Life Science

UNIT 5 – BODY SYSTEMS

Standards, Elements & Skills:

Students will describe the structure and function of cells, tissues, organs, and organ systems.

e. Explain the purpose of the major organ systems in the human body (i.e., digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease).

Skills:

- Identify the major organs contained within the major organ systems.
- Identify the role of each organ in the processes of the major organ systems of the human body.
- Differentiate between the functions of the major organ systems in the human body
- Demonstrate an understanding of the interdependence of major organ systems.

d. Explain that tissues, organs, and organ systems serve the needs cells have for oxygen, food, and waste removal.

Skills:

- Explain that tissues serve the needs cells have for oxygen, food, and waste removal
- Explain that organs serve the needs cells have for oxygen, food, and waste removal
- Explain that organ systems serve the needs cells have for oxygen, food, and waste removal.

Key Learnings:

Students will know that:

- Organ systems are made up of major organs.
- Major organs systems have specific roles in the human body.
- Organ systems are dependent on one another to carry out their functions.
- Tissues, organs, and organ systems serve the needs of cells.

Students will be able to:

- Differentiate between the functions of the major organ systems in the human body
- Demonstrate understanding of the interactions of these systems.
- Explain that tissues, organ, and organ systems serve the needs that cells have for oxygen, food, and waste removal.

Vocabulary:

- System - a group of organs that work together to perform a major function in the body
- Skeletal System - system of the body that provides shape and support, allows for movement, protects your organs, and stores mineral and other materials
- Muscular System - system of the body that allows you to move
- Integumentary System - the system of the body that covers and protects the body from injury, infection, and water loss, helps regulate body temperature, eliminates wastes, produces vitamin D, and gathers information about the environment
- Nervous System - the system of the body that receives information from inside and outside the body and directs the way in which your body responds to this information
- Endocrine System - the system of the body that produces chemicals that control many of the body's daily activities and helps to regulate long term changes such as growth and development
- Respiratory System - the system of the body that moves oxygen from the outside environment into the body and removes carbon dioxide and water from the body
- Circulatory System - the system of the body that carries needed substances to the cells and carries waste products away from the cells; also helps to fight disease
- Lymphatic System - the system of the body that filters foreign organisms from the lymph; help to fight infection
- Digestive System - the system of the body that breaks down food molecules so they can be absorbed into the blood and eliminate waste from the body
- Excretory System - the system of the body that collects wastes produced by cells and removes the wastes from the body
- Reproductive System - the system of the body that allows organisms to reproduce
- Immune System - The system of the body that help fight off infection

Essential Questions & Answers:

How does the circulatory system work with digestive, respiratory and muscular systems?
The organ systems of the body constantly work with each other to maintain homeostasis and the overall health of the body. The muscular system on a larger scale moves our bodies but on a cellular level needs food, water and other substances to provide the energy that is needed for this movement. The muscle cells receive these nutrients and get rid of waste through the circulatory system. Through the digestive and respiratory systems, the circulatory system brings nutrients and oxygen to the cells of the body, such as the muscular system. Through working with the digestive and respiratory systems, the circulatory system gets rid of waste and carbon dioxide picked up from the cells, such as the cells in the muscular system.

Using two different organ systems explain how the two systems work together to carry out one task.
The respiratory system and the digestive system work together to get oxygen and food to the cells so that energy can be produced and the cell can carry out its task. Answers vary – as long as the student can justify the relationship go with it.

What major organs systems help support the needs of the mitochondria?
The respiratory and circulatory systems provide the mitochondria with oxygen. The digestive and circulatory system supply the mitochondria with food. The circulatory and excretory system help the cell rid the body of waste.

What major body system does the cell membrane work most directly with, and how does this system support the cells needs?
The cell membrane works with the circulatory system. The circulatory system delivers nutrients, water, and oxygen to the cell and transport waste away from the cell. All of these materials pass in and out of the cell through the cell membrane into the capillaries of the circulatory system.

Choose an organ system and compare it to a cell organelle.
The nucleus is similar to the brain because it controlled the activities of the cell like the brain controls the activities of the body.
The cytoplasm is like blood. Materials are carried to the body through the blood stream just as materials for the cells organelles are carried through the cytoplasm.
The cell membrane is similar to skin because it protects the internal parts of a cell just as the skin contains the body's organs and protects the body.
The mitochondria are similar to the intestines. The intestines are where most of the nutrients from food are released to the body while the mitochondrion is where energy is released to the cell.
The stomach and vacuole are similar in that they both hold food and water for the cell/body.
A cell wall is similar to an exoskeleton because it give shape and support like our body's endoskeleton.