

**Prentice Hall Biology (Miler/Levine) © 2010 and Event-Based Science © 2005**  
**Correlated to:**  
**The Revised Washington State Science Standards, (12/14/2008)**  
**(Grades 9-12)**

Revised Washington State Science Standards December 14, 2008	Prentice Hall Biology (Miler/Levine) © 2010 / EBS © 2005
EALR 1: Systems (SYS)	
Core Content: Predictability and Feedback	
<p>In prior grades, students learned how to simplify and analyze complex situations by thinking about them as systems. In grades 9-12, students learn to construct more sophisticated system models, including the concept of feedback. Students are expected to determine whether or not systems analysis will be helpful in a given situation and if so, to describe the system, including subsystems, boundaries, flows, and feedbacks. The next step is to use the system as a dynamic model to predict changes. Students are also expected to recognize that even the most sophisticated models may not accurately predict how the real world functions. This deep understanding of systems and ability to use systems analysis is an essential tool both for scientific inquiry and for technological design.</p>	
Content Standards	
Students know that:	
<p>9-12 SYSA - Feedback is a process in which the output of a system provides information used to regulate the operation of the system. Positive feedback increases the disturbance to a system. Negative feedback reduces the disturbance to a system.</p>	<p><b>SE/TE:</b> Related material: 732, 865, 986</p> <p><b>Event-Based Science:</b>  Representative Selections:  <b><u>GOLD MEDAL!</u></b> 13-14  <b><u>BLACKOUT!</u></b> 14-15  <b><u>BLIGHT!</u></b> 35-36  <b><u>OIL SPILL!</u></b> 14  <b><u>EARTHQUAKE!</u></b> 25, 29, 34, 36-37  <b><u>GLOBAL WARMING!</u></b> 9, 10-11, 45</p>
<p>9-12 SYSB - Systems thinking can be especially useful in analyzing complex situations. To be useful, a system needs to be specified as clearly as possible.</p>	<p><b>SE/TE:</b> Related material:  73-78, 79-86, 99-105, 106-109, 110-116,  1107-121, 130-136, 137-141, 142-145,  166-172, 173-179, 487-493, 494-497,  510-515, 516-522, 523-528, 862-867,  868-874, 875-881, 882-893, 896-900,  901-905, 906-908, 909-919, 922-927,  928-934, 935-945, 948-953, 954-962,  963-975, 978-981, 982-987, 988-994,  995-1007, 1010-1013, 1014-1019, 1020-  1023, 1024-1027</p> <p><b>Event-Based Science:</b>  Representative Selections:  <b><u>OUTBREAK!</u></b> 46  <b><u>BLIGHT!</u></b> 18  <b><u>OIL SPILL!</u></b> 22-24  <b><u>TOXIC LEAK!</u></b> 17  <b><u>EARTHQUAKE!</u></b> 25, 29, 36</p>

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<p>9-12 SYSC - In complex systems, entirely new and unpredictable properties may emerge. Consequently, modeling a complex system in sufficient detail to make reliable predictions may not be possible.</p>	<p><b>SE/TE:</b> Related material: 372-376, 419-420, 484, 491, 498-499, 583</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>BLIGHT!</b></u> 35-36  <u><b>OIL SPILL!</b></u> 14, 39  <u><b>EARTHQUAKE!</b></u> 23, 25, 29, 34, 36-37  <u><b>FIRE!</b></u> 54-55  <u><b>BLACKOUT!</b></u> 4-6, 13</p>
<p>9-12 SYSD - Systems can be changing or in equilibrium.</p>	<p><b>SE/TE:</b> Related material: 19-20, 44, 214-217, 682-683, 711, 732, 827-830, 865-867, 886-887, 935-397, 967, 978, 984, 986-987</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>BLACKOUT!</b></u> 14-15, 22-23  <u><b>FIRST FLIGHT!</b></u> 8-9  <u><b>THRILL RIDE!</b></u> 21-22, 36-37  <u><b>BLIGHT!</b></u> 35-36  <u><b>EARTHQUAKE!</b></u> 25, 29, 34, 36-37</p>
<p>Performance Expectations</p>	
<p>Students are expected to:</p>	
<p>Give examples of a positive feedback system and explain its regulatory mechanism (e.g., global warming causes Earth's ice caps to melt, reflecting less energy to space, increasing temperatures). Give examples of a negative feedback system and explain its regulatory mechanism (e.g., when a human body overheats, it produces sweat that cools the body by evaporation).</p>	<p><b>SE/TE:</b> Related material: 177, 732, 865, 883, 935, 937, 986</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>GOLD MEDAL!</b></u> 13-14  <u><b>BLACKOUT!</b></u> 14-15  <u><b>BLIGHT!</b></u> 35-36  <u><b>OIL SPILL!</b></u> 14  <u><b>EARTHQUAKE!</b></u> 25, 29, 34, 36-37  <u><b>GLOBAL WARMING!</b></u> 9-13, 16</p>

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<p>Determine if a systems approach will be helpful in answering a question or solving a problem. Represent the system with a diagram specifying components, boundaries, flows, and feedbacks. Describe relevant subsystems and the larger system that contains the system being analyzed. Determine how the system functions with respect to other systems.</p>	<p><b>SE/TE:</b> Related material: 75-77, 81, 83-86, 101, 132-134, 139, 143-145, 172, 489, 490, 864, 879, 883, 885, 887, 902-903, 923, 936, 950, 965, 979, 1018, 1026</p> <p><b>Event-Based Science:</b>  Representative Selections:  <b><u>BLACKOUT!</u></b> 10-11,14-15  <b><u>FIRST FLIGHT!</u></b> 8-9, 16  <b><u>FLOOD!</u></b> 8-9, 13, 17-19  <b><u>TOXIC LEAK!</u></b> 17, 30  <b><u>EARTHQUAKE!</u></b> 25, 29, 36</p>
<p>Create a simplified model of a complex system. Trace the possible consequences of a change in one part of the system and explain how the simplified model may not be adequate to reliably predict consequences.</p>	<p><b>SE/TE:</b> Related material: 78, 92</p> <p><b>Event-Based Science:</b>  Representative Selections:  <b><u>FIRST FLIGHT!</u></b> 8-9, 16, 21  <b><u>THRILL RIDE!</u></b> 21-22, 28-29, 33, 38-39  <b><u>BLIGHT!</u></b> 35-36  <b><u>FLOOD!</u></b> 48-49  <b><u>OIL SPILL!</u></b> 14, 38, 43-44</p>
<p>Analyze whether or not a system (e.g., population) is changing or in equilibrium. Determine whether a state of equilibrium is static or dynamic (i.e., inflows equal outflows).</p>	<p><b>SE/TE:</b> 491-492</p> <p><b>Event-Based Science:</b>  Representative Selections:  <b><u>BLACKOUT!</u></b> 14-15, 22-23  <b><u>FIRST FLIGHT!</u></b> 8-9  <b><u>THRILL RIDE!</u></b> 21-22, 36-37  <b><u>FLOOD!</u></b> 17-19  <b><u>EARTHQUAKE!</u></b> 25, 29, 36</p>
	<p><b>TR:</b> Study Workbook A 17.2; Study Workbook B Ch. 17; ELL Handbook 17.2; Multilingual Glossary; Spanish Study Workbook 17.2; Assessment Program Book 17.2</p>
	<p><b>TECH:</b> Examview® CD-ROM Ch. 17; Biology.com: 17.2, <i>Real-World Inquiry: Saving the Florida Panther</i></p>

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EALR 2: Inquiry (INQ)	
Core Content: Conducting Analyses and Thinking Logically	
<p>In prior grades, students learned to revise questions so they can be answered scientifically. In grades 9-12, students extend and refine their understanding of the nature of inquiry and their ability to formulate questions, propose hypotheses, and design, conduct, and report on investigations. Refinement includes an increased understanding of the kinds of questions that scientists ask and how the results reflect the research methods and the criteria that scientific arguments are judged by. Increased abilities include competence in using mathematics, a closer connection between student-planned investigations and existing knowledge, reflecting increased knowledge and improvements in communication and collaboration, and participation in a community of learners.</p>	
Content Standards	
Students know that:	
9-12 INQA - Question - Scientists generate and evaluate questions to investigate the natural world.	<b>SE/TE:</b> 6  <b>Event-Based Science:</b> Representative Selections: <u><b>FIRE!</b></u> 12-13,16-17, 18-19,, 34-35, 58, 63 <u><b>BLIGHT!</b></u> 24, 38-39, 46 <u><b>GOLD MEDAL!</b></u> 36 <u><b>FIRST FLIGHT!</b></u> 17 <u><b>OUTBREAK!</b></u> 38
	<b>TR:</b> Study Workbook A 1.1; Study Workbook B Ch. 1; ELL Handbook 1.1; Multilingual Glossary; Spanish Study Workbook 1.1; Assessment Program Book 1.1
	<b>TECH:</b> Examview® CD-ROM Ch.1; Biology.com: 1.1, <i>Art in Motion</i> : Experimental Design
9-12 INQB - Investigate - Scientific progress requires the use of various methods appropriate for answering different kinds of research questions, a thoughtful plan for gathering data needed to answer the question, and care in collecting, analyzing, and displaying the data.	<b>SE/TE:</b> 6-9  <b>Event-Based Science:</b> Representative Selections: <u><b>FLOOD!</b></u> 48-49 <u><b>SURVIVE!</b></u> 21, 30-31, 36-38, 48-49 <u><b>ASTEROID!</b></u> 10, 23-24, 42-43 <u><b>GOLD RUSH!</b></u> 20, 28 <u><b>EARTHQUAKE!</b></u> 14-15
	<b>TR:</b> Study Workbook A 1.1; Study Workbook B Ch. 1; ELL Handbook 1.1; Multilingual Glossary; Spanish Study Workbook 1.1; Assessment Program Book 1.1
	<b>TECH:</b> Examview® CD-ROM Ch.1; Biology.com: 1.1, <i>Art in Motion</i> : Experimental Design

