Anatomy and Physiology Honors Course Overview

Content Area: **Science**
Course(s): **ANATOMY AND PHYSIOLOGY H**
Time Period:
Length: **Year**
Status: **Published**

Cover

EAST BRUNSWICK PUBLIC SCHOOLS

East Brunswick New Jersey

Superintendent of Schools

Dr. Victor P. Valeski

Science

Anatomy and Physiology Honors

Course Number: 1143

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Course Adoption: 4/21/1994

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Course Overview

Anatomy and Physiology is designed to introduce students to the structure and function of the human body. The scope of the course includes topics such as animal cell structure and biochemistry, tissue organization and function, and mammalian organs and organ systems as they relate to human biology. Extensive laboratory work, including a major mammalian dissection, is required. The course provides a strong background for students entering careers such as nursing, medical technology, and sports medicine. Eight college credits are available, through cooperation with Middlesex County College, for this course through the Senior College Experience.

Modifications

Each teacher, each student, each classroom is unique and adaptations are specific to each situation. Differentiating instruction and providing multiple ways to assess allows more flexibility for students to meet the standards and requirements of the class. Below are samples of the types of adaptations/modifications that may occur for students based on need including ELLs, students with a 504 Plan, Special Education, Basic Skills and Gifted and Talented students.

Adaptations/Modifications:

Input Adapt the way instruction is delivered to the learner. ***For example:*** • Use different visual aids, • Plan more concrete examples, • Provide hands-on activities, • Place students in cooperative groups.	**Output** Adapt how the learner can respond to instruction. ***For example:*** • Allow a verbal vs. written response, • Use a communication book for students, • Allow students to show knowledge with hands-on materials.	**Time** Adapt the time allotted and allowed for learning, task completion or testing. ***For example:*** • Individualize a timeline for completing a task, • Pace learning differently (increase or decrease) for some learners.
Difficulty Adapt the skill level, problem type, or the rules on how the learner may approach the work. ***For example:*** • Simplify task directions. • Use of calculator.	**Level of Support** Increase the amount of personal assistance with specific learner. ***For example:*** • Assign peer buddies, teaching assistants, peer tutors or cross-age tutors.	**Size** Adapt the number of items that the learner is expected to learn or complete. ***For example:*** • Reduce the number of vocabulary words a learner must learn at any one time.
Degree of Participation Adapt the extent to which a learner is actively involved in the task. ***For example:***	**Alternate Goals** Adapt the goals or outcome expectations while using the same materials. ***For example:***	**Substitute Curriculum** Provide differentiated instruction and materials to meet a learner's individual goals. ***For example:***

• Allow for small group/individual presentations vs. presentations to the whole class.	• Students in the same class are expected to either write a paragraph, write a bulleted response, or meet with the teacher to provide a verbal response.	• Individualize a timeline for completing a task, pace learning differently (increase or decrease) for some learners, • Use of Learning Ally.

Materials and other Resources

Human Anatomy & Physiology

Publisher: McGraw Hill

Author: Kenneth Saladin

Content Specific Standards

9-12.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
9-12.HS-LS4-1	Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
9-12.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.
9-12.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.
9-12.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
9-12.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
9-12.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.
9-12.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.

9-12.HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
9-12.HS-LS3	Heredity: Inheritance and Variation of Traits
9-12.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.
9-12.HS-PS1	Matter and Its Interactions
9-12.HS-PS1-1.1	Patterns.
9-12.HS-PS1-1.PS1.A.3	Attraction and repulsion between electric charges at the atomic scale explain the structure, properties, and transformations of matter, as well as the contact forces between material objects.

Interdisciplinary Standards

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
LA.RST.9-10.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
LA.RST.9-10.2	Determine the central ideas, themes, or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
LA.RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
LA.RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
LA.RST.9-10.5	Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).
LA.RST.9-10.6	Determine the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.
LA.RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
LA.RST.9-10.8	Determine if the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.
LA.RST.9-10.9	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.
LA.WHST.9-10.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant sufficient textual and non-textual evidence.
LA.WHST.9-10.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

LA.WHST.9-10.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
LA.WHST.9-10.5	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
LA.WHST.9-10.6	Use technology, including the Internet, to produce, share, and update writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
LA.WHST.9-10.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
LA.WHST.9-10.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
LA.WHST.9-10.9	Draw evidence from informational texts to support analysis, reflection, and research.

21st Century Life and Career Ready Practice Standards

CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP3.1	Career-ready individuals understand the relationship between personal health, workplace performance and personal well-being; they act on that understanding to regularly practice healthy diet, exercise and mental health activities. Career-ready individuals also take regular action to contribute to their personal financial well-being, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP5.1	Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.

CRP.K-12.CRP6.1	Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.
CRP.K-12.CRP7.1	Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
CRP.K-12.CRP9.1	Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' action, attitudes and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture.
CRP.K-12.CRP10.1	Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
CRP.K-12.CRP12.1	Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Technology Standards

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.12.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge

	and develop innovative products and process using technology.
TECH.8.1.12.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.12.D	Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
TECH.8.1.12.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.12.F	Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.12	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.12.A	The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.
TECH.8.2.12.B	Technology and Society: Knowledge and understanding of human, cultural and society values are fundamental when designing technology systems and products in the global society.
TECH.8.2.12.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.12.D	Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.
TECH.8.2.12.E	Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Pacing Guide

Anatomy and Physiology H Curricul			
Instructional Objectives	**NJSLS**	**Instructional Activities/ Methods/ Assignments**	Mate
ORGANIZATION OF THE BODY The students will be able to: 1. Define the terms "anatomy" and "physiology" 1. List and discuss in order of increasing complexity the levels of organization of the body	ORGANIZA-TION OF THE BODY NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	ORGANIZATION OF THE BODY 1. Have students list: a. by increasing order of size, the five smallest levels of organization b. the major organ systems c. major body planes and sections d. major body cavities e. the main directional	ORGANIZATION OF THE BO • Human Anatomy and Phys • Human Anatomy and Phys • Fetal Pigs • Dissection Tools • Human Torso Links: • https://www.wisc-online.co • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f

1. List and briefly discuss the major organ systems of the body and tell the functions of each 1. Explain the interaction between structure and function 1. Define homeostasis ORGANIZATION OF THE BODY, CONT'D. 1. Explain the importance of homeostatic control mechanisms and the operation of negative and positive feedback loops 1. Describe the anatomical position 1. Discuss and contrast the axial and appendicular subdivisions of the body by identifying the specific anatomical regions in each area. 1. Name the cavities of the body and identify the major organs found in each. ORGANIZATION OF THE BODY, CONT'D. 1. List and define the principal directional terms and body planes employed	ORGANIZA-TION OF THE BODY, CONT'D. ORGANIZA-TION OF THE BODY, CONT'D.	body terms and their meanings 1. Dissect and display a fetal pig. Ask students to identify at least three organs from each of the ten organ systems. 1. Pinpoint major body regions and cavities and associated organs on a human torso model. 1. Group/team assignment- create an original ?How to?? narrative which includes anatomical terms consisting of: 1- section; 4 direction; 4 cavities, 4- abdominopelvic, 6 anterior, 4 posterior, 4 body systems- do an oral presentation to the class. 1. Exercise1 ?The Language of Anatomy 1. Exercise2 ?Organ Systems Overview (pig dissection). 1. Test: Introduction to Anatomy ORGANIZATION OF THE BODY, CONT'D.	ORGANIZATION OF THE BC ORGANIZATION OF THE BC

in describing the body and the relationship of its parts. 1. Chemical Basis of Life <u>CELLS</u> The students will be able to: 1. Describe the molecular structure and function of cell membranes 1. Compare the processes of diffusion, dialysis, facilitated diffusion, osmosis, and filtration. 1. Discuss and compare the factors that determine potential osmotic pressure of electrolyte and non-electrolyte solutions. 1. Discuss the "active" cell transport mechanisms responsible for movement of some materials through cell membranes. CELLS, CONT'D.	CELLS NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	ORGANIZATION OF THE BODY, CONT'D. CELLS 1. Working in groups, students will create a	CELLS • Human Anatomy and Phys • Human Anatomy and Phys • Computer/printer • Marbles and/or uniform pie Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f CELLS, CONT'D.

1. Discuss and give examples of how cells adapt to changing conditions and what kinds of changes may be harmful to the body. 1. Discuss the structure and function of the following cell structures: endoplasmic reticulum ribosomes, golgi apparatus, mitochondria, lysosomes, peroxisomes, cytoskeleton, cell fibers, centro some, centrioles, cell extensions, nucleus, and cell connections. <u>TISSUES</u> The students will be able to: 1. Define the term <u>tissue</u>. 1. List the four major categories of tissues and discuss the basic structure and function of each type. 1. List and discuss some important structural and functional generalizations that apply to epithelium as a principal tissue type and explain how structure dictates function. 1. Classify membranous epithelium using cell shape and cell layers as criteria; discuss each 1. Type in terms of its structure, function, and location in the body. TISSUES, CONT'D.	CELLS, CONT'D. TISSUES NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	written and visual interpretation of an assigned type of active or passive transport (diffusion, facilitated diffusion, endocytosis exocytosis, pinocytosis, osmosis, filtration) present to the class. 1. Exercise5B ? Transport Mechanisms and Permeability computer simulation 1. Case Study: Plasma Protein play 1. Case Study: Cellular Signaling 1. Test: Cellular Transport and Body Tissues CELLS, CONT'D.	TISSUES • Human Anatomy and Phys • Human Anatomy and Phys • Light Microscopes • Various Tissue Slides (Epit • Color pencils Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f TISSUES, CONT'D.

1. Discuss glandular epithelium and compare endocrine and exocrine glands in terms of generalized function. 1. Discuss the structural classification of exocrine glands and explain how structure dictates function. 1. List the major types of connective tissues and contrast their important structural and functional differences. 1. Discuss the major types of connective tissue fibers, cells and matrix in terms of structure and function. TISSUES, CONT'D. 1. Compare bone and cartilage in terms of generalized function, cell types, organizational structure, and blood supply. 1. Discuss blood as a tissue. 1. Compare characteristics of neurons and neuralgia in terms of nervous system function. 1. Explain the process of regeneration as it relates to tissue repair. 1. Discuss and give examples of the two major categories or types of body membranes.	TISSUES, CONT'D.	TISSUES 1. Introductory microscope activity 1. Exercise 6A: Classification of Tissues 1. Exercise 6B: Histology Atlas 1. Exercise 8: Classification of Coverings and Lining Membranes 1. Test: Cellular Transport and Body Tissues 1. Lab Practical: Body Tissues	TISSUES, CONT'D.

SKIN AND ITS APPENDAGES The student will be able to: 1. Define the terms integument and integumentary system. 1. Discuss the generalized functions of the skin as an organ system. 1. Describe the cell types and cell layers of the epidermis in thick skin and give the function of each. 1. Discuss epidermal growth and repair. 1. Describe the layers, structural components, and functions of the dermis. Explain how these structures dictate their function.	TISSUES, CONT'D. SKIN AND ITS APPEND-AGES NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	TISSUES, CONT'D. TISSUES, CONT'D.	SKIN AND ITS APPENDAGE • Human Anatomy and Phys • Human Anatomy and Phys • Microscopes • Computers/printer • Pigmented skin, un-pigmer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f SKIN AND ITS APPENDAGE
SKIN AND ITS **APPENDAGES, CONT'D.** 1. Discuss factors that influence skin color. 1. Describe the formation, structure, and growth of hair and nails. 1. Discuss and compare the function of sweat (sudoriferous), sebaceous, and ceruminous glands. 1. Discuss the composition and function of the skin surface film.			

