Moon Area School District Curriculum Map

Course: HONORS HUMAN ANATOMY AND PHYSIOLOGY
Grade Level: 11TH and 12TH
Content Area: Science
Frequency: Full-Year Course

Big Ideas

1. The internal environment of the human organism is actively maintained constant by the function of cells, tissues, and organs organized into systems of negative feedback.
2. Structure and function, from molecular structures to organ structure, are intrinsically related to one another.
3. Understanding physical functions requires understanding of behavior at each level of organization and realization that there is tremendous interrelatedness among them.

Essential Questions

1. How are structure and function related within a human system?
2. How is homeostasis maintained within a human system?
3. What is the effect of homeostatic imbalance in a human system?
4. How are systems interdependent on each other?
5. What is the essential medical vocabulary to learn in order to demonstrate strong understanding of a human system?

Primary Resource(s) & Technology:
Textbook Series, IXL online software,
Microsoft Teams, Promethean Boards, Student Laptops/iPads

Pennsylvania and/or focus standards referenced at:
www.pdesas.org
www.education.pa.gov

Big Ideas/EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
The Human Body: An Orientation. **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.C 3.3.12.A 3.3.12.B	-define anatomy and physiology -name the levels of structural organization that make up the human body	August - September 2 weeks

		-name the organ systems of the body and state their function -list functions that humans must perform to maintain life -define homeostasis -define negative feedback and describe its role in homeostasis -verbally describe anatomical position -use proper anatomical terminology to describe body directions, surfaces, and body planes -locate the major body cavities	
Basic Chemistry **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.B 3.1.12.C 3.3.12.B 3.4.12.A	-differentiate between matter and energy -list the major energy forms -define chemical element and list the four elements that form the bulk of body matter -compare and contrast carbohydrates, lipids, proteins, and nucleic acids -define enzyme and explain their role -explain the importance of ATP in the body	September 1 week
Cells and Tissues **- BI: 1, 2, 3**	3.1.12.A 3.1.12.B	-define cell, organelle, and inclusion	Sept-Oct 2 weeks

EQ: 1, 2, 3, 4, 5	3.1.12.C 3.1.12.D 3.3.12.A 3.3.12.B 3.3.12.C	-identify the organelles on a cell model and identify their function -identify transport mechanisms of specific substances across the plasma membrane -name and describe the four major tissue types -locate tissue types in the body	
Skin and Body Membranes **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.B 3.1.12.C 3.2.12.A 3.3.12.A 3.3.12.B	-list the functions of each major body membrane - compare the tissue that make up the major membrane types -list functions of the integumentary system -label a diagram of the skin -name the factors that determine skin color -differentiate between first, second, and third degree burns	October 3 weeks
The Skeletal System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.C 3.1.12.D 3.3.12.A 3.3.12.B	-identify the subdivisions of the skeleton -name the four main classification of bones -identify the major anatomical areas of a long bone -identify the major bones of the body	Oct-Nov 5 weeks

The Muscular System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.B 3.3.12.A 3.3.12.B	-describe similarities and differences in the structure and function of the three types of muscle tissue -define muscular system -describe microscopic structure of skeletal muscle -describe steps of muscle action potential using correct terminology -describe three ways in which ATP is regenerated during muscle activity -describe oxygen debt and muscle fatigue -define origin, insertion, antagonist, synergist and fixator as they relate to muscles -name and locate major muscles and state their action	Nov-Dec 3-4 weeks
The Nervous System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.B 3.3.12.A 3.3.12.B	-list general functions of the nervous system -define central nervous system and peripheral nervous system -state the function and describe the structure of neurons -list the types of general sensory receptors and describe their functions -describe the steps of a nerve impulse	January-Feb 5 weeks

		-define reflex arc and list its elements -identify and indicate the functions of the major regions of the cerebral hemispheres -name the three meningeal layers -discuss the function of the spinal cord -describe the general function of a nerve -identify the function of the sympathetic and parasympathetic divisions of the autonomic nervous system	
The Endocrine System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.C 3.3.12.A 3.3.12.B	-define hormone and target organ -describe how endocrineglands and hormones function. -define negative feedback -describe the difference between endocrine andexocrine glands. - identify the major endocrineglands and their function. -discuss ways in which hormones promote bodyhomeostasis.	Feb-Mar 3 weeks

