

Macon County Schools Biology I Timeline

Time	Standards	Broad Goals	Honors HMD Chpts	Glencoe Chpts	Checks for Understanding	State Performance Indicators	Resources (SUGGESTED "Labs" and "Activities"; MUST-DOs are Bold and Red)
4-5 Weeks	embedde d standards Standard 1- Cells	1. Scientific Method	1	1	STEM standards	STEM standards	Student-Design/Inquiry-Based Experiments; Activities focused on graphing, interpreting data, trouble-shooting experimental procedures
		2. Cell Structure and Function	3	7	<input type="checkbox"/> 3210.1.1 Investigate cells using a compound microscope. <input type="checkbox"/> 3210.1.2 Construct a model of a prokaryotic or eukaryotic cell.	1.1 Identify the cellular organelles associated with major cell processes. 1.2 Distinguish between prokaryotic and eukaryotic cells	Microscope Lab Comparing Cells; Cell Types Venn Diagram; Organelle Structure & Function Charts; Cell and Cell Membrane Models
		3. Cell Transport	3	7	<input type="checkbox"/> 3210.1.7 Design and conduct an experiment to investigate the effect of various solute concentrations on water movement in cells.	1.7 Predict the movement of water and other molecules across selectively permeable membranes	Osmosis Lab (such as those using eggs, dialysis tubing, potato cubes)
					<input type="checkbox"/> 3210.1.8 Analyze experimental data to distinguish between active and passive transport.	1.8 Compare and contrast active and passive transport	Venn Diagram or Foldable Comparing Transport Processes; Animated Biology Clips
		4. Organic Molecules	2, 8.2	6,12	<input type="checkbox"/> 3210.1.4 Conduct tests to detect the presence of proteins, carbohydrates, and lipids.	1.4 Identify positive tests for carbohydrates, lipids, and proteins.	Biomolecules Lab
					<input type="checkbox"/> 3210.1.3 Design a graphic organizer that compares proteins, carbohydrates, lipids, and nucleic acids.	1.3 Distinguish among proteins, carbohydrates, lipids, and nucleic acids. 4.1 Identify the structure and function of DNA	Flow Chart for Identifying Structural Formulas of Biomolecules; Biomolecules Building Activity (use cut-outs or marshmallows & toothpicks)
...enzymes	2	6	<input type="checkbox"/> 3210.1.5 Design a model that illustrates enzyme function.	1.5 Identify how enzymes control chemical reactions in the body.	"Toothpickase" Demo or Simple Catalase/H ₂ O ₂ Lab		
3 Days <i>Unit Assessment / 5-Week Benchmark</i>							
	3- Flow of Energy	5. Photosynthesis	4	5	<input type="checkbox"/> 3210.3.3 Conduct experiments to investigate photosynthesis and cellular respiration.	3.3 Compare and contrast photosynthesis and cellular respiration in terms of energy transformation	BTB Photosynthesis Lab

2-3 Weeks	Standard 3- Matter an	6. Cellular Respiration	4	8	□ 3210.3.2 Construct a concept map to differentiate between aerobic and anaerobic respiration.	3.2 Distinguish between aerobic and anaerobic respiration	Lactic Acid Fermentation in Muscles Lab or Rootbeer Fermentation (i.e. Sucrose Fermentation) Lab
		7. Mitosis and Cell Cycle	5	9	□ 3210.1.6 Demonstrate the movement of chromosomes during mitosis in plant and animal cells.	1.6 Determine the relationship between cell growth and cell reproduction	Mitosis Cards Counts
	8. Meiosis and Crossing Over	6	9,10	□ 3210.4.4 Describe how the process of meiosis controls the number of chromosomes in a gamete.	4.6 Describe how meiosis is involved in the production of egg and sperm cells 4.7 Describe how meiosis and sexual reproduction contribute to genetic variation in a population	Meiosis Lab (use linked pop-beads, yarn, chromosome cut-outs, or Sodaria cards to demonstrate crossing over)	