1. Explain how the skin functions in homeostasis of body temperature. 1. Explain the classification of burns into first, second, and third degree. SKIN AND ITS **APPENDAGES, CONT'D.** 1. Compare and contrast the cause, effect, treatment, prognosis and diagnosis of skin related disorders, which are addressed in the chapter. <u>THE SKELETAL SYSTEM</u> The students will be able to: 1. Identify the two main subdivisions of the skeleton. 1. List the primary subdivisions of the axial skeleton.	SKIN AND ITS **APPENDAGES, CONT'D.** SKIN AND ITS **APPENDAGES, CONT'D.**	SKIN AND ITS APPENDAGES 1. Use an overhead projector to show an unlabeled illustration of the skin. As you ask students to label specific components ask others to identify the function of each. Use plastic model of skin. 1. Predictions: Assign teams or pairs of students. Give 20 minutes to write answers without resources; then 20 minutes to make corrections. a. Predict how high atmospheric humidity stresses body temperature homeostasis. b. Predict how a person's homeostatic body temperature responses change by body growth with lots of added fat tissue. c. Predict what possible effects you would	SKIN AND ITS **APPENDAGI** THE SKELETAL SYSTEM • Human Anatomy and Phys • Human Anatomy and Phys • Skeleton • Disarticulated bones • Skulls • X-rays • Computers/Printer Links:

1. Distinguish between the bones of the skull and those of the face; adult and fetal. 1. Name the regions of the vertebral column and give the number of vertebrae in each segment. 1. Discuss the bony components of the rib cage, or chest. 1. List the primary subdivisions of the appendicular skeleton. THE SKELETAL SYSTEM, CONT'D. 1. List the bony components of the shoulder and pelvic girdles. 1. Compare the structure and function of the wrist and hand with the ankle and foot. 1. Discuss the structural components and functional significance of the arches of the foot. 1. List the skeletal difference between men and women. 1. Discuss age changes in the skeleton. 1. Discuss the three primary types of abnormal vertebral curvatures. <u>SKELETAL TISSUES</u> The students will be able to:	THE SKELETAL SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	experience by a lack of melanin in your body. d. Predict dangers associated with exposure to constant sunlight or to constant use of depilatories. e. Predict what symptoms can cell behaviors you would expect with onset of the different kinds of skin cancer. f. Compare and contrast epidermis and dermis structurally and functionally. Explain how the structure of each dictates their function. 1. Exercise 7: The Integumentary System 1. Cancer Webquest SKIN AND ITS **APPENDAGES, CONT'D.** 1. Case Study: Lost in the Desert 1. Test: The Integumentary System	• https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f • http://daphne.palomar.edu/ THE SKELETAL SYSTEM, C SKELETAL TISSUES • Human Anatomy and Phys • Human Anatomy and Phys • Bone fragments • Microscopes • Bone tissue slides • Cross-section of bone mod • X-rays

1. List the four types of bones and give examples of each. 1. Identify the six major structures of a typical long bone. 1. Identify each of the major constituents of bone as a tissue and discuss how structural organization contributes to function. 1. Identify by name and discuss each of the major components of a haversian system. 1. List and describe the function of the three major types of cells found in bones. SKELETAL TISSUES, CONT'D. 1. List and discuss the five homeostatic functions of bones. 1. Compare and contrast the development of intramembranous and endochondral bone. 1. Describe steps involved in bone fracture repair. 1. Compare the basic structural units of bone and cartilage. 1. Identify the three specialized types of cartilage, give examples of each, and summarize the structural and functional differences between them. 1. Compare the mechanism of growth in bone and cartilage.	THE SKELETAL SYSTEM, CONT'D. SKELETAL TISSUES NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	SKIN AND ITS **APPENDAGES, CONT'D.** THE SKELETAL SYSTEM 1. Have students identify or explain on a skeletal model: a. the axial skeleton b. the appendicular skeleton c. the cranial and facial	• Computers/printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f SKELETAL TISSUES, CONT' ARTICULATION • Human Anatomy and Phys • Human Anatomy and Phys • Disarticulated bones • Skeleton

ARTICULATION 1. Define the term articulation. 1. Compare the classification of joints according to both structure and function. 1. Explain the functional significance of burase. 1. Identify the types of movement as synovial joints and give examples of specific joints where each occurs. 1. Discuss the knee joint as a typical synovial joint. 1. Compare and contrast the structural characteristics of uniaxial, biaxial, multiaxial diarthroses and give an example of each. Explain how structure dictates function. ANATOMY OF THE MUSCULAR SYSTEM The students will be able to: 1. List the major connective tissue elements related to skeletal muscle. 1. Discuss attachment of muscles. 1. Explain the functional classification of muscles based on movement pattern. 1. Identify six features that may be used to name a muscle.	SKELETAL TISSUES, CONT'D. ARTICULA-TION NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A	bones d. the sutures and fontanels of the skull e. cribriform plate of the ethmoid bone f. bony components of the rib cage or chest g. primary subdivisions of the appendicular skeleton h. bony components of the shoulder and pelvic girdles i. structural components of the arches of the foot j. structures of the wrist and hand, ankle and foot k. regions of the vertebral column and the number of vertebrae in each segment l. skeletal differences between men and women 1. EXAMINE BONES from a disarticulated skeleton and identify all markings and explain how the markings dictate the location, structure and function of each bone. 1. Use a long bone that has been split and ask several students to show the class the marrow, blood, compact bone, and spongy bone. Or you may be able to obtain a joint and ask students to identify the joint, ligaments, tendons, and muscles. THE SKELETAL SYSTEM, CONT'D. 1. Use your own or a volunteer's body to	• Computer/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f ANATOMY OF THE MUSCU • Human Anatomy and Phys • Human Anatomy and Phys • Microscopes • Muscle slides • Cats • Dissecting tools Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f ANATOMY OF THE MUSCU

ANATOMY OF THE MUSCULAR SYSTEM, CONT'D. 1. Identify major muscles, their points of attachment, and their function in the following areas • facial expression • mastication • move the head • move the abdominal • pelvic floor • acting on the shoulder girdle • move the upper and lower arm • move the wrist, hand, and fingers • move the thigh and lower leg • move the ankle and foot 1. Define posture and discuss its importance to the body as a whole. <u>MUSCLE PHYSIOLOGY</u> The students will be able to: 1. List and discuss the three generalized functions of skeletal muscle tissue. 1. Discuss the three characteristics of skeletal muscle cells that allow them to function as they do. 1. Discuss the structure and function of myofilaments. 1. Explain the series of steps in muscle contraction.	LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B ANATOMY OF THE MUSCULAR SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	demonstrate: a. a comparison of the structure and function of the wrist and hand with the ankle and foot b. functional significance of the arches of the foot c. how age changes affect one's skeleton d. three primary types of abnormal vertebral curvatures e. different types of diarthrotic joints 1. Show x-rays of skeletal diseases and deformities in addition to the usual fractures. 1. Exercise 9: Overview of Skeleton: Classification and Structure of Bones & Cartilages 1. Exercise 10: The Axial Skeleton 1. Exercise 11: The Appendicular Skeleton 1. Exercise 12: The Fetal Skeleton 1. Case Study: Dem Bones 1. Test: The Skeletal System SKELETAL TISSUES 1. Using illustrations or transparency masters, engage students in active learning by giving pairs of students each a different illustration and allowing them time to prepare a brief presentation on the	MUSCLE PHYSIOLOGY • Human Anatomy and Phys • Human Anatomy and Phys • Microscopes • Muscle slides • Color pencils • Computer/printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f MUSCLE PHYSIOLOGY, CO

1. Describe the sliding filament theory. 1. Explain the series of steps in muscle relaxation. 1. Identify and explain the energy sources for muscle contraction. MUSCLE PHYSIOLOGY, CONT'D 1. Discuss aerobic and anaerobic respiration. 1. List and describe the three types of muscle fibers. 1. Define a motor unit. 1. Describe the following types of skeletal muscle contractions: twitch, treppe, tetanus, tonic, isotonic, isometric. 1. Explain the graded strength principle. 1. Describe the anatomical and functional characteristic of cardiac and smooth muscle. (General only)	ANATOMY OF THE MUSCULAR SYSTEM, CONT'D.	structures and/or functions of one of the following: a. four types of bones (and examples) b. six major structures of a long bone c. major constituents of bone as a tissue d. major components of a haversian system e. three major types of bone cells f. five homeostatic functions of bones g. basic structural units of bones and cartilage h. three types of cartilage 1. If obtainable, display X-rays of bones in various stages of repair and ask teams of students to determine which is which and share with the rest of the class why they came to their conclusions. How accurate were they? Another alternative is to have a specialist bring and discuss X-rays that show various stages of repair taking place and explain how to read an X-ray for this kind of information. (Guest speaker, chiropractic medicine) 3. Test: The Skeletal System	THE CENTRAL NERVOUS S • Human Anatomy and Phys • Human Anatomy and Phys • Human Torso • Brain models • Brain and Spinal cord spec • Dissection tools • Computers/printer
<u>THE CENTRAL NERVOUS SYSTEM</u> The students will be able to: 1. List the major divisions of the nervous system. 1. Identify and locate the layers of the meninges. 1. Discuss the formation, circulation, and function of cerebrospinal fluid. 1. Discuss the location and structure of the spinal cord.	MUSCLE PHYSIO-LOGY NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	SKELETAL TISSUES, CONT'D.	Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f THE CENTRAL NERVOUS S

