The Cell:- Unit of Life

CLASS—XI

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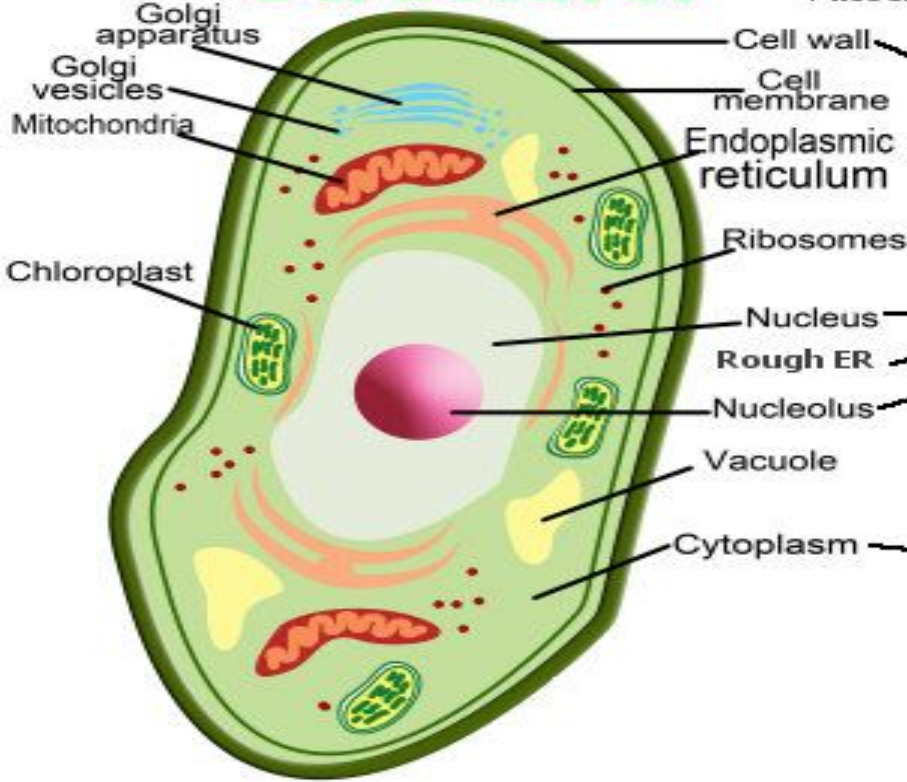
Cell Theory

- 4 main points:
  1. Cell is the basic structural unit of living things.
  2. Cell is the basic functional unit of living things.
  3. All cells are derived from previously existing cells.
  4. In a multicellular organism, the activity of the entire organism depends on the total activity of its independent cells.

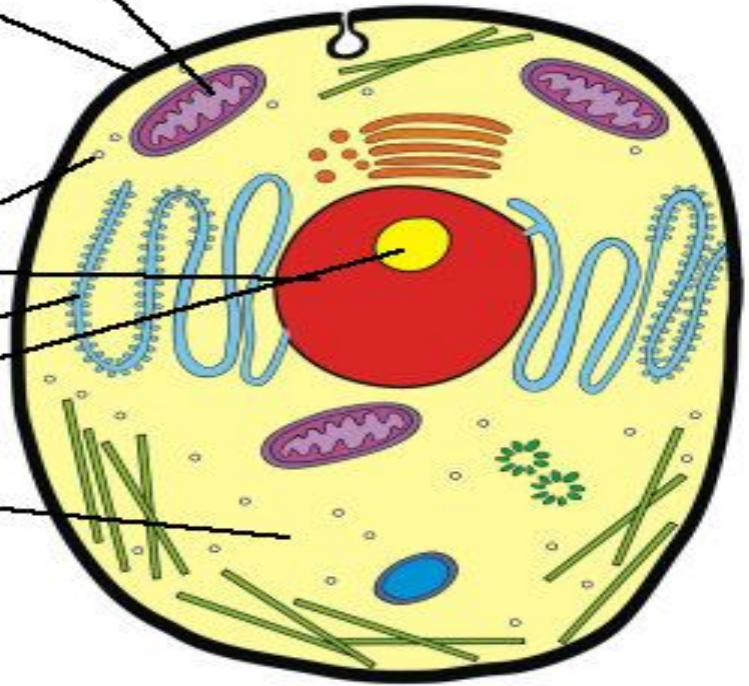
What is cell?.....

