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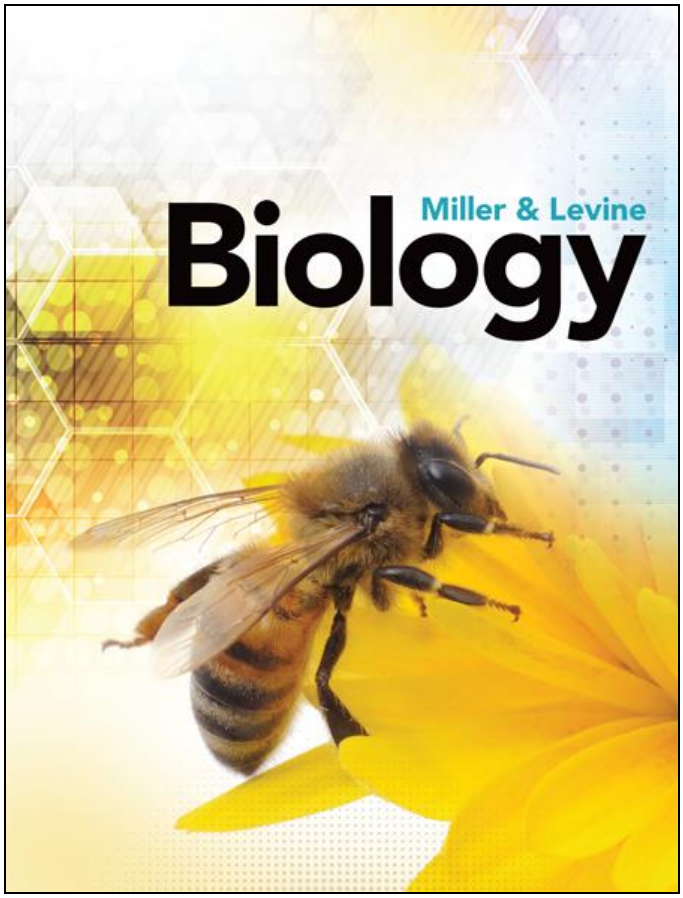

To the

Georgia Standards of Excellence for Science - Biology

Pearson

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to the
Georgia Standards of Excellence for Science: Biology

Introduction

This document demonstrates how ***Miller & Levine Biology ©2019*** meets the Georgia Standards of Excellence for Science in Biology for Grades 9-12. Correlation page references are to the Student and Teacher's Editions and cited at the page level.

Renowned Author Team 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. This innovative and fresh new program was developed for modern biology classrooms with a focus on STEM integration and 21st century education.

Problem-Based Learning The Problem-Based Learning Strand introduced in each unit opener immerses students in an active learning environment with lab investigations, STEM projects, virtual activities, and authentic readings. When students each the end of the unit, they use their newly acquired scientific knowledge and data to design, test, and evaluate a solution to the presented problem.

Performance-Based Assessment Authentic assessments of STEM learning allow students to demonstrate mastery of the chapter concepts and new standards. All Performance-Based Assessments feature real-world problems and focus on science inquiry, engineering, and STEM practices.

Case Studies Students directly interact with science phenomena in every chapter as they learn about a real-world science problem. Throughout the lessons, students find case study connections in data analysis activities, labs, diagrams, illustrations, and interactivities.

Interactive Learning Students interact with digital art, videos, and animations through interactive prompts or questions, making ***Miller & Levine Biology*** relevant to their lives.

Reading and Study Support *Biology Foundations: Reading and Study Guide Workbook* includes lesson summaries, vocabulary help, and reading tools. Practice focuses on key concepts and science literacy to improve students' understanding of scientific text.

PearsonRealize.com PearsonRealize.com is your online destination for the complete Miller & Levine Biology digital curriculum. A single sign-on provides access to biology content, assessments, resources, management tools, and real-time student data. Realize directly syncs with providers such as Google® and OpenEd to provide a seamless digital experience.

