

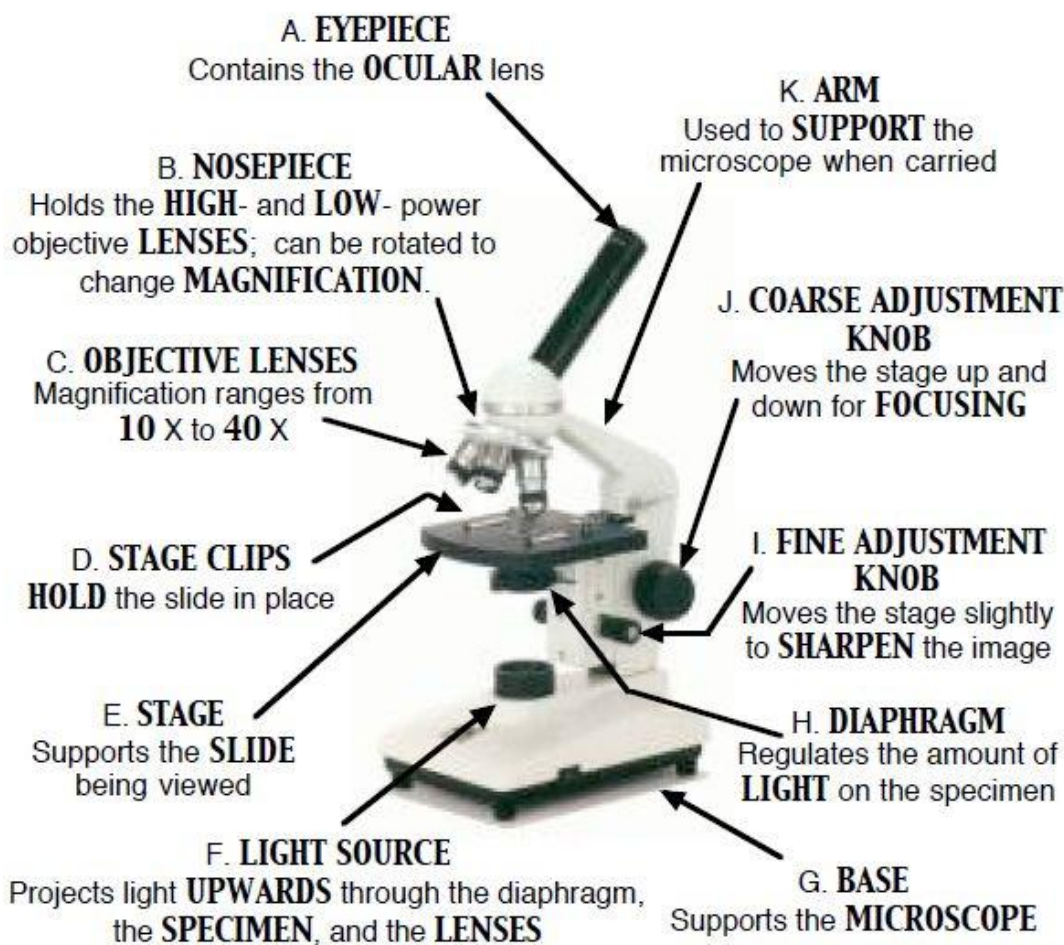
SCIENCE FORM 1
CHAPTER 2 CELL AS A UNIT OF LIFE

Cells

- The basic unit of organisms which can function on their own
- The building blocks of an organism
- Can carry out characteristics of life
- First person discover cells – Robert Hooke

Microscope

PARTS OF THE LIGHT MICROSCOPE



General structure of a cell

- Protoplasm – consist of nucleus and cytoplasm only
- Nucleus: Control all activities of cell
- Cell membrane: A thin film holds the parts of cell together & semi-permeable to the surrounding substances

- Cytoplasm: chemical reaction takes place

Plant

- Cell wall : layer of cellulose, support and give shape to cell
- Chloroplast: absorb light for photosynthesis
- Vacuole: store water and substances

Similarities between plant and animal cells

- Have cell membrane
- Able to carry out activities of life
- Have protoplasm

Differences between plant and animal cells

	Animal cells	Plant cells
Size	smaller	Larger
Shape	Irregular	Regular
Contents	<ul style="list-style-type: none"> • No cell wall • No chloroplast • Small and numerous vacuole 	<ul style="list-style-type: none"> • Have cell wall • Have chloroplast • Have large vacuole
Position of nucleus	At centre of the cells	At one side of the cells
Food storage	Glycogen granules	Starch granules

Unicellular organisms

- Are organisms that consists of only one cell
- Usually tiny and can only seen under microscope
- Can carry out life processes even only one cell

Multicellular organisms

- Are organisms that consist of many cells
- Some are made up of few cells, some made up of millions of cells
- Each type of cell has different structure and carries out specific function

Types of function and human cells

- Cells in our body have different sizes and shapes
- Each cell types only perform specific function, known as specialisation of cells