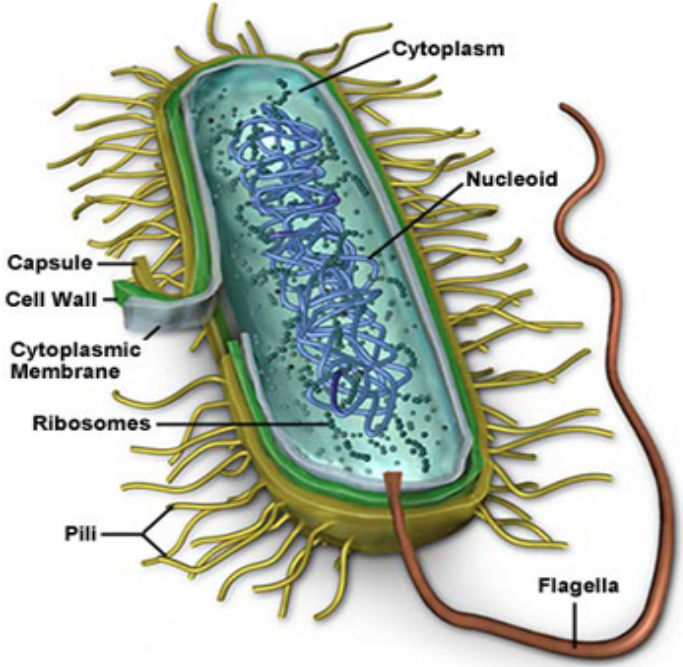
- Cells are the basic units of all living things.
- Cells make up bones, muscles, skin, and blood.
- Cells make up leaves, roots, stems, and flowers.
- As the organism grows, the cells must reproduce.

Plant Cell Structure:

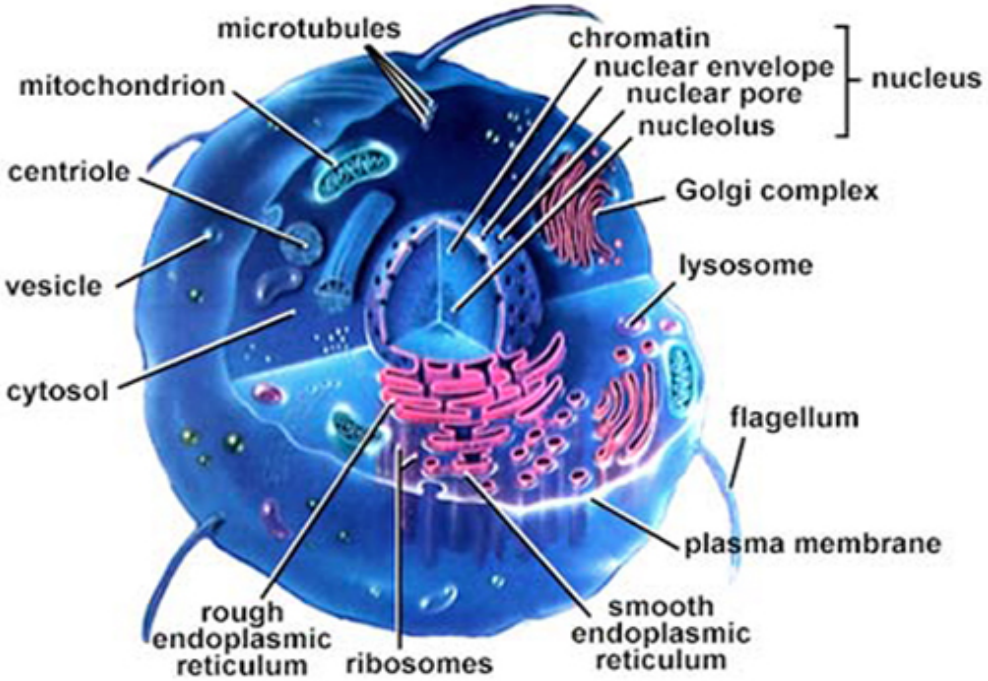


Animal Cell Structure:





prokaryotic cell (bacteria)



eukaryotic cell (protists, fungi, animals, plants)

Cell..

