

Treasure Coast Science Scope and Sequence 2012-2013

Course: Anatomy and Physiology Honors

Course Code: 2000360

Quarter: 3A

Topic(s) of Study: Endocrine System

Bodies of Knowledge: Nature of Science and Life Science

Standard(s): 1: Practice of Science, 14: Organization and Development of Living Organisms, 18: Matter and Energy Transformation

Essential Questions: Why is the endocrine system important? How does the endocrine system control body functions? What diseases are associated with this disease? What are the factors that can affect personal and public health? How do scientists design an investigation to answer a scientific question and communicate their findings?

[Syllabus: Click here](#)

[Resources: Click here](#)

[CCSS Literacy Standards: Click here](#)

NGSSS	OUTLINE OF CONTENT (CONCEPT/SKILLS)	TARGETS
<p>SC.912.L.14.29: Define the terms endocrine and exocrine. Cognitive Complexity: Low</p>	<p>I Overview</p> <p>A. Endocrinology</p> <p>B. Autocrines</p>	<ul style="list-style-type: none"> Indicate important differences between hormonal and neural controls of body functioning. (I)
<p>SC.912.L.14.30: Compare endocrine and neural controls of physiology. Cognitive Complexity: Moderate</p>	<p>II Hormones</p> <p>A. Chemistry of Hormones</p> <p>B. Mechanisms of Hormone Action</p> <p>C. Target Cell Specificity</p>	<ul style="list-style-type: none"> List the major endocrine organs, and describe their body locations. (I) Distinguish between hormones, paracrines, and autocrines. (I) Describe how hormones are classified chemically. (II)
<p>SC.912.L.14.31: Describe the physiology of hormones including the different types and the mechanisms of their action. Cognitive Complexity: Moderate</p>	<p>D. Half-Life, Onset, and Duration of Hormone Activity</p> <p>E. Interaction of Hormones at Target Cells</p>	<ul style="list-style-type: none"> Describe the two major mechanisms by which hormones bring about their effects on their target tissues. (II) List three kinds of interaction of different hormones acting on the same target cell. (II)
<p>SC.912.L.14.6: Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. Cognitive Complexity: High</p>	<p>F. Control of Hormone Release</p> <p>III The Pituitary Gland and Hypothalamus</p> <p>A. Pituitary Gland location</p>	<ul style="list-style-type: none"> Explain how hormone release is regulated. (II) Describe structural and functional relationships between the hypothalamus and the pituitary gland. (III)
<p>SC.912.L.18.3: Describe the structures of fatty acids, triglycerides, phospholipids, and steroids. Explain the functions of</p>	<p>B. Pituitary Gland Two Lobes</p> <p>C. Anterior Pituitary Hormones</p> <p>D. The Posterior Pituitary and</p>	<ul style="list-style-type: none"> List and describe the chief effects of anterior pituitary hormones. (III) Discuss the structure of the posterior pituitary, and describe the effects of the two hormones it releases. (III) Describe important effects of the two

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<p>lipids in living organisms. Identify some reactions that fatty acids undergo. Relate the structure and function of cell membranes. Cognitive Complexity: Moderate</p> <p>SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> 1.pose questions about the natural world, 2.conduct systematic observations, 3.examine books and other sources of information to see what is already known, 4.review what is known in light of empirical evidence, 5.plan investigations, 6.use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), 7.pose answers, explanations, or descriptions of events, 8.generate explanations that explicate or describe natural phenomena (inferences), 9.use appropriate evidence and reasoning to justify these explanations to others, 10.communicate results of scientific investigations, and 11.evaluate the merits of the explanations produced by others. Cognitive Complexity: 	<p style="text-align: center;">Hypothalamic Hormones</p> <p>IV The Thyroid Gland</p> <p>V The Parathyroid Glands</p> <p>VI The Adrenal (Suprarenal) Glands</p> <p>VII The Pineal Gland</p> <p>VIII Other Endocrine Glands and Tissues</p> <p>IX Developmental Aspects of the Endocrine System</p>	<p>groups of hormones produced by the thyroid gland. (IV)</p> <ul style="list-style-type: none"> • Follow the process of thyroxine formation and release. (IV) • Indicate general functions of parathyroid hormone. (V) • List hormones produced by the adrenal gland, and cite their physiological effects. (VI) • Briefly describe the importance of melatonin. (VII) • Compare and contrast the effects of the two major pancreatic hormones. (VIII) • Describe the functional roles of hormones of the testes, ovaries, and placenta. (VIII) • Name a hormone produced by the heart. (VIII) • State the location of enteroendocrine cells. (VIII) • Briefly explain the hormonal functions of the kidney, skin, adipose tissue, bones, and thymus. (VIII) • Describe the effect of aging on endocrine system functioning. (IX) • Define a scientific problem or question based on the specific body of knowledge correlated to the anatomy and physiology honors science course.
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<p>High</p> <p>HE.912.C.1.3: Evaluate how environment and personal health are interrelated.</p> <p>HE.912.C.1.4: Analyze how heredity and family history can impact personal health</p>		
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Course: Anatomy and Physiology Honors

