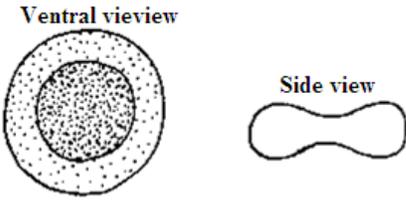
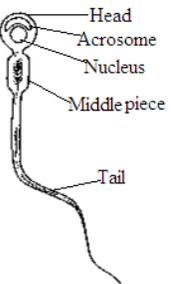
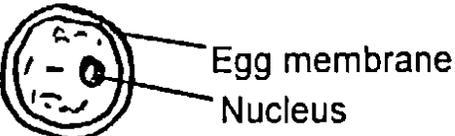
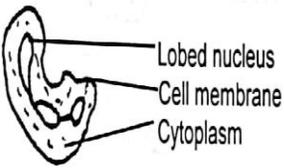
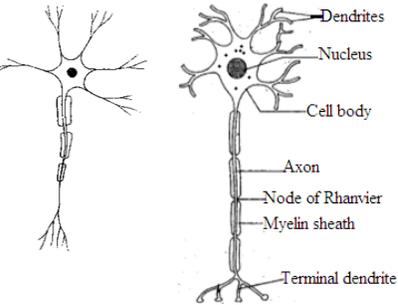
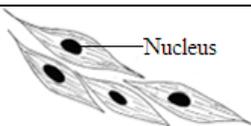


CELL SPECIALIZATION, TISSUES, ORGANS AND ORGAN SYSTEMS

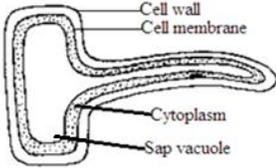
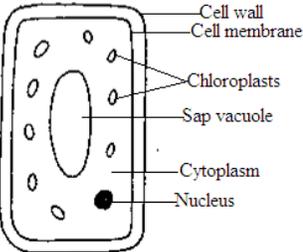
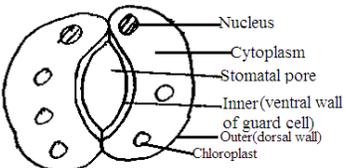
SPECIALISED CELLS

A specialized cell is one that is modified to perform a particular function in the body of an organism. They become suited or adapted for particular functions by modifying either their size, or shape, etc.

Examples of specialized cells in animals

Specialized cell	Structure	Function
Red blood cells		Carry oxygen and carbon dioxide in the body
Sperm cell		Male reproductive cell for sexual reproduction.
Ovum or egg		Female reproductive cell for sexual reproduction.
White blood cells		Defend the body against infections
Nerve cell		Transmits nerve impulses from one part of the body to another.
Muscle cells		movement of body parts

Examples of specialized cells in plants

Specialized cell	Structure	Function
Root hair cells		Absorb water and mineral salts from the soil
Palisade cells (Are found in leaves of green plants)		Carry out photosynthesis
Guard cells (Found in the epidermis of a leaf)		They control the opening and closing of stomata

LEVELS OF ORGANIZATION OF LIFE

Life is organized starting from the basic unit of life which is a cell, cells form a tissue, which then form an organ, organs form a system and systems form an organism.

Cells → Tissue(s) → Organ(s) → Organ systems → Organism

TISSUES

A tissue is a group of cells performing similar functions and have similar size and shape.

A tissue may be made up of single type of cell or may comprise of different types of cells.

Examples of animal tissues and their functions

Tissue	Functions
<ul style="list-style-type: none"> • Epithelial tissue -Made up of epithelial cells	<ul style="list-style-type: none"> • Covers surfaces and lining of cavities
<ul style="list-style-type: none"> • Blood tissue -Made up of red blood cells, white blood cells and platelets.	<ul style="list-style-type: none"> • Transports materials throughout the body and defends the body against diseases.
<ul style="list-style-type: none"> • Nervous tissue - Made up of nerve cells	<ul style="list-style-type: none"> • Transmits nerve impulses
<ul style="list-style-type: none"> • Muscular tissue -Made up of muscle cells	<ul style="list-style-type: none"> • Is responsible for movement of body parts

Examples of plant tissues and their functions

Tissue	Functions
<ul style="list-style-type: none">• Photosynthetic tissue -Made of palisade cells	<ul style="list-style-type: none">• Manufactures food for the plant by photosynthesis
<ul style="list-style-type: none">• Xylem tissue	<ul style="list-style-type: none">• Transports water and mineral salts from roots to leaves
<ul style="list-style-type: none">• Phloem tissue	<ul style="list-style-type: none">• Transports manufactured food throughout the plant
<ul style="list-style-type: none">• Epidermal tissue	<ul style="list-style-type: none">• Covers and protects the plant• Prevents excessive water loss
<ul style="list-style-type: none">• Parenchyma tissue -Made up of parenchyma cells	<ul style="list-style-type: none">• Fills up spaces between other plant cells and tissues.

ORGAN(S):

An organ is a group of different tissues working together to carry out a particular function in an organism.

An organ is made up of different types of cells grouped together as a unit.

Examples of organs in animals and their functions

Organ	Main Function(s)
<ul style="list-style-type: none">• Eye	<ul style="list-style-type: none">• For sight
<ul style="list-style-type: none">• Heart	<ul style="list-style-type: none">• For pumping blood
<ul style="list-style-type: none">• Ear	<ul style="list-style-type: none">• For hearing
<ul style="list-style-type: none">• Kidney	<ul style="list-style-type: none">• For purifying blood,• Urine formation
<ul style="list-style-type: none">• Nose	<ul style="list-style-type: none">• For smelling• Breathing
<ul style="list-style-type: none">• Tongue	<ul style="list-style-type: none">• For tasting• Talking
<ul style="list-style-type: none">• Tooth	<ul style="list-style-type: none">• For tearing, chewing, grinding food

Examples of organs in plants and their functions

Organ	Main Function(s)
<ul style="list-style-type: none">• Root	<ul style="list-style-type: none">• Absorbing water and mineral salts
<ul style="list-style-type: none">• Stem	<ul style="list-style-type: none">• Conducting materials from leaves to roots and vice versa.• Support the shoot system.
<ul style="list-style-type: none">• Leaf	<ul style="list-style-type: none">• Manufacturing food for the plant by photosynthesis
<ul style="list-style-type: none">• Flower	<ul style="list-style-type: none">• For sexual reproduction.

ORGAN SYSTEM:

An organ system is a group of several organs which work together to perform special functions.

Examples of organ systems in animals and their functions

System	Organs forming system	Main functions
Digestive system	Stomach, intestines, Liver, Pancreas	Digestion and absorption of food
Excretory system	Kidneys, bladder, lungs, skin, liver	Removal of metabolic waste products from the body
Circulatory system	Heart, arteries, veins, capillaries	Transports nutrients, carbondioxide and oxygen in the body
Sensory system	Eyes, ears, skin, nose and tongue	Senses environment through sight, smell, hearing, taste and touch
Nervous system	Brain, spinal cord, nerves	Transmits messages/information around the body i.e coordination.
Reproductive system	Testes, Ovaries, uterus, Penis	Produces offspring

Examples of organ systems in plants

- Shoot system which has organs like leaves, flowers, stems and branches.
- Root system which has roots and their branches.

ORGANISM:

This is a collection of organ systems working together as a unit. E.g. man, cow, banana plant, etc.

N.B: Some lower organisms have a very simple structure without distinct organ systems e.g. Unicellular organisms like Amoeba are made up of only one cell while some organisms like hydra are made up of a few cell types which do not form distinct organs or organ systems