

Biology

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
MC	Molecules and Cells		
MC.1	Students shall demonstrate an understanding of the role of chemistry in life processes.	The Nature of Science and Biology	Section 2: Chemistry of Life
MC.1.B.1	Describe the structure and function of the major organic molecules found in living systems:	The Nature of Science and Biology	Section 2 Part 5 Carbon Compounds
MC.1.B.1.a	carbohydrates	The Nature of Science and Biology	Section 2 Part 5 Carbon Compounds
MC.1.B.1.b	proteins	The Nature of Science and Biology	Section 2 Part 5 Carbon Compounds
MC.1.B.1.c	enzymes	The Nature of Science and Biology Photosynthesis	Section 2 Part 5 Carbon Compounds Section 1 Part 2 Enzymes: Organic Catalysts
MC.1.B.1.d	lipids	The Nature of Science and Biology	Section 2 Part 5 Carbon Compounds
MC.1.B.1.e	nucleic acids	The Nature of Science and Biology Genetics	Section 2 Part 5 Carbon Compounds Section 4 Part 3 The Structure of DNA Section 5 Part 2 From Genes to Protein: RNA
MC.1.B.2	Describe the relationship between an enzyme and its substrate molecule(s)	Photosynthesis	Section 1 Part 2 Enzymes: Organic Catalysts

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MC.1.B.3	Investigate the properties and importance of water and its significance for life:	The Nature of Science and Biology	Section 2 Part 3 Water and Solutions: Water and Living Things
MC.1.B.3.a	surface tension		
MC.1.B.3.b	adhesion	The Nature of Science and Biology	Section 2 Part 3 Water and Solutions: Water and Living Things
MC.1.B.3.c	cohesion	The Nature of Science and Biology	Section 2 Part 3 Water and Solutions: Water and Living Things
MC.1.B.3.d	polarity	The Nature of Science and Biology	Section 2 Part 3 Water and Solutions: Water and Living Things
MC.1.B.3.e	pH	The Nature of Science and Biology	Section 2 Part 4 Acids and Bases
MC.1.B.4	Explain the role of energy in chemical reactions of living systems:	Photosynthesis	Introduction Photosynthesis and Cellular Respiration Introduction

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MC.1.B.4.a	activation energy	Photosynthesis	Section 1 Part 1
MC.1.B.4.b	exergonic reactions	Photosynthesis	Section 1 Part 1
MC.1.B.4.c	endergonic reactions	Photosynthesis	Section 1 Part 1
MC.2	Students shall demonstrate an understanding of the structure and function of cells.	Cell Structure	Section 1 Part 2 Cell Features: Common Features of Cells
MC.2.B.1	Construct a hierarchy of life from cells to ecosystems		
MC.2.B.2	Compare and contrast prokaryotes and eukaryotes	Cell Structure	Section 1 Part 2 Cell Features: Common Features of Cells
MC.2.B.3	Describe the role of sub-cellular structures in the life of a cell:	Cell Structure	Section 1 Part 2 Cell Features: Common Features of Cells
MC.2.B.3.a	organelles	Cell Structure	Section 1 Part 2 Cell Features: Common Features of Cells

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MC.2.B.3.b	ribosomes	Cell Structure	Section 1 Part 2 Cell Features: Common Features of Cells
MC.2.B.3.c	cytoskeleton	Cell Structure	Section 1 Part 2 Cell Features: Common Features of Cells
MC.2.B.4	Relate the function of the plasma (cell) membrane to its structure	Cell Structure	Section 2 Part 1 The Cell Membrane: Structure and Function
MC.2.B.5	Compare and contrast the structures of an animal cell to a plant cell	Cell Structure	Section 1 Part 7 The Animal Cell and Part 8 The Plant Cell
MC.2.B.6	Compare and contrast the functions of autotrophs and heterotrophs	Photosynthesis	Section 1 Part 3 Where Does Energy Come From?
MC.2.B.7	Compare and contrast active transport and passive transport mechanisms:	Cell Structure	Section 2 Part 4 Active and Passive Transport: Tolls Versus Free Rides
MC.2.B.7.a	diffusion	Cell Structure	Section 2 Part 2 Cells and Diffusion
MC.2.B.7.b	osmosis	Cell Structure	Section 2 Part 3 Water and Solute Movement

