Instructional Guide

Grade Level Ninth **Subject Biology** **School System Pickens County**
School Year 2011-2012

Time Period (Pacing – when)	State Assessment Correlations	Standards/ Components (Pacing – what)	Resources/ Activities (Pacing – how) Curricular Alignment	Date of Common Formative Assessment (Pacing – how well)	Mapping Comments (What works what needs adjustment)
1st nine weeks	Select appropriate glassware for conducting experiments including a graduated cylinder, a beaker, a fl ask, a test tube, a microscope slide, a pipette, and a Petri dish. Select appropriate measuring equipment for conducting experiments including a balance and a stopwatch. Select appropriate optical instruments for conducting experiments including a compound microscope, an electron	Bio.1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment. Bio.1 B.1.a. Describing the steps of the scientific method Bio.1.B.1.b. Comparing controls, dependent variables, and independent variables	Modern Biology Chapter 1 pp.13-24,1066-1073 AHSGE: Biology Student Review Guide pp.27-76 Section Reviews: 1-1-1-3 Skills Worksheet: Scientific Methods Teacher Generated Worksheets: Scientific Methods Biology: Dynamics of Life: Applying Scientific Methods Teacher generated quizzes Teacher generated lab: single-celled organisms Identifying Controls and Variables: SpongeBob and Simpsons (internet) American Book Company: Scientific Method Item Specifications Teacher generated notes		

	microscope, and a magnifying glass.				

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1st nine weeks		Bio.1.B.3. Identifying safe laboratory procedures when handling chemicals and using Bunsen burners and laboratory glassware. Bio.1.B.4. Using appropriate SI units for measuring length, volume, and mass	Modern Biology pp.1066-1073 Good Apple Reproducible: Units of Measurements Teacher Generated worksheets Teacher Generated quizzes Teacher Generated Density Lab Test Generator and Item Specifications Teacher generated notes		

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1st nine weeks		Bio.4.B.1. Identify scientists who contributed to the cell theory Examples: Hooke, van Leeuwenhoek, Schleiden, Schwann, Virchow Bio.4.B.2. Distinguish between prokaryotic and eukaryotic cells Bio.4.B.3. Identifying various technologies used to observe cells Examples: light microscope, scanning electron microscope, transmission electron microscope	Modern Biology Chapter 4 Cell Structure and Function pp.69-71; pp.75; pp.21-22 AHSGE: Biology Student Review Guide pp.97-105 Active Reading Section 4-1: The History of Cell Biology Teacher generated lab: Comparing Prokaryotes and Eukaryotes (bacteria and whitefish, paramecium) under compound light microscope Teacher generated notes Item Specifications Teacher generated quiz Test Generator		

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1st nine weeks	Identify the levels of organization in the biosphere including cells, tissues, organs, and organ systems, as well as organisms, populations, communities, and ecosystems.	Bio.5. Identify cells, tissues, organs, organ systems and organisms as levels of structural organization Bio.5.B.1. Recognizing that cells differentiate to perform specific functions Examples: ciliated cells to produce movement, nerve cells to conduct electrical charges Bio.5.b.Identify organisms, populations, communities, and ecosystems as levels of organization in the biosphere.	Modern Biology pp.6-7; pp.72, 76 AHSGE: Biology Student Review Guide pp.111-113 Teacher generated notes Modern Biology Chapter 18 Into to Ecology pp.361-362 AHSGE: Biology Student Review Guide pp.385-386 Teacher generated notes included in Chapter 4 and Chapter 18		

