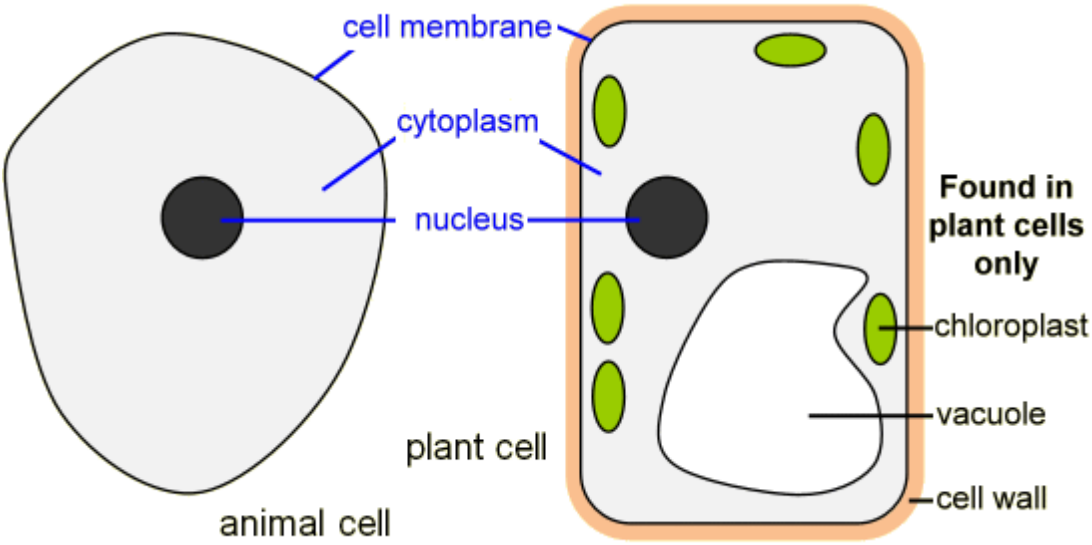
Unit 2 Cells

- Cells are the small building blocks that make up all living organisms

Animal Cell and Plant Cell



Differences between plant and animal cells

Feature	Plant Cell	Animal Cell
Cellulose cell wall	Present	Absent
Cell membrane	Present (surrounded by cell wall)	Present
Shape	Permanent Shape	Shapes vary
Chloroplasts	Present in some cells	Absent
Vacuole	Large, permanent sap filled vacuole	Small vacuoles
Nucleus	Present (Side of cell)	Present (anywhere)
Cytoplasm	Present	Present

Functions of Cell Structures

Cell Structure	Function
Cell membrane	• Forms barrier between cell and surroundings • Keeps contents of cell inside • Controls the entry and exit of substance in and out the cell • Partially permeable
Nucleus	• Controls all activities in the cell • Controls how cells develop
Cytoplasm	• Site of chemical reactions
Chloroplasts	• Photosynthesis • Store starch
Cell Wall	• Prevents cell from bursting • Gives shape to cells • Freely permeable
Sap Vacuole	• Maintain shape and firmness • Store salts and sugars

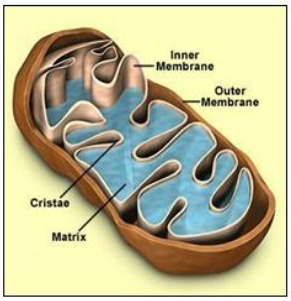
Cell Organelles

Rough Endoplasmic Reticulum

- Rough ER is a complex system of double membranes.
- They contain fluid filled spaces between the membranes which allow materials to be transported throughout the cell.
- Where ribosomes are present on the outer surface, the membranes are called Rough ER.
- The main function of Rough ER is to package and transport proteins made by the ribosomes.
- Cells in the alimentary canal have large amounts of ER
- Small pieces of Rough ER may be pinched off to form small vesicles, In this wat protein can be made and stored in the Rough ER and transported around the cell in small vesicles

Ribosomes

- Small organelles
- In prokaryotic cells are found free in cytoplasm
- Function is to synthesize proteins



Mitochondria

- Found in large eukaryotic cells
- Have double membrane
- Outer membrane controls entry and exit and entry of materials
- Inner membrane forms many folds on which some of the chemical reactions of aerobic respiration take place

Different types of specialized cells

Ciliated Cells

- Found in air passages in the lungs and oviducts in the female reproductive system
- These cells have cilia on their surface
- Cilia beat back and forth to create a current in the fluid next to the cell structures
- In airways, cilia move the mucus that traps the dust and pathogens
- In oviducts, cilia move the egg from the ovary to the uterus

Root Hair Cells

- Have long extensions that give them a large surface area to absorb water and ions from the soil

Xylem Cells

- Cylindrical and empty
- Arranged into columns like pipes
- Cell walls are thickened with bands or spirals of cellulose and a waterproof material called lignin
- These cells allow water and ions to move from the roots to the rest of the plant
- They also help support the stem and leaves

Nerve Cells

- They have thin extensions of cytoplasm like wires
- They are able to transmit information is the form of nerve impulses around the body

Red Blood Cells

- Contain a protein called hemoglobin
- They are shaped like flattened discs
- This shapes provide a large surface area compared with their volume which makes for efficient absorption of oxygen

Palisade Mesophyll cells

- Have numerous chloroplasts in the cytoplasm
- Chloroplasts trap sunlight energy for photosynthesis
- Have cell walls made up of tough cellulose
- Large vacuole filled with sap
- Starch grains are found in cytoplasm (formed by photosynthesis, are a temporary store of energy)

Sperm cells

- Have a tail and are adapted for swimming
- The head of the sperm carries genetic information from the male parent to the female parent
- Genes from the father are present in the nucleus

Egg Cells

- They contain a yolk as a store of energy
- Genes from the mother are present in the nucleus

Levels of Organization

Tissues and organs

- A group of similar cells is called a tissues, cells in a tissue look the same and they work together to carry out a shared function
- An organ us made up of a group of different tissues that work together to perform specific functions
- Different organs work together as a part of an organ system. Organ systems consists of a group of organs with related functions, working together to perform body functions.
- The digestive system is made up of the gullet, stomach, pancreas, liver and intestines
- The excretory system is made up of kidneys, uterus and bladder
- The nervous system is made up of the brain, spinal cord and nerves
- The reproductive system of females is made up of the ovaries, oviducts, uterus and vagina; in males the system is made up of testes, sperm ducts, prostate gland and penis.