



Alignment Document
State of Kansas and Aventa Learning Life Science

Life Science
2005-2007 Benchmark Blueprint

Standards	Topics	Benchmarks	Unit Name	Course Topic Description
1 The student will develop the abilities necessary to do scientific inquiry and develop an understanding of scientific inquiry.	1.1 The student will demonstrate the abilities necessary to do scientific inquiry.	1.1.1 actively engages in asking and evaluating research questions.	Life	Exploring Life
		1.1.2 actively engages in investigations, including developing questions, gathering and analyzing data, and designing and conducting research	Life	Exploring Life
		1.1.3 actively engages in using technological tools and mathematics in their own scientific investigations.	Life	Exploring Life
		1.1.4 actively engages in conducting an inquiry, formulating and revising his or her scientific explanations and models (physical, conceptual, or mathematical) using logic and evidence, and recognizing that potential alternative explanations and models should be considered.	Life	Exploring Life
		1.1.5 actively engages in communicating and defending the design, results, and conclusion of his/her investigation.	Life	Exploring Life
3 The student will develop an understanding of the cell, molecular basis of heredity, biological evolution, interdependence of organisms, matter, energy,	3.1 The student will demonstrate an understanding of the structure and function of the cell.	3.1.1 understands cells are composed of a variety of specialized structures that carry out specific functions.	Life	Cell Processes
		3.1.2 understands cell functions involve specific chemical reactions.	Life	Cell Processes
		3.1.3 understands cells function and replicate	Life	Cell Reproduction

and organization in living systems, and the behavior of organisms.		as a result of information stored in DNA and RNA molecules.		
		3.1.4 understands some plant cells contain chloroplasts, which are the sites of photosynthesis.	Life Plants	Cell Processes Plant Processes
		3.1.5 understands cells can differentiate, thereby enabling complex multicellular organisms to form.	The Human Body	Reproduction and Growth
	3.2 The student will demonstrate an understanding of chromosomes, genes, and the molecular basis of heredity.	3.2.1 understands living organisms contain DNA or RNA as their genetic material, which provides the instructions that specify the characteristics of organisms.	Life Heredity and Evolution	Cell Reproduction Heredity
		3.2.2 understands organisms usually have a characteristic number of chromosomes; one pair of these may determine the sex of individuals.	Heredity and Evolution	Heredity
		3.2.3 understands hereditary information is contained in genes, located in the chromosomes of each cell.	Heredity and Evolution	Heredity
		3.2.4 understands gametes carry the genetic information to the next generation.	The Human Body	Reproduction and Growth
		3.2.5 understands expressed mutations occur in DNA at very low rates.	Heredity and Evolution Heredity and Evolution	Heredity Evolution
	3.3 The student will understand biological evolution.	3.3.1 understands biological evolution, descent with modification, is a scientific explanation for the history of the diversification of organisms from common ancestors	Heredity and Evolution	Evolution
		3.3.2 understands populations of organisms adapt to environmental challenges and changes as a result of natural selection, genetic drift, and various mechanisms of genetic change.	Heredity and Evolution	Evolution

		3.3.3 understands biological evolution is used to explain the earth's present day biodiversity: the number, variety and variability of organisms.	Heredity and Evolution	Evolution	
		3.3.4 understands organisms vary widely within and between populations. Variation allows for natural selection to occur.	Heredity and Evolution	Evolution	
		3.3.5 understands the primary mechanism acting on variation is natural selection.	Heredity and Evolution	Evolution	
		3.3.6 understands biological evolution is used as a broad, unifying theoretical framework for biology.	Heredity and Evolution	Evolution	
	3.4 The student will understand the interdependence of organisms and their interaction with the physical environment.	3.4.1 understands atoms and molecules on the earth cycle among the living and nonliving components of the biosphere.	Ecology	Life and the Environment	
		3.4.2 understands energy is received, transformed and expended in ecosystems.	Ecology	Life and the Environment	
		3.4.3 understands the distribution and abundance of organisms and populations in ecosystems are limited by the carrying capacity.	Ecology	Life and the Environment	
		3.4.4 understands organisms cooperate and compete in complex, interdependent relationships	Ecology	Life and the Environment	
		3.4.5 understands human beings live within and impact ecosystems.	Ecology	Life and the Environment	
			Ecology	Ecosystems	
	3.5 The student will develop an understanding of matter, energy, and organization in living systems.	3.5.1 understands living systems require a continuous input of energy to maintain their chemical and physical organization.	Ecology	Resources and the Environment	
			3.5.2 understands the sun is the primary source of energy for life through the process of photosynthesis.	Plants	Plant Processes
			3.5.3 understands food molecules contain	Life	Cell Processes

		biochemical energy, which is then available for cellular respiration.		
		3.5.4 understands the structure and function of an organism serve to acquire, transform, transport, release, and eliminate the matter and energy used to sustain the organism.	Life	The Structure of Viruses and Cells
			Life	Cell Processes
	3.6 The student will understand the behavior of animals.	3.6.1 understands animals have behavioral responses to internal changes and to external stimuli.	The Human Body	The Nervous and Endocrine Systems
		3.6.2 understands most multicellular animals have nervous systems that underlie behavior.	The Human Body	The Nervous and Endocrine Systems
		3.6.3 understands behaviors are often adaptive when viewed in terms of survival and reproductive success.	Heredity and Evolution	Evolution
	3.7 The student will demonstrate an understanding of the diversity of structure and function in organisms.	3.7.1 understands differences in structure and function among organisms and can identify the characteristics of relevant life forms.	The Diversity of Life	Classifying Living Things
		3.7.2 understands that homeostasis is the dynamic regulation and balance of an organisms internal environment to maintain conditions suitable for survival.	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
		3.7.3 understands that living things change following a specific pattern of developmental stages called life cycles.	The Human Body	Immunity
			Animals	Introduction to Animals
			Animals	Mollusks, Worms, Arthropods,