3 Days *Mid-term Assessment / 9 Week Benchmark*

3-4 Weeks	Standard 4- Heredity	9. DNA ...Structure and Function	8	12	□ 3210.4.1 Use models of DNA, RNA, and amino acids to explain replication and protein synthesis.	4.1 Identify the structure and function of DNA	DNA Helix Models
		10. Mendelian Genetics and Genetic Crosses/Punnett Square Analysis	6,7	10,11	□ 3210.4.2 Complete and interpret genetic problems that illustrate sex linkage, co-dominance, incomplete dominance, multiple alleles, and polygenic inheritance.	4.4 Determine the probability of a particular trait in an offspring based on the genotype of the parents and the particular mode of inheritance.	Punnett Squares Activities; Genetic Corn Lab
		...sex-linked traits	6, 7	11	□ 3210.4.2 Complete and interpret genetic problems that illustrate sex linkage, co-dominance, incomplete dominance, multiple alleles, and polygenic inheritance.		Punnett Squares Activities
		...pedigree analysis	6, 7	11	□ 3210.4.3 Apply data to complete and interpret a genetic pedigree.	4.5 Apply pedigree data to interpret various modes of genetic inheritance.	Pedigree Analysis Activities
		11. Molecular Genetics: DNA Replication, Transcription, Translation	8	12	□ 3210.4.1 Use models of DNA, RNA, and amino acids to explain replication and protein synthesis.		Replication, Transcription, Translation Foldable; Protein Synthesis Activities (Create Dynamic Models/Graphic Organizers using cut-outs of enzymes, DNA and RNA Nucleotides, and Amino Acids; Animated Biology Clips
		...DNA Replication	3,8	7,12		4.2 Associate the process of DNA replication with its biological significance.	
		...Transcription & Translation	3,8	7,12		4.3 Recognize the interactions between DNA and RNA during protein synthesis	
		...mutations	8	12	□ 3210.4.5 Associate gene mutation with changes in a DNA molecule. □ 3210.4.6 Design an informational brochure to describe a human genetic disorder.	4.8 Determine the relationship between mutations and human genetic disorders.	Illustrations of Various Mutations at the Genomic, Chromosomal, and Post-Genomic Level; Human Genetic Disorder Powerpoint, Brochure, or Research Paper

		...ethics / research / tech.	9	13	<input type="checkbox"/> 3210.4.7 Conduct research to explore the scientific and ethical issues associated with emerging gene technologies.	4.9 Evaluate the scientific and ethical issues associated with gene technologies: genetic engineering, cloning, transgenic organism production, stem cell research, and DNA fingerprinting.	Pro and Con Listing, Class Debate, Critique of Articles Presenting Various Gene Technologies
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3 Days **Unit Assessment / 13.5 Week Benchmark** (NOTE: You may need to begin covering item 11 below prior to this benchmark.)

