

GLENCOE CORRELATION
BIOLOGY: THE DYNAMICS OF LIFE
MARYLAND
Science Content Standards
Grade Twelve

CONTENT STANDARDS	PAGE REFERENCES
1.0 Skills and Processes - Students will demonstrate the thinking and acting inherent in the practice of science.	
Scientific Inquiry	
By the end of grade 12 , students know and are able to do everything required at earlier grades and:	
1.12.1 access and process information from readings, investigations, and/or oral communications. (SFS 3.2) (SFS 4.1)	
The student will read a technical selection and interpret it appropriately. (CLG 1.5.6)	SE: 341-345, 349-351 <i>BioTechnology</i> 304, 966 <i>MiniLab</i> 343 <i>Inside Story</i> 346 <i>Focus On</i> 1064-1065 <i>Science Skill Handbook</i> 1106 TWE: EN 172 PR 346 EX 348 BJ 353
<i>The student will learn the use of new instruments and equipment by following instructions in a manual or from oral direction. (CLG 1.3.4)</i>	SE: <i>MiniLab</i> 151, 173, 987 <i>Investigate BioLab</i> 188-189 <i>Internet BioLab</i> 544-545 <i>Science Skill Handbook</i> 1106 TWE: MA 7 IN 172 AS 173 TS 188-189
The student will use relationships discovered in the lab to explain phenomena observed outside the laboratory. (CLG 1.2.7)	SE: <i>Investigate BioLab</i> 84-85 <i>MiniLab</i> 236, 327, 398, 936, 1028 <i>Design Your Own BioLab</i> 496-497, 834-835 TWE: MA 122 AS 497, 835 AL 948-949
The student will create and/or interpret graphics (scale drawings, photographs, digital images, etc.). (CLG 1.5.4)	SE: <i>Problem-Solving Lab</i> 180, 644 <i>Investigate BioLab</i> 214-215, 436-437, 1016-1017 <i>MiniLab</i> 376, 453, 476, 490, 566 TWE: RE 53 AS 145, 189 CA 172, 75 MA 273 CE 375

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1.12.2 formulate questions that lead to a testable hypothesis , which demonstrates the logical connections between the scientific concepts and the design of an investigation .	
The student will identify meaningful, answerable scientific questions. (CLG 1.2.1)	SE: 11-12, 21-22 <i>Investigate BioLab</i> 104-105, 214-215 <i>Internet BioLab</i> 238-239 <i>Design Your Own BioLab</i> 330-331, 496-497, 910-911 TWE: BR 12 EX 23 AS 30
<i>The student will pose meaningful, answerable, scientific questions. (CLG 1.2.2)</i>	SE: <i>Design Your Own BioLab</i> 164-165, 330-331, 496-497, 734-735, 834-835, 910-911 <i>Internet BioLab</i> 238-239 TWE: BR 12 AS 13, 39, 239, 435 MA 204
1.12.3 use observations, research, and select appropriate scientific information to form predictions and hypotheses .	
The student will formulate a working hypothesis. (CLG 1.2.3)	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 330-331, 496-497, 522-523, 734-735, 756-757 TWE: QD 12 AL 12-13, 798-799, 842-843 AS 239, 531
1.12.4 design experimental approaches, which answer scientific questions.	
The student will select appropriate instruments and materials to conduct an investigation. (CLG 1.2.5)	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 330-331, 496-497, 522-523, 734-735, 756-757 TWE: AL 12-13, 798-799, 842-843 MA 18 AS 39
The student will identify appropriate methods for conducting an investigation and affirm the need for proper controls in an experiment. (CLG 1.2.6)	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 330-331, 496-497, 522-523, 734-735, 756-757 <i>Internet BioLab</i> 238-239 <i>Skill Handbook</i> 1105 TWE: AL 12-13 TTPK 13 IS 14 AS 39
1.12.5 <i>demonstrate safety when conducting an investigation.</i>	
The student will recognize safe laboratory procedures. (CLG 1.3.2)	SE: 14-15 <i>Design Your Own BioLab</i> 164-165, 496-497, 776-777, 964-965 <i>Reference Handbook</i> 1107, 1108-1109 TWE: IN 15

