

Section 1 The Human Organism

- A. The human body is organized in a series of building blocks that differ in size and complexity.
- B. Life is based in chemistry; substances are either elements or compounds.
1. Inorganic substances—come from nonliving things
 - a. Minerals are involved in many of the body's chemical reactions.
 - b. Water makes up more than 70 percent of the body's tissues and plays a role in nearly every body function.
 2. Organic compounds contain carbon and make up living things
 - a. Carbohydrates (made up of carbon, hydrogen, and oxygen) are the main source of energy for living things
 - b. Lipids (fats and oils) are stored as energy reserves; they contain more energy per molecule than carbohydrates do.
 - c. Nucleic acids (DNA and RNA) direct cell activities including instructions for making proteins.
 - d. Proteins make up body structures and help carry out body processes.
- C. Cells, the smallest functional units in an organism, take in raw materials and make proteins and other products through chemical reactions.
1. Cells are organized into tissues, groups of similar cells that do the same sort of work.
 2. Tissues are organized into organs, structures made up of different types of tissue that work together.
 3. Organs are organized into organ systems, groups of organs working together to do a particular job.

Discussion Question

What are four organic compounds found in the body? *carbohydrates, lipids, nucleic acids, and proteins*

END

CHAPTER
3

Content Outline
for Teaching

Interactions of Human
Systems

Underlined words and phrases are to be filled in by students on the Note-taking Worksheet.

Section 2 How Your Body Works

- A. Systems in the body interact and work together.
1. The heart and lungs put oxygen into blood and take carbon dioxide out of it.
 2. Chemicals from food are distributed throughout the body for important body functions.
- B. **Digestion**—the breakdown of foods into molecules that cells can use; digestive system is a long tube that runs through the body
1. **Enzymes**—proteins that aid chemical reactions; some break down the chemicals in food
 2. Villi are tiny, fingerlike projections in the small intestine.
 3. Nutrients enter the bloodstream by passing through the villi in the process of **absorption**.
- C. **Cellular respiration** is a series of chemical processes in which oxygen combines with food molecules and energy is released; carbon dioxide and water are waste products.
1. The respiratory system interacts with the circulatory system in the lungs.
 - a. Lungs are made up of millions of alveoli, tiny, thin-walled sacs surrounded by capillaries.
 - b. Oxygen and carbon dioxide are exchanged between the alveoli and the capillaries.
 2. **Excretion**—the removal of waste products that occurs through the circulatory, respiratory, digestive, and urinary systems
 3. Kidneys, part of the urinary system, remove cell wastes and control the amount of water in blood.
 4. Nephrons in the kidneys filter the blood and produce urine.



- D. **Homeostasis**—process used by the body to maintain a stable internal environment
1. **Negative feedback**—the body changes an internal condition back to its normal state; the most common way the body regulates itself
 - a. Example: When blood pressure rises, the heart slows down.
 - b. Example: When glucose levels are too high, the pancreas secretes insulin to stimulate the absorption of glucose and the conversion of glucose into glycogen.
 2. **Positive feedback**—the body reacts to a change from the normal state by causing an even greater change
 - a. When contractions in the uterus push a baby into the birth canal, contractions in the uterus increase.
 - b. When a blood vessel is damaged, the vessel constricts and chemicals are released to plug and repair the hole.

Discussion Question

What is negative feedback and why is it important? *Negative feedback tells the body to return to a normal condition; it is important for the body to maintain a stable internal environment.*

END