## The Living World

In this chapter, we will be studying the science of living things. To begin, you need to recognize the characteristics of all living things. In order to be alive, a species **must** meet **all** of the following conditions.

1. Grow and develop
2. Adapt to their environments
3. Reproduce
4. Acquire and use energy
5. Have cells (or be a cell)

When we examine living things, we tend to classify them based on their complexity. Put the following terms in **increasing** order of complexity:

*Cell* *Organ* *Organ System* *Organism* *Tissue*

cell, tissue, organ, organ system, organism

(least complex) (most complex)

Definitions:

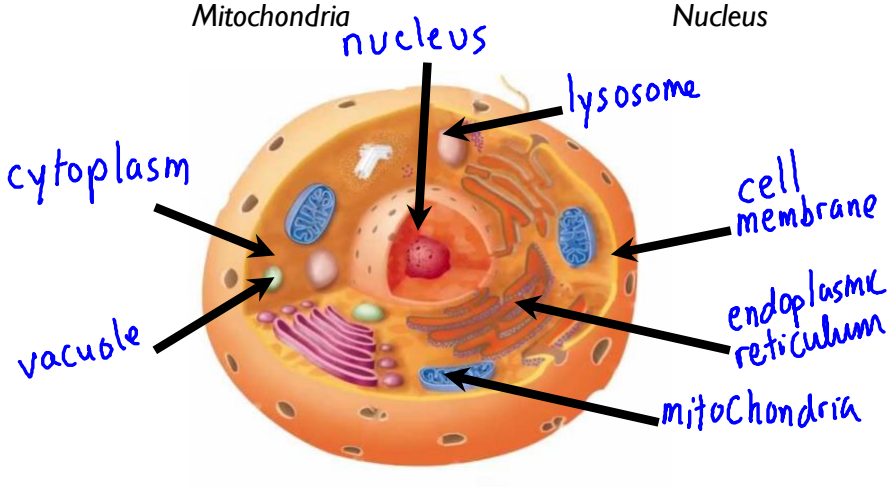
1. cell: Most basic unit of life
2. tissue: lots of cells of the same type clustered together.
3. organ: arrangement of tissues (ex: liver, heart, etc)
4. organ system: arrangement of organs that serve the same function
5. organism: you! (an arrangement of organ systems)

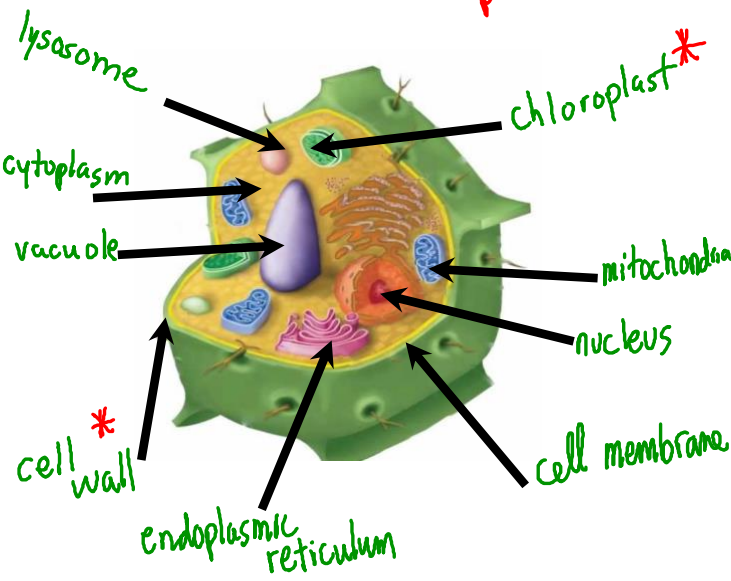
The most basic unit of life is the cell. There are many different types of cells that perform different functions, but we can group them all into plant cells and animal cells.

Label the following organelles on one or both of these cell drawings:

*Cell membrane* *Cell wall* *Chloroplast*
*Cytoplasm* *Endoplasmic reticulum* *Lysosome*
*Mitochondria* *Nucleus* *Vacuole*

*only in plant cells



Identify at least 3 differences between plant and animal cells.

1. Plant cells have cell walls (gives it rectangular shape)
2. Plant cells have chloroplasts
3. There's only one vacuole in the plant cell, and it's big!

Cells are often compared to factories. A factory has several rooms and areas that each serve a particular function, while a cell has several organelles that each do different jobs. In the table below, explain what role each of these features plays in a factory and cell.

| Factory | | Cell | |
|---|---|---|---|
| Factory component | Role in factory | Similar organelle | Role in cell |
| Wall | structural support | cell wall | structural support (plant cells ONLY) |
| Tight security | Keep unwanted things and people out | cell membrane | Allows some items through (ie. water) |
| Fluid | Surrounds everything | cytoplasm | Jelly-like substance that surrounds all organelles |
| Office | Control centre, plans for future expansion | nucleus | Control centre of cell, site of chromosomes (involved in reproduction) |
| Garbage bags and water bottles | Store garbage, store water | vacuole | Storage of water and waste products |
| Assembly line | Put something together or build something | endoplasmic reticulum | build proteins and move them around the cell |
| Furnace | Burn fuel to produce energy | mitochondria | "Burn" sugar to make energy |
| Janitor | clean up messes | lysosome | break down waste products |
| Greenhouse | growing plants | chloroplast | photosynthesis |