

Biology

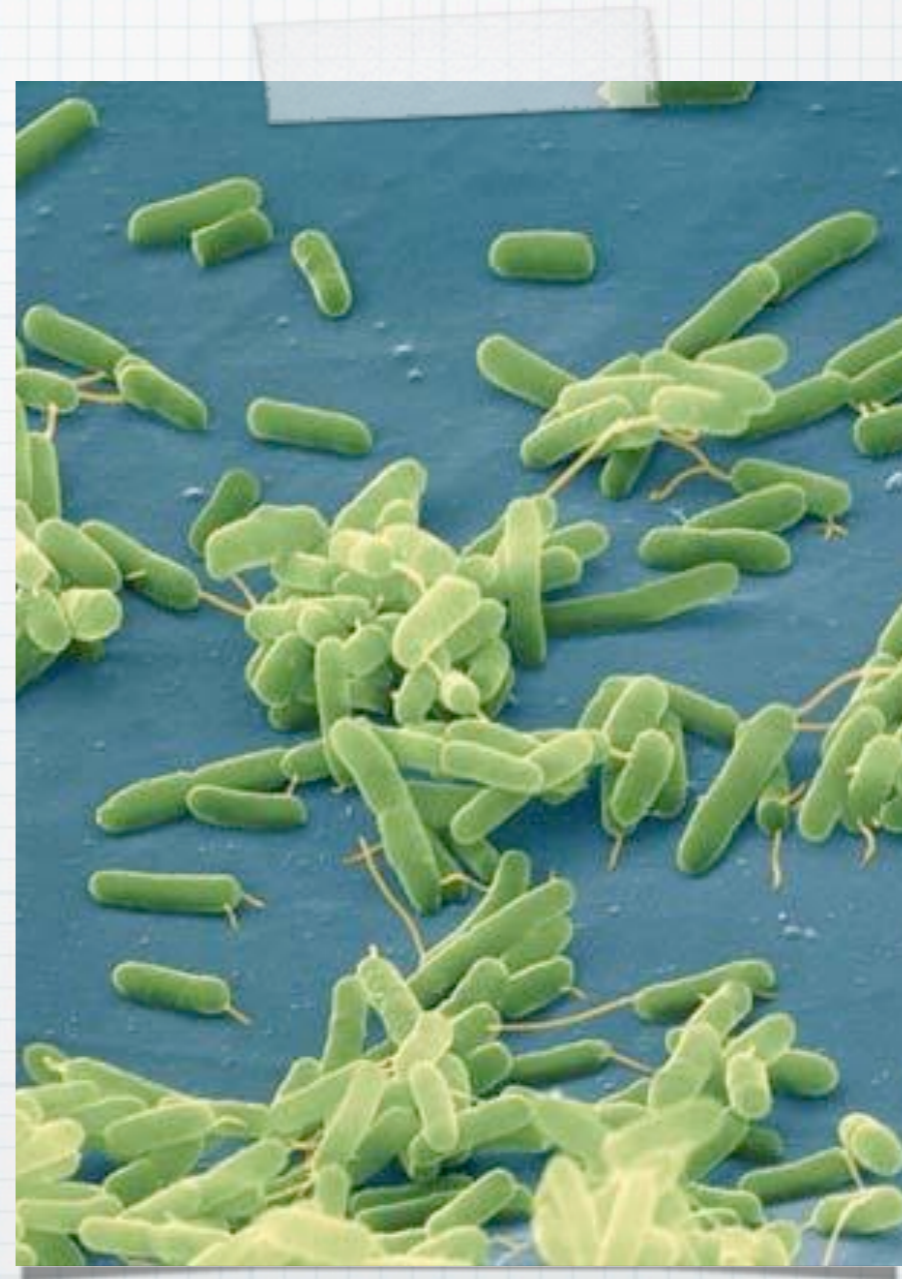
Introduction to Cells

Cell Theory

- * Biology is the study of life.
- * Ideas about cells are built on the cell theory which states:
 - * 1. All living things are made of cells and their products.
 - * 2. The cell is the simplest unit of all life.
 - * 3. All cells come from other cells

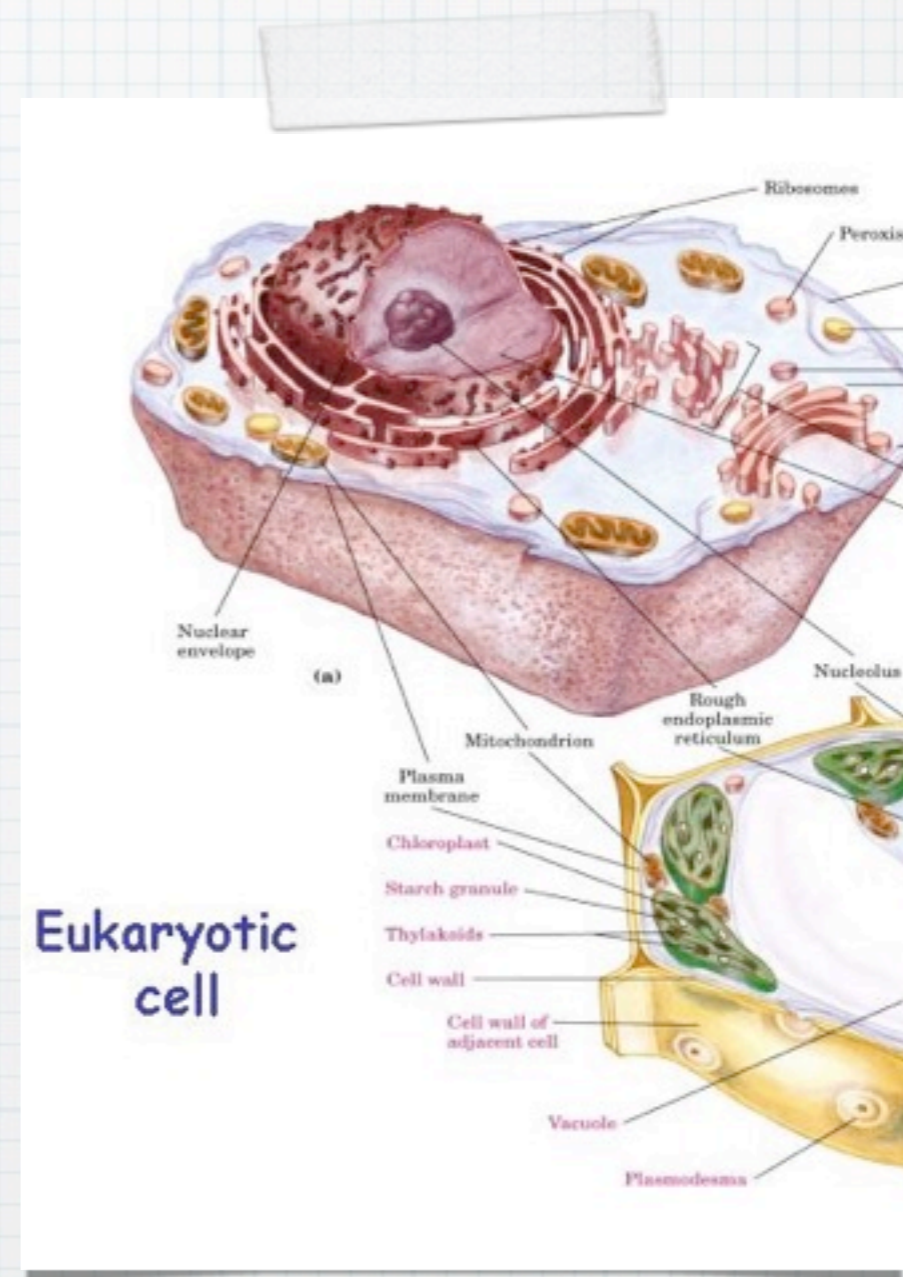
Prokaryotes

- * Cells can be simple or they can be complex.
- * The simplest cells are known as prokaryotes.
- * These cells lack a nucleus and other advanced cell parts!!



Eukaryote

- * More complex cells can exist as single-celled organisms or multi-cellular organisms.
- * These more advanced cells, called eukaryotes, have complex internal organization, including a nucleus and many cell parts.
- * Protists, fungi, plants, and animals have eukaryotic cells.

