Biology 12.1
Plant Classification

Botany: the study of plants
Eucaryotic, multicellular, tissues, autotrophic and sessile heterotrophs (parasitic and saprophytic)

- Monera are procaryotic
- Protista are single celled, lacking tissues
- Fungi are single celled, lacking tissues
- Animals are motile heterotrophs

Photosynthetic
Cell walls contain cellulose

Plant classification

a. Non-Vascularized, Bryophytes
b. Vascularized, Tracheophytes
   b1. No seeds
   b2. Seeds
      i. Non-flowering seed plants
      ii. Flowering seed plants
         1) Monocot
         2) Dicot

Non-Vascularized Plants

Phylum Bryophyta

1. No vascular tissues
2. Usually very small plants within a few centimeters
3. Used to help control erosion and are used in gardening
4. Includes mosses and liverworts
5. Anatomy of moss includes 1) leafy shoots (usually one cell thick) and 2) rhizoids (filaments of cells) used for anchoring.
6. Physiology of moss involves water transport by absorbtion between cells. This requires moist environments
7. Life cycle of moss
   1. Alternation of generations: Two generation forms in the life cycle
   2. Gametophyte: the leafy stage of the moss produces gametes
   3. Sporophyte: the stalk with capsule produces spores
   4. Dominant generation is the one most often seen: Gametophyte
8. Anatomy of liverworts includes a narrow, flattened, leathery thallus (body of plant) and rhizoids
   1. Physiology of liverworts involves water absorption between cells
   2. Life cycle of liverworts: Alternation of generations between gametophyte and sporophyte

Vascularized Plants: Subkingdom Tracheophyta

1. Vascularized tissues
2. Vascularization allows for immense size
3. Phyla based on 1) seed formation and 2) leaf and root structures

Lycopodiopsida Club mosses

1. Vascularized, and reproduce by spores not seeds.
2. Most have microphylls (tiny leaves)
3. Kingdom: Plantae
   a. Subkingdom: Tracheobionta
   b. Division: Lycopodiophyta
   c. Classes
      i. Lycopodiopsida (clubmosses)
      ii. Selaginellopsida (Spikemosses)

iii. Isoetopsida (Quillworts)

Equisetum Horsetails

1. Equisetum is the only living genus in the Equisetaceae family
2. Reproduce by spores
3. Herbaceous and terrestrial
4. Rhizome with adventitious roots.
5. Segmented aerial, ribbed, hollow stems joined at nodes.
6. Whorls of reduced small scalelike leaves around solid node.
7. Kingdom: Plantae
    a. Division: Pteridophyta
    b. Class: Equisetopsida
    c. Order: Equisetales
    d. Family: Equisetaceae
    e. There are about twenty species

Phylum Pterophyta Ferns

1. Vascularized, no seeds
2. Examples include the boston fern, tree ferns, etc.
3. Epiphytes: plants that grow on other plants but are not parasitic
4. Various varieties grow in warm, moist, shade; hot, dry desert, cold tundra
5. Some grow as vines, some as trees, some on water
6. Anatomy of ferns include 1) fronds (compound leaves) and 2) rhizoids (creeping or underground stem)
7. Physiology includes vascular tissues to conduct water and minerals
8. Life cycle
9. spore production
10. underside of the fertile fronds
11. sporangia: sac structure where spores form
12. sori: collection of sporangia form the brown spots on the frond

Seed Plants

Group Gymnospermae

1. Non flowering seed plants: Produce nonovarian enclosed seeds
2. soft woody trees or shrubs
3. Often called "evergreens" (misnomer)
4. The largest Phylum is the Coniferales (conifers, cone bearers)
    a. Family Yew: have waxy needles and red, open-ended, berry-like fruit
    b. Family Cypress: have evergreen scales and small dry cones or blue-green pea-like cones
    c. Family Pine: have needles and cones
5. Life cycle of pine tree
    a. pollen cones in the spring release pollen into the wind
    b. seed cone contains ova on its scales
    c. Good for timber

Group Angiospermae

1. Flowering seed plants
2. Seeds enclosed in the ovary
3. Fruit = the ovary of the plant enclosing the seed
4. The most abundant plants on earth
5. Very diverse (400 families)
6. Includes hard wood trees
7. Two subclasses based on the number of cotyledons
    a. Cotyledon = the first, thick leaves of the embryonic plant, containing stored food for the growing plant
    b. Subclass monocot: has one cotyledon

c. Subclass dicot: has two cotyledons

Monocots

1. One cotyledon
2. Leaf venation is parallel
3. Floral parts occur in numbers of 3's and 6's
4. Fibrous roots
5. Vascular tissue in scattered pattern

Dicots

1. Two cotyledon
2. Leaf venation is netted (branched)
3. Floral parts occur in numbers of 4's and 5's
4. Tap roots
5. Vascular tissue in circular pattern