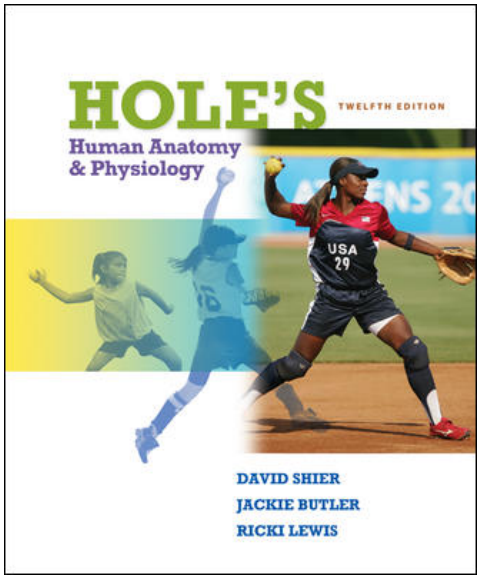
McGraw-Hill Higher Education

2010 Science Framework
Human Anatomy & Physiology

Mississippi




# HOLE'S

## HUMAN ANATOMY & PHYSIOLOGY



| STANDARDS | PAGE REFERENCES |
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| **INQUIRY** | |
| **1. Apply inquiry-based and problem-solving processes and skills to scientific investigations.** | |
| a. Use current technologies such as CD-ROM, DVD, Internet, and on-line data search to explore current research related to a specific topic. (DOK 3) | **Student Edition:**<br>*Anatomy and Physiology Revealed* 29<br>*Web Connections* 29<br>Can also be incorporated into Boxed Chapter Opener, *Clinical Application,* and *From Science to Technology* features.<br>*Boxed Chapter Opener* 76, 144, 193, 261<br>*Clinical Application* 6-7, 300, 397, 489, 509, 585<br>*From Science to Technology* 70-71, 108, 139, 513 |
| b. Clarify research questions and design laboratory investigations. (DOK 3) | See the following ancillary materials to meet this objective.<br>*Clinical Applications Manual*<br>*The Laboratory Manual for Human Anatomy and Physiology*<br>*Physiology Interactive Lab Simulations* |
| c. Demonstrate the use of scientific inquiry and methods to formulate, conduct, and evaluate laboratory investigations (e.g., hypotheses, experimental design, observations, data analyses, interpretations, theory development). (DOK 3) | See the following ancillary materials to meet this objective.<br>*Clinical Applications Manual*<br>*The Laboratory Manual for Human Anatomy and Physiology*<br>*Physiology Interactive Lab Simulations* |

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| d. Organize data to construct graphs (e.g., plotting points, labeling x-and y-axis, creating appropriate titles and legends for circle, bar, and line graphs) to draw conclusions and make inferences. (DOK 3) | See the following ancillary materials to meet this objective.<br>*Clinical Applications Manual*<br>*The Laboratory Manual for Human Anatomy and Physiology*<br>*Physiology Interactive Lab Simulations* |
| e. Evaluate procedures, data, and conclusions to critique the scientific validity of research. (DOK 3) | See the following ancillary materials to meet this objective.<br>*Clinical Applications Manual*<br>*The Laboratory Manual for Human Anatomy and Physiology*<br>*Physiology Interactive Lab Simulations* |
| f. Formulate and revise scientific explanations and models using logic and evidence (data analysis). (DOK 3) | See the following ancillary materials to meet this objective.<br>*Clinical Applications Manual* I<br>*The Laboratory Manual for Human Anatomy and Physiology*<br>*Physiology Interactive Lab Simulations* |
| g. Collect, analyze, and draw conclusions from data to create a formal presentation using available technology (e.g., computers, calculators, SmartBoard, CBL's, etc.) (DOK 3) | See the following ancillary materials to meet this objective.<br>*Clinical Applications Manual*<br>*The Laboratory Manual for Human Anatomy and Physiology*<br>*Physiology Interactive Lab Simulations* |
| **LIFE SCIENCE** | |
| **2. Demonstrate an understanding of the basic organization of the body.** | |
| a. Apply and relate appropriate anatomical terms to the body in anatomical position. (DOK 1)<br>• Relationship of body parts | **Student Edition:**<br>20-24 |
| • Major cavities and essential organs | **Student Edition:**<br>12, 13, 14, 15<br>See also *Reference Plates* 31-47 |
| b. Explain how specific mechanisms (e.g., feedback, transport, pH, temperature regulation, etc.) maintain homeostasis. (DOK 1) | **Student Edition:**<br>8-12, 60, 90-98, 181-183, 491-492, 757-758, 790-792, 819-823 |
| c. Describe the relationships and interactions of biochemical composition of the human body to body functions. (DOK 2)<br>• Compounds and elements necessary for maintaining life | **Student Edition:**<br>6, 7, 52, 60-69, 124, 699-722 |