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9-12 INQC - Explain - Conclusions must be logical, based on evidence, and consistent with prior established knowledge.	<b>SE/TE:</b> 9  <b>Event-Based Science:</b> Representative Selections: <u><b>FIRST FLIGHT!</b></u> 16, 21, 32-33 <u><b>FLOOD!</b></u> 20-21 <u><b>OIL SPILL!</b></u> 14, 22-24, 29, 38, 39, 43-44 <u><b>TOXIC LEAK!</b></u> 16, 20, 26-27, 34 <u><b>SURVIVE!</b></u> 21, 30-31, 36-38, 48-49
	<b>TR:</b> Study Workbook A 1.1; Study Workbook B Ch. 1; ELL Handbook 1.1; Multilingual Glossary; Spanish Study Workbook 1.1; Assessment Program Book 1.1
	<b>TECH:</b> Examview® CD-ROM Ch.1; Biology.com: 1.1, <i>Art in Motion: Experimental Design</i>
9-12 INQD - Communicate Clearly - The methods and procedures that scientists use to obtain evidence must be clearly reported to enhance opportunities for further investigation.	<b>SE/TE:</b> 12  <b>Event-Based Science:</b> Representative Selections: <u><b>ASTEROID!</b></u> 10, 23-24, 42-43 <u><b>GLOBAL WARMING!</b></u> 8, 25-26, 41-42, 53 <u><b>EARTHQUAKE!</b></u> 14-15, 23, 29, 34 <u><b>GOLD RUSH!</b></u> 20, 28 <u><b>FLOOD!</b></u> 37
	<b>TR:</b> Study Workbook A 1.2; Study Workbook B Ch. 1; ELL Handbook 1.2; Multilingual Glossary; Spanish Study Workbook 1.2; Assessment Program Book 1.2
	<b>TECH:</b> Examview® CD-ROM Ch. 1; Biology.com: <i>Test Tube: the Process of Science</i>
9-12 INQE - Model - The essence of scientific investigation involves the development of a theory or conceptual model that can generate testable predictions.	<b>SE/TE:</b> 13  <b>Event-Based Science:</b> Representative Selections: <u><b>FIRE!</b></u> 15, 40-41 <u><b>OUTBREAK!</b></u> 5, 38, 44-45 <u><b>FLOOD!</b></u> 10, 48-49 <u><b>OIL SPILL!</b></u> 14, 38, 39 <u><b>GLOBAL WARMING!</b></u> 8, 25-26, 41-42, 53 <u><b>EARTHQUAKE!</b></u> 14-15, 23, 29, 34
	<b>TR:</b> Study Workbook A 1.2; Study Workbook B Ch. 1; ELL Handbook 1.2; Multilingual Glossary; Spanish Study Workbook 1.2; Assessment Program Book 1.2

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9-12 INQF - Communicate - Science is a human endeavor that involves logical reasoning and creativity and entails the testing, revision, and occasional discarding of theories as new evidence comes to light.	<b>SE/TE:</b> 4-9, 10-15  <b>Event-Based Science:</b> Representative Selections: <b><u>FRAUD!</u></b> 24 <b><u>ASTEROID!</u></b> 10, 23-24, 42-43 <b><u>EARTHQUAKE!</u></b> 14-15, 23, 29, 34 <b><u>TOXIC LEAK!</u></b> 16 <b><u>GOLD RUSH!</u></b> 20-21 <b><u>FIRE!</u></b> 63
	<b>TR:</b> Study Workbook A 1.1, 1.2; Study Workbook B Ch. 1; ELL Handbook 1.1, 1.2; Multilingual Glossary; Spanish Study Workbook 1.1, 1.2; Assessment Program Book 1.1, 1.2
	<b>TECH:</b> Examview® CD-ROM Ch. 1; Biology.com: 1.1, 1.2, <i>Test Tube: the Process of Science</i> , <i>Art in Motion: Experimental Design</i>
9-12 INQG - Intellectual Honesty - Public communication among scientists is an essential aspect of research. Scientists evaluate the validity of one another's investigations, check the reliability of results, and explain inconsistencies in findings	<b>SE/TE:</b> 12  <b>Event-Based Science:</b> Representative Selections: <b><u>OUTBREAK!</u></b> 44-45 <b><u>BLIGHT!</u></b> 10-11, 19, 27-28 <b><u>ASTEROID!</u></b> 10, 23-24, 42-43 <b><u>GLOBAL WARMING!</u></b> 8, 25-26, 41-42, 53, 63-64 <b><u>EARTHQUAKE!</u></b> 14-15, 23, 29, 34
	<b>TR:</b> Study Workbook A 1.2; Study Workbook B Ch. 1; ELL Handbook 1.2; Multilingual Glossary; Spanish Study Workbook 1.2; Assessment Program Book 1.2
	<b>TECH:</b> Examview® CD-ROM Ch. 1; Biology.com: <i>Test Tube: the Process of Science</i>
9-12 INQH - Intellectual Honesty - Scientists carefully evaluate sources of information for reliability before using that information. When referring to the ideas or findings of others, they cite their sources of information.	<b>SE/TE:</b> 12, 14  <b>Event-Based Science:</b> Representative Selections: <b><u>BLACKOUT!</u></b> 48-49, 52-53 <b><u>FLOOD!</u></b> 20-21 <b><u>ASTEROID!</u></b> 10, 23-24, 42-43 <b><u>GLOBAL WARMING!</u></b> 8, 25-26, 41-42, 53, 63-64 <b><u>EARTHQUAKE!</u></b> 14-15, 23, 29, 34

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	<b>TECH:</b> Examview® CD-ROM Ch. 1
Performance Expectations	
Students are expected to:	
Generate and evaluate a question that can be answered through a scientific investigation. Critique questions generated by others and explain whether or not the questions are scientific.	<b>SE/TE:</b> 54, 122, 180, 298, 384, 626, 688, 852, 970 <b>Event-Based Science:</b> Representative Selections: <b><u>OIL SPILL!</u></b> 14, 22-24, 29, 38, 39, 43-44 <b><u>TOXIC LEAK!</u></b> 34 <b><u>SURVIVE!</u></b> 36-38 <b><u>ASTEROID!</u></b> 10, 23-24, 42-43 <b><u>GLOBAL WARMING!</u></b> 8, 25-26, 41-42, 53 <b><u>EARTHQUAKE!</u></b> 14-15, 23, 29, 34
	<b>TR:</b> Lab Manual A; Lab Manual B
Plan and conduct a scientific investigation, choosing a method appropriate to the question being asked. Collect, analyze, and display data using calculators, computers, or other technical devices when available.	<b>SE/TE:</b> 26, 54, 88, 122, 146, 180, 218, 242, 266, 298, 330, 354, 384, 410, 440, 474, 502, 530, 564, 594, 626, 656, 688, 720, 744, 774, 800, 832, 852, 888, 914, 940, 970, 1002, 1028 <b>Event-Based Science:</b> Representative Selections: <b><u>OIL SPILL!</u></b> 29, 43-44 <b><u>GLOBAL WARMING!</u></b> 25-26 <b><u>EARTHQUAKE!</u></b> 14-15, 23, 29, 34 <b><u>SURVIVE!</u></b> 30 <b><u>FLOOD!</u></b> 48-49
	<b>TR:</b> Lab Manual A; Lab Manual B
	<b>TECH:</b> Virtual Labs 1-20

