

Cells and the Cell Theory

Characteristics of Life

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Early contributors of the Cell Theory

_____ - was the first person to see cells and identify them . He stated that they looked like many boxes, called them cells. (Because they looked like a lot of little prison cells together.)

_____ - observed living cells in pond water, he called them animalcules, now called _____. Known as the Father of _____, made improvements to the microscope.

_____ - zoologist who observed tissues of animals, and realized they had cells (_____)

_____ - botanist who observed tissues of plants and realized that they contained cells. (_____)

_____ - reported that every living thing is made up of these vital units called cells, predicted that cells come from _____. (_____)

All of these developments led to the Cell Theory:

1. _____
2. _____
3. _____

What is a cell?

A cell is the basic _____, _____ and _____ unit of living organisms

- The building _____.
- You are made up of _____ trillion cells!

Types of Cells

Prokaryotic and _____

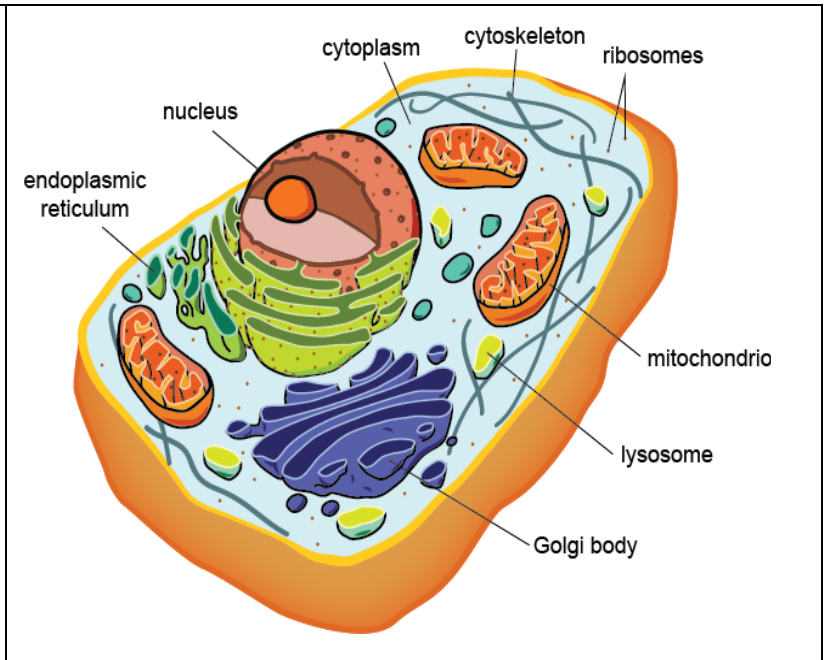
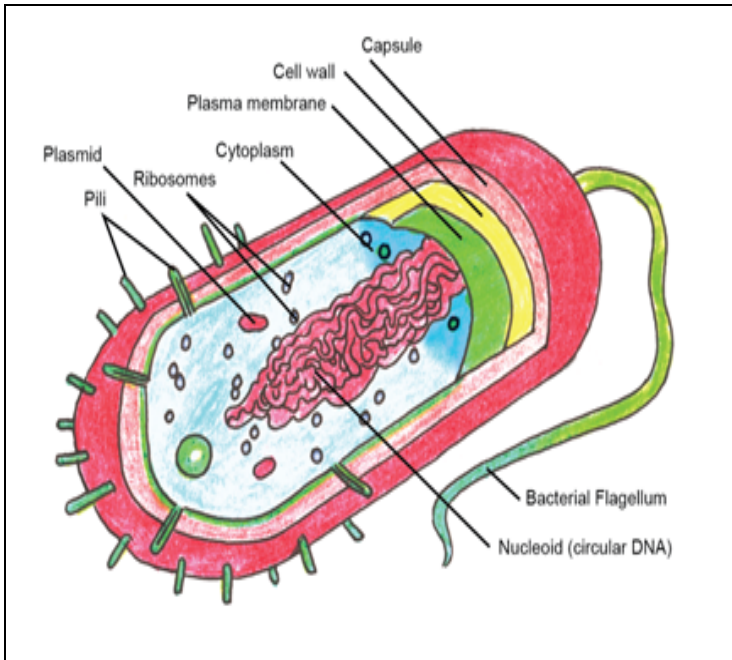
Pro = _____

