Biology Curriculum Guide
1st Nine Weeks

1 day = 50 min period

Strand: Nature of Science	Standard: Demonstrate an understanding that science is a way of knowing; design and safely conduct scientific inquiry; Use mathematics, science equipment, and technology as tools to communicate and solve life science problems; Describe the connections between pure and applied science

Days	Topic/Subtopic	Assessment	Frameworks	Resources
9	Scientific Process Inquiry Hypotheses Experimental Design Data Collection and Analysis Conclusion Bias Communication/Peer Review Theory and Laws Modification Data Verification Peer Review Tools and Technology Measurements Metric Conversion Microscope Labware Lab Safety	Questioning Quizzes Performance Assessments Lab Reports Tests	NS.10.B.1, NS.10.B.2, NS.10.B.3, NS.10.B.4, NS.11.B.1, NS.11.B.2, NS.11.B.3, NS.11.B.4, NS.11.B.5, NS.11.B.6, NS.12.B.1, NS.12.B.2, NS.13.B.1, NS.13.B.2, NS.13.B.3, NS.14.B.1, NS.14.B.2, NS.14.B.4	Labs and other resources may be found at www.sps.k12.ar.us/massengale www.accessexcellence.org Chapter 1 Any lab with data collection (Inquiry lab suggested) Look for Technology and Society Sections throughout the book. Measurement Lab Microscope Lab

MCO: Students will examine various myths that have changed over time because of scientific evidence.
In pairs, students will examine cultural "wives tales" thought to be scientific thought at one time.
Students will research the role of women and minorities in the development of scientific theory.

Biology Curriculum Guide
1st Nine Weeks

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Strand: Molecules and Cells			Standard: Demonstrate an understanding of the structure and function of cells, role of chemistry in life processes	
Days	Topic/Subtopics	Assessment	Frameworks	Resources
.5	Characteristics of Life Homeostasis Hierarchy of life from cells to ecosystems	Questioning Quizzes Performance Assessments Lab Reports Tests	MC.1.B.1, MC.1.B.2, MC.1.B.3, MC.1.B.4, MC.2.B.1, MC.2.B.11	Chapter 1, 2 Properties of Water Lab
7	Chemistry Properties of water Surface tension Adhesion Cohesion Polarity pH Chemical Reactions Activation energy Exergonic Endergonic			pH Lab Test for Organic Compounds (sugar, starch, lipids, proteins)
4	Biochemistry Macromolecules Carbohydrates Proteins Lipids Nucleic Acids Enzyme/Substrate			Enzyme Lab (variable effects)
MCO: Students will examine the website, www.blackinventor.com to find contributions of minority scientists.				

Biology Curriculum Guide
1st Nine Weeks

1 day = 50 min period

Strand: Molecules and Cells Nature of Science			Standard: demonstrate an understanding of the structure and function of cells Demonstrate an understanding of current life science theories	
Days	Topic/Subtopics	Assessments	Frameworks	Resources
9	Cells Prokaryotes Eukaryotes Subcellular Structures Organelles Ribosomes Cytoskeleton Plasma Membrane Animal/Plant cells Homeostasis Active/Passive Transport Diffusion Osmosis Endocytosis Exocytosis Phagocytosis Pinocytosis Solutions Cell Theory Discovery Scientists Current Trends	Question Quiz Performance Assessment Lab Report Test	MC.2.B.2, MC.2.B.3, MC.2.B.4, MC.2.B.5, MC.2.B.7, MC.2.B.11, NS.12.B.7	Chapter 7 View Microscopic Cells Lab (May want to allow students to make slides of various fresh foods) Compare Plant and Animal Cells Lab Diffusion and Osmosis Lab
MCO: Students will work in groups to create models of cells' structure and processes.				

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Strand: Molecules and Cells			Standard: demonstrate an understanding of how cells obtain and use energy (energetics).	
Days	Topic	Subtopics	Frameworks	Resources
1 7 6	Autotroph/Heterotroph Functions ATP Photosynthesis Chloroplasts Light Dependent Reactions Light Independent Reactions Cellular Respiration Mitochondria Aerobic/Anaerobic Respiration Lactic Acid Fermentation Alcoholic Fermentation Glycolysis Citric Acid Cycle Electron Transport Chain	Question Quiz Performance Assessment Lab Report Test	MC.3.B.1, MC.3.B.4, MC.3.B.5, MC.3.B.2, MC.3.B.3 MC.2.B.6	Chapter 8 Photosynthesis Lab Chromatography Lab Chapter 9 Fermentation/Cellular Respiration Lab Model Lab (Various Processes can be modeled using manipulative)
MCO: Cooperative Learning				

Biology Curriculum Guide
2nd Nine Weeks

1 day = 50 min period

Strand: Molecules and Cells			Standard: demonstrate an understanding of the structure and function of cells	
Days	Topic/Subtopics	Assessment	Frameworks	Resources
8	Cell Cycle Interphase Mitosis Prophase Metaphase Anaphase Telophase Cytokinesis Meiosis Maintenance of chromosome number	Question Quiz Performance Assessment Lab Report Test	MC.2.B.8, MC.2.B.9, MC.2.B.10,	Chapter 10 Mitosis/Meiosis Lab (View slides or Models)
MCO: Students will work together to create and act out a role play that demonstrates the phases of cell reproduction. www.blackinventor.com has many scientists and inventors information, students can work to create a monologue by a scientist who is struggling to get an idea accepted.				