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<p>Draw conclusions supported by evidence from the investigation and consistent with established scientific knowledge. Analyze alternative explanations and decide which best fits the data.</p>	<p><b>SE/TE:</b> 26, 54, 88, 122, 146, 180, 218, 242, 266, 298, 330, 354, 384, 410, 440, 474, 502, 530, 564, 594, 626, 656, 688, 720, 744, 774, 800, 832, 852, 888, 914, 940, 970, 1002, 1028</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>BLIGHT!</b></u> 27-28, 35-36, 44  <u><b>OIL SPILL!</b></u> 14, 22-24, 29, 38, 39, 43-44  <u><b>TOXIC LEAK!</b></u> 16  <u><b>ASTEROID!</b></u> 10, 23-24, 42-43  <u><b>OUTBREAK!</b></u> 30  <u><b>SURVIVE!</b></u> 21</p>
	<p><b>TR:</b> Lab Manual A; Lab Manual B</p>
	<p><b>TECH:</b> Virtual Labs 1-20</p>
<p>Write a detailed laboratory report that includes: the question that motivated the study, a justification for the kind of investigation chosen, hypotheses (if any), a description of what was done, a summary of data in tables and graphs, and a conclusion, based on the evidence, that responds to the question.</p>	<p><b>SE/TE:</b> 26, 54, 88, 122, 146, 180, 218, 242, 266, 298, 330, 354, 384, 410, 440, 474, 502, 530, 564, 594, 626, 656, 688, 720, 744, 774, 800, 832, 852, 888, 914, 940, 970, 1002, 1028</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>BLIGHT!</b></u> 10-11, 19, 35-36  <u><b>OIL SPILL!</b></u> 14, 22-24, 29, 38, 39, 43-44  <u><b>ASTEROID!</b></u> 10  <u><b>TOXIC LEAK!</b></u> 20, 26-27, 34  <u><b>VOLCANO!</b></u> 14-15, 60  <u><b>TORNADO!</b></u> 54</p>
	<p><b>TR:</b> Lab Manual A; Lab Manual B</p>
	<p><b>TECH:</b> Virtual Labs 1-20</p>
<p>Formulate one or more hypotheses based on a model or theory of a causal relationship. Demonstrate creativity and critical thinking to formulate and evaluate the hypotheses.</p>	<p><b>SE/TE:</b> 26, 54, 88, 122, 146, 180, 218, 242, 266, 298, 330, 354, 384, 410, 440, 474, 502, 530, 564, 594, 626, 656, 688, 720, 744, 774, 800, 832, 852, 888, 914, 940, 970, 1002, 1028</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>GLOBAL WARMING!</b></u> 8, 25-26, 41-42, 53  <u><b>FLOOD!</b></u> 10, 20-21, 48-49  <u><b>OIL SPILL!</b></u> 38  <u><b>TOXIC LEAK!</b></u> 16, 20, 26-27, 34  <u><b>ASTEROID!</b></u> 10, 23-24, 42-43  <u><b>EARTHQUAKE!</b></u> 14-15, 23, 29, 34</p>
	<p><b>TR:</b> Lab Manual A; Lab Manual B</p>



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	<b>TECH:</b> Virtual Labs 1-20
Evaluate an investigation to determine if it was a valid means of answering the question, and whether or not the results were reliable. Describe the development of a scientific theory that illustrates logical reasoning, creativity, testing, revision, and replacement of prior ideas in light of new evidence.	<b>SE/TE:</b> 26, 54, 88, 122, 146, 180, 218, 242, 266, 298, 330, 354, 384, 410, 440, 474, 502, 530, 564, 594, 626, 656, 688, 720, 744, 774, 800, 832, 852, 888, 914, 940, 970, 1002, 1028  <b>Event-Based Science:</b> Representative Selections: <u><b>FIRST FLIGHT!</b></u> 8-9, 16, 21 <u><b>OUTBREAK!</b></u> 44-45 <u><b>TOXIC LEAK!</b></u> 16, 20, 26-27, 34 <u><b>ASTEROID!</b></u> 10, 23-24, 42-43 <u><b>HURRICANE!</b></u> 20-21
	<b>TR:</b> Lab Manual A; Lab Manual B
	<b>TECH:</b> Virtual Labs 1-20
Participate in a scientific discussion about their own investigations and those performed by others. Respond to questions and criticisms, and if appropriate, revise explanations based on these discussions.	<b>SE/TE:</b> 12, 266, 688  <b>Event-Based Science:</b> Representative Selections: <u><b>BLIGHT!</b></u> 19 <u><b>OIL SPILL!</b></u> 29 <u><b>TOXIC LEAK!</b></u> 20, 34 <u><b>EARTHQUAKE!</b></u> 14-15, 23, 29, 34 <u><b>OUTBREAK!</b></u> 5
	<b>TR:</b> Lab Manual A
Provide appropriate citations for all ideas, findings, and information used in any and all written reports. Explain the consequences for failure to provide appropriate citations.	<b>SE/TE:</b> 229, 349, 459, 719, 773  <b>Event-Based Science:</b> Representative Selections: <u><b>FLOOD!</b></u> 20-21 <u><b>OIL SPILL!</b></u> 22-24 <u><b>TOXIC LEAK!</b></u> 26-27 <u><b>ASTEROID!</b></u> 23-24 <u><b>EARTHQUAKE!</b></u> 14-15, 23, 29, 34

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EALR 3: Application (APP)	
Core Content: Science, Technology, and Society	
<p>In prior grades, students learn to work with other members of a team to apply the full process of technological design and relevant science concepts to solve problems. In grades 9-12, students apply what they have learned to address societal issues and cultural differences. Students learn that science and technology are interdependent, that science and technology influence society, and that society influences science and technology. Students continue to increase their abilities to work with other students and to use mathematics and information technologies (when available) to solve problems. They transfer insights from those increased abilities to considering local, regional, and global issues. These insights and capabilities will help prepare students to solve societal and personal problems in future years.</p>	
Content Standards	
Students know that:	
<p>9-12 APPA - Science affects society and cultures by influencing the way many people think about themselves, others, and the environment. Society also affects science by its prevailing views about what is important to study, and by deciding what research will be funded.</p>	<p><b>SE/TE:</b> 14-15, 16, 136, 261, 402, 493, 593, 831, 846, 874, 934</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>OIL SPILL!</b></u> 2, 31-33, 40  <u><b>TOXIC LEAK!</b></u> 2-3, 6-7, 10-11, 18-19, 35  <u><b>SURVIVE!</b></u> 2, 6, 9, 14, 15, 16, 19, 24-25, 26, 28  <u><b>GLOBAL WARMING!</b></u> 14, 15, 27-28, 29-30, 58  <u><b>EARTHQUAKE!</b></u> 6-9, 23, 30, 34  <u><b>OUTBREAK!</b></u> 46</p>
<p>9-12 APPB - The technological design process begins by defining a problem in terms of criteria and constraints, conducting research, and generating several different solutions.</p>	<p><b>SE/TE:</b> 6-9</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>THRILL RIDE!</b></u> 11-12, 21-22, 25-33, 28-29  <u><b>FLOOD!</b></u> 20-21, 39  <u><b>TOXIC LEAK!</b></u> 33, 34  <u><b>ASTERIOD!</b></u> 50-51  <u><b>EARTHQUAKE!</b></u> 25, 29, 34, 36, 41</p>
	<p><b>TR:</b> Study Workbook A 1.1; Study Workbook B Ch. 1; ELL Handbook 1.1; Multilingual Glossary; Spanish Study Workbook 1.1; Assessment Program Book 1.1</p>
	<p><b>TECH:</b> Examview® CD-ROM Ch.1; Biology.com: 1.1, <i>Art in Motion</i>: Experimental Design</p>

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9-12 APPC - Choosing the best solution involves comparing alternatives with respect to criteria and constraints, then building and testing a mode or other representation of the final design.	<b>SE/TE:</b> 10-11, 14-15  <b>Event-Based Science:</b> Representative Selections: <u><b>FIRE!</b></u> 15, 40-41 <u><b>FIRST FLIGHT!</b></u> 16 <u><b>TOXIC LEAK!</b></u> 33, 34 <u><b>ASTERIOD!</b></u> 50-51 <u><b>EARTHQUAKE!</b></u> 25, 29, 34, 36, 41
	<b>TR:</b> Study Workbook A 1.2; Study Workbook B Ch. 1; ELL Handbook 1.2; Multilingual Glossary; Spanish Study Workbook 1.2; Assessment Program Book 1.2
	<b>TECH:</b> Examview® CD-ROM Ch. 1; Biology.com: <i>Test Tube: the Process of Science</i>
9-12 APPD - The ability to solve problems is greatly enhanced by use of mathematics and information technologies.	<b>SE/TE:</b> 11, 39, 87, 291, 435, 529, 617, 799, 905, 962  <b>Event-Based Science:</b> Representative Selections: <u><b>BLIGHT!</b></u> 52, 53 <u><b>SURVIVE!</b></u> 32-33, 58, 59 <u><b>VOLCANO!</b></u> 57, 59 <u><b>BLACKOUT!</b></u> 60-61 <u><b>TORNADO!</b></u> 54
9-12 APPE - Perfect solutions do not exist. All technological solutions involve trade-offs in which decisions to include more of one quality means less of another. All solutions involve consequences, some intended others not.	<b>SE/TE:</b> 11, 39, 87, 291, 435, 529, 617, 799, 905, 962  <b>Event-Based Science:</b> Representative Selections: <u><b>GOLD MEDAL!</b></u> 34-35 <u><b>BLACKOUT!</b></u> 10-11, 14-15, 26-27 <u><b>FLOOD!</b></u> 39 <u><b>EARTHQUAKE!</b></u> 14-15, 23, 29, 34 <u><b>ASTERIOD!</b></u> 50-51
9-12 APPF - It is important for all citizens to apply science and technology to critical issues that influence society.	<b>SE/TE:</b> 14-15, 16, 136, 261, 402, 493, 593, 831, 846, 874, 934  <b>Event-Based Science:</b> Representative Selections: <u><b>TOXIC LEAK!</b></u> 2-3, 6-7, 35 <u><b>SURVIVE!</b></u> 2, 6, 9, 14, 15, 16, 19, 24-25, 26, 28, 32-33 <u><b>EARTHQUAKE!</b></u> 6-9, 23, 30, 34 <u><b>OUTBREAK!</b></u> 3, 34 <u><b>FLOOD!</b></u> 50 <u><b>BLIGHT!</b></u> 38

