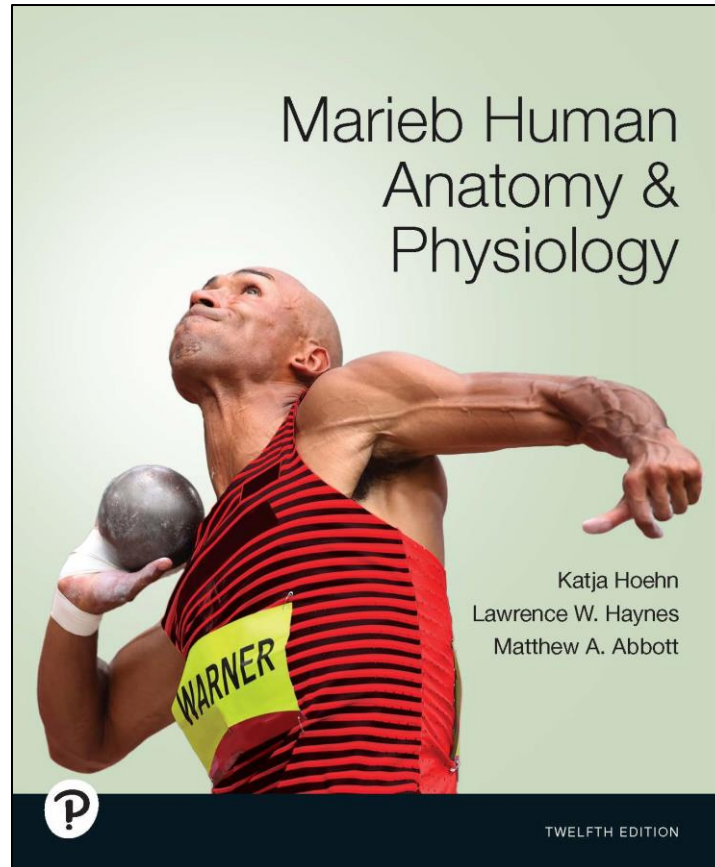


A Correlation of

Marieb Human Anatomy & Physiology
12th Edition © 2025



to the

Next Generation Science Standards (2013)
Life Science
Grades 9-12

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NGSS Lead States. 2013. Next Generation Science Standards: For States, By States. Washington, DC: The National Academies Press.

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Next Generation Science Standards Performance Expectations for High School Life Science	<i>Marieb Human Anatomy & Physiology,</i> 12 th Edition, © 2025
(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.	<p>Chapter 2: Chemistry Comes Alive Lesson 2.10: Proteins are the body’s basic structural material and have many vital outcomes, pp. 48-51 Lesson 2.11: DNA and RNA store, transmit, and help express genetic information, pp. 53-56</p> <p>Chapter 3: Cells: The Living Units Lesson 3.12: Messenger RNA carries instructions from DNA for building proteins, pp. 98-108</p>
(HS-LS1-2) Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	<p>Chapter 1: The Human Body: An Orientation Lesson 1.2: The body’s organization ranges from atoms to the entire organism, pp. 4-5</p>
(HS-LS1-3) Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	<p>Chapter 1: The Human Body: An Orientation Lesson 1.4: Homeostasis is maintained by negative feedback, pp. 9-12</p>
(HS-LS1-4) Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.	<p>Chapter 3: Cells: The Living Units Lesson 3.11: The cell cycle consists of interphase and a mitotic phase, pp. 96-98 Lesson 3.12: Messenger RNA carries instructions from DNA for building proteins, pp. 98-101</p>
(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.	<p>Chapter 2: Chemistry Comes Alive Lesson 2.7: Organic compounds are made by dehydration synthesis and broken down by hydrolysis, pp 41-43 Lesson 2.8: Carbohydrates provide an easily used energy source, pp. 43-44</p>
(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.	<p>Chapter 9: Muscles and Muscle Tissue Lesson 9.6: ATP for muscle contraction is produced aerobically and anaerobically, pp. 304-306</p> <p>Chapter 24: Nutrition, Metabolism, and Energy Balance Lesson 24.3: Metabolism is the sum of all biochemical reactions in the body, pp. 940-942 Lesson 24.4: Carbohydrate metabolism is the central player in ATP production, pp. 942-951</p>

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Next Generation Science Standards Performance Expectations for High School Life Science	<i>Marieb Human Anatomy & Physiology,</i> 12 th Edition, © 2025
(HS-LS2) Ecosystems: Interactions, Energy, and Dynamics	
(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.	SE/TE: Chapter 9: Muscles and Muscle Tissue Lesson 9.6: ATP for muscle contraction is produced aerobically and anaerobically, pp. 303-306 Chapter 16: The Endocrine System Lesson 16.1: The endocrine system is one of the body's two major control systems, pp. 602-603 Lesson 16.2: The chemical structure of a hormone determines how it acts, p. 603 Lesson 16.3: Hormones act through second messengers or by activating specific genes, pp. 603-606
(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.	Chapter 1: The Human Body: An Orientation Lesson 1.3: What are the requirements for Life? p. 8 Chapter 3: Cells: The Living Units Lesson 3.8: Cytoplasmic organelles each perform a specialized task, p.84 Chapter 9: Muscles and Muscle Tissue Lesson 9.6: ATP for muscle contraction is produced aerobically or anaerobically, pp. 303-306 Chapter 24: Nutrition, Metabolism, and Energy Balance Lesson 24.3: Metabolism is the sum of all biochemical reactions in the body, pp. 940-942
(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.	Chapter 2: Chemistry Comes Alive Lesson 2.11: DNA and RNA store, transmit, and help express genetic information, pp. 53-55 Chapter 27: The Reproductive System Lesson 27.1: The male and female reproductive systems share common features, pp. 1050-1055 Chapter 29: Heredity Chapter 29.1: Genes are the vocabulary of genetics, pp. 1135-1136
(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.	Chapter 29: Heredity Lesson 29.2: Genetic variation results from independent assortment, crossing over, and random fertilization, pp. 1136-1138 Lesson 29.3: There are several patterns of inheritance, pp. 1138-1141 Lesson 29.4: Gene expression is affected by many factors, pp. 1141-1143

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<p align="center">Next Generation Science Standards Performance Expectations for High School Life Science</p>	<p align="center"><i>Marieb Human Anatomy & Physiology,</i> 12th Edition, © 2025</p>
<p>(HS-LS3-3) Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p>	<p>SE/TE: Chapter 29: Heredity Lesson 29.2: Genetic variation results from independent assortment, crossing over, and random fertilization, pp. 1136-1138 Lesson 29.3: There are several patterns of inheritance, pp; 1138-1141 Lesson 29.4: Gene expression is affected by many factors, pp. 1141-1143</p>
<p>(HS-LS4) Biological Evolution: Unity and Diversity</p>	
<p>(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.</p>	<p>Chapter 29: Heredity Lesson 29.2: Genetic variation results from independent assortment, crossing over, and random fertilization, pp. 1136-1138 Lesson 29.3: There are several patterns of inheritance, pp. 1138-1141 Lesson 29.4: Gene expression is affected by many factors, pp. 1141-1143</p>