1 Weeks	Standard 2- Interdependence	11. Ecology and Diversity (Working on Embedded Bell-ringers Throughout School Year)					
		...Producers, Consumers, and Decomposers	13	2,3	<input type="checkbox"/> 3210.2.2 Construct and maintain a model of an ecosystem. <input type="checkbox"/> 3210.2.3 Monitor and evaluate changes in a yeast population.		Yeast Population Lab
		...Food Chain and Food Web	13	2	<input type="checkbox"/> 3210.2.4 Investigate an outdoor habitat to identify the abiotic and biotic factors, plant and animal populations, producers, consumers, and decomposers.		Create Food Webs and Assess the Effects of Species Extinction within the Web; Predator & Prey Interactions Lab
		...energy pyramids	13	2	<input type="checkbox"/> 3210.3.1 Track energy flow through an ecosystem.	3.1 Interpret a diagram that illustrates energy flow in an ecosystem 2.1 Predict how population changes or organisms at different trophic levels affect an ecosystem	Energy Pyramid Construction Activity (including trophic levels, 1% and fraction of biomass, and examples)
		...Populations and Carrying Capacity	14	4	<input type="checkbox"/> 3210.2.1 Analyze human population distribution graphs to predict the impact on global resources, society, and the economy.	2.2 Interpret the relationship between environmental factors and fluctuations in population size 2.3 Determine how the carrying capacity of an ecosystem is affected by interactions among organisms	Graphing and Analyzing of Kaibab Deer Population
		...interactions and human impact	16	2,5	<input type="checkbox"/> 3210.2.5 Conduct research on how human influences have changed an ecosystem and communicate findings through written or oral presentations.	2.4 Predict how various types of human activities affect the environment	Present Research on Human Influence on an UNESCO Ecosystem; A Grave Mistake Activity; Analysis of Sample Scenarios and Class Discussions
						2.5 Make inferences about how a specific change can affect the amount of biodiversity	
						2.6 Predict how a specific environmental change may lead to the extinction of a particular species.	
...succession	14	2,5	<input type="checkbox"/> 3210.2.6 Describe a sequence of events that illustrates biological succession.	2.7 Analyze factors responsible for the changes associated with biological succession.	Chart Comparing Types of Succession (including factors that cause each and examples)		
...cycles	13	2,8	<input type="checkbox"/> 3210.3.5 Construct models of the carbon, oxygen, nitrogen, phosphorous, and water cycles.	3.4 Predict how changes in a biogeochemical cycle can affect an ecosystem.	<i>Embedded Bell-ringers Throughout School Year</i>		

1 week	Standard 5- Biodiversity and Change	12. Modern Classification	17	17		5.6 Infer the relatedness among different organisms using modern classification systems	Create "Shoe" Key for Class; Dichotomous Key for Samples of Local Plants; Activity Analyzing Different Types of Phylogenetic Trees; Analysis of Similar DNA and Amino Acid Sequences Anatomical Evidence of Evolution Lab (Identify and Compare Illustrations of Analogous, Homologous, and Vestigial Structures; Compare their Functions and Evolutionary Relatedness) <i>Laura Fowler is creating one for here.</i> Modeling a Gene Pool, 15 Bean Soup
		...Dichotomous Key, Phylogenetics, and Cladistics	17	17	<input type="checkbox"/> 3210.5.5 Use a dichotomous key to identify an unknown organism. <input type="checkbox"/> 3210.5.4 Analyze a variety of models, samples, or diagrams to demonstrate the genetic relatedness of organisms. 3210.5.1 Create graphic organizers to demonstrate the relationship between form and function in representative organisms.	5.5 Apply evidence from the fossil record, comparative anatomy, amino acid sequences, and DNA structure that support modern classification systems. 5.1 Compare and Contrast the structural, functional, and behavioral adaptations of animals or plants found in different environments.	
		13. Evolution by Natural Selection	10,11,12	14,15 (refer to 21, 22, & 24 for examples)	<input type="checkbox"/> 3210.5.2 Explain how natural selection operates in the development of a new species.	5.2 Recognize the relationship between form and function in living things.	
					<input type="checkbox"/> 3210.5.3 Associate fossil data with biological and geological changes in the environment.	5.3 Recognize the relationships among environmental change, genetic variation, natural selection, and the emergence of a new species	
						5.4 Describe the relationship between the amount of biodiversity and the ability of a population to adapt to a changing environment	
1 week	EOC REVIEW WEEK						EOC Review Packets
3 Days	Final Assessment / EOC						
Notes:	Total Time Included in Pacing Guide Above: 14-15 Weeks; Reserve additional time for EOC Review.						
	4.5-Week, 9-Week, and 13.5-Week Benchmarks should be given without review.						
	Currently working on embedding/incorporating Ecology concepts and materials early on and throughout semester (such as bell-ringers, take-home assignments, fall/spring packet). Also, considering creation of a country-wide, weekly cumulative assessments and county-wide lab and instructional materials notebook.						