

VAN BUREN SCHOOL DISTRICT
HONORS ANATOMY & PHYSIOLOGY CURRICULUM 2006
ESSENTIALS OF ANATOMY AND PHYSIOLOGY

DAYS	CHAPTER	TOPIC	SUB-TOPICS	LABS	FRAMEWORKS	ACT
1/2	1	Scientific Method (Review)	The Nature of Science	The Scientific Method	NS.16.AP.1 Explain why science is limited to natural explanations of how the world works NS.16.AP.2 Compare and contrast hypotheses, theories, and laws NS.16.AP.3 Distinguish between a scientific theory and the term "theory" used in general conversation NS.16.AP.4 Summarize the guidelines of science: <ul style="list-style-type: none"> • explanations are based on observations, evidence, and testing • hypotheses must be testable • understandings and/or conclusions may change with additional empirical data • scientific knowledge must have peer review and verification before acceptance 	
1/2		Cell Chemistry (Review)			CC.2.AP.1 Distinguish between <i>matter</i> and <i>energy</i> CC.2.AP.2 Explain the basic assumptions and conclusions of the <i>atomic theory</i> CC.2.AP.3 Distinguish between <i>compounds</i> and <i>mixtures</i> CC.2.AP.4 Explain the role of <i>ionic, covalent, and hydrogen bonds</i> in the human body CC.2.AP.5 Write simple formulas and chemical word equations for the four basic types of reactions: <ul style="list-style-type: none"> • <i>synthesis, decomposition</i> • <i>single replacement, double replacement</i> CC.2.AP.9 Compare the structure and function of carbohydrates, lipids, proteins, and nucleic acids	

1/2	2-3	Cells Cell Chemistry (Review)	Cells and their organelles, plasma membrane structure, structure of macromolecules, mitosis, meiosis,	Cell Structure The Cell Cycle	<p>APC.3.AP.1 Explain the structure and function of the <i>plasma membrane</i></p> <p>APC.3.AP.2 Compare and contrast the different ways in which substances cross the <i>plasma membrane</i>:</p> <ul style="list-style-type: none"> • <i>diffusion</i> and <i>osmosis</i> • <i>facilitated diffusion</i> • <i>active transport</i> • <i>filtration</i> • <i>endocytosis</i> • <i>exocytosis</i> <p>APC.3.AP.3 Describe the structure and function of <i>organelles</i> and cell parts</p> <p>APC.3.AP.4 Identify chemical substances produced by cells</p> <p>APC.3.AP.6 Differentiate between <i>mitosis</i> and <i>meiosis</i></p> <p>APC.3.AP.7 Explain the consequences of abnormal cell division</p>	Process of Scientific Investigation
1/2	4	Understand that DNA is the basis for genetic information (Review)	Structure and function of DNA and RNA. Protein synthesis, DNA replication, translation, transcription, complete cellular respiration, metabolism.	construct DNA molecule. Geneticrummy. Punnettssquare Karyotype lab.	<p>APC.3.AP.5 Differentiate among replication, <i>transcription</i>, and <i>translation</i></p> <p>NS.18.AP.4 Relate the chromosome theory of heredity to recent findings in genetic research (e.g., Human Genome Project-HGP, chromosome therapy)</p>	Process of Scientific Investigations. Identification of Models
3	Chap 1	Intro to Body Organ. & Terminology	Body Organization , directional terms, quadrants, planes, cavities, membranes, body regions	Body Organization & Terminology	<p>OHB.1.AP.1 Infer the relationship between <i>anatomy</i> and <i>physiology</i></p> <p>OHB.1.AP.2 Sequence the levels of organization of the human body</p> <p>OHB.1.AP.3 Identify the major body systems</p> <p>OHB.1.AP.4 Describe relative positions, body planes, body regions and body quadrants</p> <p>OHB.1.AP.5 Identify the major body cavities and the subdivisions of each cavity</p> <p>OHB.1.AP.6 Investigate <i>homeostatic</i> control mechanisms and their importance to health and diseases</p> <p>OHB.1.AP.7 Predict the effect of positive and negative feedback mechanisms on <i>homeostasis</i></p> <p>OHB.1.AP.8 Identify the major characteristics of life:</p> <ul style="list-style-type: none"> • metabolism • responsiveness • movement • growth • reproduction • differentiation 	