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<i>The student will demonstrate safe handling of the chemicals and materials of science. (CLG 1.3.3)</i>	SE: 14-15 <i>Design Your Own BioLab</i> 164-165, 496-497, 776-777, 964-965 <i>Reference Handbook</i> 1106, 1107, 1108-1109 TWE: AL 12-13, 798-799, 842-843 IN 15
1.12.6 use mathematical processes (measuring, calculating, etc.) when conducting investigations, analyzing information, and/or displaying information.	
The student will recognize mathematics as part of the scientific endeavor, comprehend the nature of mathematical thinking, and become familiar with key mathematical ideas and skills. (CLG 4.6.2)	SE: 260-261 <i>MiniLab</i> 173 <i>Problem-Solving Lab</i> 262, 311 <i>Connection to Math</i> 276, 416 <i>Internet BioLab</i> 414-415, 626-627 <i>Investigate BioLab</i> 436-437 <i>Skill Handbook</i> 1097-1101 TWE: CA 21 AL 76-77 AS 105 PO 206 TP 405 AS 627 IS 1065
The student will recognize the important role that mathematics serves when solving problems in physics. (CLG 5.7.2)	SE: <i>Problem-Solving Lab</i> 154 <i>*Physical Science Connection</i> 52, 53, 148, 153, 800, 907 TWE: PSC 153, 906 <i>*The role of mathematics can be incorporated into discussions of physical science topics.</i>
<i>The student will recognize mathematics as an integral part of the scientific process. (CLG 1.7.4)</i>	SE: 260-261 <i>MiniLab</i> 173 <i>Problem-Solving Lab</i> 262, 311 <i>Connection to Math</i> 276, 416 <i>Internet BioLab</i> 414-415, 626-627 <i>Investigate BioLab</i> 436-437 <i>Skill Handbook</i> 1097-1101 TWE: CA 21 AL 76-77 AS 105 PO 206 TP 405 AS 627 IS 1065

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The student will use ratio and proportion in appropriate situations to solve problems. (CLG 1.6.1)	SE: <i>Investigate BioLab</i> 104-105, 386-387 <i>MiniLab</i> 173 <i>Problem-Solving Lab</i> 262, 283 <i>Skill Review</i> 262 <i>Internet BioLab</i> 274-275, 414-415 <i>Connection to Math</i> 276 TWE: AS 262, 283 AL 316-317 CA 374
<i>The student will use computers and/or graphing calculators to perform calculations for tables, graphs, or spreadsheets. (CLG 1.6.2)</i>	SE: <i>Internet BioLab</i> 24-25, 238-239, 414-415 <i>Skill Review</i> 99, 103 <i>Problem-Solving Lab</i> 101 <i>MiniLab</i> 102, 1010 TWE: AS 25, 102 IN 98 CA 101, 374 <i>*The use of computers and graphing calculators are appropriate for these activities.</i>
The student will express and/or compare small and large quantities using scientific notation and relative order of magnitude. (CLG 1.6.3)	SE: <i>MiniLab</i> 173, 476 <i>Skill Review</i> 174 <i>Investigate BioLab</i> 188-189 <i>Focus On</i> 1064-1065 <i>Skill Handbook</i> 1098 TWE: AS 476 EN 477 PR 1064
<i>The student will manipulate quantities and/or numerical values in algebraic equations. (CLG 1.6.4)</i>	SE: <i>MiniLab</i> 102, 112 <i>Investigate BioLab</i> 104-105 <i>Problem-Solving Lab</i> 154 <i>Connection to Math</i> 416
The student will judge the reasonableness of an answer. (CLG 1.6.5)	SE: 16-17 <i>Design Your Own BioLab</i> 164-165, 496-497, 834-835, 964-965 <i>Internet BioLab</i> 544-545, 626-627 <i>Investigate BioLab</i> 874-875
1.12.7 collect, organize, and display data in multiple ways that fit the context using appropriate instruments to effectively convey the information (e.g., <i>calculators, spreadsheets, and databases and graphing programs</i>). (SFS 3.2) (SFS 4.1)	
<i>The student will test a working hypothesis. (CLG 1.2.4)</i>	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 330-331, 496-497, 522-523, 734-735, 756-757 TWE: AL 12-13, 798-799, 842-843 AS 239

