Name: _____ Date: _____

Life Science Period: _____

Protists

The Amoeba

The **amoeba** is a protozoan that belongs to the **Kingdom Protista**. The name amoeba comes from the Greek word *amoibe*, which means change. Protists are microscopic unicellular organisms that don't fit into the other kingdoms. Some protists are considered plant-like while others are considered animal-like. The amoeba is considered an animal-like protist (**protozoan**) because it moves and consumes its food. Protozoans are classified by how they move, some have cilia or flagella, but the amoeba has an unusual way of creeping along by stretching its cytoplasm into fingerlike extensions called **pseudopodia**. (The word "pseudopod" means "false foot".) When looking at amoeba under a microscope, an observer will note that no amoeba looks the same as any other; the **cell membrane** is very flexible and allows for the amoeba to change shape. Amoebas live in ponds or puddles, and can even live inside people.

There are two types of cytoplasm in the amoeba, the darker cytoplasm toward the interior of the protozoan is called **endoplasm**, and the clearer cytoplasm that is found near the cell membrane is called **ectoplasm**. By pushing the endoplasm toward the cell membrane, the amoeba causes its body to extend and creep along. It is also by this method that the amoeba consumes its food. The pseudopodia extend out and wrap around a food particle in a process call phagocytosis. The food is then engulfed into the amoeba and digested by the enzymes contained in the amoeba's lysosomes. As the food is digested it exists in a structure called a **food vacuole**.

Also visible in the amoeba is the **nucleus**, which contains the amoeba's DNA. In order to reproduce the amoeba goes through cell division, where the nucleus duplicates its genetic material and the cytoplasm splits into two new daughter cells, each identical to the original parent. This method of reproduction is called **binary fission**. Another structure easily seen in the amoeba is the **contractile vacuole**, whose job is to pump out excess water so that the amoeba does not burst.

During unfavorable conditions, the amoeba can create a **cyst**; this hard-walled body can exist for a long period of time until conditions become favorable again. At this point it opens up and the amoeba emerges. Often cysts are created during cold or dry periods where the amoeba could not survive in its normal condition.

Amoebas can cause disease. A common disease caused by the amoeba is called **Amoebic Dysentery**. A person becomes infected by drinking contaminated water. The amoeba then upsets the person's digestive system and causes cramps and diarrhea. A person is most likely to be infected in countries where the water is not filtered or purified.

Questions:

1. Describe how amoebas move.

   _____

   _____

2. What structure contains the amoeba's DNA? _____

3. How does an amoeba reproduce? _____

4. What term refers to the finger-like extensions of an amoeba's body? _____

   What does the term literally mean? _____

5. When ingested through contaminated water, amoebas can cause amoebic dysentery in humans. Which body system is affected by the protist?

   _____

The Euglena

Euglenas are unicellular organisms classified into the **Kingdom Protista**, and the Phylum Euglenophyta. All euglena have **chloroplasts** and can make their own food by **photosynthesis**. They are not completely autotrophic though, euglena can also absorb food from their environment; euglenas usually live in quiet ponds or puddles.

Euglena move by a **flagellum** (plural , flagella), which is a long whip-like structure that acts like a little motor. The flagellum is located on the **anterior** (front) end, and twirls in such a way as to pull the cell through the water. It is attached at an inward pocket called the reservoir.

The Euglena is unique in that it is both **heterotrophic** (must consume food) and **autotrophic** (can make its own food). Chloroplasts within the euglena trap sunlight that is used for photosynthesis, and can be seen as several rod-like structures throughout the cell. Euglena also have an **eyespot** at the anterior end that detects light, it can be seen near the reservoir. This helps the euglena find bright areas to gather sunlight to make their food. Euglena can also gain nutrients by absorbing them across their cell membrane, hence they become heterotrophic when light is not available, and they cannot photosynthesize.

The euglena has a stiff pellicle outside the cell membrane that helps it keep its shape, though the pellicle is somewhat flexible and some euglena can be observed scrunching up and moving in an inchworm type fashion.

In the center of the cell is the **nucleus**, which contains the cell's DNA and controls the cell's activities. The nucleolus can be seen within the nucleus.

The interior of the cell contains a jelly-like fluid substance called cytoplasm. Toward the posterior of the cell is a star-like structure: the **contractile vacuole**. This organelle helps the cell remove excess water, and without it the euglena could take in some much water due to osmosis that the cell would explode.

Questions:

1. Are euglena unicellular or multicellular? _____
2. How do euglena move? _____
3. Which organelle in the euglena enables it to perform photosynthesis? _____
4. Define heterotroph: _____
5. Define autotroph: _____
6. Identify two ways in which euglena obtain their food:
    a) _____
    b) _____
7. What is the eyespot used for? _____
8. What is the function of the nucleus? _____
9. What would happen to the euglena if it did not have a contractile vacuole?