



Biology I Pacing Guide 2017-18

1st Nine Weeks (August 7th - October 6th, 2017)			
Unit	Objective	Mississippi Biology I Framework Objectives	Tentative teaching Date(s)
Scientific Inquiry	1a	Conduct a scientific investigation demonstrating safe procedures and proper care of laboratory equipment. <ul style="list-style-type: none"> ● safety rules and symbols ● proper care of lab equipment ● proper use and care of the compound microscope ● accuracy and precision in using graduated cylinders, balances, beakers, thermometers, and rulers 	
Scientific Inquiry	1b	Formulate questions that can be answered through research and experimental design.	
Scientific Inquiry	1c	Apply the components of scientific processes and methods in classroom and laboratory investigations <ul style="list-style-type: none"> ● hypotheses ● experimental design (dependent and independent variables, control and experimental groups, constants) ● observations, data analysis ● interpretation, theory development 	
Scientific Inquiry	1d	Construct and analyze graphs <ul style="list-style-type: none"> ● plotting points, labeling graphs appropriately ● circle, bar, and line graphs 	
Scientific Inquiry	1e	Analyze procedures, data, and conclusions to determine the scientific validity of research <ul style="list-style-type: none"> ● experimenter bias ● placebo ● controlled experiments 	
Scientific Inquiry	1f	Recognize and analyze alternative explanations for experimental results and to make predictions based on observations and prior knowledge	
Scientific Inquiry	1g	Communicate and defend a scientific argument in oral, written and graphic form	



Biology I Pacing Guide 2017-18

Physical Science	2a	<p>Explain and compare the use of examples and the types of bond formation (covalent, ionic, hydrogen) between or among atoms</p> <ul style="list-style-type: none"> ● subatomic particles and arrangement in atoms ● importance of ions in biological processes 	
Physical Science	2b	<p>Develop a logical argument defending water as an essential component of living systems</p> <ul style="list-style-type: none"> ● unique bonding ● polarity ● high specific heat ● surface tension ● hydrogen bonding ● adhesion and cohesion ● expansion upon freezing 	
Physical Science	2c	<p>Classify solutions as acidic, basic, or neutral and relate the significance of the pH scale to an organism's survival (consequences of having different concentrations of hydrogen and hydroxide ions)</p>	
Physical Science	2d	<p>Compare and contrast the structure, properties, and principle functions of carbohydrates, lipids, proteins, and nucleic acids in living organisms.</p> <ul style="list-style-type: none"> ● Basic chemical composition of each group ● Building components of each group (amino acids, monosaccharides, nucleic acids, etc.) ● Basic functions of each group (energy, storage, cellular, heredity) 	
Physical Science	2e	<p>Examine the life processes to conclude the role enzymes play in regulating biochemical reactions</p> <ul style="list-style-type: none"> ● enzyme structure ● enzyme function, including enzyme-substrate specificity and factors that affect enzyme function (pH and temperature) 	
Biological Organization	4a	<p>Differentiate between prokaryotic and eukaryotic cells</p> <ul style="list-style-type: none"> ● Differences in structure and size ● Differences in organisms <p><i>*Prokaryotic structure will be discussed in more detail when bacteria are studied</i></p>	
Comprehensive 1 st 9 Weeks Assessment			



Biology I Pacing Guide 2017-18

2nd Nine Weeks

(October 11th - December 20th, 2017)

