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Biology
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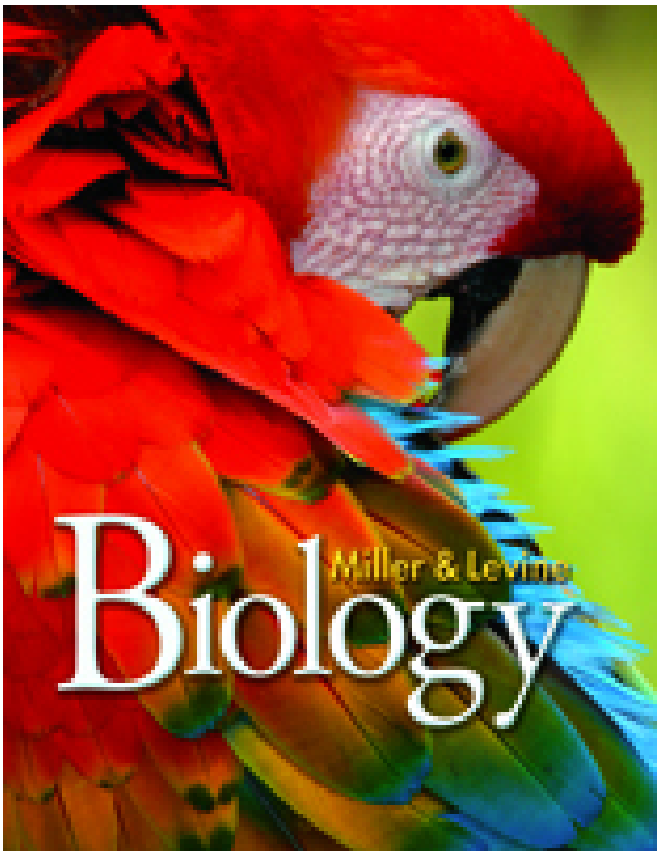

to the

Alabama Content Standards for Biology

High School

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INTRODUCTION

This document demonstrates how ***Miller & Levine Biology*** **©2014** meets the Alabama Content Standards for Biology, grades 9-12. Correlation page references are to the Student and Teacher's Editions.

Authors Ken Miller and Joe Levine have created a comprehensive on-level program to inspire students to interact with trusted and up-to-date biology content. The authors' unique storytelling style engages students in biology, with a greater focus on written and visual analogies.

Resources

Study Workbook A and Study Workbook B: Reading Foundations offer leveled resources for students of varying abilities.

- Section Summaries help students prepare for tests.
- Study Worksheets make students active and engaged readers.
- Note taking skills development helps students build understanding.
- Vocabulary Reviews with graphic organizers help students master key terminology.

Laboratory Manual A and Laboratory Manual B: Skill Foundations offer leveled activities for students of varying abilities. Teachers can choose to differentiate activities within a classroom or select from various labs to choose one that best fits the whole class profile.

Biology.com, the latest in digital instruction technology, provides a pedagogically relevant interface for your biology classroom.

- Complete Student Edition online with audio
- Complete Teacher's Edition
- Untamed Science videos (also on DVD)
- Lesson review presentations
- Editable worksheets
- Test preparation, online assessments, and remediation
- Games, animals, and simulations
- Chapter mysteries from the textbook
- Interactive study guides

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ALABAMA COURSE OF STUDY – SCIENCE	
BIOLOGY CORE – HIGH SCHOOL	
Students will:	
1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment.	**SE/TE:** 108, 193, 234, 283, 612, 683, 878, 964, 1000, A-13, A-14, A-15
• Describing the steps of the scientific method	**SE/TE:** 6-9, 28, A-8, A-9
• Comparing controls, dependent variables, and independent variables	**SE/TE:** 7, 9, 28
• Identifying safe laboratory procedures when handling chemicals and using Bunsen burners and laboratory glassware	**SE/TE:** 25, 29, 264, 283, 603, 698, 878, 964, 1000, A-11, A-12, A-13, A-14, A-15
• Using appropriate SI units for measuring length, volume, and mass	**SE/TE:** 24, 31, A-10
2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis.	**SE/TE:** 19-20, 208-211, 212-213, 214-217, 220
• Identifying functions of carbohydrates, lipids, proteins, and nucleic acids in cellular activities	**SE/TE:** 46-47, 48-49, 56-57, 200-201, 204
• Comparing the reaction of plant and animal cells in isotonic, hypotonic, and hypertonic solutions	**SE/TE:** 210-211, 221
• Explaining how surface area, cell size, temperature, light, and pH affect cellular activities	**SE/TE:** 53, 57, 240-241, 244, 245, 274-276, 278
• Applying the concept of fluid pressure to biological systems Examples: blood pressure, turgor pressure, bends, strokes	**SE/TE:** 953, 958, 959, 961
3. Identify reactants and products associated with photosynthesis and cellular respiration and the purposes of these two processes.	**SE/TE:** 226-228, 230-233, 234, 235-237, 238-239, 240-241, 244-246, 250-253, 254-260, 268
4. Describe similarities and differences of cell organelles, using diagrams and tables.	**SE/TE:** 197, 198, 200-201, 202, 206, 207
• Identifying scientists who contributed to the cell theory Examples: Hooke, Schleiden, Schwann, Virchow, van Leeuwenhoek	**SE/TE:** 190, 191, 220
• Distinguishing between prokaryotic and eukaryotic cells	**SE/TE:** 193-194, 220

