

Course: Honors Biology II

Cochran Junior Senior High School

Course Description: Senior Biology is a laboratory-based course that investigates the structure and function of the human body. Topics covered will include the basic organization of the body; biochemical composition; and major body systems along with the impact of diseases on certain systems. Students will engage in many topics and competencies related to understanding the structure and function of the human body. Working from the topics of basic anatomical terminology to the biochemical composition of the human body, all the way into great detail of each of the major systems of the body, students will learn through reading materials, study guides, unit worksheets, group work, projects, and labs. Students will be responsible for proper use of lab equipment, lab reports, and projects assigned throughout each unit. One of the goals of this course is to prepare students with the skills necessary to be successful in future science classes in college.

Concept	Competency	Resources/Strategies	Vocabulary	Text Reference	PA Academic Standards	Common Core Standards for Literacy	Assesments	Essential Questions	Timeline
Lab Safety/ Scientific Method Review	1. Identify the safety equipment, general equipment, and the proper procedures for using them in the lab. 2. List and analyze each step of the scientific method and apply it to solving a problem.	Lab Safety Introductory Lab (See Attached) Activity 1: The Process of Scientific Inquiry (<i>Laboratory Investigations For Biology 2nd Edition</i>) http://mjksciteachingideas.com/safety.html Safety Video http://www.flinnsci.com/teacher-resources/teacher-resource-videos/best-practices-for-teaching-chemistry/safety/laboratory-	Archea, Bacteria, biology, biosphere, cell, community, controlled experiment, deductive reasoning, domains, ecosystem, emergent properties, Eukarya, eukaryotic cells, evolution, genes, hypothesis, inductive reasoning, molecule, natural selection, organ system, organelle, organism, organs, peer review, population, prokaryotic cells, systems biology, technology, theory, tissues	Chapter 1	3.1.12.A9 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.C CC.3.5.11-12.D	Formal: Flinn Safety Quiz Chapter Exam Informal: Discussion Lab Activities	What steps do scientists use to investigate problems? What guidelines must be followed to design and conduct a scientific investigation?	4 weeks
Chemistry Review	1. Define and describe the general chemical principles and relate them to biology. 2. List and explain the four macromolecules and their functions in living things.	Activity 3: Macromolecules (<i>Laboratory Investigations For Biology 2nd Edition</i>) http://www.bio-alive.com/animations/biochemistry.htm	acid, adhesion, amino acid, amino group, anabolic steroid, aqueous solution, atom, atomic mass, atomic number, base, buffer, carbohydrate, carbon skeleton, carbonyl group, carboxyl group, cellulose, chemical bond, chemical reaction, chitin, cholesterol, cohesion, compound, covalent bond, denaturation,	Chapters 2 & 3	3.1.12.A7 3.2.12.A1 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.C	Formal: Vocabulary Quiz Chapter Exam Informal: Discussion Concept Map	What are the differences between matter and energy? How is the physiology of matter related to the human body? How do the structure and function of organic molecules effect the human body?	4 weeks

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Cell Review & Microscopes	1. Distinguish between different types of cells, compare their structures and explain their functions. 2. Identify the parts of and the proper ways to use the compound light microscope.	Microscope Parts & Use Review Activity Activity 4: Using the Microscope (<i>Laboratory Investigations For Biology 2nd Edition</i>) http://www.cellsalive.com/	active site, activation energy, active transport, ATP, aquaporin, cell theory, cell wall, cellular metabolism, cellular respiration, central vacuole, centriole, chloroplast, chromatin, chromosome, cilia, coenzyme, cofactor, competitive inhibitor, concentration gradient, crista, cytoplasm, cytoskeleton, diffusion, electron microscope, endocytosis, endomembrane system, endoplasmic reticulum, energy, enzyme, exocytosis, eukaryotic cell, extracellular matrix, facilitated diffusion,	Chapters 4-6	3.1.12.A4 3.1.12.A5 3.1.12.A6 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.C CC.3.5.11-12.D	Formal: Vocabulary Quiz Chapter Exam Informal: Discussion Lab Activity	What are the parts of the cell and their function? How are substances transmitted across the membrane? What is the relationship between DNA and proteins? What is the relationship between DNA and proteins?	4 weeks
Unifying Concepts of Animal Structure and Function	1. Describe the levels of organization in an animal's body. 2. Explain how size and shape can influence the structure of an animal. 3. Describe the general structures and functions of the 12 major vertebrate organ systems.	Autopsy of a Dill Pickle (See Attached) http://www2.estrellamountain.edu/faculty/farabee/BIOBK/BioBookDiversity_7.html http://www.powertolearn.com/teachers/lesson_activities/science/CBV.37.S.SCI.R5.F.pdf	adipose tissue, anatomy, blood, bone, cardiac muscle, cartilage, circulatory system, connective tissue, digestive system, endocrine system, epithelial tissue, fibrous connective tissue, homeostasis, immune system, integumentary system, interstitial fluid, loose connective tissue, lymphatic system, muscle tissue, muscular system, negative feedback, nervous system, neuron, organ, organ system, physiology, reproductive system, respiratory system, skeletal muscle, skeletal system, smooth	Chapter 20	3.1.12.A5	CC.3.5.11-12.B CC.3.5.11-12.C CC.3.5.11-12.D	Formal: Vocabulary Quiz Chapter Exam Informal: Discussion Activity	How are the tissues of the body classified?	2 weeks