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<i>The student will develop and demonstrate skills in using lab and field equipment to perform investigative techniques. (CLG 1.3.1)</i>	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 496-497 <i>Investigate BioLab</i> 188-189, 214-215, 658-659, 936-937 <i>Internet BioLab</i> 544-545, 626-627 TWE: PR 113, 585 AL 182-183 A 531 AS 735, 757
The student will organize data appropriately using techniques such as tables, graphs, and webs (for graphs: axes labeled with appropriate quantities, appropriate units on axes, axes labeled with appropriate intervals, independent and dependent variables on correct axes, appropriate title). (CLG 1.4.1)	SE: <i>Internet BioLab</i> 24-25, 414-415 <i>Skill Review</i> 99, 569, 1035 <i>Problem-Solving Lab</i> 101 <i>Thinking Critically</i> 464, 574 <i>MiniLab</i> 1010 <i>Skill Handbook</i> 1099-1101 TWE: AS 20, 25, 102 CA 374
The student will use computers and/or graphing calculators to produce tables, graphs, and spreadsheet calculations. (CLG 1.5.5)	SE: <i>Internet BioLab</i> 24-25, 238-239, 414-415 <i>Skill Review</i> 99, 103 <i>Problem-Solving Lab</i> 101 <i>MiniLab</i> 102, 1010 TWE: AS 25, 102 IN 98 CA 101, 374 <i>*The use of computers and graphing calculators are appropriate for these activities.</i>
1.12.8 analyze appropriate data to identify trends to form conclusions and apply what has been learned to evaluate the hypothesis.	
The student will analyze data to make predictions, decisions, or form conclusions. (CLG 1.4.2)	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 330-331, 496-497, 734-735, 964-965 <i>Problem-Solving Lab</i> 115 <i>Internet BioLab</i> 238-239, 544-545 TWE: AL 12-13, 488-489, 798-799, 842-843
The student will use experimental data from various investigators to validate results. (CLG 1.4.3)	SE: <i>Internet BioLab</i> 24-25, 274-275, 544-545, 626-627, 686-687 TWE: AS 25 SYD 275, 545, 627, 687
The student will determine the relationships between quantities and develop the mathematical model that describes these relationships. (CLG 1.4.4)	SE: <i>Investigate BioLab</i> 104-105, 386-387 <i>Problem-Solving Lab</i> 203, 283, 928 <i>Internet BioLab</i> 274-275, 414-415 TWE: AS 283
The student will check graphs to determine that they do not misrepresent results. (CLG 1.4.5)	SE: <i>Problem-Solving Lab</i> 20, 101, 932 <i>Internet BioLab</i> 414-415 <i>Design Your Own BioLab</i> 910-911 <i>MiniLab</i> 1010 <i>Skill Handbook</i> 1099-1101 TWE: EA 578 AS 25, 102 IN 98 CA 374

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The student will describe trends revealed by data. (CLG 1.4.6)	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 330-331, 734-735, 756-757 <i>Problem-Solving Lab</i> 101, 115 <i>Internet BioLab</i> 238-239, 414-415, 544-545 AS 25, 102 IN 98 CA 374
The student will use analyzed data to confirm, modify, or reject an hypothesis.(CLG 1.4.9)	SE: <i>Design Your Own BioLab</i> 164-165, 330-331, 496-497, 522-523, 734-735, 756-757, 964-965 TWE: AL 12-13, 488-489, 798-799, 842-843
1.12.9 interpret and communicate findings through speaking, writing, and drawing in a form suited to the purpose and audience, using developmentally appropriate methods including technology tools and telecommunications. (SFS 3.1) (SFS 4.1)	
The student will demonstrate the ability to summarize data (measurements/observations). (CLG 1.5.1)	SE: <i>Internet BioLab</i> 24-25, 238-239 <i>Design Your Own BioLab</i> 164-165, 756-757 <i>MiniLab</i> 407 <i>Investigate BioLab</i> 988-989 TWE: AS 20, 25 IN 98 AL 998-999 MA 407 EX 483
The student will explain scientific concepts and processes through drawing, writing, and/or oral communication. (CLG 1.5.2)	SE: <i>Forming Your Opinion</i> 26, 388 <i>Skill Builder</i> 187 <i>Internet BioLab</i> 238-239 <i>Design Your Own BioLab</i> 330-331 <i>MiniLab</i> 429 <i>Writing About Biology</i> 438 <i>Real World BioChallenge</i> 440, 718 <i>Researching in Biology</i> 572 TWE: AL 96-97 AS 165, 183, 303, 355, 965 MA 300 CA 479
The student will use tables, charts, and graphs to display data in making arguments and claims in both oral and written presentations. (CLG 2.8.3), (CLG 5.6.4)	SE: <i>Skill Review</i> 83 <i>Problem-Solving Lab</i> 101 <i>Investigate BioLab</i> 214-215, 386-387 <i>Internet BioLab</i> 238-239 <i>Design Your Own BioLab</i> 330-331 TWE: AS 25, 102, 275 CA 378 MA 407