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MC.2.B.7.c	endocytosis	Cell Structure	Section 2 Part 5 Vesicle-mediated Transport
MC.2.B.7.d	exocytosis	Cell Structure	Section 2 Part 5 Vesicle-mediated Transport
MC.2.B.7.e	phagocytosis	Cell Structure	Section 2 Part 5 Vesicle-mediated Transport
MC.2.B.7.f	pinocytosis	Cell Structure	Section 2 Part 5 Vesicle-mediated Transport
MC.2.B.8	Describe the main events in the cell cycle, including the differences in plant and animal cell division:	Cell Structure	Section 3 Part 5 The Eukaryotic Cell Cycle
MC.2.B.8.a	interphase	Cell Structure	Section 3 Part 6 Mitosis: Cell Xeroxing
MC.2.B.8.b	mitosis	Cell Structure	Section 3 Part 6 Mitosis: Cell Xeroxing
MC.2.B.8.c	cytokinesis	Cell Structure	Section 3 Part 6 Mitosis: Cell Xeroxing

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MC.2.B.9	List in order and describe the stages of mitosis:	Cell Structure	Section 3 Part 6 Mitosis: Cell Xeroxing
MC.2.B.9.a	prophase	Cell Structure	Section 3 Part 6 Mitosis: Cell Xeroxing
MC.2.B.9.b	metaphase	Cell Structure	Section 3 Part 6 Mitosis: Cell Xeroxing
MC.2.B.9.c	anaphase	Cell Structure	Section 3 Part 6 Mitosis: Cell Xeroxing
MC.2.B.9.d	telophase.	Cell Structure	Section 3 Part 6 Mitosis: Cell Xeroxing
MC.2.B.10	Analyze the meiotic maintenance of a constant chromosome number from one generation to the next	Cell Structure	Section 4 Part 1 Meiosis and Sexual Reproduction
MC.2.B.11	Discuss homeostasis using thermoregulation as an example	Animal Organization	Section 2 Part 1 Animal Organ Systems and Homeostasis
MC.3	Students shall demonstrate an understanding of how cells obtain and use energy (energetics).		

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MC.3.B.1	Compare and contrast the structure and function of mitochondria and chloroplasts	Photosynthesis	Section 2 Part 3 The Chloroplast Section 3 Part 4 Electron Transport System
MC.3.B.2	Describe and model the conversion of stored energy in organic molecules into usable cellular energy (ATP):	Photosynthesis	Section 3 Part 4 Electron Transport System
MC.3.B.2.a	glycolysis	Photosynthesis	Section 3 Part 2 Glycolysis Occurs in All Living Things
MC.3.B.2.b	citric acid cycle	Photosynthesis	Section 3 Part 3 Krebs Cycle: Energy Carriers and Carbon Dioxide
MC.3.B.2.c	electron transport chain	Photosynthesis	Section 3 Part 4 Electron Transport System
MC.3.B.3	Compare and contrast aerobic and anaerobic respiration:	Photosynthesis	Section 3 Part 3 Anaerobic Pathways
MC.3.B.3.a	lactic acid fermentation	Photosynthesis	Section 3 Part 3 Anaerobic Pathways
MC.3.B.3.b	alcoholic fermentation	Photosynthesis	Section 3 Part 3 Anaerobic Pathways

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MC.3.B.4	Describe and model the conversion of light energy to chemical energy by photosynthetic organisms:	Photosynthesis	Section 2 Part 1 Photosynthesis: Food Production
MC.3.B.4.a	light dependent reactions	Photosynthesis	Section 2 Part 4 Light Dependent Process: Converting Light Energy into Chemical Energy
MC.3.B.4.b	light independent reactions	Photosynthesis	Section 2 Part 5 The Light Independent Process: Let's Make a Carbohydrate!
MC.3.B.5	Compare and contrast cellular respiration and photosynthesis as energy conversion pathways	Photosynthesis	Section 1 Part 1 Photosynthesis and Cellular Respiration: Part One
HE	Heredity and Evolution		
HE.4	Students shall demonstrate an understanding of heredity.		
HE.4.B.1	Summarize the outcomes of Gregor Mendel's experimental procedures	Genetics	Section 1 Part 2 The Origins of Genetics: Gregor Mendel
HE.4.B.2	Differentiate among the laws and principles of inheritance:	Genetics	Section 1 Part 3 The Principle of Segregation Section 1 Part 6 The Principle of Independent Assortment