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Body Tissues/ Integument System	1. Explain how the structure of organs is based on the cooperative interactions of tissues. 2. Relate the structure of skin to its function.	Activity: Give Me Some Skin Man (See Attached) Case Study: Lost in the Desert http://sciencecases.lib.buffalo.edu/cs/collection/results.asp?subject_headings=Biology%20(General)	adipose tissue, cardiac muscle, connective tissue, epithelial tissue, fibrous connective tissue, integumentary system, interstitial fluid, loose connective tissue, muscle tissue, nervous tissue, organ, organ system, skeletal muscle, smooth muscle, tissue	Chapter 20 http://www.pennmedicine.org/health_info/body_guide/reftext/html/skin_sys_fin.html	3.1.12.A1 3.1.12.A5 3.1.12.A6 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.C CC.3.5.11-12.D CC.3.6.11-12.E	Formal: Vocabulary Quiz Chapter Exam Informal: Case Study Pamphlet Activity	What are the components of the physiological functions of the integument system? What are some of the associated disorders of the integument system?	2 weeks
Digestive System	1. Define and distinguish between different types of feeders. 2. Compare different digestive systems of various organisms. 3. Describe the main components of the human alimentary canal and the associated digestive glands.	Digestive System Coloring (Anatomy Coloring Book 4th Edition) Activity 14: Digestion (Laboratory Investigations For Biology 2nd Edition) http://digestive.niddk.nih.gov/ddiseases/pubs/yrdd/	absorption, alimentary canal, anus, appendix, basal metabolic rate, bile, bolus, bulk feeders, carnivores, cecum, chyme, colon, crop, digestion, duodenum, elimination, esophagus, essential amino acids, essential fatty acids, essential nutrients, feces, fluid feeders, gallbladder, gastric juice, gastrin, gastrivascular cavity, gizzard, hepatic portal vein, herbivores, high density lipoproteins, ingestion, intestine, kilocalorie, large intestine, liver, low density lipoprotein, malnutrition, metabolic rate, micrivilli, mineral, mouth, obesity, omnivores, oral cavity, pancreas, peristalsis, pharynx, RDAs, rectum, ruminants, salivary glands, small intestine, sphincter, stomach, substrate feeders, suspension feeders,	Chapter 21	3.1.12.A2 3.1.12.A5 3.1.12.A6 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.C CC.3.5.11-12.D	Formal: Vocabulary Quiz Chapter Exam Informal: Coloring Diagram Lab Activity	What are the components of the physiological functions of the digestive system? What are some of the associated disorders of the digestive system?	2 weeks

