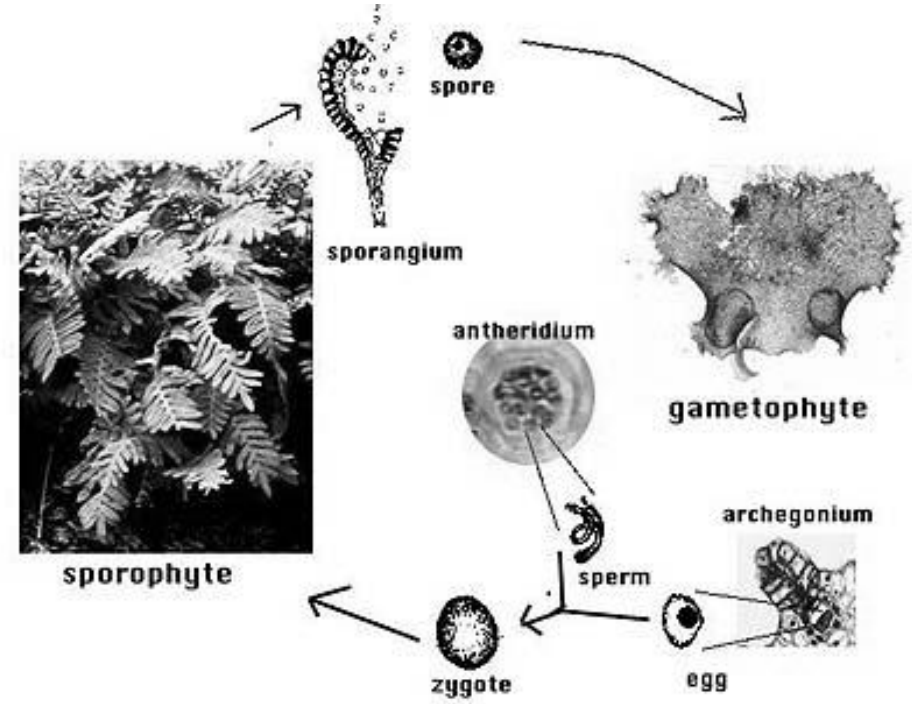
1) Sporophyte stage (diploid)
2) Gametophyte stage (haploid)
3) Show overhead 10-9



5. Can also reproduce asexually by a process called vegetative propagation
6. Importance of mosses and Liverworts
    a) Pioneer species (species that are first to get established on barren areas
    b) Begin the weathering of rocks to make soil

B. Seedless Vascular plants (plants that have conductive tissue)
    1. Includes club mosses, spike mosses, horsetails, and ferns
    2. Club mosses and spike mosses
    3. Horsetails
    4. Ferns Read
    5. The Fern life cycle
        a) Fern anchored by a rhizome
        b) Fern leaf is called a frond

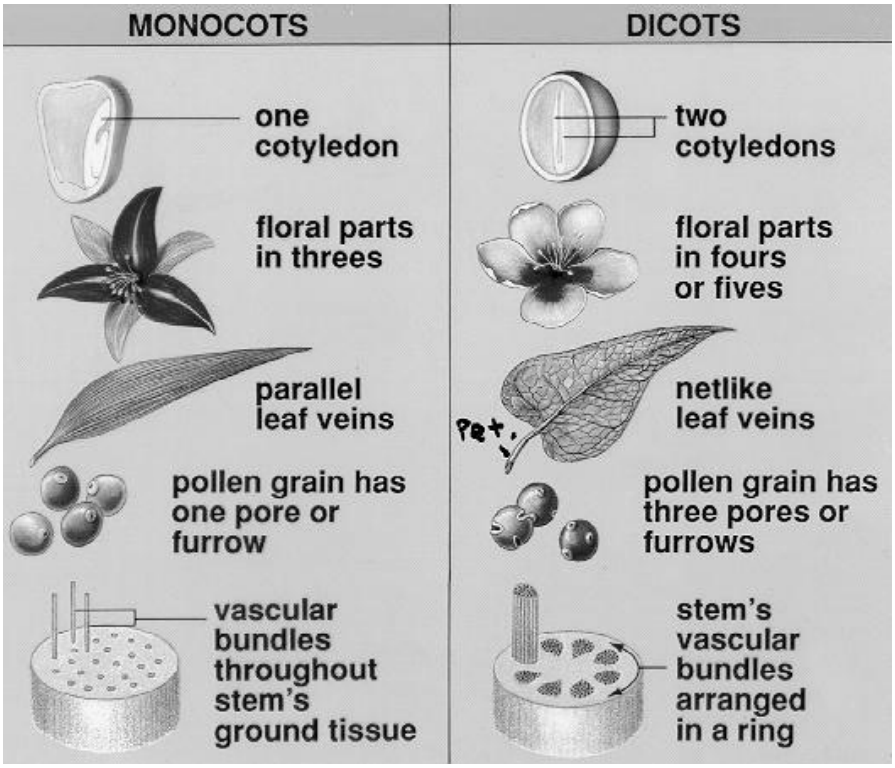
c) On the underside of the leaf spores are produced by sori
1) Haploid spores produced in sori
2) Spores that land on moist area grow into a heart shaped plant called the prothallus
3) Prothallus produces egg and sperm
4) The sperm swims to the egg
5) After fertilization the zygote develops into a mature fern plant



