



Course: Anatomy & Physiology Grade: 11/12 Designer(s): Erin Helmkamp	Overview of Course (Briefly describe what students should understand and be able to do as a result of engaging in this course): This one semester course is designed as a fundamental overview of the basic anatomy and physiology of the human body. The following major systems of the body will be studied including their components, structures, basic physiology and common disorders: digestive, excretory, respiratory, circulatory, lymphatic, skeletal, muscular and nervous. The topics will be supplemented through the use of audiovisual materials and computer technology.
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Overarching Big Ideas, Enduring Understandings, and Essential Questions
 (These “spiral” throughout the entire curriculum.)

Big Idea (A Big Idea is typically a noun and always transferable within and among content areas.)	Standard(s) Addressed (What Common Core Standard(s) and/or PA Standard(s) addresses this Big Idea?)	Enduring Understanding(s) (SAS refers to Enduring Understandings as “Big Ideas.” EUs are the understandings we want students to carry with them after they graduate. EUs will link Big Ideas together. Consider having only one or two EUs per Big Idea.)	Essential Question(s) (Essential Questions are broad and open ended. Sometimes, EQs can be debated. A student’s answer to an EQ will help teachers determine if he/she truly understands. Consider having only one or two EQs per Enduring Understanding.)
Homeostasis/Balance	(The Common Core Standard(s) and/or PA Standard(s) that addresses the first overarching Big Idea goes here.) BIO.A.4.2.1: Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen regulation).	(The Enduring Understanding(s) for the first overarching Big Idea goes here.) Through a variety of mechanisms organisms seek to maintain a biological balance between their internal and external environments	(The Essential Question(s) for the Enduring Understanding(s) for the first overarching Big Idea goes here.) How do organisms maintain a biological balance between their internal and external environments?
Structure and Function	S11.B.1.1.1: Explain how structure determines function at multiple levels of organization (e.g., chemical, cellular, anatomical). S11.B.1.1.2: Compare and contrast the structural and functional similarities and differences among living things (e.g., classify organisms into classification groups, compare systems). S11.A.1.2.1: Explain and apply scientific concepts to societal issues using case studies	Structure is related to function.	How are structure and function connected? Give an example that biology related and an example that is not biology related.

	(e.g., spread of HIV, deforestation, environmental health, energy). S11.A.2.2.2: Explain how technology (e.g., GPS, spectroscope, scanning electron microscope, pH meter, probe, interface, imaging technology, telescope) is used to extend human abilities and precision. S11.A.3.1.1: Apply systems analysis, showing relationships (e.g., flowcharts, concept maps), input and output, and measurements to explain a system and its parts		
Systems	S11.A.1.2.1: Explain and apply scientific concepts to societal issues using case studies (e.g., spread of HIV, deforestation, environmental health, energy). S11.B.1.1.2: Compare and contrast the structural and functional similarities and differences among living things (e.g., classify organisms into classification groups, compare systems). S11.A.1.3.1: Use appropriate quantitative data to describe or interpret change in systems (e.g., biological indices, electrical circuit data, automobile diagnostic systems data).	Systems are made up of smaller interdependent parts that work together to make the system function.	How are smaller parts of a system interdependent? Why are systems made up of smaller interdependent structures working together? Give an example of a biological system and and non-biological system.

Big Ideas, Enduring Understandings, and Essential Questions Per Unit of Study
(These do NOT “spiral” throughout the entire curriculum, but are specific to each unit.)

Month of Instruction (In what month(s) will you teach this unit?)	Title of Unit	Big Idea(s) (A Big Idea is typically a noun and always transferable within and among content areas.)	Standard(s) Addressed (What Common Core Standard(s) and/or PA Standard(s) addresses this Big Idea?)	Enduring Understanding(s) (SAS refers to Enduring Understandings as “Big Ideas.” EUs are the understandings we want students to carry with them after they	Essential Question(s) (Essential Questions are broad and open ended. Sometimes, EQs can be debated. A student’s answer to an EQ will help teachers	Common Assessment(s)* (What assessments will all teachers of this unit use to determine if students have answered the	Common Resource(s)* Used (What resources will all teachers of this unit use to help students understand the Big Ideas?)
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				graduate. EUs will link Big Ideas together. Consider having only one or two EUs per Big Idea.)	determine if he/she truly understands. Consider having only one or two EQs per Enduring Understanding.)	Essential Questions?)	
Weeks 1 & 2	Nutrition	Homeostasis Properties Reactions Energy Structure & Function	BIO.A.2.1.1: Describe the unique properties of water and how these properties support life on Earth (e.g., freezing point, high specific heat, cohesion). BIO.A.2.2.3: Compare and contrast the structure and function of carbohydrates, lipids, proteins, and nucleic acids in organisms. BIO.A.2.3.1: Describe the role of an enzyme as a catalyst in regulating a specific biochemical reaction. BIO.A.2.3.2: Explain how factors such as pH, temperature, and concentration levels can affect enzyme function. BIO.A.4.2.1: Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen regulation).	The human body is complex system. The coordinated functions of its many structures support life processes and maintain homeostasis. Energy is required to do work.	How are the materials that enter and leave the body related to the processes that maintain homeostasis?	Restaurant Activity Nutrition Exam	www.diets.com www.cdc.org www.my.hwr.com
Weeks 3 & 4	Digestion	Homeostasis Structure & Function System Energy	BIO.A.4.2.1: Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen BIO.A.1.2.2: Describe and interpret relationships between structure and	The human body is complex system. The coordinated functions of its many structures support life processes and maintain	How are the materials that enter and leave the body related to the processes that maintain homeostasis?	Antacid Lab Digestion Exam	www.my.hwr.com

