

Oak Ridge High School Biology Common Pacing Guide

	Week	Topic	Standard #	Standard	Activities
T e r m : C e l l s a n d B i o c h e m i s t r y	1	Scientific Method/Lab Safety/Graphing Intro to Biology	BIO1.LS1-1	1) Compare and contrast existing models, identify patterns, and use structural and functional evidence to analyze the characteristics of life. Engage in argument about the designation of viruses as non-living based on these characteristics.	Label Microscope Microscope Intro Lab Graphing Lab Data Nuggets
	2-4	Biochemistry Intro to Biology Enzymes	BIO1.LS1-2 BIO1.LS1-5	2) Evaluate comparative models of various cell types with a focus on organic molecules that make up cellular structures. 5) Research examples that demonstrate the functional variety of proteins and construct an argument based on evidence for the importance of the molecular structure to its function. Plan and carry out a controlled investigation to test predictions about factors, which should cause an effect on the structure and function of a protein.	Testing for biomolecules Enzyme Lab Biomolecule Card Sort
	5-7	Cells Cell Theory Prokaryotes/Eukaryotes Organelles Plant vs Animal	BIO1.LS1-2	2) Evaluate comparative models of various cell types with a focus on organic molecules that make up cellular structures.	Prok vs Euk Venn Diagrams Organelle Flashcards Cell Stories Cell Models Observing Cells Microscope Lab
	8-9	Membrane & Transport	BIO1.LS1-7	7) Utilize a model of a cell plasma membrane to compare the various types of cellular transport and test predictions about the movement of molecules into or out of a cell based on the homeostasis of energy and matter in cells.	Transport Dance Gummy Bear Lab Membrane Models Osmosis is Serious Business

1	Cell Cycle	BIO1.LS1-6	6) Create a model for the major	Mitosis Posters
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T e r m 2 : G e n e t i c s		(Mitosis)		events of the eukaryotic cell cycle, including mitosis. Compare and contrast the rates of cell division in various eukaryotic cell types in multicellular organisms.	Chromosome Modeling Mitosis Slide Lab
	2-4	DNA & Protein Synthesis	BIO1.LS1-3 BIO1.LS1-4 BIO1.LS3-2	3) Integrate evidence to develop a structural model of a DNA molecule. Using the model, develop and communicate an explanation for how DNA serves as a template for self-replication and encodes biological information. 4) Demonstrate how DNA sequence information is decoded through transcriptional and translational processes within the cell in order to synthesize proteins. Examine the relationship of structure and function of various types of RNA and the importance of this relationship in these processes. 2) Explain how protein formation results in phenotypic variation and discuss how changes in DNA can lead to somatic or germ line mutations.	Protein Synthesis Modeling Snork Protein Synthesis Protein Wall of Fame DNA Model DNA Hands DNA Extraction Lab
	5	Meiosis	BIO1.LS3-1	1) Model chromosome progression through meiosis and fertilization in order to argue how the processes of sexual reproduction lead to both genetic similarities and variation in diploid organisms. Compare and contrast the processes of sexual and asexual reproduction, identifying the advantages and disadvantages of each.	Meiosis chromosome modeling
	6-8	Mendelian, Non-Mendelian Inheritance, Punnett Squares, Pedigrees	BIO1.LS3-3	3) Through pedigree analysis, identify patterns of trait inheritance to predict family member genotypes. Use mathematical thinking to predict the likelihood of various types of trait transmission.	Punnett Square WS Write your own problems Make a Baby Lab Bikini Bottom WS
	9	Karyotypes, Genetic Engineering	BIO1.ETS2-3 BIO1.ETS2-1 BIO1.ETS2-2	1) Obtain, evaluate, and communicate information on how molecular biotechnology may be used in a variety of fields. 2) Investigate the means by which karyotypes are utilized in diagnostic medicine. 3) Analyze scientific and ethical	Designer Babies Discussion Who Ate the Cheese Simulation Biotech brochures