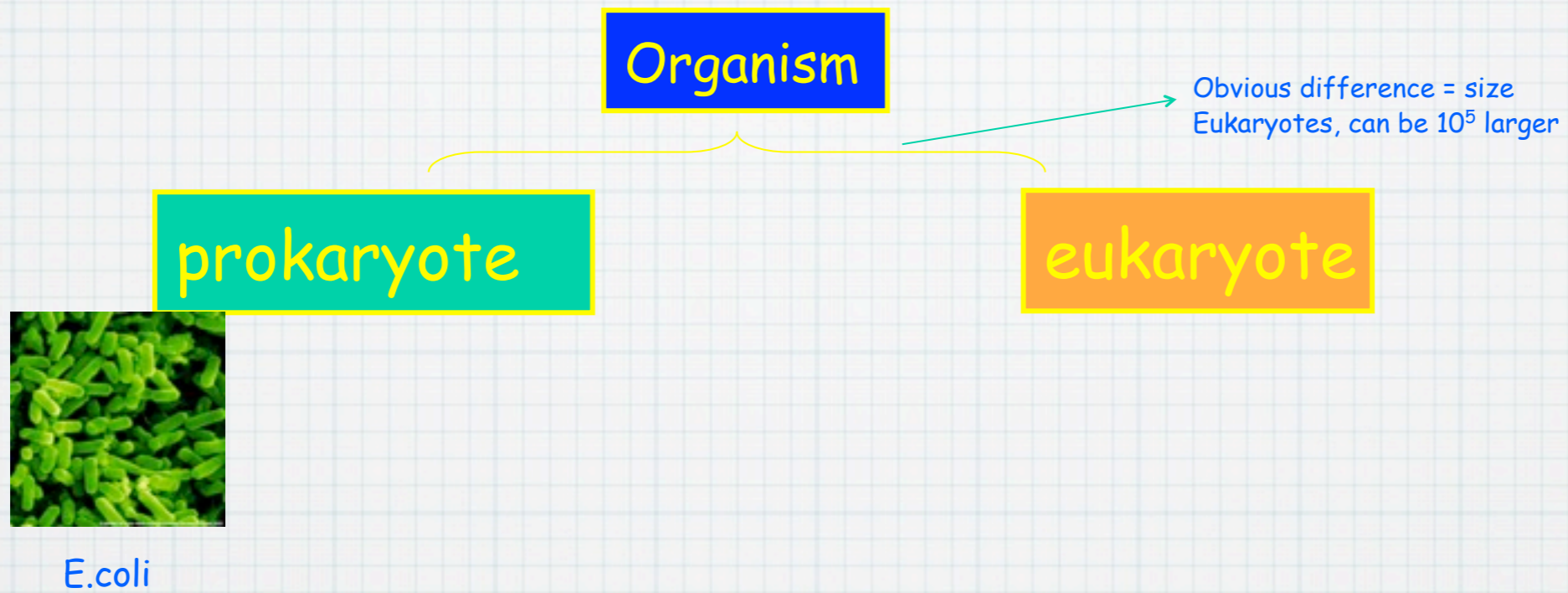


Prokaryotic vs Eukaryotic

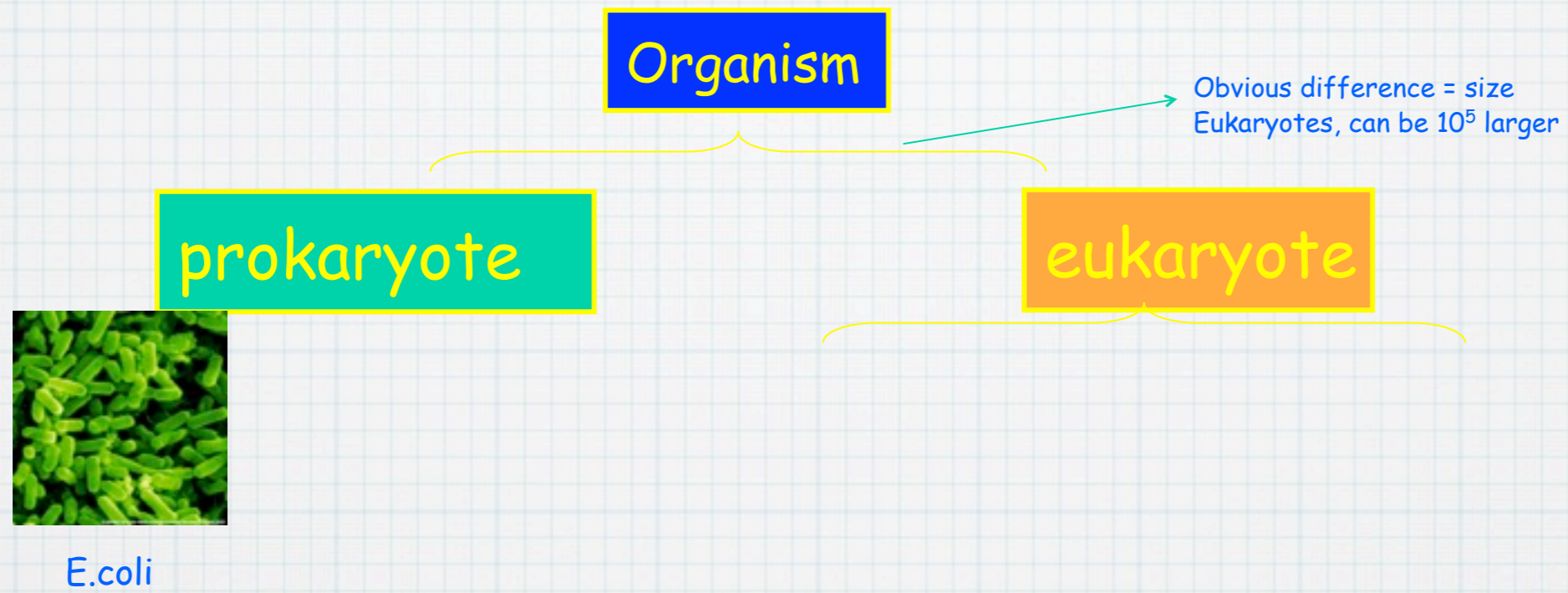
Organism

Obvious difference = size
Eukaryotes, can be 10^5 larger

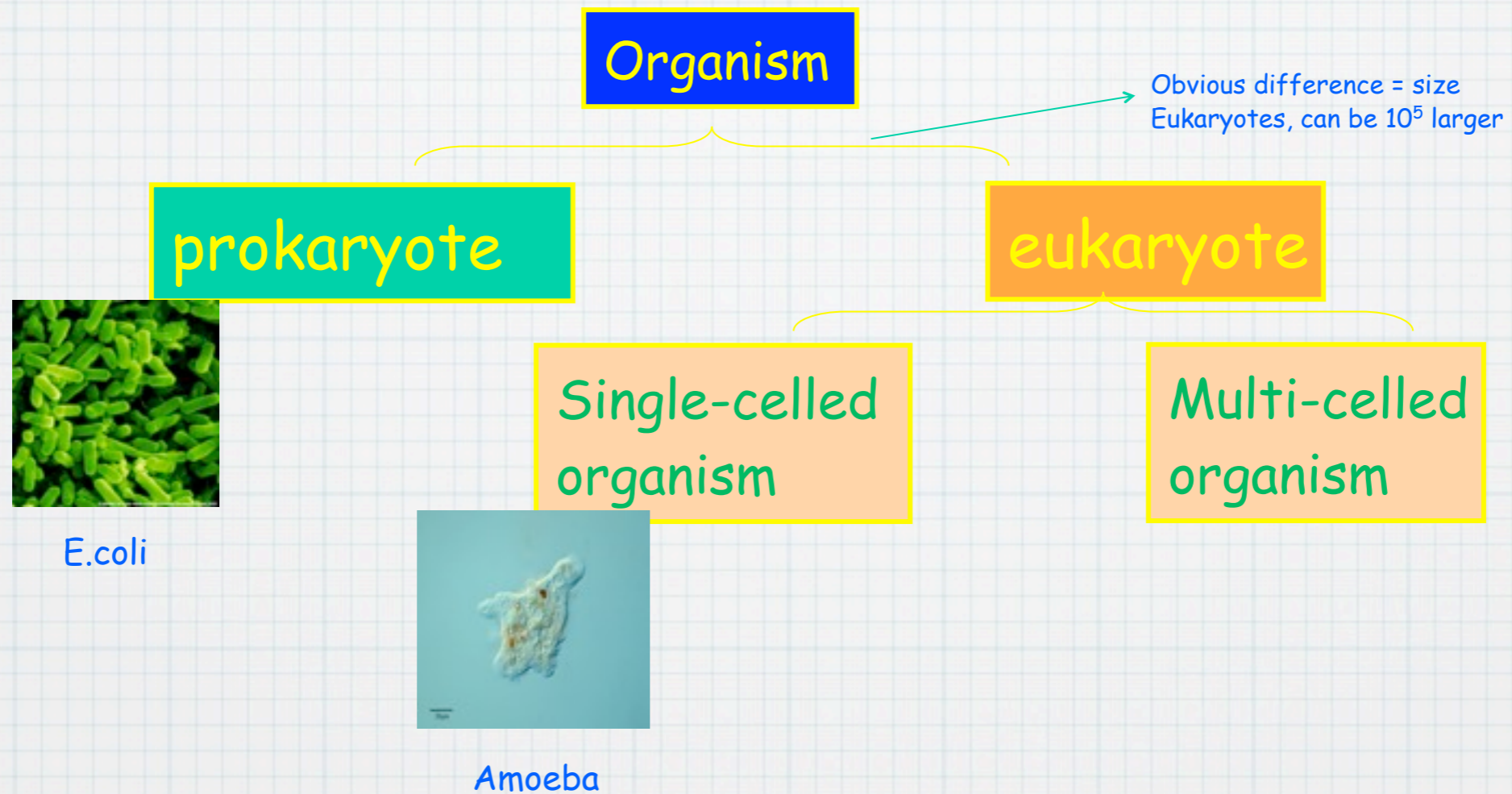
Prokaryotic vs Eukaryotic



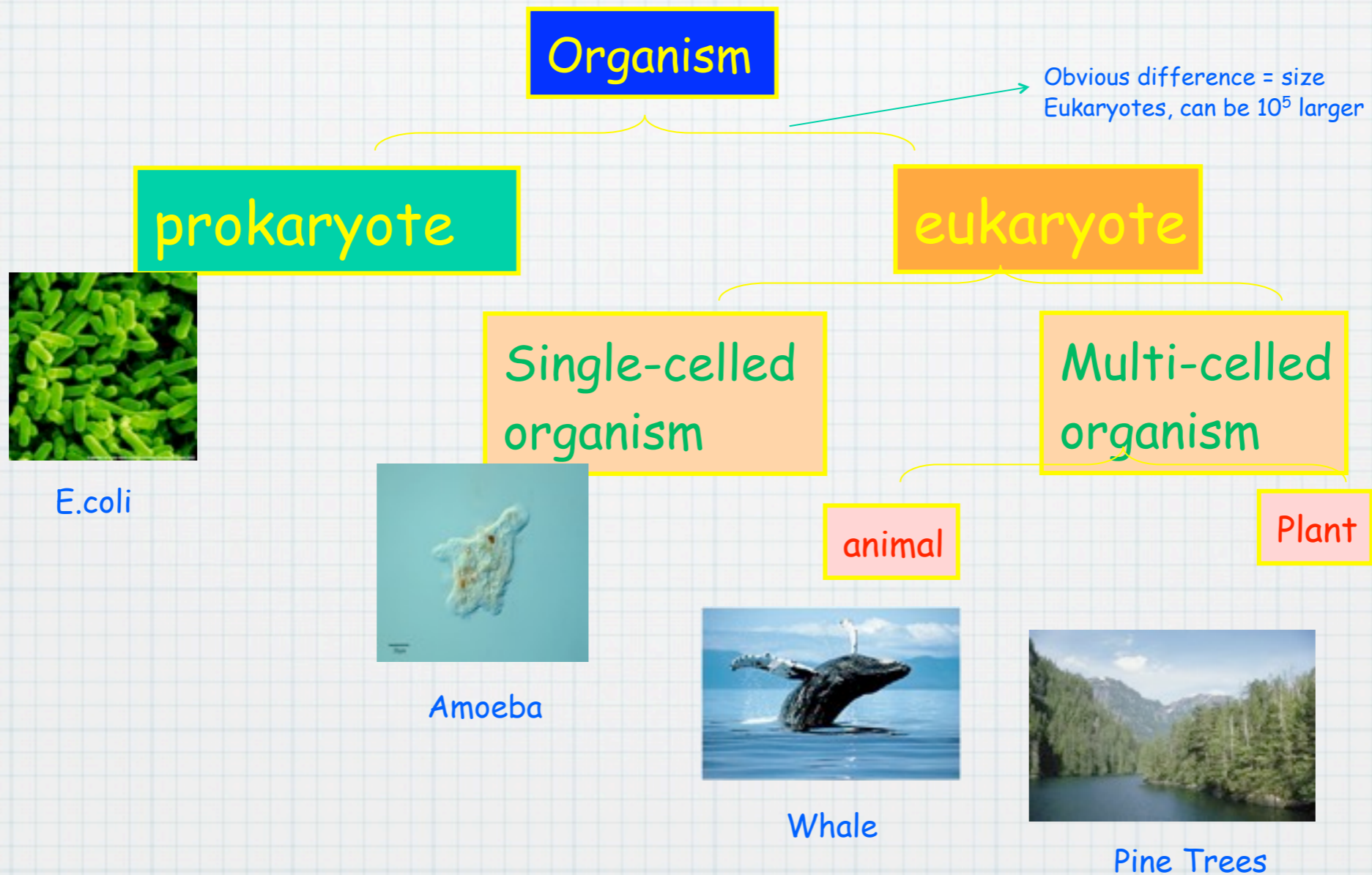
Prokaryotic vs Eukaryotic



Prokaryotic vs Eukaryotic



Prokaryotic vs Eukaryotic



Cell Organelles

Organelles

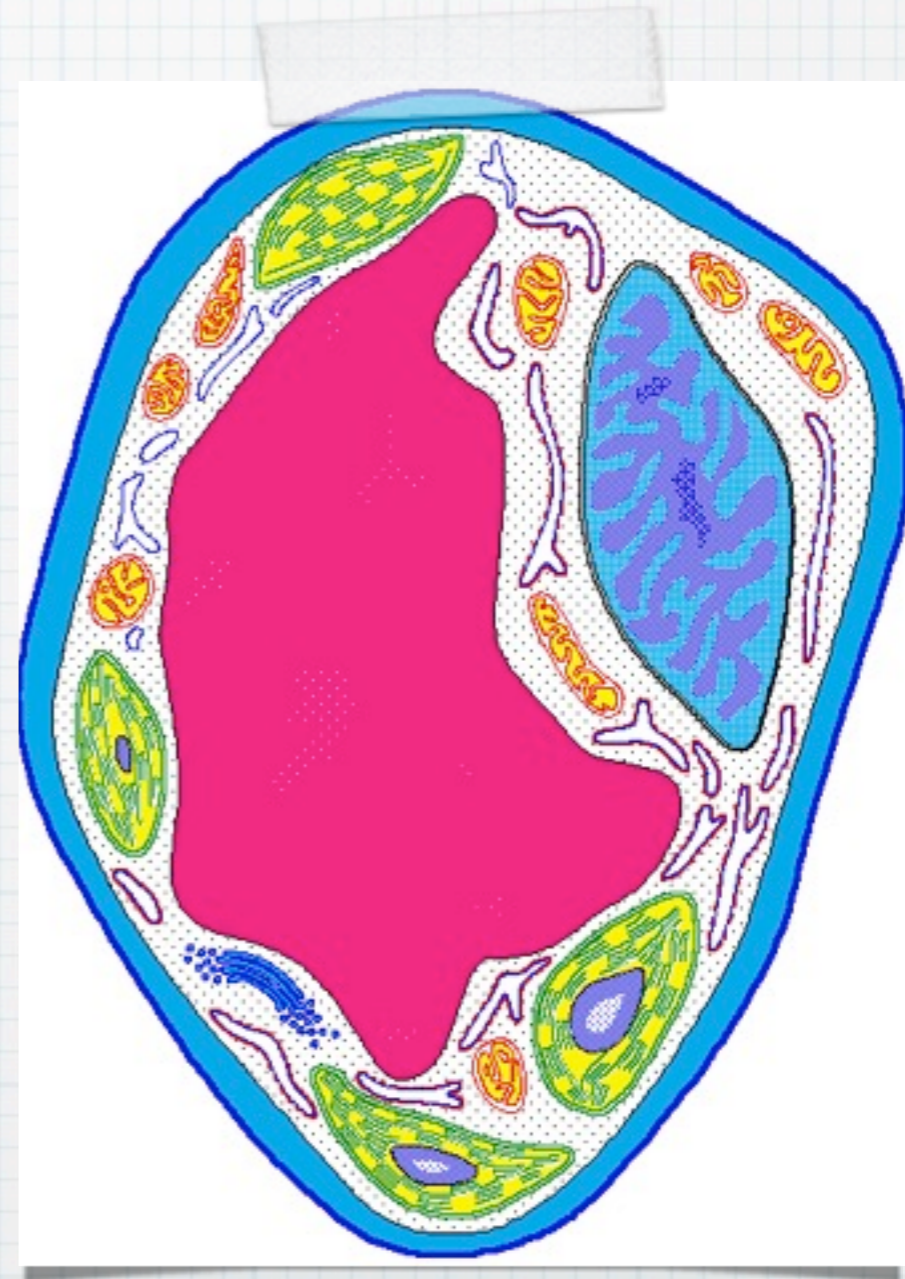
- * All cells must carry out various cellular activities in order to live.
- * Some of these activities include: obtaining and using energy, storing and transporting materials and reproducing.
- * In eukaryotic cells, these jobs are carried out by specialized cell parts called organelles, which work together to keep the cell healthy

Cytoplasm

- * All organelles are suspended in this jelly-like liquid and many chemical reactions of the cell take place here.

