

Course Name: Human Anatomy & Physiology		Semester 1 Quarter 1 Week 1-4			
Unit Title: Human Body Orientation		<p>Essential Questions: How can we compare and contrast the structure and function of the human body systems from cells to tissues to organs to organ systems? Why is homeostasis is a major theme for the entire course of anatomy and physiology? How can we analyze homeostatic imbalance in tissues, and determine the possible outcomes?</p> <p>Phenomena: https://www.georgiascienceteacher.org/phenomena/ (The Science of Sweat) Homeostasis Intro</p>			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Essential HS.L1U1.22 Construct an explanation for how cellular division (mitosis) is the process by which organisms grow and maintain complex, interconnected systems.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised. U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>	<p>Master and apply anatomical terminology including body regions, body cavities and directional terms utilized in understanding human anatomy and performing dissections. Understand the importance of homeostasis in maintaining health in the human body and be able to discuss specific homeostatic mechanisms.</p>	<p>anatomy, physiology, molecule, cell, organ, organ system, homeostasis, axial, appendicular, cranial, vertebral, thoracic cavity, abdominopelvic, pelvic, diaphragm, viscera, mediastinum, serous, parietal, pleural, thoracic, pericardial, peritoneal, superior, inferior, anterior, posterior, medial, lateral, bilateral, proximal, distal, superficial, deep, sagittal, transverse, frontal, epigastric, hypochondriac, umbilical, lumbar, iliac, acromial, antebrachial, axillary, buccal, celiac, coxal, crural, femoral, genital, gluteal, inguinal, mental, occipital, orbital, otic, palmar, pectoral, pedal, perineal, plantar, popliteal, sacral, sternal, tarsal.</p>	<p>Lab Safety Activity Systems Project Group Activity Homeostasis Research Project Current Topics in Health and Medicine Project Cat External Anatomy Lab <i>Cucumis sativum</i> Autopsy</p>	<p>Unit Quizzes and Unit Exam</p>

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 1 Quarter 1 Week 5-7			
Unit Title: Chemistry and Biochemistry		Essential Questions: What are the functions of each group of organic compounds in organisms? How do organisms obtain the essential macromolecules needed for life? How do food and fuel provide energy? Is energy conserved?			
		Phenomena:			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L2U1.19 Develop and use models that show how changes in the transfer of matter and energy within an ecosystem and interactions between species may affect organisms and their environment. .</p> <p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.</p> <p>U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.</p> <p>U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Patterns; Cause and effect; Systems and System Models; Energy and Matter; Stability and change; Structure and function.</p>	<p>Explain the functions of each group of organic compounds. Describe why enzymes are important to living systems and how environmental conditions affect enzyme function. Describe how pH is important in living systems and how buffer systems work to maintain homeostasis.</p>	<p>Chemistry: atom, nucleus, isotope, electron, element, compound, ionic bond, ion, covalent bond, molecule, cohesion, adhesion, mixture, solution, suspension, solute solvent, pH scale, acid, base, buffer, polarity, adhesion, cohesion</p> <p>Biochemistry: monomer, polymer carbohydrate, monosaccharide, polysaccharide, lipid, fatty acid, glycerol, steroid, phospholipid, saturated, unsaturated, triglyceride nucleic acid, nucleotide, RNA, DNA, protein, amino acid, chemical reaction, reactant, product, activation energy, catalyst, enzyme</p>	<p>pH/Buffer Lab, Enzyme Lab, Macromolecule Model Building Activity, Tay Sachs MiniLab, Enzyme Disease Research and Presentations.</p>	<p>Unit quizzes, Unit Exam</p>

HS Science District Instructional Guides (Date Updated: 10/23/2019)

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 1 Quarter 1 Week 8-9			
Unit Title: Tissues		Essential Questions: How can we compare and contrast the structure and function of the human body systems from cells to tissues to organs to organ systems? How do groups of specialized cells (tissues) meet all the physiological needs of an organism?			
		Phenomena: https://thewonderofscience.com/phenomenon/2018/7/8/the-immortal-cells-of-henrietta-lacks			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>Essential HS.L1U3.23 Obtain, evaluate, and communicate the ethical, social, economic and/or political implications of the detection and treatment of abnormal cell function.</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>epithelial, muscular, nervous, connective, matrix, chondrocyte, osteocyte, columnar, cuboidal, squamous, stratified, tendon, cartilage, elastic cartilage, fibrocartilage, collagen, erythrocyte, leukocyte, adipose, adipocytes, intercalated discs, multinucleated, goblet cells, microvilli, histology, neurons, axon, dendrite, neuroglial cell</p>	<p>Histology Microscope Labs (epithelial, muscle, connective, and nervous) Histology POGIL Cancer Research Project</p>	<p>Unit quizzes, Unit Exam</p>