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Respiratory System	<ol style="list-style-type: none"> Describe the three main phases of gas exchange in humans. Compare breathing mechanisms of land and aquatic organisms. Explain how gases are transported throughout an organism. 	<p>Respiratory System Coloring (<i>Anatomy Coloring Book 4th Edition</i>)</p> <p>Respiratory Models (See Attached)</p> <p>http://www.getbodysmart.com/ap/respiratorysystem/menu/menu.html</p>	<p>alveoli, breathing control center, bronchi, bronchioles, countercurrent exchange, diaphragm, gas exchange, gills, hemoglobin, larynx, lungs, negative pressure breathing, partial pressure, pharynx, surfactant, trachea, tracheal system, ventilation, vital capacity, vocal cords</p>	Chapter 22	<p>3.1.12.A5</p> <p>3.1.12.A6</p>	<p>CC.3.5.11-12.B</p> <p>CC.3.5.11-12.D</p>	<p>Formal:</p> <p>Vocabulary Quiz</p> <p>Chapter Exam</p> <p>Informal:</p> <p>Coloring Diagram</p> <p>Model Building</p>	<p>What are the components of the physiological functions of the respiratory system?</p> <p>What are some of the associated disorders of the respiratory system?</p>	2 weeks
Circulatory System	<ol style="list-style-type: none"> Describe the general functions of a circulatory system. Compare cardiovascular systems in various organisms. Describe the pathway of blood through the mammalian cardiovascular system. 	<p>Circulatory System Coloring (<i>Anatomy Coloring Book 4th Edition</i>)</p> <p>Activity 15, Part 1: Circulation (<i>Laboratory Investigations For Biology 2nd Edition</i>)</p> <p>http://www.innerbody.com/image/cardov.html</p>	<p>anemia, aorta, arteriole, artery, atherosclerosis, AV, atrium, blood, blood pressure, capillary, capillary bed, cardiac cycle, cardiac output, cardiovascular disease, cardiovascular system, closed circulatory system, diastole, double circulation, erythrocyte, erythropoietin, fibrin, fibinogen, heart, heart attack, heart murmur, heart rate, hypertension, inferior vena cava, leukemia, leukocyte, open circulatory system, phagocyte, plasma, platelet, pulmonary artery, pulmonary circuit, pulmonary vein, pulse, red blood cell, SA, single circulation, stem cell, stroke, superior vena cava, systemic circuit, systole, vein, ventricle, venule, white blood</p>	Chapter 23	<p>3.1.12.A5</p> <p>3.1.12.A6</p> <p>3.1.12.C4</p>	<p>CC.3.5.11-12.B</p> <p>CC.3.5.11-12.C</p> <p>CC.3.5.11-12.D</p>	<p>Formal:</p> <p>Vocabulary Quiz</p> <p>Chapter Exam</p> <p>Informal:</p> <p>Coloring Diagram</p> <p>Lab Activity</p>	<p>What are the components and physiological mechanisms of the circulatory system?</p> <p>What are the disorders associated with the circulatory system?</p>	2 weeks

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Blood	1. Relate the structure of blood vessels to their fuction. 2. Explain how blood pressure is measured and what can cause changes. 3. Describe the components of blood and their functions.	Blood Typing Lab Activity (in classroom) Activity 15, Parts 2-4: Circulation (<i>Laboratory Investigations For Biology 2nd Edition</i>) Dracula's Dilemma (See Attached) http://health.howstuffworks.com/human-body/systems/circulatory/blood.htm	anemia, aorta, antigen, antibodies, arteriole, artery, atherosclerosis, AV, atrium, blood, blood pressure, capillary, capillary bed, cardiac cycle, cardiac output, cardiovascular disease, cardiovascular system, closed circulatory system, diastole, double circulation, erythrocyte, erthropoietin, fibrin, fibinogen, heart, heart	Chapter 23	3.1.12.A1 3.1.12.A5 3.1.12.A6 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.C CC.3.5.11-12.D	Formal: Vocabulary Quiz Chapter Exam Informal: Classroom Activities Lab Activity	What are the components and physiological mechanisms of the blood? What are the disorders associated with the blood?	2 weeks
Lymphatic System & Body Defences	1. Describe the structure and function of the lymphatic system. 2. Describe the nature of innate and adaptive immune responses. 3. Analyze how malfunctions or failure in the immune system can cause disease.	Lymphatic System Coloring (<i>Anatomy Coloring Book 4th Edition</i>) Lymphatics in Action (Skit Activity) Internet Research : HIV & AIDS (See Attached) http://uhaweb.hartford.edu/BUGL/immune.htm	active immunity, adaptive immunity, AIDS, allergens, allergies, antibody, antigen, antigen receptor, antigen binding site, antigenic presenting cell, antihistamine, autoimmune disease, B cell, cell mediated immune response, clonal selection, complement system, cytotoxic T cell, effector cell, helper T cell, histamine, HIV, humoral immune response, immune system, immunodeficiency disease, imflammatory response, innate immunity, interferon, lymph, lymph nodes, lymphatic system, lymphocytes, macrophage, major histocompatibility molecules, memory cells, monoclonal anitbody, natural killer cell, neutrophil, nonself molecule, opportunistic infections, passive immunity, pathogens, phagocytosis, plasma cell,	Chapter 24	3.1.12.A1 3.1.12.A5 3.1.12.A6	CC.3.5.11-12.B CC.3.5.11-12.D CC.3.6.11-12.C	Formal: Vocabulary Quiz Chapter Exam Internet Research Informal: Coloring Diagram Skit	What are the components and physiological mechanisms of the lymphatic system? What are the disorders associated with the lymphatic system?	2 weeks