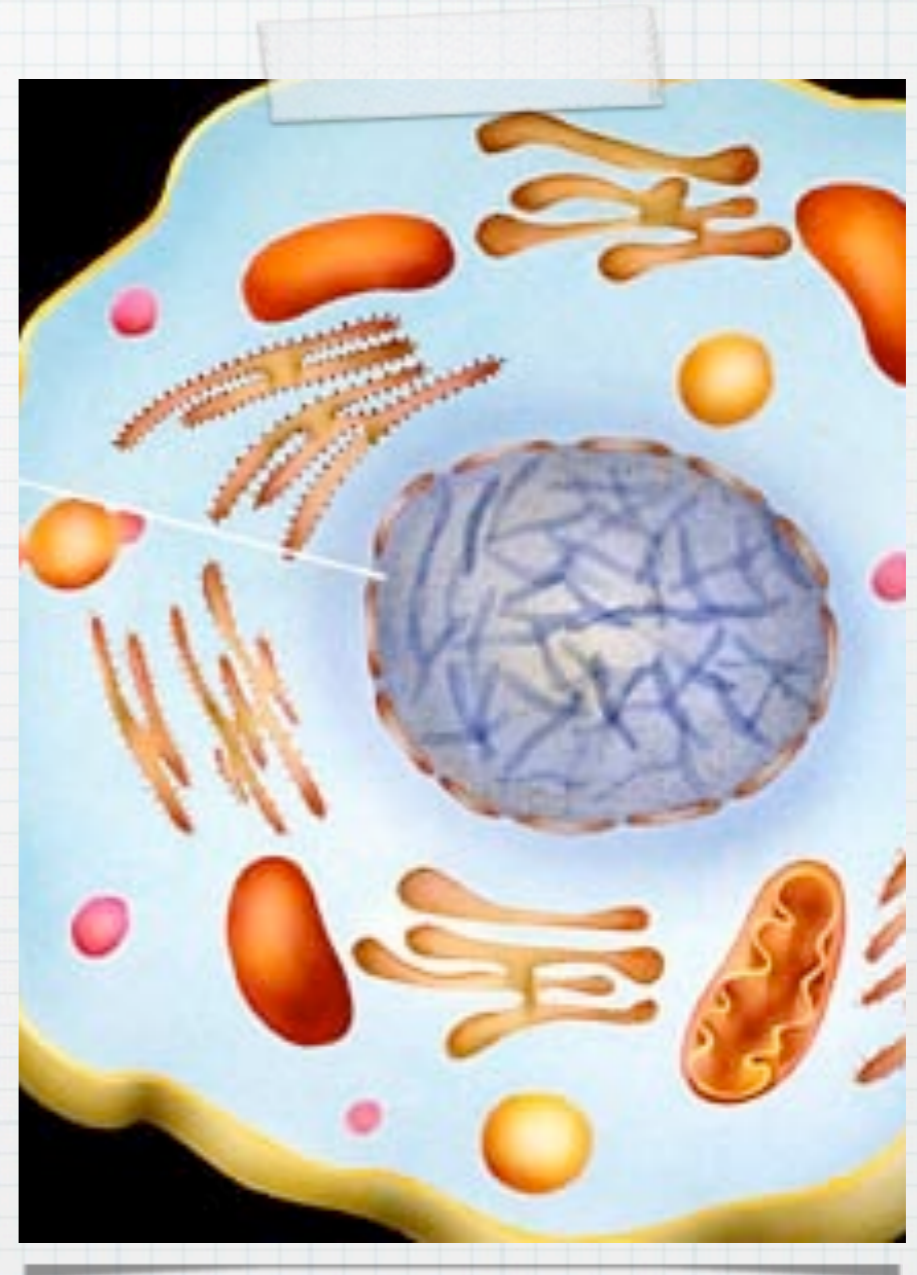
Cell Membrane

- * A cell membrane surrounds all cells and forms the outer barrier of the cell.
- * It is flexible and contains 2 layers.
- * The membrane allows only certain substances to pass through such as food, water, oxygen and waste.



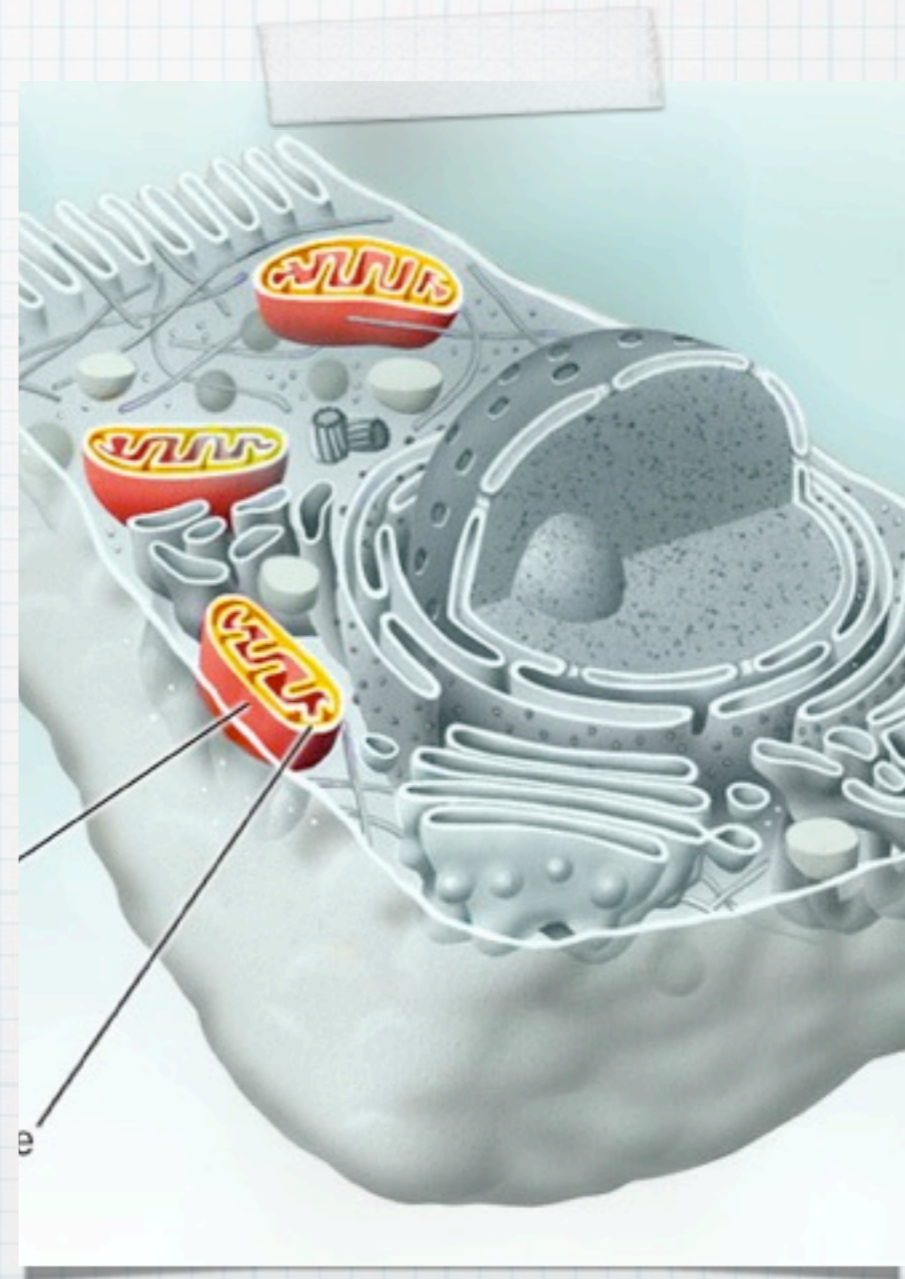
Nucleus

- * The nucleus is a large sphere found inside cells and it contains genetic information that controls all cell activities.
- * The coded instructions for the cell are found within DNA (deoxyribonucleic acid) which is in the form of chromosomes, located inside the nucleus.