				arguments to support the pros and cons of application of a specific biotechnology technique such as stem cell usage, in vitro fertilization, or genetically modified organisms.	
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	1	Darwin & Natural Selection (Including selection on polygenic traits)	BIO1.LS4-2	2) Using a model that demonstrates the change in allele frequencies resulting in evolution of a population over many generations, identify causative agents of change.	Cricket Song Cartoon Speciation Lab
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T e r m 3 : E v o l u t i o n a n d E n e r g y		and speciation)			
	2-3	Mechanisms, Evidences, Uses of Evolution	BIO1.LS4-1	1) Evaluate scientific data collected from analysis of molecular sequences, fossil records, biogeography, and embryology. Identify chronological patterns of change and communicate that biological evolution is supported by multiple lines of empirical evidence that identify similarities inherited from a common ancestor (homologies).	Dialogue Resistance Graphs
	4-5	Phylogenetic Trees	BIO1.LS4-1	1) Evaluate scientific data collected from analysis of molecular sequences, fossil records, biogeography, and embryology. Identify chronological patterns of change and communicate that biological evolution is supported by multiple lines of empirical evidence that identify similarities inherited from a common ancestor (homologies).	Pipcleaner phylogeny
	6-7	Photosynthesis Cellular Respiration	BIO1.LS1-8 BIO1.LS1-9	8) Create a model of photosynthesis demonstrating the net flow of matter and energy into a cell. Use the model to explain energy transfer from light energy into stored chemical energy in the product. 9) Create a model of aerobic respiration demonstrating flow of matter and energy out of a cell. Use the model to explain energy transfer mechanisms. Compare aerobic respiration to alternative processes of glucose metabolism.	BTB Lab Leaf disk lab Transpiration Lab Cricket Respiration Lab
	8	Cycles	BIO1.LS2-3 BIO1.LS1-2	2) Create a model tracking carbon atoms between inorganic and organic molecules in an ecosystem. Explain human impacts on climate based on this model. 3) Analyze through research the cycling of matter in our	Be a Carbon Atom Be a Nitrogen Atom

T r a n s f o r m a t i o n				biosphere and explain how biogeochemical cycles are critical for ecosystem function.	
	9	Interactions	BIO1.LS2-1 BIO1.LS2-4 BIO1.LS2-5	1) Analyze mathematical and/or computational representations of population data that support explanations of factors that affect population size and carrying capacities of populations within an ecosystem. Examine a representative ecosystem and, based on interdependent relationships present, predict population size effects due to a given disturbance. 4) Analyze data demonstrating the decrease in biomass observed in each successive trophic level. Construct an explanation considering the laws of conservation of energy and matter and represent this phenomenon in a mathematical model to describe the transfer of energy and matter between trophic levels. 5) Analyze examples of ecological succession, identifying and explaining the order of events responsible for the formation of a new ecosystem in response to extreme fluctuations in environmental conditions or catastrophic events.	Trophic Pyramid Cut Out Data Nugget Population Examples Pred/Prey Simulation

T e r m	1	Interactions	BIO1.LS2-1 BIO1.LS2-4 BIO1.LS2-5	1) Analyze mathematical and/or computational representations of population data that support explanations of factors that affect	Trophic Pyramid Cut Out Data Nugget Population Examples Pred/Prey Simulation
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4 : E c o l o g y , E O C R e v i e w				<p>population size and carrying capacities of populations within an ecosystem. Examine a representative ecosystem and, based on interdependent relationships present, predict population size effects due to a given disturbance.</p> <p>4) Analyze data demonstrating the decrease in biomass observed in each successive trophic level. Construct an explanation considering the laws of conservation of energy and matter and represent this phenomenon in a mathematical model to describe the transfer of energy and matter between trophic levels.</p> <p>5) Analyze examples of ecological succession, identifying and explaining the order of events responsible for the formation of a new ecosystem in response to extreme fluctuations in environmental conditions or catastrophic events.</p>	
	2	Biodiversity	BIO1.LS4-3	3) Identify ecosystem services and assess the role of biodiversity in support of these services. Analyze the role human activities have on disruption of these services.	Data Nugget Case Studies Forest Cost Analysis
	3-4	EOC Review	All Standards	All Standards	Review Games Reflect on learning in biology through writing
	5	EOC Testing			
	6-8	Body Systems/Dissections	BIO1.LS4-3	3) Identify ecosystem services and assess the role of biodiversity in support of these services. Analyze the role human activities have on disruption of these services.	Pig Dissection Body System Posters Body System Interaction Card Sort Body System Interaction Lab Rotation
	9	Review & 9 weeks exam	All Standards	All Standards	Reflect on learning in biology through writing (i.e. write a letter to next year students on how to do well in class)