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HE.4.B.2.a	dominance	Genetics	Section 1 Part 5 Genotype and Phenotype
HE.4.B.2.b	segregation	Genetics	Section 1 Part 3 The Principle of Segregation
HE.4.B.2.c	independent assortment	Genetics	Section 1 Part 6 The Principle of Independent Assortment
HE.4.B.3	Use the laws of probability and Punnett squares to predict genotypic and phenotypic ratios	Genetics	Section 1 Part 4 Punnett Squares
HE.4.B.4	Examine different modes of inheritance:	Genetics	
HE.4.B.4.a	sex linkage	Genetics	Section 2 Part 1 Extending Mendel’s Rules: The Chromosome Theory Of Inheritance
HE.4.B.4.b	codominance	Genetics	Section 2 Part 2 Codominant alleles
HE.4.B.4.c	crossing over	Cell Structure	Section 4 Part 7 Meiosis and Genetic Variation

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HE.4.B.4.d	incomplete dominance	Genetics	Section 2 Part 3 Incomplete Dominance
HE.4.B.4.e	multiple alleles	Genetics	Section 2 part 4 Multiple alleles
HE.4.B.5	Analyze the historically significant work of prominent geneticists	Genetics	Section 2 Part 1 Extending Mendel’s Rules: The Chromosome Theory Of Inheritance (Thomas Hunt Morgan) Section 1 Part 2 The Origins of Genetics: Gregor Mendel Section 1 Part 7 Mutations (Hugo de Vries)
HE.4.B.6	Evaluate karyotypes for abnormalities:	Genetics	Section 3 Part 1 Human Genetic Traits
HE.4.B.6.a	monosomy	Genetics	Section 3 Part 2 Human Chromosomal Abnormalities
HE.4.B.6.b	trisomy	Genetics	Section 3 Part 2 Human Chromosomal Abnormalities
HE.5	Students shall investigate the molecular basis of genetics.	Genetics	Section 4 Part 1 DNA: THE MOLECULAR BASIS OF GENETICS (includes multimedia presentation)

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HE.5.B.1	Model the components of a DNA nucleotide and an RNA nucleotide	Genetics	Section 4 Part 3 The Structure of DNA Section 5 Part 2 From Genes to Proteins: RNA
HE.5.B.2	Describe the Watson-Crick double helix model of DNA, using the base-pairing rule (adenine-thymine, cytosine-guanine)	Genetics	Section 4 Part 3 The Structure of DNA
HE.5.B.3	Compare and contrast the structure and function of DNA and RNA	Genetics	Section 4 Part 3 The Structure of DNA Section 5 Part 2 From Genes to Proteins: RNA
HE.5.B.4	Describe and model the processes of replication, transcription, and translation	Genetics	Section 4 Part 4 DNA Replication: Copying the Code Section 5 Part 3 From Genes to Proteins: Transcription Section 5 Part 4 From Genes to Proteins: Translation
HE.5.B.5	Compare and contrast the different types of mutation events, including point mutation, frameshift mutation, deletion, and inversion	Genetics	Lab RNA Section 5 Part 5 Genetic Mutations
HE.5.B.6	Identify effects of changes brought about by mutations:		
HE.5.B.6.a	beneficial	Evolution	Section 2 Part 2 Mutation Rate

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HE.5.B.6.b	harmful	Genetics	Section 2 Part 2 Mutation Rate
HE.5.B.6.c	neutral	Genetics	Section 2 Part 2 Mutation Rate
HE.6	Students shall examine the development of the theory of biological evolution.	Evolution	Section 1 Part 1 Pre-Renaissance Thought Section 1 Part 2 Evolutionary Thought During the 1700s
HE.6.B.1	Compare and contrast Lamarck's explanation of evolution with Darwin's theory of evolution by natural selection	Evolution	Section 1 Part 2 Evolutionary Thought During the 1700s Section 1 Part 3 Evolution by Natural Selection
HE.6.B.2	Recognize that evolution involves a change in allele frequencies in a population across successive generations	Evolution	Section 2 Part 1 EVOLUTION AND GENETICS
HE.6.B.3	Analyze the effects of mutations and the resulting variations within a population in terms of natural selection	Evolution	Section 2 Part 2 Mutation Rate
HE.6.B.4	Illustrate mass extinction events using a time line	Evolution	
HE.6.B.5	Evaluate evolution in terms of evidence as found in the following:	Evolution	Section 1 Part 4 Evidence for Evolution

