



Biology

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STANDARDS		PAGE REFERENCES
Standard 1: Nature of Science		
Students exercise the basic tenets of scientific investigation, make accurate observations, exercise critical thinking skills, apply proper scientific instruments of investigation and measurement tools, and communicate results in problem solving. Students evaluate the validity of information by utilizing the tools of scientific thinking and investigation. Students summarize their findings by creating lab reports using technical writing including graphs, charts, and diagrams to communicate the results of investigations.		
Goal 1.1: Understand Systems, Order, and Organization		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.1.1.1	Explain the scientific meaning of system, order, and organization. (648.01a)	Student Edition: 36, 38, 484-489, 490-496 <i>Data Analysis Lab</i> 494 <i>MiniLab</i> 488 <i>National Geographic</i> 37 Teacher Wraparound Edition: A 487, 491; CB 485; CT 493; D 484, 488, 490, 493; DC 489, 491, 493; RS 487; SP 492, 494, 496; WS 492

STANDARDS		PAGE REFERENCES
9-10.B.1.1.2	Apply the concepts of order and organization to a given system. (648.01a)	Student Edition: <i>BioLab</i> 505 <i>Data Analysis Lab</i> 494 <i>MiniLab</i> 488, 500 <i>National Geographic</i> 37 Teacher Wraparound Edition: A 487, 491; CB 485; CT 493; D 16, 38, 484, 488, 490, 493; DC 489, 491, 493; RS 487; SP 492, 494, 496; WS 492
Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanation		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.1.2.1	Use observations and data as evidence on which to base scientific explanations. (648.02a)	Student Edition: 11-16 <i>BioLab</i> 107, 209 <i>Data Analysis Lab</i> 39, 98, 169, 189, 232 <i>Design Your Own BioLab</i> 23, 83, 173 <i>Launch Lab</i> 3, 31 <i>MiniLab</i> 19, 159, 203 <i>National Geographic</i> 17 Teacher Wraparound Edition: CB 17, 20; DC 16
9-10.B.1.2.2	Develop models to explain concepts or systems. (648.02b)	Student Edition: 492-496 <i>Data Analysis Lab</i> 528 <i>Design Your Own BioLab</i> 871 <i>MiniLab</i> 66, 331, 334, 361, 365, 1035, 1052 <i>National Geographic</i> 497 Teacher Wraparound Edition: DC 188, 191
9-10.B.1.2.3	Develop scientific explanations based on knowledge, logic and analysis. (648.02c)	Student Edition: 11-16, 18-21 <i>BioLab</i> 107 <i>Data Analysis Lab</i> 39, 63, 98, 189, 194, 837 <i>Design Your Own BioLab</i> 23, 51, 533 <i>MiniLab</i> 19, 42, 48, 77, 101, 121, 127 <i>National Geographic</i> 17 Teacher Wraparound Edition: D 7, 16

STANDARDS		PAGE REFERENCES
Goal 1.3: Understand Constancy, Change, and Measurement		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.1.3.1	Measure changes that can occur in and among systems. (648.03b)	Student Edition: <i>BioLab</i> 107, 137, 843, 1011, 1067 <i>Design Your Own BioLab</i> 83, 173 <i>Launch Lab</i> 31 <i>MiniLab</i> 48, 127, 965 Teacher Wraparound Edition: SP 20
9-10.B.1.3.2	Analyze changes that can occur in and among systems. (648.03b)	Student Edition: <i>BioLab</i> 107, 137, 843 <i>Data Analysis Lab</i> 39, 63, 98, 131, 164, 420, 549, 806, 859 <i>Design Your Own BioLab</i> 83, 173 <i>Launch Lab</i> 31 <i>MiniLab</i> 42, 77, 101, 120, 127, 154, 159, 468, 938, 965, 1093
9-10.B.1.3.3	Measure and calculate using the metric system. (648.03c)	Student Edition: <i>BioLab</i> 107, 137, 209, 409 <i>Data Analysis Lab</i> 1028, 1090 <i>Design Your Own BioLab</i> 173, 1039 <i>Launch Lab</i> 217, 1019 <i>MiniLab</i> 154, 159, 245, 1023 Teacher Wraparound Edition: D 14; SP 20
Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State		
Reference to 7.S.3.2.1		
Goal 1.5: Understand Concepts of Form and Function		
No objectives in Biology.		

