Warm Up

- 1.) What types of organisms, if any, did you find in the water samples used in the lab?
- 2.) Which objective lens (4x, 10x, 40x) did you find it easiest to observe small specimens using the microscope?
- 3.) What is a microorganism?

Microbe Classification Activity

The teacher will hand out pictures of different microbes.

On a separate sheet of paper, you will work with your shoulder partner to answer the questions on the following slide.

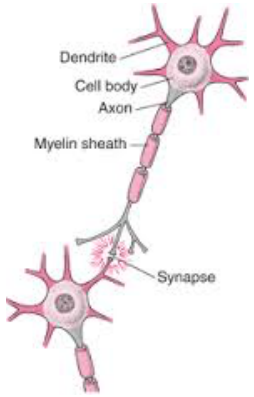
Make sure both partners names are on the paper, along with the date and period.

Microbe Classification Activity

- 1. What traits to different microbes possess?
- 2. Which of these traits do multiple microbes have?
- 3. Work on putting these microbes into categories. Which microbes did you classify together? Why?

Warm Up

- Name 3 types of Microbes.
- What is the largest cell?

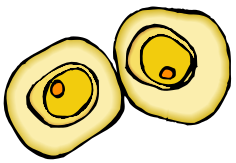


The egg (Ostrich egg specifically) is one of the largest common cells. However, a Giant Squid's nerve cell can run up to 39 feet long!

MicroOrganism Notes

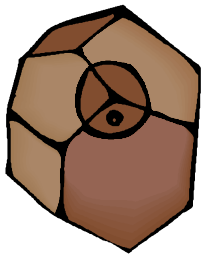
- You will get a guided notes sheet. Make sure you put this in your notebook because we will not finish today.

- **Microorganism**
  - Comes from the Greek words, *mikrós*, meaning "small" and *organismós*, meaning "organism."
  - Microorganisms are also known as **microbes.**
  - The study of microorganisms is called microbiology.
  - A microscopic organism comprises either a single cell, cell clusters, or no cell at all (acellular).
    - **Unicellular** organism is an organism made of only one cell.
    - **Acelluar** organisms are organism that exist without a cellular structure.



Cartilage cells

- Cells are the basic unit of structure in most living organisms.
- Cells have different shapes & characteristics based on their function.
- Most cells consist of a…
  - **Cell membrane** or the outside boundary that separates the cell from the environment.
  - **Cytoplasm** or the thick gel-like substance located within the cell membrane & houses all organelles of the cell.
  - **Nucleus** or the location of most of the genes & organelles that directs the majority of the cell's activities.