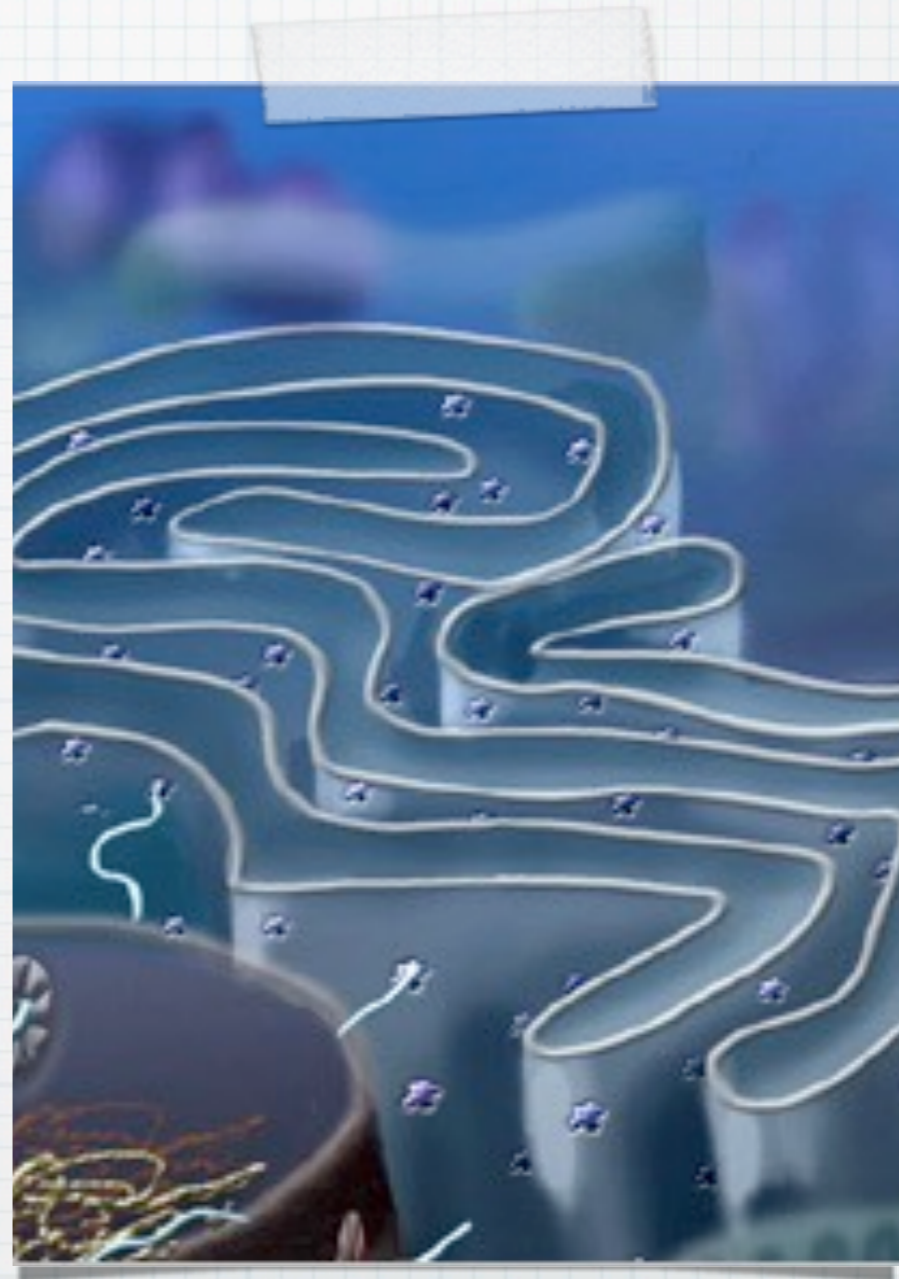
Mitochondria

- * Most cells contain many mitochondria.
- * They are something like tiny “power plants” since their job is to provide energy through cell respiration.



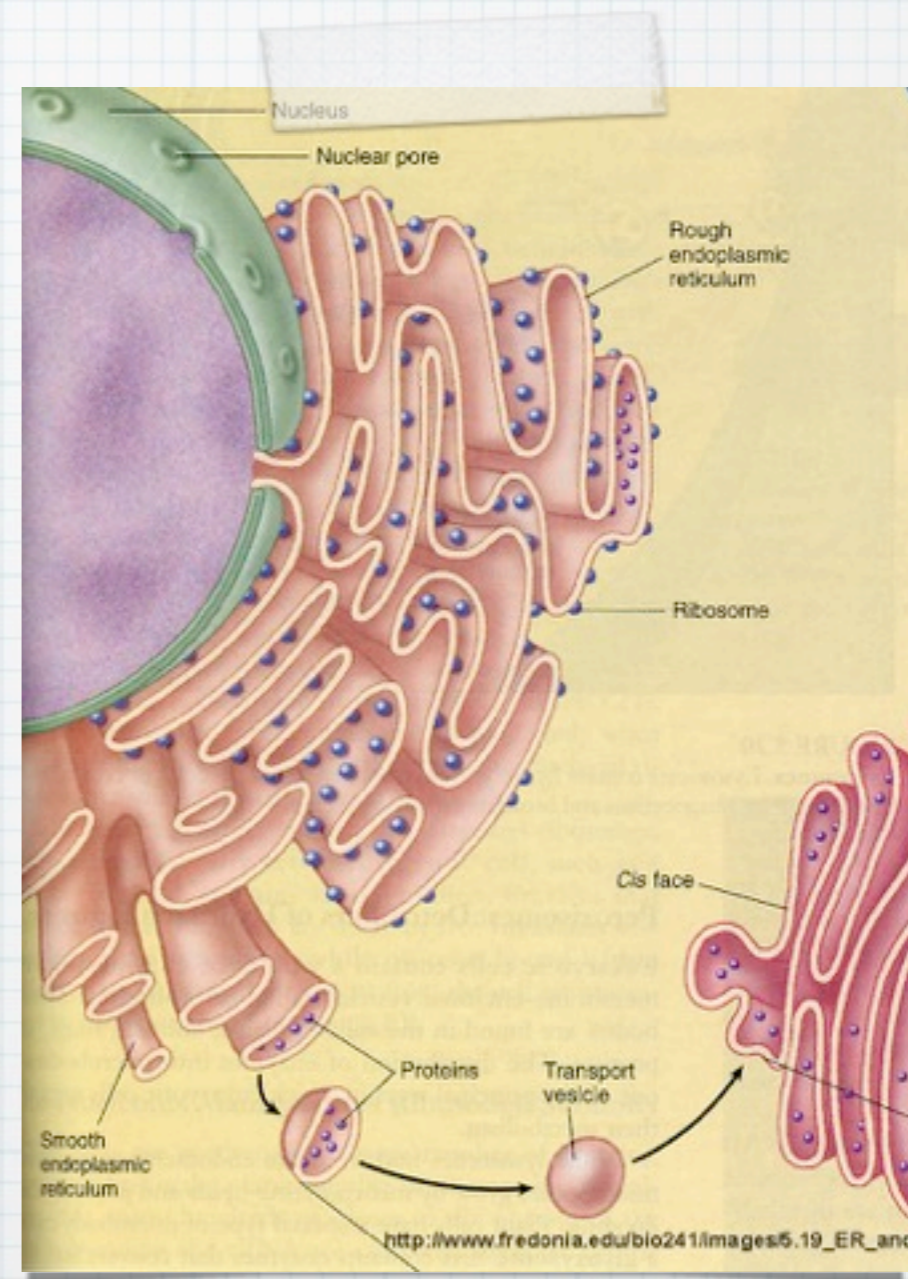
Endoplasmic Reticulum

- * This cell organelle consists of a system of interconnecting membrane tubes and pockets that may extend from the nucleus to the cell membrane.
- * It's job is to transport materials such as proteins throughout the cell.