- Cells are the structural and functional units of all living organisms.
- Unicellular.
- Multicellular.
- ***Functions of cell....***
- Nutrients to Energy..
- Each cell having its own set of instrunction.

Name _____ Period _____

Cell Organelles – Study Chart

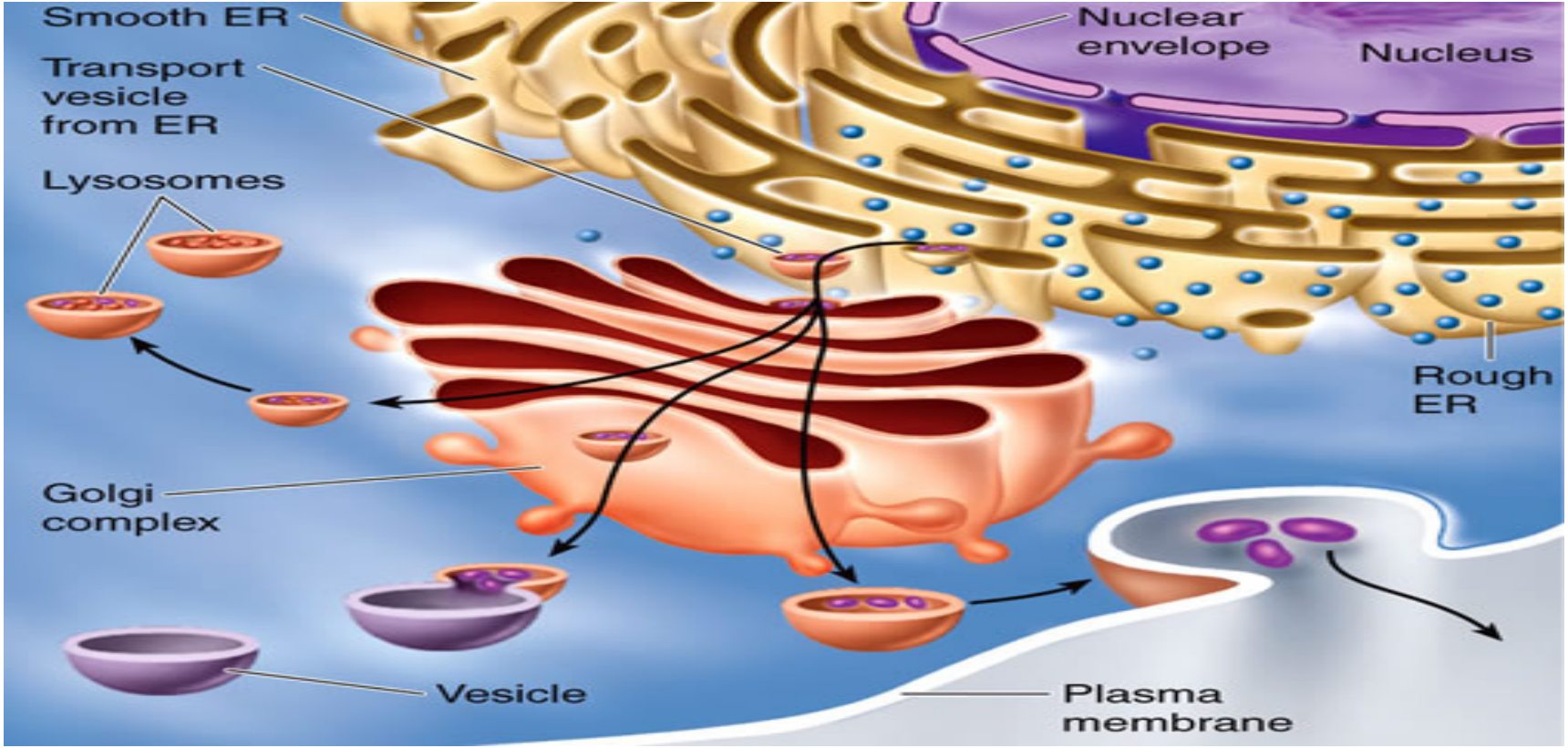
Organelle	Plant/Animal or both	Job / Function
Cell Wall	Plants, Prokaryotes, NOT ANIMALS	Provides and maintains the shape of the cell and serves as a protective barrier. In plants, wall is made of **cellulose**. Bacterial cell walls are made of **peptidoglycan.**
Chloroplast	Plants, NOT ANIMALS	Uses the energy from sunlight to form glucose molecules from CO_2 and H_2O. Glucose is an energy STORAGE molecule.
Nucleus	All Eukaryotes	**Protective container for the cell's DNA.** DNA never leaves the nucleus, but messages (mRNA) can be sent to other parts of the cell.
Ribosomes	ALL CELLS	Smallest organelle found in ALL cells. **Builds proteins** by putting together long chains of Amino Acids according to the mRNA message (a copy of a piece of DNA). Thousands in each cell.
Mitochondria	All Eukaryotes	**Powerhouse of the cell.** Converts glucose into ATP, an energy molecule used in almost every reaction the cell does.
Cell Membrane	ALL CELLS	**Controls what molecules are allowed in and out of the cell.** Also called the Plasma Membrane. Made of a sea of phospholipids molecules that together form the outer barrier of the cell.
Cytoplasm (A.K.A. Cytosol)	ALL CELLS	**The liquid that fills the cell.** Contains lots of proteins and dissolved ions that are involved in many cell reactions.
Vacuole	All Eukaryotes	Basically, a membrane enclosed sac that can be filled with anything the cell needs to keep separate. **Stores food, water, etc.** In plants the vacuole also helps the cell maintain its rigidity.
Golgi Body	All Eukaryotes	Receives products from the ER and adds final **modifications**. It also **sorts** these products and **sends** them to their final destinations.
Lysosomes	All Eukaryotes	A membrane enclosed bag of digestive juices. **Breaks down large molecules** and old cell parts into their components that can be **recycled** to build new cell parts
Rough ER	All Eukaryotes	Large folded membrane system studded with ribosomes. **Ribosomes build proteins and the ER helps fold or modify them.** Products are shipped to the Golgi.
Smooth ER	All Eukaryotes	Large folded membrane system. **Puts together lipids** and is important in making new membranes.
Microtubules & Microfilaments	All Eukaryotes	Long tubes or cord-like structures **that provide the cell's internal structure and allow cell movement**. Other organelles are anchored to this network called the cytoskeleton. Work together in muscle contraction, and the motion of cilia and flagella

