



Biology

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STANDARDS	PAGE REFERENCES
<p>Science As Inquiry requires students to combine processes and scientific knowledge with scientific reasoning and critical thinking to develop their understanding of science.</p>	
<p>12.2.1 By the end of twelfth grade, students will develop the abilities needed to do scientific inquiry.</p>	
<ul style="list-style-type: none"> Formulate questions and identify concepts that guide scientific investigations. 	<p>Student Edition: 11-14, 16, 18-20 <i>BioLab: Design Your Own</i> 23, 173, 533, 567, 593 <i>National Geographic</i> 17 <i>Section Assessment</i> 21 (#1) Teacher Wraparound Edition: CT 18; DC 16; SP 17; WS 20</p>
<ul style="list-style-type: none"> Design and conduct scientific investigations. 	<p>Student Edition: 16, 18-20 <i>BioLab: Design Your Own</i> 23, 83, 173, 533, 567, 593, 653, 1035 <i>Section Assessment</i> 21 (#5) Teacher Wraparound Edition: CT 18</p>

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<ul style="list-style-type: none"> Use technology and mathematics to improve investigations and communications. 	<p>Student Edition: <i>BioLab</i> 623, 783, 809, 1011, 1067 <i>BioLab: Design Your Own</i> 235 <i>Cutting-Edge Biology</i> 106 <i>Investigation and Experimentation</i> xxxvi, xl-xli</p> <p>Teacher Wraparound Edition: CB 20</p>
<ul style="list-style-type: none"> Formulate and revise scientific explanations and models using logic and evidence. 	<p>Student Edition: <i>BioDiscoveries</i> 842 <i>BioLab: Design Your Own</i> 23, 83, 173, 287, 653 <i>In the Field</i> 408</p> <p>Teacher Wraparound Edition: AC 842; DIB 408; WS 435</p>
<ul style="list-style-type: none"> Recognize and analyze alternative explanations and models. 	<p>Student Edition: 402-406, 440-441 <i>BioDiscoveries</i> 842 <i>BioLab: Design Your Own</i> 23, 83, 173, 287, 653 <i>In the Field</i> 408</p> <p>Teacher Wraparound Edition: CB 404; DC 440; DIB 408</p>
<ul style="list-style-type: none"> Communicate and defend a scientific argument. 	<p>Student Edition: <i>BioLab: Design Your Own</i> 23, 83, 173, 235, 287, 653, 925 <i>MiniLab</i> 77 <i>Section Assessment</i> 407 (#6)</p> <p>Teacher Wraparound Edition: AC 257; DC 407</p>
<p>Life Science focuses on science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</p>	
<p>12.4.1 By the end of twelfth grade, students will develop an understanding of the cell.</p>	
<ul style="list-style-type: none"> Investigate and describe the form and function of subcellular structures that regulate cell activities. 	<p>Student Edition: 186, 193-200 <i>Data Analysis Lab</i> 194 <i>National Geographic</i> 192</p> <p>Teacher Wraparound Edition: CB 195; CT 194, 196; FA 200; RS 195; WS 193</p>