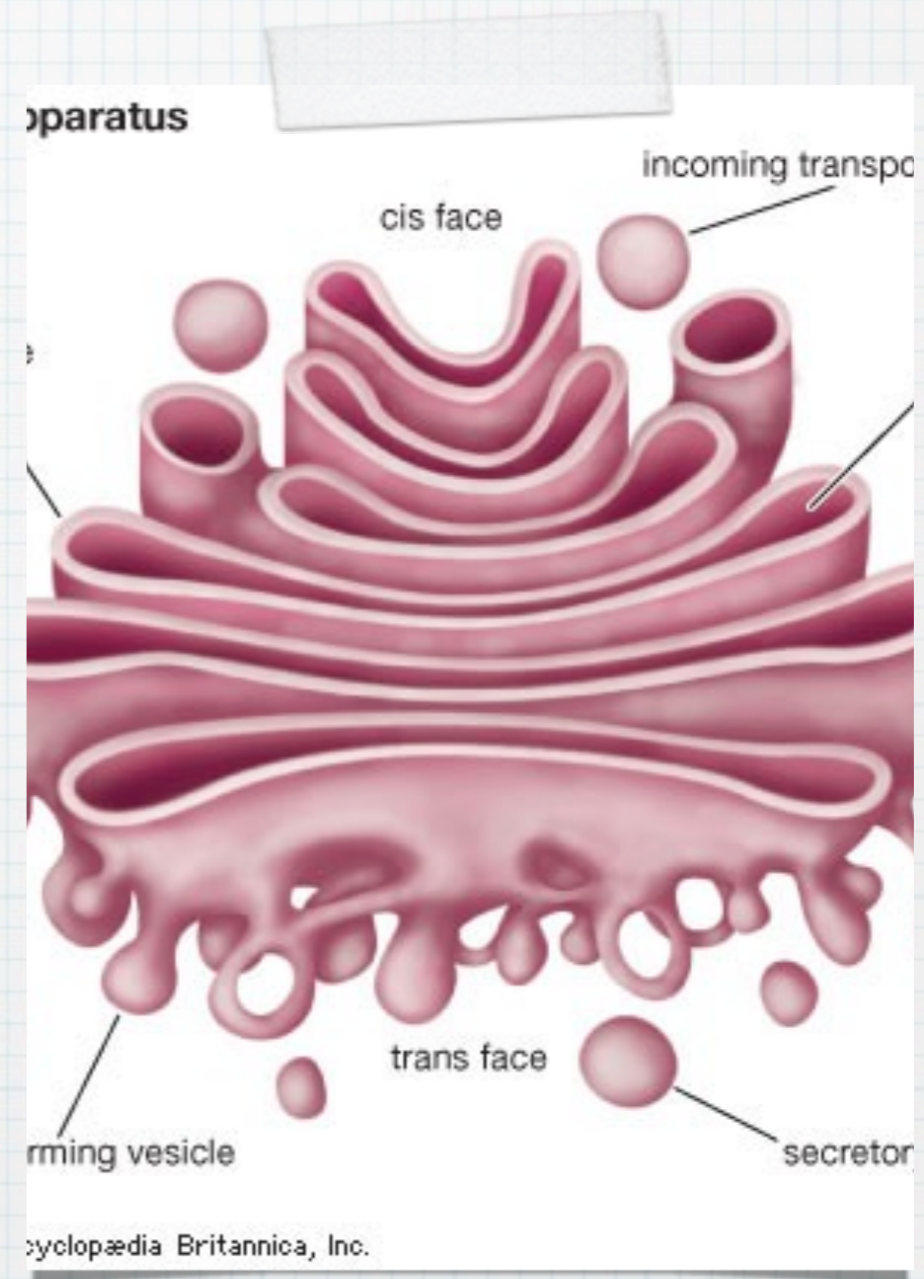
Ribosomes

- * These tiny organelles act as protein factories in order to produce the many necessary proteins making up living things.
- * They can be attached to the endoplasmic reticulum or just float freely in the cytoplasm.



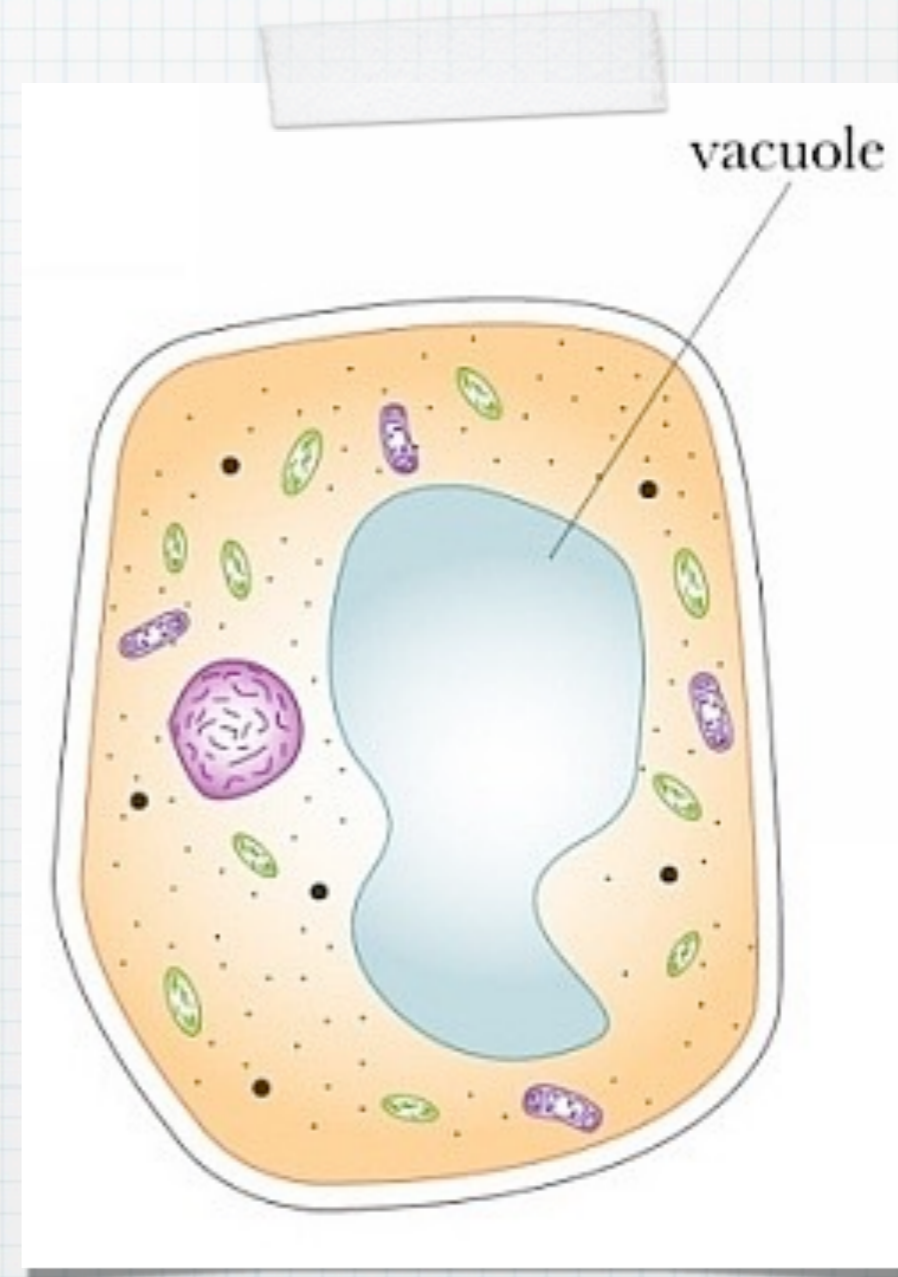
Golgi Bodies

- * These are stacked membrane sacs which collect and process materials to be removed from the cell.
- * One of these materials is mucus which is then secreted out of the cell in order to line the intestines and airways.



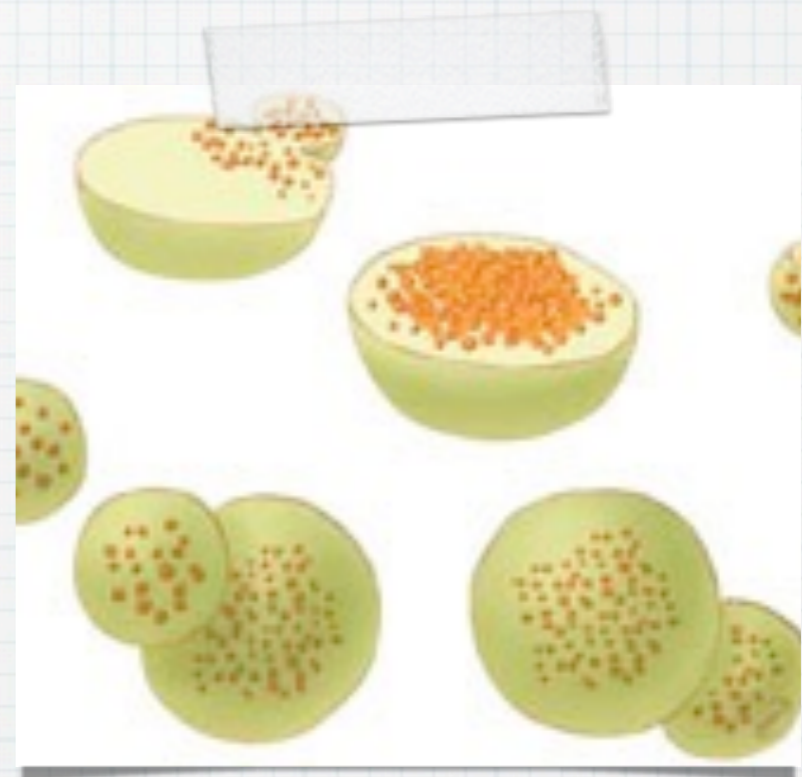
Vacuoles

- * A cell vacuole is a single membrane sac which encloses a fluid.
- * Depending on the cell, the vacuole can have various functions such as:
 - * 1) storage of food, water or other materials
 - * 2) the removal of substances from the cell.