HS Science District Instructional Guides (Date Updated: 10/23/19)

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 1 Quarter 2 Week 10-12			
Unit Title: Integumentary System		Essential Questions: How does the form and function of skin contribute to our bodies overall homeostasis?			
		Phenomena: https://www.ngssphenomena.com/#/uv-sun-damage/			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L.1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L.1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised. U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>epidermis, hypodermis, reticular layer, papillary layer, keratinocytes, keratin, melanocytes, melanin, dermis, stratum corneum, stratum basale, stratum spinosum, stratum granulosum, stratum lucidum, epidermis, sebaceous gland, follicle, Meissner corpuscle, Pacinian corpuscle, nociceptor, stretch receptor, arrector pili muscle.</p>	<p>There is Only 1 Way to Skin a Cat (Lab) Integumentary System Stations (Lab) Integumentary Diseases Research Project and Presentations</p>	<p>Unit quizzes, Unit Exam</p>

HS Science District Instructional Guides (Date Updated: 10/23/2019)

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 1 Quarter 2 Week 13-16			
Unit Title: Skeletal System		Essential Questions: How can we compare and contrast the different types of bones?			
		Phenomena:			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised. U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>osteoblast, osteocyte, osteon, epiphysis, diaphysis, periosteum, endosteum, medullary cavity, compact bone, cancellous bone, growth plate, osteoclast, vertebrae, pectoral girdle, pelvic girdle, endochondral ossification, intramembranous ossification, cranium, mandible, condyle, fossa, foramen, suture , process, sphenoid, ethmoid, facet, spinous process, ligament, intervertebral disc, symphysis, hyaline cartilage, elastic cartilage, fibrocartilage, chondrocyte, lacunae, canaliculi, and all major bones that comprise the skeleton.</p>	<p>Cat/Human Skeletal Comparative Lab, Analysis of Skeletal Remains Lab, Cranial Comparison Lab Bone Walk, Skeletal System WebQuest, Skeletal System Disease Research Project and Presentations</p>	<p>Unit Quizzes, Unit Exam and lab practical</p>

HS Science District Instructional Guides (Date Updated: 10/23/2019)

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 1 Quarter 2 Week 17-18 and Semester 2 Quarter 3 Week 1-3			
Unit Title: Muscular System		Essential Questions: How is the structure of a muscle related to its function?			
		Phenomena:			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.</p> <p>U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.</p> <p>U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>muscle fiber, sarcolemma, sarcoplasm, sarcomere, Z-line, M line, H zone, A band, I band, transverse tubule, actin, myosin, myofibril, fascicle, cross-bridge, tropomyosin, troponin, contraction phase, relaxation phase, sliding filament mechanism, epimysium, perimysium, endomysium, muscle belly, tendon, aponeurosis, neuromuscular junction, Acetylcholine, synaptic cleft, synaptic vesicle and the names of all major muscles of the human body.</p>	<p>Muscle Labs 1-7 (Identify muscles of cat and compare to human muscles) Sports Medicine WebQuest Muscle Contraction WebQuest Muscle Disease Research and Presentations</p>	<p>Unit Quizzes, Unit Exam and lab practical</p>

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 2 Quarter 3 Week 4-8			
Unit Title: Cardiovascular System		Essential Questions:			
		Phenomena: https://thewonderofscience.com/phenomenon/2018/7/5/malaria-and-sickle-cell-anemia			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.</p> <p>U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.</p> <p>U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>atria, ventricles, auricles, myocardium, pericardium, endocardium, aortic semilunar valve, pulmonary semilunar valve, ventricular septum, interventricular sulcus, papillary muscles, chordae tendinae, artery, vein, capillary, tunic media, tunic intima, tunic externa, apex, base, bicuspid valve, tricuspid valve, interventricular sulcus, SA node, AV node, bundle of His, bundle branches, Purkinje fibers, RBC's, WBC's, platelets, plasma, ABO blood types, Rh factors, erythroblastosis fetalis, pulmonary circulation, systemic circulation, myocardial infarct, endocarditis, systolic, diastolic, granulocytes, agranulocytes, erythrocytes, leukocytes, platelets, plasma.</p>	<p>Pig Heart External (Lab) Pig Heart Internal (Lab) Cat Thoracic Cavity Dissection (Lab) Cat Vein Dissection (Lab) Cat Artery Dissection (Lab) Vital Signs (Blood Pressure and Pulse Rate) (Lab) Cardiovascular System WebQuest Blood Typing (Lab) Blood Typing Game (Internet Activity) Cardiovascular Disease Research and Presentation</p>	<p>Unit Quizzes, Unit Exam and lab practical</p>

HS Science District Instructional Guides (Date Updated: 10/23/2019)