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| • Major groups of organic substances in the human body | **Student Edition:**<br>61-69, 700-706 |
| • Major types of chemical reactions employed within the organ systems | **Student Edition:**<br>58-60, 115-135, 291-292, 757, 819-823<br>*Appendix C: Cellular Respiration* 944-947 |
| • Effects of external factors (e.g., heat, pH, etc.) on enzymatic reactions | **Student Edition:**<br>76, 117-119, 819 |
| d. Categorize the relationship of the cell and its functions to the more complex levels of organization within the body. (DOK 2)<br>• Anabolic and catabolic reactions within a human cell | **Student Edition:**<br>4-5, 76-90, 115-135 |
| • Four major categories of tissues and their location, structure, and function | **Student Edition:**<br>144-153, 155-156, 158-162 |
| **3. Demonstrate an understanding of the structure, functions, and relationships of the body systems.** | |
| a. Identify structures and explain functions of the components of the integumentary system. (DOK 1) | **Student Edition:**<br>8, 14, 170-187 |
| b. Research and distinguish among common integumentary system disorders in terms of origin, manifestation, and treatments. (DOK 1) | **Student Edition:**<br>173, 177<br>*Clinical Application* 175, 179, 181 |
| c. Compare the structure and functions of the skeletal system with its relationship to movement. (DOK 1)<br>• Structures which comprise bone | **Student Edition:**<br>14, 160-162, 193-238, 301-305 |
| • Difference between endochondrial and intramembranous ossification | **Student Edition:**<br>197-198 |
| • Major bones of the axial and appendicular skeleton, noting inherent differences between males and females | **Student Edition:**<br>193-238 |
| • Types of joints and their movements | **Student Edition:**<br>261-263, 267-277 |
| d. Research and draw conclusions about changes in the skeletal system associated with disease, disorder, injury, age, and stress. (DOK 3) | **Student Edition:**<br>198, 200, 213, 231, 235, 236, 238, 240, 265, 278-280, 908<br>*Clinical Application* 202-203, 204, 225, 278-279<br>*Integrative Assessment* 244 (#6, #7) |

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| e. Compare the functions and structures of the muscular system with its relationship to movement. (DOK 1)<br>• Major components and functions of skeletal muscle fiber | **Student Edition:**<br>14, 163, 285-288 |
| • Major skeletal muscles and the process of contraction | **Student Edition:**<br>289-299, 305-332, 334 |
| • Three types of muscles in the body | **Student Edition:**<br>163-164, 285-288, 300-301, 302 |
| f. Research and evaluate the impact of medical technology on muscle physiology and disease. (DOK 3) | **Student Edition:**<br>*Clinical Application* 291, 300 |
| g. Relate the components of the nervous system to the senses and the functions of the human body systems. (DOK 1)<br>• Four types of neurological cells and the functions of each | **Student Edition:**<br>16, 354-364 |
| • Conduction of a nerve impulse | **Student Edition:**<br>365-376 |
| • Structures and functions of the brain and spinal cord | **Student Edition:**<br>384-387, 389-405, 407-410 |
| • Divisions of the nervous system (e.g., central nervous system, peripheral nervous system, sympathetic and parasympathetic, etc.) | **Student Edition:**<br>354, 355, 361-363, 364, 411-431 |
| h. Describe functions of the various sense organs and identify environmental factors that affect their responses. (DOK 1) | **Student Edition:**<br>438-471, 473-476<br>*Clinical Application* 451 |
| i. Distinguish the location, structure, and functions of the endocrine glands. (DOK 1)<br>• Major endocrine glands | **Student Edition:**<br>16, 485, 492-512, 845-846, 857-861 |
| • Function of each endocrine gland and the various hormones they generated by each | **Student Edition:**<br>492-512, 845-846, 857-861 |
| • Negative feedback mechanisms that regulate hormonal secretions. | **Student Edition:**<br>9-11, 492, 494, 495, 496, 503, 504, 508, 509-511<br>*Integrative Assessments* 520 (#2), 521 (#6) |
| j. Research common disorders or diseases of the endocrine system and assess the unique problems associated with diagnoses and treatments. (DOK 3) | **Student Edition:**<br>491, 498, 501, 502, 504, 510<br>*Clinical Application* 497, 509, 512<br>*From Science to Technology* 54, 513 |