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to the
Georgia Standards of Excellence for Science: Biology

Georgia Standards of Excellence for Science, Biology	Miller & Levine Biology ©2019
SB1 Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.	
SB1.a Construct an explanation of how cell structures and organelles (including nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, Golgi, endoplasmic reticulum, vacuoles, ribosomes, and mitochondria) interact as a system to maintain homeostasis.	**SE/TE:** Figure 8-6 The Cell as a Factory, 249; Figure 8-7 Nucleus, 249; Figure 8-8 Making Proteins, 250-251; Figure 8-14 Cell Membrane, 256; Figure 8-15 Mosaic, 257; Figure 8-16 Comparing Cell Types, 258-259; Figure 8-17 Diffusion, 261; Exploration Lab: Detecting Diffusion, 261; Figure 8-19 Osmosis, 262; Figure 8-20 Osmotic Pressure, 263; Figure 8-21 Active Transport, 264-265; Lesson 8.3 Review question 5, 265; Chapter 8 Assessment question 33, 42, 52, 276-278; Supporting Content: Cell Structure, 248-259; Cell Transport, 260-265
SB1.b Develop and use models to explain the role of cellular reproduction (including binary fission, mitosis, and meiosis) in maintaining genetic continuity.	**SE/TE:** Quick Lab: Mitosis, 347; Model of Meiosis, 396; Figure 12-18 Comparing Mitosis and Meiosis, 397; Supporting Content: Cell Division and Reproduction, 341-342; The Cell Cycle, 345-345; Mitosis, 346-347; Comparing Meiosis to Mitosis, 393-397 **TE Only:** Build Science Skills, 345; Build Science Skills, 349; Build Science Skills, 394
SB1.c Construct arguments supported by evidence to relate the structure of macromolecules (carbohydrates, proteins, lipids, and nucleic acids) to their interactions in carrying out cellular processes.	**SE/TE:** Case Study: Trace Elements, 54; Lesson 2.3 Review question 4, 57; Chapter Assessment, 69; Supporting Content: Macromolecules, 53-57
SB1.d Plan and carry out investigations to determine the role of cellular transport (e.g., active, passive, and osmosis) in maintaining homeostasis.	**SE/TE:** Exploration Lab: Detecting Diffusion, 261; Science Skills Activity Cell Transport in Plants, 263; Supporting Content: Cell Transport, 260-265

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SB1.e Ask questions to investigate and provide explanations about the roles of photosynthesis and respiration in the cycling of matter and flow of energy within the cell (e.g., single-celled alga).	**SE/TE:** Lesson 10.1 Review questions 3, 5, 313; Supporting Content: Primary Producers, 114; Biological Processes, 126; An Overview of Photosynthesis, 289; An Overview of Respiration, 311; Comparing Photosynthesis and Cellular Respiration, 313 **TE Only:** Build Science Skills, 127
SB2 Obtain, evaluate, and communicate information to analyze how genetic information is expressed in cells.	
SB2.a Construct an explanation of how the structures of DNA and RNA lead to the expression of information within the cell via the processes of replication, transcription, and translation.	**SE/TE:** Chapter 13 Assessment, question 31, 436; Lesson 14.1 Review, questions 2, 3, 444; Analyzing Data, 447; Lesson 14.2 Review, questions 1, 2, 3, 450; Supporting Content: The Role of DNA, 416; DNA Replication, 424-427; RNA, 440-444; Ribosomes and Protein Synthesis, 445-450
SB2.b Construct an argument based on evidence to support the claim that inheritable genetic variations may result from: new genetic combinations through meiosis (crossing over, nondisjunction); non-lethal errors occurring during replication (insertions, deletions, substitutions); and/or heritable mutations caused by environmental factors (radiation, chemicals, and viruses).	**SE/TE:** Lesson 14.1 Review questions 1-6, 444; Lesson 15.2 Review question 1, 484 Performance Based Assessment: Tracking Royal Blood, 498-499; Topic Assessment, 501; Supporting Content: Prophase I, 394; Mutations, 457-461; Chromosomal Disorders, 480 **TE Only:** Differentiated Instruction, 483

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SB2.c Ask questions to gather and communicate information about the use and ethical considerations of biotechnology in forensics, medicine, and agriculture.	**SE/TE:** Performance-Based Assessment: A Tale of Two Diseases - Lung Cancer and Melanoma, 948-949; Case Study: What will the future hold for genetically-modified crops?, 528-529; Performance-Based Assessment: Gene Therapy, 532-533
SB3 Obtain, evaluate, and communicate information to analyze how biological traits are passed on to successive generations.	
SB3.a Use Mendel's laws (segregation and independent assortment) to ask questions and define problems that explain the role of meiosis in reproductive variability.	**SE/TE:** Lesson 12.4 Review questions 4, 5, 399; Supporting Content: A Summary of Mendel's Principles, 389; Applying Mendel's Principles, 383-389; Genes and Alleles, 380; Dominant and Recessive Alleles, 380; Replication and Separation of Generic Material, 396; Gene Linkage, 398
SB3.c Construct an argument to support a claim about the relative advantages and disadvantages of sexual and asexual reproduction.	**SE/TE:** Lesson 11.1 Review questions 2, 5, 342; Lesson 26.3 Review question 1, 887; Chapter 26 Assessment question 47, 900; Supporting Content: Cell Division and Reproduction, 341-342; Asexual and Sexual Reproduction, 880-881; Topic Assessment, Write About Science, 900 **TE Only:** Build Science Skills, 881