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 2 Quarter 3 Week 9 and Quarter 4 Week 10			
Unit Title: Digestive System		Essential Questions: How can we relate the structure of the digestive system to its functions? How does the digestive system work together with the other human body systems?			
		Phenomena:			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised. U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>oral cavity and structures, salivary glands, parotid, submandibular, and sublingual, pharynx, esophagus, peristalsis, stomach, pyloric sphincter, cardioesophageal sphincter, fundus, mesentery, omentum, small intestine, duodenum, ileum, jejunum, villi, microvilli, chyme, bolus, mastication, ghrelin, CCK, parietal cells, chief cells, emesis, large intestine, cecum, ascending/transverse/descending colon, rectum, anus, defecation, liver, gallbladder, pancreas, digestion, mechanical, chemical, absorption, secretion, excretion, pepsinogen, pepsin</p>	<p>Salivary Gland Dissection (Cat Lab) Oral Cavity Dissection (Cat Lab) Abdominal Cavity Digestive Tract Dissection (Cat Lab) Digestive System Disease Research and Presentations Digestive System WebQuest</p>	<p>Unit quizzes, test and lab practical</p>

HS Science District Instructional Guides (Date Updated: 10-23-19)

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 2 Quarter 4 Week 11-12			
Unit Title: Respiratory System		Essential Questions:			
		Phenomena: https://www.nhlbi.nih.gov/news/2019/lungmap-nhlbi-project-breathes-life-first-depth-atlas-human-lung			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised. U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>oral and nasal cavity, pleura, lobes of lungs, diaphragm, pharynx - naso-, oro-, laryngo-, larynx, bronchi, bronchioles, alveoli(-us); gas exchange, vocal folds, thyroid cartilage, glottis, epiglottis, trachea, tidal volume, residual volume, vital capacity, inspiratory reserve, expiratory reserve</p>	<p>Cat Thoracic Cavity Dissection (Lab) Respiratory Disease Research Poster Project Respiratory Volume Respirometer (Lab)</p>	<p>Unit Quizzes, Unit Exam and lab practical</p>

HS Science District Instructional Guides (Date Updated: 10/23/2019)

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 2 Quarter 4 Week 13-14			
Unit Title: Urinary & Reproductive		Essential Questions:			
		Phenomena:			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.</p> <p>U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.</p> <p>U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>Urinary: kidneys, cortex, medulla, capsule, hilum, renal pelvis, minor and major calyces, nephron - bowman's/glomerular capsule, PCT, loop of Henle, DCT, collecting duct, ureter, urethra, renal artery/vein, afferent/efferent arteriole, glomerulus, peritubular capillaries, absorption, secretion, excretion, water balance, micturition, urea, adrenal glands, antidiuretic hormone, retroperitoneal.</p> <p>Reproductive: ovary, fallopian tube, bipartite uterus, scrotum, epididymis, vas deferens, spermatic cord</p>	<p>Cat Pelvic Cavity Dissection 1 (Urinary Lab) Cat Pelvic Cavity Dissection 2 (Reprod. Lab)</p>	<p>Unit Quizzes, Unit Exam and lab practical</p>

HS Science District Instructional Guides (Date Updated: 10/23/2019)

Course Name: Human Anatomy & Physiology		Quarter/Pacing: Semester 2 Quarter 4 Week 15-18			
Unit Title: Nervous System		Essential Questions: How can we relate the structure of the nervous system to its functions? How do our bodies sense our internal and external environments?			
		Phenomena: https://www.psywww.com/intropsych/ch02-human-nervous-system/neuropsychology.html#phineas http://www.learner.org/resources/series142.html http://www.learner.org/series/discoveringpsychology/brain/brain_flash.html			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments
<p>Essential HS.L1U1.20 Ask questions and/or make predictions based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.</p> <p>Plus HS+B.L1U1.7 Develop and use models to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal).</p> <p>U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised. U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.</p>	<p>Cause and effect, Systems and System Models; Structure and function</p>		<p>central nervous system, peripheral nervous system, autonomic, somatics, neurons, glial cell, action potential, depolarization, neurotransmitter, synapse, motor end plate, cerebral cortex, medulla oblongata, pons, spinal cord, meninges, cerebrospinal fluid, cerebellum, hypothalamus, thalamus, ventricle, gyrus, sulcus.</p>	<p>Cow Eye Dissection (Lab) Sheep Brain Dissection (Lab) Cat Nervous System Dissection (Lab) Nervous System Disease Project Brain Cap Activity</p>	<p>Unit quizzes, Unit Exam, Lab Practical</p>

HS Science District Instructional Guides (Date Updated: _____)

Course Name: Human Anatomy & Physiology		Quarter/Pacing:			
Unit Title:		Essential Questions:			
		Phenomena:			
Standards	Cross Cutting Concepts	Objectives	Key Vocabulary	Resources (Activities/Labs)	Assessments