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Performance Expectations	
Students are expected to:	
Describe ways that scientific ideas have influenced society or the development of differing cultures. List questions that scientists investigate that are stimulated by the needs of society (e.g., medical research, global climate change).	<b>SE/TE:</b> 14-15, 16, 136, 261, 402, 493, 593, 831, 846, 874, 934  <b>Event-Based Science:</b> Representative Selections: <u><b>OUTBREAK!</b></u> 6, 10, 16, 17-18, 24, 31, 32-33, 46, 47 <u><b>BLIGHT!</b></u> 15, 24, 25, 36, 38-39, 42, 46, 48 <u><b>GLOBAL WARMING!</b></u> 14, 15, 27-28, 58 <u><b>EARTHQUAKE!</b></u> 6-9, 23, 30, 34 <u><b>TOXIC LEAK!</b></u> 41-44 <u><b>EARTHQUAKE!</b></u> 26-28
Work collaboratively with other students to generate ideas for solving a problem. Identify criteria and constraints, research the problem, and generate several possible solutions.	<b>TE only:</b> Related material: 11, 14  <b>Event-Based Science:</b> Representative Selections: <u><b>BLIGHT!</b></u> 35-36 <u><b>OIL SPILL!</b></u> 22-24, 38 <u><b>GLOBAL WARMING!</b></u> 8, 25-26, 41-42, 53 <u><b>EARTHQUAKE!</b></u> 6-9, 14-15, 23, 29, 34, 41 <u><b>OUTBREAK!</b></u> 5 <u><b>SURVIVE!</b></u> 11
Choose the best solution for a problem, create a model or drawing of the final design, and devise a way to test it. Redesign the solution, if necessary, then present it to peers.	<b>TE only:</b> Related material: 11, 14  <b>Event-Based Science:</b> Representative Selections: <u><b>FIRE!</b></u> 15, 40-41 <u><b>THRILL RIDE!</b></u> 11-12, 21-22, 28-29, 33, 38-39 <u><b>OIL SPILL!</b></u> 38, 39 <u><b>ASTERIOD!</b></u> 50-51 <u><b>EARTHQUAKE!</b></u> 6-9, 14-15, 23, 29, 34, 41
Use proportional reasoning, functions, graphing, and estimation to solve problems. Use computers, probes, and software when available to collect, display, and analyze data.	<b>SE/TE:</b> 20, 48, 77, 102, 115, 135, 164, 172, 216, 240, 251, 288, 294, 320, 327, 345, 381, 400, 429, 470, 500, 524, 548, 556, 591, 624, 644, 678, 706, 710, 740, 763, 784, 828, 850, 883, 910, 938, 956, 1017, 1025, 1116-1121  <b>Event-Based Science:</b> Representative Selections: <u><b>OIL SPILL!</b></u> 22-24, 45 <u><b>ASTERIOD!</b></u> 42-43, 50-51, 51-52 <u><b>GLOBAL WARMING!</b></u> 27-28, 60, 61-62 <u><b>EARTHQUAKE!</b></u> 29, 41, 43 <u><b>GOLD RUSH!</b></u> 20 <u><b>HURRICANE!</b></u> 52

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<p>Analyze a societal issue that may be addressed through science and/or technology. Compare alternative solutions by considering trade-offs and unintended consequences (e.g., removing dams to increase salmon spawning).</p>	<p><b>SE/TE:</b> 14-15, 16, 136, 261, 402, 493, 593, 831, 846, 874, 934</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>FIRE!</b></u> 12-13, 18-19, 20-22, 34-35  <u><b>BLIGHT!</b></u> 36, 38-39, 42, 48  <u><b>FLOOD!</b></u> 1-2, 23  <u><b>TOXIC LEAK!</b></u> 2-3, 6-7, 33, 35  <u><b>SURVIVE!</b></u> 14, 32-33  <u><b>OUTBREAK!</b></u> 5, 6, 10, 16, 17-18, 24, 31, 32-33, 47</p>
<p>Critically analyze scientific information in current events to make personal choices, or to inform public-policy decisions.</p>	<p><b>SE/TE:</b> 16, 136, 261, 402, 493, 593, 831, 846, 874, 934</p> <p><b>Event-Based Science:</b>            Representative Selections:  <u><b>FLOOD!</b></u> 1-2, 28, 50  <u><b>OIL SPILL!</b></u> 31-33, 39, 40  <u><b>OUTBREAK!</b></u> 6, 10, 16, 17-18, 24, 31, 32-33, 47  <u><b>TOXIC LEAK!</b></u> 2-3, 6-7, 34, 35  <u><b>GLOBAL WARMING!</b></u> 14, 15, 58</p>
<p>EALR 4: Life Science</p>	
<p>Big Idea: Structures and Functions of Living Organisms (LS1)</p>	
<p>Core Content: Processes Within Cells</p>	
<p>In prior grades, students learned that all living systems are composed of cells, which make up tissues, organs, and organ systems. In grades 9-11, students learn that cells have complex molecules and structures that enable them to carry out life functions such as photosynthesis and respiration and pass on their characteristics to future generations. Information for producing proteins and reproduction is coded in DNA and organized into genes in chromosomes. This elegant yet complex set of processes explains how life forms replicate themselves with slight changes that make adaptations to changing conditions possible over long periods of time. These processes that occur within living cells help students understand the commonalities among the diverse living forms that populate Earth today.</p>	
<p>Content Standards</p>	
<p>Students know that:</p>	
<p>9-11 LS1A - Carbon-containing compounds are the building blocks of life. Photosynthesis is the process that plant cells use to combine the energy of sunlight with molecules of carbon dioxide and water to produce energy-rich compounds that contain carbon (food) and release oxygen.</p>	<p><b>SE/TE:</b> 45-49, 230-234, 235-241</p> <p><b>Event-Based Science:</b>  <u><b>BLIGHT!</b></u> 5, 10-11, 13  <u><b>OIL SPILL!</b></u> 27-29  <u><b>FIRE!</b></u> 24  <u><b>GLOBAL WARMING?</b></u> 3, 12-13, 16</p>

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	<b>TR:</b> Study Workbook A 2.3, 8.2, 8.3; Study Workbook B Ch. 1, 8; ELL Handbook 2.3, 8.2, 8.3; Multilingual Glossary; Spanish Study Workbook 2.3, 8.2, 8.3; Assessment Program Book 2.3, 8.2, 8.3; Lab Manual A: <i>Investigating Photosynthesis</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 2, 8; Biology.com: 2.3, 8.2, 8.3, <i>Interactive Art: Polymers, Interactive Art: Photosynthesis, Data Analysis: Shedding Light on Marine Algae; Art in Motion: Light-Dependent Reactions, Art Review: Light-Independent Reactions; Visual Analogy: Carrying Electrons; Virtual Labs 6, 7</i>
9-11 LS1B - The gradual combustion of carbon-containing compounds within cells, called cellular respiration, provides the primary energy source of living organisms; and the combustion of carbon by burning of fossil fuels provides the primary energy source for most of modern society.	<b>SE/TE:</b> 82, 178, 250-253, 254-261  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> 10-11 <b><u>OIL SPILL!</u></b> 41-42 <b><u>GLOBAL WARMING?</u></b> 12-13, 20, 41-42 <b><u>GOLD MEDAL!</u></b> 13-14 <b><u>FIRE!</u></b> 50-51
	<b>TR:</b> Study Workbook A 9.1, 9.2; Study Workbook B Ch. 9; ELL Handbook 9.1, 9.2; Multilingual Glossary; Spanish Study Workbook 9.1, 9.2; Assessment Program Book 9.1, 9.2
	<b>TECH:</b> Examview® CD-ROM Ch. 9; Biology.com: 9.1, 9.2, <i>Art in Motion: Opposite Processes: Respiration and Photosynthesis, Virtual Lab 8</i>
9-11 LS1C - Cells contain specialized parts for determining its essential functions, such as regulation of cellular activities, energy capture and release, formation of proteins, waste disposal, the transfer of information, and movement.	<b>SE/TE:</b> 196-205  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> 5, 10-11 <b><u>GLOBAL WARMING?</u></b> 3
	<b>TR:</b> Study Workbook A 7.2; Study Workbook B Ch. 7; ELL Handbook 7.2; Multilingual Glossary; Spanish Study Workbook 7.2; Assessment Program Book 7.2
	<b>TECH:</b> Examview® CD-ROM Ch. 7; Biology.com: 7.2, <i>Visual Analogy: A Cell as a Living Factory, Virtual Labs 3, 4, 5</i>