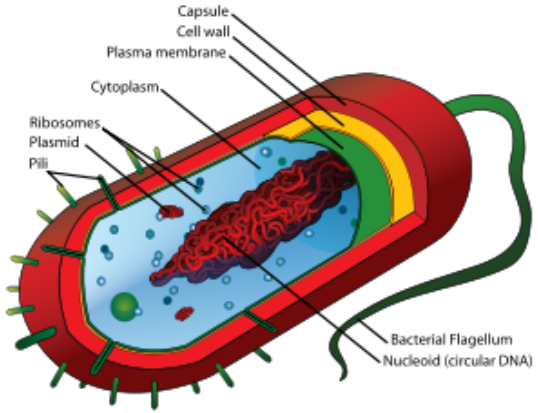
Liver Cell

Connective tissue cell

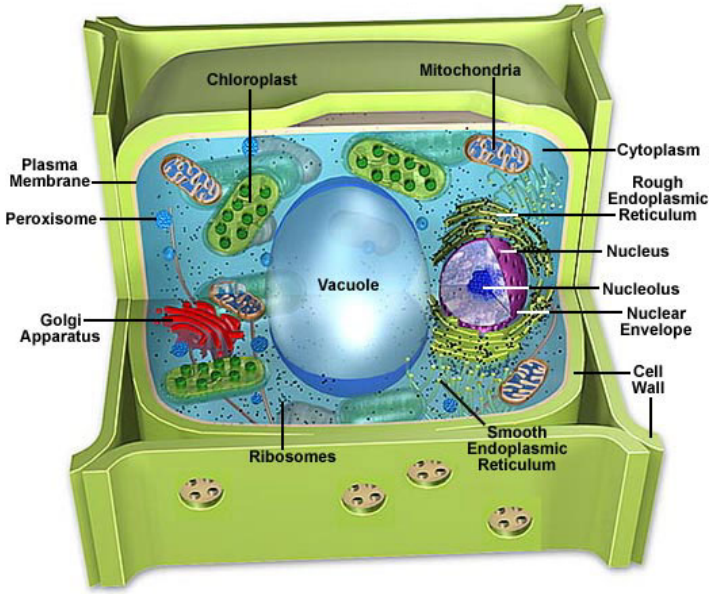
Bone Cell

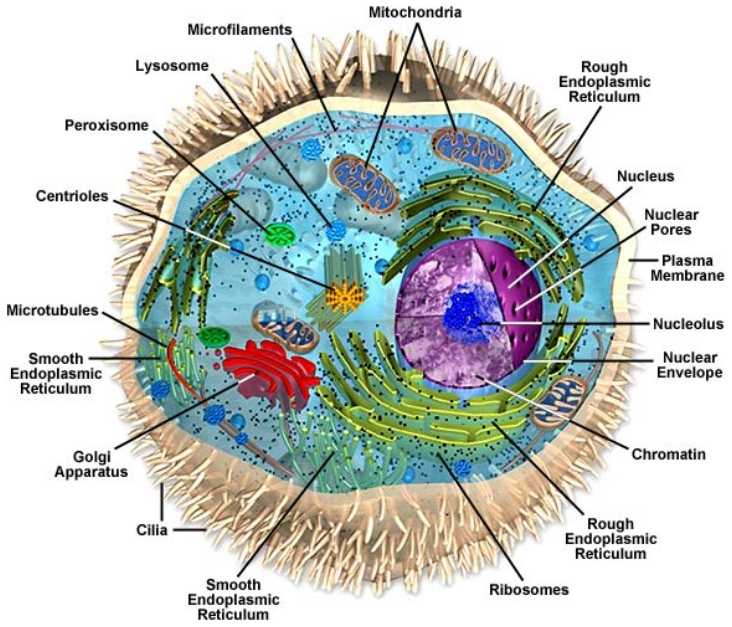
– There are 2 main categories of cells

1. Prokaryotic cells
   - Cells that do not contain a nucleus
   - Ex.) Bacteria & Archaea



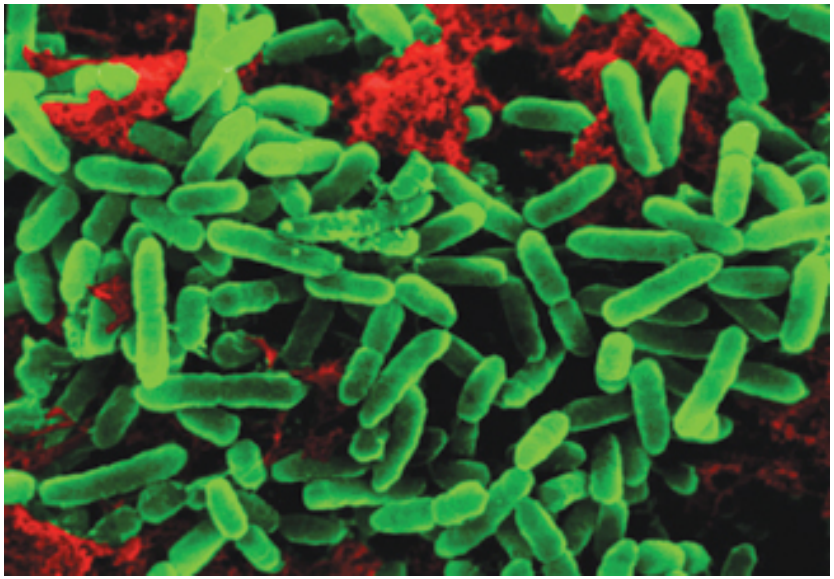
2. Eukaryotic cells
   - Cells that do contain a nucleus
   - Ex.) Plant cells, animal cells, protists, & fungi



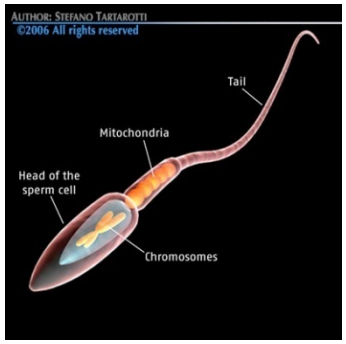


- Microorganisms are very diverse; they include bacteria, fungi, and protists.
- They also include microscopic plants (green algae) and animals such as plankton.
- Most microorganisms are unicellular (single-celled) however some multicellular organisms are microscopic.
- Some unicellular protists and bacteria are macroscopic and visible to the naked eye.
- Microorganisms live in all parts of the Earth where there is liquid water, including soil, hot springs, on the ocean floor, high in the atmosphere and deep inside rocks within the Earth's crust.