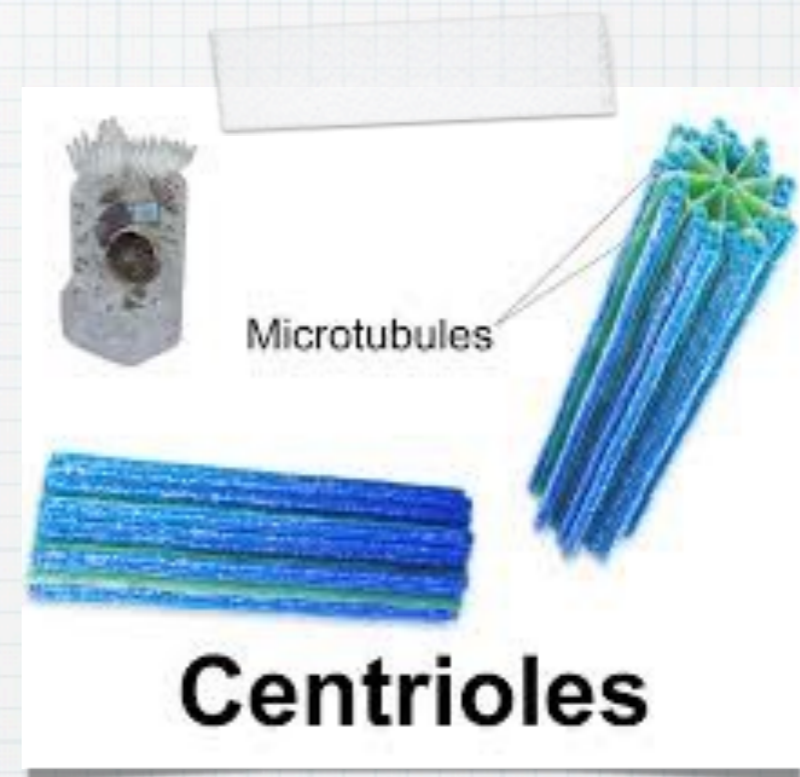
Organelles only in Animal

- * Lysosomes – These are vacuoles filled with digestive enzymes which can be released to break down food or recycle substances. (recycling plant?)



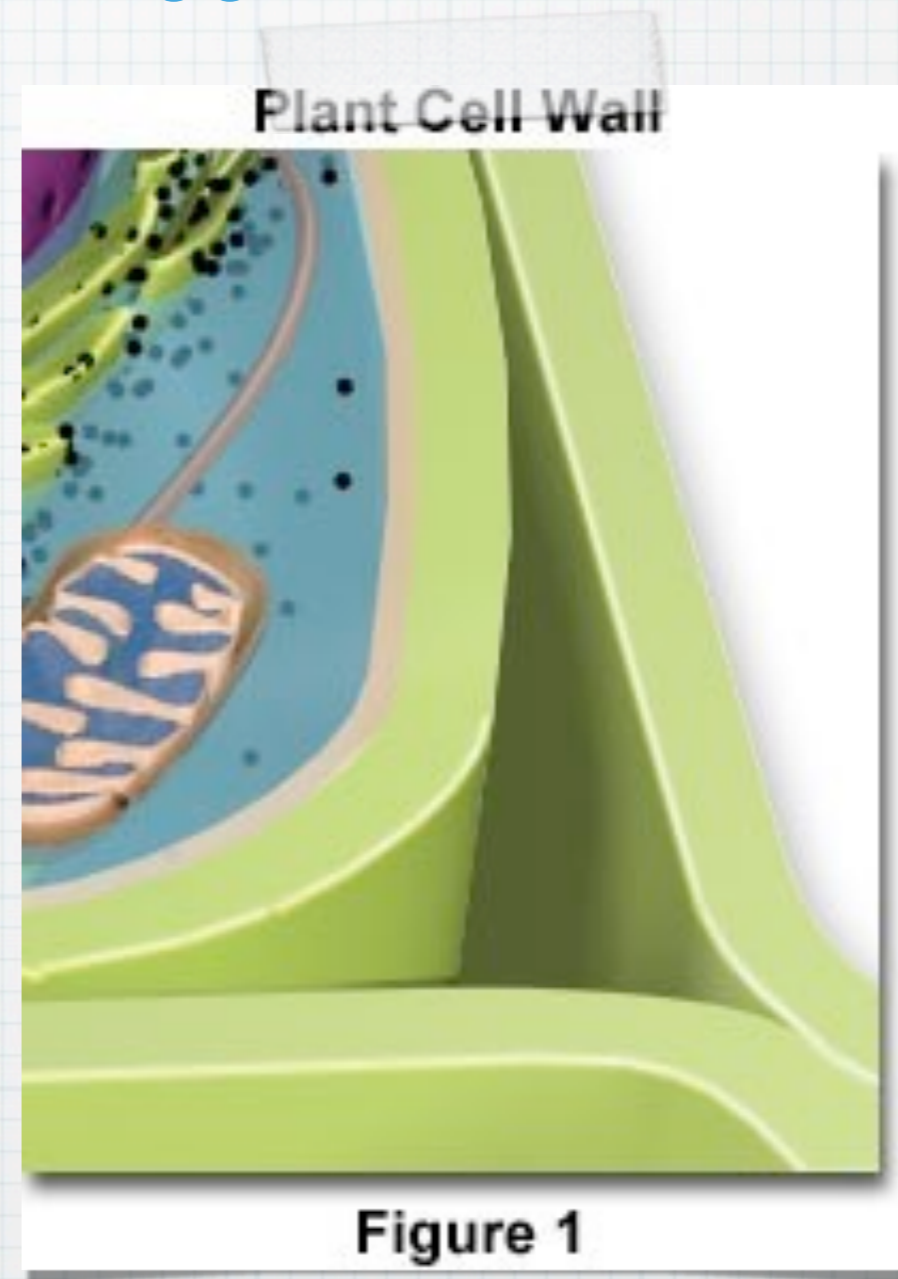
Organelles only in Animal

- * Centrioles - Star-shaped structures which help in cell division.