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HE.6.B.5.a	fossil record	Evolution	Section 1 Part 4 Evidence for Evolution
HE.6.B.5.b	DNA analysis	Evolution	Section 1 Part 5 Biogeography: Separation and Divergence (subheading Biochemistry)
HE.6.B.5.c	artificial selection	Evolution	
HE.6.B.5.d	morphology	Evolution	Section 1 Part 4 Evidence for Evolution
HE.6.B.5.e	embryology	Evolution	Section 1 Part 5 Embryology
HE.6.B.5.f	viral evolution		
HE.6.B.5.g	geographic distribution of related species	Evolution	Section 1 Part 5 Biogeography: Separation and Divergence
HE.6.B.5.h	antibiotic and pesticide resistance in various organisms	Evolution	Section 2 Part 4 Directional Selection

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HE.6.B.6	Compare the processes of relative dating and radioactive dating to determine the age of fossils	History of Life on Earth	Section 1 Part 2 Methods of Age Dating: Section 1 Part 3 Radioactive Decay
HE.6.B.7	Interpret a Cladogram	Biological Diversity	Section 1 Part 3 Cladistic Classification
CDL	Classification and the Diversity of Life	Biological Diversity	
CDL.7	Students shall demonstrate an understanding that organisms are diverse.	Biological Diversity	
CDL.7.B.1	Differentiate among the different domains:	Biological Diversity	Section 1 Part 4 The Kingdoms and Domains of Life
CDL.7.B.1.a	Bacteria	Biological Diversity	Section 1 Part 5 Domain Bacteria
CDL.7.B.1.b	Archaea	Biological Diversity	Section 1 Part 5 Domain Bacteria (subheading Domain Archaea)
CDL.7.B.1.c	Eukarya	Biological Diversity	Section 1 Part 6 Domain Eukarya

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CDL.7.B.2	Differentiate the characteristics of the six kingdoms:	Biological Diversity	Section 1 Part 4 The Kingdoms and Domains of Life
CDL.7.B.2.a	Eubacteria	Biological Diversity	Section 2 Part 1 Prokaryotes: Bacteria and Archaea
CDL.7.B.2.b	Archaea	Biological Diversity	Section 2 Part 1 Prokaryotes: Bacteria and Archaea
CDL.7.B.2.c	Protista	Biological Diversity	Section 3 Part 1 The “Protista”: a Kingdom in Transition and succeeding parts of this section
CDL.7.B.2.d	Fungi	Biological Diversity	Section 5 Part 1 Kingdom Fungi and succeeding parts of this section
CDL.7.B.2.e	Plantae	Biological Diversity	Section 4 Part 1 The Plant Kingdom and succeeding parts of this section
CDL.7.B.2.f	Animalia	Biological Diversity	Section 6 Part 1 Kingdom Animalia: Lions and tigers and us, oh my! and succeeding parts of this section continued in section 7 and succeeding parts
CDL.7.B.3	Identify the seven major taxonomic categories:	Biological Diversity	Section 1 Part 1 Taxonomy

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CDL.7.B.3.a	kingdom	Biological Diversity	Section 1 Part 1 Taxonomy
CDL.7.B.3.b	phylum	Biological Diversity	Section 1 Part 1 Taxonomy
CDL.7.B.3.c	class	Biological Diversity	Section 1 Part 1 Taxonomy
CDL.7.B.3.d	order	Biological Diversity	Section 1 Part 1 Taxonomy
CDL.7.B.3.e	family	Biological Diversity	Section 1 Part 1 Taxonomy
CDL.7.B.3.f	genus	Biological Diversity	Section 1 Part 1 Taxonomy
CDL.7.B.3.g	species	Biological Diversity	Section 1 Part 1 Taxonomy
CDL.7.B.4	Classify and name organisms based on their similarities and differences applying taxonomic nomenclature using dichotomous keys	Biological Diversity	

