**SECTION A: LIVING ORGANISMS AND THE ENVIRONMENT**

1. describe the characteristics of living organisms;

Living organisms have many characteristics namely nutrition, respiration, excretion, growth, irritability, movement and reproduction.

**Nutrition** is the selection of foods and preparation of foods, and their ingestion to be assimilated by the body.

**Cellular respiration** is the set of the metabolic reactions and processes that take place in the cells of organisms to convert biochemical energy from nutrients into adenosine triphosphate (ATP), and then release waste products

**Excretion** is the process by which waste products of metabolism and other non-useful materials are eliminated from an organism.

**Growth** refers to a positive change in size, often over a period of time.

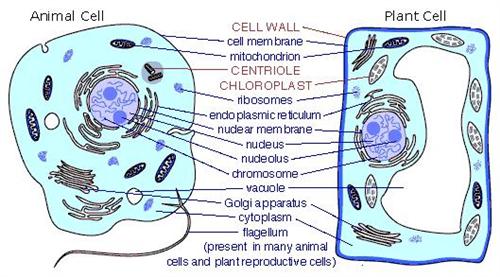
**Irritability** is an excessive response to stimuli.

**Movement** is the ability of an organism to change in position over a period of time.

**Reproduction** is the biological process by which new offspring individual organisms are produced from their parent organism.

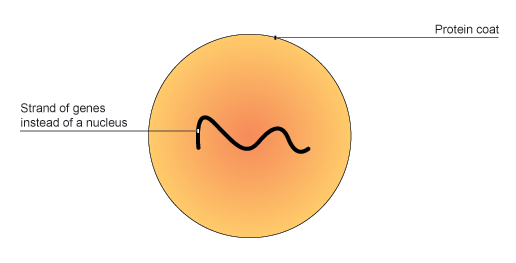
1. compare the structures of an unspecialized plant and animal cell and selected microbes;

**Plant and Animal Cells**

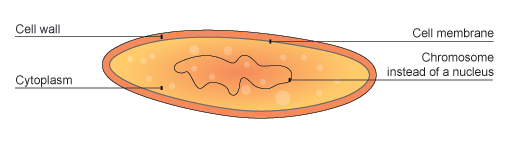


**MICROBES**

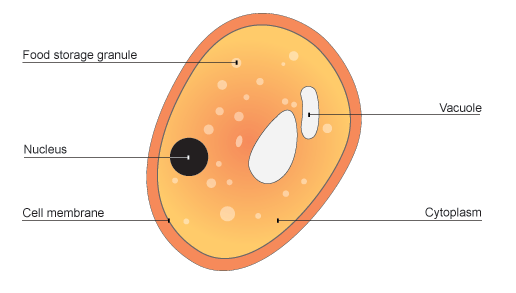
**Virus**



**Bacteria**



**Fungus**

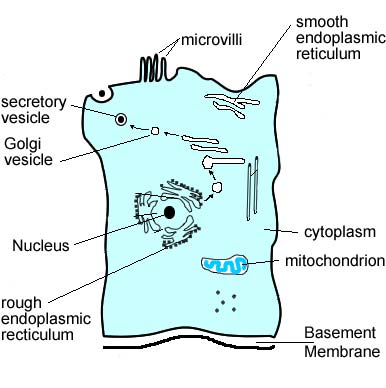


1. state the functions of cell structures;

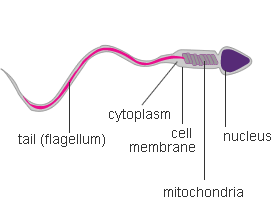
|  |  |
| --- | --- |
| Structure | Function |
| Cell Wall | Acts as a pressure vessel, preventing over-expansion when water enters the cell. |
| Cell Membrane | Protects cell from damage.  Regulates the entrance and exit of substances thus maintaining internal balance. |
| Nucleus | Controls the activities of a cell through regulating gene expression. |
| Ribosome | Protein synthesis, where they pair each codon of the messenger RNA strand with the appropriate amino acid. |
| Cytoplasm | Provides support to the internal structures of a cell by being a medium for their suspension.  Vital site for metabolism. |
| Mitochondria | Produce energy.  Helps building certain parts of the blood and hormones. |
| Vacuole | Isolates substances that might be harmful to the cell and maintains an acidic internal pH.  Helps maintain turgor pressure. |
| Chloroplast | Captures light energy which is stored in the energy storage molecules ATP (adenosine triphosphate).  Aids in food production. |
| Endoplasmic Reticulum | Helps to create a highway of membranes throughout a cell.  Smooth ER is for storage.  Rough ER is for packing proteins. |

1. identify selected cells which make up the human body;

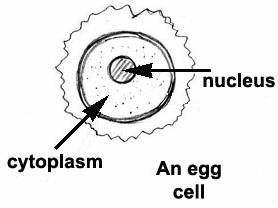
**Epithelial cell**



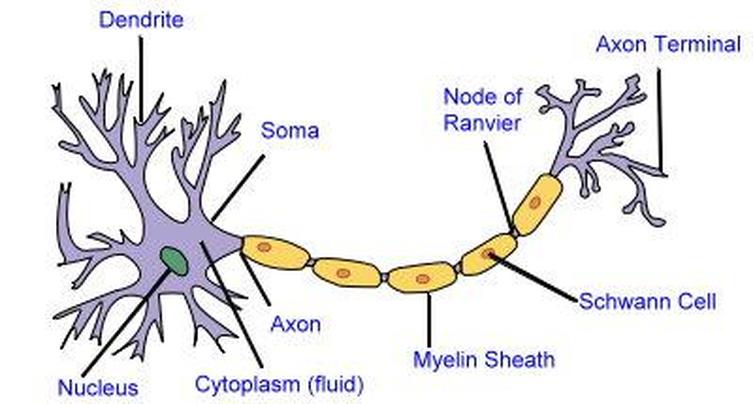
**Sperm cell**



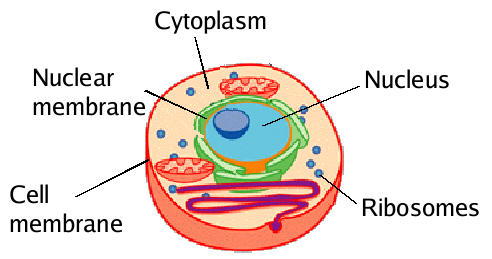
**Egg cell**



**Nerve cell**



**Muscle cell**



1. explain the importance of cell specialization in humans;

**Cell specialization** is when a cell adapts itself to perform a particular task.

**Cellular differentiation** is the process by which a less specialized cell becomes a more specialized cell type.

Similar specialized cell act together as tissues. Multiple tissues carry out their functions as an organ. Various organs perform their tasks as an organ system. An ideal organism has various organ systems for each special task.

1. distinguish between osmosis and diffusion;

**Osmosis** is the spontaneous net movement of solvent (liquids and fluids) molecules through a partially permeable membrane into a region of higher solute concentration, in the direction that tends to equalize the solute concentrations on the two sides.

**Diffusion** is the net movement of solute (solids and gases) particles from a region of high concentration to a region of low concentration.

Osmosis occurs in solvent particles whereas diffusion occurs in solute particles. Diffusion also does not require a semi permeable membrane, unlike osmosis.