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<ul style="list-style-type: none"> Investigate and describe cell functions (e.g., photosynthesis, respiration, cell division). 	<p>Student Edition: 201-207, 220, 222-224, 226, 228-233, 246-247, 248, 250-252 <i>Launch Lab</i> 243 <i>MiniLab</i> 220, 223 <i>National Geographic</i> 225, 249</p> <p>Teacher Wraparound Edition: DC 250; RE 233; WS 205</p>
<ul style="list-style-type: none"> Investigate and understand that complex multicellular organisms are formed as highly organized arrangements of differentiated cells. 	<p>Student Edition: 8, 694, 697, 699</p> <p>Teacher Wraparound Edition: DC 698; DE 694; WS 694</p>
<p>12.4.2 By the end of twelfth grade, students will develop an understanding of the molecular basis of heredity.</p>	
<ul style="list-style-type: none"> Investigate and describe how DNA carries the genetic code. 	<p>Student Edition: 171, 330-331, 336-338, 340-341 <i>MiniLab</i> 331 <i>National Geographic</i> 339 <i>Section Assessment</i> 341 (#1)</p> <p>Teacher Wraparound Edition: DC 171; DE 330, 339; WS 336</p>
<ul style="list-style-type: none"> Investigate and understand that genetic variation occurs when genetic information is transmitted during sexual reproduction. 	<p>Student Edition: 270-271, 275-276, 283 <i>Section Assessment</i> 276 (#5)</p> <p>Teacher Wraparound Edition: DC 276; SP 271</p>
<ul style="list-style-type: none"> Investigate and explain how some mutations could help, harm or have no effect on individual organisms. 	<p>Student Edition: 254-255, 345-349, 434</p> <p>Teacher Wraparound Edition: CT 349; DC 347; WS 346</p>
<ul style="list-style-type: none"> Investigate and explain how mutations in sex cells, but not in body cells, could be passed on to offspring. 	<p>Student Edition: 349, 434</p> <p>Teacher Wraparound Edition: CT 349</p>

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<p>12.4.3 By the end of twelfth grade, students will develop an understanding of the theory of biological evolution.</p>	
<ul style="list-style-type: none"> Understand that the concept of biological evolution is a theory which explains the consequence of the interactions of: (1) the potential for a species to increase its numbers; (2) the genetic variability of offspring due to mutation and recombination of genes; (3) a finite supply of the resources of life; and (4) the ensuing selection by the environment of those offspring better able to survive and leave offspring. 	<p>Student Edition: 420, 422, 431-436, 439-441 <i>BioLab</i> 443 <i>Data Analysis Lab</i> 435 <i>National Geographic</i> 421 <i>Launch Lab</i> 417</p> <p>Teacher Wraparound Edition: DC 421</p>
<ul style="list-style-type: none"> Investigate and use the theory of biological evolution to explain diversity of life. 	<p>Student Edition: 405-407, 438-440, 495-496, 498 <i>National Geographic</i> 497 <i>Section Assessment</i> 441 (#3)</p> <p>Teacher Wraparound Edition: DC 405; SP 495, 497</p>
<ul style="list-style-type: none"> Investigate whether natural selection provides a scientific explanation of the fossil record and the molecular similarities among the diverse species of living organisms. 	<p>Student Edition: 423-428 <i>BioLab</i> 443 <i>Section Assessment</i> 430 (#1-#4)</p> <p>Teacher Wraparound Edition: MI 423</p>
<ul style="list-style-type: none"> Investigate and use biological classifications based on similarities. 	<p>Student Edition: 484-489, 490-496, 498 <i>BioLab</i> 505, 623 <i>Data Analysis Lab</i> 494 <i>Launch Lab</i> 483 <i>MiniLab</i> 488, 500 <i>National Geographic</i> 497</p> <p>Teacher Wraparound Edition: DC 493; SP 492</p>
<p>12.4.4 By the end of twelfth grade, students will develop an understanding of the interdependence of organisms.</p>	
<ul style="list-style-type: none"> Investigate and understand that atoms and molecules cycle among living and nonliving components of the biosphere. 	<p>Student Edition: 45-49</p> <p>Teacher Wraparound Edition: DC 46; RS 49; SP 47</p>

