



Science Pre-Advanced Placement Biology

Unit Name		<i>NATURE OF SCIENCE</i>		First 9 Weeks, Days to Teach: Week 1 – 2.5
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions	
	<p>TEKS</p> <p>1B. Make wise choices in the use and conservation resources and the disposal or recycling of materials</p> <p>2A. Plan and implement investigative procedures including asking questions, formulating testable hypotheses, selecting equipment and technology</p> <p>3B. Evaluate promotional claims that relate to biological issues such as product labeling and advertisements.</p>	<p>control group, controlled experiment, data, dependent variable, experiment, experimental group, hypothesis, independent variable, observation, prediction, sampling, theory</p>	<p>How can you design an experiment an experiment to determine the best performing product?</p> <p>How can you scientifically present data and results?</p>	
	<p>TEKS</p> <p>2B. Collect data and make measurements with precision.</p> <p>2C. Organize, analyze, evaluate, make inferences, and predict trends from data.</p> <p>2D. Communicate valid conclusions.</p> <p>3E. Evaluate models according to their adequacy in representing biological objects or events.</p>	<p>x-axis, y-axis, grid, interval, pie graph, line graph, bar graph</p>	<p>How can data be analyzed and used to predict trends?</p> <p>How can technology assist in data analysis and prediction of trends?</p>	
	<p>TEKS</p> <p>3C. Evaluate the impact of research on scientific thought, society, and the environment.</p>	<p>science, biology</p>	<p>How can scientific articles be interpreted and analyzed?</p>	
	<p>TEKS</p> <p>3A. Analyze, review, and critique scientific explanations, including hypothesis and theories, as to their strengths and weaknesses using scientific evidence and information</p> <p>3D. Describe the connection between biology and future careers.</p>	<p>Base unit, compound light microscope, electron microscope, magnification, magnification, resolution</p>	<p>What careers might need a biology background?</p> <p>How have scientists influenced current scientific careers?</p>	



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	3F. Research and describe the history of biology and contributions of scientists.		
	TEKS 1A. Demonstrate safe practices during field and laboratory investigations.	Safety goggles, lab apron, eye wash , fire blanket, fire extinguisher, safety shower, heat protective gloves	What constitutes safe laboratory practice?



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Unit Name <i>Chemistry of Life</i>		First 9 Weeks, Days to Teach: Week 2.5 – 5.5	
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions
	TEKS 9A. Compare the structures and functions of different types of biomolecules such as carbohydrates, lipids, proteins, and nucleic acids. AP Biology Connections: I. Molecules and Cells A. Chemistry of Life 4. Enzymes	adenosine triphosphate, alcohol, functional group, monomer, macromolecule, peptide, organic compound, polymer, amino acid, carbohydrate, saccharide, fatty acid, nucleic acid, nucleotide, peptide bond, phospholipids, protein, lipid	Where can biomolecules be found in living systems and how can they be identified?
	AP Biology Connections: I. Molecules and Cells A. Chemistry of Life	adhesion, capillary, cohesion, hydrogen bond, polar	What properties of water make it an important biochemical molecule?
	TEKS 9C. Investigate and identify the effects of enzymes on food molecules. AP Biology Connections: I. Molecules and Cells A. Chemistry of Life 4. Enzymes	enzyme, activation energy, catalyst, product, reactant	How are enzymes important in metabolism of biomolecules?



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Unit Name <i>THE CELL & CELLULAR PROCESSES</i>		First 9 Weeks, Second 9 Weeks Days to Teach: Week 5.5 – 10.5	
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions
	AP Biology Connections: I. Molecules and Cells B. Cells 1. Prokaryotic and Eukaryotic Cells	nosepiece, objective lens, ocular lens, resolution, stage	What is the proper use and care of a microscope?
	TEKS 4A. Identify the parts of prokaryotic and eukaryotic cells.	cell, cell membrane, cell theory, eukaryote, nucleus, organelle, prokaryotes, cell wall, crista, chloroplast, chromatin, cytosol, chromosome, cilium, cytoplasm, cytoskeleton, endoplasmic reticulum, flagellum, Golgi apparatus, lysosome, plasmid, microfilament, microtubule, mitochondria, nuclear envelope, nuclear pore, nucleolus, ribosome, rough endoplasmic reticulum, smooth endoplasmic reticulum, thylakoid membrane, vacuole	What are the differences and similarities between prokaryotic and eukaryotic cells?
	TEKS 4A. Identify the parts of prokaryotic and eukaryotic cells.	analogy, model	What is the structure and function of the eukaryotic cell?
	TEKS 4B. Investigate and identify cellular processes including homeostasis, permeability, energy production, transportation of molecules, disposal of wastes, function of cellular parts, and synthesis of new molecules. AP Biology Connections: I.Molecules and Cells B.Cells 2. Cell Membranes	homeostasis, permeability, osmosis, hypotonic, hypertonic, isotonic, active transport, passive transport, facilitated diffusion, carrier protein, concentration gradient, contractile vacuole, cytolysis, diffusion, equilibrium, ion channel, plasmolysis, turgor pressure, endocytosis, exocytosis, phagocytosis, pinocytosis, sodium-potassium pump, vesicle	How does the structure of the cell membrane relate to its function? How can you evaluate the movement of molecules across a biological membrane?