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| k. Identify and discuss the structures and functions of the organs of the digestive system and discuss their relationships to the interaction among the human body systems. (DOK 2)<br>• Major organs of the digestive system (e.g., alimentary canal and accessory structures) | **Student Edition:**<br>17, 652-654, 656-690<br>*Interconnections* 692 |
| • Roles of organs in the mechanical and chemical digestion of food and nutrient absorption | **Student Edition:**<br>652, 656, 658-659, 660, 665, 666, 668-669, 671-672, 674, 678, 678, 682-685 |
| • Contents of the alimentary canal and how they are mixed and moved | **Student Edition:**<br>654, 656-657, 661, 664-665, 669-670, 686, 689-690 |
| • Enzymes and gland secretions as related to the absorption of digestion products | **Student Edition:**<br>660-661, 666, 666, 668-669, 671-672, 682-683 |
| l. Research common disorders or diseases of the digestive system and identify a diagnosis, based upon a given set of symptoms, for a specific disorder. (DOK 3) | **Student Edition:**<br>666, 686, 687<br>*Clinical Application* 661, 677, 679, 691 |
| m. Describe the primary functions of the respiratory organs and the relationships between structure and function. (DOK 1)<br>• Breathing verses respiration | **Student Edition:**<br>17, 736-738, 740-748, 750-759 |
| • Gaseous exchange between air and blood and mechanisms of gaseous transport by the blood | **Student Edition:**<br>759-764, 766 |
| n. Research to describe various diseases commonly affecting normal respiratory function and assert environmental and social factors which may contribute to the incidence of disease. (DOK 2) | **Student Edition:**<br>736, 744<br>*Clinical Application* 739, 749, 756, 765 |
| o. Demonstrate an understanding of the structures and functions of the circulatory system and their role in maintaining homeostasis. (DOK 2)<br>• Blood types and the four parts of blood in terms of morphology, function and origin | **Student Edition:**<br>10, 16, 523-548, 553-580 |
| • Pulminary and systemic circulation | **Student Edition:**<br>553, 561-563, 590-607 |
| • Systolic and diastolic pressures in relationship to cardiovascular health | **Student Edition:**<br>580, 582-587, 589-590<br>*Clinical Application* 583, 588 |

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| p. Investigate and describe the social and economic impact of technological advances in medical treatment on cardiovascular disorders. (DOK 3) | **Student Edition:**<br>553<br>*Clinical Application* 585, 609<br>*From Science to Technology* 546, 566 |
| q. Describe and discuss the structures and functions of the lymphatic system and the relationships to the circulatory system and immunity. (DOK 1)<br>• Major lymphatic organs and pathways | **Student Edition:**<br>16, 617-625, 626<br>*Interconnections* 645 |
| • Functions of lymph nodes, lymphocytes, immunoglobulins, thymus, and spleen | **Student Edition:**<br>623-625, 628-635 |
| • Types of immunity and immune responses | **Student Edition:**<br>625-638 |
| r. Research and describe common lymphatic disorders and present conclusions about the effectiveness of available treatment options. (DOK 3) | **Student Edition:**<br>624, 638, 641-643<br>*Clinical Application* 642-643<br>*From Science to Technology* 636-637 |
| s. Explain the role of the structures and functions of the urinary system as they relate to the formation, composition and elimination of urine. (DOK 1) | **Student Edition:**<br>17-18, 775-802 |
| t. Research and describe the treatments of common urinary system disorders. (DOK 1) | **Student Edition:**<br>779, 790, 792, 797, 799<br>*Clinical Application* 779, 782, 793 |
| u. Identify and discuss the locations, structures, and functions of the major components of the male and female reproductive systems. (DOK 1)<br>• Role of hormones in maturation and reproduction | **Student Edition:**<br>18, 508, 833-862, 883-884 |
| • Development of a fetus. | **Student Edition:**<br>877-898 |
| v. Research common reproductive diseases and disorders and justify the need for continued research in the diagnosis and treatment of reproductive system diseases. (DOK 3) | **Student Edition:**<br>835, 859, 867, 869<br>*Clinical Application* 841, 842-843 , 861, 864-865<br>*From Science to Technology* 878-879 |