

ANATOMY & PHYSIOLOGY LEVEL 2

Chapter 1 The Human Body: An Orientation

Framework Standard: Biology Biology

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
4.8 Recognize that the body's systems interact to maintain homeostasis. Describe the basic function of a physiological feedback loop.	<p>Be able to define anatomy and physiology.</p> <p>Name the levels of structural organization that make up the human body, and explain how they are related.</p> <p>Name the organ systems of the body, and briefly state the major functions of each system.</p> <p>Define homeostasis, and explain its importance.</p> <p>Define negative feedback, and describe its role in maintaining homeostasis and normal body Function.</p> <p>Understand anatomical position,</p>	<p>Current Anatomy and Physiology textbook edition (Marieb, 8th ed.)</p> <p>Reading Topics: CH 1 (pgs 1-24)</p> <p>Overview of A & P Levels of Organization Homeostasis The Language of Anatomy</p> <p>Chapter 1 Worksheet series</p> <p>CH 1 transparencies</p> <p>Laserdisc and Powerpoint presentations by chapter</p> <p>Teacher-led discussions</p>	<p>CH 1 Worksheet: Intro to the Human Body</p> <p>Chapter 1 test</p> <p>Laboratory exercises: Anatomical model and use of regional and directional terminology</p>

	and be able to use proper anatomical terminology to describe body directions, surfaces and body planes.		
--	---------------------------------------------------------------------------------------------------------	--	--

ANATOMY & PHYSIOLOGY LEVEL 2

Chapter 2 Basic Chemistry

Framework Standard: Biology

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
1.1 Recognize that biological organisms are composed primarily of very few elements. The six most common are C, H, N, O, P, and S	<p>Define chemical element, and list the six elements that form the bulk of body matter</p> <p>Explain how elements and atoms are related</p> <p>List the subatomic particles, and describe their relative masses, charges, and positions in the atom</p>	<p>Essentials of Human A & P textbook (Marieb, 8th ed.)</p> <p>Reading topics: Chapter 2 (pgs 25-54)</p> <p>Composition of Matter Molecules and Compounds Biochemistry : Inorganic and Organic Compounds</p> <p>Chapter 2 Worksheet series</p>	<p>Chapter 2 Worksheet:: Chemistry</p> <p>Chapter 2 test</p> <p>Laboratory exercise: Acids, bases and buffers</p>

	<p>Define radioisotope, and describe briefly how radioisotopes are used in the diagnosis and treatment of disease</p> <p>Understand the pH scale and location of acids and bases on the scale</p>	<p>CH 2 transparencies</p> <p>Video: “The Molecules of Life”</p> <p>Laserdisc and Powerpoint presentations on chapter topics</p> <p>Teacher-led discussions</p>	

Chapter 2 Basic Chemistry - 2

Framework Standard: Biology

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
1.2 Describe the basic molecular structures and primary functions of the four major categories of organic molecules (carbohydrates, lipids, proteins and nucleic acids).	<p>Compare and contrast carbohydrates, lipids, proteins, and nucleic acids in terms of their building blocks, structures and functions in the body</p> <p>Differentiate between fibrous and globular proteins</p>	<p>Essentials of Human A & P textbook (Marieb, 8th ed.)</p> <p>Reading topics: Chapter 2 (pgs 25-54)</p> <p>Composition of Matter Molecules and Compounds Biochemistry : Inorganic and Organic Compounds</p>	<p>Chapter 2 Worksheet: Chemistry</p> <p>Chapter2 test</p> <p>Laboratory exercises: Simulated protein synthesis Protein synthesis</p>

	<p>Compare and contrast the structure and functions of DNA and RNA</p> <p>Explain the importance of ATP in the body</p>	<p>Chapter 2 Worksheet series</p> <p>CH 2 transparencies</p> <p>Video: “The Molecules of Life”</p> <p>Laserdisc and Powerpoint presentations on chapter topics</p> <p>Teacher-led discussions</p>	
--	-------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Chapter 2 Basic Chemistry - 3

