The Cell Theory

1. All Organisms are composed of one or more cells.

2. The cell is the basic unit of structure and organisation in organisms.

3. All cells come from preexisting cells.

Membranes

Permeable Membrane:	A membrane that lets everything through
Semipe-rmeable Membrane:	A membrane that lets some/certain thing [mater-ials] through
Imperm-eable Membrane:	A membrane that does not let things [materials] through

Cytoplasm

Where cellular reactions take place

Has a thick jelly-like structure

Allows protein respiration in the [Mitochon-dria]

Where Mitosis and Meiosis occurs

Cell Wall

Porus to let things through

Rigid (100x thicker than the cell membrane)

Maintains shape and protects cells

Attaches to other cell walls to form strong structures (plants need to be strong but don't have skeletons)

Golgi Body

Golgi apparatus

Port of the cell

Where items are collected, packed and exported

Receives proteins from the Rough Endopl-asmic Reticulum [rER]

Modifies proteins by adding lipids or carbs or by changing shapes

Sends proteins to damaged cell parts for recovery

Cell Structure Of A Leaf

The lamella is the broad flat surface of a leaf. [The large surface area allows for maximum absorption of light.] The thin lamella also allows for light to get to deeper portions of the leaves.

Thin cells in the upper epidermis allow sunlight to reach the mesophyll

Palisade cells are packed with Chloroplasts. Have large vacuoles or stores.

The spongy mesophyll have large air spaces between it's cells for gaseous exchange

Xylem vessels start a series of plant cells. At a certain point the carbohydrate lignin forms within the cell walls. Lignin in impermeable. Living contents of the cell die; The end walls between the cells break down. Continuous tubes are formed.

Tissues

Group of cells with a common function.

Note: Cells (similar) to tissues to organs to organ systems to organisms

Mitochondria

The powerhouse of the cell

Provides energy to all parts of the cell

Where cellular respiration takes place

[Glucose+O2=ATP+CO2] transports to other cells

Cytoskeleton

Skeleton of the cell

Some cells can move using:

Flagella: a few long whip-like structures outside the cells

Cillia: Hundreds of short hairlike structures outside the cells

Cytoskeleton

Skeleton of the cell

Some cells can move using:

Mitochondria

The powerhouse of the cell

Provides energy to all parts of the cell

Where cellular respiration takes place

[Glucose+O2=ATP+CO2] transports to other cells

Nucleus

Controls the cell

Is the brain of the cell

Contains DNA/Genetic Material

Cell Membrane

Protective outer boundary of the cell.

Allows materials like water and oxygen, does not allow harmful materials like carbon dioxide and waste products.

Is permeable

Reproduction/Stem Cells

Egg cell + sperm cells = zygote (totipotent stem cells that divide and re-divide)

Zygote - Embryo (the embryo can either divide, resulting in growth, or it can differentiate to different parts of the body.

Embryonic Stem Cells: Puripotent (can be specialised into any different type of cell)

Adult stem cells - Multipotent (they give rise to the same type of cells, like stem cells)

In Leukemia abnormal white blood cells divide and re-divide to form a mass of cell tumour which block blood vessels

Hemapoetic - Blood forming cells

Xylem And Phloem

Xylem:	Transports water from the roots to the leaves. Xylem has two main types of tissues. Hexagonal shapes.
Phloem:	Transports manufactured food from the leaves to other parts of the plant. Circular shapes.
Both:	Xylem and phloem are transport systems in vascular plants

Smooth Endoplasmic Reticulum [sER]

Does not contain ribosomes

Does not contain proteins

Produces lipids, cholesterol, etc.

Breaks down toxic substances via detoxification

Lysosomes

Digestive part of the cell

Has digestive enzymes

Converts carbohydrates to glucose and proteins to amino acids

Vacuoles

Storage house of the cell

Stores water, food, minerals, nutrients and waste products

Plants have one

Rough Endoplasmic Reticulum [rER]

Contains ribosomes

Contains proteins

Pack/enclose proteins in vesicles

Transport substances within the cell

Ribosomes

Float in the cytoplasm

Makes proteins

Osmosis

Diffusion of/for water

Prokaryote & Eukaryote Cells

Prokaryote Cells:	Pro stands for before, Karoyote stands for nucleus. Oldest cell type, small and simple, lack nucleus and organelles, single-celled, single circular chromosone. Membrane bound organelles like mitochondria, endoplasmic reticulum, golgi body are absent. 70s Ribosomes. Pili present.

Prokaryote & Eukaryote Cells (cont)

Both:	Have DNA, have ribosomes, have cytomplasms, have a plasma membrane, brane present
Eukaryote Cells	Eu stands for true, Karyote stands for nucleus (karyon). Evolved from prokaryotes, larger and more complex, contain nucleus and organelles, multicellular, multiple linear chromosones

Pits

Regions where Lignin is not deposited

Plant Cells vs Animal Cells

Plant Cells:	Having cell wall outside of the cell membrane, large fluid-filled vacuole. Have chloroplasts
Animal Cells:	Have cytoplasms, have nucleus, have cell membrane, lack vacuoles or only have a few in liver cells