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SB4 Obtain, evaluate, and communicate information to illustrate the organization of interacting systems within single-celled and multi-celled organisms.	
SB4.a Construct an argument supported by scientific information to explain patterns in structures and function among clades of organisms, including the origin of eukaryotes by endosymbiosis. Clades should include: archaea, bacteria, eukaryotes - fungi, plants, animals.	**SE/TE:** Argument-Based Inquiry: Construct a Cladogram, 628; Chapter 19 Assessment questions 20, 21, 23, 25, 26, 28, 35-39, 45, 637-638; Lesson 20.2 Review questions 1-6, 658; Lesson 21.2 Review question 1, 697; Supporting Content: Modern Evolutionary Classification, 619-629; Evolutionary Patterns and Processes, 653-658; The Earliest Eukaryotes, 662-663; What are Prokaryotes?, 689-690; Animal Evolution and Diversity, 807-815; Primate Evolution, 816-821 **TE Only:** Build Writing Skills, 621; Build Writing Skills, 663; Build Science Skills, 811; Build Writing Skills, 813; Build Science Skills, 819; Build Science Skills, 820
SB4.b Analyze and interpret data to develop models (i.e., cladograms and phylogenetic trees) based on patterns of common ancestry and the theory of evolution to determine relationships among major groups of organisms.	**SE/TE:** Argument-Based Inquiry: Construct a Cladogram, 628; Chapter 19 Assessment question 39-43, 638; Case Study Wrap-Up, 630-631; Performance-Based Assessment: Build a Cladogram, 634-635; Supporting Content: Finding Order in Biodiversity, 613-618; Modern Evolutionary Classification, 619-629; Evolutionary Patterns and Processes, 653-658; The Earliest Eukaryotes, 662-663; What are Prokaryotes?, 689-690; Animal Evolution and Diversity, 807-815; Primate Evolution, 816-821 **TE Only:** Build Writing Skills, 616; Differentiated Instruction, 625; Build Science Skills, 626; Differentiated Instruction, 626

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SB4.c Construct an argument supported by empirical evidence to compare and contrast the characteristics of viruses and organisms.	**SE/TE:** Reading Tool, 682; Quick Lab, How do viruses differ in structure?, 683; Lesson 21.1 Review question 4-6, 688; Topic Assessment, 717; Supporting Content: Viruses and Cells, 688 **TE Only:** Differentiated Instruction, 684
SB5 Obtain, evaluate, and communicate information to assess the interdependence of all organisms on one another and their environment.	
SB5.a Plan and carry out investigations and analyze data to support explanations about factors affecting biodiversity and populations in ecosystems.	**SE/TE:** Argument-Based Inquiry: Estimating Population Size, 148; In Your Neighborhood Guided Inquiry: Biodiversity on the Forest Floor, 188; Supporting Content: How Populations Grow, 144-151; Limits to Growth, 152-157; Biodiversity, Ecosystems, and Resilience, 186-189
SB5.b Develop and use models to analyze the cycling of matter and flow of energy within ecosystems through the processes of photosynthesis and respiration. Arranging components of a food web according to energy flow. Comparing the quantity of energy in the steps of an energy pyramid. Explaining the need for cycling of major biochemical elements (C, O, N, P, and H).	**SE/TE:** Quick Lab: How Can You Model Energy Flow in Ecosystems?, 121; Lesson 4.2 Review questions 1, 2, 5, 122; Figure 4.7, The Matter Mill, 123; Figure 4.9, The Water Cycle, 125; Figure 4.11, The Carbon Cycle, 127; Figure 4.13, The Nitrogen Cycle, 129; Lesson 4.3 Review question 7, 131; Supporting Content: Energy Flows in Ecosystems, 118-122; Cycles of Matter, 123-131; Performance Based Assessment: Can Algal Blooms Be Useful?, 136-137; Chapter 4 Assessment questions 21, 23, 28, 138-140 **TE Only:** Build Science Skills, 126

