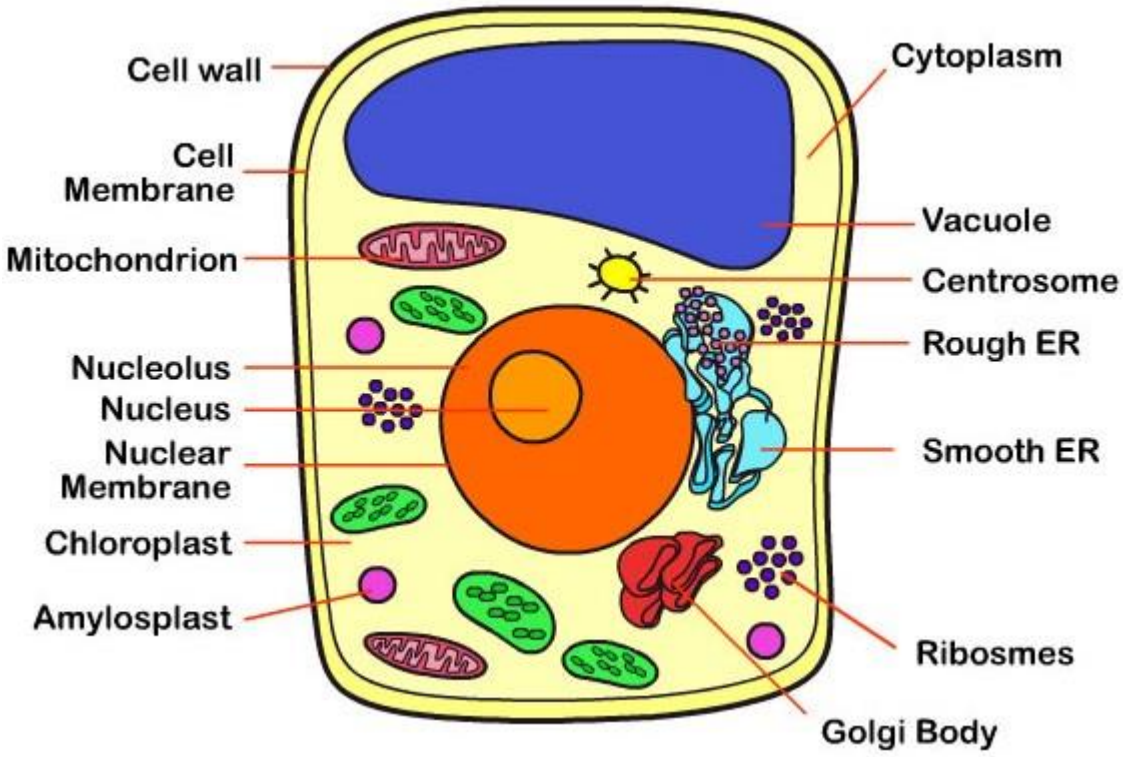
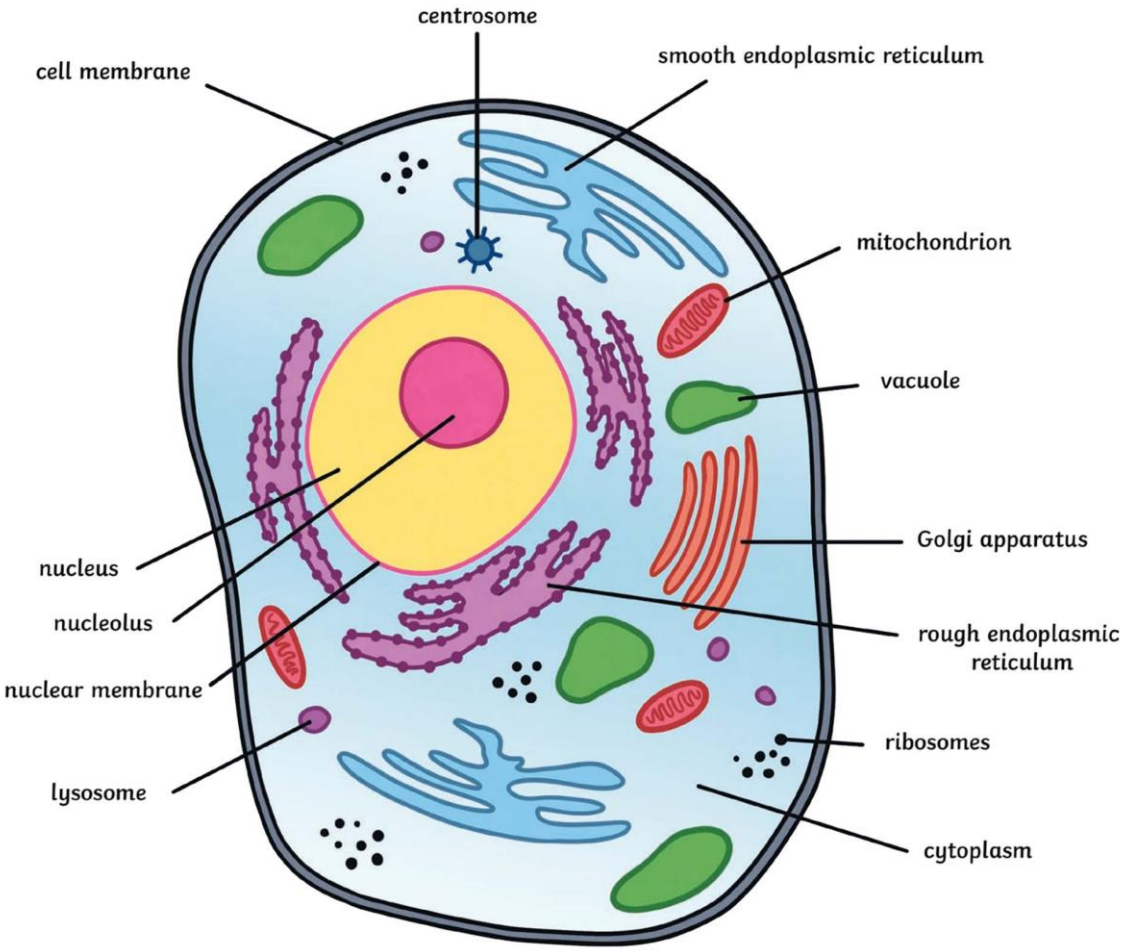
Cells