1. List the three major divisions of the brain. 1. Describe the structure of the cerebellum. 1. Identify and discuss the primary functions of the two major components of the diencephalon. THE CENTRAL NERVOUS SYSTEM CONT'D. 1. Describe the structure of the cerebrum. 1. Discuss the sensory, motor, and integrative function of the cortex. 1. Define electroencephalogram (EEG) and explain how it is produced. 1. Compare and contrast somatic sensory and somatic motor pathways. 1. Structure, location & function of: • Medulla oblongata • Pons Varolii' • Mid-brain • Thalamus • Hypothalamus • Cerebrum • Cerebellum • Lymbic system • Reticular formation THE PERIPHERAL NERVOUS SYSTEM The students will be able to: 1. Identify the cranial nerves by name and give the generalized function of each. 1. Discuss the generalized	MUSCLE PHYSIO-LOGY, CONT'D. THE CENTRAL NERVOUS SYSTEM NJSLS: PS1.A PS1.B PS3.A	ARTICULATION 1. Identify all major joints on the human skeleton 1. The human skeleton parts can be moved to show angular movements and the contribution the diarthrotic joints make between rigid bones. Ask volunteer students to move their bodies to demonstrate flexion, abduction, circumduction, etc. 1. Create a written narrative which illustrates a common everyday movement, sport or occupational movement and identify the bones and joints used. Classify each joint by type and range of movement. Discuss the short term and long term effects of the movement (effect on the joint) example - baseball injury - rotator cuff. 1. Exercise 13: Articulations & Body Movement.	THE PERIPHERAL NERVOU • Human Anatomy and Phys • Human Anatomy and Phys • Microscopes • Nerve slides • Brain models • Human torso • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f

structure or ranching of a typical spinal nerve. 1. Identify the location of the four major pairs of plexuses. 1. Identify the basic principles of somatic motor pathways. 1. List and discuss several of the somatic reflexes of clinical importance. 1. Identify the two major subdivision of the autonomic nervous system. THE PERIPHERAL NERVOUS SYSTEM, CONT'D. 1. Compare and contrast the structures of the parasympathetic and sympathetic pathways. 1. Identify the autonomic neurotransmitters and the fibers where they are found. 1. Discuss the function of the autonomic nervous system as a whole 1. Compare and specify function of the sympathetic and parasympathetic divisions of the autonomic nervous system. <u>NERVOUS SYSTEM CELLS</u> The students will be able to: 1. Describe the generalized	PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B THE CENTRAL NERVOUS SYSTEM CONT'D.	1. Test: The Skeletal System ANATOMY OF THE MUSCULAR SYSTEM 1. Use a pair of scissors or lab scales to demonstrate a first-class lever, asking the class to demonstrate operation of a first-class level in the human body. Similarly, describe while demonstrating uses of second-class levers (use of a wheelbarrow) and third-class levers (lifting/moving a filled shovel) while students move their bodies in a way that demonstrates these as well. 1. **Deducing muscle action**. The action of a particular muscle can be deduced not only from its name, but also from its points of attachment. The way to demonstrate this principle is to use lengths of rope or twine to mimic each particular muscle. One end of the rope is placed on a flexible skeleton at the origin and the other end at the insertion. If the "insertion" end is pulled toward the "origin" end, the action of the muscle can be reproduced, although	THE PERIPHERAL NERVOU NERVOUS SYSTEM CELLS • Human Anatomy and Phys • Human Anatomy and Phys • Microscopes • Nerve slides • Neuron model • Computer/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f

function of the nervous system. 1. Identify and describe the various subdivisions of the nervous system. 1. Identify and describe the general structural and functional characteristics of the two main types of cells that compose the nervous system. 1. List and describe the structure and function of the five types of neuralgia. 1. Identify the type of neuroglia cells found only in the peripheral nervous system. NERVOUS SYSTEM CELLS, CONT'D. 1. Classify neurons according to structural and functional characteristics. 1. Discuss the structural and functional components of a three-neuron ipsilateral reflex arc. 1. Differentiate between white and gray matter. 1. Describe the stages of the healing process after injury to a peripheral motor neuron. 1. Identify the characteristics of resting membrane potentials and local potentials. NERVOUS SYSTEM CELLS,	THE PERIPHERAL NERVOUS SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B THE PERIPHERAL NERVOUS SYSTEM, CONT'D.	somewhat awkwardly. This is a good opportunity to emphasize that coordinated groups of muscles are needed for smooth movements typical in the human body. It might also be a good opportunity how a muscle that crosses more than joint can have more than one action. ANATOMY OF THE MUSCULAR SYSTEM, CONT'D. 1. Exercise 14: Microscopic Anatomy and Organization of Skeletal Muscle. 1. Exercise 15: Gross Anatomy of the Muscular System. 1. Dissection Exercise 1:Dissectionand Identification of Cat Muscles. 1. Case Study:A Spill at Parsenn Bowl- Knee Injury and Recovery 1. Test: The Muscular System	NERVOUS SYSTEM CELLS, NERVOUS SYSTEM CELLS,

CONT'D. 1. Describe the sequence of events in an action potential. 1. Compare and contrast continuous propagation of an action potential with salatory conduction. 1. List and describe the structural components of a synapse. 1. Explain the mechanism of conduction of an action potential across a synapse. <u>SENSE ORGANS</u> The students will be able to: 1. Describe the dual sensory functions of the ear. 1. List and discuss the function of the major anatomical components in the external, middle, and inner ear. 1. Identify the hearing sense organ and describe its function. 1. Discuss the physiology of hearing. 1. Identify and describe the sense organs involved in the sense of balance.	NERVOUS SYSTEM CELLS NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B NERVOUS SYSTEM CELLS, CONT'D.	MUSCLE PHYSIOLOGY 1. Stimulate class involvement by asking students to: "Abduct the arm and extend the elbow. While the arm is extended, try to abject the arm as if against resistance. What muscle is in use right now?" (Answer: The latissimus dorsi). 1. Group projects: a. create a functional model which illustrates muscle excitation, contraction and relaxation b. create a visual which will compare and contrast isotonic and isometric muscle contraction. Highlight the different effects of each. c. Create a visual which illustrates examples of first-class, second-class, and third-class lever systems of the muscular system. d. Create a visual which compares and contrasts the series of steps in muscle contraction and relaxation. Be sure to identify the energy sources for muscle contraction. Differentiate between twitch, treppe, tetanus, and tonus. e. Create a visual which explains the graded strength principle. Which type of exercise	SENSE ORGANS • Human Anatomy and Phys • Human Anatomy and Phys • Microscopes • Sense organ slides • Sense organ models • Sheep Eyes • Dissecting tools • Computer/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f SENSE ORGANS, CONT'D.

1. Identify the major anatomical structures that are visible in a horizontal section through the eyeball. SENSE ORGANS, CONT'D. 1. Describe the layers that make up the retina. 1. Compare the structure, function, and location of rods and cones in the retina. 1. Discuss the cavities and humors of the eye. 1. List and give the function of the extrinsic and intrinsic eye muscles. 1. Identify the accessory structures of the eye. 1. Discuss the four processes that focus light rays on the retina and describe the most common errors of refraction. 1. Describe the function of photopigments. <u>THE ENDOCRINE SYSTEM</u> The students will be able to: 1. Compare the endocrine structure and function with nervous structure and function. 1. Identify the different ways to classify hormones. 1. Differentiate between the mechanisms of steroid & nonsteroid hormones. 1. Describe endocrine reflexes.	NERVOUS SYSTEM CELLS, CONT'D.	will reveal the most physical benefit to an individual interested in toning their muscles. Do they need a health spa to accomplish their goal MUSCLE PHYSIOLOGY, CONT'D. 1. Create a functional model of the sarcomere and be prepared to identify all major parts and explain how the structure dictates the function of the sarcomere 1. Exercise 16B: Skeletal Muscle Physiology: Computer Simulation 1. Case Study: A perfect Storm in the Operating Room. 1. Test: The Muscular System THE CENTRAL NERVOUS SYSTEM	THE ENDOCRINE SYSTEM • Human Anatomy and Phys • Human Anatomy and Phys • Cats • Dissecting tools • Microscopes • Endocrine tissue slides • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f THE ENDOCRINE SYSTEM,

1. Discuss the chemical nature, classification, and mechanism of action of prostaglandins. 1. Discuss the size, location, and anatomical components of the pituitary gland. THE ENDOCRINE SYSTEM, CONT'D. 1. List the hormones of the adenohypophysis, describe their general functions, and identify the primary locations of their target cells. 1. Describe a typical negative feedback system 1. List and identify the action of the hormones stored and released by the neurohypophysis. 1. Discuss the structure, location, and functions of the thyroid and parathyroid glands. 1. Compare and contrast the functions of the hormones produced by the cells of the adrenal cortex with those secreted by the adrenal medulla. THE ENDOCRINE SYSTEM, CONT'D. 1. Describe the types of cells found in the pancreatic islets, and identify the functions of the pancreatic hormones. 1. List and identify the hormonal functions of the ovaries and the testes.	SENSE ORGANS NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B SENSE ORGANS, CONT'D.	1. Exercise 19: Gross Anatomy of Brain & Cranial Nerves 1. Dissections: the brain and spinal cord. 1. Case Study: Split My Brain 1. Case Study: Spinal Cord Injury 1. Case Study: Brain vs. Spinal Cord 1. Test: Nervous System I THE CENTRAL NERVOUS SYSTEM CONT'D.	THE ENDOCRINE SYSTEM,

1. List the hormones associated with the placenta, the thymus, the mucous lining of the gastrointestinal tract, and the heart. BLOOD The students will be able to: 1. Describe the generalized functions of blood and explain how the packed cell volume is determined. 1. List the types of blood cells that are normally found in circulating blood and identify the most important function of each. 1. Discuss the normal appearance, size, shape, and number of erythrocytes in circulating blood. 1. Describe the structure and function of hemoglobin. 1. Describe the process of red blood cell formation (erythropoiesis) and destruction. BLOOD, CONT'D. 1. Discuss the generalized function, classification, normal appearance, size,	THE ENDOCRINE SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B THE	THE PERIPHERAL NERVOUS SYSTEM 1. The cranial nerves: Assign pairs of students to create their own unlabeled diagrams to photocopy for the other students. Ask them to provide space at the bottom of each diagram for writing in the generalized function of each nerve. Have each pair conduct a competition among the other students to complete the labeling of each diagram in class. Diagrams to be labeled should include: a. cranial nerves (an overview) b. trigeminal nerve c. facial nerve d. glossopharyngeal nerve e. vagus nerve f. accessory nerve The spinal nerves: use the same diagramming tactics now to turn attention to the spinal nerves. Again, as pairs of students prepare their particular diagram for labeling, they should save room for students to briefly identify the general function of each. Diagrams to b labeled	BLOOD • Human Anatomy and Phys • Human Anatomy and Phys • Microscopes • Blood slides • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f BLOOD, CONT'D.

shape, and number of leukocytes in circulating blood. 1. Compare and contrast granulocytes and agranulocytes. 1. Discuss the stages in development of granular and agranular leukocytes. 1. Discuss the appearance, size shape, number, and function of platelets in circulating blood. 1. Discuss the important physical properties of platelets and their relationship to hemostasis. BLOOD, CONT'D. 1. Describe ABO and Rh blood grouping. 1. List the major plasma components and their generalized functions. 1. Explain the steps involved in blood coagulation and the factors that oppose and hasten clotting.	ENDOCRINE SYSTEM, CONT'D. THE ENDOCRINE SYSTEM, CONT'D.	should include: a. spinal nerves (an overview) b. rami of the spinal nerves c. cervical plexus d. brachial plexus e. lumbosacral plexus THE PERIPHERAL NERVOUS SYSTEM, CONT'D. 1. Exercise 21 The Spinal Cord, Spinal Nerves, and Autonomic Nervous System 1. Case Study:It Takes a lot of Nerve 1. Case Study: I've Fallen Over and Can't get Up 1. Test: Nervous System I NERVOUS SYSTEM CELLS 1. As you assign this chapter	BLOOD, CONT'D. ANATOMY OF THE CARDIC • Human Anatomy and Phys • Human Anatomy and Phys • Microscope • Cardiovascular tissue slide • Cats • Sheep hearts • Dissecting tools • Computers/Printer Links:

ANATOMY OF THE CARDIOVASCULAR SYSTEM The students will be able to: 1. List the primary organs of the cardiovascular system and relate each organ or group of organs to the movement and/or direction of blood flow in the system. 1. Discuss the location, size, and position of the heart in the thoracic cavity. 1. Describe the structure of the pericardium, the function of each pericardial layer, the pericardial space, and the pericardial fluid. 2. List and discuss the three layers of the heart wall, the heart cavities, and the valves. ANATOMY OF THE CARDIOVASCULAR SYSTEM. CONT'D. 1. Trace blood through the heart and its coronary blood vessels. 1. List the anatomical components of the heart conduction system. 1. List, locate, and compare the primary coats or layers of tissue found in major arteries and veins. 1. Correlate structure of arteries, arterioles, veins, venules, and capillaries with their function.	BLOOD NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B BLOOD, CONT'D.	to read, assign four teams of students to prepare to demonstrate to the class: a. The structure and function of the five types of neuroglia; b. The structural and functional components of a three-neuron ipsilateral reflex arc; c. The characteristics of resting membrane potentials and local potentials; and d. Compare and contrast the continuous propagation of an action potential and saltatory conduction. 1. Exercise 17: Histology of Nervous Tissue 1. Exercise 22: Human Reflex Physiology 1. Exercise 18B: Neurophysiology of Nerve Impulses: computer simulation 1. Case Study: Wearing on her Nerves 1. Test: Nervous System I NERVOUS SYSTEM CELLS, CONT'D.	• https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f ANATOMY OF THE CARDIC ANATOMY OF THE CARDIC

1. List anatomical components of microcirculation and discuss the reservoir function of veins. ANATOMY OF THE CARDIOVAS-CULAR SYSTEM, CONT'D. 1. Trace the path of blood as it leaves the right side of the heart until it returns to the left side of the heart. 1. Identify the unusual anatomical characteristics of the hepatic portal circulation. 1. List and discuss the function of the six structures characteristic of the fetal circulation. 1. Discuss changes that occur in the vascular system at birth. <u>PHYSIOLOGY OF THE CARDIOVASCULAR SYSTEM</u> Students will be able to: 1. Trace a cardiac impulse through the conduction system of the heart. 1. Discuss normal ECG deflections and intervals and their relationship to mechanical contraction. 1. Compare the results of parasympathetic and	BLOOD, CONT'D.	NERVOUS SYSTEM CELLS, CONT'D.	PHYSIOLOGY OF THE CARI • Human Anatomy and Phys • Human Anatomy and Phys • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f PHYSIOLOGY OF THE CARI

sympathetic stimulation on the heart and explain the mechanism involved in both types of autonomic control. 1. Discuss several factors that influence heart rate. 1. Discuss the major event of the cardiac cycle. PHYSIOLOGY OF THE CARDIOVASCULAR SYSTEM, CONT'D. 1. Discuss the physical principles that govern fluid flow and circulation. 1. Discuss how cardiac output, stroke volume, peripheral resistance, vasomotor pressorflex, and chemoreflex control mechanisms influence arterial blood pressure. 1. Explain the main determinants of peripheral resistance. 1. Identify and discuss the most important factors influencing venous return to the heart. 2. Describe the ADH mechanism in relation to total blood volume. PHYSIOLOGY OF THE CARDIOVASCU-LAR SYSTEM, CONT'D. 1. Explain how the blood pressure gradient and peripheral resistance are related to the minute volume of blood.	ANATOMY OF THE CARDIOVAS-CULAR SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B ANATOMY OF THE CARDIOVAS-CULAR SYSTEM. CONT'D.	SENSE ORGANS 1. Dissection: eye 1. Exercise 23: General Sensation 1. Exercise 24: Special Senses- Vision 1. Exercise 25: Special Senses- Hearing and Equilibrium 1. Case Study:Why does Grandpa ignore Grandma? 1. Case Study: ?I can see clearly now?? (perception) 1. Test: Nervous System II SENSE ORGANS, CONT'D.	PHYSIOLOGY OF THE CARI PHYSIOLOGY OF THE CARI

1. Discuss measurement of arterial blood pressure. 1. Define pulse and identify two factors most responsible for its existence. 1. Identify those body areas where the pulse can be felt and those areas where pressure may be applied to stop arterial bleeding. PHYSIOLOGY OF THE CARDIOVASCU-LAR SYSTEM, CONT'D. 1. Explain how the blood pressure gradient and peripheral resistance are related to the minute volume of blood. 1. Discuss measurement of arterial blood pressure. 1. Define pulse and identify two factors most responsible for its existence. 1. Identify those body areas where the pulse can be felt and those areas where pressure may be applied to stop arterial bleeding. <u>LYMPHATIC SYSTEM</u> The students will be able to: 1. Describe the generalized function of the lymphatic system and list the primary	ANATOMY OF THE CARDIOVAS-CULAR SYSTEM. CONT'D. PHYSIO-LOGY OF CARDIOVAS-CULAR SYSTEM	THE ENDOCRINE SYSTEM 1. Use a human torso to demonstrate endocrine gland location, or you might prefer to dissect a pig/cat for this same purpose. Identify the following endocrine organs: pituitary, thyroid, parathyroids, adrenals, pancreas, ovaries or testes, thymus, pineal body. 1. Research teams. Assign pairs of students as research teams to investigate and lead a subsequent discussion on the following topics: a. What is the timing mechanism between hypothalamus and pituitary to key certain body rhythms (e.g., menstrual cycle, daily fluctuations of internal human body temperature, secretion	LYMPHATIC SYSTEM • Human Anatomy and Phys • Human Anatomy and Phys • Microscope • Lymphatic tissue slides • Human torso • Cat • Dissection tools • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f

lymphatic structures. 1. Compare the chemical structure of lymph and interstitial fluid. 1. Discuss the formation, distribution, and general body plan of lymphatic drainage through the right lymphatic duct and the thoracic duct. 1. Compare the structure of lymphatic vessels and veins. 1. Discuss the specialized function of the lymphatic system in absorption of fats and other nutrients from the small intestine. LYMPHATIC SYSTEM, CONT'D. 1. Discuss the "lymphatic pump" and other lymphokinetic action that result in central movement, or flow, of lymph. 1. Describe and correlate the structure of lymph nodes with their function as biological filters. 1. Give the location of the major groups, or clusters, of lymph nodes in the body and identify their two primary functions. 1. Discuss lymphatic drainage of the breast. 1. Locate the thymus in the body and discuss its gross and microscopic anatomy. LYMPHATIC SYSTEM, CONT'D. 1. Discuss the function of the	NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B PHYSIO-LOGY OF THE CARDIOVAS-CULAR SYSTEM, CONT'D.	of potassium in the nephron, etc.)? b. How has genetic engineering increased the production of growth hormone and insulin? c. How does a hormone affect cell metabolism through the secondary messenger, cyclic AMP? d. What types of therapy correct diseases of hormone imbalance, such as diabetes mellitus, dwarfism, etc.? e. How do endorphins alter the body's tolerance to pain? f. What is the entire range of prostaglandin body effects? g. What is known about the pineal gland's contribution to body function? THE ENDOCRINE SYSTEM, CONT'D. a. How do various hormones mobilize the body to handle stress? b. How will the expanding fields of endocrinology and neurophysiology revolutionize the treatment of many medical and emotional disorders? c. Explain what happens with steroid abuse. 1. Exercise 27:Functional Anatomy of Endocrine	LYMPHATIC SYSTEM, CON LYMPHATIC SYSTEM, CON

thymus that result in its designation as a primary central organ of the lymphatic system. 1. Discuss the location, structure, and function of the spleen. <u>IMMUNE SYSTEM</u> The students will be able to: 1. Differentiate between the two major categories of immune mechanisms. 1. Explain the inflammatory response and phagocytosis as it relates to inflammation. 1. Compare and contrast specific and nonspecific mechanisms of immunity. 1. Discuss the formation of lymphocytes and identify the two major classes of these specialized cells. 1. Compare the chemistry and functional activity of antigens and antibodies. IMMUNE SYSTEM, CONT. 1. Discuss the development	PHYSIO-LOGY OF THE CARDIOVAS-CULAR SYSTEM, CONT'D. PHYSIO-LOGY OF THE CARDIOVAS-CULAR SYSTEM, CONT'D.	Glands 1. Exercise 28B: Endocrine System Physiology computer simulation 1. Histology Review Supplement (Physio Ex) 1. Dissection Exercise 3: Identification of Selected Endocrine Organs of the Cat 1. Case Study: Chemical Eric 1. Case Study: It's Just Stress, Right? 1. Test: The Endocrine System THE ENDOCRINE SYSTEM, CONT'D.	IMMUNE SYSTEM • Human Anatomy and Phys • Human Anatomy and Phys • Computer/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f IMMUNE SYSTEM, CONT.

and activation of B cells. 1. Discuss the relationship between chemical structure and functional activity of antibodies or immunoglobulins. 1. Describe the development, activation, and functions of T cells. 1. Explain the role of the thymus in cell-mediated immunity. 1. Discuss the origin and function of lymphokines and lymphotoxin 1. Describe the different classification of acquired immunity. <u>ANATOMY OF THE RESPIRATIORY SYSTEM</u> The students will be able to: 1. List and locate the organs of the respiratory system. 1. List the generalized functions of the respiratory system. 1. Describe and correlate the anatomy of the nose with its specialized function. 1. Locate the paranasal sinuses in the skull and describe how they drain the nose. 1. List the anatomical divisions of the pharynx and name the openings into and between its divisions.	LYMPHATIC SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B LYMPHATIC SYSTEM, CONT'D.	BLOOD 1. Point out blood cell production sites on an articulated skeleton. 1. **Hematocrit**. The concept of how the packed cell volume (hematocrit) test works can be illustrated by the carnival ride (often called the "Round-Up") in which people are held against the inside perimeter of a cylinder by the centrifugal force of rotation. 1. **Blood typing**. Rh typing, and its relationship to erythroblastosis fetalis, is especially difficult for many beginning students to grasp. The use of case histories is a good approach. Working out a few "what if" scenarios often works well. One note about the Rh factor: it is actually several different factors, each of which have slightly different immunological characteristics and inheritance patterns. In short, reality is more complicated than the simplified explanation given in the textbook. 1. Exercise 29A: Blood. NOTE: Use artificial blood, if not use the lab as an information guide (answer all fill in question).	ANATOMY OF THE RESPIR • Human Anatomy and Phys • Human Anatomy and Phys • Cats • Dissection tools • Microscopes • Respiratory tissue slides • Computers/Printer • Human Torso Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f ANATOMY OF THE RESPIR