CONTENT STANDARDS	PAGE REFERENCES
<p>The student will use computers and/or graphing calculators to produce the visual materials (tables, graphs, and spreadsheets) that will be used for communicating results. (CLG 1.5.3)</p>	<p>SE: <i>Internet BioLab</i> 24-25, 238-239, 414-415 <i>Skill Review</i> 99, 103 <i>Problem-Solving Lab</i> 101 <i>MiniLab</i> 102, 1010</p> <p>TWE: IS 15 AS 25, 102 IN 98 CA 101, 374</p> <p><i>*The use of computers and graphing calculators are appropriate for these activities.</i></p>
<p>The student will communicate conclusions derived through a synthesis of ideas. (CLG 1.5.9)</p>	<p>SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 330-331, 496-497, 734-735, 964-965 <i>Problem-Solving Lab</i> 115 <i>Internet BioLab</i> 238-239, 544-545</p> <p>TWE: AL 12-13 AS 59, 127, 331, 523 PR 321</p>
Critical Thinking	
<p>1.12.10 analyze similarities and differences of objects, materials, concepts, and actions.</p>	
<p>The student will describe similarities and differences when explaining concepts and/or principles. (CLG 1.5.8)</p>	<p>SE: <i>Problem-Solving Lab</i> 68, 235 <i>Investigate BioLab</i> 188-189, 436-437, 776-777 <i>MiniLab</i> 429, 566, 589, 620, 754</p> <p>TWE: AL 182-183 BJ 234 VL 266 PO 270</p>
<p>1.12.11 construct various classification systems and infer degree of divergence and/or kinship of various objects, materials, concepts, actions, and organisms.</p>	
<p>The student will use, explain, and/or construct various classification systems. (CLG 1.5.7)</p>	<p>SE: 443-449, 452-453 <i>MiniLab</i> 446, 453, 538 <i>Skill Review</i> 449 <i>Investigate BioLab</i> 460-461, 810-811 <i>Design Your Own BioLab</i> 570-571 <i>Problem-Solving Lab</i> 682 <i>Focus On</i> 1070-1071</p> <p>TWE: IN 444 CA 446 BJ 447 DI 449 AS 453 AL 454</p>
<p>1.12.12 critique scientific information in order to detect bias and analyze the source of the bias. (SFS 2.2)</p>	
<p>The student will critique arguments that are based on faulty, misleading data or on the incomplete use of numbers. (CLG 1.1.3)</p>	<p>SE: <i>Problem-Solving Lab</i> 16 <i>Biology and Society</i> 938</p>