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	<p>TEKS</p> <p>4B. Investigate and identify cellular processes including homeostasis, permeability, energy production, transportation of molecules, disposal of wastes, function of cellular parts, and synthesis of new molecules.</p> <p>AP Biology Connections: I.Molecules and Cells B.Cells 2. Cell Membranes</p>	<p>cell cycle, mitosis, interphase, prophase, metaphase, anaphase, telophase, cytokinesis, autosome, centromere, diploid, haploid, histone, karyotype, nonhistone, sex chromosome, binary fission, centriole, centrosome, cleavage furrow, kinetochore, M phase, S phase, spindle fiber</p>	<p>How do cells reproduce?</p> <p>What are the parts of the cell cycle?</p> <p>What amount of time do cells spend in the different stages of the cell cycle?</p>
	<p>TEKS</p> <p>4B. Investigate and identify cellular processes including homeostasis, permeability, energy production, transportation of molecules, disposal of wastes, function of cellular parts, and synthesis of new molecules.</p> <p>AP Biology Connections I.Molecules and Cells B. Cells 3. Cell Cycle and Mitosis</p>	<p>cellular respiration, glycolysis, pyruvic acid, acetyl coenzyme A, aerobic respiration, citric acid, electron transport chain, Krebs' cycle, mitochondrial matrix</p>	<p>How do the processes of photosynthesis and cellular respiration depend upon one another?</p>
	<p>TEKS</p> <p>4B. Investigate and identify cellular processes including homeostasis, permeability, energy production, transportation of molecules, disposal of wastes, function of cellular parts, and synthesis of new molecules.</p> <p>AP Biology Connections I.Molecules and Cells C.Cellular Energetics 2 Fermentation and cellular respiration</p>	<p>alcoholic fermentation, anaerobic pathway, lactic acid fermentation, fermentation</p>	<p>How do organisms produce energy in the absence of oxygen?</p>



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Unit Name <i>Heredity and Molecular Genetics</i>		Second 9 Weeks	Days to Teach: Week 10.5 - 17
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions
	<p>TEKS</p> <p>6A. Describe components of deoxyribonucleic acid (DNA), and illustrate how information for the traits of an organism is carried in the DNA.</p> <p>6D. Compare genetic variations observed in plants and animals.</p> <p>AP Biology Connections: II. Heredity and Evolution A. Heredity 3. Inheritance Patterns</p>	<p>bacteriophage, nucleotide, complementary base pair, replication, double helix, DNA helicase, DNA polymerase</p>	<p>How do the results of dihybrid crosses express themselves in living organisms?</p>
	<p>TEKS</p> <p>6B. Explain replication, transcription, and translation using models of DNA and ribonucleic acid (RNA).</p> <p>6C. Identify and illustrate how changes in DNA cause mutations and evaluate the significance of these changes.</p>	<p>RNA, transcription, translation, gene expression, messenger RNA, transfer RNA, ribosomal RNA, codon, anticodon, genetic code, operon, intron, exon, point mutation, deletion, insertion, frame shift mutation</p>	<p>How does DNA instruct the body to make protein?</p>
	<p>AP Biology Connections: Nucleic Acid Technology and Applications</p>	<p>genetic engineering, recombinant DNA, electrophoresis, Human Genome Project, transgenic</p>	<p>How is biotechnology used in research labs?</p>
	<p>TEKS</p> <p>6E. Compare the processes of mitosis and meiosis and their significance to sexual and asexual reproduction.</p>	<p>meiosis, spermatogenesis, ovum oogenesis, crossing over, allele, independent assortment, asexual reproduction, sexual reproduction, fertilization, sporophyte, gametophyte, genotype, phenotype, Law of segregation, probability, test cross, sex-linked, pedigree, polygenic, multiple alleles, incomplete dominance, codominance</p>	<p>How does mitosis compare to meiosis?</p>