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Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.1.6.1	Identify questions and concepts that guide scientific investigations. (649.01a)	Student Edition: 16, 18-21 <i>BioLab</i> 107, 351, 475, 809 <i>Design Your Own BioLab</i> 23, 235, 533, 593, 681 <i>MiniLab</i> 8, 19, 66, 127, 154, 203, 396, 488, 564, 580, 672, 728, 1035 <i>National Geographic</i> 17 Teacher Wraparound Edition: CB 17
9-10.B.1.6.2	Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b)	Student Edition: <i>Design Your Own BioLab</i> 23, 51, 83, 173, 235, 287, 533, 567, 593, 653, 681, 717, 871, 925, 1039 <i>MiniLab</i> 500 Teacher Wraparound Edition: A 13; D 205
9-10.B.1.6.3	Use appropriate technology and mathematics to make investigations. (649.01c)	Student Edition: 432 <i>BioLab</i> 209, 1067 <i>MiniLab</i> 48, 127, 154, 203, 223, 245
9-10.B.1.6.4	Formulate scientific explanations and models using logic and evidence. (649.01d)	Student Edition: <i>BioLab</i> 107 <i>Design Your Own BioLab</i> 871 <i>MiniLab</i> 159, 281, 331, 361, 365, 1035, 1052 Teacher Wraparound Edition: A 329
9-10.B.1.6.5	Analyze alternative explanations and models. (649.01e)	Student Edition: <i>BioLab</i> 107, 209, 317, 351, 381, 409, 443, 505 <i>Design Your Own BioLab</i> 235, 287 <i>MiniLab</i> 19, 66, 331, 334, 365, 468 Teacher Wraparound Edition: A 329

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9-10.B.1.6.6	Communicate and defend a scientific argument. (649.01f)	Student Edition: 11-16 <i>BioLab</i> 107, 1067 <i>Data Analysis Lab</i> 39, 63, 98 <i>Design Your Own BioLab</i> 23, 51, 83, 567 <i>Launch Lab</i> 31, 91, 575 <i>MiniLab</i> 19, 77, 101, 281, 564, 1093 <i>National Geographic</i> 17 Teacher Wraparound Edition: A 13; DC 13
9-10.B.1.6.7	Explain the differences among observations, hypotheses, and theories. (649.01g)	Student Edition: 3, 11, 14, 16, 18-21, 422-423 <i>National Geographic</i> 17, 421 Teacher Wraparound Edition: CB 17; D 16; DC 16; SP 17
Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors		
No objectives in Biology.		
Goal 1.8: Understand Technical Communication		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.1.8.1	Analyze technical writing, graphs, charts, and diagrams. (658.02a)	Student Edition: <i>Data Analysis Lab</i> 14, 39, 98, 131, 164, 169, 189, 194, 232, 251, 274, 303, 340, 348, 376, 406, 420, 435, 459, 494, 528, 544, 549, 590, 611, 615, 646, 732, 777, 837 <i>National Geographic</i> 316 Teacher Wraparound Edition: WIB 22

STANDARDS		PAGE REFERENCES
Standard 2: Physical Science		
No goals or objectives in Biology.		
Standard 3: Biology		
Students explain the importance of cells as they relate to the organization and structure of complex organisms, differentiation and specialization during development, and the chemical reactions necessary to sustain life. Students describe the functions of cell structures. Students use the theory of evolution to explain diversity of life.		
Goal 3.1: Understand the Theory of Biological Evolution		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.3.1.1	Use the theory of evolution to explain how species change over time. (652.01a)	Student Edition: 13, 418, 423-427, 452-460, 461-466, 467-473 <i>BioLab</i> 475 <i>Launch Lab</i> 417 <i>National Geographic</i> 421 Teacher Wraparound Edition: A 421; CB 418; CT 425; D 424, 425, 426; DC 425, 426; MI 423; RS 425; SP 423, 426, 427
9-10.B.3.1.2	Explain how evolution is the consequence of interactions among the potential of a species to increase its numbers, genetic variability, a finite supply of resources, and the selection by the environment of those offspring better able to survive and reproduce. (652.01a)	Student Edition: 418-420, 423-429, 431-441 <i>Data Analysis Lab</i> 435 <i>Launch Lab</i> 417 <i>MiniLab</i> 429 <i>National Geographic</i> 421 Teacher Wraparound Edition: A 421; CB 432, 436; CT 425, 436; D 420, 426, 428, 429; DC 434; RS 425; WS 424, 433
Goal 3.2: Understand the Relationship between Matter and Energy in Living Systems		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.3.2.1	Explain how matter tends toward more disorganized states (entropy). (653.01a)	Student Edition: 218-219 <i>Launch Lab</i> 217 Teacher Wraparound Edition: MI 218