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1st nine weeks	Identify cell structures including cell membrane, cell wall, nucleus, ribosome, smooth endoplasmic reticulum, rough endoplasmic reticulum, Golgi body, vacuole, chloroplast, and mitochondrion. Classify organisms as prokaryotic or eukaryotic	Bio.4. Describe similarities and differences of cell organelles, using diagrams and tables	Modern Biology Chapter 4 Cell Structure and Function pp.74-90 AHSGE: Biology Student Review Guide pp.106-110 Instructional Fair: Biology, Parts of the Cell worksheet, Animal Cells label, and Plant Cell label Skills Worksheet: Concept Mapping Cell Structure and Function Walch Publishing Unit 1 Activity 7: Differences between Plant and Animal Cells; Unit 1 Activity 5: A Cell Factory Section Reviews 4-1-4-3 Teacher generated practice test review worksheet Skills Worksheet: Cell Structure Pathways to Learning Science: Window Cells ARI Raft: Cell Campaign Posters Sills Worksheet: Cell Structure and Function Color Plates – Animal and Plant Cells Teacher generated notes Item Specifications Video- Inside a Cell		

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1st nine weeks	Recognize and apply the definition of homeostasis. (The ability of an organism or cell to maintain internal balance and stability by adjusting its physiological processes.) Recognize and apply the definition of active transport. (The movement of a substance across a biological membrane against its concentration or electrochemical gradient with the help of energy input and specifi c transport proteins.) Recognize and apply the defi nition of passive transport. (The diffusion of a substance across a biological membrane.) Recognize and apply the defi nition of osmosis. (The movement of water	Bio.2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis. Bio.2.B.1. Identify functions of carbohydrates, lipids, proteins, and nucleic acids in cellular activities	Modern Biology Chapter 5 Homeostasis and Cell Transport pp.97-106 AHSGE: Biology Student Review Guide pp.137-150 Modern Biology Section Reviews 5-1-5-2 Skills Worksheet: Homeostasis and Cell Transport Science Skills: Cells and Their Environment Teacher Modified Practice Test worksheets Teacher generated worksheets Lab :What are Diffusion and Osmosis? Egg lab (internet) Skills Worksheet: Concept Mapping 4-Column Vocabulary Test Generator and Item Specifications Modern Biology Chapter 2 Chemistry of Life pp.35-44 Teacher Modified Practice Tests (worksheets) Teacher generated worksheets Venn Diagrams Modern Biology Skills Worksheet: Concept Mapping Jellyfish map Teacher generated quiz Test Generator AHSGE: Biology Student Review Guide pp.117-136 Teacher generated notes		

	across a selectively permeable membrane.) Recognize and apply the definition of diffusion. (The spontaneous tendency of a substance to move down its concentration gradient from a more concentrated to a less concentrated area.) Recognize and apply the definition of exocytosis. (The cellular secretion of macromolecules by the fusion of vesicles with the cell membrane.) Recognize and apply the definition of endocytosis. (The cellular uptake of macromolecules and particulate substances by localized regions of the cell membrane that surround the substance and pinch off to form an intracellular vesicle.)		Item Specification		

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1st nine weeks		Bio.2.B.2. Comparing the reaction of plant and animal cells in isotonic, hypotonic, and hyptertonic solutions Bio.2.B.4. Applying the concept of fluid pressure to biological systems Examples: blood pressure, turgor pressure, bends, strokes Bio.2.B.3. Explaining how surface area, cell size, temperature, light, and pH affect cellular activities	Modern Biology Chapter 5 pp.98-100 AHSGE: Biology Student Review Guide pp.151-154 4-column vocabulary Teacher generated worksheets Internet worksheets Osmosis lab: Comparing potato slices in 3 types of solution Modern Biology Chapter 4 Cell Structure pp.72-73 AHSGE: Biology Student Review Guide pp.89-93 Test Generator Teacher generated quizzes Teacher generated notes Item Specifications		

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1st nine weeks	Identify the chemical formula for photosynthesis. Identify the function of photosynthesis. Identify the chemical formula for respiration. Identify the function of respiration. Identify the relationship between photosynthesis and respiration	Bio.3.a. Identify reactants and products associated with photosynthesis Bio.3.b. Identify purpose of photosynthesis	Modern Biology Chapter 6 Photosynthesis pp.113-114, 124 AHSGE: Biology Student Review Guide pp.165-168 Science Skills: Photosynthesis and Cell Respiration Teacher generated review worksheet Teacher generated quiz ARI Chunking Text (internet material) Teacher generated notes Item Specifications Video-Bill Nye-Plants		