Biology Curriculum Guide
2nd Nine Weeks

1 day = 50 min period

Strand: Heredity and Evolution			Standard: Demonstrate an understanding of heredity	
Days	Topic/Subtopics	Assessments	Frameworks	Resources
8	Mendel Experimental Procedure and Results Laws/Principles Dominance Segregation Independent Assortment Probability Punnett Squares Genotypic Ratios Phenotypic Ratios Patterns of Inheritance Sex Linkage Codominance Crossing Over Incomplete Dominance Mulitple Alleles	Question Quiz Performance Assessment Lab Report Test Use pedigree to analyze the different patterns of Inheritance	HE.4.B.1, HE4.B.2, HE.4.B.3, HE.4.B.4, HE.4.B.5, HE.4.B.6	Chapter 11 Mendelian Genetics Lab (Sample a population for ratios) Probability Lab Good place for research project on disorders, people, or other
4	Karyotypes Monosomy Trisomny			Chapter 14 Karyotype Lab
MCO: . www.blackinventor.com has many scientists and inventors information				

Biology Curriculum Guide
2nd Nine Weeks

Strand: Heredity and Evolution Nature of Science			Standard: Demonstrate an understanding of heredity Investigate that molecular basis of Genetics Relate the Chromosome Theory of Heredity to the recent findings in Genetics research (Human Genome Project, Chromosome Therapy etc..), research current events and topics in Biology; Relate the development of the cell theory to current trends in cellular biology	
Days	Topic/Subtopics	Assessments	Frameworks	Resources
2 8 9	History Prominent Geneticist DNA and RNA Nucleotide components Structure of DNA Function of DNA History Processes Replication Trancription Translation Mutations Point Mutations Frameshift Mutations Deletion Inversion Change effects Benficial Harmful Neutral Technology Current Issues	Question Quiz Performance Assessment Lab Report Test	HE.4.B.5, HE.5.B.1, HE5.B.2, HE.5.B.3, HE.5.B.4, HE.5.B.5, HE.5.B.6 NS.12.B.4, NS.12.6, NS.12.B.7	Chapter 12, 13, 14 DNA Isolation Lab Paper-based lab for replication, transcription, and translation
MCO: Cooperative Learning				

Biology Curriculum Guide
2nd Nine Weeks

Strand: Heredity and Evolution Nature of Science			Standard: Examine the development of the theory of biological evolution Demonstrate an understanding of current life science theories	
Days	Topic/Subtopics	Assessment	Frameworks	Resources
2 3 3	Darwin/Lamarck Evidence Theories Evaluate Evidence Fossil record Relative dating Radioactive Dating Mass Extinction DNA Analysis Artificial Selection Morphology Embryology Viral evolution Geographic distribution of related species Antibiotic and pesticide resistance in various organisms Allele Frequencies Effects of Mutations Populations Successive Generations Speciation	 Question Quiz Performance Assessment Lab Report Test	HE.6.B.1, HE.6.B.2, HE.6.B.3, HE.6.B.4, HE.6.B.5, HE.6.B.6, NS.12.B.3	Chapter 15, 16, 17 Natural Selection and Adaptation Lab Timeline of Mass Extinction (There is one in the Modern Biology Book)
MCO: Cooperative Learning, Debate				

Biology Curriculum Guide
3rd Nine Weeks

Strand: Heredity and Evolution Classification and the Diversity of Life			Standard: Examine the development of the theory of biological evolution demonstrate an understanding that organisms are diverse	
Days	Topic/Subtopics	Assessments	Frameworks	Resources
1 4	Cladogram Classification Domains Bacteria Archaea Eukarya Kingdoms Eubacteria Archaebacteria Protista Fungi Plantae Animalia Major Categories Kingdom Phylum Class Order Family Genus Species Application Classify Binomial nomenclature Dichotomous Key Arkansas' Biodioversity	Question Quiz Performance Assessment Lab Report Test	HE.6.B.7, CDL.7.B.1, CDL.7.B.2, CDL.7.B.3, CDL.7.B.4, CDL.7.B.5	Chapter 18 Classification Lab Use of dichotomous keys Biodiversity Scavenger Hunt or Collection
MCO: www.blackinventor.com has many scientists and inventors information				