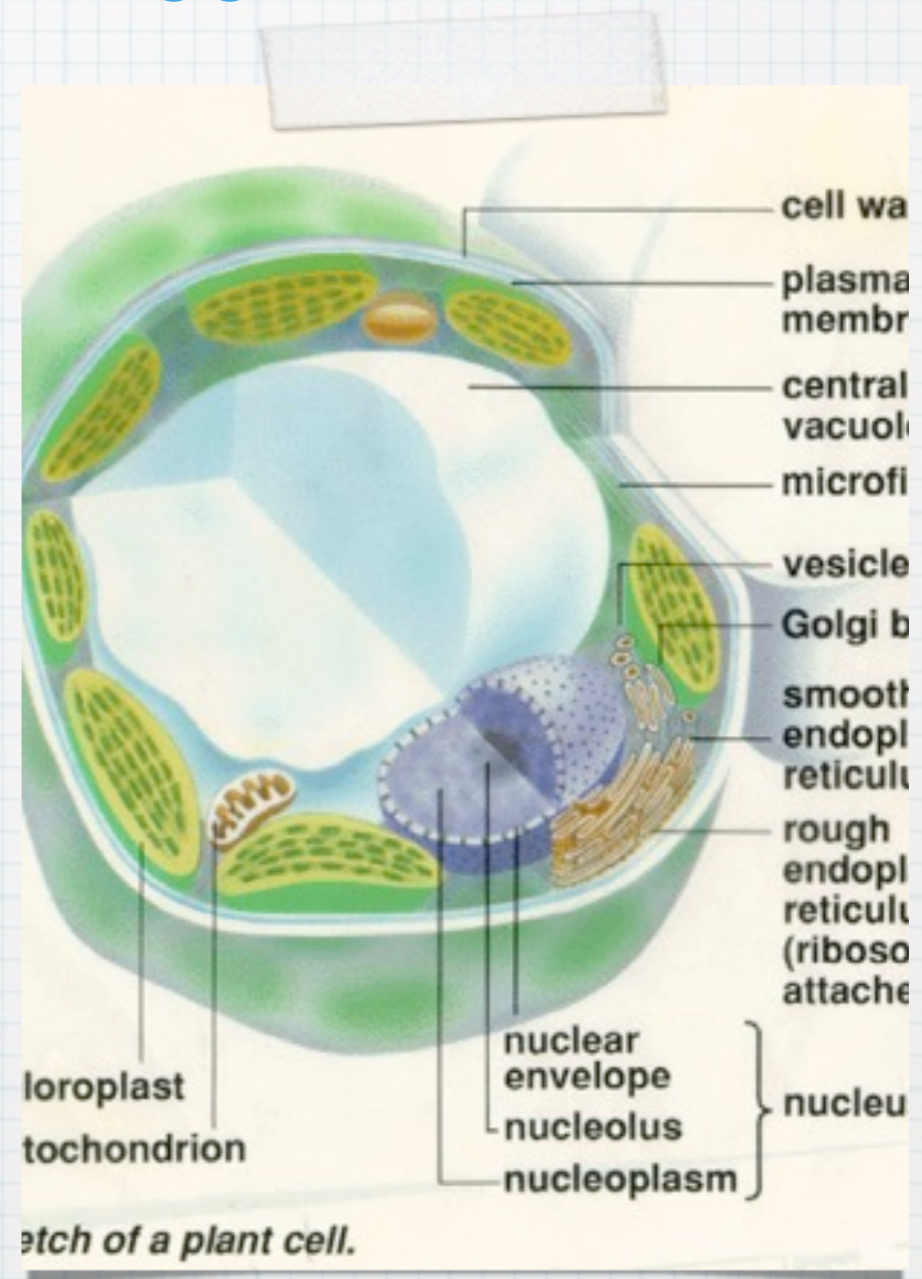
Organelles Found in Plant Cells

- * Cell Wall
- * Plant cells have a rigid outer wall outside the cell membrane to provide structure and support.



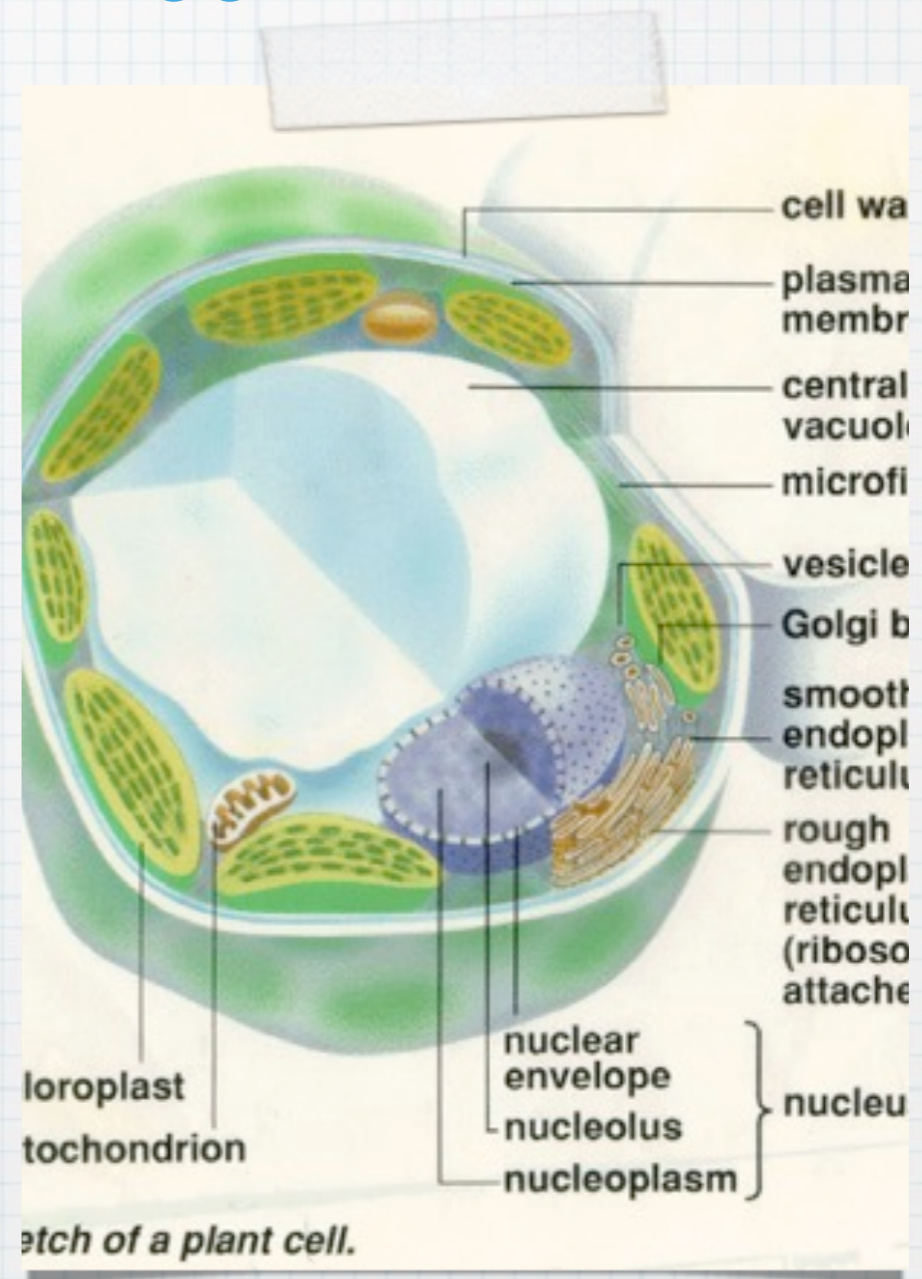
Organelles Found in Plant Cells

- * Large Central Vacuole
- * In plant cells this structure fills with water and pushes against the cell wall to provide support..



Organelles Found in Plant Cells

- * Chloroplasts
- * These organelles are used to carry out photosynthesis.
- * They contain the green pigment chlorophyll which captures sunlight energy and uses it to turn carbon dioxide and water into food.



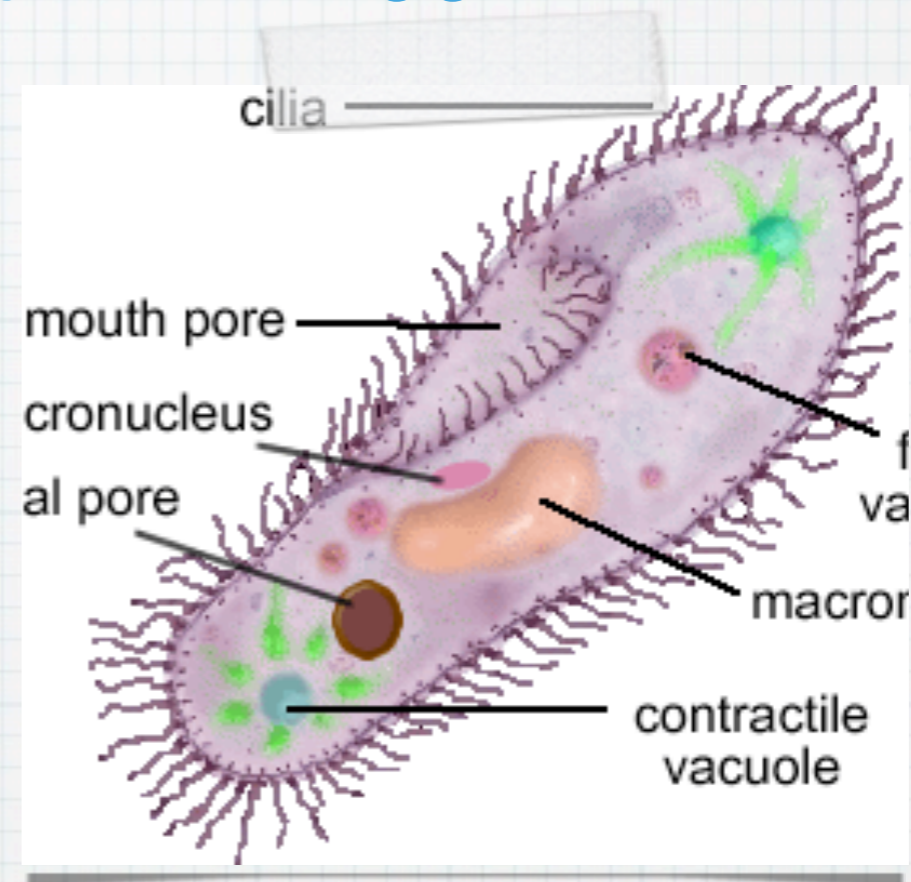
Organelles Found in Only Some Cells

- * Some cells have structures called flagella or cilia which help them to move.
- * A flagellum is a tail-like whip that rotates in order to help a cell move from place to place.



Organelles Found in Only Some Cells

- * Cilia consist of many hair-like structures which help to move a cell or move things past a cell.



- * eg. some bacteria