Framework Standard: Biology

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
1.3 Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, that have an effect on enzymes	<p>Differentiate between ionic, polar covalent, and covalent bonds, and describe the importance of hydrogen bonds</p> <p>Contrast synthesis, decomposition, and</p>	<p>Essentials of Human A & P textbook (Marieb, 8th ed.)</p> <p>Reading topics: Chapter 2 (pgs 25-54)</p> <p>Composition of Matter Molecules and Compounds</p>	<p>Chapter 2 worksheet: Chemistry</p> <p>Chapter 2 test</p> <p>Laboratory exercises: Catalase experiment</p>

	<p>exchange reactions</p> <p>Define enzyme, and explain the role of enzymes</p>	<p>Biochemistry : Inorganic and Organic Compounds</p> <p>Chapter 2 Worksheet series</p> <p>CH 2 transparencies</p> <p>Video: “The Molecules of Life”</p> <p>Laserdisc and Powerpoint presentations on chapter topics</p> <p>Teacher-led discussions</p>	
--	---------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

ANATOMY & PHYSIOLOGY LEVEL 2

Chapter 3 Cells and Tissues

Framework Standard: Biology

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
2.1 Relate cell parts/organelles (plasma membrane, nuclear envelope, nucleus, nucleolus, cytoplasm, mitochondrion, endoplasmic reticulum, Golgi apparatus,	Understand the structure of the plasma membrane, and explain how the various transport processes account for the	Essentials of Human Anatomy & Physiology (Marieb, 8 th ed.)	<p>Chapter 3 worksheet: Cancer articles series</p> <p>Chapter 3 test</p>

<p>lysosome, ribosome, vacuole, cell wall, chloroplast, cytoskeleton, centriole, cilium, flagellum, pseudopod) to their functions. Explain the role of cell membranes as a highly selective barrier (diffusion, osmosis, facilitated diffusion, active transport).</p>	<p>directional movement of specific substances across the plasma membrane.</p> <p>Relate cell parts/organelles (plasma membrane, nuclear envelope, mitochondria, etc) to their functions.</p> <p>Define selective permeability, diffusion, active transport, passive transport, exocytosis, endocytosis, phagocytosis, hypertonic, hypotonic and isotonic.</p> <p>Identify on a cell model or diagram the three major cell regions (nucleus, cytoplasm, and plasma membrane)</p> <p>List the structures of the nucleus, and explain the function of chromatin and nucleoli</p> <p>Identify the organelles on a cell model or describe them, and discuss the major function of each</p> <p>Name some cell types, and relate their overall shape and internal structure to their special functions</p> <p>Name the four major tissue types and their chief subcategories</p>	<p>Reading topics: Chapter 3 (pgs 61-97)</p> <p>Cell Anatomy & Physiology Body Tissues (epithelial, connective, muscle and nervous)</p> <p>Chapter 3 Worksheet series</p> <p>Chapter 3 transparencies</p> <p>Video: “Fat chance in a thin world”</p> <p>Articles: “What’s Really Risky?”</p> <p>Powerpoint presentations by chapter</p> <p>Teacher-led discussions</p>	<p>Laboratory Exercises:</p> <p>Osmosis and Diffusion Histology laboratory</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------

	<p>Explain how the four main tissue types differ structurally and functionally</p> <p>Give the chief locations of the various tissue types in the body</p> <p>Describe the process of tissue repair (wound healing)</p>		

Chapter 3 Cells and Tissues - 2

Framework Standard: Biology

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
<p>2.6 Describe the cell cycle and the process of mitosis. Explain the role of mitosis in the formation of new cells, and its importance in maintaining chromosome number during asexual reproduction.</p>	<p>Be able to describe the events associated with DNA replication, and the events related to transcription and translation.</p>	<p>Essentials of Human Anatomy & Physiology (Marieb, 8th ed.)</p> <p>Reading topics: Chapter 3 (pgs 61-97)</p> <p>Cell anatomy & physiology Body tissues (epithelial, connective, muscle and nervous)</p>	<p>Chapter 3 worksheet: Cells and Tissues</p> <p>Chapter 3 test</p> <p>Lab Exercise: “CHNOPS” Activity</p>

