

GRADE 7

UNIT 3

DYNAMIC EQUILIBRIUM

<p>UNIT 3 – Dynamic Equilibrium: The Human Animal (SEPUP <i>Body Works</i> Module)</p>	<p>Time needed: 6-7 weeks</p>
<p>ESSENTIAL QUESTION: How do human body systems function to maintain homeostasis?</p>	
<p>Key Idea 1: Living things are both similar to and different from each other and from nonliving things.</p>	
<p>Performance Indicator 1. Compare and contrast the parts of plants, animals, and one-celled organisms.</p>	
<p>Major Understandings: LE 1.1a Living things are composed of cells. Cells provide structure and carry on major functions to sustain life. Cells are usually microscopic in size. LE 1.1b The way in which cells function is similar in all living things. Cells grow and divide, producing more cells. Cells take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or an organism needs. LE 1.1c Most cells have cell membranes, genetic material, and cytoplasm. Some cells have a cell wall and/or chloroplasts. Many cells have a nucleus. LE 1.1d Some organisms are single cells; others, including humans, are multicellular. LE 1.1e Cells are organized for more effective functioning in multicellular organisms. Levels of organization for structure and function of a multicellular organism include cells, tissues, organs, and organ systems. LE 1.1f Many plants have roots, stems, leaves, and reproductive structures. These organized groups of tissues are responsible for a plant’s life activities. LE 1.1g Multicellular animals often have similar organs and specialized systems for carrying out major life activities. LE 1.1h Living things are classified by shared characteristics on the cellular and organism level. In classifying organisms, biologists consider details of internal and external structures. Biological classification systems are arranged from general (kingdom) to specific (species).</p>	
<p>Performance Indicator 2. Explain the functioning of the major human organ systems and their interactions.</p>	
<p>Major Understandings: LE 1.2a Each system is composed of organs and tissues which perform specific functions and interact with each other, e.g., digestion, gas exchange, excretion, circulation, locomotion, control, coordination, reproduction, and protection from disease. LE 1.2b Tissues, organs, and organ systems help to provide all cells with nutrients, oxygen, and waste removal. LE 1.2c The digestive system consists of organs that are responsible for the mechanical and chemical breakdown of food. The breakdown process results in molecules that can be absorbed and transported to cells. LE 1.2d During respiration, cells use oxygen to release the energy stored in food. The respiratory system supplies oxygen and removes carbon dioxide (gas exchange).</p>	

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- LE 1.2e The excretory system functions in the disposal of dissolved waste molecules, the elimination of liquid and gaseous wastes, and the removal of excess heat energy.
- LE 1.2f The circulatory system moves substances to and from cells, where they are needed or produced, responding to changing demands.
- LE 1.2g Locomotion, necessary to escape danger, obtain food and shelter, and reproduce, is accomplished by the interaction of the skeletal and muscular systems, and coordinated by the nervous system.
- LE 1.2h The nervous and endocrine systems interact to control and coordinate the body's responses to changes in the environment, and to regulate growth, development, and reproduction. Hormones are chemicals produced by the endocrine system; hormones regulate many body functions.
- LE 1.2i The male and female reproductive systems are responsible for producing sex cells necessary for the production of offspring.
- LE 1.2j Disease breaks down the structures or functions of an organism. Some diseases are the result of failures of the system. Other diseases are the result of damage by infection from other organisms (germ theory). Specialized cells protect the body from infectious disease. The chemicals they produce identify and destroy microbes that enter the body.

General Skills (from NYS Core Curriculum)

- GS 1. follow safety procedures in the classroom and laboratory
- GS 2. safely and accurately use the following measurement tools: metric ruler, balance, stopwatch, graduated cylinder, thermometers, spring scale, voltmeter
- GS 3. use appropriate units for measured or calculated values
- GS 4. recognize and analyze patterns and trends
- GS 5. classify objects according to an established scheme and a student-generated scheme
- GS 6. develop and use a dichotomous key
- GS 7. sequence events
- GS 8. identify cause-and-effect relationships
- GS 9. use indicators and interpret results

Living Environment Skills (from NYS Core Curriculum)

- LE 1. Manipulate a compound microscope to view microscopic objects
- LE 2. Determine the size of a microscopic object, using a compound microscope
- LE 3. Prepare a wet mount slide
- LE 4. Use appropriate staining techniques
- LE 5. Design and use a Punnett square or a pedigree chart to predict the probability of certain traits
- LE 6. Classify living things according to a student-generated scheme and an established scheme
- LE 7. Interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web
- LE 8. Identify pulse points and pulse rates
- LE 9. Identify structure and function relationships in organisms.