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1st nine weeks		Bio.3.c. Identify reactants and products associated with cellular respiration Bio.3.d. Identify purpose of cellular respiration	Modern Biology Chapter 7 Cellular Respiration pp.131-135 AHSGE: Biology Student Review Guide pp.169-179 Teacher generated worksheet Teacher generated quiz ARI chunking text(internet material) Teacher generated notes Item Specifications Video-Bill Nye-Respiration		

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1st nine weeks	Demonstrate an understanding of how meiosis leads to variation. Describe the role of meiosis in producing variation. Describe the role of meiosis in reproduction. Describe the role of mitosis in cell repair. Describe the role of mitosis in growth. Describe the role of both mitosis and meiosis.	Bio.6.a. Describe the roles of mitotic division during growth, and repair of cells	Modern Biology Chapter 8 Cell Reproduction pp.151-159 AHSGE: Biology Student Review Guide pp.177-180 Teacher generated notes Teacher generated puzzles (Discovery School) Biology: The Dynamics of Life Study Guide and Chapter Assessment: Cell Reproduction Section Reviews 8-1-8-2 Skills Worksheet: Cell Cycle and Mitosis 4-Column Vocabulary: Phases of Mitosis Karyotype matching (internet) Teacher generated worksheet: Comparing Mitosis and Meiosis Teacher modified practice chapter test review worksheet ARI Raft: Mitosis Fairy Tales Teacher generated quiz Mitosis Microscope Lab; onion root tip and whitefish Item Specifications Video- Mitosis and Cytokinesis		

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1st nine weeks		Bio.6.b. Describe the roles of meiotic division during reproduction Bio.6.B.1.Comparing sperm and egg formation in terms of ploidy Example: ploidy – haploid, diploid	Modern Biology Chapter 8 Cell Reproduction pp.161-164 AHSGE: Biology Student Review Guide pp.181-186 Skills Worksheet: Meiosis Teacher generated worksheet: Phases of Meiosis Skills Worksheet: Cell Reproduction Teacher modified practice chapter test review worksheets Video-Meiosis Square Dance Teacher generated quiz		
		Bio. 6.B.2. Comparing sexual and asexual reproduction	Modern Biology Chapter 8 pp.154-155, 164 AHSGE: Biology Student Review Guide pp.187-189 Teacher generated notes Teacher generated worksheet: Comparing Asexual and Sexual Reproduction Teacher generated quiz Test Generator		

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1st nine weeks	Use Punnett squares to determine phenotypic and genotypic percentages. Recognize dominant and recessive alleles and their roles in determing the phenotypes of offspring. Compare the terms heterozygous and homozygous, and demonstrate an understanding of how these terms relate to phenotypes and genotypes of offspring.	Bio.7.. Apply Mendel's law to determine phenotypic and genotypic probabilities of offspring Bio.7.B.1. Defining important genetic terms, including dihybrid cross, monohybrid cross, phenotype, genotype, homozygous, heterozygous, dominant trait, recessive trait, incomplete dominance, codominance, and allele	Modern Biology Chapter 9: Fundamentals of Genetics pp.173-186 AHSGE: Biology Student Review Guide pp.193-195, 209-212 Teacher generated notes Teacher generated worksheet: Homozygous and Heterozygous practice Teacher generated worksheet: Genotype and Phenotype practice Hands-on Activity: Composite Faces (internet) Teacher generated vocabulary		

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1st nine weeks		Bio.7.B.2. Interpreting inheritance patterns shown in graphs and charts Bio.7.B.2. Calculating genotypic and phenotypic percentages and ratios using a Punnett square	Modern Biology Chapter 9 pp.182-186 AHSGE: Biology Student Review Guide pp.196-200, 217-222 Holt BioSources Quick Lab A6: Interpreting Information in a Pedigree Crosses That Involves 2 Trait (www.biologycorner.com) Teacher generated worksheets Teacher modified practice chapter test review worksheets Teacher generated Punnett Puzzles Simple Genetics Practice Problems (www.biologycorner.com) Oompah Loompa Genetics (www.biologycorner.com) Section Review 9-2 Teacher generated dihybrid crosses Skills Worksheet: Fundamentals of Genetics Teacher generated quizzes Test Generator		