Plants Part II

I. Seed Plants - Plant that reproduces and store embryo in a seed
   A. Gymnosperms - unprotected seed example: conifers, ginkgoes, cycads
   B. Angiosperm – vesseled seed (seed is protected)
      1. Monocots
         a. One seed leaf
         b. Parallel veins in leaf
         c. Flower and fruit parts in threes or multiples of three
         d. Vascular bundle is a group of vascular tissue together
      2. Dicots
         a. Two seed leaves
         b. Netted veins on leaf

c. Flowers and fruits are in fours or fives or multiples of 4 or 5
d. Vascular bundles occur in rings inside the stem



II. Parts of plants (Plant organs)

A. Roots
1. Anchoring plant
2. Conduct water minerals
3. Absorb water and minerals
4. Store food

B. Stems – above ground portion of plant
1. Support leaves, flowers and fruit
2. Conduct food and water between roots and leaves

C. Leaves
1. Photosynthesis
2. Storage

D. Leaf structure
1. Epidermis outer layer covered with a waxy cuticle
2. Stomata pore for CO_2, O_2, and H_2O
3. Guard cells regulate the stomata
4. Palisade layer Cells packed with chloroplasts for photosynthesis

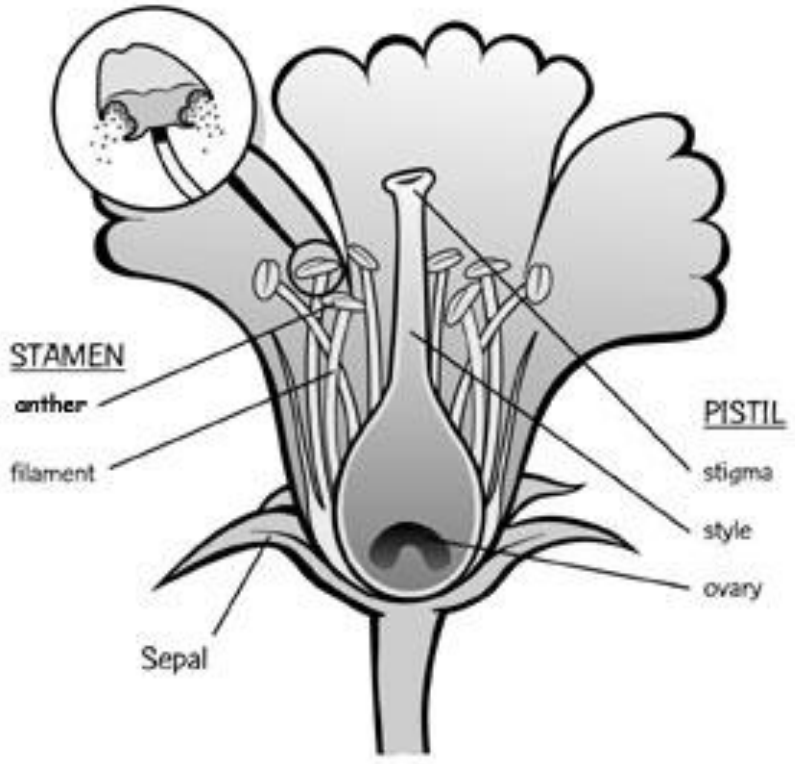
5. Spongy layer - spongy layer with conductive tissue xylem and phloem

E. Vascular tissue
1. Xylem - transport water and minerals up the plant
2. Phloem – moves food down the plant
3. Cambium separates vascular tissue and produces new vascular tissue

III. Plant Reproduction

A. Gymnosperm Reproduction
1. Male and female cones
2. Pollen blows from male cones to female cones
3. Fertilization takes place in the female cones
4. Seeds develop in the female cones

B. Angiosperm Reproduction
1. The flower
a. Female
1) Stigma
2) Style
3) Ovary
b. Male portion
1) Anther
2) Filament



2. Seed development
    a. Pollination is when the pollen grain from the male containing the sperm is placed on the stigma of the female
    b. An embryo is the result of pollination
        1) Stem
        2) Root
        3) Cotyledons
3. Seed dispersal and germination
    a. Dispersal
        1) Animals
        2) Wind
        3) Water

Germination - is when the seed begins to grow