Chapter 6 **Date: _____**

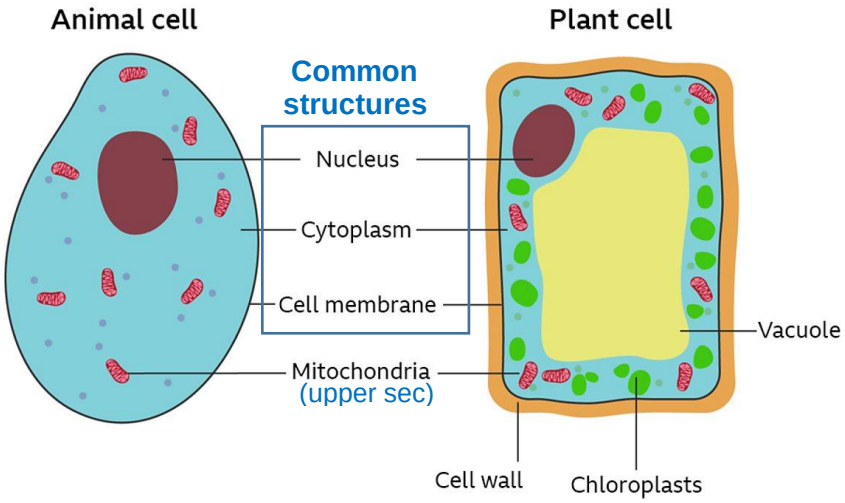
Model of Cells – the Basic Unit of Life

1 The Basic Units of Life

- Organisms are composed of one (_____) or more cells (_____).
- Bacteria and Amoeba are examples of unicellular organisms.
- Plants and animals are examples of multicellular organisms.
- Most cells are too small to be seen by the naked eye; one way to study cells is to use a _____.

2 Parts of a cell

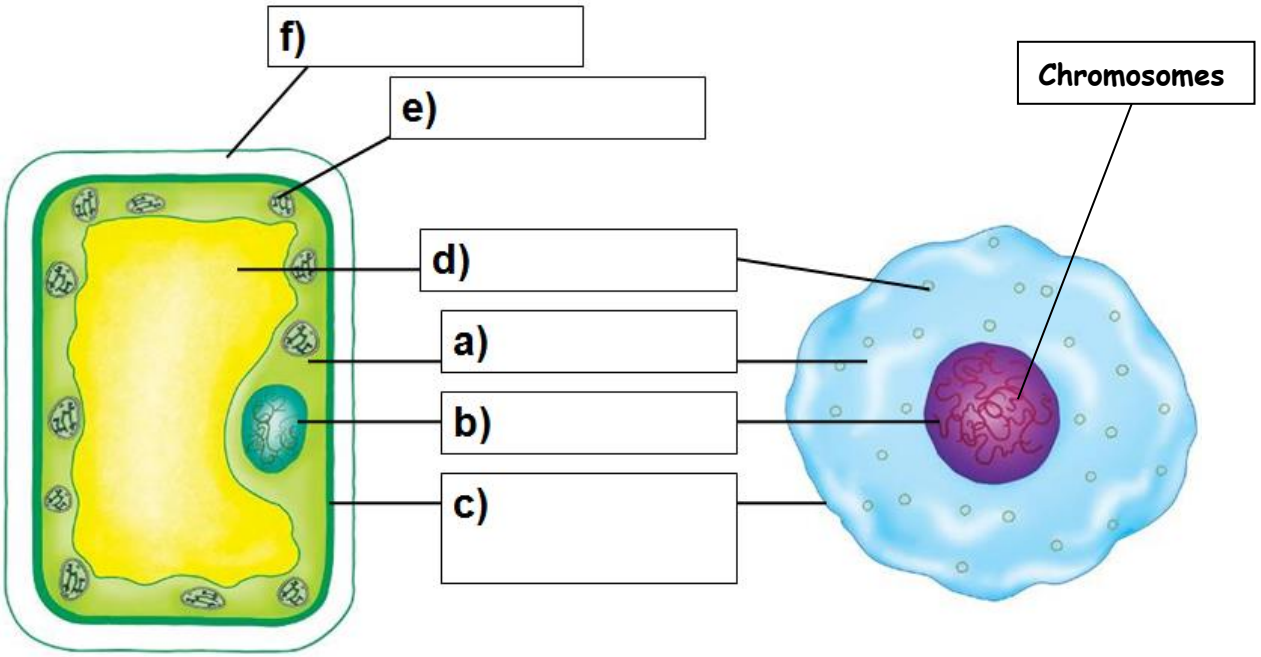
- Cells can be broadly catergorised into _____ and _____ cells.
- The following are common structures present in both plant and animal cells.