Some of important Definitions..

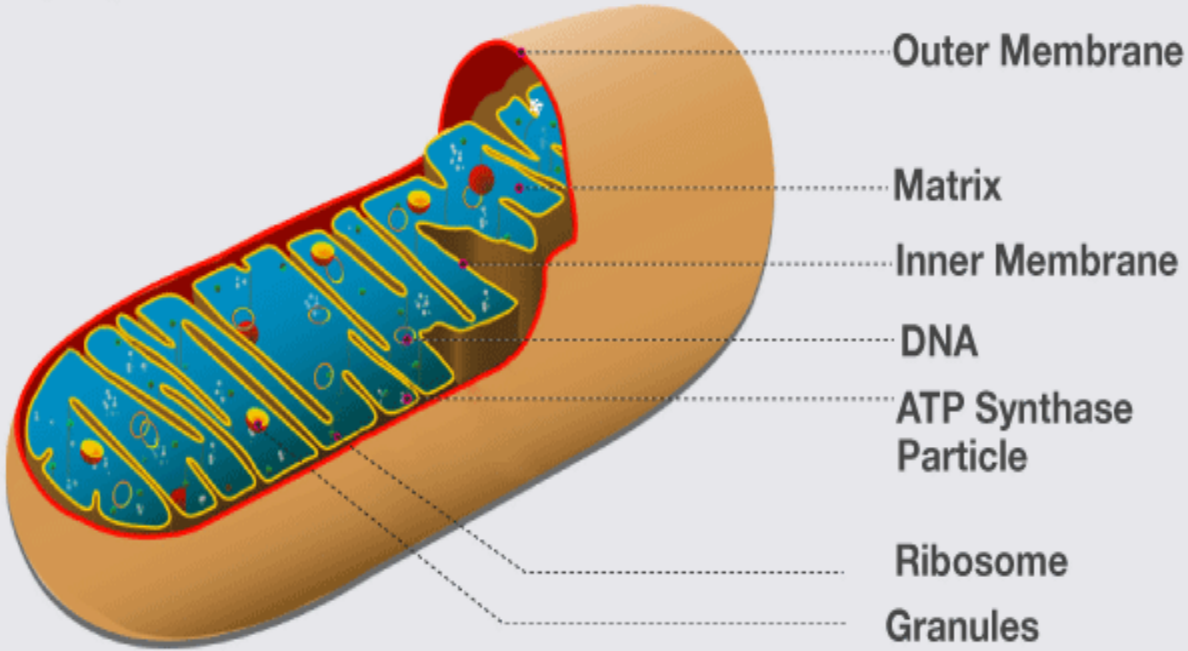
- Spindle Fiber –One of a network of filaments that extend inward from the poles of a dividing cell, forming a spindle-shaped figure.

- Centromere –The most condensed and constricted region of a chromosome, to which the spindle fiber is attached during mitosis.