Types of cells
a. Animal cells: No cell wall and plastids
b. Plant cells: Have cell wall and plastids

Plant cell



Animal cell



Parts of a cell

Plasma membrane	• Outermost membrane • Allows things to enter or leave the cell by diffusion/osmosis • It also prevents from entering • Made up of lipids and proteins
Cell wall	○ Only in plants ○ Made up of cellulose ○ Rigid, and able to withstand outside pressure
Nucleus	• Dark, dot like structure • Plays important role in cell division • Contain chromosomes • Chromosomes contain DNA that have information about the organism, to be passed to the offspring
Cytoplasm	○ Fluid inside the plasma membrane ○ Contains cell organelles
Cell organelles	• Parts having their own functions

Cell organelles

Endoplasmic reticulum	• Two types – Smooth (SER), Rough (RER • RER creates proteins • SER creates lipids (fat molecules) • Proteins and lipids act as enzymes and hormones • ER transports materials to different parts of the cell
Golgi apparatus	○ Flattened sacs parallel to each other ○ Pack the materials created by ER and supply to other parts of the cell ○ Store, modify and pack the products ○ Convert complex sugars to simple sugars ○ Create lysosomes
Lysosomes	• Sacs filled with enzymes • Break down bacteria, food and foreign substances • Keep the cell clean by removing wastes • If damaged, lysosomes digest themselves
Mitochondria	○ Powerhouse of the cell ○ Has two membranes – Outer is porous, inner has folds ○ Provides energy to cell in the form of ATP molecules ○ Has its own DNA and ribosomes
Plastids	• Only in plant cells • Two types – Chromoplasts, Leucoplasts • Chromoplasts contain chlorophyll • Leucoplasts store oils, proteins and starch • Have their own DNA and ribosomes
Vacuoles	○ Sacs for storing solid and liquid contents ○ Store amino acids, proteins, sugars ○ Large in plants, small in animals

Cell division

Mitosis	Meiosis
• Each mother cell divides to form *two* daughter cells • They have *same* number of chromosomes as mother cell • For growth and repair of tissues	○ Mother cells divide to form *four* daughter cells ○ They have *half* the number of chromosomes as mother cell ○ Form gametes needed for reproduction

Diffusion: Movement of **gases** (O_2 and CO_2) in and out of the cells
Osmosis: Movement of **water** in and out of the cells

Types of solutions related to osmosis

Hypotonic	More water *outside* the cell	Water *enters* the cell
Isotonic	Water concentration *same* in and out	*No* movement of water
Hypertonic	More water *inside* the cell	Water *leaves* the cell

Prokaryotes: Cells have no nuclear and organelle membranes
Eukaryotes: Cells have nuclear and organelle membranes