Bio 11 Kingdom Protista

Characteristics:

1. -All eukaryotes
2. -Most unicellular
3. -Some autotroph, some heterotroph, some both!
4. -All reproduce asexually (exception: conjugation)
5. -Mostly found in water (pond, ocean, lake, puddle)

3 major types:

1) Animal-like (zooplankton)

A) Characteristics:
   1. -heterotrophs
   2. -move (cilia, flagella, streaming)
   3. -respond to environment

B) Key Phyla:
   1. Sarcodina (Amoebas)
   2. Sporozoa (Plasmodium)
   3. Ciliophora (Paramecium)

2) Plant-like (phytoplankton)

A) Characteristics:
   1. -autotrophs, mostly single-celled algae
   2. -have cell walls, chloroplasts

B) Key Phyla:
   1. Chrysophyta (diatoms)
   2. Pyrrophyta (dinoflagellates)
   3. Euglenophyta (euglena)

3) Fungi-like (slime mold) [heterotrophs (saprotrophs)/ found in shady, cool, damp areas / reproduce via spores]

Ecological Roles:

Positive Roles:

1) Many protists (plant- and animal-like) are symbiotic with animals (e.g. dinoflagellates and corals)
2) Protists are food sources for aquatic animals (and us: ice cream, sushi)
3) Plant-like protists are primary producers (photosynthesis), supplying 80% of Earth's oxygen

Negative Roles:

1) Many animal-like protists such as plasmodium are pathogenic and cause disease (e.g.malaria)
2) Plant-like protists such as euglena and diatoms can cause algae blooms (stifles life, consumes nutrients)
3) Plant-like dinoflagellate blooms can cause toxic "red tides"

Stations: Learning about key species in the kingdom protista that represent its diversity
(Refer to pages 382-399 in your textbook to finish answers)

1) Evolution of Protists: the ___endosymbiont_____ Hypothesis
   A. Read pages 382-383 and describe the hypothesis regarding the evolution of Protista:

   B. Draw out in comic strip form how this may have taken place:

   C. Apply the concept: How might the hypothesis explain the double membranes that surround organelles such as the mitochondrion, chloroplast, and nucleus?

2) Phylum Ciliophora (Feature species: PARAMECIUM)
   Use page 384-385 to answer the following questions:
   A. What "type" is this protist (animal-like, plant-like, fungi-like)? animal-like

   B. How do these protists move? cilia

   C. What are trichocysts and what are they used for? Spike-like structures in pellicle used for defence

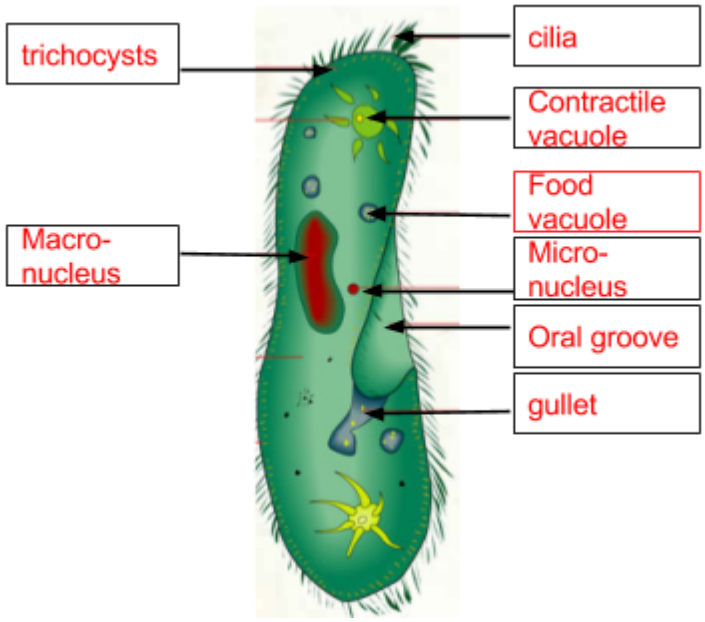
   D. Where does food enter these organisms, and how? Through the oral groove and into the gullet

   E. Where does this food get stored and then digested? Food vacuoles

   F. How do these organisms control the amount of water within it? Contractile vacuoles pump water out of the cell to regulate solute/solvent balance

3) Phylum Ciliophora Continued….