Course Code: 2000360

Quarter: 3B

Topic(s) of Study: Blood and Cardiovascular System

Bodies of Knowledge: Nature of Science and Life Science

Standard(s): 1: Practice of Science, 14: Organization and Development of Living Organisms

Essential Questions: Why is blood essential for the maintenance of the body? How is blood cycled through the body? How does the heart beat? What factors affect the heart? How does the fetal circulatory system change after birth? What are some diseases associated with blood and the heart? What are the factors that can affect personal and public health? How do scientists design an investigation to answer a scientific question and communicate their findings?

[Syllabus: Click here](#)

[Resources: Click here](#)

[CCSS Literacy Standards: Click here](#)

NGSSS	OUTLINE OF CONTENT (CONCEPT/SKILLS)	TARGETS
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<p>SC.912.L.14.34: Describe the composition and physiology of blood, including that of the plasma and the formed elements. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.35: Describe the steps in hemostasis, including the mechanism of coagulation. Include the basis for blood typing and transfusion reactions. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.36: Describe the factors affecting blood flow through the cardiovascular system. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.37: Explain the components of an electrocardiogram. Cognitive Complexity: Low</p> <p>SC.912.L.14.38: Describe normal heart sounds and what they mean. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.39: Describe hypertension and some of the factors that produce it. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.40: Describe the histology of the major arteries and veins of systemic, pulmonary, hepatic portal, and coronary circulation. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.41: Describe fetal circulation and changes that occur to the circulatory system</p>	<p>I Overview: Blood Composition and Functions</p> <p style="padding-left: 20px;">A. Components</p> <p style="padding-left: 20px;">B. Physical Characteristics and Volume</p> <p style="padding-left: 20px;">C. Functions</p> <p>II Blood Plasma</p> <p>III Formed Elements</p> <p style="padding-left: 20px;">A. Erythrocytes</p> <p style="padding-left: 20px;">B. Leukocytes</p> <p style="padding-left: 20px;">C. Agranulocytes</p> <p style="padding-left: 20px;">D. Platelets</p> <p>IV Hemostasis</p> <p>V Transfusion and Blood Replacement</p> <p>VI Diagnostic Blood Tests</p> <p>VII Developmental Aspects of Blood (including heredity and environmental factors)</p> <p>VIII Heart Anatomy</p> <p style="padding-left: 20px;">A. Size, Location, and Orientation</p> <p style="padding-left: 20px;">B. Coverings of the Heart</p> <p style="padding-left: 20px;">C. Layers of the heart Wall</p> <p style="padding-left: 20px;">D. Chambers and Associated Great Vessels</p> <p style="padding-left: 20px;">E. Pathway of Blood Through the Heart</p> <p style="padding-left: 20px;">F. Coronary Circulation</p> <p style="padding-left: 20px;">G. Heart Valves</p> <p>IX Cardiac Muscle Fibers</p> <p style="padding-left: 20px;">A. Microscopic Anatomy</p>	<ul style="list-style-type: none"> • Describe the composition and physical characteristics of whole blood. Explain why it is classified as a connective tissue. (I) • List eight functions of blood. (I) • Discuss the composition and functions of plasma. (II) • Describe the structure, function, and production of erythrocytes. (III) • Describe the chemical makeup of hemoglobin. (III) • Give examples of disorders caused by abnormalities of erythrocytes. Explain what goes wrong in each disorder. (III) • List the classes, structural characteristics, and functions of leukocytes. (III) • Describe how leukocytes are produced. (III) • Give examples of leukocyte disorders, and explain what goes wrong in each disorder. (III) • Describe the structure and function of platelets. (III) • Describe the processes of hemostasis. (IV) • List factors that limit clot formation and prevent undesirable clotting. (IV) • Give examples of hemostatic disorders. Indicate the cause of each condition. (IV) • Describe the ABO and Rh blood groups. (V) • Explain the basis of transfusion reactions. (V) • Describe fluids used to replace blood volume and the circumstances for their use. (V) • Explain the diagnostic importance of blood testing. (VI) • Describe changes in the sites of blood production and in the type of hemoglobin produced after birth. (VII) • Name some blood disorders that