Kary = _____

Eu = _____

Kary = _____

Cells: Prokaryotic vs. Eukaryotic



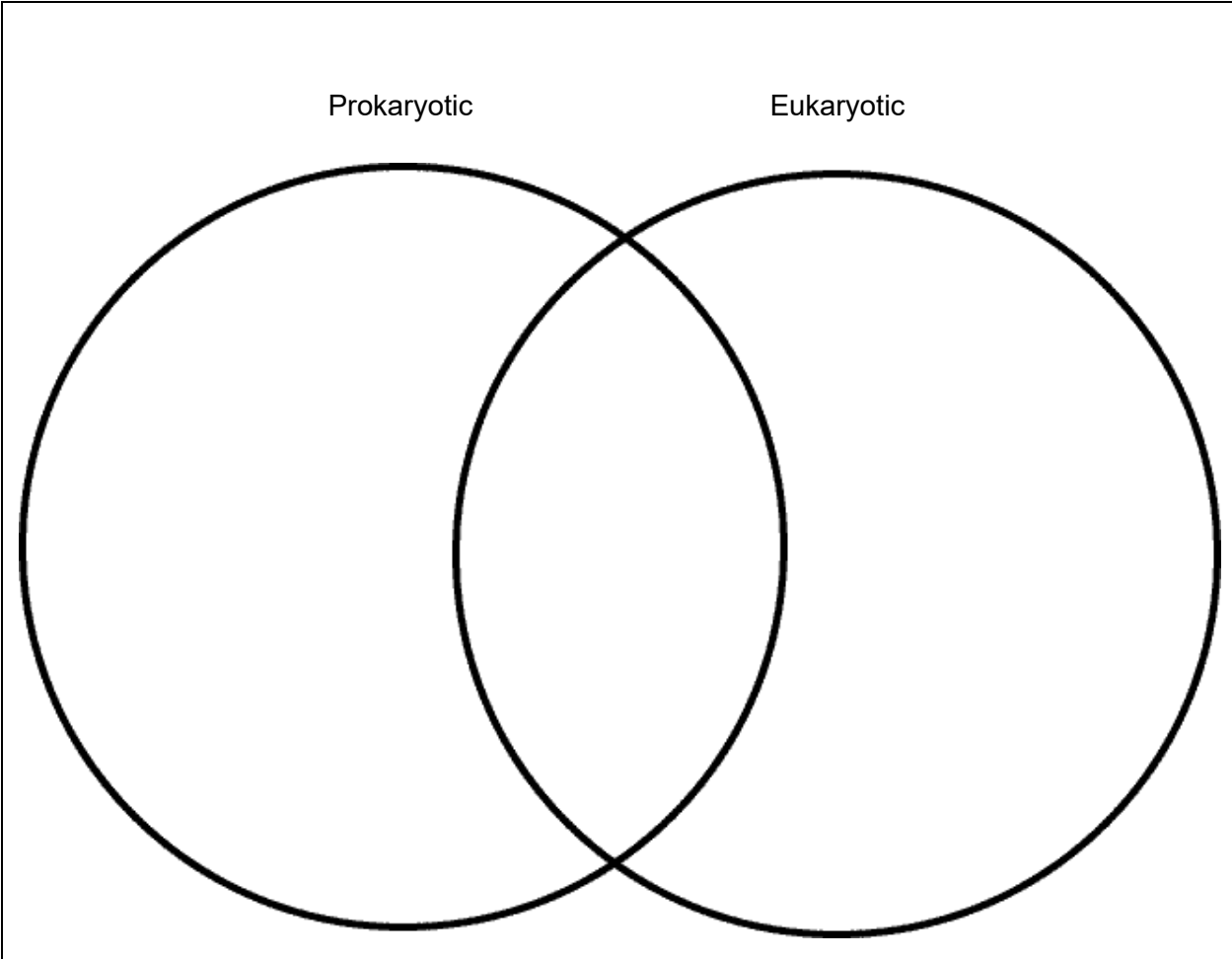
Prokaryotic	Eukaryotic
<p>1. _____ cells, small in size</p> <p>2. Bacteria</p> <p>3. Do NOT have a _____, their _____ is circular and floats in the _____</p> <p>*Some _____ have a _____ structure called a _____, this helps them to move.</p> <p>*A capsule surrounds some bacteria and helps them avoid the body's _____ system.</p>	<p>1. More complex</p> <p>2. _____ & _____</p> <p>3. Have a _____ that contains the _____ information</p> <p><i>*Plants/Animals/Protists & Fungi</i></p> <p>*Four main parts</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p>

Cell Features, all cells have...

