

Anatomy and Physiology Curriculum Overview

Unit 1 - Introduction

Students will:

- **Differentiate** between physiology and anatomy
- **Describe** the various cell and tissue types (clarification: epithelial, connective, nervous, muscle)
- **Identify** anatomical regions and anatomical directional terminology
- **Define** homeostasis in terms of feedback loops. (ie: Temperature regulation)

Supports the Foundational Learning of NGSS

HS-LS1 From Molecules to Organisms: Structures and Processes

Performance Expectations:

HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

HS-LS1-4 Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

HS-LS1-7 Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.

Unit 1 - Integumentary System

Students will:

- **Identify and describe the functions** of the layers of the skin and corresponding components. (including receptors (noci, thermo, chemo, mechano, proprio-receptors)
- **Describe the structure and function** of corresponding components of skin
- **Explore** disruptions of homeostasis (i.e.: skin cancer, wounds, burns, acne, moles, psoriasis, etc.)
- **Distinguish between** the complexity levels of structural organization

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Unit 2 - Muscular and Skeletal Systems

Students will:

- **Identify** structures and histology of the muscular and skeletal systems.
- **Describe** the functions of the muscular and skeletal system and their interdependence.
- **Identify** the major joint types and components.
- **Explain** the structure and function of muscle and bone cells.
- **Describe** the mechanism of muscle contraction.
- **Identify** major muscles of the muscular system

- **Identify** major bones of the axial and appendicular skeletal system
- **Explore** disruptions of homeostasis (i.e.: fractures, sprains, etc.)

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Unit 3 - Nervous System

Students will:

- **Describe** the divisions of nervous system.
- **Identify** the structures of the nervous system.
- **Describe** the functions of the central and peripheral nervous system.
- **Describe** the cell and tissue types of the nervous system.
- **Explore** the physiology of nerve conduction and the events in synaptic transmission.
- **Identify and describe** the structure and function of sensory organs.
- **Explore** disruptions of homeostasis (i.e.:multiple sclerosis, epilepsy, addiction, etc.)

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Unit 4 - Digestive System

Students will:

- **Identify** the basic anatomy and physiology of the human digestive system.
- **Describe** the functions of the organs within the digestive system.
- **Examine** the histology of the organs of the digestive system.
- **Compare** mechanical and chemical digestion
- **Explore and describe** the basic absorption of macromolecules, vitamins and minerals.
- **Explain** the role of enzymes and bile in the digestive system.
- **Explore** disruptions of homeostasis (i.e.:constipation, ulcers, diarrhea, etc.)

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Unit 5 - Circulatory System

Students will:

- **Identify** the structures and histology of the circulatory system.
- **Describe** the function of the circulatory system.
- **Describe** the pathway of blood through the heart, lungs and body.
- **Describe** the events of one cardiac cycle.
- **Identify** the components of blood.
- **Explore** blood types.
- **Explore** disruptions of homeostasis (i.e.: heart attacks, clotting, strokes, wound healing, blood pressure, etc.)

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Unit 6 - Respiratory and Excretory Systems

Students will:

- **Identify** the structures and histology of the respiratory and excretory systems.
- **Describe** the respiratory system including the mechanisms of ventilation, gas exchange, and transport.
- **Describe** the physiology of the excretory system in the production and removal of waste products.
- **Explore** disruptions of homeostasis (i.e.: kidney stones, COPD, lung cancer, kidney failure, CO poisoning, abnormal urinalysis, etc.)

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Unit 7 - Lymphatic and Immune Systems

Students will:

- **Explain** the basic functions and structure of the lymphatic system.
- **Explain** the basic functions of the immune response.

- **Discuss** the roles of the cells of the immune system and how they function in acquired immunity in both the primary or secondary immune response
- **Discuss** the roles of active and passive immune responses.
- **Explore** disruptions of homeostasis

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Unit 8 - Endocrine and Reproductive Systems

Students will:

- **Identify** the major anatomical structures of the endocrine system.
- **Describe** the major functions of the endocrine glands and the hormones they produce
- **Differentiate** between endocrine and exocrine glands on a macroscopic level.
- **Identify** and discuss the major endocrine disorders
- **Identify** the major anatomical structures of the male and female reproductive systems
- **Describe** the menstrual cycle/phases
- **Explore** disruptions of homeostasis

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Project

Select a systemic disease and complete research during the duration of the course

Students will:

- **Conduct** systematic observations and examine multiple resources to research problem
- **Use** tools to gather, analyze, and interpret data
- **Pose** answers and explanations through hypothesis and predictions
- **Use** appropriate evidence and reasoning to **justify** how chosen disease will impact body systems and **explain** connections to others