UNIT 5

Preparation

Prerequisite Concepts

This unit draws and builds upon your understanding of human systems, homeostasis, and the flow of matter in living systems from your Biology 20 studies.

Organization of Systems in the Human Body

The trillions of cells that make up your body can be organized into about one hundred different types. Similarly specialized cells that perform a common function make up a tissue. Tissues of different types are organized as organs, which themselves are organized structurally and functionally as systems that work together to perform functions necessary to sustain and maintain the human organism. These functions may be divided into groups with a common purpose.

Transport

Circulatory system

Lymphatic and immune systems

The circulatory system consists of the heart and the blood vessels, which pump and carry blood through the body. Blood transports nutrients and oxygen to cells and removes waste molecules excreted by cells. While blood is moving throughout the body, it distributes heat produced by the muscles.

The lymphatic system consists of lymphatic vessels, lymph, and lymph nodes. Lymphatic vessels absorb fat from the digestive system and collect excess tissue fluid, which is returned to the blood and, thus, the circulatory system.

The circulatory system and the lymphatic system are also involved in protecting the body against disease and substances that are foreign to the body. Certain blood cells—white blood cells (leukocytes and lymphocytes) and platelets—are part of the body's immune system.

Maintenance of the Body

Digestive system

Respiratory system

Excretory system

Three systems—the digestive, respiratory, and excretory systems—add and/or remove substances from the blood.

The digestive system consists of the digestive tract and various organs that directly or indirectly process food into nutrient molecules that enter the blood.

The respiratory system consists of the lungs and tubes that take air to and from the lungs. This system brings oxygen into the body and removes carbon dioxide from the body. It also exchanges gases with the blood.

The excretory (urinary) system includes the kidneys and the urinary bladder, along with tubes that process and transport urine. This system rids the body of wastes and helps regulate the fluid level and chemical content of the blood.

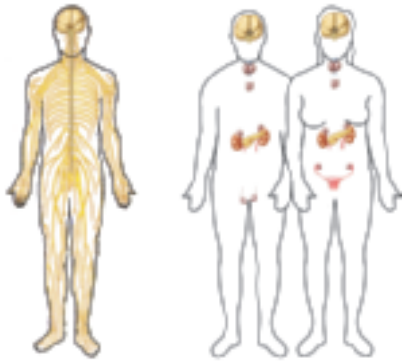
Sensory Input and Motor Output

Integumentary system | Muscular system | Skeletal system

The integumentary system consists of the skin and its accessory structures. The sensory receptors in the skin, and in organs such as the eyes and ears, are sensitve to certain external stimuli and communicate with the brain and spinal cord via nerve fibres.

The muscular and the skeletal systems include the muscles and the bones to which they are attached. This system enables the body and its parts to move. The motor system, along with the integumentary system, also protects and supports the internal environment of the body.

Control



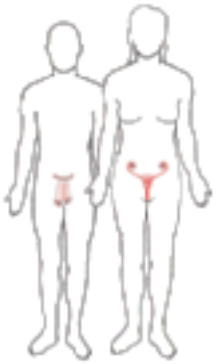
Nervous system | Endocrine system

The nervous system consists of the brain, spinal cord, and associated nerves that conduct nerve impulses from receptors to the brain the spinal cord. Nerves also conduct impulses from the brain and spinal cord to the muscles and glands, allowing the body to respond to both external and internal stimuli.

The endocrine system consists of the hormonal glands that secrete chemicals that serve as messengers between body cells. Both the nervous and the endocrine systems coordinate and regulate the functions of the body's other systems.

You will be studying these two systems in greater detail in Unit 5.

Reproduction



Reproductive system

The reproductive system involves different organs in the male and the female. The male system consists of the testes and other glands, as well as ducts, that conduct semen to and through the penis. The testes produce sex cells called sperm. The female system consists of the ovaries, oviducts, uterus, vagina, and external genitals. The ovaries produce sex cells called eggs or ova. When a sperm fertilizes an egg, an offspring begins development.

You will be studying the male and female reproductive systems in greater detail in Unit 6.