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Urinary System	1. Describe and analyze the three ways that animals eliminate nitrogenous wastes. 2. Describe and explain the four major processes by which the human excretory system produces and disposes of urine. 3. Relate the function of the kidneys to the excretory system.	Urinary System Coloring (<i>Anatomy Coloring Book 4th Edition</i>) Urinary System Case Studies with Internet Research (See Attached) http://webanatomy.net/anatomy/urinary_notes.htm	ammonia, antidiuretic, Bowman's capsule, collecting duct, countercurrent heat exchange, dialysis, distal tube, ectotherm, endotherm, excretion, filtrate, filtration, glomerulus, loop of Henle, nephron, osmoconformer, osmoregulation, osmoregulator, proximal tubule, reabsorption, renal cortex, renal medulla, secretion, thermoregulation, urea, ureter, urethra, uric acid, urinary bladder, urinary system, urine	Chapter 25	3.1.12.A5 3.1.12.A6 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.D CC.3.6.11-12.C	Formal: Vocabulary Quiz Chapter Exam Informal: Coloring Diagram Case Study	What are the components and physiological mechanisms of the urinary system? What are the disorders associated with the urinary system?	2 weeks

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Endocrine System	<p>1. Identify and describe the structures involved in hormone production.</p> <p>2. Distinguish between the two major classes of vertebrate hormones.</p> <p>3. Relate and analyze the process of hormone production to maintaining homeostasis.</p>	<p>Endocrine System Coloring (<i>Anatomy Coloring Book 4th Edition</i>)</p> <p>You are the Doctor: Endocrine Project (See Attached)</p> <p>http://www.hormone.org/diseases-and-conditions</p>	<p>adrenal cortex, adrenal gland, adrenal medulla, adrenocorticotrophic hormone, amino acid derived hormone, androgen, antagonistic hormones, anterior pituitary, calcitonin, corticosteroid, diabetes mellitus, endocrine gland, endocrine system, endorphin, epinephrine, estrogen, glucagon, glucocorticoid, goiter, gonad, growth hormone, hormone, hypoglycemia, hypothalamus, inhibiting hormone, insulin, mineralocorticoid, neurosecretory cell, norepinephrine, pancreas, parathyroid glands, parathyroid hormone, pineal gland, pituitary gland, posterior pituitary, progesterin, prolactin, releasing hormone, steroid hormone, target cell, testosterone, TRH</p>	Chapter 26	<p>3.1.12.A5</p> <p>3.1.12.A6</p>	<p>CC.3.5.11-12.B</p> <p>CC.3.5.11-12.D</p> <p>CC.3.6.11-12.B</p> <p>CC.3.6.11-12.C</p>	<p>Formal:</p> <p>Vocabulary Quiz</p> <p>Chapter Exam</p> <p>Informal:</p> <p>Coloring Diagram</p> <p>Project</p>	<p>What are the components and physiological mechanisms of the endocrine system?</p> <p>What are the disorders associated with the endocrine system?</p>	2 weeks
Reproductive System	<p>1. Describe and define the structures and functions of the female and male human reproductive system.</p> <p>2. Explain how organisms develop.</p> <p>3. Describe the main changes that occur during each of the trimesters of human development.</p>	<p>Reproductive System Coloring (<i>Anatomy Coloring Book 4th Edition</i>)</p> <p>Case Study: The Case of the Sexually Arrested Orangutans</p> <p>http://sciencecases.lib.buffalo.edu/cs/collection/results.asp?subject_headings=Biology%20(General)</p> <p>Miracle of Life Video</p> <p>http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/S/SexHormones.html</p>	<p>allantois, amnion, asexual reproduction, blastocoel, blastocyst, bulbourethral gland, cleavage, clitoris, conception, contraception, embryo, fertilization, homeotic genes, internal fertilization, neural tube, notochord, penis, prostate gland, secondary oocyte, seminal vesicle, sexual reproduction, STD, testes, trimesters, tubal ligation, yolk sac, zygote</p>	Chapter 27	<p>3.1.12.A5</p> <p>3.1.12.A6</p> <p>3.1.12.C4</p>	<p>CC.3.5.11-12.B</p> <p>CC.3.5.11-12.D</p>	<p>Formal:</p> <p>Vocabulary Quiz</p> <p>Chapter Exam</p> <p>Informal:</p> <p>Coloring Diagram</p> <p>Case Study</p>	<p>What are the components and physiological mechanisms of the reproductive system?</p> <p>What are the disorders associated with the reproductive system?</p>	2 weeks