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9-11 LS1D - The cell is surrounded by a membrane that separates the interior of the cell from the outside world and determines which substances may enter and which may leave the cell.	<b>SE/TE:</b> 203-205
	<b>TR:</b> Study Workbook A 7.2; Study Workbook B Ch. 7; ELL Handbook 7.2; Multilingual Glossary; Spanish Study Workbook 7.2; Assessment Program Book 7.2
	<b>TECH:</b> Examview® CD-ROM Ch. 7; Biology.com: 7.2, Virtual Labs 3, 4
9-11 LS1E - The genetic information responsible for inherited characteristics is encoded in the DNA molecules in chromosomes. DNA is composed of four subunits (A,T,C,G). The sequence of subunits in a gene specifies the amino acids needed to make a protein. Proteins express inherited traits (e.g., eye color, hair texture) and carry out most cell function.	<b>SE/TE:</b> 338-343, 344-349, 350-353, 366-371 <b>Event-Based Science:</b> <b><u>SURVIVE!</u></b> 14
	<b>TR:</b> Study Workbook A 12.1, 12.2, 12.3, 13.2; Study Workbook B Ch. 12, 13; ELL Handbook 12.1, 12.2, 12.3, 13.2; Multilingual Glossary; Spanish Study Workbook 12.1, 12.2, 12.3, 13.2; Assessment Program Book 12.1, 12.2, 12.3, 13.2; Lab Manual A: <i>DNA Extraction</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 12, 13; Biology.com: 12.1, 12.2, 12.3, 13.2, <i>Art in Motion: Hershey-Chase, Visual Anthology: The Main Function of DNA and Books, Test Tube: Memory Tricks for Base Pairing, Data Analysis, DNA Hybridization Curves; Real-World Inquiry: Tracking Illegal Whaling, Interactive Art: Transcription and Translation, Tutor Tube: What Are Proteins so Important?; Interactive Art: DNA Replication</i>
9-11 LS1F - All of the functions of the cell are based on chemical reactions. Food molecules are broken down to provide the energy and the chemical constituents needed to synthesize other molecules. Breakdown and synthesis are made possible by proteins called enzymes. Some of these enzymes enable the cell to store energy in special chemicals, such as ATP, that are needed to drive the many other chemical reactions in a cell.	<b>SE/TE:</b> 196-197, 198-213, 250-253, 254-261, 262-265, 274-278, 279-285, 286-291 <b>Event-Based Science:</b> <b><u>FIRE!</u></b> 50-51

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	<b>TR:</b> Study Workbook A 7.2, 7.3, 9.1, 9.2, 9.3, 10.1, 10.2, 10.3; Study Workbook B Ch. 7, 9, 10; ELL Handbook 7.2, 7.3, 9.1, 9.2, 9.3, 10.1, 10.2, 10.3; Multilingual Glossary; Spanish Study Workbook 7.2, 7.3, 9.1, 9.2, 9.3, 10.1, 10.2, 10.3; Assessment Program Book 7.2, 7.3, 9.1, 9.2, 9.3, 10.1, 10.2, 10.3; Lab Manual A: <i>Investigating Fermentation by Making Kimchi, Photosynthesis and Respiration</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 7, 9, 10; Biology.com: 7.2, 7.3, 9.1, 9.2, 9.3, 10.1, 10.2, 10.3, <i>Art in Motion: Opposite Processes: Respiration and Photosynthesis, Real-World Inquiry: Cells as Medicine Factories; Art in Motion: Active Transport; Interactive Art: Cellular Respiration and Fermentation; Real-World Inquiry: Getting Energy from Fats, Proteins, and Complex Carbohydrates; Art Review: Electron Transport and ATP Synthesis; Virtual Labs 9, 10</i>
9-11 LS1G - Cells use the DNA that forms their genes to encode enzymes and other proteins that allow a cell to grow and divide to produce more cells, and respond to the environment.	<b>SE/TE:</b> 362-365, 366-371, 372-376, 377-383
	<b>TR:</b> Study Workbook A 13.1, 13.2, 13.2, 13.4; Study Workbook B Ch.13; ELL Handbook 13.1, 13.2, 13.2, 13.4; Multilingual Glossary; Spanish Study Workbook 13.1, 13.2, 13.2, 13.4; Assessment Program Book 13.1, 13.2, 13.2, 13.4
	<b>TECH:</b> Examview® CD-ROM Ch. 13; Biology.com: 13.1, 13.2, 13.2, 13.4, <i>Visual Analogy: Master Plans and Blueprints, Art in Motion: RNA Processing, Interactive Art: Transcription and Translation, Tutor Tube: Why Are Proteins so Important?, Art Review: Types of Mutations, Real-World Inquiry: Fruit Flies with Heart Disease?, Data Analysis: Identifying Lac Operon Mutants; Virtual Labs 11, 12</i>



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<p>9-11 LS1H - Genes are carried on chromosomes. Animal cells contain two copies of each chromosome with genetic information that regulate body structure and functions. Cells divide by a process called mitosis, in which the genetic information is copied so that each new cell contains exact copies of the original chromosomes.</p>	<p><b>SE/TE:</b> 279-280, 328-329, 338-343</p> <p><b>Event-Based Science:</b>  <b><u>SURVIVE!</u></b> 10</p>
	<p><b>TR:</b> Study Workbook A 10.2, 11.4, 12.1; Study Workbook B Ch. 10, 11, 12; ELL Handbook 10.2, 11.4, 12.1; Multilingual Glossary; Spanish Study Workbook 10.2, 11.4, 12.1; Assessment Program Book 10.2, 11.4, 12.1</p>
	<p><b>TECH:</b> Examview® CD-ROM Ch. 10, 11, 12; Biology.com: 10.2, 11.4, 12.1, <i>Art Review:</i> Eukaryotic Chromosome, <i>Tutor Tube:</i> Unraveling Chromosome Vocabulary; <i>Data Analysis:</i> Gene Location and Crossing-Over, <i>Tutor Tube:</i> Connecting Punnett Squares to Meiosis</p>
<p>9-11 LS1I - Egg and sperm cells are formed by a process called meiosis in which each resulting cell contains only one representative chromosome from each pair found in the original cell. Recombination of genetic information during meiosis scrambles the genetic information, allowing for new genetic combinations and characteristics in the offspring. Fertilization restores the original number of chromosome pairs and reshuffles the genetic information, allowing for variation among offspring.</p>	<p><b>SE/TE:</b> 324-329, 484, 492</p> <p><b>Event-Based Science:</b>  <b><u>BLIGHT!</u></b> 32, 33</p>
	<p><b>TR:</b> Study Workbook A 11.4; Study Workbook B Ch. 11; ELL Handbook 11.4; Multilingual Glossary; Spanish Study Workbook 11.4; Assessment Program Book 11.4</p>
	<p><b>TECH:</b> Examview® CD-ROM Ch.11; Biology.com: 11.4, <i>Art in Motion:</i> Meiosis, <i>Data Analysis:</i> Gene Location and Crossing-Over, <i>Tutor Tube:</i> Connecting Punnett Squares to Meiosis</p>

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Performance Expectations	
Students are expected to:	
Explain how plant cells use photosynthesis to produce their own food. Use the following equation to illustrate how plants rearrange atoms during photosynthesis: $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ . Explain the importance of photosynthesis for both plants and animals, including humans.	<b>SE/TE:</b> 226-229, 230-234, 235-241  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> : 5, 10-11, 13 <b><u>OIL SPILL!</u></b> 27-29 <b><u>FIRE!</u></b> 24 <b><u>GLOBAL WARMING?</u></b> 3, 12-13, 16
	<b>TR:</b> Study Workbook A 8.1, 8.2, 8.3; Study Workbook B Ch. 3; ELL Handbook 8.1, 8.2, 8.; Multilingual Glossary; Spanish Study Workbook 8.1, 8.2, 8.; Assessment Program Book 8.1, 8.2, 8.; Lab Manual A: <i>Investigating Photosynthesis</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 8; Biology.com: 8.1, 8.2, 8.3, <i>Visual Analogy: ATP as a Charged Battery</i> , <i>Interactive Art: Photosynthesis</i> , <i>Data Analysis: Shedding Light on Marnie Algae</i> , <i>Art in Motion: Light-Dependent Reactions</i> , <i>Art Review: Light-Dependent Reactions</i> ; Virtual Labs 6, 7
Explain how the process of cellular respiration is similar to the burning of fossil fuels (i.e., both processes involve combustion of carbon-containing compounds to transform chemical energy to a different form of energy).	Opportunities to address this standard can be found on the following pages: <b>SE/TE:</b> 82, 251-252  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> 10-11 <b><u>OIL SPILL!</u></b> 41-42 <b><u>GLOBAL WARMING?</u></b> 12-13, 20, 41-42 <b><u>GOLD MEDAL!</u></b> 13-14 <b><u>FIRE!</u></b> 50-51
Draw, label, and describe the functions of components of essential structures within cells (i.e., cellular membrane, nucleus, chromosome, chloroplast, mitochondrion, ribosome)	<b>SE/TE:</b> 196-207  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> : 5, 10-11
	<b>TR:</b> Study Workbook A 7.2; Study Workbook B Ch. 7; ELL Handbook 7.2; Multilingual Glossary; Spanish Study Workbook 7.2; Assessment Program Book 7.2
	<b>TECH:</b> Examview® CD-ROM Ch. 7; Biology.com: 7.2, <i>Art Review: Plant and Animal Cells</i> ; <i>Visual Analogy: A Cell as a Living Factory</i> ; <i>Tutor Tube: Plants Have Mitochondria Too</i> ; Virtual Labs 3, 4