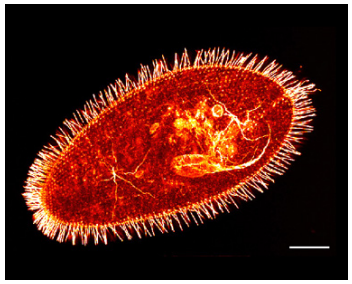
- Microorganisms can also be autotrophic or heterotrophic.
  - An **autotroph** is an organism that can make their own food typically through photosynthetic processes.
  - A **heterotroph** is an organism that cannot make their own food.
- Microorganisms are critical to nutrient recycling in ecosystems as they act as decomposers.



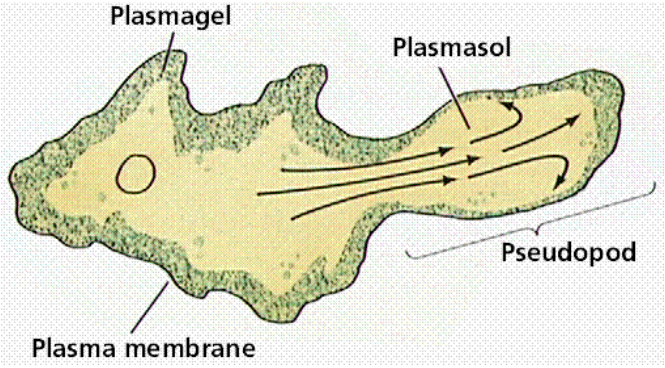
- Methods of movement in some microorganisms
  - Flagellum (flagella, pl.)
    - "tail-like " structure attached to the outer membrane of some cells & cellular organisms.
    - Moves in a snake-like, side-winding motion.
      - Ex. Sperm cells



  - Cilium (cilia, pl.)
    - "hair-like" structures that outer membrane of some cells & cellular organisms.
    - Moves in a back-and-forth motion moving at about 40-60 strokes per second.
      - Ex. Paramecium



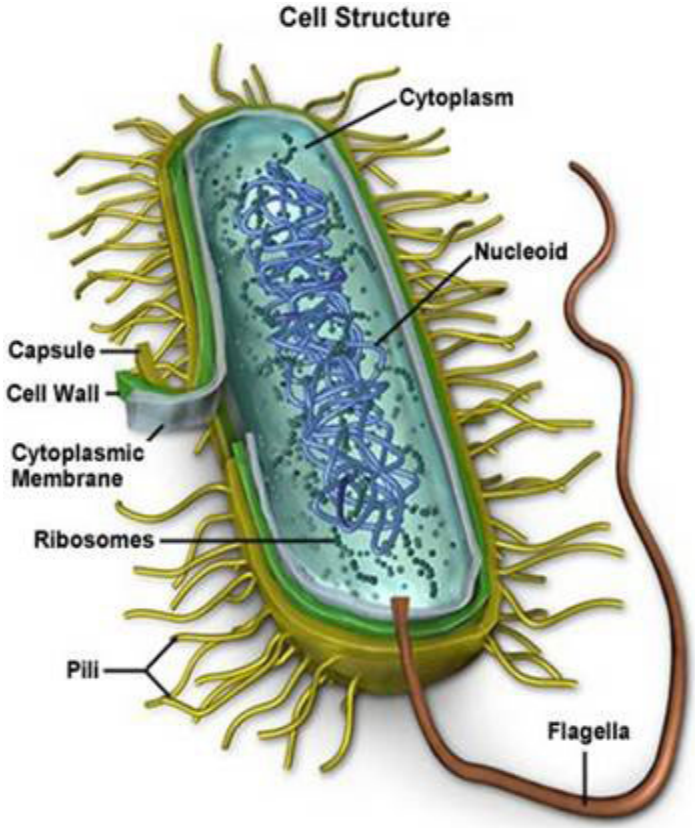
  - Pseudopodium (pseudopods, pl.)
    - "False foot" extensions of the cytoplasm and cell membrane used for movement
    - Cell membrane pushes in one direction & the cytoplasm flows into the bulge.
      - Ex. Ameoba