		Chapter 3 Worksheet series Chapter 3 transparencies Video: “Fat chance in a thin world” Chapter specific mainstream articles (newspaper) Laserdisc and Powerpoint presentations by chapter Teacher-led discussions	

ANATOMY & PHYSIOLOGY LEVEL 2

Chapter 4 Skin and Body Membranes

Framework Standard: None Applicable

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
Understand the main types and locations of membranes in the human body	List the general functions of each membrane type – cutaneous, mucous, serous,	Essentials of Human Anatomy & Physiology (Marieb, 8 th ed.)	Chapter 4 worksheet: Skin and body membranes

<p>Recognize the main structures of the integument and their location in the body</p> <p>Know the layers of the epidermis and characteristics of each layer</p> <p>Know the factors which determine skin color, and describe the function of melanin</p> <p>Know the clinical importance of different burns categories and characteristics of the three main skin cancers</p>	<p>and synovial.</p> <p>Be able to distinguish and name the following skin structures: epidermis, dermis (2 layers), hair and hair follicle, sebaceous gland, and sweat gland.</p> <p>Differentiate between 1st-, 2nd-, and 3rd-degree burns</p> <p>Summarize the differences between the basal cell and squamous cell carcinomas, and malignant melanoma</p>	<p>Reading topics: Chapter 4(pgs 107-125)</p> <p>Classification of body membranes Integumentary system</p> <p>Chapter 4 worksheet series</p> <p>Video: “Skin”</p> <p>Chapter specific mainstream articles (newspaper)</p> <p>Laserdisc and Powerpoint presentations by chapter</p> <p>Teacher-led discussions</p>	<p>Chapter 4 test</p> <p>Laboratory Exercise:</p> <p>Integument model activity</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------

ANATOMY & PHYSIOLOGY LEVEL 2

Chapter 5 The Skeletal System

Framework Standard: Biology

Learning Objectives/ Content Outcomes	Skills	Resources	Assessments
---------------------------------------	--------	-----------	-------------

(The learner should be able to...)			
<p>4.5 Explain how the muscular/skeletal system (skeletal, smooth and cardiac muscles, bones, cartilage, ligaments, tendons) works with other systems to support the body and allow for movement. Recognize that bones produce blood cells.</p>	<p>Know the main functions of bone tissue in the human body, including blood cell production, providing support and protection, and to allow for movement.</p> <p>Identify and name the bones of the skull and vertebrae</p> <p>Discuss the importance of the intervertebral discs and normal and abnormal spinal curvatures.</p> <p>Know some of the common bone fracture terms and how bones repair themselves.</p> <p>Be able to discuss the differences between fibrous, cartilaginous and synovial joints</p>	<p>Essentials of Human Anatomy & Physiology (Marieb, 8th ed.)</p> <p>Reading topics: Chapter 5 (pgs 129-171)</p> <p>Bones: an overview Axial skeleton Appendicular skeleton Joints</p> <p>Chapter 5 worksheet series</p> <p>Video: “Fracture Repair”</p> <p>Laserdisc: “Bone Fractures” “Joint replacement surgery” “Osteoarthritis”</p> <p>Chapter articles: “Bone Loss” “Vitamin A and Bone Fractures”</p> <p>Powerpoint presentations by chapter</p> <p>Teacher-led discussions</p>	<p>Chapter 5 test</p> <p>Lab Exercises:</p> <p>Skull Axial Skeleton Appendicular Skeleton</p> <p>X-ray interpretation of bone fractures</p>