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Describe the structure of the cell membrane and how the membrane regulates the flow of materials into and out of the cell.	<b>SE/TE:</b> 203-205
	<b>TR:</b> Study Workbook A 7.2; Study Workbook B Ch. 7; ELL Handbook 7.2; Multilingual Glossary; Spanish Study Workbook 7.2; Assessment Program Book 7.2
	<b>TECH:</b> Examview® CD-ROM Ch. 7; Biology.com: 7.2, <i>Visual Analogy: A Cell as a Living Factory</i> ; Virtual Labs 3, 4
Describe how DNA molecules are long chains linking four subunits (smaller molecules) whose sequence encodes genetic information. Illustrate the process by which gene sequences are copied to produce proteins.	<b>SE/TE:</b> 344-349, 350-353, 363, 366-370, 384  <b>Event-Based Science:</b> <b><u>SURVIVE!</u></b> 14
	<b>TR:</b> Study Workbook A 12.2, 12.3, 13.2; Study Workbook B Ch. 12, 13; ELL Handbook 12.2, 12.3, 13.2; Multilingual Glossary; Spanish Study Workbook 12.2, 12.3, 13.2; Assessment Program Book 12.2, 12.3, 13.2; Lab Manual A: <i>DNA Extraction</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 12, 13; Biology.com: 12.2, 12.3, 13.2, <i>Art Review: Eukaryotic and Prokaryotic DNA Replication</i>
Explain how cells break down food molecules and use the constituents to synthesize proteins, sugars, fats, DNA and many other molecules that cells require. Describe the role that enzymes play in the breakdown of food molecules and synthesis of the many different molecules needed for cell structure and function. Explain how cells extract and store energy from food molecules.	<b>SE/TE:</b> 250-253, 254-261, 262-265  <b>Event-Based Science:</b> <b><u>FIRE!</u></b> 50-51
	<b>TR:</b> Study Workbook A 9.1, 9.2, 9.3; Study Workbook B Ch. 9; ELL Handbook 9.1, 9.2, 9.3; Multilingual Glossary; Spanish Study Workbook 9.1, 9.2, 9.3; Assessment Program Book 9.1, 9.2, 9.3; Lab Manual A: <i>Investigating Fermentation by Making Kimchi, Photosynthesis and Respiration</i>

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	<b>TECH:</b> Examview® CD-ROM Ch. 9; Biology.com: 9.1, 9.2, 9.3, <i>Art in Motion</i> : Opposite Processes: Respiration and Photosynthesis, <i>Interactive Art</i> : Cellular Respiration and Fermentation, <i>Real-World Inquiry</i> : Getting Energy from Fats, Proteins, and Complex Carbohydrates, <i>Data Analysis</i> : Lactic Acid and Athletes; Virtual Lab 8
Explain that regulation of cell functions can occur by changing the activity of proteins within cells and/or by changing whether and how much particular genes are expressed.	<b>SE/TE:</b> 286-291  <b>Event-Based Science:</b> <b><u>SURVIVE!</u></b> 10
	<b>TR:</b> Study Workbook A 10.3; Study Workbook B Ch. 10; ELL Handbook 10.3; Multilingual Glossary; Spanish Study Workbook 10.3; Assessment Program Book 10.3
	<b>TECH:</b> Examview® CD-ROM Ch. 10; Biology.com: 10.3, <i>Art in Motion</i> : Growth of Cancer Cells
Describe and model the process of mitosis, in which one cell divides, producing two cells, each with copies of both chromosomes from each pair in the original cell.	<b>SE/TE:</b> 282-285, 326-328, 353
	<b>TR:</b> Study Workbook A 10.2, 11.4; Study Workbook B Ch. 10, 11; ELL Handbook 10.2, 11.4; Multilingual Glossary; Spanish Study Workbook 10.2, 11.4; Assessment Program Book 10.2, 11.4
	<b>TECH:</b> Examview® CD-ROM Ch. 10, 11; Biology.com: 10.2, 11.4, <i>Data Analysis</i> : Timing of the Cell Cycle, <i>Interactive Art</i> : Mitosis; Virtual Labs 9, 10
Describe and model the processes of meiosis, in which egg and sperm cells are formed with only one set of chromosomes from each parent. Model and explain the process of genetic recombination that may occur during meiosis and how this then results in differing characteristics in offspring. Describe the process of fertilization that restores the original chromosome number, while reshuffling the genetic information, allowing for variation among offspring. Predict the outcome of specific genetic crosses involving two characteristics	<b>SE/TE:</b> 313-318, 324-329, 421-424, 430  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> 32, 33

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	<b>TR:</b> Study Workbook A 11.2, 11.3, 15.2; Study Workbook B Ch. 11, 15; ELL Handbook 11.2, 11.3, 15.2; Multilingual Glossary; Spanish Study Workbook 11.2, 11.3, 15.2; Assessment Program Book 11.2, 11.3, 15.2, <i>Art Review: Eukaryotic Chromosome</i> , <i>Data Analysis: Timing of the Cell Cycle</i> , <i>Interactive Art: Mitosis</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 11, 15; Biology.com: 11.2, 11.3, 15.2, <i>Art in Motion: Meiosis</i> ; <i>Data Analysis: Gene Location and Crossing Over</i>
EALR 4: Life Science	
Big Idea: Ecosystems (LS2)	
Core Content: Maintenance and Stability of Populations	
<p>In prior grades, students learned to apply key concepts about ecosystems to understand the interactions among organisms and the nonliving environment. In grades 9-11, students learn about the factors that foster or limit growth of populations within ecosystems and that help to maintain the health of the ecosystem overall. Organisms participate in the cycles of matter and flow of energy to survive and reproduce. Given abundant resources, populations can increase at rapid rates. But living and nonliving factors limit growth, resulting in ecosystems that can remain stable for long periods of time. Understanding the factors that affect populations is important for many societal issues, from decisions about protecting endangered species to questions about how to meet the resource needs of civilization while maintaining the health and sustainability of Earth's ecosystems.</p>	
Content Standards	
Students know that:	
9-11 LS2A - Matter and energy is transferred and cycled through living and nonliving components in ecosystems. The cycling of matter and energy is important for maintaining the health and sustainability of an ecosystem.	<b>SE/TE:</b> 69-72, 73-78, 79-86  <b>Event-Based Science:</b> <u><b>SURVIVE!</b></u> 20, 54 <u><b>GLOBAL WARMING?</b></u> 12-13 <u><b>OIL SPILL!</b></u> 27-29, 43-44
	<b>TR:</b> Study Workbook A 3.2, 3.3, 3.4; Study Workbook B Ch. 3; ELL Handbook 3.2, 3.3, 3.4; Multilingual Glossary; Spanish Study Workbook 3.2, 3.3, 3.4; Assessment Program Book 3.2, 3.3, 3.4

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	<b>TECH:</b> Examview® CD-ROM Ch. 3; Biology.com: 3.2, 3.3, 3.4, <i>Art Review: Producers and Consumers</i> , <i>Tutor Tube: Producers and Consumers</i> , <i>Visual Analogy: Earth's Recycling Center</i> , <i>Real-World Inquiry: Biosphere III</i> , <i>Interactive Art: The Water Cycle</i>
9-11 LS2B - Living organisms have the capacity to produce very large populations. Population density is the number of individuals of a particular population living in a given amount of space.	<b>SE/TE:</b> 130-136, 137-141, 142-145  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> 40-41 <b><u>OUTBREAK!</u></b> 51
	<b>TR:</b> Study Workbook A 5.1, 5.2, 5.3; Study Workbook B Ch. 5; ELL Handbook 5.1, 5.2, 5.3; Multilingual Glossary; Spanish Study Workbook 5.1, 5.2, 5.3; Assessment Program Book 5.1, 5.2, 5.3; Lab Manual A: <i>Analyzing a Population of Bacteria</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 5; Biology.com: 5.1, 5.2, 5.3, <i>Tutor Tube: Visualizing Exponential Quantities</i> , <i>Real-World Inquiry: Restoring the Bay</i> , <i>Interactive Art: Moose-Wolf Populations on the Isle Royale</i> , <i>Art in Motion: Age Structure of World Population</i> ; <i>Data Analysis: Invasion of Zebra Mussels</i>
9-11 LS2C - Population growth is limited by the availability of matter and energy found in resources, the size of the environment, and the presence of competing and/or predatory organisms.	<b>SE/TE:</b> 137-141  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> 15, 38-41 <b><u>SURVIVE!</u></b> 48-49
	<b>TR:</b> Study Workbook A 5.2; Study Workbook B Ch. 5; ELL Handbook 5.2; Multilingual Glossary; Spanish Study Workbook 5.2; Assessment Program Book 5.2; Lab Manual A: <i>Analyzing a Population of Bacteria</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 5; Biology.com: 5.2, <i>Real-World Inquiry: Restoring the Bay</i> , <i>Interactive Art: Moose-Wolf Populations on the Isle Royale</i>