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CDL.7.B.5	Investigate Arkansas' biodiversity using appropriate tools and technology		
CDL.7.B.6	Compare and contrast the structures and characteristics of viruses (lytic and lysogenic cycles) with non-living and living things		
CDL.7.B.7	Evaluate the medical and economic importance of viruses		
CDL.7.B.8	Compare and contrast life cycles of familiar organisms	Biological Diversity	Section 3 Part 1 The "Protista": a Kingdom in Transition
CDL.7.B.8.a	sexual reproduction	Cell Structure Plant Structure Animal Organization	Section 4 Part 1 Meiosis and Sexual Reproduction Section 2 Part 1 Flowering Plant Reproduction Section 10 Part 1 The Reproductive System and Human Development
CDL.7.B.8.b	asexual reproduction	Cell Structure Plant Structure Animal Organization	Section 3 Part 1 Chromosomes and Cell Reproduction Section 2 Part 9 Vegetative Propagation Section 10 Part 1 The Reproductive System and Human Development (subheading asexual reproduction)
CDL.7.B.8.c	metamorphosis	Biological Diversity	Section 7 Part 2 Phylum Arthropoda: Segmented Bodies with Segmented Appendages

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CDL.7.B.8.d	alternation of generations	Biological Diversity	Section 4 Part 1 The Plant Kingdom
CDL.7.B.9	Classify bacteria according to their characteristics and adaptations	Biological Diversity	Section 2 Part 2 Bacterial Structure Section 2 Part 4 Classification of Bacteria
CDL.7.B.10	Evaluate the medical and economic importance of bacteria	Biological Diversity	Section 2 Part 4 Classification of Bacteria Section 2 Part 5 Disease-causing Bacteria
CDL.7.B.11	Describe the characteristics used to classify protists:	Biological Diversity	Section 3 Part 2 Classification of Protists
CDL.7.B.11.a	plant-like	Biological Diversity	Section 3 Part 5 Kingdom Alveolata (dinoflagellates) Section 3 Part 8 Kingdom Stramenopila; 9 (Brown Algae) Section 3 Part 11 Kingdom Rhodophyta, the Red Algae
CDL.7.B.11.b	animal-like	Biological Diversity	Section 3 Part 2 Classification of Protists plus parts 3 and 4
CDL.7.B.11.c	fungus-like	Biological Diversity	Section 3 Part 10 Kingdom Stramenopila (oomycetes)
CDL.7.B.12	Evaluate the medical and economic importance of protists	Biological Diversity	Section 3 Part 6 Kingdom Alveolata ((malaria) most parts in Section 3 include some discussion of this standard, too numerous

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			to list them all here
CDL.7.B.13	Compare and contrast fungi with other eukaryotic organisms	Biological Diversity	Section 5 part 1 Kingdom Fungi
CDL.7.B.14	Evaluate the medical and economic importance of fungi	Biological Diversity	Section 5 Part 5 Symbiotic Fungal Associations: Lichens and Mycorrhizae Section 5 Part 4 Phylum Basidiomycota Section 5 Part 3 Phylum Ascomycota
CDL.7.B.15	Differentiate between vascular and nonvascular plants	Biological Diversity	Section 4 Part 3 Land Plants: Embryophyta
CDL.7.B.16	Differentiate among cycads, gymnosperms, and angiosperms	Biological Diversity	Section 4 Part 8 Cycadophyta Section 4 Part 9 Pinophyta: the Cone Bearers Section 4 Part 11 Angiosperms: Flowering Plants
CDL.7.B.17	Describe the structure and function of the major parts of a plant:	Plant Structure	Section 1 Part 1 Plant Organs, Tissues, and Cells
CDL.7.B.17.a	roots	Plant Structure	Section 1 Part 2 Plant Organs: Stems, Roots, Leaves, and Flowers (includes multimedia presentation)

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CDL.7.B.17.b	stems	Plant Structure	Section 1 Part 2 Plant Organs: Stems, Roots, Leaves, and Flowers (includes multimedia presentation)
CDL.7.B.17.c	leaves	Plant Structure	Section 1 Part 3(untitled)
CDL.7.B.17.d	flowers	Plant Structure	Section 1 Part 3(untitled)
CDL.7.B.18	Relate the structure of plant tissue to its function	Plant Structure	Section 1 Part 4 Plant Tissues
CDL.7.B.18.a	epidermal	Plant Structure	Section 1 Part 6 Epidermal Cells
CDL.7.B.18.b	ground	Plant Structure	Section 1 Part 4 Plant Tissues
CDL.7.B.18.c	vascular	Plant Structure	Section 1 Part 5 Vascular Tissue: Xylem (phloem covered under subheading)
CDL.7.B.19	Evaluate the medical and economic importance of plants	Biological Diversity	Section 4 Part 12 Angiosperm Life Cycle (subheading Angiosperm Systematics)