Parts	Function
1. Cell membrane A thin and _____ membrane surrounding the cell	_____the substances entering and leaving the cell. • Allows glucose, water, oxygen and waste products to move in and out of the cell. Serves as a _____between the cell and external environment.
2. Cytoplasm A jelly-like substances within the cell.	• Contains _____ to store food. • Site where many _____reactions take place.

3. Nucleus Largest structure in the cell and spherical shape. • Contains _____ which carry genetic information **Chromosomes** - Long _____ structures found in nucleus. - Contains _____that carry genetic material (**DNA**) to be passed down from parents to offspring.	• Controls _____ (eg. repair of worn-out parts) • Responsible for _____
4. Vacuole • Fluid-filled spaces surrounded by membranes • Found in the cytoplasm	Stores water and other nutrients • _____ and _____ in **animal** cells • _____*and* _____ *vacuole in **plant** cells)*

Similarities and Differences between Animal and Plant Cells



Plant Cell **Animal Cell**

Summary Table - Structural differences between plant and animal cells

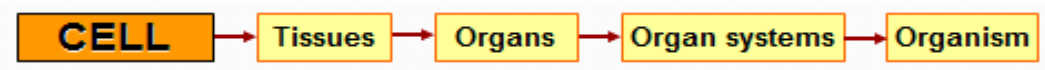
Feature	Plant cell	Animal cell
Cell wall		
Number and size of vacuoles		
Chloroplast		

Functions of cell wall, chloroplasts and vacuole in <u>plant cells</u>

Structure	Function
Cell wall - Thick layer surrounding cell membrane - Made up of _____ - _____to substances	• _____ _____and gives _____to the cell.
Chloroplasts - Contains the green pigment, _____	• Chlorophyll is needed for _____of _____ required for _____.
Vacuole - Usually a _____ fluid-filled space surrounded by a membrane.	• Filled with _____, which contains water and dissolved minerals.

3 Forming a multicellular organism

Cell Organisation



- _____ with specific functions are organised into _____
- Different tissues are in turn grouped into _____.
- Many organs are then grouped into _____.

  Eg. A human body is made up of different organs such as the heart, liver and stomach. These organs work together and make the five main organ systems in your body – the **digestive system**, the **circulatory system**, the **respiratory system**, the **skeletal system** and the **muscular system**.

- All organ systems work together to enable_____ to function properly.

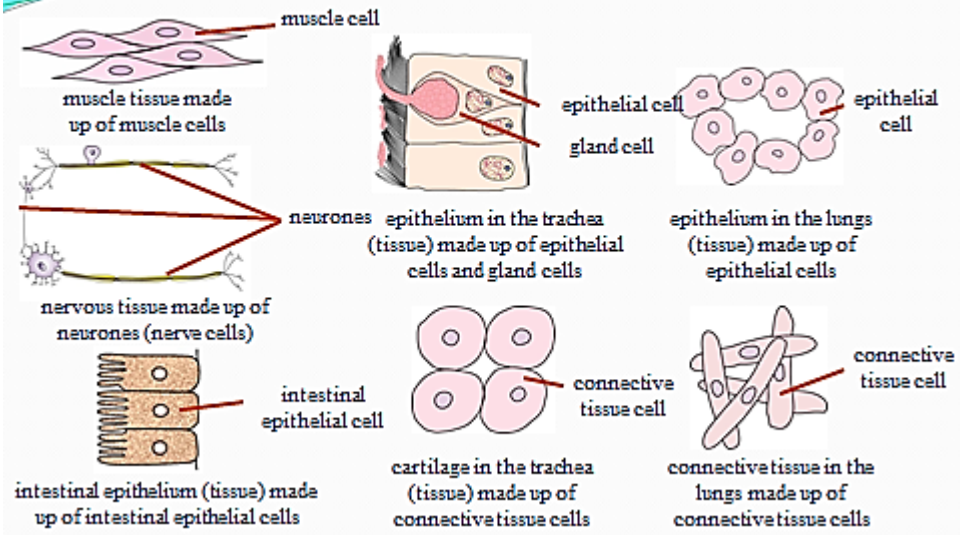
Eg. Heart Muscle Cells → Heart Muscle Tissues → Heart → Circulatory System → Human Body

➢ Heart (organ) is formed by muscle tissue, blood vessels, nerve tissue and connective tissue. It pumps oxygen-rich blood to all the cells in the body.