A. Label the following **paramecium** diagram using the following terms: micronucleus, macronucleus, food vacuole, contractile vacuole, cilia, trichocysts, gullet, oral groove



B. Look at the slide presented- what type of sexual reproduction are these paramecium in the process of in the slide?

conjugation

C. What is the purpose of this process?

Increasing genetic diversity of population, passing on potentially advantageous mutations

4) Phylum Sporozoa (PLASMODIUM)

A. What "type" of protist are sporozoa (animal-like, plant-like, fungi-like)?
animal-like

B. How do sporozoa move?
They do not move as individuals, but use spores to travel between hosts

C. What type of consumer are sporozoa?
parasitic

D. **Plasmodium** life cycle includes two hosts and is responsible for the blood disease __malaria_____.

E. Draw the two hosts that plasmodium requires for its life cycle and list the tissues infected in each.

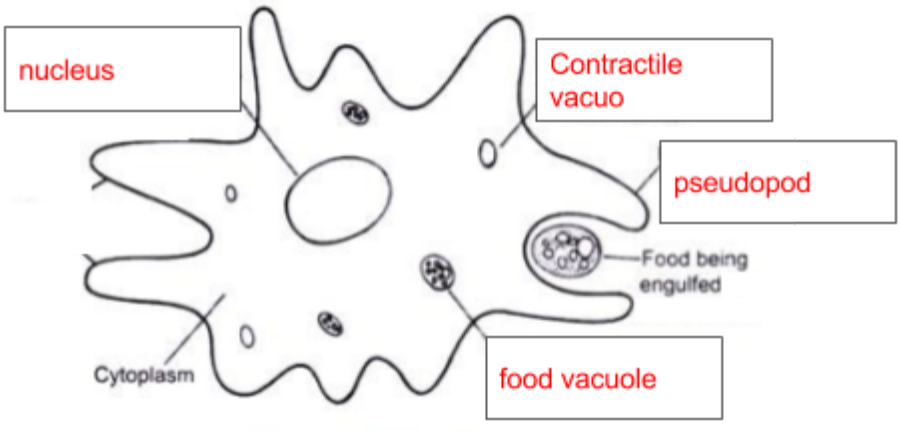
Human: liver, blood cells
Mosquito: gut, salivary gland

5) Phylum Sarcodina (AMOEBA)

A. What "type" of protist are sporozoa (animal-like, plant-like, fungi-like)? How do you know?
animal-like

B. Amoebas have pseudopods, which literally translate to fake feet.
These structures are used to move and eat via cytoplasmic streaming.

C. Label the following amoeba diagram using the following terms: nucleus, contractile vacuole, pseudopod, food vacuole
Observe the amoeba in the slide.



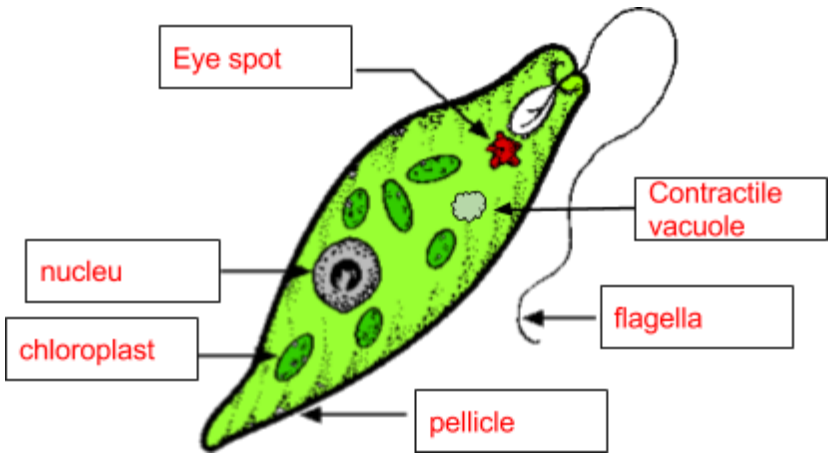
What are your observations of the amoeba in the slide?

6) Phylum Euglenophyta (EUGLENA)

C. What "type" of protist are sporozoa (animal-like, plant-like, fungi-like)? How do you know?
Plant-like, they are green (chloroplasts with chlorophyll, photoautotrophs)

D. How do euglena move?
flagella

E. Label the following diagram of a Euglena with the following terms: flagella, chloroplast, nucleus, eyespot, pellicle and contractile vacuole:



D. What is the function of the pellicle? Provides structural support for flagella, acts as cell wall

7) Phylum Pyrrophyta (DINOFLAGELLATES)

A. What "type" of protist are pyrrophyta (animal-like, plant-like, fungi-like)? How do you know?

Plant-like, green, chloroplasts

B. Critical thinking: Dinoflagellates cause __algae_____ blooms. What impact do these blooms have on surrounding ecosystems?

Loss of nutrients, light, overcrowding, build up of CO2 and toxins, marine mortality

8) Phylum Chrysophyta (DIATOMS)

A. What "type" of protist are pyrrophyta (animal-like, plant-like, fungi-like)? How do you know?

Plant-like, no movement, some green

B. What are the cell walls of diatoms made out of and how are they shaped?

silica/glass, multiple geometric shapes

C. Observe a slide of mixed diatoms. Using the field guide and information sheet, identify as many organisms as you can and draw them below: