

<p>Anatomy & Physiology Curriculum Map</p> <p>Unit 1 Form & Movement Timeline: Quarter 1</p>	<p>Course Description:</p> <p>The purpose of this course is to help students gain a better understanding of their own bodies and the constant need to maintain balance in living things. Investigations and assessments will require students to apply their knowledge to real-world situations. Students will develop laboratory techniques, study skills, and presentation abilities that will help them in college and beyond.</p> <p>Length of Course: One Year/Two Semesters</p>	
<p>Essential Questions</p>	<p><i>How is the human body organized?</i></p> <p><i>How does the shape or organization of an organ relate to its function?</i></p> <p><i>How do the body systems work together to allow movement?</i></p>	
<p>Standards</p>	<p>There is a relationship between the organization of cells into tissues and the organization of tissues into organs. (Central Concept)</p> <p>The structures and functions of organs determine their relationships within body systems of an organism. (Central Concept)</p> <p>Homeostasis allows the body to perform its normal functions. (Central Concept)</p> <p>Explain how the muscular/skeletal system (skeletal, smooth and cardiac muscle, bones, cartilage, ligaments, tendons) works with other systems to support and allow for movement. Recognize that bones produce both red and white blood cells. (Standard 4.4)</p>	
<p>Concepts and Skills</p>	<ul style="list-style-type: none"> • Identify the four tissue types (epithelial, connective, muscle, and nervous) and their respective functions. • Describe locations on the body using directional terms. • Identify the major bones and muscles of the body and describe their functions. • Classify bones and muscles based on form and/or function. • Relate the components of a bone to its function (support, movement, protection). • Describe the processes of bone growth and development. • Relate the components of a muscle to its function (movement). 	<p>SIS1. Make observations, raise questions, and formulate hypotheses.</p> <p>SIS2. Design and conduct scientific investigations.</p> <p>SIS3. Analyze and interpret results of scientific investigations.</p> <p>SIS4. Communicate and apply the results of scientific investigations</p> <p style="text-align: center;">CCR Reading Standards</p> <ul style="list-style-type: none"> • Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. • Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. • Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. • Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 11-12 texts and topics</i>. • Analyze the structure of the relationships among concepts in a text, including relationships among key terms.

		<ul style="list-style-type: none"> Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. Read and comprehend science/technical texts in the text complexity band independently and proficiently. <p style="text-align: center;">CCR Writing Standards</p> <p>CCWSL.4 Produce clear and coherent writing in which development, organization, and style are appropriate to task, purpose, and audience.</p> <p style="text-align: center;">CCR Math Standards</p> <p>CCSS.Math.Content.7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</p> <p>CCSS.Math.Content.7.SP.C.6 approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</p> <p>CCSS.Math.Content.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</p> <ul style="list-style-type: none"> CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
Content Objectives	<ul style="list-style-type: none"> Students will explain the relationship between cells, tissues, organs and systems. Students will classify tissues by type and describe the general function of each tissue type. Students will label a diagram showing the various layers of skin. Students will describe the characteristics of each skin layer. Students will collect, stain and observe skin cells using a microscope. Students will explain how the skin heals from a burn or other injury. Students will use directional terms correctly in discussions and writing. Students will describe the functions of the skeletal system and its relation to other body systems. 	

	<ul style="list-style-type: none"> • Students will locate and describe the various bones of the body. • Students will classify bones based on shape and function. • Students will identify the major parts of a bone. • Students will explain how bones grow and heal. • Students will explain how the skeletal system changes with age. • Students will differentiate between bone, cartilage, tendons, and ligaments. • Students will classify joints based on shape and range of motion. • Students will describe common injuries and illnesses that affect the bones. • Students will differentiate the three muscle types. • Students will explain the difference between voluntary and involuntary muscles. • Students will identify and explain the components of a muscle cell. • Students will describe the energy needs of muscle cells. • Students will describe the chemical activities required for muscle movement. • Students will locate and describe the various muscles of the body. • Students will describe muscle movements in discussions and writing using correct terminology. • Students will contrast aerobic and anaerobic exercise. • Students will describe common injuries and illnesses that affect the muscles.
Assessments/ Products	<ul style="list-style-type: none"> • Students will demonstrate understanding of facts and concepts through tests and quizzes that ask them to apply their knowledge of the body to real-life situations. • Students will demonstrate their ability to use vocabulary correctly through laboratory reports, writing assignments, and class discussions. • Students will demonstrate their ability to use microscopes and dissection tools through extended laboratory investigations. • Students will demonstrate their ability to perform research and present it using technology through a case study of a patient. <p>Notebooks:</p> <ul style="list-style-type: none"> ➤ Content Notes (every day or close to it): Students will identify topics; identify the main ideas and most important details and examples associated with each topic; include summaries as well as student-generated follow-up questions and answers, reflections, visualizations, and responses to the content, using higher order thinking skills (e.g., predict, connect, infer, analyze, evaluate, categorize, synthesize). ➤ Vocabulary: Students will highlight additional, key vocabulary in their notebooks; they will build an understanding of the vocabulary using vocabulary-development exercises (e.g., word webs, Frayer Model), as well as use the vocabulary in their daily work and conversations. ➤ Narrative and Explanatory Essay (in response to one or more Essential and Guiding Questions)/Investigation Reports: Student work will include evidence of planning: graphic organizers, brainstorming lists; editing of language, vocabulary, grammar, structure; organized and developed ideas utilizing precise and domain specific language; student sharing, student and teacher feedback, and revisions based on these

	<p>conversations. Argumentative essays/investigation reports will include an explicit claim, scientific evidence in support of the claim (from reports, data, observations, etc.), and an explanation of how the evidence connects to and verifies the claim.</p>
<p>Texts, Materials, and Resources</p>	<p>Laboratory Investigations: "Virtual Slide Box" of tissues. Identifying rodent bones found in owl pellets. Identifying the muscles of a frog. Dissecting and examining a chicken wing.</p> <p>Websites: Anatomy Corner: Cells & Tissues Interactive Activity & Quiz: Tissue Types Tissues of Life: Science Museum of Minnesota (Super Healers – Wound Healing, Body Slices – Body Organization) Anatomy Corner: Skeletal System Review the clickable skeleton, then try the "Interactive Body." Anatomy Corner: Muscular System Review the muscles of the body (male or female). Anatomy Arcade: "Whack a Bone," "Poke a Muscle" Movement Terminology: Interactive Lesson</p> <p>Videos: "Tissues & Organs" (32:28) Includes tissue types as well as stem cell research and tissue engineering. "Life Science: Health" Segments on Healthy Skin (3:32) and Melanoma (5:30) "The Ultimate Guide: Human Body: Organs" (19:58) Includes segments on the skeleton, skin, balance, etc. "Discovering Ardi" (1:28:04) Shows how scientists learn about early human ancestors by studying the skeleton of 4.4 million year old "Ardi." "American History: American Beginnings" (55:24) Relates theories about the first Americans to skeletal structure and anthropology. "Human Body: Pushing the Limits – Strength" (43:15) Includes segments about bone and muscle strength, connective tissues, and energy use. "First Response" Includes segments on musculoskeletal injuries (2:10) and first aid (5:47). "The Musculoskeletal System" (24:30) Includes segments on bones (9:01) and muscles (5:47) – especially as they relate to athletics. "Life Changing Medicine" Includes segments on hand transplants (~8:00) and regenerative muscle (4:36). "Building the Bionic Body" (20:41) Describes emerging limb replacement technologies. "Mechanics in the Human Body" (4:28) Describes how an early scientist made discoveries and models of how the body worked and moved.</p>

<p>Anatomy & Physiology Curriculum Map</p> <p>Unit 2 Learning & Development Timeline: Quarter 2</p>	<p>Course Description:</p> <p>The purpose of this course is to help students gain a better understanding of their own bodies and the constant need to maintain balance in living things. Investigations and assessments will require students to apply their knowledge to real-world situations. Students will develop laboratory techniques, study skills, and presentation abilities that will help them in college and beyond.</p> <p>Length of Course: One Year/Two Semesters</p>	
<p>Essential Questions</p>	<p><i>How do neurons work?</i></p> <p><i>How does the nervous system control each one of the activities in our body?</i></p> <p><i>How do drugs (chemicals) change the way neurons communicate?</i></p> <p><i>Why are humans considered more advanced than other animals?</i></p>	
<p>Standards</p>	<p>4.4 Explain how the nervous system (brain, spinal cord, sensory neurons, motor neurons) mediates communication between different parts of the body and the body's interactions with the environment. Identify the basic unit of the nervous system, the neuron, and explain generally how it works.</p> <p>4.8 Recognize that the body's systems interact to maintain homeostasis. Describe the basic function of a physiological feedback loop.</p>	
<p>Concepts and Skills</p>	<ul style="list-style-type: none"> • <i>The neuron is the functional unit of the brain</i> • <i>The sequence of events involved in neurons communication</i> • <i>The role of neurotransmitters in synaptic transmission</i> • <i>Central and peripheral nervous system components</i> • <i>Specific brain areas control specific brain functions</i> • <i>Drugs affect the biology and chemistry of the brain</i> • <i>Structure and function of the cell membrane</i> • <i>Hormones control and coordinate many body activities</i> • <i>The endocrine system helps the body respond to internal and external environment</i> 	<p>SIS1. Make observations, raise questions, and formulate hypotheses.</p> <p>SIS2. Design and conduct scientific investigations.</p> <p>SIS3. Analyze and interpret results of scientific investigations.</p> <p>SIS4. Communicate and apply the results of scientific investigations</p> <p style="text-align: center;">CCR Reading Standards</p> <ol style="list-style-type: none"> 1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. 2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 11-12 texts and topics</i>. 5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms. 6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g.,