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<p>at birth. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.6: Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. Cognitive Complexity: High</p> <p>SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> 1.pose questions about the natural world, 2.conduct systematic observations, 3.examine books and other sources of information to see what is already known, 4.review what is known in light of empirical evidence, 5.plan investigations, 6.use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), 7.pose answers, explanations, or descriptions of events, 8.generate explanations that explicate or describe natural phenomena (inferences), 9.use appropriate evidence and reasoning to justify these explanations to others, 	<p>B. Mechanism and Events of Contraction</p> <p>C. Energy Requirements</p> <p>X Heart Physiology</p> <ol style="list-style-type: none"> A. Electrical Events B. Heart Sounds C. Mechanic Events: The Cardiac Cycle D. Cardiac Output <p>XI Developmental Aspects of the Heart (including heredity and environmental factors)</p> <p>XII Overview of Blood Vessel Structure and Function</p> <ol style="list-style-type: none"> A. Structure of Blood Vessel Walls B. Arterial System C. Capillaries D. Venous System E. Vascular Anastomoses <p>XIII Physiology of Circulation</p> <ol style="list-style-type: none"> A. Introduction to Blood Flow, Blood Pressure, and Resistance B. Systemic Blood Pressure C. Maintaining Blood Pressure D. Blood Flow Through Body Tissues: Tissue Perfusion <p>XIV Circulatory Pathways: Blood Vessels of the body</p>	<p>become more common with age. (VII)</p> <ul style="list-style-type: none"> • Describe the size, shape, location, and orientation of the heart in the thorax. • Name the coverings of the heart. (VIII) • Describe the structure and function of each of the three layers of the heart wall. (VIII) • Describe the structure and functions of the four heart chambers. (VIII) • Name each chamber of the heart and provide the name and general route of its associated great vessel(s). (VIII) • Trace the pathway of blood through the heart. (VIII) • Name the major branches and describe the distribution of the coronary arteries. (VIII) • Name the heart valves and describe their location, function, and mechanism of operation. (VIII) • Describe the structural and functional properties of cardiac muscle, and explain how it differs from skeletal muscle. (IX) • Briefly describe the events of cardiac muscle cell contraction. (IX) • Name the components of the conduction system of the heart, and trace the conduction pathway. (X) • Draw a diagram of a normal electrocardiogram tracing. Name the individual waves and intervals, and indicate what each represents. (X) • Name some of the abnormalities that can be detected on an ECG tracing. (X) • Describe normal heart sounds, and explain how heart murmurs differ. (X) • Describe the timing and events of the cardiac cycle. (X) • Name and explain the effects of various factors regulating stroke volume and heart rate. (X) • Explain the role of the autonomic nervous system in regulating cardiac
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<p>10. communicate results of scientific investigations, and</p> <p>11. evaluate the merits of the explanations produced by others. Cognitive Complexity: High</p> <p>HE.912.C.1.4: Analyze how heredity and family history can impact personal health</p>	<p>A. The Two Main Circulations of the Body</p> <p>B. Systemic Arteries and Veins: Differences in Pathways and Courses</p> <p>C. Principal Vessels of the Systemic Circulation</p> <p>XV Developmental Aspects of Blood Vessels (including heredity and environmental factors)</p>	<p>output. (X)</p> <ul style="list-style-type: none"> • Describe fetal heart formation, and indicate how the fetal heart differs from the adult heart. (XI) • Provide examples of age-related changes in heart function. (XI) • Describe the three layers that typically form the wall of a blood vessel, and state the function of each. (XII) • Define vasoconstriction and vasodilation. (XII) • Compare and contrast the structure and function of the three types of arteries. (XII) • Describe the structure and function of a capillary bed. (XII) • Describe the structure and function of veins, and explain how veins differ from arteries. (XII) • Define blood flow, blood pressure, and resistance, and explain the relationships between these factors. (XIII) • List and explain the factors that influence blood pressure, and describe how blood pressure is regulated. (XIII) • Define hypertension and describe its manifestations and consequences. (XIII) • Explain how blood flow is regulated in the body in general and in its specific organs. (XIII) • Outline factors involved in capillary dynamics, and explain the significance of each. (XIII) • Define circulatory shock. List several possible causes. (XIII) • Trace the pathway of blood through the pulmonary circuit, and state the importance of this special circulation. (XIV) • Describe the general functions of the systemic circuit. (XIV) • Name and give the location of the major arteries and veins in the systemic
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		<p>circulation. (XIV)</p> <ul style="list-style-type: none">• Describe the structure and special function of the hepatic portal system. (XIV)• Explain how blood vessels develop in the fetus. (XV)• Provide examples of changes that often occur in blood vessels as a person ages. (XV)• Define a scientific problem or question based on the specific body of knowledge correlated to the anatomy and physiology honors science course.
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Treasure Coast Science Scope and Sequence 2012-2013