			Animals	and Echinoderms Fish, Amphibians, and Reptiles
			Animals	Birds and Mammals
		3.7.4 understands that in complex organisms there is a division of labor into specific body systems i.e., respiration, digestion, nervous, endocrine, excretion, circulatory, reproductive, immune, skeletal and muscle.	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
			The Human Body	Immunity
		3.7.5 understands taxonomy is the systematic way in which organism are placed into a hierarchical classification system, according to their physical and genetic characteristics and their evolutionary history.	The Diversity of Life	Classifying Living Things
5 The student will develop understandings about the relationship between science and technology.	5.1 The student will develop an understanding that technology is applied science.	5.1.1 understands technology is the application of scientific knowledge for functional purposes.	Life	The Structure of Viruses and Cells
			Life	Cell Processes
			Life	Cell Reproduction
			Heredity and Evolution	Heredity
			Diversity of Life	Protists and Fungi
			Plants	Introduction to Plants

			Plants	Plant Processes
			Animals	Introduction to Animals
			Animals	Fish, Amphibians, and Reptiles
			Ecology	Resources and the Environment
			The Human Body	Bones, Muscles, and Skin
			The Human Body	Nutrients and Digestion
			The Human Body	The Circulatory System
			The Human Body	Reproduction and Growth
		5.1.2 understands creativity, imagination, and a broad scientific knowledge base are required to produce useful results.	Life	The Structure of Viruses and Cells
			Life	Cell Processes
			Life	Cell Reproduction
			Heredity and Evolution	Heredity
			Diversity of Life	Protists and Fungi
			Plants	Introduction to Plants
			Plants	Plant Processes
			Animals	Introduction to Animals
			Animals	Fish, Amphibians, and Reptiles
			Ecology	Resources and the Environment



			The Human Body	Bones, Muscles, and Skin
			The Human Body	Nutrients and Digestion
			The Human Body	The Circulatory System
			The Human Body	Reproduction and Growth
		5.1.3 understands science advances new technologies. New technologies open new areas for scientific inquiry.	Life	The Structure of Viruses and Cells
			Life	Cell Processes
			Life	Cell Reproduction
			Heredity and Evolution	Heredity
			Diversity of Life	Protists and Fungi
			Plants	Introduction to Plants
			Plants	Plant Processes
			Animals	Introduction to Animals
			Animals	Fish, Amphibians, and Reptiles
			Ecology	Resources and the Environment
			The Human Body	Bones, Muscles, and Skin
			The Human Body	Nutrients and Digestion
			The Human Body	The Circulatory System
		The Human Body	Reproduction and Growth	

<p>7 The student will develop understanding of science as a human endeavor, the nature of scientific knowledge, and historical perspectives.</p>	<p>7.1 The student will develop an understanding that science is a human endeavor that uses models to describe and explain the physical universe.</p>	<p>7.1.1 demonstrates an understanding of science as both vocation and avocation.</p>	<p>Life Heredity and Evolution Diversity of Life Plants Plants Animals Animals Animals Ecology The Human Body The Human Body The Human Body</p>	<p>Cell Reproduction Heredity Protists and Fungi The Seed Plants Plant Processes Introduction to Animals Fish, Amphibians, and Reptiles Birds and Mammals Ecosystems Nutrients and Digestion The Nervous and Endocrine Systems Reproduction and Growth</p>
		<p>7.1.2 explains how science uses peer review, replication of methods, and norms of honesty.</p>		
		<p>7.1.3 recognizes the universality of basic science concepts and the influence of personal and cultural beliefs that embed science in society.</p>		
		<p>7.1.4 recognizes that society helps create the ways of thinking (mindsets) required for scientific advances, both toward training scientists and educating a populace to utilize benefits of science (e.g., standards of</p>		

		hygiene, attitudes toward forces of nature, etc.).		
		7.1.5 understands there are many issues which involve morals, ethics, values or spiritual beliefs that go beyond what science can explain, but for which solid scientific literacy is useful.		
		7.1.6 recognizes society's role in supporting topics of research and determining institutions where research is conducted.		
	7.2 The student will develop an understanding of the nature of scientific knowledge.	7.2.1 understands scientific knowledge describes and explains the physical world in terms of matter, energy, and forces. Scientific knowledge is provisional and is subject to change as new evidence becomes available.	Life	Exploring Life
		7.2.2 understands scientific knowledge begins with empirical observations, which are the data (also called facts or evidence) upon which further scientific knowledge is built.	Life	Exploring Life
		7.2.3 understands scientific knowledge consists of hypotheses, inferences, laws, and theories.	Life	Exploring Life
		7.2.4 understands a testable hypothesis or inference must be subject to confirmation by empirical evidence	Life	Exploring Life
		7.3 The student will understand science from historical perspectives.	7.3.1 demonstrates an understanding of the history of science.	Life
	Life			The Structure of Viruses and Cells
	Life			Cell Reproduction
	Heredity and Evolution			Heredity



			Heredity and Evolution	Evolution
		7.3.2 demonstrates a knowledge that scientific method historically proceeded from an inductive approach rather than a deductive approach.		