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The student will recognize data that are biased. (CLG 1.1.4), (CLG 2.8.2), (CLG 5.6.2)	SE: <i>Problem-Solving Lab</i> 16 <i>Biology and Society</i> 938
The student will explain the factors that produce biased data. (CLG 1.1.5)	SE: <i>Problem-Solving Lab</i> 16 <i>Biology and Society</i> 938
TWE: BR 15	
1.12.13 analyze the adequacy of the supporting evidence used to form conclusions, devise a plan, or solve a practical problem. (SFS 2.2)	
The student will determine the sources of error that limits the accuracy or precision of experimental results. (CLG 1.4.7)	SE: <i>Internet BioLab</i> 24-25, 414-415, 544-545 <i>Design Your Own BioLab</i> 58-59, 164-165, 734-735, 964-965
TWE: AS 77, 215	
1.12.14 provide supporting evidence when forming conclusions, devising a plan or solving a practical problem. (SFS 2.2)	
The student will defend the need for verifiable data. (CLG 1.2.8)	SE: 15-17 <i>Problem-Solving Lab</i> 16 <i>Biology and Society</i> 938
TWE: CT 17 IN 1060	
1.12.15 analyze and extend patterns.	
1.12.16 analyze conclusions and modify ideas based on new information from developmentally appropriate readings, data, and the ideas of others.	
The student will modify or affirm scientific ideas according to accumulated evidence. (CLG 1.1.2)	SE: 17, 18, 393-403, 1024-1025 <i>MiniLab</i> 6 <i>Investigate BioLab</i> 84 <i>Design Your Own BioLab</i> 330-331 <i>Biology and Society</i> 388 <i>Focus On</i> 1060-1061
TWE: EX 18 PR 394, 1061 CA 388	
1.12.17 describe to others how scientific information was used.	
Applications of Science	
1.12.18 apply scientific principles and/or concepts to understand a new situation.	
1.12.19 The student will apply skills, processes, and concepts of biology, chemistry, physics, and earth/space science to societal issues. (CLG 1.7.1)	SE: 116-120, 121-125, 347-348, 351-353 <i>Connection to Chemistry</i> 106 <i>Physical Science Connection</i> 118 <i>Problem-Solving Lab</i> 124 <i>Biology and Society</i> 498, 990, 1044
TWE: EN 119 PSC 119 CD 123 AS 352 GF 990	

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<i>The student will describe the role of science in the development of literature, art, and music. (CLG 1.7.3)</i>	SE: <i>Connection to Literature</i> 86, 190 <i>Connection to Art</i> 128, 628 TWE: FR 86, 190, TS 128, 190
<i>The student will apply chemistry to the concepts of biology, earth/space science, and environmental science. (CLG 4.6.1)</i>	SE: 118, 141-151, 157-161 <i>Connection to Chemistry</i> 106, 240, 812 <i>Inside Story</i> 162 <i>Design Your Own BioLab</i> 164-165 <i>MiniLab</i> 228
<i>The student will apply physics to the concepts of biology, earth/space science, and environmental science. (CLG 5.7.1)</i>	SE: <i>Physical Science Connection</i> 52, 53, 564, 655, 843, 907, 946 <i>Connection to Physics</i> 778, 912
<i>The student will investigate the role of chemistry in areas of human endeavor and achievement. (CLG 4.6.3)</i>	SE: 281-283, 345, 347-348, 350-351 <i>Connection to Chemistry</i> 106 <i>Problem-Solving Lab</i> 283
<i>The student will investigate the role of physics in all areas of human endeavor and achievement. (CLG 5.7.3)</i>	SE: 171-172 <i>Physical Science Connection</i> 171 <i>BioTechnology</i> 304, 966 <i>Connection to Physics</i> 778 <i>Focus On</i> 1064-1065
1.12.20 defend a position on a scientific issue and take into account the different types of risks and benefits in formulating a plan of action. (SFS 2.3)	
<i>The student will investigate an issue such as climatic changes or electric power generation. (CLG 2.8.1)</i>	SE: <i>Connection to Chemistry</i> 106 <i>Physical Science Connection</i> 118 <i>Biology and Society</i> 600, 854, 1044 TWE: AS 83, 115 IN 100, 123 TS 106 EN 117 PSC 119
<i>The student will investigate a social issue related to physics such as alternate energy source, fiber optics in telecommunications, nuclear power, microwave technology, effect of power lines, etc. (CLG 5.6.1)</i>	SE: <i>Physical Science Connection</i> 118 <i>Researching in Biology</i> 912 <i>BioTechnology</i> 966 TWE: PSC 119 TS 966
1.12.21 The student will recognize that real problems have more than one solution and decisions to accept one solution over another are made on the basis of many issues. (CLG 1.1.1), (CLG 2.8.5), (CLG 5.6.3) (SFS 2.3)	
<i>The student will explain why curiosity, honesty, openness, and skepticism are highly regarded in science. (CLG 2.8.4)</i>	SE: 11-16, 18, 21-22 <i>Problem-Solving Lab</i> 16 <i>Biology and Society</i> 938, 1044 TWE: IN 1060