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• Identifying various technologies used to observe cells Examples: light microscope, scanning electron microscope, transmission electron microscope	**SE / TE:** 191, 192, 194
5. Identify cells, tissues, organs, organ systems, organisms, populations, communities, and ecosystems as levels of organization in the biosphere.	**SE / TE:** 64, 65, 68, 216, 862-863
• Recognizing that cells differentiate to perform specific functions Examples: ciliated cells to produce movement, nerve cells to conduct electrical charges	**SE / TE:** 215, 217, 292-293, 380
6. Describe the roles of mitotic and meiotic divisions during reproduction, growth, and repair of cells.	**SE / TE:** 282-283, 284, 285, 324-329, 333
• Comparing sperm and egg formation in terms of ploidy Example: ploidy—haploid, diploid	**SE / TE:** 990
• Comparing sexual and asexual reproduction	**SE / TE:** 19, 277-278, 300
7. Apply Mendel's law to determine phenotypic and genotypic probabilities of offspring.	**SE / TE:** 315, 332
• Defining important genetic terms, including dihybrid cross, monohybrid cross, phenotype, genotype, homozygous, heterozygous, dominant trait, recessive trait, incomplete dominance, codominance, and allele	**SE / TE:** 310, 312, 314, 315, 317, 319, 320, 321
• Interpreting inheritance patterns shown in graphs and charts	**SE / TE:** 311
• Calculating genotypic and phenotypic percentages and ratios using a Punnett square	**SE / TE:** 315-316, 332
8. Identify the structure and function of DNA, RNA, and protein.	**SE / TE:** 48-49, 342-343, 344-345, 362-365
• Explaining relationships among DNA, genes, and chromosomes	**SE / TE:** 197, 279-280, 323, 328-329
• Listing significant contributions of biotechnology to society, including agricultural and medical practices Examples: DNA fingerprinting, insulin, growth hormone	**SE / TE:** 419, 430-431, 433-434, 436-439, 443

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• Relating normal patterns of genetic inheritance to genetic variation Example: crossing-over	**SE / TE:** 482-486, 499
• Relating ways chance, mutagens, and genetic engineering increase diversity Examples: insertion, deletion, translocation, inversion, recombinant DNA	**SE / TE:** 418-420, 421-427
• 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)	**SE / TE:** 395, 398-401, 412, 413
9. Differentiate between the previous five-kingdom and current six-kingdom classification systems.	**SE / TE:** 523-524, 528
• Sequencing taxa from most inclusive to least inclusive in the classification of living things	**SE / TE:** 513-515, 532
• Identifying organisms using a dichotomous key	**SE / TE:** 511
• Identifying ways in which organisms from the Monera, Protista, and Fungi kingdoms are beneficial and harmful Examples: - beneficial—decomposers, - harmful—diseases	**SE / TE:** 614-616, 622-625
• Justifying the grouping of viruses in a category separate from living things	**SE / TE:** 574 **TE only:** Quick Facts, 576
• Writing scientific names accurately by using binomial nomenclature	**SE / TE:** 512, 532
10. Distinguish between monocots and dicots, angiosperms and gymnosperms, and vascular and nonvascular plants.	**SE / TE:** 641-642, 643-645, 646-649, 650-654
• Describing the histology of roots, stems, leaves, and flowers	**SE / TE:** 650-651, 664, 668, 669-673, 674-679, 680-684, 690-691, 696-697
• Recognizing chemical and physical adaptations of plants Examples: - chemical—foul odor, bitter taste, toxicity; - physical—spines, needles, broad leaves	**SE / TE:** 684, 691

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11. Classify animals according to type of skeletal structure, method of fertilization and reproduction, body symmetry, body coverings, and locomotion. Examples: - skeletal structure—vertebrates, invertebrates; - fertilization—external, internal; - reproduction—sexual, asexual; - body symmetry—bilateral, radial, asymmetrical; - body coverings—feathers, scales, fur; - locomotion—cilia, flagella, pseudopodia	**SE / TE:** 730-731, 737-741, 742-743, 746-747, 757, 758-763, 764, 824-826
12. Describe protective adaptations of animals, including mimicry, camouflage, beak type, migration, and hibernation.	**SE / TE:** 113-114, 460-463, 472, 476-477, 478
• Identifying ways in which the theory of evolution explains the nature and diversity of organisms	**SE / TE:** 451-453, 465
• Describing natural selection, survival of the fittest, geographic isolation, and fossil record	**SE / TE:** 460-464, 471-473, 476-478, 495, 496, 497, 538-545, 566
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.	**SE / TE:** 69-70, 73-76, 77-78, 90-92
• 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	**SE / TE:** 66-67, 68, 90, 92
• Contrasting autotrophs and heterotrophs	**SE / TE:** 69, 71, 72, 228, 244
• Describing the niche of decomposers	**SE / TE:** 71, 72, 74, 90
• Using the ten percent law to explain the decreasing availability of energy through the trophic levels	**SE / TE:** 77-78, 91
14. Trace biogeochemical cycles through the environment, including water, carbon, oxygen, and nitrogen.	**SE / TE:** 79-80, 81, 82-85, 86, 91-92

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• 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	**SE / TE:** 108-109, 136, 168-170, 176, 177-179, 182-184
• Describing the process of ecological succession	**SE / TE:** 106-109, 124
15. Identify biomes based on environmental factors and native organisms. Example: tundra—permafrost, low humidity, lichens, polar bears	**SE / TE:** 110-111, 112-115, 116, 125
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	**SE / TE:** 138-141, 148-149
• Discriminating among symbiotic relationships, including mutualism, commensalism, and parasitism	**SE / TE:** 103-104, 124, 614-616