5	5	Tissues	Analyze different types of tissues and characteristics. Recognize various tissues under microscope. 3 primary germ layers, tissue repair, tissue changes with age, glandular epithelium. Ethical Study: Placebos	Study slides and photomicrographs of tissue types. Draw each tissue from slides Importance of Microscopes	T.4.AP.1 Describe the structure, location, and function of each <i>tissue</i> category: <ul style="list-style-type: none"> • <i>epithelial</i> • <i>connective</i> • <i>nervous</i> • <i>muscle</i> NS.19.AP.2 Use appropriate equipment and technology as tools for solving problems (e.g., microscopes, centrifuges, flexible arm cameras, computer software and hardware) NS.20.AP.2 Discuss why scientists should work within ethical parameters NS.20.AP.3 Explain how the cyclical relationship between science and technology results in reciprocal advancements in science and technology NS.17.AP.1 Develop and explain the appropriate procedure, controls, and variables (dependent and independent) in scientific experimentation NS.17.AP.3 Identify sources of bias that could affect experimental outcome	
3	6	Integumentary System	Layers of the integument, skin coloring, structures of the skin, functions of skin, changes with age, disorders of the skin, membranes. Case Study	Diagrams and models of cross-section of skin. Fingerprint Lab Slides of skin cross sections.	BS.5.AP.1 Identify the components of the <i>integumentary system</i> BS.5.AP.2 Discuss the physiological mechanisms of the skin BS.5.AP.3 Identify the macroscopic and microscopic structure of the <i>integumentary system</i> BS.5.AP.4 Describe disorders associated with the <i>integumentary system</i> NS.20.AP.1 Compare and contrast human biology concepts in <i>pure science</i> and <i>applied science</i>	Identification of conclusions, hypotheses, models or predictions.
5	7	Skeletal System	Gross and microscopic anatomy of different bone types. Bone formation; bone remodeling, axial and appendicular skeleton, fracture repair, joint types, t, bone markings, blood cell formation, levers, types of joint movement.	Identify and locate bones of axial and appendicular skeleton on an articulated and disarticulated skeleton.	BS.6.AP.1 Identify the components the <i>skeletal system</i> BS.6.AP.2 Discuss the physiological mechanisms of the <i>skeletal system</i> BS.6.AP.3 Identify the macroscopic and microscopic structure of bone BS.6.AP.4 Describe disorders associated with the <i>skeletal system</i>	Process of Scientific Investigation

