Cell Theory

What we know about the cell today is thanks to the work of ***many*** observations made by ***many*** people and cultures over ***many*** centuries. These observations have been organized and summarized into the Cell Theory. Its points are as follows:

- All cells come from other cells
- The cell is the most basic unit of life
- All living things are composed of one or more cells
- The wellness of an organism is dependant on the wellness of the individual cells.

Cell Structures and Their Functions

- Cells are like factories in which the business of life is always going on
- To carry out these activities, cells have basic structures in common
  - These structures are known as organelles
  - Each organelle has a specific role in the activities necessary for life

Cell Membrane

- surrounds and protects the contents of the cell
- Is selectively permeable, meaning it controls the movement of materials into and out of the cell

Cytoplasm

- Jelly like substance that fills up the cell
- supports the cell structures
- Because it is fluid and constantly moving like blood, it distributes materials such as oxygen and food to different parts of the cell

Nucleus

- Largest organelle
- controls the cell's activity (control centre)

- Contains chromosomes (DNA), genetic material that directs a cell's growth and reproduction
- Surrounded by a nuclear membrane
- Contains the nucleolus – it makes ribosome parts

Vacuoles

- Storage places for extra food, water, wastes, and other substances the cell cannot use right away
- Animal cells have many small vacuoles, plants have one large central vacuole

Ribosomes

- Make proteins
- Can be found in the cytoplasm or attached to the endoplasmic reticulum

Endoplasmic Reticulum

- Folded membrane that forms a system of canals within the cytoplasm
- Materials are transported through these canals to different parts of the cell or to outside of the cell.
- Some of the ribosomes are attached to the endoplasmic reticulum

Mitochondria

- Transform energy
- Powerhouse of the cell
- Breakdown food to release energy for the cell's activities

Golgi bodies

- Package useful materials, such as proteins and lipids, and secrete them to the outside of the cell for use elsewhere in the organism

Lysosomes

- Breakdown food, wastes, and worn-out cell parts

Cell Wall

- Only found in __plant__ cells, __fungi__, and some __unicellular__ organisms.
- Located just outside the __cell membrane__
- Thick and __rigid__ and made mostly of a tough material called __cellulose__
- Provides __support__ for the cell

Chloroplasts

- Only found in __plants__ and some unicellular organisms; not in __animal__ cells
- Contain the green pigment __chlorophyll__, which absorbs __sunlight__
- Is where __photosynthesis__ takes place (i.e. convert light energy to usable chemical energy)