Blood **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.C 3.2.12.A 3.3.12.A 3.3.12.B	- indicate the composition and volume of wholeblood. - list the cell types in blood and describetheir function. - Explain the role of the hemocytoblast - Describe the blood-clotting process - Name some factorsthat may inhibit or enhance the blood-clotting process - describe the ABO and Rh blood groups. - explain the basis for a transfusion reaction - explain the basis of physiologic jaundice seen in some newborn babies.	March 2 weeks
The Cardiovascular System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.B 3.3.12.A 3.3.12.B	-Describe to location of theheart -trace the pathway of bloodthrough the heart -compare the pulmonary and systemic circuits -explain the operation of theheart valves - name the functional bloodsupply of the heart - name the element of the intrinsic conduction system	Mar-Apr 3 weeks

		of the heart -define systole, diastole, stroke volume, cardiac cycle, heart sounds, and murmur -compare and contrast the structure and function of arteries, veins, and capillaries. -define blood pressure andpulse -define hypertension and atherosclerosis, and describe possible health consequencesof these conditions	
The Lymphatic System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.B 3.3.12.A 3.3.12.B	- name the two majortypes of structures composing the lymphatic system, and explain how the lymphatic system is functionally related to the cardiovascular and immune system - Describe the composition and function of lymph and lymph structures. - Describe the protective functions ofskin and mucous membranes. - Explain the importance of phagocytes and natural killer cells - Describe the inflammatory process - Define antigen andhapten - Compare and contrastthe function of B an	April 2-3 weeks

		- T lymphocytes - List the five antibody classes - Distinguish betweenactive and passive immunity	
The Respiratory System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.B 3.1.12.C 3.3.12.A 3.3.12.B	- name the organs of the respiratory passageway and describe their function - describe protective mechanisms of the respiratory system. - Define cellular respiration, externalrespiration, internal - respiration,pulmonary ventilation, expiration,and inspiration. - Explain mechanismsof air flow. - Describe respiratory volumes - Describe the process of gas exchange in the lungs and tissues. - Name several physical factors that influence respiratoryrate. - Describe the symptoms and probable causes of	Apr-May 2-3 weeks

		COPD and lung cancer.	
The Digestive System and Body Metabolism **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.B 3.1.12.C 3.3.12.A 3.3.12.B	- name the organs of the alimentary system and how theyfunction - Identify the overall function of the digestive system - Explain how villi aid digestive processes. - Describe the mechanisms of swallowing, vomiting, and defecation. - List the major enzymes produced by the digestive organs or accessory glands, and name the foodstuffs on which they act. - State the function of bile in the digestive process - Define nutrient and calorie - List the six major nutrient categories - Define enzyme, metabolism, anabolism, and catabolism - Describe the metabolic roles of the liver - Recognize the sources of carbohydrates,	May 2-3 weeks

		fats,and proteins, and their uses in cell metabolism - List several factors that influence metabolic rate, and indicate the effect ofeach	
The Urinary System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.B 3.3.12.A 3.3..12.B	- identify the regions ofthe kidney - recognize the structure and functionof a nephron - describe the process or urine formation - describe the function of the kidneys in excretion of nitrogen-containing wastes - describe the composition of normal urine - describe general structure and function of ureters, bladder, and urethra - name three common urinary tract problems - name and localize the three main fluid compartments of the body - explain the role of	May 1-2 weeks

		antidiuretic hormone in the regulation ofwater balance. - Explain the role of aldosterone in sodiumand potassium balance of the blood - Compare and contrast the relative speed of buffers, the respiratory system, and the kidneys in maintaining the acid-base balance of the blood.	
The Reproductive System **BI: 1, 2, 3** **EQ: 1, 2, 3, 4, 5**	3.1.12.A 3.1.12.B 3.3.12.A 3.3.12.B	-identify and state function forthe organs of the male reproductive system -trace the pathway followed bysperm -define meiosis and spermatogenesis -identify and state function forthe organs of the female reproductive system. -describe function of the vesicular follicle and corpus luteum of the ovary. -define oogenesis -describe the phases and controls of the menstrual cycle -describe the structure andfunction of the mammary glands	May-June 1-2 weeks

		-define fertilization and zygote -distinguish between anembryo and a fetus -identify the three stages of labor	
Dissection of Fetal Pig -examine external and internal anatomy of fetal pig		- preserved pigs and lab manuals	Usually some time in May 3-4 days