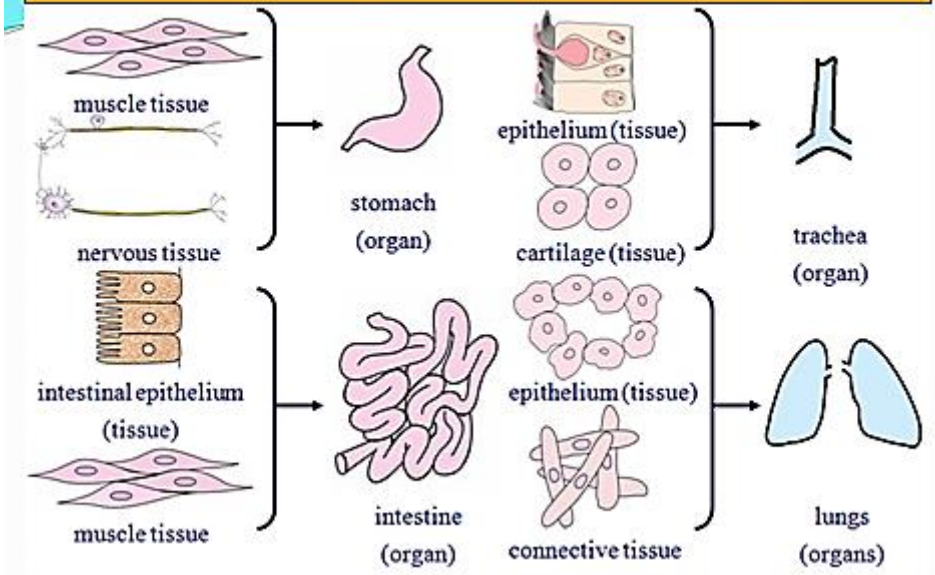
➢ In circulatory system, the heart, arteries and veins work together to transport blood to all parts of the body

Eg. Plant Cells → Leaf Tissues → Leaf → Root & Shoot System → Plant

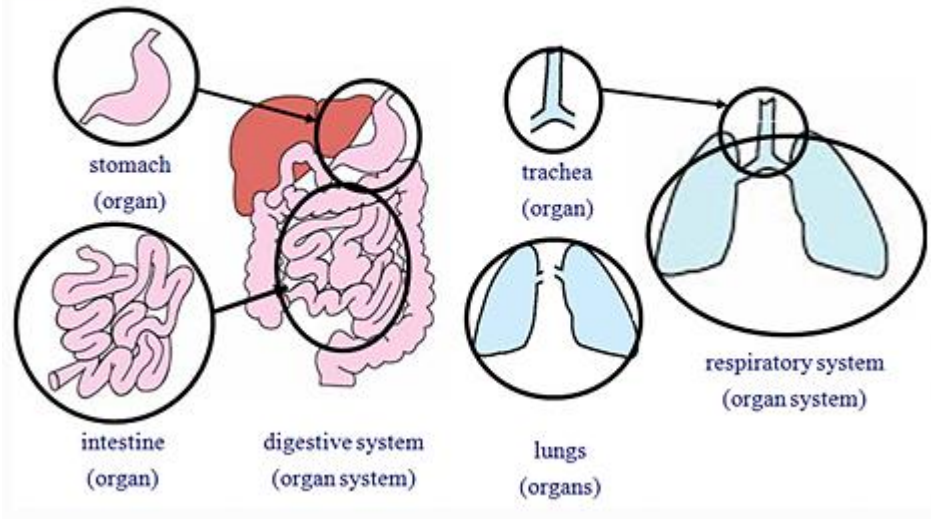
A group of cells work together to form a **tissue**.



Different tissues group together to form an **organ**.



Several organs work together to form an **organ system**.



4 Division of Labour

Division of labour is the _____ into _____ and more _____ tasks for maximum _____.

- Within a plant **cell**:
  Each part of a cell is specially designed to carry out its specific role.

  - Cell membrane regulates substances that enter and leave the cell
    Water needed by photosynthesis can pass through cell membrane.
  - Chloroplasts allow the plant cells to carry out photosynthesis to make its own food.

- Within a **multicellular organism** like the human body:
  Work is divided among each type of cell, tissue and organ to ensure body receive sufficient oxygen and energy

  - Lungs in our _____ system take in oxygen and release energy from our food intake.

  - Muscle tissue in our _____ system uses the released energy to contract and relax

  - Heart in our _____ system pumps blood around the body.

  - Red blood cells in _____ transport oxygen to all parts of the body

Essential Takeaways

1 Typical plant and animal cell models represent various types of cells.
2 Cells are organised into tissues, organs and systems that make up a multi-cellular organism. This helps to explain the various processes occurring in our body.
3 We can infer whether an organism is an animal or plant based on its cellular composition.

Keywords to Note

Unicellular Multicellular Organisms Cell Membrane Cytoplasm Nucleus Chromosomes Vacuole Cell Wall Chloroplast Cell Organisation Systems Division of Labour