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Technology	
<i>1.12.22 design, construct, and use models (e.g., math, computer, physical) to make predictions about actual events.</i>	
<i>The student will use models and computer simulations to extend his/her understanding of scientific concepts. (CLG 1.4.8)</i>	SE: MiniLab 228, 268 Problem-Solving Lab 291 Investigate BioLab 302-303, 354-355, 386-387 TWE: QD 53 CA 101 AL 266-267 VL 405 UM 883
<i>1.12.23 demonstrate and explain how using existing tools extend knowledge and identify the limitations, which drive the need for new technologies (i.e., create improvements in observing, estimating, measuring, computing, collecting, and communicating scientific data and information).</i>	
<i>The student will explain how development of scientific knowledge leads to the creation of new technology and how technological advances allow for additional scientific accomplishments. (CLG 1.7.6)</i>	SE: 21-22, 171-173, 341-345, 347-348, 349-353 BioTechnology 688, 966, 1018 Connection to Physics 912 Focus On 1064-1065 TWE: EN 172 QD 342 EX 378 AS 353 GF 688
<i>1.12.24 explain that when designing a device, process, or system (e.g., manufacturing, marketing, operating, maintaining, replacing, and disposing of) risk analysis and technology assessment determines how it will be employed.</i>	
<i>1.12.26 explain that science and technology have strongly influenced the course of history and cite how human inventiveness has brought new risks as well as improvements to human existence.</i>	
<i>The student will identify and evaluate the impact of scientific ideas and/or advancements in technology on society. (CLG 1.7.2)</i>	SE: 22-23, 345, 347-348, 351-353, 1039-1040 Connection to Chemistry 106 Problem-Solving Lab 353, 1040 Biology and Society 498, 1044 TWE: EN 345 IN 345 AS 353 GF 1044
History of Science	
<i>1.12.27 describe how various cultures from ancient times to the present have made contributions that led to current scientific ideas and technological invention.</i>	
<i>1.12.28 explain that scientific careers differ from one another in what is studied, techniques used, where studied, and outcomes sought but they share a common purpose and philosophy and are part of the same scientific enterprise.</i>	
<i>The student will investigate career possibilities in the various areas of science. (CLG 1.7.5)</i>	SE: Careers in Biology 8, 38, 448, 652, 974, 1014 Biotechnology Careers 230, 351, 732, 958 TWE: TP 207, 298

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3.0 Life Science - Students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.	
Cellular	
3.12.1 explain that most life functions involve chemical reactions regulated by information stored within the cell and may be influenced by the cell's response to its environment .	
The student will be able to describe the unique characteristics of chemical compounds and macromolecules utilized by living systems (water, carbohydrates, lipids, proteins, nucleic acids, minerals, vitamins). (CLG 3.1.1)	SE: 152-153, 157-161, 163, 282-283, 924-927 <i>Problem-Solving Lab</i> 154 <i>Skill Review</i> 163 <i>BioDigest</i> 245 TWE: CD 153 AS 156 QD 159 UAA 161 EN 925
The student will be able to discuss factors involved in the regulation of chemical activity as part of a homeostatic mechanism (osmosis, temperature, pH, enzyme regulation). (CLG 3.1.2)	SE: 149-150, 161-163, 175-176, 195-199 <i>Inside Story</i> 162 <i>Design Your Own BioLab</i> 164-165 <i>MiniLab</i> 198 <i>Internet BioLab</i> 544-545 TWE: CT 162 AL 196 IS 198
The student will describe the flow of matter and energy between living systems and the physical environment (water cycle, carbon cycle, nitrogen cycle, photosynthesis, cellular respiration, chemosynthesis). (CLG 3.1.3)	SE: 52-54, 56-57, 221-224, 225-228, 230, 231-232, 234, 237, 486 <i>Inside Story</i> 55, 229, 233 TWE: QD 53 PR 55 RE 56 CA 133
The student will explain the function of structures found in cellular and multicellular organisms (transportation of materials, waste disposal, movement, feedback, asexual and sexual reproduction, control of structures, capture and release of energy, protein synthesis). (CLG 3.2.1)	SE: 180-185, 187, 198-200, 225-230, 231-234, 264-265, 288-295, 608, 610, 917-919, 920-923, 929-935, 985-987, TWE: CA 180 IN 227 UM 184, 289, 607, 918
The student will conclude that cells exist within a narrow range of environmental conditions and changes to that environment, either naturally occurring or induced, may cause death of the cell or organism (pH, temperature, light, water, oxygen, carbon dioxide, radiation, toxins). (CLG 3.2.2)	SE: 8-9, 150, 175-176, 195-198, 212, 297-298, 300-301 <i>Design Your Own BioLab</i> 164-165 <i>Problem-Solving Lab</i> 176 <i>Internet BioLab</i> 544-545 TWE: AL 196 EX 213
3.12.3 describe the abnormal functioning in cell regulation, such as cancer, as it relates to cell growth, division, and response to environment.	