1. Identify and locate the tonsils. ANATOMY OF THE RESPIRATIORY SYSTEM, CONT'D. 1. Discuss the location, structure, and specialized functions of the larynx. 1. Describe the structure and function of the trachea, bronchi, bronchioles, and alveoli. 1. Identify the lobes of the lungs and the bronchopulmonary segments. 1. Discuss the gross surface anatomy and generalized functions of the lungs. 1. Discuss the structure and function of the thorax and mediastinum in respiration. <u>PHYSIOLOGY OF THE RESPIRATORY SYSTEM</u> The students will be able to: 1. List and briefly discuss the regulated and integrated processes that ensure tissues of an adequate oxygen supply and prompt removal of carbon dioxide. 1. Define pulmonary ventilation and outline the mechanism of normal, quiet inspiration and expiration. 1. List by names and explain the volume of air	LYMPHATIC SYSTEM, CONT'D.	1. Exercise 29B: Blood Analysis Computer Simulation 1. Test: The Cardiovascular System BLOOD, CONT'D. BLOOD, CONT'D.	PHYSIOLOGY OF THE RESP • Human Anatomy and Phys • Human Anatomy and Phys Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f PHYSIOLOGY OF THE RESP

exchanged in pulmonary ventilation. PHYSIOLOGY OF THE RESPIRATORY SYSTEM, CONT'D. 1. Define the following: tidal volume, expiratory reserve volume, inspiratory reserve volume, residual volume, minimal volume, inspiratory capacity, functional residual capacity, total lung capacity. 1. Demonstrate the principles of partial pressure (Dalton's law) in explaining the movement of respiratory gases between alveolar air and blood moving through pulmonary capillaries. PHYSIOLOGY OF THE RESPIRATORY SYSTEM, CONT'D. 1. Discuss the major factors that determine the volume of oxygen entering lung capillary blood. 1. Explain how blood transports oxygen and	IMMUNE SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B IMMUNE SYSTEM	ANATOMY OF THE CARDIOVASCULAR SYSTEM 1. The heart is amenable to three basic tools for illustration: take-apart model, real heart (sheep fetal pig, cat) and transparency. 1. Research teams. Assign pairs of students to investigate and report back on one of the following: (select any or all) a. What is the relationship between aspirin and heart disease? b. What is the current progress on developing treatments for various heart diseases? c. How do ions figure into heart metabolism and function? d. What current	PHYSIOLOGY OF THE RESP PHYSIOLOGY OF THE RESP

carbon dioxide. 1. Interpret changes in oxygen - hemoglobin dissociation curve at various blood pH levels. 1. Discuss gas exchange in tissue capillaries between arterial blood and cells PHYSIOLOGY OF THE RESPIRATORY SYSTEM, CONT'D. 1. Explain the reciprocal interaction of oxygen and carbon dioxide on blood gas transport (Bohr vs. Haldane effect) 1. Discuss the primary factors that influence the respiratory control center and thereby control respirations. PHYSIOLOGY OF THE RESPIRATORY SYSTEM, CONT'D.	ANATOMY OF THE RESPIRA-TIORY SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B ANATOMY OF THE RESPIRA-TIORY SYSTEM,	breakthroughs successfully treat blood vessel disorders (aneurysms, phlebitis, etc.)? 1. Exercise 30: Anatomy of the Heart 1. Histology Review Supplement (Physio Ex) 1. Exercise 32: Anatomy of Blood Vessels 1. Dissection Exercise 4: Dissection of the Blood Vessels of the Cat 1. Case Study: Anyone Who had a Heart 1. Test: The Cardiovascular System ANATOMY OF THE CARDIOVASCULAR SYSTEM, CONT'D.	PHYSIOLOGY OF THE RESP

10. Explain the reciprocal interaction of oxygen and carbon dioxide on blood gas transport (Bohr vs. Haldane effect) 11. Discuss the primary factors that influence the respiratory control center and thereby control respirations. 10. Explain the reciprocal interaction of oxygen and carbon dioxide on blood gas transport (Bohr vs. Haldane effect) 11. Discuss the primary factors that influence the respiratory control center and thereby control respirations. <u>ANATOMY OF THE DIGESTIVE SYSTEM</u> The students will be able to: 1. Discuss the generalized function of the digestive system. 2. List, in sequence, each of the component part or segments of the alimentary canal from mouth to anus and identify the accessory organs of digestion that are located within or open into the gastrointestinal tract. 1. List and describe the four layers of the wall of the GI tract. 1. Discuss the major modifications of the coats of the digestive tract. 1. List and describe the structures of the mouth. ANATOMY OF THE DIGESTIVE SYSTEM, CONT'D. 1. Identify and compare the structure and secretions of	CONT'D. **PHYSIOLOGY** OF THE RESPIRA-TORY SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	ANATOMY OF THE CARDIOVASCULAR SYSTEM, CONT'D. PHYSIOLOGY OF THE CARDIOVASCULAR SYSTEM, 1. Give students problems to solve, providing two of three variables (P_1, P_2, pressure difference). 1. Give students problems to solve, providing two of three variables (CO, heart	ANATOMY OF THE DIGEST • Human Anatomy and Phys • Human Anatomy and Phys • Cats • Dissection tools • Microscopes • Digestive tissue slides • Skulls • Human torso • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f ANATOMY OF THE DIGEST

the salivary glands. 1. Discuss the structural components of a typical tooth and identify by name and number the deciduous and permanent tract. 1. Define the term <u>deglutition</u> and identify the structural divisions of the pharynx. 1. Discuss the size, position, divisions, curves, sphincters, coats, and glands of the stomach. ANATOMY OF THE DIGESTIVE SYSTEM, CONT'D. 1. Compare the structure and the functional activity of chief cells, parietal cells, and mucus-producing cells of the stomach. 1. Discuss the size, position, divisions, and wall of the small and large intestines. 1. Locate and discuss the significance of the vermiform appendix. 1. Discuss the peritoneum and its reflections. 1. Discuss the structure and functions of the liver and gallbladder. 1. Explain the relationship between cell types and function in the pancreas. <u>PHYSIOLOGY OF THE DIGESTIVE SYSTEM</u> The students will be able to:	**PHYSIOLOGY** OF THE RESPIRA-TORY **SYSTEM, CONT'D.** **PHYSIOLOGY** OF THE RESPIRA-TORY **SYSTEM, CONT'D.**	rate, and stroke volume); solve the value of the third. 1. Give students problems to solve, providing two of four blood pressures (systolic, diastolic, mean, and pulse); solve the value of the other two. 1. Display an electrocardiogram, or, better yet, run one on a subject in class, if equipment is available. 1. Exercise 33A: Human Cardiovascular Physiology/Blood Pressure & Pulse Determinations 1. Demonstrate blood pressure-taking techniques with sphygmomanometer and stethoscope. 1. Ask students to monitor and count pulse rates at the wrists, radial artery. PHYSIOLOGY OF THE PHYSIOLOGY OF THE CARDIOVAS-CULAR SYSTEM, CONT'D. 1. Research teams. Assign pairs of students to investigate the following issues and be prepared to report back to the rest of the class. Encourage creative presentation. a. What are the problems and limitations for the bearer of a mechanical pacemaker?	ANATOMY OF THE DIGEST PHYSIOLOGY OF THE DIGE • Human Anatomy and Phys • Human Anatomy and Phys • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f

1. Describe the primary mechanisms of the digestive system.

1. Define and compare mechanical and chemical digestion.

1. Discuss the function of mastication.

1. List and explain the three min steps or stages of deglutition.

1. Differentiate between peristalsis and segmentation.

1. Explain the process of emptying the stomach.

PHYSIOLOGY OF THE DIGESTIVE SYSTEM, CONT'D.

1. Define the different processes involved in mechanical digestion and identify the organ(s) that accomplish each process.

1. Define chemical digestion.

1. Define the term <u>enzyme</u> and classify enzymes according to the type of chemical reactions catalyzed.

1. List and discuss six important enzyme properties.

1. List the most important digestive juices and enzymes, the food product each digests, and he resulting products.

1. Compare and contrast

PHYSIOLOGY OF THE RESPIRA-TORY **SYSTEM, CONT'D.**

PHYSIOLOGY OF THE RESPIRA-TORY **SYSTEM, CONT'D.**

b. What factors affect pressure changes in arteries, capillaries, and veins? How?
c. What effect does prolonged, intense, physical exercise have on cardiovascular health? Why?
d. What CVS changes occur during shock?
e. How do alterations from standard ECG patterns revel anomalies in cardiovascular function?
f. How is blood flow measured from the heart?
g. How do exercise and high-density lipid production affect cardiovascular heath?
h. Does jogging improve heart function? How? Why?
i. How does the CVS contribute to body temperature control?
j. What anatomical and physiological changes occur in the circulatory system beyond middle age?

PHYSIOLOGY OF THE CARDIOVASCULAR SYSTEM, CONT'D.

1. **ECG and contraction**. Students often fail to realize that the deflections of the ECG do not represent the systole and diastole of the heart

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protein, fat, and carbohydrate digestion. PHYSIOLOGY OF THE DIGESTIVE SYSTEM, CONT'D. 1. Discuss the control of salivary, gastric, pancreatic, biliary, and intestinal exocrine secretions. 1. Identify and discuss the absorption of nutrients resulting from the digestive process and the structures into which they are absorbed. 1. Discuss elimination and defecation. <u>NUTRITION AND METABOLISM</u> The students will be able to: 1. Define the terms <u>nutrition</u> and <u>metabolism</u>. 1. Outline the processes of anabolism and catabolism and discuss the role ATP, adenosine triphosphate/adenosine diphosphate (ATP/ADP) system and its role in metabolism. 1. Discuss various dietary	ANATOMY OF THE DIGESTIVE SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	chambers. Instead, they represent the <u>electrical activity</u> that precedes the contraction/relaxation events of the myocardium. A good look at Figure 19.2 shows that the peak of the QRS complex <u>precedes</u> the peak of ventricular contraction. This is a good time to note the value of this figure in drawing together the many aspects of heart function into a single time sequence. The somewhat complex appearance of this figure puts off many beginning students as first, but they later realize it is a valuable review and reference tool. 1. **Blood flow, pressure, and resistance**. Many of the concepts of hemodynamics can be easily demonstrated with a piece of rubber tubing attached to a faucet. Squeezing of the hand from the outside can mimic the phenomenon of vasoconstriction. PHYSIOLOGY OF THE CARDIOVASCULAR SYSTEM, CONT'D. 1. Exercise 33B: Cardiovascular Dynamics Computer Simulations	NUTRITION AND METABOI • Human Anatomy and Phys • Human Anatomy and Phys • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f NUTRITION AND METABOI

sources of carbohydrates. 1. Discuss the steps involved in glycolysis. 1. Explain what is meant by the terms anaerobic respiration and aerobic respiration. NUTRITION AND METABOLISM, CONT'D. 1. Compare, contrast, and explain glycogenesis and glycogenolysis. 1. Discuss the generalized mechanisms of blood glucose homeostasis. 1. Discuss the dietary sources of lipids. 1. Identify the major lipid constituents in blood and discuss their mechanisms of transport. 1. Discuss the metabolism of lipids and the role of the liver as the chief site of ketogenesis. 1. Outline hormonal control of fat metabolism. 1. Compare and contrast protein anabolism and catabolism. NUTRITION AND METABOLISM, CONT'D. 1. Discuss the two kinds of protein or nitrogen imbalance. 1. Discuss the importance of vitamins and minerals. 1. Define the term metabolic rate and discuss how it can be expressed.	ANATOMY OF THE DIGESTIVE SYSTEM, CONT'D. ANATOMY OF THE DIGESTIVE SYSTEM, CONT'D.	1. Test: The Cardiovascular System LYMPHATIC SYSTEM 1. Allow 10-15 minutes for students to write a response to the following question: a. Should lymphatic system study be separate from the study of the systemic circulation? b. Is the spleen necessary for a person's survival? Use shared responses to these two questions as the basis for discussion. 1. Assign pairs of students to investigate the following issues and be prepared to report back to the rest of the class. Encourage creative presentation: a. What factors affect the pressure dynamics of lymph circulation? b. How do lymph nodes mobilize to fight the	NUTRITION AND METABOI THE URINARY SYSTEM