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CDL.7.B.20	Identify the symmetry of organisms:	Biological Diversity	Section 6 Part 2 Trends in Animal Evolution
CDL.7.B.20.a	radial	Biological Diversity	Section 6 Part 2 Trends in Animal Evolution
CDL.7.B.20.b	bilateral	Biological Diversity	Section 6 Part 2 Trends in Animal Evolution
CDL.7.B.20.c	asymmetrical	Biological Diversity	Section 6 Part 2 Trends in Animal Evolution
CDL.7.B.21	Compare and contrast the major invertebrate classes according to their nervous, respiratory, excretory, circulatory, and digestive systems	Biological Diversity	Section 6 Parts 4-12 plus Section 7 Parts 1-6 This is also covered somewhat under the corresponding organ system in Animal Organization
CDL.7.B.22	Compare and contrast the major vertebrate classes according to their nervous, respiratory, excretory, circulatory, digestive, reproductive and integumentary systems	Biological Diversity	Section 7 Parts 7-14 This is also covered somewhat under the corresponding organ system in Animal Organization
EBR	Ecology and Behavioral Relationships		
EBR.8	Students shall demonstrate an understanding of ecological and behavioral relationships among organisms.		

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EBR.8.B.1	Cite examples of abiotic and biotic factors of ecosystems	Population Ecology	Section 2 Part 1 Community And Ecosystem Dynamics
EBR.8.B.2	Compare and contrast the characteristics of biomes	Population Ecology	Section 2 Part 2 Terrestrial Biomes
EBR.8.B.3	Diagram the carbon, nitrogen, phosphate, and water cycles in an ecosystem	Population Ecology	Section 3 Part 1 The Biosphere And Mass Extinctions
EBR.8.B.4	Analyze an ecosystem's energy flow through food chains, food webs, and energy pyramids	Population Ecology	Section 2 Part 5 Disturbance of a Community
EBR.8.B.5	Identify and predict the factors that control population, including predation, competition, crowding, water, nutrients, and shelter	Population Ecology	Section 1 Part 2 Several Basic Controls Govern Population Size
EBR.8.B.6	Summarize the symbiotic ways in which individuals within a community interact with each other:	Population Ecology	Section 1 Part 2 Several Basic Controls Govern Population Size
EBR.8.B.6.a	commensalism	Population Ecology	Section 1 Part 2 Several Basic Controls Govern Population Size
EBR.8.B.6.b	parasitism	Population Ecology	Section 1 Part 2 Several Basic Controls Govern Population Size

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EBR.8.B.6.c	mutualism	Population Ecology	Section 1 Part 2 Several Basic Controls Govern Population Size
EBR.8.B.7	Compare and contrast primary succession with secondary succession	Population Ecology	Section 2 Part 4 Community Density and Stability (subheading Change in Communities Over Time)
EBR.8.B.8	Identify the properties of each of the five levels of ecology:	Population Ecology	
EBR.8.B.8.a	organism	Population Ecology	Section 2 Part 1 Community And Ecosystem Dynamics
EBR.8.B.8.b	population	Population Ecology	Section 1 Part 1 Population Growth
EBR.8.B.8.c	community	Population Ecology	Section 2 Part 1 Community And Ecosystem Dynamics
EBR.8.B.8.d	ecosystem	Population Ecology	Section 2 Part 1 Community And Ecosystem Dynamics
EBR.8.B.8.e	biosphere	Population Ecology	Section 2 Part 1 Community And Ecosystem Dynamics

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EBR.9	Students shall demonstrate an understanding of the ecological impact of global issues.	Population Ecology	Section 2 Part 5 Disturbance of a Community
EBR.9.B.1	Analyze the effects of human population growth and technology on the environment/biosphere	Population Ecology	Section 3 Part 3 Temperatures, Greenhouses, and Climate Changes
EBR.9.B.2	Evaluate long range plans concerning resource use and by-product disposal in terms of their environmental, economic, and political impact		
EBR.9.B.3	Assess current world issues applying scientific themes (e.g., global changes in climate, epidemics, pandemics, ozone depletion, UV radiation, natural resources, use of technology, and public policy)	Population Ecology	Section 3 Part 3 Temperatures, Greenhouses, and Climate Changes
NS	Nature of Science		
NS.10	Students shall demonstrate an understanding that science is a way of knowing.	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method
NS.10.B.1	Explain why science is limited to natural explanations of how the world works	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method
NS.10.B.2	Compare and contrast hypotheses, theories, and laws	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method

