



Alignment Document
State of Mississippi and Aventa Learning Life Science

Life Science
2005-2007 Benchmark Blueprint

Standards	Benchmarks	Unit Name	Course Topic Description
BI.1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.	BI.1.a Demonstrate the proper use and care for scientific equipment used in biology.	Life Life	Exploring Life The Structure of Viruses and Cells
	BI.1.b Observe and practice safe procedures in the classroom and laboratory.	Life Life	Exploring Life The Structure of Viruses and Cells
	BI.1.c Apply the components of scientific processes and methods in the classroom and laboratory investigations.	Life	Exploring Life
	BI.1.d Communicate results of scientific investigations in oral, written, and graphic form.	Life	Exploring Life
BI.2 Investigate the biochemical basis of life.	BI.2.a Identify the characteristics of living things.	Life	Exploring Life
	BI.2.b Describe and differentiate between covalent and ionic bonds using examples of each.		
	BI.2.c Describe the unique bonding and characteristics of water that makes it an essential component of living systems.		
	BI.2.d Classify solutions using the pH scale and relate the importance of pH to organism survival.	Life	Cell Processes
	BI.2.e Compare the structure, properties and functions of carbohydrates, lipids, proteins and nucleic acids in living organisms.	The Human Body	Nutrients and Digestion
	BI.2.f Explain how enzymes work and identify factors that can affect enzyme action.	Life	Cell Processes
BI.3 Investigate cell structures, functions, and methods of reproduction.	BI.3.a Differentiate between prokaryotic and eukaryotic cells.	Life	The Structure of Viruses and Cells
		Diversity of Life	Classifying Living Things

	BI.3.b Distinguish between plant and animal (eukaryotic) cell structures.	Life Diversity of Life	The Structure of Viruses and Cells Classifying Living Things
	BI.3.c Identify and describe the structure and basic functions of the major eukaryotic organelles.	Life Life	The Structure of Viruses and Cells Cell Processes
	BI.3.d Describe the way in which cells are organized in multicellular organisms.	The Human Body	Bones, Muscles, and Skin
		The Human Body	Nutrients and Digestion
		The Human Body	The Circulatory System
		The Human Body	Respiration and Excretion
		The Human Body	The Nervous and Endocrine Systems
		The Human Body	Reproduction and Growth
	BI.3.e Relate cell membrane structure to its function in passive and active transport.	Life Life	The Structure of Viruses and Cells Cell Processes
	BI.3.f Describe the main events in the cell cycle and cell mitosis including differences in plant and animal cell divisions.	Life	Cell Reproduction
BI.3.g Relate the importance of meiosis to sexual reproduction and the maintenance of chromosome number.	Life	Cell Reproduction	
BI.3.h Identify and distinguish among forms of asexual and sexual reproduction.	Life	Cell Reproduction	
BI.4 Investigate the transfer of energy from the sun to living systems.	BI.4.a Describe the structure of ATP and its importance in life processes.	Life	Cell Processes
	BI.4.b Examine, compare, and contrast the basic processes of photosynthesis and cellular respiration.	Life Plants	Cell Processes Plant Processes

	BI.4.c Compare and contrast aerobic and anaerobic respiration.	Life	Cell Processes
BI.5 Investigate the principles, mechanisms, and methodology of classical and molecular genetics.	BI.5.a Compare and contrast the molecular structures of DNA and RNA as they relate to replication, transcription, and translation.	Life	Cell Reproduction
	BI.5.b Identify and illustrate how changes in DNA cause mutations and evaluate the significance of these changes.	Life Heredity and Evolution	Cell Reproduction Heredity
	BI.5.c Analyze the applications of DNA technology (forensics, medicine, agriculture).	Life Heredity and Evolution	Cell Reproduction Heredity
	BI.5.d Discuss the significant contributions of well-known scientists to the historical progression of classical and molecular genetics.	Life Heredity and Evolution	Cell Reproduction Heredity
	BI.5.e Apply genetic principles to solve simple inheritance problems including monohybrid crosses, sex linkage, multiple alleles, incomplete dominance, and codominance.	Heredity and Evolution	Heredity
	BI.5.f Examine inheritance patterns using current technology (gel electrophoresis, pedigrees, karyotypes).	Heredity and Evolution	Heredity
	BI.6 Investigate concepts of natural selection as they relate to diversity of life.	BI.6.a Analyze how organisms are classified into a hierarchy of groups and subgroups based on similarities and differences.	Diversity of Life
BI.6.b Identify characteristics of kingdoms including monerans, protists, fungi, plants and animals.		Diversity of Life	Bacteria
		Diversity of Life	Protists and Fungi
	Plants	Introduction to Plants	
	Plants	The Seed Plants	
	Animals	Introduction to Animals	
Animals	Mollusks, Worms, Arthropods, and Echinoderms		

		Animals	Fish, Amphibians, and Reptiles
		Animals	Birds and Mammals
	BI.6.c Differentiate among major divisions of the plant and animal kingdoms (vascular/non-vascular; vertebrate/invertebrate).	Plants	Introduction to Plants
		Plants	The Seed Plants
		Animals	Introduction to Animals
		Animals	Mollusks, Worms, Arthropods, and Echinoderms
		Animals	Fish, Amphibians, and Reptiles
		Animals	Birds and Mammals
	BI.6.d Compare the structures and functions of viruses and bacteria relating their impact on other living organisms.	Life	The Structure of Viruses and Cells
		Diversity of Life	Bacteria
	BI.6.e Identify evidence of change in species using fossils, DNA sequences, anatomical and physiological similarities, and embryology.	Heredity and Evolution	Evolution
	BI.6.f Analyze the results of natural selection in speciation, diversity, adaptation, behavior and extinction.	Heredity and Evolution	Evolution
BI.7 Investigate the interdependence and interactions that occur within an ecosystem.	BI.7.a Analyze the flow of energy and matter through various cycles including carbon, oxygen, nitrogen and water cycles.	Ecology	Life and the Environment
	BI.7.b Interpret interactions among organisms in an ecosystem (producer/consumer/decomposer, predator/prey, symbiotic relationships and competitive relationships).	Ecology	Life and the Environment
	BI.7.c Compare variations, tolerances, and adaptations of plants and animals in major biomes.	Ecology	Ecosystems
	BI.7.d Investigate and explain the transfer of energy in an ecosystem including food chains, food webs, and food pyramids.	Ecology	Life and the Environment



	BI.7.e Examine long and short-term changes to the environment as a result of natural events and human actions.	Ecology Ecology Ecology	Life and the Environment Ecosystems Resources and the Environment
--	---	-------------------------------	---