1. Discuss the major factors that influence the basal metabolic rate (BMR). 1. Discuss the relationship between energy intake, output and balance, and body weight. <u>THE URINARY SYSTEM</u> The students will be able to: 1. List the major organs of the urinary system. 1. Discuss and compare the structure and functions of the ureters, urinary bladder, and urethra. 1. Locate or position the kidneys in the abdominal cavity and identify the gross internal structures visible in a coronal section. 1. Name the parts of a nephron and describe the role of each component in the formation of urine. 1. Describe the renal blood supply and trace blood flow through the specialized vessels of the kidney. THE URINARY SYSTEM, CONT'D. 1. Discuss how the kidneys form urine, and trace urine from its point of formation to the exterior of the body. 1. Discuss filtration, reabsorption, and secretion	PHYSIO-LOGY OF THE DIGESTIVE SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B **PHYSIOLOGY** OF THE DIGESTIVE	common cold? c. What cancers affect the lymphatic system? d. What is thymus gland' role in immunity? 1. Exercise 35: Lymphatic System & Immune Response 1. Dissection Exercise 5: The Main Lymphatic Ducts of the Cat 1. Case Study:Pharyngitis 1. Test: The Lymphatic and Immune Systems LYMPHATIC SYSTEM, CONT'D.	• Human Anatomy and Phys • Human Anatomy and Phys • Microscopes • Urinary tissue slides • Cats • Dissecting tools • Sheep kidneys • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f THE URINARY SYSTEM, CC

in relation to the formation of urine by the kidneys. 1. Discuss the countercurrent mechanisms for concentrating or diluting urine. 1. Explain how urine volume is regulated under normal conditions. 1. Describe the physical characteristics of normal urine. THE URINARY SYSTEM, CONT'D. 6. Discuss how the kidneys form urine, and trace urine from its point of formation to the exterior of the body. 1. Discuss filtration, reabsorption, and secretion in relation to the formation of urine by the kidneys. 1. Discuss the countercurrent mechanisms for concentrating or diluting urine. 1. Explain how urine volume is regulated under normal conditions. 1. Describe the physical characteristics of normal urine. <u>FLUID AND ELECTROLYTE BALANCE</u> *<u>NOTE:</u> THE FOLLOWING COULD BY TREATED SEPARATELY OR IN	SYSTEM, CONT'D. **PHYSIOLOGY** OF THE DIGESTIVE SYSTEM, CONT'D.	LYMPHATIC SYSTEM, CONT'D. IMMUNE SYSTEM 1. Research teams. Assign pairs of students to investigate the following issues and be prepared to report back to the rest of the class. Encourage creative presentation. a. Study the symptoms and developmental stages of several autoimmune diseases. b. How could the future of human health and lifespans prosper through the successful marketing of interferon? How far	THE URINARY SYSTEM, CC FLUID AND ELECTROLYST • Human Anatomy and Phys • Human Anatomy and Phys • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c

CONJUNCTION WITH CHEMISTRY, RESPIRATION, and NUTRITION OR EXCRETION. The students will be able to: 1. Discuss the phrase <u>fluid and electrolyte balance.</u> 1. Discuss total body water content in terms of body weight, sex, and age. 1. List, describe, and compare the body fluid compartments and their subdivisions. 1. Discuss avenues by which water enters and leaves the body. FLUID AND ELECTROLYTE BALANCE, CONT'D. 1. Explain the mechanisms that maintain homeostasis of the body fluid compartments and of total body fluid volume. 1. Explain the regulation of water and electrolyte levels in plasma and interstitial fluid. 1. Discuss edema and the mechanisms of edema formation. 1. Explain how water and electrolyte levels are regulated in intracellular fluid. 1. Discuss the regulation of sodium and potassium levels in body fluids. 1. Discuss dehydration. <u>ACID-BASE BALANCE</u> The students will be able to:	NUTRITION AND METABO-LISM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B NUTRITION AND **METABOLISM**, CONT'D.	has researched progressed in achieving this? c. What are some common substances, antigenic to most people? d. How do individuals develop an allergic reaction to certain drugs, such as penicillin? e. Why do individuals usually not react to their own body molecules as antigenic? f. How does the body immune system mobilize for rejection of a transplanted organ? g. How does the genetic blueprint determine antigen-antibody makeup? h. How does AIDS diminish the body immune system? i. How can cancer agents be thwarted by the body's immune system? j. How successfully can various human body cell types be cloned to large numbers? 1. Exercise 35: Lymphatic System & Immune Response IMMUNE SYSTEM, CONT. 1. Case Study: A Bad Reaction 1. Video: Contagion. Students discuss the validity of the video. 1. Test: The Lymphatic and Immune Systems	• http://www.innerbody.com • https://homes.bio.psu.edu/f FLUID AND ELECTROLYTE ACID-BASE BALANCE • Human Anatomy and Phys • Human Anatomy and Phys • Computers/Printer Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f

1. Define acid-base balance. 1. Discuss the concept of pH. 1. List four acids that contribute hydrogen ions to body fluids and identify the source of each. 1. Give examples of acid- and base-forming elements and identify dietary sources for each. 1. Identify and contrast chemical and physiological buffers. 1. Contrast strong and weak acids and bases. 1. Compare the buffering of a strong acid and base with a weak acid and base. ACID-BASE BALANCE, CONT'D. 1. Explain how the chloride shift makes it possible for carbon dioxide to be buffered in red blood cells and then carried as bicarbonate in the plasma. 1. Contrast the respiratory and urinary mechanisms of pH control. 1. Compare the effects of hypoventilation and hyperventilation on blood pH. 1. Discuss the function of the distal renal tubule in acidification of urine.	NUTRITION AND **METABOLISM**, CONT'D.	ANATOMY OF THE RESPIRATIORY SYSTEM 1. This system lends itself to the use of listing and diagramming. Break the class up into pairs and have each pair prepare to lead a class discussion on one of the following: a. structure and function of the nose b. structure and function of the pharynx c. structure and function of the larynx d. structure and function of the trachea e. structure and function of the bronchi f. structure and function of the bronchioles g. structure and function of the alveoli h. structure and function of the lungs	ACID-BASE BALANCE, CON MALE REPRODUCTIVE SYS • Human Anatomy and Phys • Human Anatomy and Phys • Human Torso • Microscopes • Reproductive tissue slides Links: • https://www.wisc-online.co • http://www.getbodysmart.c

MALE REPRODUCTIVE SYSTEM The students will be able to: 1. List the essential and accessory organs of the male reproductive system and give the generalized function of each. 1. Describe the gross and microscopic anatomy of the testes. 1. Discuss the primary functions of testosterone and identify the cell type responsible for its secretion. 1. Describe the structure of a mature spermatozoan. MALE REPRODUCTIVE SYSTEM, CONT'D. 1. Trace the passage of an individual sperm cell from its point of formation, in sequence, through the genital ducts to the exterior of the body. 1. Describe the structure, location, and function(s) of the following: seminal vesicles, prostate gland, bulbourethal glands. 1. Identify the components and functions of the male external genitals. 1. Discuss the composition and course of seminal fluid.	THE URINARY SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B THE URINARY SYSTEM, CONT'D.	i. structure and function of the thorax 1. Display a sheep pluck or expose viscera for demonstration in a dissected mammal. 1. Use the skull to demonstrate the internal nose (ethmoid, conchae, etc.) and sinuses. 1. An analogy can be struck between the respiratory tract from the bronchus level and a branch moving from its trunk and subdividing. Alveoli are clustered like a bunch of grapes, the mounting alveolar duct acting like a stem. 1. With the use of a spirometer (if available), compare the lung capacity of the following: a person who smokes, a nonsmoker, an infant, a 7-year-old, a sedentary individual, an athlete, and an elderly person. ANATOMY OF THE RESPIRATIORY SYSTEM, CONT'D. 1. Explain why breathing into a paper bag restores normal blood chemistry more rapidly than continued breathing into the atmosphere. 1. Exercise 36: Anatomy of the Respiratory System 1. Dissection Exercise 6: Dissection of the	• http://www.innerbody.com • https://homes.bio.psu.edu/f MALE REPRODUCTIVE SYS MALE REPRODUCTIVE SYS

1. List and discuss the male functions in reproduction. MALE REPRODUCTIVE SYSTEM, CONT'D. 1. Trace the passage of an individual sperm cell from its point of formation, in sequence, through the genital ducts to the exterior of the body. 1. Describe the structure, location, and function(s) of the following: seminal vesicles, prostate gland, bulbourethal glands. 1. Identify the components and functions of the male external genitals. 1. Discuss the composition and course of seminal fluid. 1. List and discuss the male functions in reproduction. <u>FEMALE REPRODUCTIVE SYSTEM</u> The students will be able to : 1. List the essential and accessory sex organs of the female reproductive system and give the generalized functions of each. 1. Discuss the structure of the uterus, including details of its wall layers, size, shape, cavities, blood supply, and ligaments. 2. Locate the uterus in the pelvic cavity and compare its position with the abnormal position of	THE URINARY SYSTEM, CONT'D. FLUID AND ELECTROLYTE BALANCE NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B	Respiratory System of Cat 1. Histology Review Supplement (PhysioEx) 1. Case Study: Ice Hockey Injury 1. Test: The Respiratory System PHYSIOLOGY OF THE RESPIRATORY SYSTEM 1. Assign pairs to prepare brief demonstration on the following: a. Create visual aids to outline for the rest of the class the mechanism of normal, quiet inspiration and expiration; b. Explain the volume of air exchanged in pulmonary ventilation; c. Demonstrate the principles of partial pressures (Dalton's law) in explaining movement of respiratory gases between alveolar air and blood moving through pulmonary capillaries; d. Make a flip chart to help you explain major	FEMALE REPRODUCTIVE S • Human Anatomy and Phys • Human Anatomy and Phys • Human Torso • Microscopes • Reproductive tissue slides • Clicker mobile device appl Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f FEMALE REPRODUCTIVE S