		<p>a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.</p> <p>8. Read and comprehend science/technical texts in the text complexity band independently and proficiently.</p> <p style="text-align: center;">CCR Writing Standards</p> <p>CCWSL.4 Produce clear and coherent writing in which development, organization, and style are appropriate to task, purpose, and audience.</p> <p style="text-align: center;">CCR Math Standards</p> <p>CCSS.Math.Content.7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</p> <p>CCSS.Math.Content.7.SP.C.6 approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</p> <p>CCSS.Math.Content.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</p> <p>CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.</p>
<p>Content Objectives</p>	<ul style="list-style-type: none"> • Identify and describe the structure and function of neurons • How is the structure of a neuron related to its function? • Describe the steps in neurotransmission • Explain how drugs disrupt communication among neurons • Analyze data on how the way a drug is taken into the body influences its effect • Distinguish between the CNS and PNS • Describe specific functions in specific areas of the brain • Examine, interpret and analyze brain images • How do messages get from the brain to the rest of the body? • Describe what happens in your nervous system after you touch something hot. • Describe how different parts of the body communicate through hormones • Describe the major functions of the endocrine system • Identify the structures that produce and release hormones • Explain how hormones cause changes inside the cell • Explain how hormones levels are regulated in the body • Identify the two major glands that control the endocrine system 	

<p>Assessments/ Products</p>	<p>Quick Labs/Demonstrations/Projects/Practices:</p> <p>Quick Lab: Knee-Jerk Reflex Quick Lab: The Action Potential Quick Lab: The Blind Spot Quick Lab: Impaired Senses Inquiry Lab: Reaction Times Positron Emission Tomography and Brain Function Analysis Inquiry Lab: Investigating the Effect of Caffeine on Heart Rate Quick Lab: Observing Solubilities Inquiry Lab: It's a Balancing Act! Case Studies</p> <p>Content Notes: Students will identify topics; identify the main ideas and most important details and examples associated with each topic; include summaries as well as student-generated follow-up questions and answers, reflections, visualizations, and responses to the content, using higher order thinking skills (e.g., predict, connect, infer, analyze, evaluate, categorize, synthesize).</p> <p>Vocabulary: Students will highlight additional, key vocabulary in their notebooks; they will build an understanding of the vocabulary using vocabulary-development exercises (e.g., word webs, Frayer Model), as well as use the vocabulary in their daily work and conversations.</p> <p>Narrative and Explanatory Essay (in response to one or more Essential and Guiding Questions)/Investigation Reports: Student work will include evidence of planning: graphic organizers, brainstorming lists; editing of language, vocabulary, grammar, structure; organized and developed ideas utilizing precise and domain specific language; student sharing, student and teacher feedback, and revisions based on these conversations. Argumentative essays/investigation reports will include an explicit claim, scientific evidence in support of the claim (from reports, data, observations, etc.), and an explanation of how the evidence connects to and verifies the claim.</p> <p>Other Sample Products: KWL Charts. Venn Diagrams, Concept Maps, H.O.T. Boxes, Others?</p>
<p>Texts, Materials, and Resources</p>	<p><i>Holt Biology Textbook</i> <i>Anatomy and Physiology for Health Professional Textbook</i> <i>The Brain: Understanding Neurobiology Through the Study of Addiction. NIH Curriculum Supplemental Series</i> <i>Making Sense of It All- Exploring the Nervous System and Senses. Laying the Foundation (NMS Initiative)</i> http://www.haspi.org/curriculum-anatomy-physiology.html <i>Laying the Foundation – NMS Initiative</i> <i>Holt Biology</i> <i>Anatomy and Physiology for Health Professional Textbook</i> http://www.haspi.org/curriculum-anatomy-physiology.html http://kidshealth.org/classroom/9to12/body/systems/endocrine.pdf www.biologycorner.com www.anatomycorner.com</p>

