A Correlation of

Essentials of Human Anatomy and Physiology

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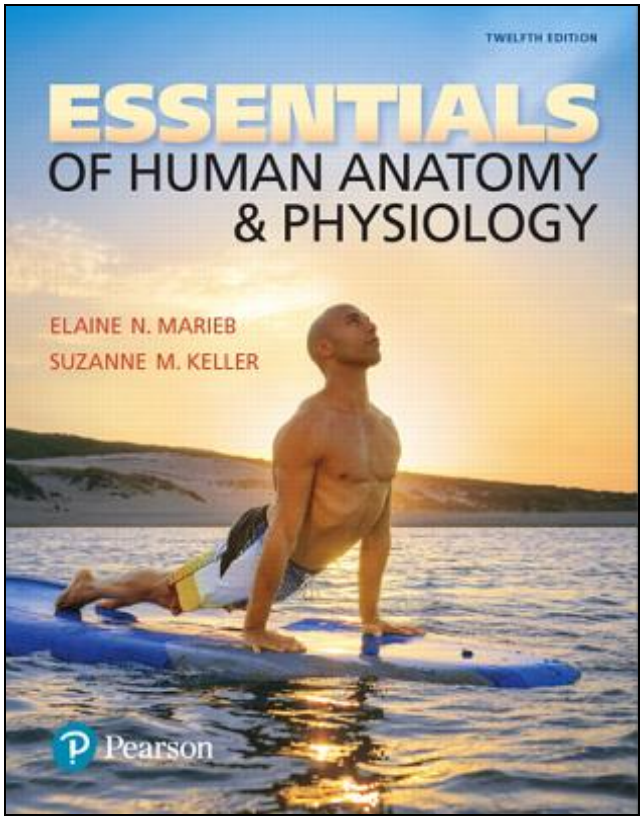

To the

Next Generation Science Standards
Life Science
Performance Expectations

Pearson

A Correlation of Essentials of Human Anatomy and Physiology 12th Edition, ©2018 to the Next Generation Science Standards Life Science Performance Expectations

Next Generation Science Standards Life Science Performance Expectations	Essentials of Human Anatomy and Physiology, 12th Edition, ©2018
HS-LS1 From Molecules to Organisms: Structures and Processes	
HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.	**SE:** Did You Get It? Question 26-27, page 88 Chapter 3 Review Question 25 **Supporting Content:** Nucleic Acids, pages 52-55 Protein Synthesis pages 85-87
HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	**SE:** Figure 1.2, The body's organ systems, pages 5-6 Figure 1.3, Examples of interrelationships among organ systems that illustrate life functions, page 8 Figure 3.18, Summary of the major functions, characteristics, and body locations of the four tissue types…, page 101 Figure 3.20, Types of muscle tissue and their common locations in the body Systems in Sync, page 129 Figure 5.8, The human skeleton, page 147 Systems in Sync, page 176 Table 6.1, Comparison of Skeletal, Cardiac, and Smooth Muscles Figure 7.2 Organization of the nervous system, page 226 Systems in Sync, page 220 Systems in Sync, page 272 Figure 9.7, Hormonal control of the level of calcium in the blood Systems in Sync, page 332 Figure 10.3, The development of blood cells, page 345 Systems in Sync, page 391 Figure 12.1 Relationship of lymphatic vessels to blood vessels, page 399 Systems in Sync, page 430 F 13.4, Anatomical relationships of organs in the thoracic cavity, pages 442-443 Systems in Sync, page 458 Figure 14.4, Anatomy of the stomach, page 468 Systems in Sync, page 505 Figure 15.9, The continuous mixing of body fluids, page 525