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Nervous System	<p>1. Describe and analyze the structural and functional subdivisions of the nervous system.</p> <p>2. Describe the diversity of animal nervous systems and provide examples.</p> <p>3. List and explain the general structures of the nervous system.</p>	<p>Case Study: Taking it on the Chin http://sciencecases.lib.buffalo.edu/cs/collection/results.asp?subject_headings=Biology%20(General)</p>	<p>Alzheimer's disease, amygdala, autonomic nervous system, axon, basal nuclei, biogenic amine, central canal, centralization, cerebellum, cerebral hemispheres, circadian rhythm, corpus callosum, dendrites, enteric division, forebrain, ganglia, gray matter, hindbrain, hippocampus, intergration, interneurons, major depression, medulla oblongata, midbrain, motor neurons, motor output, motor system, nerve, nerve cords, nerve net, nervous systems, neurotransmitter, parasympathetic division, Parkinson's disease, sensory input, sensory neurons, stimulus, sympathetic division, synaptic terminal synaptic vesicle, thalamus, threshold, ventricle,</p>	Chapter 28	<p>3.1.12.A1 3.1.12.A5 3.1.12.A6 3.1.12.C4</p>	<p>CC.3.5.11-12.B CC.3.5.11-12.D</p>	<p>Formal: Vocabulary Quiz Chapter Exam Informal: Case Study</p>	<p>What are the components and physiological mechanisms of the nervous system? What are the disorders associated with the nervous system?</p>	2 weeks

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The Senses	1. Describe and explain the structures involved in the various senses and how they function.	Activity 16: The Sensory System: (<i>Laboratory Investigations For Biology 2nd Edition</i>) Case Study: Why Does Grandpa Ignore Grandma? http://sciencecases.lib.buffalo.edu/cs/collection/results.asp?subject_headings=Biology%20(General)	aqueous humor, astigmatism, auditory canal, basilar membrane, chemoreceptor, choroid, cochlea, compound eye, cones, conjunctiva, cornea, eardrum, electromagnetic receptor, Eustachian tube, eye cup, farsightedness, fovea, hair cells, inner ear, iris, lens, mechanoreceptor, nearsightedness, middle ear, organ of Corti, outer ear, pain receptor, photopsin, photoreceptor, pinna, pupil, receptor potential, retina, rhodopsin, rods, sclera, semicircular canals, sensory adaptation, sensory receptor, sensory transduction, stretch receptor, single lens eye, thermoreceptor, visual acuity	Chapter 29	3.1.12.A5 3.1.12.A6 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.C CC.3.5.11-12.D	Formal: Vocabulary Quiz Chapter Exam Informal: Case Study Lab Activity	What are the components and physiological mechanisms of the sensory organs? What are the disorders associated with the sensory organs?	3 weeks
Muscular/Skeletal System	1. Describe and analyze the various methods of locomotion found among animals. 2. Analyze the three main types of skeletons and provide examples of each. 3. Explain how the muscles and skeleton interact to produce movement.	Muscular & Skeletal System Coloring (<i>Anatomy Coloring Book 4th Edition</i>) Activity: Makin' Muscles Activity: The Skeletal Challenge (See Attached) https://homes.bio.psu.edu/faculty/strauss/anatomy/skel/skeletal.htm http://www.gwc.maricopa.edu/class/bio101/lab/16/skeletal.htm	actin, appendicular skeleton, axial skeleton, ball and socket joints, endoskeleton, exoskeleton, hinge joints, hydrostatic skeleton, ligaments, locomotion, motor unit, muscle fibers, myofibrils, myosin, osteoporosis, pivot joints, red bone marrow, sarcomere, thick filaments, thin filaments, yellow	Chapter 30	3.1.12.A5 3.1.12.A6	CC.3.5.11-12.B CC.3.5.11-12.D	Formal: Vocabulary Quiz Chapter Exam Informal: Coloring Diagram Classroom Activities	What are the components and physiological mechanisms of the skeletal system? What are associated disorders of the skeletal system? What are the components and physiological mechanisms of the muscular system? What are associated	5 weeks

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Fetal Pig Dissection	1. Analyze the various structures of the fetal pig and relate them and their functions to that of a human.	Virtual Pig Dissection http://www.whitman.edu/academics/courses-of-study/biology/virtual-pig/ Lab: Fetal Pig Dissection Comparative Anatomy Written Report	All vocabulary learned throughout the year is integrated into this final laboratory exercise.	Lab Exercise	3.1.12.A1 3.1.12.A2 3.1.12.A5 3.1.12.A6 3.1.12.A7 3.1.12.A9 3.1.12.C4	CC.3.5.11-12.B CC.3.5.11-12.C CC.3.5.11-12.D CC.3.5.11-12.I CC.3.6.11-12.C CC.3.6.11-12.H	Formal: Practical Exam Informal: Virtual Pig Dissection Lab Activity	How do them various systems of the organism contribute to the maintinence of homeostasis?	3 weeks