Biology Curriculum Guide
3rd Nine Weeks

Strand: Classification and Diversity of Life Nature of Science			Standard: demonstrate an understanding that organisms are diverse Demonstrate an understanding of current life science theories	
Days	Topic/Subtopics	Assessments	Frameworks	Resources
4	Viruses Structure Characteristics Living/Nonliving Lytic Cycle Lysogenic Cycle Importance Medical Economics	Question Quiz Performance Assessment Lab Report Test	CDL.7.B.6, CDL.7.B.7, CDL.7.B.8, CDL.7.B.9, CDL.7.B.10, CDL.7.B.11, CDL.7.B.12, NS.12.B.5,	Chapter 19, 20 Spread of Infectious Disease Lab
5	Bacteria Classify Characteristics Adaptations Life Cycles Importance Medical Economics			
2	Germ Theory Immunology Infectious Diseases			
3	Protists Plant-like Animal-like Fungi-like Life Cycles Importance Medical Economic			Pond Water Survey Lab
MCO: Look for Biology and History sections throughout the book				

Biology Curriculum Guide
3rd Nine Weeks

Strand: Classification and Diversity of Life			Standard: demonstrate an understanding that organisms are diverse	
Days	Topic/ Subtopics	Assessments	Frameworks	Resources
3 7	Fungi Characteristics Life Cycles Importance Medical Economic Plants Life Cycles Nonvascular Vascular Cycads Gymnosperms Angiosperms Structure/Function Roots Stems Leaves Flowers Tissues Epidermal Ground Vascular Importance Medical Economics	Question Quiz Performance Assessment Lab Report Test	CDL.7.B.8, CDL.7.B.13, CDL.7.B.14, CDL.7.B.15, CDL.7.B.16, CDL.7.B.17, CDL.7.B.18, CDL.7.B.19,	Chapter 21, 22, 23, 24 Fungi Lab (observe mold, mushrooms, yeast, etc.) Plant Lab (root, stem, leaf, seed)
MCO: www.blackinventor.com has many scientists and inventors information				

Biology Curriculum Guide
3rd Nine Weeks

Strand: Classification and the Diversity of Life			Standard: demonstrate an understanding that organisms are diverse	
Days	Topic/ Subtopics	Assessments	Frameworks	Resources
15	Animals Symmetry Bilateral Radial Asymmetrical Invertebrates Classify according to organ systems Vertebrates Classify according to organ system Life Cycles	Question Quiz Performance Assessment Lab Report Test	CDL.7.B.8, CDL.7.B.20, CDL.7.B.21, CDL.7.B.22,	Chapter 26, 27, 28, 29, 30, 31, 32, 33 Comparative Anatomy Lab Dissection of Various Organisms
MCO: Look for Biology and History sections throughout the book				

Biology Curriculum Guide
4th Nine Weeks

Strand: Ecology and Behavioral Relationships Nature of Science			Standard: demonstrate an understanding of ecological and behavioral relationships among organisms Describe the connections between pure and applied science	
Days	Topic/ Subtopics	Assessments	Frameworks	Resources
14	Ecosystems Abiotic/biotic factors Biomes Cycles Carbon Nitrogen Phosphate Water Energy Flow Food Chains Food Webs Energy Pyramids Population Factors Predation Competition Crowding Water/nutrients Shelter Symbiosis Commensalism Parasitism Mutualism Primary/ Secondary Succession Hiearchy Organism Population Community Ecosystem Biosphere	Question Quiz Performance Assessment Lab Report Test	EBR.8.B.1, EBR.8.B.2, EBR.8.B.3, EBR.8.B.4, EBR.8.B.5, EBR.8.B.6, EBR.8.B.7, EBR.8.B.8, NS.14.B.3	Chapter 3, 4, 5, 6 Nature Walk Lab
MCO: Students will examine the contributions of various scientists to the development of scientific theory: one resource is www.blackinventor.com has many scientists and inventors information				

Biology Curriculum Guide
4th Nine Weeks

Strand: Ecology and Behavioral Relationships Nature of Science			Standard: demonstrate an understanding of the ecological impact of global issues Describe various life science careers and the training required for the selected career
Days	Topic/ Subtopics	Assessments	Frameworks	Resources
10	Human Population Growth effects Technological Effects Resources Long-range plans By-product Disposal Environmental, Political, Economic Impact Current World Issues Global Warming Epidemics Pandemics Ozone Depletion UV radiation Natural resources Use of technology Public policy Careers (can be substituted at any time)	Question Quiz Performance Assessment Lab Report Test	EBR.9.B.1, EBR.9.B.2, EBR.9.B.3, NS.15.B.1	Chapter 5, 6 Look for Issues in Biology sections throughout the book. Look for Careers in Biology Sections throughout the book.
MCO: Students work in cooperative groups to investigate ecological issues that influence humans, policy, and career development. Students will examine careers related to environmental issues.				