5	8	Muscular System	Functional unit of a muscle, Oxygen Debt, muscle fatigue, types of muscle tissue, skeletal muscles, types of contraction, actin and myosin filaments, sliding filament theory, disorders origins and insertions, neuromuscular junction, motor units, smooth muscle, cardiac muscle, muscle interactions, major skeletal muscles.	Identify smooth, cardiac, skeletal muscles from slides. , palpate specific muscles Muscle Man	BS.7.AP.1 Identify the components the <i>muscular system</i> BS.7.AP.2 Discuss the physiological mechanisms of the <i>muscular system</i> BS.7.AP.3 Identify the macroscopic, microscopic, and molecular structure of muscle BS.7.AP.4 Describe disorders associated with the <i>muscular system</i>	Process of Scientific Investigation
5	9	Nervous System	Neuron structure, nerve impulse, structure and function of brain lobes, spinal cord tracts, PNS, reflex arc, cranial nerves, nerve plexuses, ANS, disorders, aging, neuroglia, neurotransmitters, cerebral cortex, meninges, neuronal pools, cerebral spinal fluid. Case Study	Sheep brain dissection. General sensation Lab Reflex lab	BS.8.AP.1 Identify the components the <i>nervous system</i> BS.8.AP.2 Discuss the physiological mechanisms of the <i>nervous system</i> BS.8.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>nervous system</i> BS.8.AP.4 Describe disorders associated with the <i>nervous system</i> NS.19.AP.2 Use appropriate equipment and technology as tools for solving problems (e.g., microscopes, centrifuges, flexible arm cameras, computer software and hardware) NS.17.AP.2 Research and apply appropriate safety precautions (refer to ADE Guidelines) when designing and/or conducting scientific investigations NS.18.AP.5 Research current events and topics in human biology NS.17.AP.4 Gather and analyze data using appropriate summary statistics NS.17.AP.5 Formulate valid conclusions without bias NS.17.AP.6 Communicate experimental results using appropriate reports, figures, and tables	Interpretation of Data and other Information
5	10	Senses	Taste, smell, vision, hearing, disorders, equilibrium, pain.	Dissect the cows eye Lab on vision, smell, taste, hearing and equilibrium	NS.19.AP.1 Collect and analyze scientific data using appropriate mathematical calculations, figures, and tables NS.17.AP.1 Develop and explain the appropriate procedure, controls, and variables (dependent and independent) in scientific experimentation NS.17.AP.4 Gather and analyze data using appropriate summary	Interpretation of data and other Information

5	11	Endocrine System	Endocrine organ functions and locations, hormones, hypothalamus and pituitary disorders. End of Semester 1	Study human torso for locations of glands Observe slides of microscopic anatomy	BS.9.AP.1 Identify the components of the <i>endocrine system</i> BS.9.AP.2 Discuss the physiological mechanisms of the <i>endocrine system</i> BS.9.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>endocrine system</i> BS.9.AP.4 Describe disorders associated with the <i>endocrine system</i>	Identification of models
10	12 and 13	Circulatory System	Composition and physical characteristics of blood. Types of blood cells, blood types, blood testing, blood flow through hearts, valves, contraction, ECG, fetal heart, SA and AV nodes, arteries, veins, and capillaries, blood pressure pulmonary and systemic circulation, electrocardiogram, cardiac cycle, origin and development, hemostasis.	Dissection of pigs heart. Study model of heart. Blood typing lab Use of stethoscope and sphygmomanometer	BS.10.AP.1 Identify the components of the <i>cardiovascular system</i> BS.10.AP.2 Discuss the physiological mechanisms of the <i>cardiovascular system</i> BS.10.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>cardiovascular system</i> BS.10.AP.4 Describe disorders associated with the <i>cardiovascular system</i>	Interpretation of data and other information. Identification of models.
5	14	Lymphatic System and Immune System	Structure, distribution and function of lymphatic system. Source of lymph, lymph nodes and other lymphoid organs, disorders. Surface membrane barriers, inflammatory process, B and T lymphocytes, macrophages, antibodies, organ transplants, immune deficiency, autoimmune disease	Lab microscopic anatomy of the lymph node, test for rheumatoid factor.	BS.11.AP.1 Identify the components of the <i>immune and lymphatic systems</i> BS.11.AP.2 Discuss the physiological mechanisms of the <i>immune and lymphatic systems</i> BS.11.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>immune and lymphatic systems</i> BS.11.AP.4 Describe disorders associated with the <i>immune and lymphatic systems</i> NS.18.AP.3 Describe the relationship between the germ theory of disease and our current knowledge of immunology and control of infectious diseases	Identification of patterns, trends, relationship of data.