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<ul style="list-style-type: none"> Investigate and describe the flow of energy through ecosystems, in one direction, from producers to herbivores to carnivores and decomposers. 	<p>Student Edition: 41-44 <i>MiniLab</i> 42 <i>Section Assessment</i> 44 (#2)</p> <p>Teacher Wraparound Edition: FA 44</p>
<ul style="list-style-type: none"> Investigate and cite examples of organisms cooperating and competing in ecosystems. 	<p>Student Edition: 38-40, 95-96 <i>BioLab</i> 107</p> <p>Teacher Wraparound Edition: DC 40; FA 40, 99</p>
<ul style="list-style-type: none"> Investigate and understand that interactions among organisms are affected by the conflict between an organism's capacity to produce infinite populations and the finite amount of resources. 	<p>Student Edition: 94-98 <i>BioLab</i> 107 <i>Data Analysis Lab</i> 98 <i>Section Assessment</i> 99 (#2)</p> <p>Teacher Wraparound Edition: DC 94; WS 95, 96</p>
<ul style="list-style-type: none"> Investigate and describe how humans modify the ecosystem as a result of population growth, technology, and consumption. 	<p>Student Edition: 100-105, 123-128 <i>Biology & Society</i> 50, 1010 <i>Section Assessment</i> 128 (#1)</p> <p>Teacher Wraparound Edition: CB 124; SP 127</p>
<p>12.4.5 By the end of twelfth grade, students will develop an understanding of matter, energy, and organization in living systems.</p>	
<ul style="list-style-type: none"> Investigate and understand that living systems require a constant input of energy to maintain their chemical and physical organization. 	<p>Student Edition: 10, 218-221</p> <p>Teacher Wraparound Edition: DC 219</p>
<ul style="list-style-type: none"> Investigate and understand that producers use solar energy to combine molecules of carbon dioxide and water into organic compounds. 	<p>Student Edition: 10, 41, 43, 47, 219, 220, 222-224, 226 <i>National Geographic</i> 225 <i>Section Assessment</i> 227 (#1)</p> <p>Teacher Wraparound Edition: DC 222; FA 227</p>

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<ul style="list-style-type: none"> Investigate and explain how distribution and abundance of different organisms in ecosystems are limited by the availability of matter and energy and the ability of the ecosystem to recycle materials. 	<p>Student Edition: 68-73, 94-95 <i>Section Assessment 73 (#6)</i></p> <p>Teacher Wraparound Edition: CT 65; DC 94; RS 72</p>
<p>12.4.6 By the end of twelfth grade, students will develop an understanding of the behavior of organisms.</p>	
<ul style="list-style-type: none"> Investigate and describe how nervous systems function in multicellular animals. 	<p>Student Edition: 711, 728, 739, 747, 768, 796, 826, 837, 855, 865, 886, 962-965, 967, 968-972 <i>MiniLab 965</i> <i>National Geographic 966</i> <i>Section Assessment 967 (#1)</i></p> <p>Teacher Wraparound Edition: DC 962, 969; DE 886, 963</p>
<ul style="list-style-type: none"> Investigate and describe how organisms respond to internal changes and external stimuli. 	<p>Student Edition: 9, 908, 910, 912-915, 916-923, 962-965, 967, 968-972, 973-976 <i>BioLab: Design Your Own 567, 925, 983</i> <i>MiniLab 975</i> <i>Section Assessment 915 (#2)</i></p> <p>Teacher Wraparound Edition: CB 913; SP 910</p>
<ul style="list-style-type: none"> Investigate and explain how the behavioral patterns of organisms have evolved through natural selection. 	<p>Student Edition: 908-910, 912-915, 916-923 <i>MiniLab 912</i> <i>National Geographic 911</i> <i>Section Assessment 915 (#1), 923 (#1)</i></p> <p>Teacher Wraparound Edition: CT 914; DC 909; WS 911</p>
<ul style="list-style-type: none"> Investigate and understand that behavioral biology relates to humans since it provides links to psychology, sociology, and anthropology. 	<p>The following page references can be incorporated to meet this standard.</p> <p>Student Edition: 908-909, 915, 977-981 <i>Biology & Society 898</i> <i>Careers in Biology 910, 922</i> <i>Section Assessment 981 (#5)</i></p> <p>Teacher Wraparound Edition: CT 910; WS 910</p>