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	TEKS 6F. Identify and analyze karyotypes.	karyotype	How can genetic disorders be detected using a karyotype?
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Unit Name <i>EVOLUTIONARY BIOLOGY</i>		Second 9 Weeks, Third 9 Weeks Days to Teach: Week 18 – 20	
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions
	<p>TEKS</p> <p>7B. Illustrate the results of natural selection in speciation, diversity, phylogeny, adaptation, behavior, and extinction.</p> <p>AP Biology Connections: II. Heredity and Evolution B.Evolutionary Biology 3.Mechanisms of Evolution</p>	<p>half-life, archaeobacteria, eubacteria, protest, natural selection, adaptation, reproductive isolation, gradualism, punctuated equilibrium, divergence, speciation, subspecies</p>	<p>What factors influence natural selection?</p>
	<p>TEKS</p> <p>7A. Identify evidence of change in species using fossils, DNA sequences, anatomical similarities, physiological similarities, and embryology.</p>	<p>homologous structure, analogous structure</p>	<p>How can the fossil record be used to compare the evolutionary adaptations of organisms?</p>
	<p>TEKS</p> <p>7A. Identify evidence of change in species using fossils, DNA sequences, anatomical similarities, physiological similarities, and embryology.</p>	<p>embryology, vestigial structure</p>	<p>What is the difference between homologous and analogous structures?</p>



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Unit Name <i>DIVERSITY OF ORGANISMS</i>		Third 9 Weeks, Days to Teach: 21 – 25	
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions
	<p>TEKS</p> <p>8A. Collect and classify organisms at several taxonomic levels such as species, phylum, and kingdom using dichotomous keys.</p> <p>8B Analyze relationships among organisms and develop a model of a hierarchical classification system based on similarities and differences using taxonomic nomenclature.</p> <p>8C Identify characteristics of kingdoms including monerans, protists, fungi, plants, and animals.</p> <p>AP Biology Connections: Organisms and Populations Diversity of Organisms 2. Survey of the Diversity of Life</p>	<p>taxonomy, binomial nomenclature, domain, kingdom, phylum, class, order, family, genus, species</p>	<p>How do biologists classify organisms?</p>
	<p>TEKS</p> <p>8B. Analyze relationships among organisms and develop a model of a hierarchical classification system based on similarities and differences using taxonomic nomenclature.</p>	<p>dichotomous key, convergent evolution, derived character, ancestral character</p>	<p>How can a dichotomous key be used to classify organisms?</p>
	<p>TEKS</p> <p>4C. Compare the structures and functions of viruses to cells and describe the role of viruses in causing diseases and conditions such as acquired immune deficiency syndrome, common colds, smallpox, influenza, and warts.</p>	<p>multicellular differentiation, protist, virus, capsid, prion, lytic, lysogenic, provirus, retrovirus, pathogen, bacteria, bacillus, coccus, spirillum, pilus, toxin, antibiotic, endospore, cilia, conjugation, aerobic, anaerobic, protozoan, algae, amoeba, pseudopod, paramecium, euglena, diatom, plasmodium, chitin, mycelium, hypha, yeast, budding, rhizoid, lichen</p>	<p>What is a virus? How does virus structure relate to function?</p>