STANDARDS		PAGE REFERENCES
9-10.B.3.2.2	Explain how organisms use the continuous input of energy and matter to maintain their chemical and physical organization. (653.01b)	Student Edition: 218-221, 222-224 <i>Launch Lab</i> 217 <i>MiniLab</i> 220 <i>National Geographic</i> 225 Teacher Wraparound Edition: CT 221; D 224; MI 218; SP 219
9-10.B.3.2.3	Show how the energy for life is primarily derived from the sun through photosynthesis. (653.01c)	Student Edition: 218-221, 222-224 <i>Design Your Own BioLab</i> 235 <i>Launch Lab</i> 217 Teacher Wraparound Edition: CT 227; D 224; DC 225, 232
9-10.B.3.2.4	Describe cellular respiration and the synthesis of macromolecules. (653.01d)	Student Edition: 218-221, 228-233 <i>Launch Lab</i> 217 Teacher Wraparound Edition: A 228; CT 233; D 231; DC 225, 228, 230, 231; RS 229, 230; WS 229, 231
9-10.B.3.2.5	Show how matter cycles and energy flows through the different levels of organization of living systems (cells, organs, organisms, communities) and their environment. (653.01h)	Student Edition: 34-36, 41-44, 45-49, 60-64, 65-66, 218-221, 222-224, 228-233 <i>Launch Lab</i> 217 <i>MiniLab</i> 42 <i>National Geographic</i> 37, 225 Teacher Wraparound Edition: CT 41; D 45; MI 45
Goal 3.3: Understand the Cell is the Basis of Form and Function for All Living Things		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.3.3.1	Identify the particular structures that underlie the cellular functions. (651.01a)	Student Edition: 182-185, 187-190, 191, 193-200 <i>Data Analysis Lab</i> 189, 194 <i>National Geographic</i> 192, 225 Teacher Wraparound Edition: CB 195, 196, 197; CT 194, 198; D 187, 188, 191; DC 195, 197, 199; RS 195

STANDARDS		PAGE REFERENCES
9-10.B.3.3.2	Explain cell functions involving chemical reactions. (651.01b)	Student Edition: 201-203, 220-224, 228-233 <i>Data Analysis Lab</i> 189 <i>National Geographic</i> 225 Teacher Wraparound Edition: A 202; CB 337; CT 204, 227, 233; FA 227
9-10.B.3.3.3	Explain how cells use DNA to store and use information for cell functions. (651.01c)	Student Edition: 326-332, 333-338, 340-349 <i>MiniLab</i> 331 <i>National Geographic</i> 339 Teacher Wraparound Edition: CB 327; D 330, 339; DC 329
9-10.B.3.3.4	Explain how selective expression of genes can produce specialized cells from a single cell. (651.01e)	Student Edition: 309, 342-344 Teacher Wraparound Edition: CB 344; D 309
Standard 4: Earth and Space Systems		
No goals or objectives in Biology.		
Standard 5: Personal and Social Perspectives; Technology		
Students understand that science and technology interact and impact both society and the environment. Students describe issues such as water and air quality, hazardous waste, renewable and nonrenewable resources.		
Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced		
Objective(s): By the end of Biology, the student will be able to:		
9-10.B.5.1.1	Analyze environmental issues such as water and air quality, hazardous waste, forest health, and agricultural production. (656.01a)	Student Edition: 6, 60-64, 68-73, 74-81, 126, 172, 588, 1079 <i>Biology and Society</i> 50, 1010 <i>Design Your Own BioLab</i> 51, 83 <i>MiniLab</i> 48, 77 <i>National Geographic</i> 67, 82, 136, 172 Teacher Wraparound Edition: CT 73, 75; D 69, 126

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<p>Goal 5.2: Understand the Relationship between Science and Technology</p>		
<p>Objective(s): By the end of Biology, the student will be able to:</p>		
9-10.B.5.2.1	Explain how science advances technology. (655.01a)	<p>Student Edition: 4-6, 11-16 <i>BioDiscoveries</i> 22, 752, 924 <i>Careers in Biology</i> 184 <i>Cutting-Edge Biology</i> 106, 208, 234, 442, 504, 532, 808, 952, 982 <i>MiniLab</i> 101</p> <p>Teacher Wraparound Edition: WS 4</p>
9-10.B.5.2.2	Explain how technology advances science. (655.01a)	<p>Student Edition: 4-6, 11-16 <i>BioDiscoveries</i> 752, 924 <i>Careers in Biology</i> 184 <i>Cutting-Edge Biology</i> 106, 208, 234, 442, 504, 532, 952, 982 <i>MiniLab</i> 101</p> <p>Teacher Wraparound Edition: WS 4</p>
9-10.B.5.2.3	Explain how science and technology are pursued for different purposes. (656.01b)	<p>The teacher may expand on the following page references to meet this standard.</p> <p>Student Edition: 4-6, 11-16, <i>BioDiscoveries</i> 22, 752, 924 <i>Careers in Biology</i> 184 <i>Cutting-Edge Biology</i> 106, 208, 234, 442, 504, 532, 808, 952, 982 <i>MiniLab</i> 101</p> <p>Teacher Wraparound Edition: WS 4</p>

STANDARDS		PAGE REFERENCES
<p>Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them</p>		
<p>Objective(s): By the end of Biology, the student will be able to:</p>		
<p>9-10.B.5.3.1</p>	<p>Describe the difference between renewable and nonrenewable resources. (656.03a)</p>	<p>Student Edition: 124, 129-131</p> <p>Teacher Wraparound Edition: DC 130; SP 130</p>