			<p>function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).</p> <p>BIO.A.3.1: Identify and describe the cell structures involved in processing energy</p> <p>BIO.A.3.2: Identify and describe how organisms obtain and transform energy for their life processes</p>	homeostasis.			
Week 5 & 6	Excretion	Homeostasis Structure & Function System Waste	<p>BIO.A.4.2: Explain mechanisms that permit organisms to maintain biological balance between internal and external environments.</p> <p>BIO.A.1.2.2: Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).</p>	<p>The human body is complex system.</p> <p>The coordinated functions of its many structures support life processes and maintain homeostasis.</p>	How are the materials that enter and leave the body related to the processes that maintain homeostasis?	Sensitivity Lab Excretion Exam	www.my.hwr.com
Week 7	Respiratory	Homeostasis Structure & Function System	<p>BIO.A.4.2: Explain mechanisms that permit organisms to maintain biological balance between internal and external environments.</p> <p>BIO.A.1.2.2: Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular</p>	<p>The human body is complex system.</p> <p>The coordinated functions of its many structures support life processes and maintain homeostasis.</p>	<p>How do the structures of the respiratory system and circulatory system work together to maintain homeostasis?</p> <p>How are oxygen and carbon dioxide exchanged between humans and the</p>	Breathing/Pulse Rate Lab Respiratory Exam	www.my.hwr.com

			organisms).		environment?		
Week 8 & 9	Circulatory System	Homeostasis Structure & Function System	BIO.A.4.2: Explain mechanisms that permit organisms to maintain biological balance between internal and external environments. BIO.A.1.2.2: Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	The human body is complex system. The coordinated functions of its many structures support life processes and maintain homeostasis.	How do the structures of the respiratory system and circulatory system work together to maintain homeostasis?	EKG Lab Circulation Exam	www.my.hwr.com www.nhlbi.nih.gov www.mayoclinic.org
Week 10	Blood	Homeostasis Structure & Function System Transport	BIO.A.4.2: Explain mechanisms that permit organisms to maintain biological balance between internal and external environments. BIO.A.1.2.2: Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	The human body is complex system. The coordinated functions of its many structures support life processes and maintain homeostasis.	What structures are used to help the circulatory system function? How do the structures of the respiratory system and circulatory system work together to maintain homeostasis?	Virtual Bloodtyping Lab Blood Exam	www.my.hwr.com
Week 11 & 12	Lymphatic & Immune Systems	Homeostasis Structure & Function System Transport	BIO.A.4.2: Explain mechanisms that permit organisms to maintain biological balance between internal and external environments. BIO.A.1.2.2: Describe and interpret relationships between structure and function at various levels of biological organization	The human body is complex system. The coordinated functions of its many structures support life processes and maintain homeostasis.	What structures are used to transport substances throughout the body?	Disease Project Lymphatic & Immune Exam	www.my.hwr.com www.cdc.gov www.medlineplus.gov www.nih.gov www.nlm.nih.gov

			(i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).				
Week 13 & 14	Bones & Muscles	Homeostasis Structure & Function System Support Protection Movement	BIO.A.4.2: Explain mechanisms that permit organisms to maintain biological balance between internal and external environments. BIO.A.1.2.2: Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	The human body is complex system. The coordinated functions of its many structures support life processes and maintain homeostasis.	What structures are used to support and protect the body? What structures are used to allow movement in the body?	Virtual Skeletal Lab Muscle Fatigue Lab Bone & Muscle Exam	www.my.hwr.com www.glencoe.com/sites/common_assets/science/virtual_lab/LS21/LS21.html
Weeks 15-18	Nervous System & Senses	Homeostasis Structure & Function System	BIO.A.4.2.1: Explain how organisms maintain homeostasis (e.g., thermoregulation, water regulation, oxygen) BIO.A.1.2.2: Describe and interpret relationships between structure and function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).	The human body is complex system. The coordinated functions of its many structures support life processes and maintain homeostasis.	What structures send messages throughout our body? How are these structures involved in allowing us to sense stimuli in the environment?	Nervous System Exam	www.my.hwr.com www.nytimes.com

* Some teachers may need to think about the assessments and resources used in order to determine the Big Ideas, Enduring Understandings, and Essential Questions embedded in their courses. At this point in your curriculum mapping, you might want to ignore the “Common Assessments” and “Common Resources Used” columns. However, you may use them if you wish.