- Ribosomes - make protein for use by the organism

- Cytoplasm - jelly-like fluid found in the cell
- _____ - genetic material
- Cytoskeleton - internal _____ of the cell, gives the shape and _____
- Cell Membrane - outer boundary, the _____ controls what

Venn Diagram of Prokaryotic and Eukaryotic Cells



Cells and the Cell Theory, Continued

Cell Features and Functions:

1. Nucleus - _____
 - a. usually found in the _____ of the cell
 - b. has Nuclear Membrane (or nuclear envelope) - holds the _____ in place and keeps it _____
 - c. has Nuclear _____ - that regulate what go into the nucleus
 - d. Contains the cells _____
 - e. _____ - inside of the Nucleus - makes ribosomes

2. _____ - cells energy center; turns food to chemical energy called _____; also called the "_____ " of the cell, the mighty mitochondria; folded _____ increases surface area for energy production during _____

3. Plasma Membrane - _____, double membrane that _____ what enters and _____ the cell

4. Ribosome - _____, make the proteins in the cell

5. _____ - storage tanks
 - a. Store food, water and _____ in the cell
 - b. Plant Vacuoles are much _____, the keep the plant from wilting

6. Cytoplasm - jelly/gel
 - a. liquid/gel like substance that surround the _____
 - b. _____ the organelles

7. Golgi Apparatus (or Golgi Body) - _____ proteins, the factory or a _____

8. Lysosome (animal only) - _____
 - a. break down and digest _____ products using _____

9. Endoplasmic Reticulum (ER) - _____, "intracellular highway"
 - a. Rough ER - contains _____, involved in protein synthesis
 - b. Smooth ER - contains NO _____, synthesizes lipids, phospholipids and steroids

10. Cytoskeleton - helps the cell maintain _____ & _____; movement
 - a. microtubules - _____
 - b. microfilaments - threadlike
 - c. _____ - only in animal cells; used during _____ (paired)

11. Vacuole - " _____ " of the cell, area to store food, water and chemicals, plant cells usually have a large central _____, this keeps the plant upright prevents wilting

12. Chromatin - _____ chromosomes inside of the cell

Protein Production

The cell is like a factory. It produces _____ which goes to serve different functions in the body.

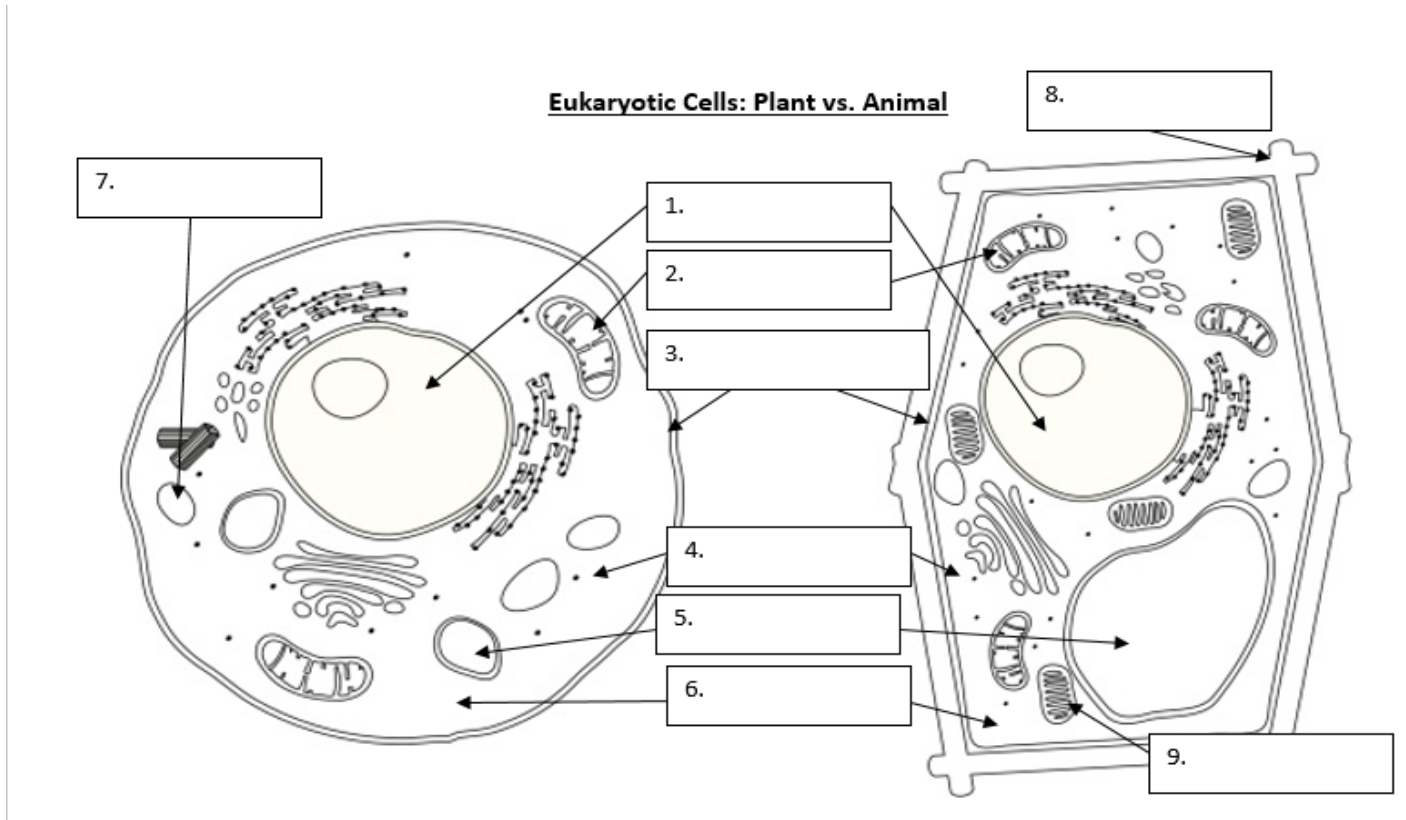
1. DNA has instructions to build proteins
2. _____.
3. The _____ and sends proteins through the _____.
4. The proteins go to the _____ where they are packaged to _____