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1st nine weeks	Recognize that amino acids make up protein. Recognize that proteins can function as enzymes. Compare the functions of DNA and RNA in the production of protein. Identify patterns of base pairing of DNA and RNA. Recognize DNA as making up genes and chromosomes	Bio.8. Identify the structure and function of DNA, RNA, and protein Bio.8.B.1. Explaining relationships among DNA, genes, and chromosomes	Modern Biology Chapter 10: DNA,RNA, and Protein Synthesis pp.196-210 AHSGE: Biology Student Review Guide pp.223-230 Teacher generated notes Teacher generated activity: Translating a habitat and Translating a Werewolf Science Skills: How Proteins Are Made (3 versions) Teacher generated quiz Teacher generated review: DNA replication and Protein Synthesis #1 and #2 Pathways of Learning Science: Dork DNA Modern Biology pp.151-152		

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1st nine weeks		Bio.8.B.2. Listing significant contributions of biotechnology to society, including agricultural and medical practices Examples: DNA fingerprinting, insulin, growth hormone Bio.8.B.3. Relating normal patterns of genetic inheritance to genetic variation Example: Crossing-over	AHSGE: Biology Student Review Guide pp.236-239, 181-184 Teacher generated notes included in Chapter 8		
		Bio.8.B.4. Relating ways chance, mutagens, and genetic engineering increase diversity Examples: insertion, deletion, translocation, inversion, recombinant DNA Bio.8.B.5. Relating genetic disorders and disease to patterns of genetic inheritance Examples: hemophilia, sickle cell anemia, Down's Syndrome, Tay-Sachs Disease, cystic fibrosis, color blindness, phenylketonuria (PKU)	Modern Biology Chapter 12: Inheritance Patterns and Human Genetics pp.235-248 AHSGE: Biology Student Review Guide pp. 201-222, 231-235 Teacher generated notes Teacher generated worksheets Teacher generated quiz Test Generator Video-Breaking the Code Item Specifications		

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2nd nine weeks	Identify and define similarities and differences between the five-kingdom and six-kingdom classifi cation systems.	Bio.9. Differentiate between the previous five-kingdom and current six-kingdom classification systems Bio.9.B.1. Sequencing taxa from most inclusive to least inclusive in the classification of living things Bio.9.B.5.Writing scientific names accurately by using binomial nomenclature	Modern Biology Chapter 17: Classification of Organisms pp.346-350, 337-339 AHSGE: Biology Student Review Guide pp.243-249 Teacher generated notes Section Reviews 17-1,17-3 Video-Channel One: How Living Things are Classified Worksheet: Interpreting Graphics – Taxonomy (internet) Item Specifications Teacher generated worksheet: binomial nomenclature practice Teacher generated quiz		

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2nd nine weeks		Bio.9.B.2.Identifying organisms using a dichotomous key Bio.9.B.3. Identifying ways in which organisms from the Monera, Protista, and Fungi kingdoms are beneficial and harmful. Examples: Beneficial – decomposers; Harmful – diseases Bio.9.B.4. Justifying the grouping of viruses in a category separate from living things	Modern Biology Chapter 17 pp.347-348 Teacher generated worksheets: Organizing Life and Animal Groupings AHSGE: Biology Student Review Guide pp.250-268 Teacher generated notes Dichotomous Keys: Norms, Sharks, Pamishans (internet source) Teacher generated quizzes Test Generator Item Specifications		