Thanksgiving Holiday Break: November 20-24, 2017

Christmas Break: December 21, 2017- January 3, 2018

Unit	Objective	Mississippi Biology I Framework Objectives	Tentative teaching Date(s)
Physical Science	2f	Describe the role of adenosine triphosphate (ATP) in making energy available to cells. <ul style="list-style-type: none"> ● ATP structure ● ATP function 	
Physical Science	2g	Analyze and explain the biochemical process of photosynthesis and cellular respiration and draw conclusions about the roles of the reactants and products in each. <ul style="list-style-type: none"> ● photosynthesis and respiration (products and reactants) ● light-dependent reactions and light independent reactions in photosynthesis ● aerobic and anaerobic processes in cellular respiration 	
Biological Organization	4b	Differentiate between types of cellular reproduction <ul style="list-style-type: none"> ● main events in the cell cycle and cell mitosis ● binary fission ● significance of meiosis in sexual reproduction 	
Genetics and Heredity	5b	Utilize Mendel's laws to evaluate the results of monohybrid Punnett squares involving complete dominance, codominance, sex linked, and multiple alleles	
Genetics and Heredity	5a	Analyze and explain the molecular basis of heredity and the inheritance of traits to successive generations by using the Central Dogma of molecular Biology. <ul style="list-style-type: none"> ● structures of DNA and RNA ● processes of replication, transcription, and translation ● messenger RNA codon charts 	



Biology I Pacing Guide 2017-18

Genetics and Heredity	5c	Examine inheritance patterns using current technology (pedigrees, karyotypes, gel electrophoresis)	
Genetics and Heredity	5d	<p>Discuss the characteristics and implications of both chromosomal and gene mutations</p> <ul style="list-style-type: none"> ● significance of nondisjunction, deletion, substitutions, translocation and frame shift mutation in animals ● occurrence and significance of genetic disorders such as sickle cell anemia, Tay Sachs disorder, cystic fibrosis, hemophilia, Downs Syndrome, color blindness 	
Comprehensive 2nd 9 Weeks Assessment			



Biology I Pacing Guide 2017-18

3rd Nine Weeks (January 8, 2018 - March 9, 2018)			
Dr. MLK Holiday: January 15			
President's Day Holiday: February 19			
Unit	Objective	Mississippi Biology I Framework Objectives	Tentative teaching Date(s)
Evolution	6b	Critique data (comparative anatomy, biogeography, molecular biology, fossil record, etc.) used by scientists (Redi, Needham, Spallanzani, Pasteur) to develop an understanding of evolutionary processes and patterns	
Evolution	6c	Research and summarize the contributions of scientists (Darwin, Malthus, Lamarck, and Lyell) whose work led to the development of the theory of evolution	
Evolution	6d	Analyze and explain the roles of natural selection including the mechanisms of speciation (pesticide and antibiotic resistance)	
Evolution	6e	Differentiate among chemical evolution, organic evolution, and the evolutionary steps along the way to aerobic heterotrophs and photosynthetic autotrophs	
Biological Organization	4c	Describe and differentiate among organizational levels of organisms (cells, tissues, organs, systems, types of tissues)	
Evolution	6a	Draw conclusions about how organisms are classified in a hierarchy of groups and subgroups based on similarities that reflect the evolutionary relationships <ul style="list-style-type: none"> ● characteristics of the six kingdoms ● major levels of hierarchy of taxa (kingdom, phylum/division, class, order, family, genus, and species) ● body plans ● methods of sexual reproduction (conjugation, fertilization, pollination) 	



Biology I Pacing Guide 2017-18

		<ul style="list-style-type: none"> • methods of asexual reproduction (budding, binary fission, regeneration, spore formation) 	
Biological Organization	4d	Explain and describe how plant structures (vascular and nonvascular) and cellular functions are related to the survival of plants (movement of materials, plant reproduction)	
Ecology	3a	Compare and contrast the characteristics of the world's major biomes (deserts, tundra, taiga, grassland, temperate forest, tropical rainforest) <ul style="list-style-type: none"> • plant and animal species • climate • adaptations of organisms 	
Ecology	3b	Provide examples to justify the interdependence among environmental elements <ul style="list-style-type: none"> • biotic and abiotic factors in an ecosystem (water, carbon, oxygen, mold, leaves) • energy flow in ecosystems (energy pyramids, and photosynthetic organisms to herbivores, carnivores, and decomposers) • roles of beneficial bacteria • interrelationships of organisms (cooperation, predation, parasitism, commensalism, symbiosis, and mutualism) 	
Ecology	3c	Examine and evaluate the significance of natural events and human activities on major ecosystems (succession, population growth, technology, loss of genetic diversity, consumption of resources).	
Comprehensive 3rd 9 Weeks Assessment			