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SB5.c Construct an argument to predict the impact of environmental change on the stability of an ecosystem.	**SE/TE:** Performance-Based Assessment: The Populations of Yellowstone, 194-195; Chapter 6 Assessment questions 24, 31, 197; Supporting Content: How do species interactions shape ecosystems, 173; Succession, 182-185; How do species interactions shape ecosystems?, 191 **TE Only:** Build Science Skills, 183
SB5.d Design a solution to reduce the impact of a human activity on the environment.	**SE/TE:** Case Study: Biology and technology solve problems, 30-31; Problem-Based Learning: Invasives in Your Neighborhood, 74-75; Case Study: From harmless algal bloom to toxic menace: What's to blame?, 132-133; Performance-Based Assessment: Can Algal Blooms Be Useful, 136-137; Case Study: How can a rising tide be stopped?, 226-227; Performance-Based Assessment: Biodiversity in the Everglades, 230-231; Problem-Based Learning: Power from Pond Scum, 238-239; Case Study: How do species interactions shape ecosystems, 190-191; Performance-Based Assessment: Data from the Corn Field, 302-303; Case Study: Can San Francisco sourdough be copied?, 326-327; Case Study: Living things don't carry ID cards... or do they?, 428-429; Problem-Based Learning: Recovery Plans for Endangered Species, 678-679; Case Study: How can we save the crops we depend on?, 788-789

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SB5.e Construct explanations that predict an organism's ability to survive within changing environmental limits (e.g., temperature, pH, drought, fire).	**SE/TE:** Analyzing Data: Predator-Prey Dynamics, 178; Performance-Based Assessment: Making a Better Bread - Mastering Fermentation, 330-331; Performance-Based Assessment: Good Grief! When Weeds Fight Back!, 604-605; Supporting Content: Habitats, Niches, and Species Interactions, 174-181; Succession, 182-185 **TE Only:** Build Science Skills, 183
SB6 Obtain, evaluate, and communicate information to assess the theory of evolution.	
SB6.a Construct an explanation of how new understandings of Earth's history, the emergence of new species from pre-existing species, and our understanding of genetics have influenced our understanding of biology.	**SE/TE:** Lesson 17.3 Review question 2, 559; Case Study Wrap Up, 568-569; Topic Assessment, 576; Supporting Content: Darwin's Theory, 555-559; Genetics Joins Evolutionary Theory, 580-582; Evolutionary Patterns and Processes, 652-658; Earth's Early History, 659-665
SB6.b Analyze and interpret data to explain patterns in biodiversity that result from speciation.	**SE/TE:** Lesson 17.3 Review question 2, 559; Lesson 18.3 Review question 3, 595; Performance-Based Assessment: Evolution in Action, 572-573; Topic Assessment, 576; Supporting Content: Case Study: Lizards, Legs, and the Diversity of Life, 543, 568-569; Observations from the Voyage, 546-548; Common Ancestry, 558-559; The Process of Speciation, 592-595; Evolutionary Patterns and Processes, 652-658
SB6.c Construct an argument using valid and reliable sources to support the claim that evidence from comparative morphology (analogous vs. homologous structures), embryology, biochemistry (protein sequence) and genetics support the theory that all living organisms are related by way of common descent.	**SE/TE:** Exploration Lab: Evidence of Evolution, 565; Lesson 17.4 Review question 3, 567; Supporting Content: Common Ancestry, 558-559; Comparing Anatomy and Development, 562-564; Figure 17-15 Homologous Structures, 563; Genetics and Molecular Biology, 564-565

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SB6.d Develop and use mathematical models to support explanations of how undirected genetic changes in natural selection and genetic drift have led to changes in populations of organisms.	**SE/TE:** Quick Lab: Modeling Genetic Drift, 588; Topic Assessment, 608; Supporting Content: Natural Selection on a Single-Gene Trait, 586; Natural Selection of Polygenic Traits, 586-587; Genetic Drift, 588-589; Evolution Versus Genetic Equilibrium, 589-591 **TE Only:** Differentiated Instruction, 586
SB6.e Develop a model to explain the role natural selection plays in causing biological resistance (e.g., pesticides, antibiotic resistance, and influenza vaccines).	**SE/TE:** Lesson 18.2 Review question 6, 591; Case Study: How can antibiotics keep up with drug-resistant bacteria?, 600-601; Performance-Based Assessment: When Weeds Fight Back!, 604-605; Supporting Content: Helpful Effects, 461; Evolution as Genetic Change, 585; "Superbugs", 695