Organisation of cells

Cells --> tissues --> organs --> systems --> organism

Cells

- Basic structural unit of organism
- a. Epithelial cells : cover the body's surface
- b. Reproductive cell : to produce offspring
- c. Muscle cell: allow movement
- d. Nerve cell: convey message throughout the body
- e. Red blood cell: transport oxygen throughout body
- f. White blood cell: destroy bacteria and germ
- g. Bone cell: support organs

Tissues

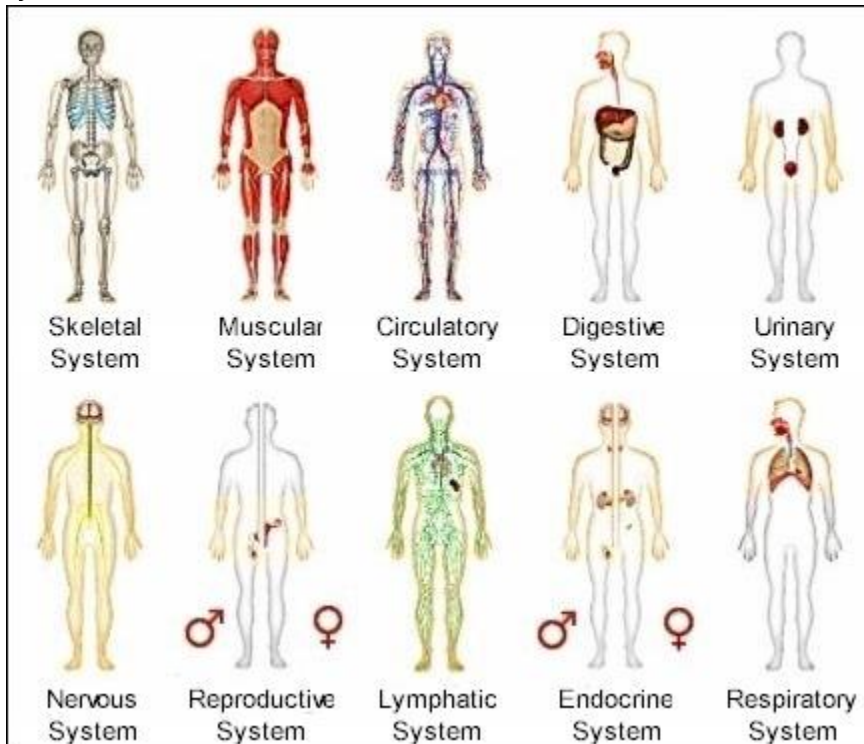
- A group of similar cells working together as a unit to perform a specific function
- a. Epithelial tissue
 - Covers the external surfaces of body
 - Lines the cavities and organs of the body
 - Forms glands such as sweat glands and digestive glands
- b. Nervous tissue
 - Responds to stimuli and transmit impulses
 - Can be found in the brain and spinal cord
- c. Connective tissue
 - Connects the various sets of tissues
 - Provides protection and support
 - Stores and transport materials
 - Eg. Blood, fat tissues, cartilage tissue and bone tissues
- d. Muscle tissue
 - Causes movement by contraction
 - Found in heart, walls of the digestive tract and skeletal muscle

Organs

- A few different types of tissue grouped together form an organ
- Eg. Heart, eyes, ears, kidneys



Systems



1. The **skeletal system** consists of **206** bones. Its functions include:
 - Strengthen and support the body.
 - Protect important internal organs.
2. The **muscular system** contains three different kinds of muscle, Functions of the muscular system include:
 - Constitute different kinds of body movements through muscular contractions (e.g. heart beat and breathing).
 - Maintain posture, stabilize joints, and produce energy.
3. The **nervous system** is composed of the brain, spinal cord, and millions of nerve cells
 - The major function of the nervous system is to pass information and nerve impulses from one part of the body to another.
4. The **respiratory system** consists of the lungs and the many air tracts of different sizes.
 - The main function of the respiratory system is to provide passages and room for gaseous exchange.
5. The **circulatory system** is composed of the heart and a complicated network of blood vessels.
 - Its main function is to transport nutrients and oxygen to the body tissues, and remove metabolic wastes from the cells at the same time.
6. The **lymphatic system** is made up of a network of lymph vessels that runs along the veins and arteries. Functions of the lymphatic system include:
 - The lymph node along the lymph vessels contains cells that can destroy bacteria, and helps the immune response.
7. The **digestive system** contains the esophagus and certain organs responsible for digestion
 - It main function is to break down food into smaller substances for better absorption.
8. The **urinary system** is made up of two horsebean-shaped kidneys, two ureters, urinary bladder, and the urethra. Major functions of the urinary system include:

- Discharge metabolic wastes outside the body through urination.

9. The **endocrine system** is made up of special glands called the endocrine glands.

- Its major functions is to secrete hormones to regulate metabolism of the body, growth, development and reproduction.

10. The **reproductive system** differs very much in male and female.

- The major function of the reproductive system is for the production of offspring.

Each of the above systems is responsible for the processes that are essential for life.

Human beings are complex organisms

- human have millions of cells which specialised to perform specific functions
- specialisation of cells in the body enables body cells to perform various life processes, causing division of work among the cells
- cells are organised to perform tissues, organs and systems to ensure body function efficiently and smoothly



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