CONTENT STANDARDS	PAGE REFERENCES
Genetics	
3.12.4 explain how traits are inherited and passed from one generation to the next (i.e., from parental DNA, RNA to gross anatomical traits of offspring).	
The student will demonstrate that the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring (meiosis, fertilization). (CLG 3.3.1)	SE: 253-255, 257, 263-270 <i>Problem-Solving Lab</i> 264 <i>MiniLab</i> 268 <i>BioDigest</i> 361 TWE: CD 269
The student will illustrate and explain how expressed traits are passed from parent to offspring (phenotypes, dominant and recessive traits, sex-linked traits, genotypes, punnett square). (CLG 3.3.2)	SE: 253-262, 309-314, 315-322, 323-324, 326-328 <i>Problem-Solving Lab</i> 262, 311, 318 <i>Internet BioLab</i> 274-275 <i>MiniLab</i> 310 TWE: IS 261, 313 MA 261 CE 313 UM 319
The student will explain how a genetic trait is determined by the code in a DNA molecule (definition of gene, structure of DNA, sequence of bases directing protein formation, proteins). (CLG 3.3.3)	SE: 281-284, 288-295 <i>Problem-Solving Lab</i> 283, 291 <i>MiniLab</i> 293 <i>Skill Review</i> 295 <i>Investigate BioLab</i> 302-303 <i>BioDigest</i> 361-362 TWE: QD 289 CA 294 AS 295
The student will describe the effect of gene alteration on an organism and/or a population (mutations, chromosome number, cloning, genetic recombination). (CLG 3.3.4)	SE: 271, 273, 296-301, 344-345, 347-348 <i>Problem-Solving Lab</i> 299 <i>MiniLab</i> 300 <i>BioDigest</i> 363 <i>BioTechnology</i> 688 TWE: EN 297 IS 298 AS 299 CA 300
Evolution	
3.12.6 analyze the mechanisms of evolutionary changes (i.e., genetic variation, environmental changes, and natural selection).	
The student will explain how new traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population (natural selection, adaptations, variation). (CLG 3.4.1)	SE: 10, 269-270, 296-297, 395-399, 404-413 <i>Problem-Solving Lab</i> 397 <i>MiniLab</i> 398, 407 <i>Internet BioLab</i> 414-415 TWE: AL 408-409, 432-433 AS 413

CONTENT STANDARDS	PAGE REFERENCES
The student will estimate degrees of kinship among organisms or species (classification, anatomical similarities, similarities of DNA base and/or amino acid sequence). (CLG 3.4.2)	SE: 443-449, 450-453 <i>Problem-Solving Lab</i> 426, 433, 447 <i>MiniLab</i> 429, 453 <i>Skill Review</i> 435 <i>Investigate BioLab</i> 437 TWE: CA 451 VL 451 UM 453
Biochemistry	
3.12.8 explain the correlation between the structure and function of biologically important molecules and their relationships to life processes.	
The student will be able to describe the unique characteristics of chemical compounds and macromolecules utilized by living systems (water, carbohydrates, lipids, proteins, nucleic acids, minerals, vitamins). (CLG 3.1.1)	SE: 152-153, 157-161, 163, 282-283, 924-927 <i>Problem-Solving Lab</i> 154 <i>Skill Review</i> 163 <i>BioDigest</i> 245 TWE: CD 153 AS 156 QD 159 UAA 161
The student will be able to discuss factors involved in the regulation of chemical activity as part of a homeostatic mechanism (osmosis, temperature, pH, enzyme regulation). (CLG 3.1.2)	SE: 149-150, 161-163, 175-176, 195-199 <i>Inside Story</i> 162 <i>Design Your Own BioLab</i> 164-165 <i>MiniLab</i> 198 <i>Internet BioLab</i> 544-545 TWE: CT 162 AL 196 IS 198
The student will analyze the relationships among organisms and between organisms and abiotic factors (abiotic/biotic factors: space, soil, water, air, temperature, food, light, organisms; relationships: predator – prey, parasite – host, mutualism, commensalism). (CLG 3.5.1)	SE: 37-38, 42-45, 46-47, 52-54, 56-57, 65-66, 97-99 <i>MiniLab</i> 36 <i>Problem-Solving Lab</i> 37 <i>Design Your Own BioLab</i> 58-59 TWE: AL 38-39 RE 44 EX 45 VL 48
Ecology	
3.12.12 analyze the interdependence of diverse living organisms and their interactions with the components of the biosphere .	
The student will analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem (diversity, succession, niche). (CLG 3.5.2)	SE: 42-45, 67-69, 111-114 <i>Design Your Own BioLab</i> 58-59 <i>Problem-Solving Lab</i> 68 <i>Investigate BioLab</i> 84-85 <i>BioDigest</i> 132-135 TWE: VL 42 UST 43 EX 69 CA 135

