I. Bacteria
   A. Shape
      1. bacilli
      2. cocci
      3. spirilla
   
   B. Structure
      1. circular DNA
      2. plasma membrane
      3. cell wall
         a. may be encased in lipopolysaccharide membrane
      b. gram - (has membrane)
      c. gram + (no membrane)
      
      4. flagella (simple)
      5. pili
      6. endospores
   
   C. Reproduction
      1. binary fission
      2. conjugation
         a. 
         b. 
         c. 
   
   D. Differences from eukaryotes
      1. no internal compartmentalization
      2. small size
      3. unicellular
      4. no chromosomes
      5. binary fission
      6. simpler flagella
      7. metabolic diversity 
         a. 

b.

E. Types
1. archaebacteria
   a. harsh environments
   b. methanogens
   c. thermoacidophiles

2. photosynthetic eubacteria
   a. cyanobacteria
      - Anabaena
   b. probably responsible for initial O$_2$ production on earth

3. chemoautotrophic eubacteria
4. heterotrophic eubacteria
   a.
   b.

F. Diseases Table 13.3
1.
2.

II. Viruses
A. Structure
1. nucleic acid core
   a. most have DNA
   b. some use RNA
2. protein coat (capsid)
3. may be covered by envelope (proteins, lipids, glycoproteins)
4. tiny

B. Shape
1. helical/spherical
2. isometric
3. can be complex

C. Infection (animal virus)
   1. glycoproteins on envelope of virus
   2. must “match” with surface receptors on a cell
   3. endocytosis
   4. viral DNA may incorporate into cell’s DNA
   5. viral DNA may simply direct protein synthesis on its own
   6. viral RNA (if present) may be copied
      - reverse transcriptase
   7. cell “commandeered” by virus
      a.
      b.

D. Bacteriophages

E. Diseases  TABLE 13.4
   1.
   2.