Plant Cells (Only)

1. Cell Wall - _____, provides shape
2. _____ - contain green _____ (gives a plant color), traps energy from the sun and converts it to chemical energy, _____
3. Central Vacuole - _____, keeps plant from wilting when full of water

Organelle Interactions

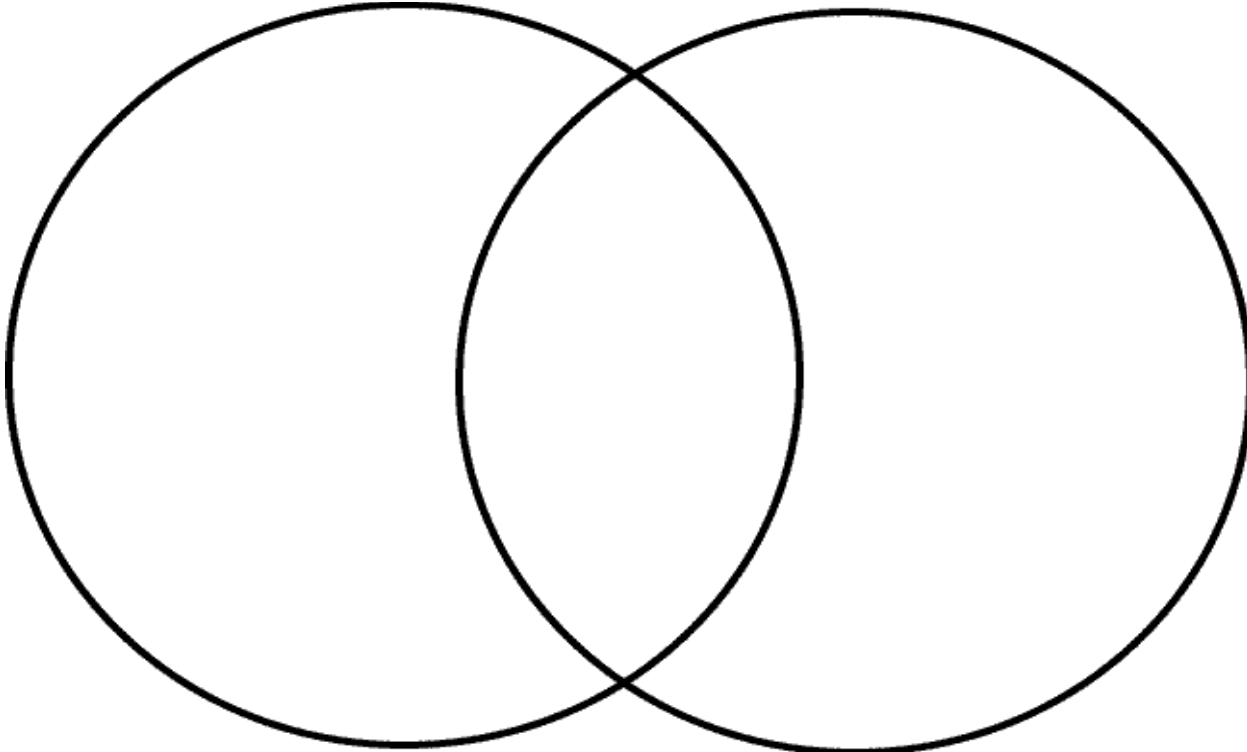
All these organelles work together to keep the cell running!!!!