retroflexion. 1. Identify the functions of the uterus. FEMALE REPRODUCTIVE **SYSTEM, CONT'D.** 1. Discuss the location, structure, divisions, and functions of the uterine tubes. 1. Describe the structure of the ovaries and explain the steps in development of mature ova from ovarian follicles. 1. Discuss the two functions of the ovaries. 1. Discuss the location, structure, and primary functions of the vagina. 1. Identify the structures that together constitute the female external genitals. FEMALE REPRODUCTIVE SYSTEM, CONT'D. 1. Explain the clinical importance of the perineum during childbirth. 1. Describe the structure of the breasts and the mechanism controlling lactation. 2. Identify the phases of the endometrial, or menstrual cycle. 1. Explain the hormonal	LS3.A LS3.B LS4.A LS4.B FLUID AND ELECTRO-LYTE BALANCE, CONT'D.	factors in determining the volume of oxygen entering lung capillary blood; e. Draw a flow chart to help you explain how blood transports oxygen and carbon dioxide; f. Create sample problems for the rest of the class to solve, interpreting changes in an oxygen-hemoglobin dissociation curve at various blood pH levels; g. Create a chart or representative diagram to illustrate the reciprocal interaction of oxygen and carbon dioxide on blood gas transport (the Bohr vs. Haldane effect); h. Draw a chart that lays out all the primary factors that influence the respiratory control center and thus control respirations. PHYSIOLOGY OF THE RESPIRATORY SYSTEM, CONT'D. 1. After students have read the chapter, ask them to list and briefly describe the regulated and integrated processes that ensure tissues of an adequate oxygen supply and prompt removal of carbon dioxide. Let them refer to the text. After 10-15 minutes, get them into small groups to collaborate on completing the assignment. Share	FEMALE REPRODUCTIVE S

control of cyclical changes that occur in the ovaries and in the uterus. 1. Discuss the importance of the female reproductive cycles. 1. Compare and contrast menarche and menopause. FEMALE REPRODUCTIVE SYSTEM, CONT'D. 1. Explain the clinical importance of the perineum during childbirth. 1. Describe the structure of the breasts and the mechanism controlling lactation. 1. Identify the phases of the endometrial, or menstrual cycle. 1. Explain the hormonal control of cyclical changes that occur in the ovaries and in the uterus. 1. Discuss the importance of the female reproductive cycles. 1. Compare and contrast menarche and menopause. <u>GROWTH AND DEVELOPMENT (OPTIONAL CHAPTER)</u> The students will be able to: 1. Explain the meaning of developmental biology. 1. Describe the process of meiosis and how it differs	ACID-BASE BALANCE NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B ACID-BASE BALANCE, CONT'D.	group results in class. Any discrepancies? 1. Show techniques for air volume measurement with a spirometer. The hand-held dial face model is effective, but students get a better visualization of air displacement with pneumatic models. 1. Blow exhaled air through a sodium bicarbonate solution (for CO_2) and blood (for O_2). Explain the observed color change in each case. PHYSIOLOGY OF THE RESPIRATORY SYSTEM, CONT'D. 1. **Pulmonary ventilation**. "Nature abhors a vacuum." This principle, coupled with an understanding of atmospheric and other pressure gradients at work in the respiratory system, is the basis for student understanding of both pulmonary ventilation and gas exchange. Figure pulmonary ventilation and gas exchange. Figure 23-1 is a classic respiratory system model of a bell jar representing the thoracic cavity, a rubber sheet represent the diaphragm, and a balloon representing the lungs to explain these basic principles.	FEMALE REPRODUCTIVE S GROWTH AND DEVELOPM • Human Anatomy and Phys • Human Anatomy and Phys Links: • https://www.wisc-online.cc • http://www.getbodysmart.c • http://www.innerbody.com • https://homes.bio.psu.edu/f

from mitosis. 1. Compare and contrast spermatogenesis and oogenesis. 1. Outline the steps involved in fertilization and implantation. 1. Describe the early stages in the development of the human embryo. 1. Identify the developmental and structural features of the placenta. GROWTH AND DEVELOPMENT (OPTIONAL CHAPTER), CONT'D. 1. Outline the developmental changes that occur during the first trimester of pregnancy. 1. Explain the histogenesis and organogenesis. 1. Identify and describe the stages of labor. 1. Explain two processes that can result in twinning, or double birth. 1. Give a brief description of the four most common postnatal periods, including the major growth and developmental changes. 1. Describe, by body system, the effects of aging.	MALE REPRODUC-TIVE SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B MALE REPRODUC-**TIVE SYSTEM,** CONT'D.	1. **Spirogram/gas transport**. Discussion of a spirogram tracing is an excellent way to help students visualize the different volumes of gas that lungs inhale and exhale as a function of time. The relationship of lung volumes to disease states is a good example of how pathology can be used to assist students in understanding normal anatomy and physiology. Asthma, emphysema, pneumonia, and other respiratory diseases have unique and very predictable effects on specific lung volumes. Have students "create" unique respiratory system diseases, and then predict the effects of each illness on one or more lung volumes. This exercise can then be expanded to include effects of hemoglobin, oxygen, and carbon dioxide transport problems as they affect gas transport and overall respiratory system function. PHYSIOLOGY OF THE RESPIRATORY SYSTEM, CONT'D. 1. **Respiratory regulation**. Working in groups of 4. Complex physiological control systems are difficult and multifaceted learning challenges for students and use of analogies can be helpful. Air travel and air traffic procedures are useful example to help	GROWTH AND DEVELOPM

	MALE REPRODUC-**TIVE SYSTEM,** CONT'D.	students understand the interrelated homeostatic mechanisms of respiratory control. Use the following example: (1) Inbound or outbound airline passengers can be used to represent oxygen and carbon dioxide molecules. (2) Capacity of passenger transport will be determined by the type and size of the plane, the length of the flight, and the frequency of departure and landing. (3) Jet ways separate and yet connect the terminal building and the plane (respiratory membrane). (4) Air traffic controllers use incoming message from pilots (weather reports, density of traffic, equipment problems) to regulate and control movement of planes. With a little encouragement creative students can apply this analogy to almost every aspect of respiratory control. PHYSIOLOGY OF THE RESPIRATORY SYSTEM, CONT'D. 1. Exercise 37B: Respiratory System Mechanics Computer Simulation 1. Histology Review Supplement (PhysioEx) 1. Case Study: Into Thin Air 1. Test: The Respiratory System	

	FEMALE REPRODUC-TIVE SYSTEM NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	ANATOMY OF THE DIGESTIVE SYSTEM 1. As you outline the route food takes through the digestive system, use a human mannequin with removable organs to demonstrate digestive anatomy. 1. Along this same line, a human skull can be invaluable in showing the types and distribution of teeth. If this is not possible, have students use a mirror and tongue depressor to locate incisors, cuspids, bicuspids, and molars in their own mouths. Ask them to chart their own mouths.	
	FEMALE REPRODUC-TIVE SYSTEM CONT'D.	1. Research teams: A good way to expand student knowledge and help students to invest a personal interest in the subject is by assigning small teams of students to investigate a topic that will expand on a particular section of the chapter. As you progress in lecture/discussion through the chapter, incorporate	

	FEMALE REPRODUC-TIVE SYSTEM, CONT'D.	student team presentations on the following subjects into the class discussion. If possible, allow each team to choose their own topic from the following suggestions: a. What genetic mechanism affects hard palate development in cleft palate conditions? b. What chemical components of saliva facilitate physical and chemical digestion? ANATOMY OF THE DIGESTIVE SYSTEM, CONT'D. a. How does water fluoridation affect the rate of tooth decay in a community? b. What practices can retard periodontal disease? c. Visit a local autopsy to view the viscera of this and upcoming systems (urinary, reproductive). d. Display a dissected mammal to the rest of the class for revealed digestive viscera. e. What dietary adjustment can promote motility in a sluggish GI tract? f. How is peritonitis treated? How does it develop? g. What cancers affect GI anatomy and what precautions can retard them (i.e., diet)? h. What current progress is being made to promote successful liver transplants? i. How must a person adjust dietary habits	
	FEMALE REPRODUC-TIVE SYSTEM, CONT'D.		

		after gallbladder removal? 1. Exercise 38: Anatomy of the Digestive System 1. Dissection Exercise 7: Dissection of the Digestive System of the Cat. 1. Test: The Digestive System ANATOMY OF THE DIGESTIVE SYSTEM, CONT'D.	
	GROWTH AND DEVELOP-MENT (OPTIONAL) NJSLS: PS1.A PS1.B PS3.A PS3.B PS3.C LS1.A LS1.B LS2.B LS3.A LS3.B LS4.A LS4.B	PHYSIOLOGY OF THE DIGESTIVE SYSTEM	

	GROWTH AND DEVELOP-MENT (OPTIONAL CHAPTER), CONT'D.	1. Assign teams of students to research and present to the rest of the class the basics of: a. protein digestion b. fat digestion c. carbohydrate digestion and give the end products of each process. 1. Assign pairs of students to prepare a brief presentation on each of the following: a. Salivary secretion b. Gastric secretion c. Pancreatic secretion d. Bile secretion e. Intestinal secretion 1. Divide students into pairs, giving each a stethoscope. Students take turns listening with the stethoscope as partner swallows water. Instruct students to :Place the stethoscope below the xiphoid process, approximately one inch below and slightly to the left. There should be two distinct sounds, one when the water reaches the cardioesophageal sphincter and one when the peristaltic waves begin and the sphincter opens." Ask students to record their answer to the following question: "How long does it take for the water to reach the sphincter and for it to open?" (Should be a matter of seconds). Compare timings with whole class. PHYSIOLOGY OF THE DIGESTIVE SYSTEM, CONT'D.	

		1. Exercise 39B: Chemical & Physical Processes of Digestion computer simulation 1. Histology Review Supplement 1. Interactive Computer Software 1. Case Study: Sweet Indigestion 1. Test: The Digestive System PHYSIOLOGY OF THE DIGESTIVE SYSTEM, CONT'D.	

		NUTRITION AND METABOLISM 1. Assign teams to explain each of the following: a. using stick-ball molecules, contrast the trends of catabolism and anabolism. b. Make a display of food labels showing the caloric values of their contents, plus percentages of nutrients, vitamins, and minerals. c. Make a poster or series of posters to help the class differentiate between glycolysis, glycogenesis, glycogenolysis, and gluconeogenesis. d. Prepare a demonstration of the factors influencing basal and total metabolic rate. e. Demonstrate factors affecting energy balance and body weight. 1. Assign research teams to each cover one of the following subjects and	

		prepare a brief presentation on each. Encourage them to interview a physician or a nutritional therapist or pharmacist when appropriate. Then ask the class to come together to report their findings and offer explanation - must use medical sources. a. What are the effects of a carbohydrate restricted diet? NUTRITION AND METABOLISM, CONT'D. a. Study a variety of current popular diets. What's the safest way to lose weight? b. Is it true that minerals and vitamins do not provide energy? c. Draw charts/diagrams on poster boards to represent the mechanisms of radiation, conduction, convection, and evaporation. d. Explain how the metabolic rate is affected by exercise, hormones, age, climate, food, sleep, and the nervous system. e. Visit a local pharmacy and observe the number and kinds of minerals and vitamins available for the consumer. f. Map out specific pathways of glycolysis showing the	

		interconvertibility of carbohydrates, fats, and lipids. 1. Test: The Digestive System NUTRITION AND METABOLISM, CONT'D. THE URINARY SYSTEM	

		1. Assign teams of students of each prepare a presentation on one of the following: a. Structure and function of the ureters, bladder, and urethra. b. Structure and function of the kidney. c. Components of a nephron and the role each part plays in the formation of urine. d. Pathway of blood flow through the specialized vessels of the kidney. e. Formation of urine in the kidney and its route from there to the exterior of the body. f. Filtration, reabsorption, and secretion as related to formation of urine in the kidney. g. Countercurrent mechanisms for concentrating or diluting urine. h. Regulation of urine volume under normal circumstances. i. Physical characteristics of normal urine. 1. If possible, use a take-apart mannequin to locate urinary organs. 1. A simple, sagittal cut on a real kidney quickly points out its gross composition (capsule, cortex, medulla, etc.) - use fetal pig/cat. 1. Together, make a chart of all the normal and abnormal components of urine. Students should make one concurrently in their notes.	

