

Course: <i>AP Biology</i>	Teacher: John Girard				Draft updated: September 1, 2009
Month	September (24 classes)	October (27 classes)	November (22 classes)	December (18 classes)	January (20 classes)
Topic	Life Chemistry & Cell Transport	Cell Energetics, Cell Cycle, Protein Synthesis, & DNA Replication	Classical Genetics & Molecular Genetics	Evolution	Classification & Kingdoms
Essential Questions	<p>What are the properties of water and why is water important to living organisms?</p> <p>How do the properties of carbon contribute to the formation of organic molecules?</p> <p>What are cells & what are the components of cells?</p> <p>How do organelles perform the work of a cell?</p> <p>How is cell transport regulated, and how is the plasma membrane selectively permeable?</p> <p>What factors affect plasma membrane permeability?</p>	<p>How is ATP energy created?</p> <p>How do cells get energy to do work?</p> <p>How do cells communicate?</p> <p>Where do new cells come from?</p> <p>How are proteins made?</p> <p>How is DNA copied?</p> <p>Why do organisms vary in phenotype?</p>	<p>What are genetic traits?</p> <p>What controls how genetic traits are expressed?</p> <p>How has technology affected genetics?</p> <p>What are viruses & bacteria?</p> <p>What genetic implications do viruses and bacteria have?</p>	<p>How did life come to exist?</p> <p>Who created and who contributed to the idea of evolution and the theory of natural selection?</p> <p>How do the mechanisms of evolution work?</p> <p>What evidence is available to support evolution?</p> <p>What is the Hardy-Weinberg theory and how does it demonstrate that populations evolve?</p>	<p>How are living organisms different from each other and how are they classified?</p> <p>What is taxonomy?</p> <p>What are protists & fungi & how do they function?</p> <p>What are sponges, cnidarians, worms, & mollusks & how do they function?</p> <p>What are arthropods & echinoderms & how do they function?</p>

<p>Objectives</p>	<ul style="list-style-type: none"> *Conduct a scientific experiment *Describe atoms and their interactions *Compare covalent & Ionic bonds *Describe the properties of water AND it's importance to life *Describe the chemical composition, structure, AND function of organic molecules *Quantify enzyme activity in beef liver *Identify and describe cell organelles *Manipulate a microscope to focus a slide *Describe cell organelle functions *Describe factors contributing to plasma membrane permeability *Compare & contrast cell transport mechanisms 	<ul style="list-style-type: none"> *Describe the relationship between photosynthesis & cell respiration *Identify reactants & products of photosynthesis, cell respiration, & fermentation *Compare / contrast exergonic & endergonic reactions *Calculate ΔG *Describe how a plant & animal cell creates/metabolizes ATP *Describe intra and extra cellular communication mechanisms *Describe DNA structure *Describe DNA replication Compare /contrast DNA & RNA (mRNA, tRNA, & rRNA) *Describe protein synthesis *Compare & contrast mitosis & meiosis *Prepare a wet-mount onion tip microscope slide 	<ul style="list-style-type: none"> *Identify Mendel's Laws of heredity *Complete monohybrid & dihybrid cross *Describe genetic traits & their relationship to alleles *Describe how the processes of transformation, protein electrophoresis PCR, RFLP, & DNA fingerprinting work *Debate the pros & cons of the use of genetically engineered food *Create a human karyotype & pedigree *Calculate chi-square *Describe the use of viruses and bacteria in modern genetics *Describe the structures & functions of viruses & bacteria *Compare/contrast prokaryotes & eukaryotes *Compare/contrast archaeobacteria & eubacteria 	<ul style="list-style-type: none"> *Describe Earths early atmosphere *Compare/contrast fossil types *Describe Redi, Spallanzani, Pasteur, Miller & Urey experiments & their relationship with the origins of life *Describe Darwin's idea of Evolution by the theory of natural selection & evidence to support it *Describe the contributions made by Hutton, Malthus, Cuvier, Lamarck, Lyell, & Wallace to Darwin's Theory of Evolution *Describe natural selection & its' importance in Darwin's theory & its' effects on polygenic traits *Define genetic drift & genetic equilibrium * Describe speciation & why it occurs *Compare/contrast adaptive radiation, convergent evolution, co-evolution, & punctuated equilibrium 	<ul style="list-style-type: none"> *Differentiate organisms by characteristics utilizing a dichotomous key *Create a dichotomous key given different characteristics *Describe the structures & functions of Protists, fungi, sponges, cnidarians, worms, & mollusks *Describe the reproductive cycles of protists, fungi, sponges, cnidarians, worms, & mollusks *Compare/contrast acoelomates, pseudocoelomates, & coelomates *Compare/contrast incomplete & complete metamorphosis * Compare/contrast intracellular & extracellular digestion * Compare /contrast protostome & deuterostome development
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<p>Reading</p> <p>Campbell Reece Biology 7th edition 2005</p>	<p>Chap 1 pg 2-26 Chap 2 pg 32 -44 Chap 3 pg 47-55 Chap 4 pg 58-66 Chap 5 pg 68-89 Chap 6 pg 94-120 Chap 7 pg 124-137</p>	<p>Chap 8 pg 141-157 Chap 9 pg 160-177 Chap 10 pg 181-197 Chap 11 pg 201-213 Chap 12 pg 218-232 Chap 13 pg 238-248 Chap 19 pg 359-380</p>	<p>Chap 14 pg 251-268 Chap 15 pg 274-289 Chap 16 pg 293-306 Chap 17 pg 309-330 Chap 18 pg 334-356 Chap 20 pg 384-407 Chap 21 pg 411-420 Chap 27 pg 534-546</p>	<p>Chap 22 pg 438-451 Chap 23 pg 454-469 Chap 24 pg 472-486 Chap 26 pg 512-529</p> <p>Supplemental: Excerpts from Darwin's- <i>The Origin of Species</i></p> <p>Wallace's - <i>1858 On the Tendency of Varieties to Depart Indefinitely from the Original Type</i></p>	<p>Chap 25 pg 491-506 Chap 28 pg 549-567 Chap 31 pg 608-623 Chap 32 pg 626-633 Chap 33 pg 638-667</p>
<p>Writing</p>	<p>Pill bug animal behavior AP Lab #11</p> <p>Released open ended essay questions</p>	<p>Aerobic respiration & Photosynthesis comparison project Released open ended essay questions</p>	<p>Genetically engineered food debate Released open ended essay questions</p>	<p>Released open ended essay questions</p>	<p>Released open ended essay questions</p>
<p>Assessments</p>	<p>Test</p> <p>Open ended essay questions</p> <p>AP Lab #1</p> <p>AP Lab #2 or Peroxidase enzyme lab</p> <p>AP Lab #11</p>	<p>Test</p> <p>Open ended essay questions</p> <p>AP Lab # 3</p> <p>AP Lab #4</p> <p>AP Lab #5</p> <p>Aerobic respiration & Photosynthesis comparison project</p>	<p>Test</p> <p>Open ended essay questions</p> <p>AP Lab #6 (Transformation, Restriction, PCR & Electrophoresis)</p> <p>AP Lab #7</p>	<p>Test</p> <p>Open ended essay questions</p> <p>AP Lab #8</p>	<p>Test</p> <p>Open ended essay questions</p> <p>Kingdoms PowerPoint Project</p>

