## I. CELL THEORY:

A. Three parts: "History of cell"

1. All Organisms are made of one or more cells.
2. The cell is the basic unit of all living things.
3. All cells come from existing cells.

## II. CELL STRUCTURE:

| STRUCTURE | WHAT IS IT? | PURPOSE |
|---|---|---|
| Cell Membrane (Diffusion)<br>- Egg in vinegar<br>- Balloon w/ vanilla | • thin outer part<br>• Surrounds cell | • Protects<br>• Filters by diffusion<br>• Supports |
| Cell Wall | Thick outer layer of plant cells ONLY | • Protects<br>• Supports |
| Nucleus | Round structure inside cell | • Controls<br>• Holds DNA for reproduction |
| Cytoplasm | Jelly-like<br>80% water | • Produces needed materials<br>• Gets rid of waste<br>• Holds organelles |
| Organelles: | Small specialized structures in cytoplasm | Special jobs to keep cell working |
| a) Mitochondria | Powerhouse of cell<br>-cell Respiration | Breaks down sugar(food) to produce energy(ATP) |
| b) Chloroplast | Site of photosynthesis | use $CO_2$ + Sun energy to produce food |

## Chloroplasts:

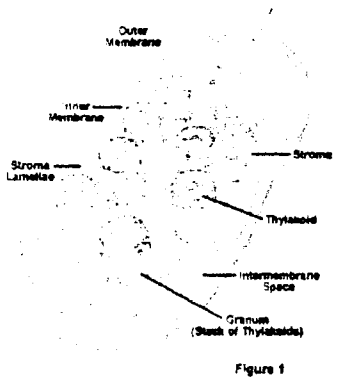
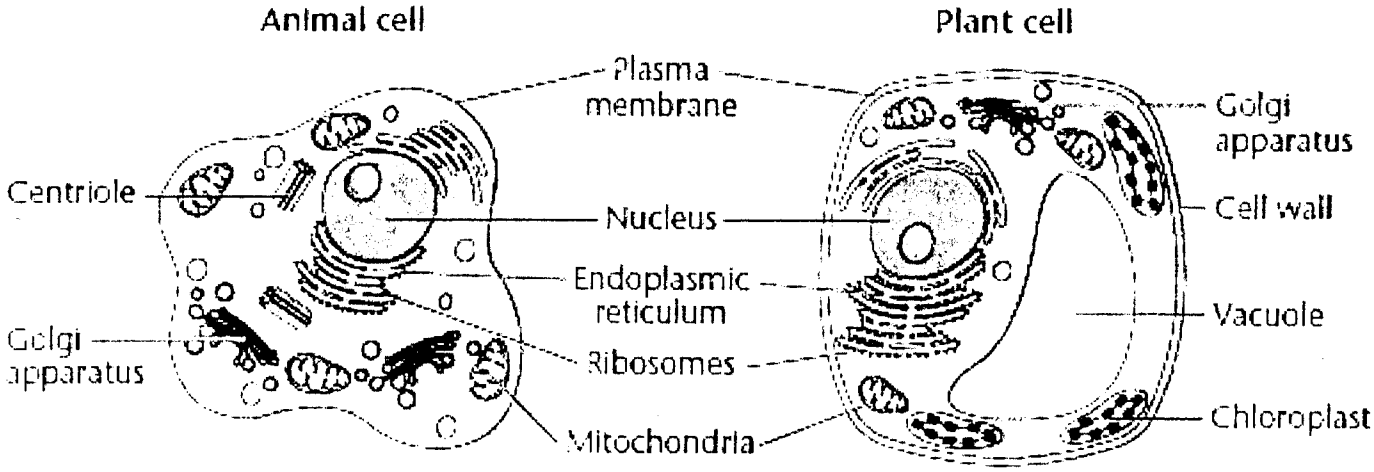


Figure 1

1. Found only in Plants.
2. Chlorophyll gives them a Green color.
3. Makes Sugar/glucose/food

## III ANIMAL CELLS vs PLANT CELLS:

Cells Alive - Plant vs. Animal




A. How are they alike?

1. Both have nucleus + Cell membrane
2. Both have cytoplasm + organelles

B. How are they different:

1. Plants have Chloroplast
2. Plants have Cell walls
3. Plants have large vacuoles (water storage)

## IV ORGANIZATION OF LIVING THINGS:

A. Multicellular Organisms:

1. Made of many cells.
2. They grow by making more small cells, not by making their cells larger.
3. Usually larger than single-celled organisms.
4. Their lifespan is longer.
5. Each type of cell has a special job.

Cell Types

B. Tissue:

1. A group of cells that work together to perform a job.
2. Animals have 4 basic types of tissues:

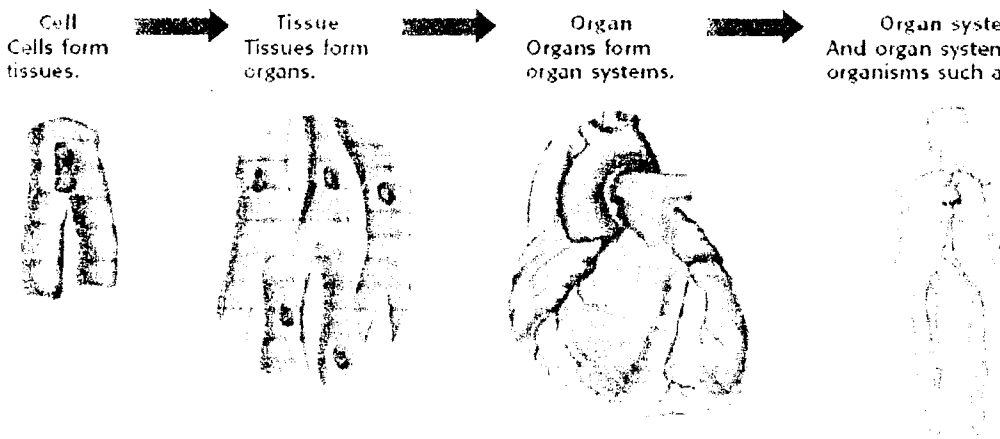
Connective protective muscle nerve

C. Organ:

1. A structure that is made up of 2 or more tissues working together to perform a specific function.
2. Examples: Heart Lung Kidney Brain