Course: Anatomy and Physiology Honors

Course Code: 2000360

Quarter: 3C

Topic(s) of Study: Lymphatic System

Bodies of Knowledge: Nature of Science and Life Science

Standard(s): 1: Practice of Science, 14: Organization and Development of Living Organisms, 16: Heredity and Reproduction

Essential Questions: How do nonspecific and specific body defenses keep the human body healthy? How does the lymphatic system function in helping the body stay healthy? What diseases are associated with this system? What are the factors that can affect personal and public health? How do scientists design an investigation to answer a scientific question and communicate their findings?

[Syllabus: Click here](#)

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NGSSS	OUTLINE OF CONTENT (CONCEPT/SKILLS)	TARGETS
<p>SC.912.L.14.42: Describe the anatomy and the physiology of the lymph system. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.52: Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics. Cognitive Complexity: Moderate</p> <p>SC.912.L.16.8: Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.6: Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.</p>	<p>I Lymphatic Vessels A. One Way System to the Heart B. Low-pressure Vessels</p> <p>II Lymphoid Cells and Tissues</p> <p>III Lymph Nodes</p> <p>IV Other Lymphoid Organs A. Spleen B. Thymus C. Tonsils D. Small Intestines</p> <p>V Developmental Aspects of the Lymphatic System and Lymphoid Organs and Tissues (including heredity and environmental factors)</p> <p>VI Immune System: Innate Defenses A. Surface Barriers: Skin and Mucosae B. Internal Defenses: Cells and Chemicals</p>	<ul style="list-style-type: none"> • List the functions of the lymphatic vessels. (I) • Describe the structure and distribution of lymphatic vessels. (I) • Describe the source of lymph and mechanism(s) of lymph transport. (I) • Describe the basic structure and cellular population of lymphoid tissue. (II) • Differentiate between diffuse and follicular lymphoid tissues. (II) • Describe the general location, histological structure, and functions of lymph nodes. (III) • Name and describe the other lymphoid organs of the body. (IV) • Compare and contrast other lymphoid organs with lymph nodes, structurally and functionally. (IV) • Outline the development of the lymphatic system and the lymphoid organs and tissues. (V) • Describe surface membrane barriers and their protective functions. (VI) • Explain the importance of phagocytosis and natural killer cells in innate body defense. (VI) • Describe the inflammatory process.