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2nd nine weeks	Trace the flow of energy through food chains, food webs, and energy pyramids	Bio.13. Trace the flow of energy as it decreases through the trophic levels from producers to the quaternary level in food chains, food webs, and energy pyramids Bio.13.B.4. Using the ten percent law to explain the decreasing availability of energy through the trophic levels Bio.13.B.3. Describing the niche of decomposers Bio.13.B.1. Describing the interdependence of biotic and abiotic factors in an ecosystem Examples: effects of humidity on stomata size, effects of dissolved oxygen on fish respiration Bio.13.B.2. Contrasting autotrophs and heterotrophs	Modern Biology Chapter 18 Intro to Ecology pp.359-369 AHSGE: Biology Student Review Guide pp.385-395 Teacher generated notes Video-National Geographics "America's Endangered Species" Section Reviews 18-1-18-3 Video-Channel One "Food Chains and Webs" Teacher generated video quiz Video-Abiotic Factors and the Environment Science Skills worksheet ARI-Raft: Endangered Species T-shirt design ARI-Raft: Folklore Story on Endangered Species 4 Column Vocabulary Teacher generated worksheets Teacher generated quizzes Test Generator Item Specifications Activity;"Babushka Boxes"		

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2nd nine weeks	Demonstrate an understanding of the water cycle. Describe all events of the water cycle. Demonstrate an understanding of the carbon cycle. Describe all events of the carbon cycle. Demonstrate an understanding of the oxygen cycle. Describe all events of the oxygen cycle. Demonstrate an understanding of the nitrogen cycle. Describe all events of the nitrogen cycle.	Bio.14.. Trace biogeochemical cycles through the environment, including water, carbon, oxygen, and nitrogen Bio.14.B.2. Describing the process of ecological succession	Modern Biology Chapter 18 Intro to Ecology pp.371-374; Chapter 20 pp.408-410 AHSGE: Biology Student Review Guide pp.375-384, 412-413 Teacher generated notes Video-Bill Nye-The Water Cycle ARI-Bubble Map Section Review 18-4 Skills Worksheet Teacher generated worksheets Teacher generated quiz Item Specification		

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2nd nine weeks	Identify terrestrial biomes including the tundra, desert, rainforest, grassland, taiga (coniferous forest), and the temperate deciduous forest. Identify the aquatic biomes including freshwater and marine. Identify terrestrial and aquatic biomes based on the rainfall and temperature characteristics	Bio.15. Identify biomes based on environmental factors and native organisms Example: tundra- permafrost, low humidity, lichens, polar bears	Modern Biology Chapter 21 Ecosystems pp.417-428 AHSGE: Biology Student Review Guide pp. 405-411 Teacher generated notes Video- Channel One: Biomes Teacher generated terrestrial biomes chart Teacher generated aquatic biomes chart Teacher generated worksheets Teacher generated quizzes ARI Raft- Travel Brochure Through the Biomes Test Generator, Item Specifications		

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2nd nine weeks	Identify the limiting factors that affect populations in an ecosystem as either density-dependent or density-independent including natural disasters, space, food, water, air, abiotic and biotic factors, human activity, disease, and succession.	Bio.16. Identify density-dependent and density-independent limiting factors that affect populations in an ecosystem Examples: density-dependent-disease, predator-prey relationships, availability of food and water; density-independent – natural disasters, climate Bio.16.B.1. Discriminating among symbiotic relationships, including mutualism, commensalism, and parasitism	Modern Biology Chapter 19 Populations pp.386-388; Chapter 20 pp.403-404 AHSGE: Biology Student Review Guide pp.387-388, 396-401 Teacher generated notes Teacher generated symbiosis game Teacher generated quizzes Teacher generated graphic organizers Test Generator Item Specifications		

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2nd nine weeks		Bio.14.B.1. Relating natural disasters, climate changes, nonnative species, and human activity to the dynamic equilibrium of ecosystems Examples: Natural disasters – habitat destruction resulting from tornadoes;Climate changes – changes in migratory patterns of birds; Nonnative species – exponential growth of kudzu and Zebra mussels due to absence of natural controls; Human activity – habitat destruction resulting in reduction of biodiversity, conservation resulting in preservation of biodiversity	AHSGE: Biology Student Review Guide pp. 398, 414-417 Teacher generated notes Teacher generated worksheets Teacher generated quizzes		