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9-11 LS2D - Scientists represent systems in the natural world, using mathematical models.	<b>SE/TE:</b> 130, 139, 143-145  <b>Event-Based Science:</b> Representative Selections: <u><b>ASTEROID!</b></u> 51-52 <u><b>GOLD RUSH!</b></u> 53-54 <u><b>THRILL RIDE!</b></u> 49 <u><b>GLOBAL WARMING!</b></u> 27
9-11 LS2E - Interrelationships of organisms may generate ecosystems that are stable for hundreds or thousands of years. Biodiversity refers to the different kinds of organisms in specific ecosystems or on the planet as a whole.	<b>SE/TE:</b> 65, 99-103, 166-172, 451-453  <b>Event-Based Science:</b> <u><b>SURVIVE!</b></u> 39, 54 <u><b>OIL SPILL!</b></u> 27-29
	<b>TR:</b> Study Workbook A 4.2, 6.3, 16.1; Study Workbook B Ch. 4, 6, 16; ELL Handbook 4.2, 6.3, 16.1; Multilingual Glossary; Spanish Study Workbook 4.2, 6.3, 16.1; Assessment Program Book 4.2, 6.3, 16.1
	<b>TECH:</b> Examview® CD-ROM Ch. 4, 6, 16; Biology.com: 4.2, 6.3, 16.1, <i>Real-World Inquiry: Going Organic</i> , <i>Data Analysis: Managing Biodiversity</i> , <i>Art Review: Threats to Biodiversity</i>
9-11 LS2F - The concept of sustainable development supports adoption of policies that enable people to obtain the resources they need today, without limiting the ability of future generations to meet their own needs. Sustainable processes include substituting renewable for nonrenewable resources, recycling, and using fewer resources.	<b>SE/TE:</b> 154-157, 158-165, 166-172, 173-179  <b>Event-Based Science:</b> <u><b>BLIGHT!</b></u> 38-39 <u><b>GLOBAL WARMING?</b></u> 37-39 <u><b>SURVIVE!</b></u> 23
	<b>TR:</b> Study Workbook A 6.1, 6.2, 6.3, 6.4; Study Workbook B Ch. 6; ELL Handbook 6.1, 6.2, 6.3, 6.4; Multilingual Glossary; Spanish Study Workbook 6.1, 6.2, 6.3, 6.4; Assessment Program Book 6.1, 6.2, 6.3, 6.4; Lab Manual A: <i>Acid Rain's Effect on Plants</i> ; <i>Oil-Eating Bacteria</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 6; Biology.com: 6.1, 6.2, 6.3, 6.4, <i>Interactive Art: The Effect of Human Activity</i> , <i>Visual Analogy: Ecological Footprints</i>

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Performance Expectations	
Students are expected to:	
Explain how plants and animals cycle carbon and nitrogen within an ecosystem. Explain how both matter and energy cycle in ecosystems, resulting in the formation of differing chemical compounds and heat.	<b>SE/TE:</b> 73-78, 79-86  <b>Event-Based Science:</b> <b><u>SURVIVE!</u></b> 20, 54 <b><u>GLOBAL WARMING?</u></b> 12-13 <b><u>OIL SPILL!</u></b> 27-29, 43-44
	<b>TR:</b> Study Workbook A 3.1, 3.2; Study Workbook B Ch. 3; ELL Handbook 3.1, 3.2; Multilingual Glossary; Spanish Study Workbook 3.1, 3.2; Assessment Program Book 3.1, 3.2
	<b>TECH:</b> Examview® CD-ROM Ch. 3; Biology.com: 3.1, 3.2, <i>Visual Analogy: Earth's Recycling Center</i> ; <i>Interactive Art: The Water Cycle</i> ; <i>Visual Analogy: Interlocking Cycles</i>
Evaluate the conditions necessary for rapid population growth (e.g., given adequate living and nonliving resources and no disease or predators, populations of an organism increase at rapid rates). Given ecosystem data, calculate the population density of an organism.	<b>SE/TE:</b> 130-136, 137-141, 142-145  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> 40-41 <b><u>OUTBREAK!</u></b> 51
	<b>TR:</b> Study Workbook A 5.1, 5.2, 5.3; Study Workbook B Ch. 5; ELL Handbook 5.1, 5.2, 5.3; Multilingual Glossary; Spanish Study Workbook 5.1, 5.2, 5.3; Assessment Program Book 5.1, 5.2, 5.3; Lab Manual A: <i>Analyzing a Population of Bacteria</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 5; Biology.com: 5.1, 5.2, 5.3, <i>Tutor Tube: Visualizing Exponential Quantities</i> , <i>Real-World Inquiry: Restoring the Bay</i> , <i>Interactive Art: Moose-Wolf Populations on the Isle Royale</i> , <i>Art in Motion: Age Structure of World Population</i>
Explain factors, to include matter and energy, in the environment that limit the growth of plant and animal populations in natural ecosystems.	<b>SE/TE:</b> 137-141  <b>Event-Based Science:</b> <b><u>BLIGHT!</u></b> 15, 38-41 <b><u>SURVIVE!</u></b> 48-49



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	<b>TR:</b> Study Workbook A 5.2; Study Workbook B Ch. 5; ELL Handbook 5.2; Multilingual Glossary; Spanish Study Workbook 5.2; Assessment Program Book 5.2; Lab Manual A: <i>Analyzing a Population of Bacteria</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 5; Biology.com: 5.2, <i>Real-World Inquiry: Restoring the Bay</i> , <i>Interactive Art: Moose-Wolf Populations on the Isle Royale</i>
Draw a systems diagram to illustrate and explain why introduced (nonnative) species often do poorly and have a tendency to die out, as well as why they sometimes do very well and force out native species.	<b>SE/TE:</b> 169
Compare the biodiversity of organisms in different types of ecosystems (e.g., rain forest, grassland, desert) noting the interdependencies and interrelationships among the organisms in these different ecosystems.	<b>SE/TE:</b> 166-171, 451-453, 465
	<b>TR:</b> Study Workbook A 6.3, 16.1; Study Workbook B Ch. 6, 16; ELL Handbook 6.3, 16.1; Multilingual Glossary; Spanish Study Workbook 6.3, 16.1; Assessment Program Book 6.3, 16.1
	<b>TECH:</b> Examview® CD-ROM Ch. 6, 16; Biology.com: 6.3, 16.1, <i>Data Analysis: Measuring Biodiversity</i> , <i>Art Review: Threats to Biodiversity</i>
Explain how scientific concepts and findings relate to a resource issue currently under discussion in the state of Washington (e.g., removal of dams to facilitate salmon spawning in rivers; construction of wind farms). Explain how the concept of sustainable development may be applied to a current resource issue in the state of Washington.	Opportunities to address this standard can be found on the following pages: <b>SE/TE:</b> 154-157, 158-165, 166-172, 173-179  <b>Event-Based Science:</b> Can Be Developed From: <u><b>BLACKOUT!</b></u> 35 <u><b>BLIGHT!</b></u> 38-39 <u><b>GLOBAL WARMING?</b></u> 37-39 <u><b>SURVIVE!</b></u> 23

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EALR 4: Life Science	
Big Idea: Biological Evolution (LS3)	
Core Content: Mechanisms of Evolution	
<p>In prior grades, students learned how the traits of organisms are passed on through the transfer of genetic information during reproduction. In grades 9-11, students learn about the factors that underlie biological evolution: variability of offspring, population growth, a finite supply of resources, and natural selection. Both the fossil record and analyses of DNA have made it possible to better understand the causes of variability and to determine how the many species alive today are related. Evolution is the major framework that explains the amazing diversity of life on our planet and guides the work of the life sciences.</p>	
Content Standards	
Students know that:	
<p>9-11 LS3A - Biological evolution is due to: (1) genetic variability of offspring due to mutations and genetic recombination, (2) the potential for a species to increase its numbers, (3) a finite supply of resources, and (4) selection by the environment for those offspring better able to survive and produce offspring.</p>	<p><b>SE/TE:</b> 450-453, 454-459, 460-464, 465-473, 482-486, 487-493, 494-497, 498-501</p> <p><b>Event-Based Science:</b>  <u><b>SURVIVE!</b></u> 1-2, 28-31, 35-43</p>
	<p><b>TR:</b> Study Workbook A 16.1, 16.2, 16.3, 16.4, 17.1, 17.2, 17.3, 17.4; Study Workbook B Ch. 16, 17; ELL Handbook 16.1, 16.2, 16.3, 16.4, 17.1, 17.2, 17.3, 17.4; Multilingual Glossary; Spanish Study Workbook 16.1, 16.2, 16.3, 16.4, 17.1, 17.2, 17.3, 17.4; Assessment Program Book 16.1, 16.2, 16.3, 16.4, 17.1, 17.2, 17.3, 17.4; Lab Manual A: <i>Amino Acid Sequences and Indicators of Evolution, Competing Beaks, Ecosystems and Speciation</i></p>
	<p><b>TECH:</b> Examview® CD-ROM Ch. 16, 17; Biology.com: 16.1, 16.2, 16.3, 16.4, 17.1, 17.2, 17.3, 17.4, <i>Interactive Art: Darwin's Voyage, Art in Motion: The Ladder of Life, Real-World Inquiry: Selecting Vegetables, Tutor Tube: Variation, Adaptation, and Natural Selection, Art Review: Homologous and Analogous; Virtual Labs 13, 14, 15</i></p>