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<p>Cognitive Complexity: High</p> <p>SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> 1.pose questions about the natural world, 2.conduct systematic observations, 3.examine books and other sources of information to see what is already known, 4.review what is known in light of empirical evidence, 5.plan investigations, 6.use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), 7.pose answers, explanations, or descriptions of events, 8.generate explanations that explicate or describe natural phenomena (inferences), 9.use appropriate evidence and reasoning to justify these explanations to others, 10.communicate results of scientific investigations, and 11.evaluate the merits of the explanations produced by others. <p>Cognitive Complexity:</p>	<p>VII Immune System: Adaptive Defenses</p> <ol style="list-style-type: none"> A. Antigens B. Cells of the Adaptive Immune System C. Humoral Immune Response D. Cell-Mediated Immune Response E. Homeostatic Imbalances of Immunity F. Developmental Aspects of the Immune System 	<p>Identify several inflammatory chemicals and indicate their specific roles. (VI)</p> <ul style="list-style-type: none"> • Name the body’s antimicrobial substances and describe their function. (VI) • Explain how fever helps protect the body. (VI) • Define antigen and describe how antigens affect the adaptive defenses. (VII) • Define complete antigen, hapten, and antigenic determinant. (VII) • Compare and contrast the origin, maturation process, and general function of B and T lymphocytes. (VII) • Define immunocompetence and self-tolerance, and describe their development in B and T lymphocytes. (VII) • Name several antigen-presenting cells and describe their roles in adaptive defenses. (VII) • Define humoral immunity. (VII) • Describe the process of clonal selection of a B cell. (VII) • Recount the roles of plasma cells and memory cells in humoral immunity. (VII) • Compare and contrast active and passive humoral immunity. (VII) • Describe the structure of an antibody monomer, and name the five classes of antibodies. (VII) • Explain the function(s) of antibodies and describe clinical uses of monoclonal antibodies. (VII) • Follow antigen processing in the body. (VII) • Define cell-mediated immunity and describe the process of activation and clonal selection of T cells. (VII) • Describe T cell functions in the body. (VII)
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<p>High</p> <p>HE.912.C.1.3: Evaluate how environment and personal health are interrelated.</p>		<ul style="list-style-type: none">• Indicate the tests ordered before an organ transplant is done, and methods used to prevent transplant rejection. (VII)• Give examples of immune deficiency diseases and of hypersensitivity states. (VII)• Cite factors involved in autoimmune disease. (VII)• Describe changes in immunity that occurs with aging. (VII)• Briefly describe the role of the nervous system in regulating the immune response. (VII)• Define a scientific problem or question based on the specific body of knowledge correlated to the anatomy and physiology honors science course.
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Treasure Coast Science Scope and Sequence 2012-2013

Course: Anatomy and Physiology Honors

Course Code: 2000360

Quarter: 3D

Topic(s) of Study: Respiratory System

Bodies of Knowledge: Nature of Science and Life Science

Standard(s): 1: Practice of Science, 14: Organization and Development of Living Organisms, 16: Heredity and Reproduction

Essential Questions How does the respiratory system work to transport vital gases throughout the body? What diseases are associated with this system? What are the factors that can affect personal and public health? : How do scientists design an investigation to answer a scientific question and communicate their findings?

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NGSSS	OUTLINE OF CONTENT (CONCEPT/SKILLS)	TARGETS
<p>SC.912.L.14.43: Describe the histology of the respiratory system. Cognitive Complexity : Moderate</p> <p>SC.912.L.14.44: Describe the physiology of the respiratory system including the mechanisms of ventilation, gas exchange, gas transport and the mechanisms that control the rate of ventilation. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.6: Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. Cognitive Complexity: High</p> <p>SC.912.L.16.8: Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer. Cognitive Complexity: Moderate</p> <p>SC.912.L.16.10: Evaluate the impact of biotechnology on the</p>	<p>I Functional Anatomy of the Respiratory System</p> <p style="margin-left: 20px;">A. The Nose and Paranasal Sinuses</p> <p style="margin-left: 20px;">B. The Pharynx</p> <p style="margin-left: 20px;">C. The Larynx</p> <p style="margin-left: 20px;">D. The Trachea (Windpipe)</p> <p style="margin-left: 20px;">E. Bronchi and Subdivisions</p> <p style="margin-left: 20px;">F. The Lungs and Pleurae</p> <p>II Mechanics of Breathing</p> <p style="margin-left: 20px;">A. Pressure Relationships in the Thoracic Cavity</p> <p style="margin-left: 20px;">B. Pulmonary Ventilation</p> <p style="margin-left: 20px;">C. Physical Forces Influencing Pulmonary Ventilation</p> <p style="margin-left: 20px;">D. Respiratory Volumes and Pulmonary Function</p> <p style="margin-left: 20px;">E. Nonrespiratory Air Movements</p> <p>III Gas Exchange Between the Blood, Lungs, and</p>	<ul style="list-style-type: none"> • Identify the organs forming the respiratory passageway(s) in descending order until the alveoli are reached. (I) • Describe the location, structure, and function of each of the following: nose, paranasal sinuses, pharynx, and larynx. (I) • List and describe several protective mechanisms of the respiratory system. (I) • Distinguish between conducting and respiratory zone structures. (I) • Describe the makeup of the respiratory membrane, and relate structure to function. (I) • Describe the gross structure of the lungs and pleurae. (I) • Explain the functional importance of the partial vacuum that exists in the intrapleural space. (II) • Relate Boyle’s law to the events of inspiration and expiration. (II) • Explain the relative roles of the respiratory muscles and lung elasticity in producing the volume changes that cause air to flow into and out of the lungs. (II) • List several physical factors that influence pulmonary ventilation. (II)

