



Meridian District #15 Curriculum Map

Teacher Name: Payton Cloe

Grade: 10th/11th Grade

Subject Area: Biology



Month	Topic/Content	Skill	Standard	Instruction/Resources	Assessments
August/ September	<u>Chapter 1:</u> Introduction to Biology <u>Chapter 2:</u> The Chemistry of Life	- Microscope Usage Mastery - Lab Safety Protocols - Comparisons of the various levels of organization that exist in the living world - Recognizing Ionic Compounds compared to Covalent Molecules based on Elements Present in Formula - Recognizing the basic formula for chemical reactions - Relating the monomers of Biological compounds to the larger polymers they form. - Recognizing formulaic differences between the 4 classes of biological molecule - Understanding of basic BMR and Daily Caloric Needs - Going through the full process of Experimental Design and the Scientific	➤ HS-PS1-1 ➤ HS-PS1-2 ➤ HS-PS1-4 ➤ HS-PS1-7 ➤ HS-PS1-8 ➤ HS- LS1-1 ➤ HS- LS1-2 ➤ HS- LS1-7	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom	- Section Reviews - Vocabulary - "Design a Lab" Lab - Microscopy Lab - Food Labels Project - Chapter Test - Article Reviews - Chapter Review Assignment - PBS NOVA: "Hunting the Elements" Video -

		Method			
October	<u>Chapter 3: Ecology</u> <u>Chapter 7: Cells</u>	- Explain the steps of the Hydrologic Cycle - Explain how Carbon, Nitrogen, and Phosphorus Cycle through Ecosystems - Explain how bacteria play a role in nitrogen fixation - Outline the impact humans have had on ecosystems based on farming practices and habitat destruction - Cite the relationship between runoff and algal blooms - Create a basic food chain - Link food chains into food webs to show complete feeding relationships in a selected ecosystem - Compare Prokaryotes to Eukaryotes - Explain the function of Eukaryotic Organelles - Contrast Diffusion vs Facilitated Diffusion - Explain the Process of Osmosis	➤ HS - LS2-2 ➤ HS - LS2-3 ➤ HS - LS2-4 ➤ HS - LS2-5 ➤ HS - LS2-6 ➤ HS-LS1-1 ➤ HS - LS1-6	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom	- Section Review Assignments - Vocabulary - Looking at Cells Lab - Diagram a Cell Project - Ch. 3 Test - Ch. 7 Test - "Isle Royale" Data Lab - Ch. 3 Review Assignment - Ch. 7 Review Assignment - Supplemental Video Worksheets

		- Describe Isotonic, Hypotonic, and Hypertonic - Cite examples of specialized cells and tissues in both plant and animal cells.			
November	Finish Ch. 7 Cells <u>Chapter 8:</u> Photosynthesis	- Diagram and label a Chloroplast - Explain the steps of the Light-dependent reactions - Explain the steps in the Light-independent reactions - Model ways to impact the rates of photosynthesis. - Examine key historical research that contributed to our modern understanding of photosynthesis - Draw and label the component parts of an ATP molecule - Write and balance the chemical equation for photosynthesis - Write and balance the chemical equation for cellular	➤ HS-LS1-5 ➤ HS - LS1 - 7	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom	- Chapter Review Assignment - Section Reviews (7.4) - Ch. 8 Vocabulary - Ch. 8 Section Reviews - Ch. 8 Test - Ch. 8 Review Assignment - Ch. 9 Vocabulary - Ch. 9 Section Reviews - Ch. 9 Test - Ch. 9 Review Assignment - Supplemental Video Worksheets

		respiration - Compare the chemical equations of photosynthesis and cellular respiration. - Diagram the structure of a mitochondrion - Examine the endosymbiotic theory. - Examine the Light absorption spectrums of Chlorophylls A and B.			
December	Chapter 9: Cellular Respiration Final Exam Review (Reviewing all Previously Used Topics and NGSS Standards)	- Label a Mitochondrion - Write the complete definition for aerobic Cellular Respiration - Compare Aerobic Pathway to Anaerobic Pathway - Describe the work of ATP Synthase - Explain oxidative phosphorylation - Compare Alcoholic Fermentation to Lactic Acid Fermentation - Outline the process of Glycolysis - Outline the process of the Krebs Cycle	➤ HSLS2-5 ➤ HSLS1-6 ➤ HSLS1-7	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom	- Ch. 9 Vocabulary - Ch. 9 Section Review Assign. - Mitosis Worksheet - Meiosis Worksheet - Allium Root Tip Lab - Ch. 9 Test - Supplemental Video Worksheets

		- Describe how ATP is made via the ETC - Describe the role of FADH₂ and NADH - Explain the role of excited electrons to the process of ATP Synthesis.			
January	Chapter 11: Mendelian Genetics Chapter 12: DNA (intro)	➤ Summarize Mendel's law of Dominance ➤ Apply the Law of Dominance to Monohybrid Crosses ➤ Explain the terms homozygous and heterozygous ➤ Summarize Mendel's laws of Segregation and Independent Assortment. ➤ Compare the Non-Mendelian inheritance patterns of Codominance to Incomplete Dominance ➤ Perform a cross using Multiple Alleles ➤ Discuss Human Inheritance that involves Multiple Alleles ➤ Perform a Dihybrid Cross ➤ Do crosses to determine Human	➤ HSLS1-4 ➤ HSLS3-1 ➤ HSLS3-2 ➤ HSLS3-3	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom - Geniventure Online Lab from The Concord Consortium	- Ch. 11 Vocabulary - 11.1 Review Questions - 11.2 Review Questions - 11.3 Review Questions - Monohybrid Quiz - Dihybrid Quiz - Ch. 11 Review Assignment - Ch. 11 Test - PBS Nova: Rosalind Franklin's Legacy Article Review. - Dragon Genetics Lab - Supplemental Video Worksheets

