I. Endosymbiosis
   A. Occurred in early eukaryotes
      Pelomyxa
      entry of mitochondria/chloroplasts
   B. Mitochondria and chloroplasts are similar to bacteria
      1. circular DNA
      2. similar translational machinery
      3. binary fission

II. Eukaryotic Reproduction
   A. Sexual
      1. gametes
      2. evolutionary advantage
      3. diversity
      4. includes self-fertilization
   B. Asexual
      1. no gametes
      2. identical
      3. parthenogenesis

III. Protists
   A. Most diverse kingdom
      1. most unicellular eukaryotes
      2. not plant, animal or fungus
      3. “catchall”
      4. algae
      5. protozoa
      6. mold
   B. Heterotrophs that lack locomotor apparatus
1. amoebas
   a. pseudopodia
   b. simple fission (mitosis)
   c. soil
   d. can be parasites

2. forams
   a. marine
   b. rigid shells

C. Algae
   1. unicellular or multicellular
   2. pigment differences

   3. green
      a. ancestors of plants
      b. mostly unicellular
      c. mostly motile

   4. red
      a. mostly multicellular
      b. marine
      c. not motile
      d. hard cell walls

   5. brown
      a. kelp
      b. seaweed

D. Flagellates (3 phyla)
   1. dinoflagellates
      a. photosynthetic
      b. aquatic
      c. red tides
      d. some bioluminescent

   2. zoomastigotes
      a. heterotrophs
      b. trypanosomes
c. gut of termites

3. euglenoids

E. Ciliates
1. ciliated
2. two nuclei per cell

3. heterotrophs
4. paramecium

F. Molds
1. heterotrophs
2. 3 phyla
   a. cellular slime molds
      - can aggregate into slugs
      - change location (toward light)
      - differentiates and sporulates
   b. plasmodial slime molds
      - oozing mass of slime
      - many nuclei
   c. water molds
      - rusts and mildews
      - parasitic or feed off dead organic matter

G. Sporozoans
1. animal parasites
2. plasmodium (malaria)