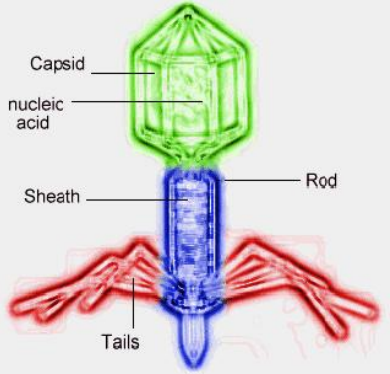
- Examples of common microorganisms

1. Bacteria

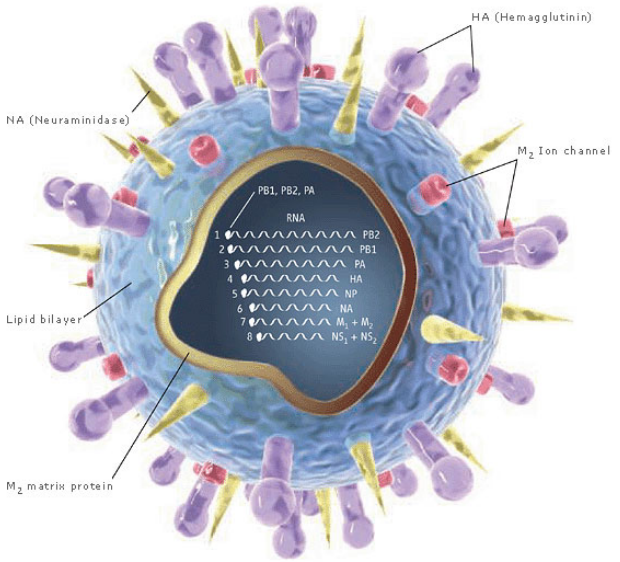
   - Single-celled, non-nucleus containing microorganism that comes in various shapes from spheres, to rods, to spirals.
     - Toxin: A poison produced by bacterial pathogens that damage cells.
   - Diseases caused by bacteria
     - Tetanus
     - Typhoid fever
     - Diphtheria,
     - Syphilis,
     - Cholera,
     - Leprosy
     - Tuberculosis (TB)



2. Virus

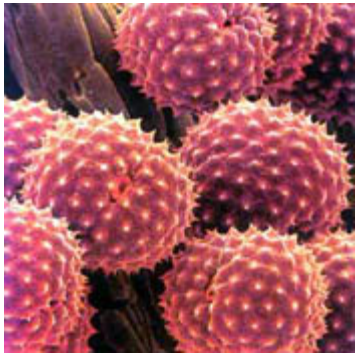


- a small acellular organism that can replicate only inside the living cells of organisms.
- Most viruses are too small to be seen directly with a light microscope.
- Viruses infect all types of organisms, from animals and plants to bacteria.
- 1st discovered in 1898, there are millions of different types.
- Diseases caused by viruses include
  - Influenza (Flu)
  - Common cold
  - Chicken pox
  - SARS
  - HIV/AIDS



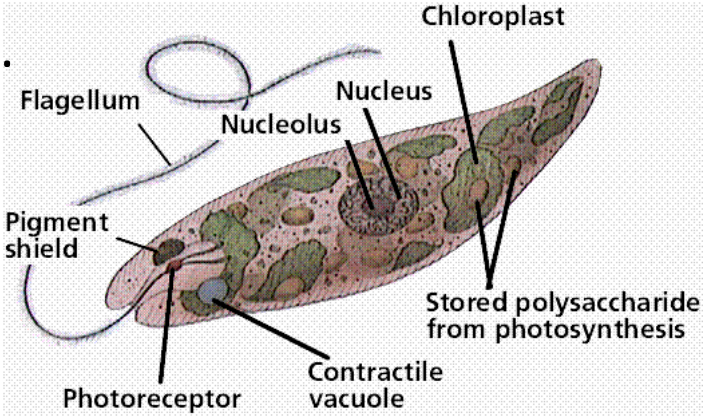
3. Fungi

- Many fungi are parasites on plants and animals, including humans.
- Some fungi can cause serious diseases in humans several of which may be fatal if untreated.
- Diseases caused by fungi include…
  - Ringworm
  - Athlete's foot
  - Toxic black mold
  - Mold/Fungus specific allergies



4. Protists

- Unicellular or multi-cellular organism without specialized tissues.
- Diseases caused by protists include…
  - Malaria
  - African sleeping sickness
  - Amebic dysentery



Video on Protists

- http://www.brainpop.com/science/diversityoflife/protists/

Paramecium

- Feeding on Yeast
- Paramecium are single-celled organisms
- They eat using a mouth pore that brings food into the cell- Heterotroph
- The move around using cilia (hair like things on the outside of the cell). They vibrate the celia to move around in their environment

Euglena

- Videos: Movement Euglena
- Euglena are single-celled organisms
- They eat using the process of photosynthesis (like a plant) and by eating food that they encounter- Autotroph and Heterotroph
- They move around using a whip like structure called a flagella

Volvox

- Volvox are single-celled organisms but they live in colonies and act almost like multi-cellular organisms
- Volvox make food using **photosynthesis** (like a plant)
- Each cell has two **flagella**, but they do not move around much

Amoeba

- Feeding Movement & Feeding
- They eat by surrounding tiny particles of food with **pseudopods**, forming a bubble-like food vacuole. This is called **phagocytosis**.
- Amoebas reproduce asexually by **binary fission.**

Warm Up

1.) What are 2 structures found on single-celled organisms that allow for movement?

2.) What does pseudopodia mean?

3.) Name one disease cause by a protist.