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<p>individual, society and the environment, including medical and ethical issues. Cognitive Complexity: High</p> <p>SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> 1.pose questions about the natural world, 2.conduct systematic observations, 3.examine books and other sources of information to see what is already known, 4.review what is known in light of empirical evidence, 5.plan investigations, 6.use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), 7.pose answers, explanations, or descriptions of events, 8.generate explanations that explicate or describe natural phenomena (inferences), 9.use appropriate evidence and reasoning to justify these explanations to others, 10.communicate results of scientific investigations, and 11.evaluate the merits of the explanations produced by others. Cognitive Complexity: High 	<p>Tissues</p> <ol style="list-style-type: none"> A. Dalton’s Law of Partial Pressures B. Henry’s Law C. External Respiration: Pulmonary Gas Exchange D. Internal Respiration <p>IV Transport of Respiratory Gases by Blood</p> <ol style="list-style-type: none"> A. Oxygen Transport B. Carbon Dioxide Transport <p>V Control of Respiration</p> <ol style="list-style-type: none"> A. Neural Mechanisms B. Factors Influencing Breathing Rate and Depth <p>VI Respiratory Adjustments</p> <ol style="list-style-type: none"> A. Exercise B. High Altitude <p>VII Homeostatic Imbalances of the Respiratory System</p> <ol style="list-style-type: none"> A. Chronic Obstructive Pulmonary Diseases (COPD) B. Asthma C. Tuberculosis (TB) D. Lung Cancer <p>VIII Developmental Aspects of the Respiratory System (including heredity and environmental factors)</p>	<ul style="list-style-type: none"> • Explain and compare the various lung volumes and capacities. (II) • Define dead space. (II) • Indicate types of information that can be gained from pulmonary function tests. (II) • State Dalton’s law of partial pressures and Henry’s law. (III) • Describe how atmospheric and alveolar air differs in composition, and explain these differences. (III) • Relate Dalton’s and Henry’s laws to events of external and internal respiration. (III) • Describe how oxygen is transported in the blood, and explain how oxygen loading and unloading is affected by temperature, pH, BPG, and PCO₂. (IV) • Describe carbon dioxide transport in the blood. (IV) • Describe the neural controls of respiration. (V) • Compare and contrast the influences of arterial pH, arterial partial pressures of oxygen and carbon dioxide, lung reflexes, volition, and emotions on respiratory rate and depth. (V) • Compare and contrast the hyperpnea of exercise with hyperventilation. (VI) • Describe the process and effects of acclimatization to high altitude. (VI) • Compare the causes and consequences of chronic bronchitis, emphysema, asthma, tuberculosis, and lung cancer. (VII) • Trace the embryonic development of the respiratory system. (VIII) • Describe normal changes that occur in the respiratory system from infancy to old age. (VIII) • Define a scientific problem or question based on the specific body of knowledge correlated to the anatomy and physiology honors science course.
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HE.912.C.1.3: Evaluate how environment and personal health are interrelated.		
HE.912.C.1.4: Analyze how heredity and family history can impact personal health		