1) $6CO_2 + 12H_2O + light = C_6H_{12}O_6 + 6O_2 + 6H_2O$
   1.1) any one of the three (CO_2, H_2O, light) can be limiting
   1.2) consequences of those limitations quite different

2) leaf radiation budget
   2.1) shortwave
        2.1.1) reflected
        2.1.2) transmitted
        2.1.3) absorbed
   2.2) if absorbed
        2.2.1) Ps
        2.2.2) Ts
        2.2.3) re-radiated
        2.2.4) conducted
               2.2.4.1) convected

3) boundary layer
   3.1) thickness of boundary layer = f()
        3.1.1) leaf size
        3.1.2) lobes or teeth
        3.1.3) surface
   3.2) boundary later determines conductance resistance

4) why does temperature matter?
   4.1) gross Ps
        4.1.1) enzyme mediated and complex
        4.1.2) subject to selection pressure
        4.1.3) typically unimodal curve
        4.1.4) appropriate to regional climate
   4.2) respiration
        4.2.1) fairly simple oxidation
        4.2.2) Q10 curve, not modal
   4.3) net Ps
        4.3.1) area inbetween gross Ps and Resp
        4.3.2) can be negative even in high light

5) leaf design
   5.1) assume water and CO_2 not limiting
   5.2) importance of palisade tissue
   5.3) number of layers of palisade determine parameters
        5.3.1) minimum light requirement
        5.3.2) maximum rate
   5.4) low light versus high light enviro
   5.5) decision made in bud the year before
   5.6) or long-lived leaves have to plan out

6) Ps response curve
   6.1) consequence of leaf design
   6.2) three critical points
        6.2.1) compensation point (= break-even)
        6.2.2) saturation point (= more light doesn't help)
        6.2.4) maximum rate (5 fold difference)
   6.3) shade-intolerant versus shade-tolerant

7) why do plants transpire?
   7.1) couple of reasons
        7.1.1) nutrient transport
        7.1.2) necessary evil
   7.2) Ts rate = f()
        7.2.1) diffusion gradient (= VPD)
        7.2.2) stomatal conductance
               7.2.2.1) fantastic control
   7.3) maximum rate?
        7.3.1) some crops faster than a lake
        7.3.2) forests ~ 1/2 a lake to 0

8) carbon allocation
   8.1) gross Ps to net Ps = f(leaf design and stomatal control)
   8.2) maintenance resp = f(temp and biomass)
   8.3) carbon pool
   8.4) allocation
        8.4.1) new leaves
        8.4.2) branches and stems
        8.4.3) roots
        8.4.4) mycorrhizae
        8.4.5) defense
        8.4.6) reproduction
        8.4.7) storage