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NS.10.B.3	Distinguish between a scientific theory and the term "theory" used in general conversation	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method
NS.10.B.4	Summarize the guidelines of science:		
NS.10.B.4.a	explanations are based on observations, evidence, and testing	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method
NS.10.B.4.b	hypotheses must be testable	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method
NS.10.B.4.c	understandings and/or conclusions may change with additional empirical data	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method
NS.10.B.4.d	scientific knowledge must have peer review and verification before acceptance	The Nature of Science and Biology	
NS.11	Students shall design and safely conduct scientific inquiry.		
NS.11.B.1	Develop and explain the appropriate procedure, controls, and variables (dependent and independent) in scientific experimentation	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method Lab: Salt Boiling Lab: Enzymes

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NS.11.B.2	Research and apply appropriate safety precautions (refer to ADE Guidelines) when designing and/or conducting scientific investigations		
NS.11.B.3	Identify sources of bias that could affect experimental outcome	The Nature of Science and Biology	Lab: Salt Boiling
NS.11.B.4	Gather and analyze data using appropriate summary statistics		Lab: Salt Boiling Lab: Enzymes
NS.11.B.5	Formulate valid conclusions without bias	The Nature of Science and Biology	Lab: Salt Boiling Lab: Enzymes
NS.11.B.6	Communicate experimental results using appropriate reports, figures, and tables	The Nature of Science and Biology	Lab: Salt Boiling Lab: Enzymes
NS.12	Students shall demonstrate an understanding of current life science theories.	The Nature of Science and Biology	Section 1 Part 5 Seven Unifying Themes of Biology
NS.12.B.1	Recognize that theories are scientific explanations that require empirical data, verification, and peer review	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method
NS.12.B.2	Understand that scientific theories may be modified or expanded based on additional empirical data, verification, and peer review	The Nature of Science and Biology	Section 1 Part 2 Science and The Scientific Method

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NS.12.B.3	Summarize biological evolution	Evolution	Evolution journal
NS.12.B.4	Relate the development of the cell theory to current trends in cellular biology		
NS.12.B.5	Describe the relationship between the germ theory of disease and our current knowledge of immunology and control of infectious diseases		
NS.12.B.6	Relate the chromosome theory of heredity to recent findings in genetic research (e.g., Human Genome Project-HGP, chromosome therapy)		
NS.12.B.7	Research current events and topics in biology	Genetics	Section 6 Part 1 Biotechnology and the Genetics Revolution
NS.13	Students shall use mathematics, science equipment, and technology as tools to communicate and solve life science problems.	The Nature of Science and Biology	Lab: Salt Boiling
NS.13.B.1	Collect and analyze scientific data using appropriate mathematical calculations, figures, and tables	The Nature of Science and Biology	Lab: Salt Boiling
NS.13.B.2	Use appropriate equipment and technology as tools for solving problems (e.g., microscopes, centrifuges, flexible arm cameras, computer software and hardware)	The Nature of Science and Biology	various labs and lab protocols

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NS.13.B.3	Utilize technology to communicate research findings	The Nature of Science and Biology	
NS.14	Students shall describe the connections between pure and applied science.		
NS.14.B.1	Compare and contrast biological concepts in pure science and applied science		
NS.14.B.2	Discuss why scientists should work within ethical parameters	Discussion Board	Various topics
NS.14.B.3	Evaluate long-range plans concerning resource use and by-product disposal for environmental, economic, and political impact		
NS.14.B.4	Explain how the cyclical relationship between science and technology results in reciprocal advancements in science and technology		
NS.15	Students shall describe various life science careers and the training required for the selected career.	Nature of Science and Biology	Section 1 Part 1 Who is a biologist?
NS.15.B.1	Research and evaluate science careers using the following criteria:		

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NS.15.B.1.a	educational requirements		
NS.15.B.1.b	salary		
NS.15.B.1.c	availability of jobs		
NS.15.B.1.d	working conditions		