Instructional Strategies	<p>Linguistic - Oral Lecture, Reading aloud in class</p> <p>Logical / Mathematical - Metric measurement & conversions</p> <p>Spacial - PowerPoint Presentation</p> <p>Kinesthetic - Labwork</p> <p>Interpersonal - Jigsawing, Labwork</p> <p>Intrapersonal - Independent Class Work</p>	<p>Linguistic - Oral Lecture, Reading aloud in class</p> <p>Logical / Mathematical - Calculate Ion charge</p> <p>Spacial - PowerPoint Presentation</p> <p>Kinesthetic - Labwork</p> <p>Interpersonal - Jigsawing, Labwork</p> <p>Intrapersonal - Independent Class Work</p>	<p>Linguistic - Oral Lecture, Reading aloud in class</p> <p>Logical / Mathematical - Enzyme Lab</p> <p>Musical - Cell rap</p> <p>Spacial - PowerPoint Presentation</p> <p>Kinesthetic - Labwork</p> <p>Interpersonal - Jigsawing, Labwork</p> <p>Intrapersonal - Independent Class Work</p>	<p>Linguistic - Oral Lecture, Reading aloud in class</p> <p>Logical / Mathematical - Punnett squares</p> <p>Musical - Phototropism song</p> <p>Spacial - PowerPoint Presentation</p> <p>Kinesthetic - Labwork</p> <p>Interpersonal - Jigsawing, Labwork</p> <p>Intrapersonal - Independent Class Work</p>	<p>Linguistic - Oral Lecture, Reading aloud in class</p> <p>Logical / Mathematical - Calculate probability, create karyotypes</p> <p>Spacial - PowerPoint Presentation</p> <p>Kinesthetic - Labwork</p> <p>Interpersonal - Jigsawing, Labwork</p> <p>Intrapersonal - Independent Class Work</p>
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Month	February (19 classes)	March (24 classes)	April (21 classes)	May (26 classes)	June (15 classes)
Topic	Kingdoms	Human Body	Ecology	Dissection	Research
Essential Questions	<p>What are chordates & how do they function?</p> <p>What are fish, amphibians, reptiles, birds, & mammals & how do they function?</p> <p>What are plants and how do they function?</p>	<p>What organs are found in the human body & how do they function?</p>	<p>How do organisms interact within their environment?</p> <p>How does energy flow through an ecosystem?</p> <p>How is a community created?</p> <p>How do the environments of organisms differ?</p> <p>What factors affect the size of a population?</p>	<p>Is organ placement related to function?</p> <p>How are insects adapted to their environment?</p>	<p>How is scientific research conducted?</p>
Objectives	<ul style="list-style-type: none"> *Describe structures & functions of fish, amphibians, reptiles, birds, & mammals *Describe life cycles and reproduction of fish, amphibians, reptiles, birds, & mammals *Compare/contrast invertebrate & vertebrate respiration & excretion *Compare/contrast open & closed circulatory systems *Describe plant structures & their 	<ul style="list-style-type: none"> *Describe the structures and functions of the integumentary, skeletal, muscular, digestive, excretory, & nervous systems *Label structures of the skeletal integumentary, muscular, digestive, excretory, & nervous systems *Compare/contrast chemical & mechanical digestion *Compare/contrast 	<ul style="list-style-type: none"> *Describe organization of the biosphere *Compare relationships between organisms *Describe the movement of energy through trophic levels *Describe primary & secondary succession and their relationship in the creation of a climax community *Compare the environments that make up a biome *Identify factors 	<ul style="list-style-type: none"> *Dissect a frog and pig comparing organ systems *Collect, display, and classify Insects representing 8 Orders 	<ul style="list-style-type: none"> *Research & conduct an experiment of your choosing (<u>With instructor approval</u>) *Collect and synthesize data at Outer Island

