Introduction

Importance of plants:

- Plants are unique and essential to life on earth.
- Unlike most living things, plants make their own food from sunlight and water. Either directly or indirectly.
- They are the primary food source for humans and other animals.
- They provide fuel.
- Replenish the earth's oxygen supply.
- Prevent soil erosion.
- Slow down wind movement.
- Cool the atmosphere.
- Provide wildlife habitat.
- Supply medicinal compounds and beautify our surroundings.

Definitions

- **Botany, plant science, plant biology:** is a branch of biology and the science of plant life.
- **Botanist:** A person engaged in the study of botany is called a botanist.
- **Botany discipline (branches):** 1-structure. 2-growth. 3-disease. 4-reproduction. 5-development. 6-metabolism. 7-taxonomy. 8-chemical properties. 9-evolutionary relationship.
- **The main discipline that researches focus on botany is:** 1-plant population groups. 2-evolution. 3-physiology. 4-structure. 5-systematic
- **Sub discipline in botany :** 1-agronomy 2-forestry 3-horticulture 4-paleobotany.
- **Key scientists in botany:** 1-Theopharastus 2-Ibn al-Baitar 3-Carl Linnaeus 4-Gregor Mendal 5-Norman Borlaug

- **Plant anatomy:** is the study of the internal cells and tissues of plant.
- **Plant morphology**: is the study of plant in general and its external form.
- **Cell biology:** the study of structure and physiology of cells.

Characters of plant cell:

- plant cells are **eukaryotic** because it have membrane-encased nucleus and other orginales.
- central vacuole
- cytoplasm
- cytosol
- dictyosome
- endoplasmic reticulum
- microbodies
- microfilaments
- microtubules
- mitochondria
- plastids
- cell wall.

Plant body contains; 1- roots 2- stems 3- leaves

The function of roots:

1) anchor plants into the ground.
2) gather water and mineral nutrients from soil.
3) produce hormones.

**fleshy roots (caroot, beets) store carbohydrates

Function of stems : 1- provide support to the leaves.
2- store nutrients.

Function of leaves: gather sunlight and begin photosynthesis.

***large green- flat-flexible leaves = foliage leaves

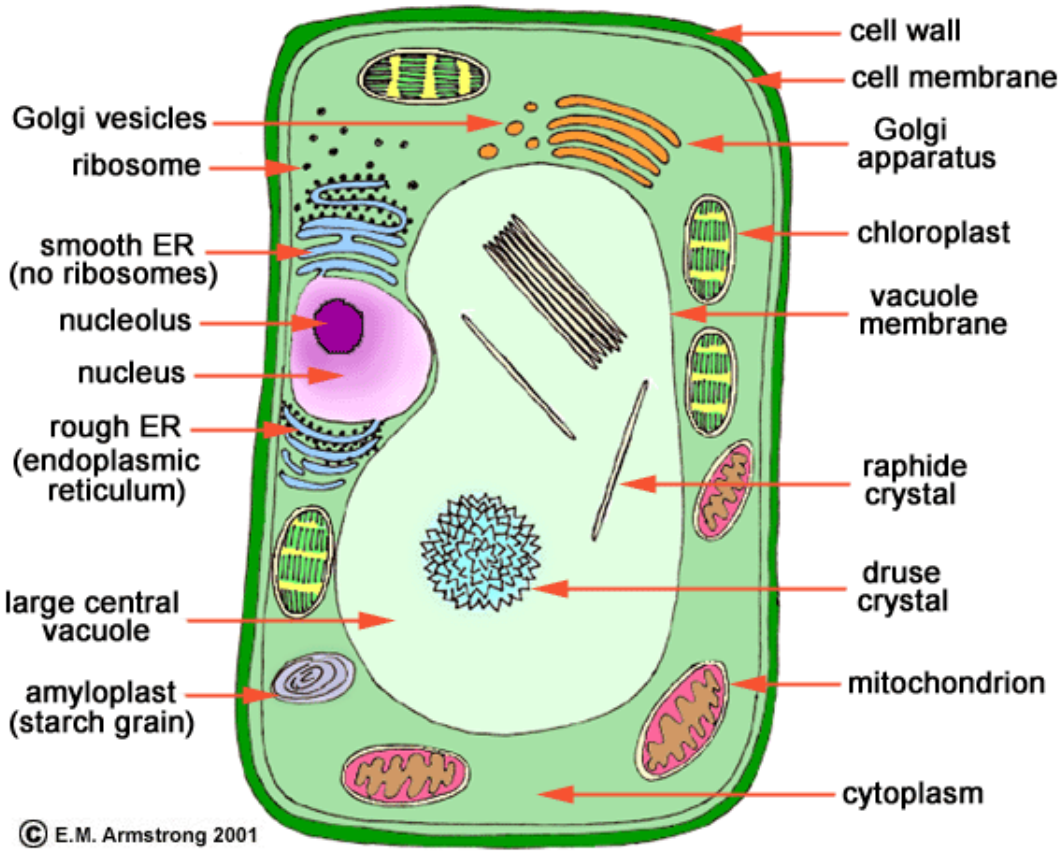
Gymnosperm: are seed producing plants which have open seeds, such as Conifers, Cycads , Ginkgo, Gnetophyta.

Angiosperm: are seed –producing plants that produce flowers , having enclosed seeds.

Woody plants: undergo secondary growth resulting into additional types of tissues wood(secondary xylem) and bark (secondary phloem and cork).

Plant cell structure:

- All plant cell have a cell wall surrounding the **protoplasm**.
- All living component in the cell are bounded by a membrane called the **plasma membrane.**
- **Cytosol:** is a soup like fluid in which various bodies called organelles dispersed.
- **Cytoplasm :** all cellular components between the plasma membrane and nucleus.
- Most organelles are surrounded by a membrane.
- Most plant cells are tiny and can-not seen by eyes.
- Cells in higher plants vary in length between 10- 100 micrometers.


cell wall
cell membrane
Golgi vesicles
Golgi apparatus
ribosome
chloroplast
smooth ER (no ribosomes)
vacuole membrane
nucleolus
nucleus
rough ER (endoplasmic reticulum)
raphide crystal
druse crystal
large central vacuole
amyloplast (starch grain)
mitochondrion
cytoplasm
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