Comparison: Animal Cells & Plant Cells

Animal Cells

Plant Cells



Microscopes

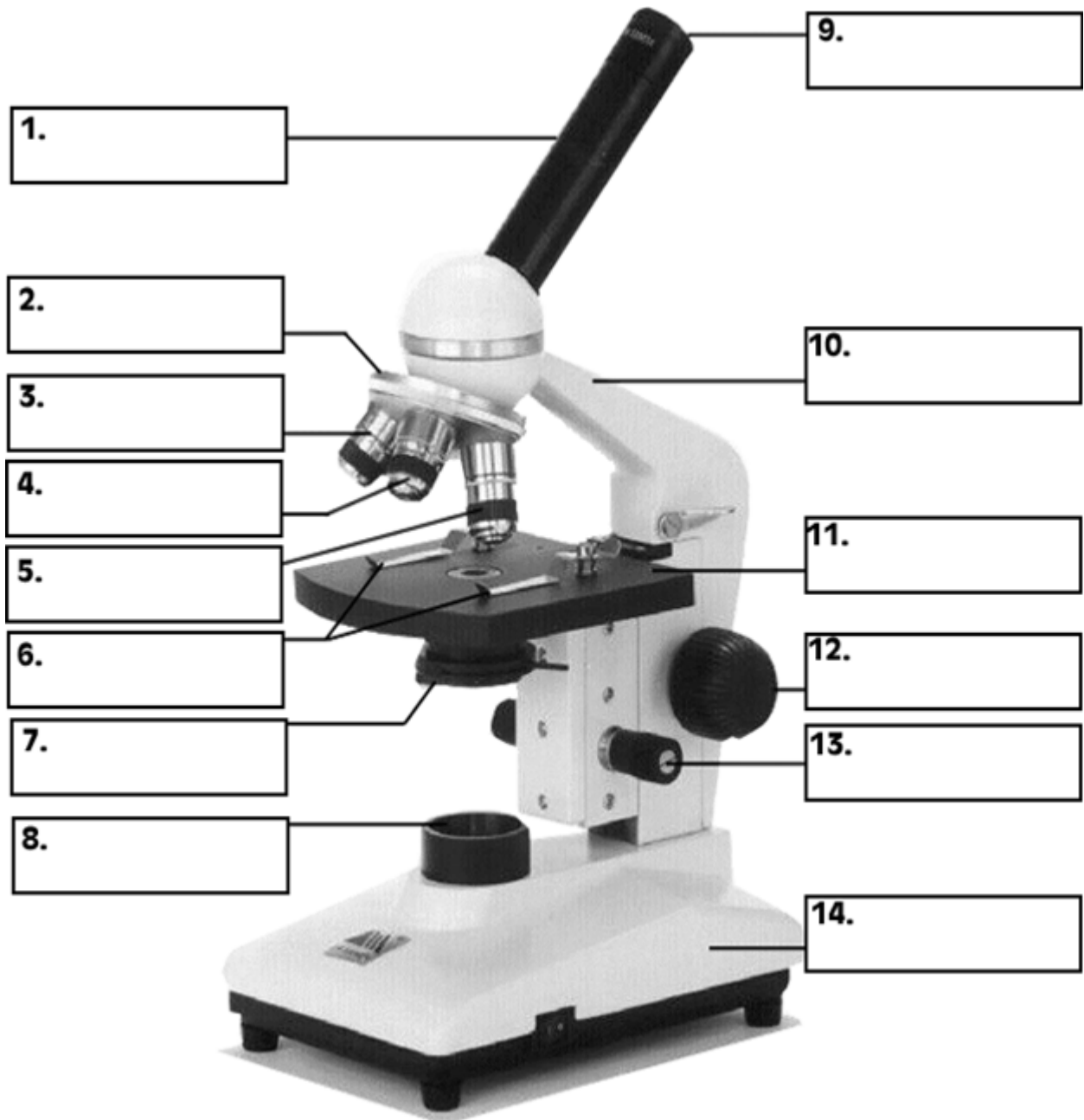
Using a Microscope

- Used to observe _____ in greater detail
- _____ Microscopes - limited magnification
- Advanced Microscopes - Electron (Scanning and _____), can see much greater detail