	<p>functions</p> <ul style="list-style-type: none"> *Compare / contrast primary & secondary growth in vascular plants *Describe water transport in vascular plants *Describe plant reproduction mechanisms *Classify plants *Describe the evolution of plant characteristics 	<p>skeletal, smooth, & cardiac muscle</p> <ul style="list-style-type: none"> *Describe the events of nerve transmission including a synapse *Describe how human vision & hearing functions *Describe the structures & functions of the endocrine, circulatory, immune, & respiratory systems *Label structures of the endocrine, circulatory, immune, & respiratory systems *Compare/contrast negative & positive hormonal feedback systems *Compare/contrast blood vessels *Describe the path of blood circulation *Compare/contrast humoral immunity & Cell-mediated immunity *Describe gas transport and respiration 	<p>that affect population growth</p>		
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<p>Reading</p> <p>Campbell Reece Biology 7th edition 2005</p>	<p>Chap 34 pg 671-705 Chap 29 pg 573-588 Chap 30 pg 591-606 Chap 35 pg 710-734 Chap 36 pg 738-753 Chap 37 pg 764-767 Chap 38 pg 771-784 Chap 39 pg 788-813</p>	<p>Chap 40 pg 823-840 Chap 41 pg 844-862 Chap 42 pg 867-894 Chap 43 pg 898-917 Chap 44 pg 922-938 Chap 45 pg 943-959 Chap 46 pg 964-983 Chap 47 pg 987-1006 Chap 48 pg 1011-1039 Chap 49 pg 1045-1074</p>	<p>Chap 50 pg 1080-1098 Chap 52 pg 1136-1155 Chap 53 pg 1159-1180 Chap 54 pg 1184-1205 Chap 55 pg 1209-1229</p>	<p>Primary Literature T.B.D.</p>	<p>Primary Literature T.B.D. based on student research</p>
<p>Writing</p>	<p>Released open ended essay questions</p>	<p>Released open ended essay questions</p>	<p>Released open ended essay questions</p>	<p>Primary Literature summaries</p> <p>Biology Research Lab</p>	<p>Research Lab Report Outer Island Lab</p>
<p>Assessments</p>	<p>Test</p> <p>Open ended essay questions</p> <p>AP Lab #9</p>	<p>Test</p> <p>Open ended essay questions</p> <p>AP Lab #10</p>	<p>Test</p> <p>Open ended essay questions</p> <p>AP Lab #12</p> <p>The Introduction, Increase, and Crash of Reindeer on ST. MATTHEW ISLAND Population Study</p>	<p>Mock AP Biology Exam</p> <p>Anatomical comparison of frog & pig (based on dissection)</p> <p>Primary Literature summaries</p> <p>Insect Collection</p> <p>Biology Research Lab</p>	<p>Research Lab Report Outer Island Lab</p>

Instructional Strategies	Linguistic - Oral Lecture, Reading aloud in class Logical / Mathematical - Calculate Hardy-Weinberg Spacial - PowerPoint Presentation Kinesthetic - Labwork Interpersonal - Jigsawing, Labwork Intrapersonal - Independent Class Work	Linguistic - Oral Lecture, Reading aloud in class Logical / Mathematical - Digesting Dinner Essay Spacial - PowerPoint Presentation Kinesthetic - Labwork Interpersonal - Jigsawing, Labwork Intrapersonal - Independent Class Work	Linguistic - Oral Lecture, Reading aloud in class Logical / Mathematical - Differentiate Leukocytes Spacial - PowerPoint Presentation Kinesthetic - Labwork Interpersonal - Jigsawing, Labwork Intrapersonal - Independent Class Work	Linguistic - Oral Lecture, Reading aloud in class Logical / Mathematical - Dichotomous Keys Musical - Oh My Fungi song Spacial - PowerPoint Presentation Kinesthetic - Labwork Interpersonal - Jigsawing, Labwork Intrapersonal - Independent Class Work	Linguistic - Oral Lecture, Reading aloud in class Logical / Mathematical - Dichotomous Keys Spacial - PowerPoint Presentation Kinesthetic - Labwork Interpersonal - Jigsawing, Labwork Intrapersonal - Independent Class Work
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