Endomembrane system

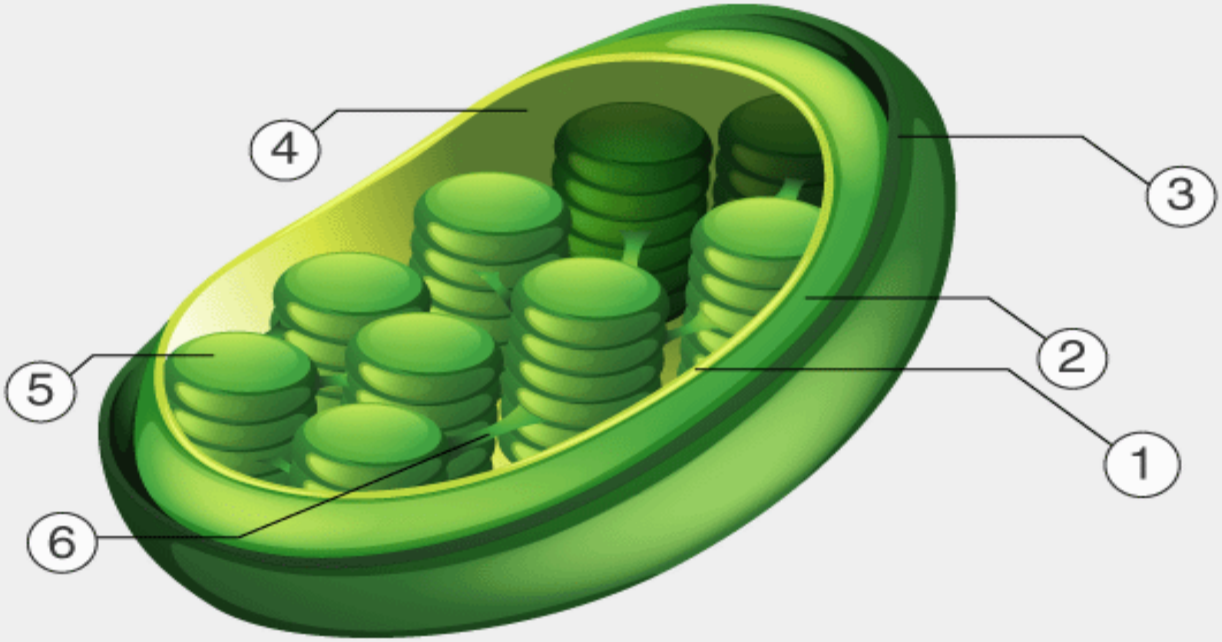


MITOCHONDRIA



CHLOROPLAST

BYJU'S The Learning App



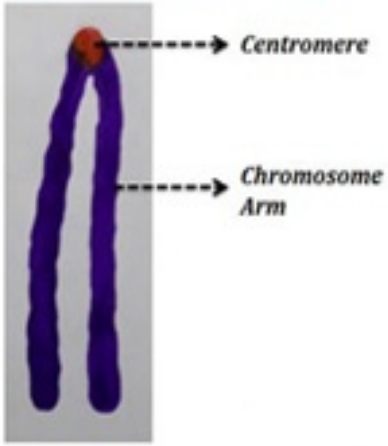
1 Inner membrane | 2 Intermembrane space | 3 Outer membrane

4 Stroma | 5 Thylakoid | 6 Lamella

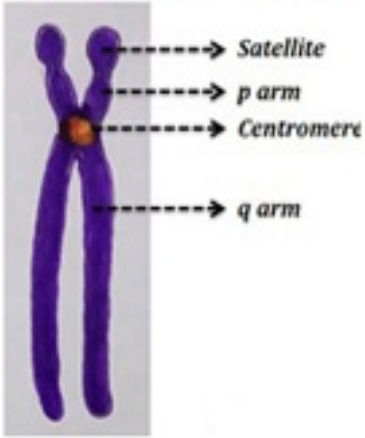
CLASSIFICATION OF CHROMOSOMES

BASED ON THE POSITION OF CENTROMERE

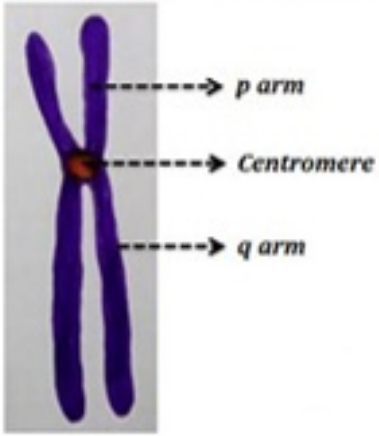
Telocentric Chromosome



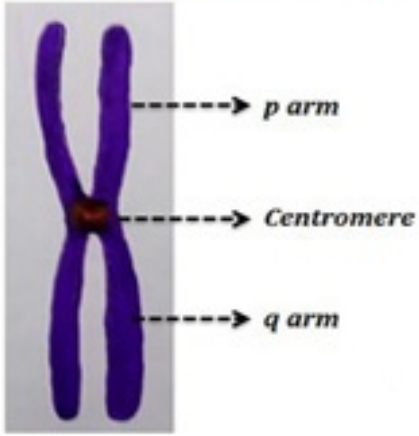
Acrocentric Chromosome



Sub-metacentric Chromosome



Metacentric Chromosome



Definition..

- Chromatin–A complex of nucleic acids and proteins, primarily histones, in the cell nucleus that stains readily with basic dyes and condenses to form chromosomes during cell division.
- Chromatid –Either of the two daughter strands of a replicated chromosome that are joined by a single centromere and separate during cell division to become individual chromosomes.

Definition..

- Chromosome–thread–like, gene–carrying bodies in the nucleus of a cell. Chromosomes are composed primarily of DNA and protein. They are visible only under magnification during certain stages of cell division. Humans have 46 chromosomes in each somatic cell and 23 in each sex cell.

Definition..

- Equatorial plane –The plane that contains all of the centromeres and their spindle attachments during metaphase of mitosis.

- kinetochore fibers –specialized regions in the centromeres of chromosomes.

References:-
Google Images
NCERT Text Book
KVS, NVS
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BUJU’s