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2nd nine weeks	Demonstrate knowledge of structures and reproduction, identify the differences in venation patterns, and demonstrate knowledge about the signifi cance of the number of cotyledons. Distinguish between monocots and dicots. Distinguish between angiosperms and gymnosperms. Distinguish between vascular and nonvascular plants.	Bio.10. Distinguish between monocots and dicots, angiosperms and gymnosperms, and vascular and nonvascular plants.	Modern Biology Chapter 28 pp.564-565, 575-576 AHSGE: Biology Student Review Guide pp269-290 Concept Mapping: Characteristics of Monocots and Dicots ARI: Venn Diagram : Monocots and Dicots Teacher generated flow chart Video-Channel One-Plant Kingdom Teacher generated notes Teacher generated graphic organizers and worksheets Teacher generated quiz		

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2nd nine weeks		Bio.10.B.1. Describing the histology of roots, stems, leaves, and flowers Bio.10.B.2. Recognizing chemical and physical adaptations of plants Examples: Chemical – foul odor, bitter taste, toxicity; Physical – spines, needles, broad leaves	Modern Biology Chapter 29 Plant Structure and Function pp.583-602; Chapter 30 Plant Reproduction pp.613-624 AHSGE:Biology Student Review Guide pp.291-295, 299-302 Teacher generated notes ARI: Venn Diagram-Plant Adaptations (chemical and physical) Teacher generated worksheets Teacher generated quiz Item Specifications; Test Generator		

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2nd nine weeks	Compare invertebrates and vertebrates. Compare endoskeletons and exoskeletons. Compare internal and external fertilization. Compare sexual and asexual reproduction. Compare bilateral and radial symmetry. Classify animals according to type of skeletal structure. Classify animals according to method of fertilization and reproduction. Classify animals according to type of body symmetry. Classify animals according to type of body coverings. Classify animals according to type of locomotion. Classify animals according to multiple physical characteristics.	Bio.11. Classify animals according to type of skeletal structure, method of fertilization and reproduction, body symmetry, body coverings, and locomotion Examples: Skeletal structure – verte.,inverte. Fertilization – external, internal Reproduction – sexual, asexual Body symmetry – bilateral, radial, asymmetrical Body coverings – feathers, scales, fur Locomotion – cilia, flagella, pseudopodia	Modern Biology Chapters 32-43 Classifying Animals AHSGE: Biology Student Review Guide pp.305-324 Teacher generated notes Video-Channel One – Animal Kingdom Teacher generated chart/table comparing animal classifications and their features ARI-Bubble Maps Teacher generated worksheets ARI Raft-Constructing the perfect animal for specific habitats Teacher generated quizzes Test Generator Item Specifications		

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2nd nine weeks	Recognize and apply the defi nition of mimicry. (The resemblance of one organism to another or to an object in its surroundings for concealment and protection from predators.) Recognize and apply the defi nition of camoufl age. (The method or result of concealing by disguise or protective coloration such that the organism appears to be part of the natural surroundings.) Distinguish between different beak types, and identify what each type is used for. Recognize and apply the defi nition of migration. (The process of changing location periodically, especially by moving seasonally from one region to another.) Recognize and apply the defi nition of hibernation. (The process of passing winter in an inactive or dormant state.)	Bio.12. Describe protective adaptations of animals, including mimicry, camouflage, beak type, migration, and hibernation	Modern Biology pp. 365, 399-401, 898 AHSGE: Biology Student Review Guide pp.325-340 Teacher generated notes ARI Bubble Map Teacher generated worksheets Teacher generated quizzes Item Specifications ARI Raft-Ideal Animals		

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2nd nine weeks		Bio.12.B.1. Identifying ways in which the theory of evolution explains the nature and diversity of organisms Bio.12.B.2. Describing natural selection, survival of the fittest, geographic isolation, and fossil record	AHSGE: Biology Student Review Guide pp.363-374 Teacher generated notes Teacher generated worksheets Test Generator		