5	15	Digestive System	Major organs, tissue composition, gross and microscopic anatomy of each organ, saliva, salivary glands, wall of digestive system, gastric juices, pancreatic juices, bile, defecation, dental formula, chemical breakdown, nutrition.	Enzyme lab Identify villi on slide.	<p>BS.13.AP.1 Identify the components the <i>digestive system</i></p> <p>BS.13.AP.2 Discuss the physiological mechanisms of the <i>digestive system</i></p> <p>BS.13.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>digestive system</i></p> <p>BS.13.AP.4 Describe disorders associated with the <i>digestive system</i></p> <p>CC.2.AP.10 Describe the characteristics and importance of <i>enzymes</i></p> <p>CC.2.AP.7 Explain the relationship among acids, bases, and salts</p> <p>CC.2.AP.8 Relate the concept of pH to <i>homeostasis</i></p>	
5	16	Respiratory System	Heirarchy of respiratory organ structure and functions of lungs and pleura, physiology of breathing, lung volumes and capacities, disorders, respiratory control, gas transport.	Lab - spirometer, Lab-respiratory sounds Examine sheep pluck	<p>BS.12.AP.1 Identify the components of the <i>respiratory system</i></p> <p>BS.12.AP.2 Discuss the physiological mechanisms of the <i>respiratory system</i></p> <p>BS.12.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>respiratory system</i></p> <p>BS.12.AP.4 Describe disorders associated with the <i>respiratory system</i></p>	
5	17 maybe 18	Urinary System	Gross anatomy of kidney, nephron functions, urine, structure and function of ureters, bladder, urethra, feed back for water regulation and sodium balance, filtration, micturation.	Lab-urinalysis for glycosuria, albumnuria and organic and inorganic constituents of the urine	<p>BS.14.AP.1 Identify the components the <i>urinary system</i></p> <p>BS.14.AP.2 Discuss the physiological mechanisms of the <i>urinary system</i></p> <p>BS.14.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>urinary system</i></p> <p>BS.14.AP.4 Describe disorders associated with the <i>urinary system</i></p> <p>CC.2.AP.6 Analyze the role of water in the human body</p>	Process of scientific investigation.
5	19	Male and Female Reproductive System	Structure and function of male reproductive organs, sources and functions of semen, spermatogenesis, STD's, development, puberty, sexual response, testosterone Structure and function of female reproductive organs, mammary glands, oogenesis, ovarian cycle, menstrual cycle, estrogen, progesterone, female sexual response, fertilization and birth.	Lab-microscopic anatomy of reproductive organs. Slides of sperm Cross-section of uterine tube and uterine wall	<p>BS.15.AP.1 Describe the components and the organization of the <i>reproductive system</i></p> <p>BS.15.AP.2 Discuss the physiological mechanisms of the <i>reproductive system</i></p> <p>BS.15.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>reproductive system</i></p> <p>BS.15.AP.4 Describe disorders associated with the <i>reproductive system</i></p>	

5	20	Pregnancy growth and development	Fertilization, early embryonic development, hormonal changes, embryonic stage , fetal stage, birth process, postnatal period.	Slides of early embryonic development.	<p>BS.15.AP.1 Describe the components and the organization of the <i>reproductive system</i></p> <p>BS.15.AP.2 Discuss the physiological mechanisms of the <i>reproductive system</i></p> <p>BS.15.AP.3 Identify the macroscopic, microscopic, and molecular structure of the <i>reproductive system</i></p>	
5		Fetal pig dissection	Keep daily journal of lab experience. Follow complete dissection guide provided.	Dissection of the fetal pig.	<p>NS.17.AP.2 Research and apply appropriate safety precautions (refer to ADE Guidelines) when designing and/or conducting scientific investigations</p> <p>NS.17.AP.4 Gather and analyze data using appropriate summary statistics</p>	all
	Incorporated Activities	<p>Career Study</p> <p>Case Studies</p> <p>Dissections at Elem. Sch.</p> <p>Scientific Journal Report</p>			<p>NS.21.AP.1 Research and evaluate health science careers using the following criteria:</p> <ul style="list-style-type: none"> • educational requirements • salary • availability of jobs • working conditions <p>NS.19.AP.3 Utilize technology to communicate research findings</p>	