--	--	--

ANATOMY &PHYSIOLOGY LEVEL 2

CH 6: Muscular System

Framework Standard: Biology

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
4.6 Explain how the muscular/skeletal system (skeletal, smooth and cardiac muscles, bones, cartilage, ligaments, tendons) works with other systems to support the body and allow for movement. Recognize that bones produce blood cells.	<p>Have sufficient understanding of the differences in function for skeletal muscle, smooth muscle and cardiac muscle and their importance in the human body.</p> <p>Understand how an action potential is initiated and skeletal muscle contraction occurs.</p> <p>Define terminology regarding contractions, including tetanus, graded response and muscle tone.</p> <p>Discuss sources of ATP for contraction, the oxygen debt,</p>	<p>Essentials of Human Anatomy & Physiology (Marieb, 8th ed.)</p> <p>Reading topics: Chapter 6 (pgs 177-215)</p> <p>Overview of muscle tissue Skeletal muscle activity Muscle movements, types and names Gross anatomy of (selected) skeletal muscles</p> <p>Chapter 6 Worksheet series</p> <p>Chapter 6 transparencies</p> <p>Laserdisc: "Muscle</p>	<p>Chapter 6 worksheet: Muscle groups and functions</p> <p>Chapter 6 test</p> <p>Lab Exercise: none</p>

	and waste products formed such as lactate. Recognize and know by name selected muscles found in the thigh, abdomen and shoulder, and their actions as a group	contraction” Video: “Muscle tissue” Powerpoint presentations by chapter Teacher-led discussions	

ANATOMY &PHYSIOLOGY LEVEL 2

Chapter 7 The Nervous System

Framework Standard: Biology

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
4.4 Explain how the nervous system (brain, spinal cord, sensory neurons, motor neurons) mediates communication among different parts of the body and mediates the body’s interactions with the environment. Identify the basic unit of the nervous system, the neuron, and explain generally how it works.	Is able to diagram out the general organization of the CNS, PNS, and other branches of the nervous system Can list the types and functions of the neuroglial cells Describe the general structure of a neuron and its important	Essentials of Human Anatomy & Physiology (Marieb, 8 th ed.) Reading topics: Chapter 7 (Pgs 221-265) Organization of the nervous system Nervous tissue: structure and function	Chapter worksheets: Stress and Emotion Neurotransmitters and drugs Chapter 7 test Lab Exercises: Reflex Physiology Activity

	<p>anatomical regions</p> <p>Distinguish between sensory, motor and association neurons based on physiology and morphology</p> <p>Can explain how the two main divisions of the nervous system mediate communication between different parts of the body and mediates the body's interactions with the environment.</p> <p>Can describe a reflex arc, and list its elements</p> <p>Can recognize and identify the four main lobes (frontal, parietal, occipital and temporal) of the cerebrum and list some functions of each</p> <p>Will be able to identify elements of the diencephalon and midbrain</p>	<p>Central nervous system Peripheral nervous system</p> <p>Chapter 7 worksheet series</p> <p>Chapter 7 transparencies</p> <p>Powerpoint presentations by chapter</p> <p>Video: "Perception" "Teenage Brain" "Stress and Emotion" "Cocaine and the Brain"</p> <p>Teacher-led discussions</p>	<p>Sheep brain dissection</p> <p>Cranial Nerve Activity</p>

ANATOMY &PHYSIOLOGY LEVEL 2

Chapter 8: Special Senses (eye)

Framework Standard: Biology : none applicable

Learning Objectives/ Content Outcomes (The learner should be able to...)	Skills	Resources	Assessments
<p>Identify the accessory structures of the eye and their functions</p> <p>Name the eye tunics and indicate the major function of each</p> <p>Explain how rods and cones differ, and what their roles are in vision</p> <p>Describe image formation on the retina</p> <p>Describe the visual pathway to the optic cortex</p>	<p>Recognition of ocular structures from a chart or model of human eye</p> <p>Explain the differences in anatomy and physiology of the two main light receptors of the retina</p> <p>Understand how images are formed on the retina, and how the brain interprets them</p>	<p>Essentials of Human Anatomy & Physiology (Marieb, 8th ed.)</p> <p>Reading topics: Chapter 8 (pgs 271-284)</p> <p>The eye and vision: Anatomy of the eye Pathway of light through the eye Visual fields and pathways Eye reflexes</p> <p>Chapter 8 Worksheet series</p> <p>Chapter 8 transparencies</p> <p>Powerpoint presentations by chapter</p> <p>Teacher-led discussions</p>	<p>Chapter 8 worksheet: Eye and vision</p> <p>Chapter 8 test</p> <p>Lab Exercise: Eye dissection Visual function</p> <p>Demo: Ophthalmoscope use</p>