		Carriers for Autosomal Dominant and Recessive Disorders ➤ Perform a Cross to Determine the Sex of Offspring (XX vs XY)			
February	Continue Ch. 12 DNA	- Describe the experiments of Griffith, Avery, and Hershey/Chase. - Explain the shape of DNA discovered by Crick and Watson - Construct an accurate model of the DNA Double Helix - Use Chargaff's Rule to map out complementary strands of DNA. - Research the contributions of Linus Pauling and Rosalind Franklin. - Explain how Chargaff's rule results in DNA Replication being an easy process - Compare the roles of DNA polymerase, DNA Ligase, DNA Helicase, and RNA Primase	➤ HSLS 3-1 ➤ HSLS 3-2 ➤ HSLS 3-3	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom	- Ch. 12 Vocabulary - 12.1 Review Questions - 12.2 Review Questions - 12.3 Review Questions - Ch. 12 Review Assignment - DNA Modeling Lab - Supplemental Video Worksheets

		- Construct a step by step diagram of the processes that allow for DNA Replication to occur. - Explain the complementary structure of the DNA strands and the 5' to 3' structure of the strands - Solve a complementary strand question when given either the leading or lagging strand. - Examine various point mutations and cite known examples in humans. - Use a karyotype to identify Chromosomal mutations like Turner's, Klinefelters, and Down's Syndrome.			
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March	Chapter 15: Darwin and Natural Selection Chapter 18: Classification of Living Things	- Discuss Darwin's trip upon the Beagle and its relevance to his theory of Natural Selection - Compare the work of Darwin to that of Alfred Russel Wallace. - Examine the role that the works of Hutton, LaMarck, Lyell, and Malthus had on Darwin's development of his theory. - Look at Pre-Darwinian evolutionary theories focusing on the transformational theory of LaMarck - Discuss On the Origin of Species and examine Darwin's evidence for his theory of natural selection - Look at Linnaeus' first system of Classification - Discuss modern changes to taxonomy that include DNA and derived characters - Perform an overview of the modern 3	➤ HSLS4-1 ➤ HSLS4-2 ➤ HSLS4-3 ➤ HSLS4-4 ➤ HSLS 4-5	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom	- Chapter 15 Vocabulary - 15.1 Review Questions - 15.2 Review Questions - 15.3 Review Questions - HHMI Video Assignment - PBS NOVA Article Review: Ten Great Advances in Evolution - Founder Event Simulation mini lab - Ch. 15 Test - Chapter 18 Vocabulary - 18.1 Review Questions - 18.2 Review Questions - 18.3 Review Questions - Vocabulary Review wkst - Fav. Animals Classification Lab - Using a Dichot. Key
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		domain system of taxonomy and the requirements of each domain and also the 6 kingdoms of life.			Lab - Supplemental Video Worksheets
April	Finish up Ch. 18 STEM Project: Balsa Bridges (7 days) Invertebrates Project	➤ Go over basic Research and Development Protocol ➤ Draw a scale model of a bridge design ➤ Build a Scale model of a bridge design ➤ Pull your bridge and calculate it's efficiency. ➤ Research a single group of invertebrates and select its key features ➤ Build a Google Slides Presentation to present to your classmates over your chosen phyla of invertebrates.	➤ HS-ETS1-2 ➤ HS-ETS1-3	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom	- Ch 18 Test - Bridge Design Days - Bridge Build Days - Bridge Pull Day - Invertebrate Presentation Project (rubric) - Supplemental Video Worksheets

May	Vertebrates: <u>Chapters 30-32</u>	➤ Define vertebrates ➤ Explain the 4 key traits of the chordate body plan. ➤ Examine the Edicarian and Cambrian Periods that gave rise to early chordates. ➤ Compare and Contrast Jawless, Cartilaginous, and Bony Fish ➤ Cite examples of keystone species of each of the 3 types of fish. ➤ Look at the fossil record to track the evolution of tetrapods ➤ Look at the key features of amphibians and how those adaptations have led to life on land ➤ Examine keystone species of the major groups of amphibians ➤ Examine adaptations of reptiles ➤ Look at the evolution of reptiles and mass extinctions that led to the end of the dinosaurs ➤ Compare	➤ HS-LS4-1 ➤ HS-LS4-2 ➤ HS-LS4-5	- Ch. Notes (provided) - Audio lectures - Supplemental Videos - Textbook (Miller/Levine 2014) - Google Classroom - PBS Eons	- Animal Vocabulary - Fish Review - Amphibian Review - Reptile Review - Mammal Review - Bird Review - Tetrapod Paper - Supplemental Video Worksheets
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		Endotherms to Ectotherms ➤ Examine the major groups of mammals and their key adaptations that led to them thriving after the Cretaceous Extinction ➤ Examine the evolutionary trees of dinosaurs and birds ➤ Look at the major adaptations of birds that are useful to flight			
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