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9-11 LS3B - Random changes in the genetic makeup of cells and organisms (mutations) can cause changes in their physical characteristics or behaviors. If the genetic mutations occur in eggs or sperm cells, the changes will be inherited by offspring. While many of these changes will be harmful, a small minority may allow the offspring to better survive and reproduce.	<b>SE/TE:</b> 372-376, 420, 484, 491  <b>Event-Based Science:</b> <b><u>SURVIVE!</u></b> 14, 28-31
	<b>TR:</b> Study Workbook A 13.3; Study Workbook B Ch. 3; ELL Handbook 13.3; Multilingual Glossary; Spanish Study Workbook 13.3; Assessment Program Book 13.3
	<b>TECH:</b> Examview® CD-ROM Ch. 3; Biology.com: 13.3, <i>Art Review: Types of Mutations, Real-World Inquiry: Fruit Flies with Heart Disease; Virtual Lab 11</i>
9-11 LS3C - The great diversity of organisms is the result of more than 3.5 billion years of evolution that has filled available ecosystem niches on Earth with life forms.	<b>SE/TE:</b> 99-105, 465-473  <b>Event-Based Science:</b> <b><u>SURVIVE!</u></b> 3, 25, 46-47
	<b>TR:</b> Study Workbook A 4.2, 16.4; Study Workbook B Ch. 4, 16; ELL Handbook 4.2, 16.4; Multilingual Glossary; Spanish Study Workbook 4.2, 16.4; Assessment Program Book 4.2, 16.4
	<b>TECH:</b> Examview® CD-ROM Ch. 4, 16; Biology.com: 4.2, 16.4, <i>Real-World Inquiry: Going Organic, Art Review: Homologous and Analogous, Visual Analogy: Finch Beak Tools; Virtual Lab 15</i>
9-11 LS3D - The fossil record and anatomical and molecular similarities observed among diverse species of living organisms provide evidence of biological evolution.	<b>SE/TE:</b> 465-473  <b>Event-Based Science:</b> <b><u>SURVIVE!</u></b> 9, 41, 49 <b><u>GOLD MEDAL!</u></b> 17
	<b>TR:</b> Study Workbook A 16.4; Study Workbook B Ch. 16; ELL Handbook 16.4; Multilingual Glossary; Spanish Study Workbook 16.4; Assessment Program Book 16.4
	<b>TECH:</b> Examview® CD-ROM Ch. 16.4; Biology.com: 16.4, <i>Art Review: Homologous and Analogous, Visual Analogy: Finch Beak Tools</i>

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9-11 LS3E - Biological classifications are based on how organisms are related, reflecting their evolutionary history. Scientists infer relationships from physiological traits, genetic information, and the ability of two organisms to produce fertile offspring.	<b>SE/TE:</b> 510-515, 516-522, 523-528  <b>Event-Based Science:</b> <u><b>SURVIVE!</b></u> 7 <u><b>BLIGHT!</b></u> 7
	<b>TR:</b> Study Workbook A 18.1, 18.2, 18.3; Study Workbook B Ch. 18; ELL Handbook 18.1, 18.2, 18.3; Multilingual Glossary; Spanish Study Workbook 18.1, 18.2, 18.3; Assessment Program Book 18.1, 18.2, 18.3; Lab Manual A: Constructing a Dichotomous Key
	<b>TECH:</b> Examview® CD-ROM Ch. 18; Biology.com: 18.1, 18.2, 18.3, <i>Tutor Tube: Organizing the Taxa</i> , <i>Art in Motion: Using a Dichotomous Key</i> , <i>Interactive Art: Cladograms</i> , <i>Real-World Inquiry: A Friend for Lonesome George</i> , <i>Art Review: Three Domains</i> , <i>Data Analysis: Bar-Coding Life</i>
Performance Expectations	
Students are expected to:	
Explain biological evolution as the consequence of the interactions of four factors: population growth, inherited variability of offspring, a finite supply of resources, and natural selection by the environment of offspring better able to survive and reproduce. Predict the Effect on a species if one of these factors should change.	<b>SE/TE:</b> 450-453, 454-459, 460-464, 465-473, 482-486, 487-493, 494-497, 498-501  <b>Event-Based Science:</b> <u><b>SURVIVE!</b></u> 46-47
	<b>TR:</b> Study Workbook A 16.1, 16.2, 16.3, 16.4. 17.1, 17.2, 17.3, 17.4; Study Workbook B Ch. 16, 17; ELL Handbook 16.1, 16.2, 16.3, 16.4. 17.1, 17.2, 17.3, 17.4; Multilingual Glossary; Spanish Study Workbook 16.1, 16.2, 16.3, 16.4. 17.1, 17.2, 17.3, 17.4; Assessment Program Book 16.1, 16.2, 16.3, 16.4. 17.1, 17.2, 17.3, 17.4; Lab Manual A: <i>Amino Acid Sequences and Indicators of Evolution</i> , <i>Competing Beaks</i> , <i>Ecosystems and Speciation</i>

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<p>Describe the molecular process by which organisms pass on physical and behavioral traits to offspring, as well as the environmental and genetic factors that cause minor differences (variations) in offspring or occasional —mistakes□ in the copying of genetic material that can be inherited by future generations (mutations.) Explain how a genetic mutation may or may not allow a species to survive and reproduce in a given environment.</p>	<b>SE/TE:</b> 308-312, 313-318, 319-322, 323-329, 372-376, 377-383, 420, 484, 491  <b>Event-Based Science:</b> <u><b>SURVIVE!</b></u> 30-31
	<b>TR:</b> Study Workbook A 11.1, 11.2, 11.3, 11.4, 13.3, 13.4; Study Workbook B Ch. 11, 13; ELL Handbook 11.1, 11.2, 11.3, 11.4, 13.3, 13.4; Multilingual Glossary; Spanish Study Workbook 11.1, 11.2, 11.3, 11.4, 13.3, 13.4; Assessment Program Book 11.1, 11.2, 11.3, 11.4, 13.3, 13.4; Lab Manual A: <i>Independent Assortment and Gene Linkage</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 11, 13; Biology.com: 11.1, 11.2, 11.3, 11.4, 13.3, 13.4, <i>Real-World Inquiry: A New Flower, Interactive Art: Punnett Squares, Art Review: Exceptions to Mendel’s Principles, Art in Motion: Meiosis, Data Analysis: Gene Location and Crossing-Over, Tutor Tube: Connecting Punnett Squares to Meiosis; Real-World Inquiry: Fruit Flies With Heart Disease; Virtual Labs 11, 12</i>
<p>Explain how the millions of different species alive today are related by descent from a common ancestor. Explain that genes in organisms that are very different (e.g., yeast, flies, and mammals) can be very similar because these organisms all share a common ancestor.</p>	<b>SE/TE:</b> 482-486, 487-493, 494-497, 498-501  <b>Event-Based Science:</b> <u><b>SURVIVE!</b></u> 41

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	<b>TR:</b> Study Workbook A 17.1, 17.2, 17.3, 17.4; Study Workbook B Ch. 17; ELL Handbook 17.1, 17.2, 17.3, 17.; Multilingual Glossary; Spanish Study Workbook 17.1, 17.2, 17.3, 17.; Assessment Program Book 17.1, 17.2, 17.3, 17.4; Lab Manual A: <i>Competing Beaks, Ecosystems and Speciation</i>
	<b>TECH:</b> Examview® CD-ROM Ch. 17; Biology.com: 17.1, 17.2, 17.3, 17.4, <i>Interactive Art: Darwin's Voyage, Art in Motion: The Ladder of Life, Real-World Inquiry: Selecting Vegetables, Tutor Tube: Variation, Adaptation, and Natural Selection, Art Review: Homologous and Analogous</i>
Using the fossil record and anatomical and/or molecular (DNA) similarities as evidence, formulate a logical argument for biological evolution as an explanation for the development of a representative species (e.g., birds, horses, elephants, whales).	<b>SE/TE:</b> 465-473, 477  <b>Event-Based Science:</b> <u><b>SURVIVE!</b></u> 9, 41, 49 <u><b>GOLD MEDAL!</b></u> 17
	<b>TR:</b> Study Workbook A 16.4; Study Workbook B Ch. 16; ELL Handbook 16.4; Multilingual Glossary; Spanish Study Workbook 16.4; Assessment Program Book 16.4
	<b>TECH:</b> Examview® CD-ROM Ch. 16.4; Biology.com: 16.4, <i>Art Review: Homologous and Analogous, Visual Analogy: Finch Beak Tools</i>
Classify organisms, using similarities and differences in physical and functional characteristics. Explain similarities and differences among closely related organisms in terms of biological evolution (e.g., —Darwin's finches □ had different beaks due to food sources on the islands where they evolved).	<b>SE/TE:</b> 510-515, 516-522, 523-528  <b>Event-Based Science:</b> <u><b>SURVIVE!</b></u> 7, 35
	<b>TR:</b> Study Workbook A 18.1, 18.2, 18.3; Study Workbook B Ch. 18; ELL Handbook 18.1, 18.2, 18.3; Multilingual Glossary; Spanish Study Workbook 18.1, 18.2, 18.3; Assessment Program Book 18.1, 18.2, 18.3; Lab Manual A: <i>Constructing a Dichotomous Key</i>

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**Correlated to:**  
**The Revised Washington State Science Standards, (12/14/2008)**  
**(Grades 9-12)**

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	<p><b>TECH:</b> Examview® CD-ROM Ch. 18; Biology.com: 18.1, 18.2, 18.3, <i>Tutor Tube</i>: Organizing the Taxa, <i>Art in Motion</i>: Using a Dichotomous Key, <i>Interactive Art</i>: Cladograms, <i>Real-World Inquiry</i>: A Friend for Lonesome George, <i>Art Review</i>: Three Domains, <i>Data Analysis</i>: Bar-Coding Life; <i>Visual Analogy</i>: Finch Beak Tools</p>