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	<p>TEKS</p> <p>4D. Identify and describe the role of bacteria in maintaining health such as in digestion and in causing diseases such as in streptococcus infections and diphtheria.</p> <p>11D. Summarize the role of microorganisms in maintaining and disrupting equilibrium including diseases in plants and animals and decay in an ecosystem</p>		<p>How can bacteria influence the health of living systems?</p>
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Unit Name <i>Structure and Function of Plants and Animals</i>		Third Nine Weeks, Fourth Nine Weeks Days to Teach: 26 – 32	
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions
	<p>TEKS</p> <p>10C. Analyze and identify characteristics of plant systems and subsystems</p> <p>13A. Evaluate the significance of structural and physiological adaptations of plants to their environments.</p> <p>13B. Survey and identify methods of reproduction, growth, and development of various types of plants.</p> <p>AP Biology Connections: III. Organisms and Populations A. Structure and function of plants and animals 2. Structural, physiological and behavioral adaptations</p>	<p>stomates (pl. stomata), guard cell, mesophyll, cuticle, monocot, dicot, xylem, phloem, vascular tissue, herbaceous plants, woody plants, turgor pressure</p>	<p>What are the functions of stomata?</p> <p>How do stomata differ in various types of plants?</p>
	<p>TEKS</p> <p>5A. Compare cells from different parts of plants and animals including roots, stems, leaves, epithelia, muscles, and bones to show specialization o structure and function</p> <p>5B. Identify cell differentiation in the development of organisms</p> <p>5C. Sequence the levels of organization in multicellular organisms to relate the parts to each other and to the whole</p> <p>10A. Interpret the functions of systems in organisms including circulatory, digestive, nervous, endocrine, reproductive, integumentary, skeletal, respiratory, muscular, excretory, and immune.</p> <p>10B. Compare the interrelationships of organ systems to each other and to the body as a whole.</p>	<p>organ, organ system, tissue, dorsal, ventral, medial, lateral, posterior, anterior, proximal, distal, cranial region, pectoral region, caudal region, pelvic region, umbilical cord, digestive system, excretory system, circulatory system, reproductive system, respiratory system, nervous system, immune system, urogenital tract, papillae, liver peritoneal membrane, small intestine, large intestine, gall bladder, rugae, pyloric sphincter, spleen, artery, vein, pancreas, rectum, mesentery, kidney, lung ureter, bladder, thymus, heart, muscle, atrium, ventricle, aorta, cross section, oxygenated, deoxygenated, chordae tendinae, ovary, oviduct, uterus, penis, testicle, epididymus, nares, trachea, esophagus, bronchus,</p>	<p>How do the systems of the fetal pig compare to other animals?</p> <p>What are the structures and the functions of the systems of the fetal pig?</p> <p>How do the systems of the fetal pig interact?</p>



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		bronchiole, alveoli, diaphragm, spinal cord, brain, vertebrae, nerve	
	TEKS 11B. Investigate and identify how organisms, including humans, respond to external stimuli.	Stimulus, response, taxis, social insects, termites, pheromone, variable, control	How do scientists use observations to learn about animal behavior in response to stimuli?
	TEKS 11C. Analyze the importance of nutrition, environmental conditions, and physical	Basal Metabolic Index (BMI), Basal Metabolic Rate (BMR), calorie, saturated fat, unsaturated fat, simple sugar, complex sugar, carbohydrate, protein, aerobic exercise, anaerobic exercise	How does my diet and daily activity influence my overall health?



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Unit Name <i>ECOLOGY</i>			Fourth 9 Weeks, Days to Teach: WEEK 33 - 35
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions
	<p>TEKS</p> <p>12A. Analyze the flow of energy through various cycles including the carbon, oxygen, nitrogen, and water cycles.</p>	<p>Biogeochemical cycle, nitrogen cycle, carbon cycle, water cycle, oxygen cycle, decay, decomposer, evaporation, transpiration, condensation, nitrogen fixation, nitrification, denitrification, urea, ammonia, nitrite, nitrate, reservoir, biosphere, geosphere, hydrosphere, atmosphere, sediment, organic, inorganic, precipitation, photosynthesis, lithosphere</p>	<p>How does energy flow through the ecosystem?</p>
	<p>TEKS</p> <p>9D. Analyze the flow of matter and energy through different trophic levels and between organisms and the physical environment</p> <p>12B. Interpret interactions among organisms exhibiting predation, parasitism, commensalism, and mutualism.</p>	<p>Parasitism, commensalism, mutualism, symbiosis, predator, prey, reproductive success, carrying capacity, generation, population size, reproductive rate</p>	<p>How do predator-prey relationships influence survival of organisms?</p>
	<p>TEKS</p> <p>12C. Compare variations, tolerances, and adaptations of plants and animals in different biomes.</p>	<p>Tundra, grassland, niche, population, community, ecosystem, freshwater, marine, desert, forest, adaptation, biotic factor, abiotic factor, renewable resource, non-renewable resource, pollution, habitat</p>	<p>What are the different biomes found on Earth?</p> <p>How do living and non-living factors relate on Earth?</p>
	<p>TEKS</p> <p>12D. Identify and illustrate that long-term survival of species is dependent on a resource base that may be limited.</p>	<p>Species, population, resource, limited resource, environment, carrying capacity</p>	<p>How are ecosystems affected by limiting factors?</p>



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	<p>TEKS</p> <p>12E. Investigate and explain the interactions in an ecosystem including food chains, food webs, and food pyramids.</p>	<p>Control, variable, niche, food web, ecosystem, biotic factor, abiotic factor, food pyramid, trophic level, energy, food chain, omnivore, carnivore, herbivore, producer, consumer, detritivore, decomposer, primary consumer, secondary consumer, tertiary consumer</p>	<p>How do living and non-living organisms interact in ecosystems?</p> <p>What influences survival rates in ecosystems?</p>
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