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(Continued) HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	**(Continued)** Systems in Sync, page 534 Systems in Sync, page 571 **Supporting Content:** From Atoms to Organisms, pages 2-3 Organ System Overview, pages 3-4, 7 Body Tissues, pages 88-102 The Integumentary System, pages 112-118 Axial Skeleton, pages 146-158 Appendicular Skeleton, pages 158-166 Joints, pages 166-173 Overview of Muscle Tissues, pages 181-185 Organization of the Nervous System, pages 226-227 Central Nervous System, pages 239-247 Peripheral Nervous System, pages 255-269 Major Endocrine Organs, pages 312-315, 317-327 Other Hormone-Producing Tissues and Organs, pages 327-331 Composition and Functions of Blood, pages 337-347 The Heart, pages 357-370 Blood Vessels, pages 370-389 Lymphatic System 398-403 Functional Anatomy of the Respiratory System, pages 436-445 Anatomy of the Digestive System, pages 463-474 Accessory Digestive Organs, pages 474-476 Kidneys, pages 512-520 Ureters, Urinary Bladder and Urethra, pages 520-524 Anatomy of the Male Reproductive System, pages 539-543 Anatomy of the Female Reproductive System, pages 547-551 Mammary Glands, pages 554-556

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HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	**SE:** **Supporting Content:** Figure 3.18, Types of epithelia and examples of common locations in the body, page 8 Feedback Mechanisms, pages 19-20 Lysomes, page 69 Figure 9.2, Endocrine gland stimuli, page 311 Figure 9.7, Hormonal control of the level of calcium ions in the blood, page 320 Stimuli for Control of Hormone Release, pages 311- Figure 9.9, major mechanisms controlling aldosterone release from the adrenal cortex, page 322 Figure 9.10, Roles of the hypothalamus, adrenal medulla, and adrenal cortex in the stress response, page 324 Figure 9.12, Regulation of the blood glucose level by a negative feedback mechanism involving pancreatic hormones, page 326 Figure 10.4, Mechanism for regulating the rate of RBC production, page 346 Figure, 14.23, Metabolic events occurring in the liver as the blood glucose level rises and falls, page 496 Regulation of Food Intake, page 497 Figure 14.24, Mechanism of body temperature regulation, page 500
HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.	**SE:** Figure 3.15, Stages of Miosis, page 84 Figure 16.3, Spermatogenesis, page 543 Figure 16.10, Events of oogenesis **Supporting Content:** Cell Division, pages 82-85 Spermatogenesis, pages 544-545 Oogenesis and the Ovarian Cycle, pages 551-555

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HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.	The scope of *Essentials of Human Anatomy and Physiology* is the human body, therefore photosynthesis falls outside of the curriculum.
HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.	**SE:** Did You Get It? Question 20, 22; page 48 Did You Get It? Question 23, page 52 Chapter 2 Review Question 30 Did You Get It? Question 26-27, page 88 Chapter 3 Review Question 25 **Supporting Content:** Organic Compounds, pages 42-56 Protein Synthesis, pages 85-88 Metabolism, pages 490-496
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.	**SE:** Figure 14.19, Summary equation for cellular respiration, page 491 Figure 14.20, The formation of ATP in the cytosol and the mitochondria during cellular respiration, page 491 Figure 14.22, Metabolism by body cells, page 493 **Supporting Content:** Metabolism, pages 490-496 193, 194

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HS-LS2 Ecosystems: Interactions, Energy, and Dynamics	
HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions. HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere. HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.	The scope of *Essentials of Human Anatomy and Physiology* is the human body, therefore ecosystems fall outside of the curriculum.
HS-LS3 Heredity: Inheritance and Variation of Traits	
HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.	**SE:** **Supporting Content:** Cell Division, pages 82-85

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HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.	The scope of *Essentials of Human Anatomy and Physiology* is the human body, therefore heredity falls outside of the curriculum.
HS-LS4 Biological Evolution: Unity and Diversity	
HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. HS-LS4-3. Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations. HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.*	The scope of *Essentials of Human Anatomy and Physiology* is the human body, therefore biological evolution falls outside of the curriculum.