D. Organ System:

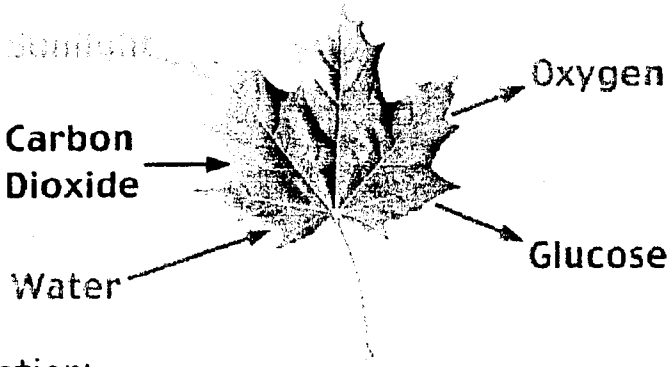
1. A group of organs working together to perform a job.
2. Examples: cardiovascular digestive excretory nervous endocrine



V CELL ENERGY:

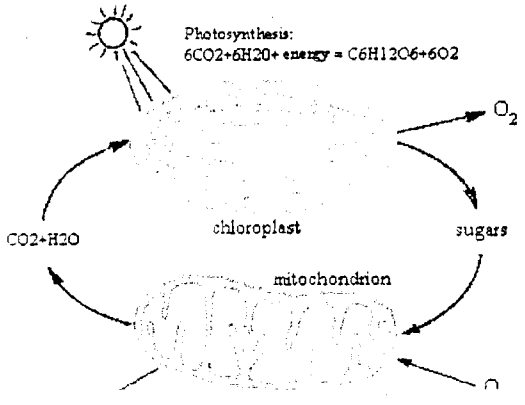
A. Photosynthesis:

1. When plants use $H_2O$, $CO_2$, and Sunlight to make food. (glucose/sugar) $C_6H_{12}O_6$
2. Plants need minerals that is found in water
3. Plants also produce oxygen during photosynthesis.

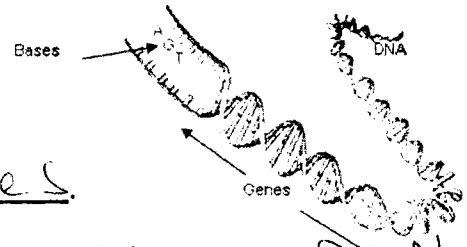



B. Cellular Respiration:

1. When animal cells use oxygen to break down food.
2. During this chemical process, sugar (glucose) is broken down into $CO_2$ & $H_2O$, then energy is released
3. Most of the energy is used to maintain Body temperature
4. Some of the energy is used to fuel cell activity.
5. This takes place mostly in the mitochondria of the cells.
6. Breathing is called respiration and it supplies the oxygen needed for cellular respiration.

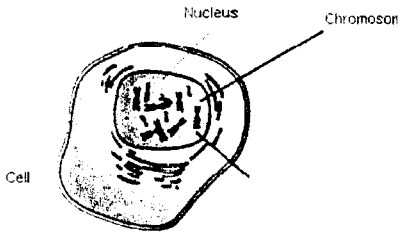


# VI REPRODUCTION




## A. Chromosomes and DNA:

1. Chromosomes are made up of genes.
2. Genes are made up of deoxyribonucleic acid, known as D N A, the hereditary material that controls all cell activities.
3. Chromosomes occur in pairs.
4. Human have 46 chromosomes in 23 pairs.




## B. Sexual Reproduction:

1. There are 2 parents.
2. Each parent gives a Sex cell which has half the normal number of chromosomes
3. The two sex cells fuse to form one cell.
4. That new cell in humans is called the Zygote.
5. Sexual reproduction increases Variation.

## C. Gregor Mendel:

1. Studied genetics, the passing of genes to offspring.
2. Learned that genes are dominant or recessive
3. Dominant genes are stronger and cover over recessive genes.

D. Punnett Squares:

1. They are used to organize the possible gene combinations.
2. A capital letter represents a dominant gene.
3. A lower case letter represents a recessive gene.
4. Letters on top of the Punnett square represent one parent
5. Letters on the side of the Punnett square represent another parent
6. Example: Tongue Rolling R = gene for rolling r = nonrolling gene

RR = roller ( pure strain) Rr = roller (hybrid) rr = nonroller (pure strain)

| | R | R |
|---|---|---|
| r | Rr | Rr |
| r | Rr | Rr |

| | R | r |
|---|---|---|
| R | RR | Rr |
| r | Rr | rr |

— PTC paper

E. Asexual Reproduction:

1. The production of new organisms without the fusion of two sex cells.
2. The new organism is the result of mitotic divisions.
3. Types of asexual reproduction:

a) Binary Fission:

* most common
* 1 parent cell divides to form 2 matching cells.