		THE URINARY SYSTEM, CONT'D. 1. Make arrangements for the class to visit a hemodialysis unit at a local hospital. After the visit ask them to write down all that they observed and learned. Discuss their observations and information in class the following session (optional). 2. Research teams: For additional coverage/enhancement of the material in this chapter assign teams of students to investigate one of the following issues and report back to the class: a. At what rate does the kidney clear various toxins and drugs introduced into the blood? b. By what transport principles does the hemodialysis machine work? c. How can liver malfunction affect kidney EFP? How do other body systems. Compensate for this disruption? d. How can high blood pressure affect EFP? How do other body systems compensate for this disruption? e. How does the kidney modulate red blood cell production? f. How are other drugs besides penicillin and PAH processed by renal physiology? g. What specific tests and	

		indicators detect drugs such as cocaine by urinalysis? h. How do kidney stones interfere with renal passage? How are they formed and treated? THE URINARY SYSTEM, CONT'D. 1. Exercise40: Anatomy of Urinary System 1. Dissection Exercise 8: Dissection of the Urinary System of the Ct. 1. Exercise 41B: Renal System Physiology computer simulation 1. Histology Review Supplement 1. Case Study:One Headache after Another 1. Test: The Urinary System FLUID AND ELECTROLYTE BALANCE	

		1. Assign teams of students to research and present to the rest of the class discussions of: a. How other body systems respond to reverse the trends of acidosis and alkalosis. b. Function of the cerebral cortex in modifying the thirst sensation beyond hypothalamic contribution. c. How diuretics such as ethyl alcohol and caffeine manifest their action. d. Pathological body states and the induction of edema. e. Effects of environmental change on water output's ability to control water levels. f. The Donnan equilibrium principle. 1. Case Study: Girl Pulled from Ruins (dehydration) 1. Test: The Urinary System FLUID AND ELECTROLYTE BALANCE, CONT'D.	

		ACID-BASE BALANCE 1. Break class into small groups to discuss the following topics and present their conclusions to the class for discussion: a. Explain how the rate and depth of respirations can influence the Ph of blood. b. What mechanisms are taking place in an individual who suffers from diabetes. c. If there is a sodium deficit in the interstitial fluid compartments, how might that contribute to water intoxification and eventual shock? 1. Divide the class into research teams to investigate and report back to the class on one of the following topics:	

		a. Develop a diet that avoids a particular source of acidity in the daily diet. b. Evaluate the need for at least several mechanisms in the body for pH adjustment instead of just one. c. Relate buffer pair action to respiratory and renal mechanisms as they comprehensively maintain ECF pH. d. Review and further explore other concepts of physiology throughout the text that use the tools of chemistry for clarification: Boyle's law, food hydrolysis, hemoglobin dissociation, etc. e. Study a variety of foods, by actual testing when possible, for their pH values. f. How do external buffers supplement the body's internal pH control system: g. What are the common sources of acidosis and alkalosis plus their current, comprehensive treatments? ACID-BASE BALANCE, CONT'D. 1. Exercise 47:Acid-Base Balance Computer Simulation 1. Test: The Urinary System	

		MALE REPRODUCTIVE SYSTEM 1. The dialectical journal exercise will once again give students a good jumping off point for mastery of new material if you open by asking them to predict the answers to the questions below on the left-hand side of their notebooks, leaving space in the right-hand column to respond to and improve on or correct their answers as they progress through the chapter. Ask them to predict the correct answers to the following: a. How do you think normal functioning of this system differs from the end result of normal function measured in <u>any other</u> organ system of the body? b. List the essential and accessory organs of the male reproductive system (as you now	

		understand them) and the function of each. c. Describe the structure of the mature spermatozoan. d. Describe the anatomy and function of the testes. e. Trace the passage of an individual sperm cell from its point of formation, in sequence, through the genital ducts to the exterior of the body. f. Describe the structure, location, and function(s) of the following: seminal vesicles, prostate gland, bulbourethal glands. MALE REPRODUCTIVE SYSTEM, CONT'D. As the class progresses through the chapter, encourage them to correct any mistakes they made in their predictions and to fill in anything they had left out in the right-hand column of the notebook journal. 1. Assign research to teams to investigate and report on the following: a. Distinguish between interstitial cells and seminiferous tubules of the testis. b. Break down the composition of seminal fluid. c. Plot the order of anatomical landmarks encountered by migrating sperm cell in the male tract. Include the seminal fluid added	

		by glands in the process. d. How do hormones regulate male reproductive physiology? e. When are the current advances for an effective male birth control pill? f. Select a male disease/malfunction and investigate how it is treated. g. How can male infertility be lessened or reversed? h. What factors promote sperm motility and survival? i. Even popular magazines have had much to say in the past few years about the PSA (prostate specific antigen)> Explain this test and update the class on latest research findings. MALE REPRODUCTIVE SYSTEM, CONT'D. 1. Dissection Exercise 9: Dissection of the Reproductive System of the Cat. 1. Exercise 42: Anatomy of the Reproductive System 1. Exercise 43: Physiology of Reproduction: Gametogenesis & The Female Cycles 1. Case Study: An Unusual Case of Animal Reproduction	

		FEMALE REPRODUCTIVE SYSTEM 1. Begin by asking students to predict the answers to the questions below on the left hand side of their notebooks, leaving space in the right-hand column to respond to and improve on or correct their answers as they progress through the chapter. Ask them to predict correct answers to the following: a. List the essential and accessory sex organs of the female reproductive system (as you now understand them) and give the functions of each. b. Describe, as fully as you can, the structure and function of the uterus. c. Describe, as fully as you can, the structure and function of the uterine tubes. d. Trace the steps in the development of mature	

		ova. e. Describe the structure, location, and function(s) of the vagina. f. Describe the structure of the breasts and the mechanism controlling lactation. g. Identify the phases of the menstrual cycle. As the class progresses through the chapter, encourage them to correct any mistakes they make in their predictions and to fill in anything they had left out in the right-hand column. 1. Use a take-apart torso to locate female anatomy and physiology. FEMALE REPRODUCTIVE SYSTEM, CONT'D. 1. As you or a student team present the menstrual cycle to the rest of the class, direct students to construct diagrams in their notes to demonstrate hormonal integration in the menstrual cycle, as you construct yours on the board. 1. Assign student research teams to investigate and present to the class a discussion on one of the following: a. How does female reproductive physiology change with age? b. How are various female venereal disease conditions treated? c. What are the physiological side effects and dangers of the birth control pill?	

		d. How is infertility successfully treated in the female? e. What overall physiological and metabolic body changes occur with menopause? f. What cancerous conditions plague the female reproductive system? g. What physiological adjustments occur in the mother's body during pregnancy? h. What is the origin for chromosomal and point mutation birth defect? Use several examples. i. Rank the events of the menstrual cycle into at least 10 orderly steps. FEMALE REPRODUCTIVE SYSTEM, CONT'D. a. Distinguish differentiation from the morphogenesis trends in prenatal development. b. How do the two ovarian hormones and two pituitary gonadotropins interact to regulate the menstrual cycle? Plot cycle changes of all over 28 days. c. What is the value of studying embryology? d. Investigate and present both sides of the ethical issue of culturing test-tube embryos. 1. Dissection Exercise 9: Dissection of the	

		Reproductive System of the Cat. 1. Exercise 42: Anatomy of the Reproductive System 1. Exercise 43: Physiology of Reproduction: Gametogenesis & The Female Cycles 1. Case Study: An Unusual Case of Animal Reproduction FEMALE REPRODUCTIVE SYSTEM, CONT'D. GROWTH AND DEVELOPMENT	

		(OPTIONAL CHAPTER) 1. Ask a local pediatrician to discuss child development with the class. Using an infant model have him demonstrate the procedure used in doing physical exam on an infant, pointing out possible problem areas during early stages of growth and development. 1. Obtain urine samples from pregnant and nonpregnant females. Test the urine with a pregnancy testing kit. 1. Assign student research teams to each investigate and prepare a presentation on one of the following: a. Discuss the major developmental changes characteristic of the prenatal stage of life from fertilization to birth. b. Discuss the stages of labor that characterize normal vaginal birth. c. When is cesarean birth preferable? d. Investigate and compare different birth procedures chosen by parents (e.g., home births, LaMaze method, etc.) e. Identify and describe the three primary germ layers and several derivatives in the adult body that develop from each layer. Create posters to illustrate these for the class.	

		GROWTH AND DEVELOPMENT (OPTIONAL CHAPTER), CONT'D. a. Make charts incorporating diagrams or photos, where obtainable, to illustrate major developmental changes in infancy (birth through 18 months) a. Make charts incorporating diagrams or photos, where obtainable, to illustrate major developmental changes in childhood (18 months through <u>early</u> puberty). b. Make charts incorporating diagrams or photos, where obtainable, to illustrate major developmental changes in adolescence and adulthood (to age 50). c. Make charts incorporating diagrams or photos, where obtainable, to illustrate major developmental changes in old age.	

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Formative and Summative Assessment

Teachers ultilize a variety of methods for assesment including:

Category Criteria	**Unit Tests and Quizzes** Individual assessments based on specific or general content knowledge.	**Labs, Projects & Classwork** Any group work primarily completed in class to be checked and/or graded for completion.	**Lab Assessments** Individual assessments based on group lab work. Lab data and other notes may sometimes be used.	**Homework** Any work assigned to be completed outside of the classroom.

All students take a common Midterm and Final Exam.

Grading and Evaluation Guidelines

Marking period grades for Honors Anatomy and Physiology will be determined using the following weighting:

10% Homework and Homework Quizzes

30% Classwork, Labs, Projects

60% Tests and Lab Practicals

The final grade for the course Honors Anatomy and Physiology will be computed using six scores. Each marking period grade will account for 20%. Mid-term grades and final exam grades will account for 10% each.

20% Marking Period 1

20% Marking Period 2

20% Marking Period 3

20% Marking Period 4

10% Mid-Term Exam

10% Final Exam

Other Details

SCED

03053 Anatomy and Physiology H
Usually taken after a comprehensive initial study of biology, Anatomy and Physiology courses present the human body and biological systems in more detail. In order to understand the structure of the human body and its functions, students learn anatomical terminology, study cells and tissues, explore functional systems (skeletal, muscular, circulatory, respiratory, digestive, reproductive, nervous, and so on), and may dissect mammals.

Grades 11-12

East Brunswick High School

This section must include SCED numbers, grade level, schools where the course is offered, and any other necessary identifying information.