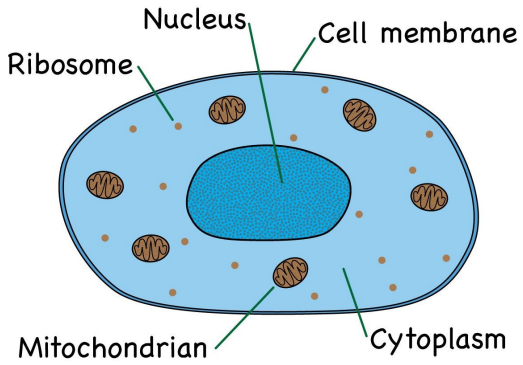
Cell Structure HL

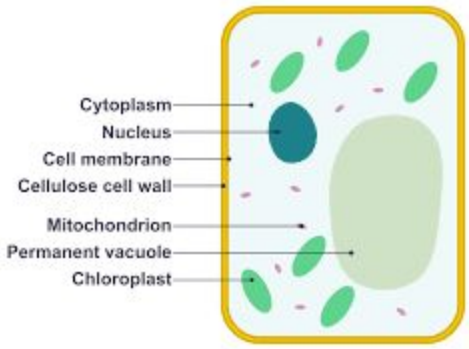
Animal Cells

Animal cells are surrounded by an outer membrane called the Plasma Membrane.
The protoplasm is all the living parts of a cell.
The Cytoplasm is the living material in a cell outside the nucleus.



Plant Cells

Plant cells are enclosed by a rigid cell wall made of cellulose. Cellulose is a strong structural carbohydrate. The Vacuoles contain a fluid called cell sap. This is a solution of salts,sugars and pigments.



Cell Ultrasound

Cell structures cannot be seen under a light microscope, therefore scientists must use an Electron Microscope. There are two different types of Electron Microscopes.

1. A transmission electron microscope (TEM) - Sends a beam of electrons through a thin section of the specimen. This shows the internal structure of the specimen in great detail.

2. A scanning electron microscope (SEM) - Uses a beam of electrons to provide a surface view of the specimen.

Ultrastructure of a generalised cell

Cell membrane

Membranes are composed of phospholipids and proteins. The functions of a cell membrane are :

- Retain the cell contents.
- Recognise molecules that touch them.
- Control what enters and leaves the cell.
- Gives support to the cell.

Nucleus

A nucleus is surrounded by a double membrane with numerous pores. These allow the controlled entry and exit of molecules into and out of the nucleus. The nucleus contains strands of DNA.
Nuclear pores - allow a type of RNA called mRNA to pass in and out of the nucleus.
Nucleolus - the area in the nucleus that stains dark.
The function of the Nucleus is to control what goes in and out of the cell.

Cytoplasm

The cytoplasm is the jelly-like liquid in a cell that surrounds the nucleus. It houses cell organelles such as mitochondria,chloroplasts and ribosomes.

Mitochondria

The mitochondria supplies energy to the cell. Cells with loads of mitochondrias will be very energetic and Cells with only a few mitochondrias will produce less energy.

Chloroplasts (PLANTS ONLY)

Chloroplasts are surrounded by double membranes. They contain the green pigment for plants.

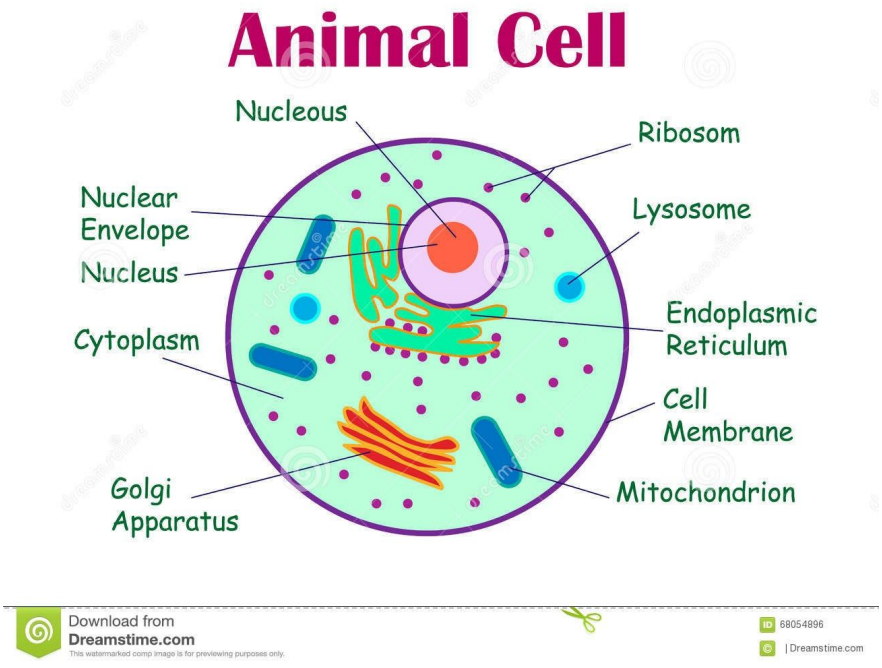
Cell Wall (PLANTS ONLY)

Plant cell walls are made out of cellulose. Cell walls are fully permeable meaning all molecules can pass through. The function is to support and strengthen the cell.

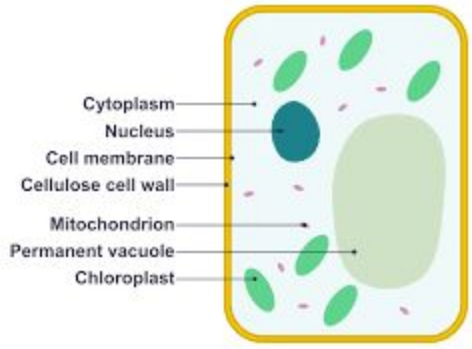
Ribosomes

Ribosomes are tiny, bead-like structures. They are made out of RNA and protein. They work by combining amino acids to form proteins. The function of ribosomes are to make protein.

Ultrastructure of an animal cell



Ultrastructure of a plant cell



Differences between animal and plant cells

Plant Cells

- Have a cell wall.
- Have chloroplasts
- Have a large vacuole

Animal cells

- Do not have a cell wall
- Do not have a chloroplast
- Do not have a large vacuole

Prokaryotic and Eukaryotic cells

Prokaryotic cells

- Do not have a nucleus or membrane enclosed organelles.
- Single celled
- Have a circular loop of DNA
- Small cells
- An example would be bacteria

Eukaryotic Cells

- Have a nucleus
- Have membrane enclosed organelles
- Have large cells
- Includes animals, fungi and plants
- More advanced than prokaryotic cells.