Microscope: Total Power Magnification

- To find this, _____ the power of the _____ lens (4X, 10X, 40X), by the power of the _____ (usually _____)
- Example: A student is viewing a slide using an objective lens with a power of 4X. What is the total power magnification?
 - _____ x _____
 - _____ x _____ = _____

Microscopes



Review of Organelles

- Nucleus - _____

- Mitochondria - _____

- Cell Membrane - _____

- Ribosomes - _____

- Cytoplasm - _____

- Vacuole - _____

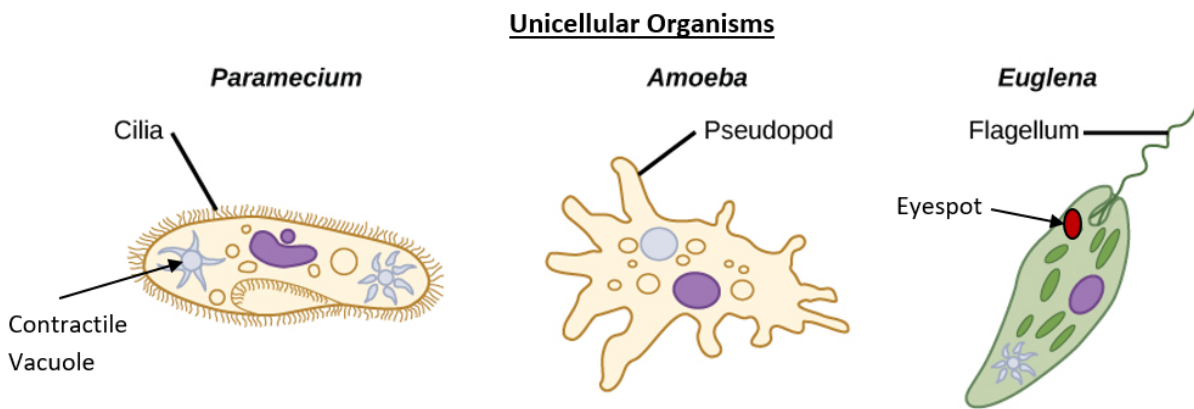
- Chloroplast - _____

- Cell Wall - _____

- Lysosome - _____

Specialization of Cells

Cells all begin as _____ - DNA and genetics play a role in determining the type of cell they become (examples: _____, muscle, _____, ...)



Unicellular Organism

Structure and Adaptations

- A _____ is composed of many cells (ex. you - plant and animal cells)
- Unicellular - means they are composed of a single cell (ex. Bacteria, Protozoa, Euglena)
- Unicellular organisms have many structures that help them survive
 - Contractile Vacuoles
 - _____
 - Flagella
 - _____
 - Eyespots

Contractile Vacuoles

- Store excess water that enters the cell, and expels it to the exterior
 - It _____ when filling with water, then contracts to release it out again
 - _____ and some algae

Cilia

- many _____ structures
- used for _____
- the non-motile cilia serve as _____ organelles

Flagella

- single, _____ tail used for movement
- found in _____, protists, specialized plant, animal and fungi cells

Pseudopods

- _____ that help the unicellular organism move
- sometimes used to obtain food

Eyespots

- A dark area that functions in _____; influences motion so that the organism can move _____ or away from light
 - Toward - _____ phototaxis
 - Away - _____ phototaxis
 - found in green algae

Adaptive Behaviors

Remember "taxis" - an innate behavior in response to an outside stimuli

Chemotaxis

- Movement in response to _____ (chemo)
- some unicellular organisms direct _____ according to chemicals in their environment
 - fine food particles
 - _____ from poisons

Phototaxis

- Movement toward or away from _____
- Many plant like unicellular organisms will move toward light to better photosynthesis, just like a plant that tilts toward the window
 - Positive Phototaxis - _____
 - Negative Phototaxis - _____