CONTENT STANDARDS	PAGE REFERENCES
The student will investigate how natural and man-made changes in environmental conditions will affect individual organisms and the dynamics of populations (depletion of food, destruction of habitats, disease, natural disasters, pollution, population increase, urbanization). (CLG 3.5.3)	SE: 36-38, 93, 97-99, 103, 115-120 <i>Problem-Solving Lab</i> 37, 115 <i>Design Your Own BioLab</i> 58-59 <i>Biology and Society</i> 60 TWE: QD 97, 117 IN 97 EN 119
The student will illustrate how all organisms are part of and depend on two major global food webs (oceanic food web, terrestrial food web). (CLG 3.5.4)	SE: 46-52, 73, 74-75 <i>MiniLab</i> 73 <i>BioDigest</i> 133-134 TWE: CA 73 UM 74
The student will analyze the consequences and/or trade-offs between technological changes and their effect on the individual, society and the environment. They may select topics such as bioethics, genetic engineering, endangered species, and food supply. (CLG 3.6.1)	SE: 22-23, 345, 347-348, 351-353 <i>Connection to Chemistry</i> 106 <i>Biology and Society</i> 498, 1044 TWE: CTB 106 EN 345 IN 345 BA 498 FYO 1044
<i>3.12.13 analyze the consequences of extinction and introduction of exotic species within ecosystems.</i>	
6.0 Environmental Science - Students will use scientific skills and processes to explain the interactions of environmental factors (living and non-living) and analyze their impact from a local to a global perspective.	
Flow of Matter and Energy	
<i>6.12.1 analyze and explain the movement of matter and energy through the biosphere (lithosphere, hydrosphere, atmosphere, and organisms) and the influence of this movement on weather patterns, climatic zones, and the distribution of life.</i>	
<i>The student will demonstrate that matter cycles through and between living systems and the physical environment constantly being recombined in different ways. (CLG 6.1.1)</i>	SE: 48-50, 52-54, 56-57 <i>Physical Science Connection</i> 53 <i>Inside Story</i> 55 <i>BioDigest</i> 133 TWE: PR 55 RE 56
<i>The student will analyze how the transfer of energy between atmosphere, land masses and oceans results in areas of different temperatures and densities that produce weather patterns and establish climate zones around the earth (CLG 6.1.2)</i>	SE: 75 <i>Focus On</i> 1062-1063 TWE: TS 1062

CONTENT STANDARDS	PAGE REFERENCES
Interdependence of Organisms	
<i>6.12.2 use physical, chemical, biological, and ecological concepts to analyze and explain the interdependence of organisms within the environment.</i>	
<i>The student will explain how organisms are linked by the transfer and transformation of matter and energy at the ecosystem level. (CLG 6.2.1)</i>	SE: 44-45, 46-54, 56-57 <i>Problem-Solving Lab 50</i> <i>BioDigest 133-134</i> TWE: CA 48, 50 VL 51 PSC 52
<i>The student will explain why interrelationships and interdependencies of organisms contribute to the dynamics of ecosystems. (CLG 6.2.2)</i>	SE: 44-45, 46-54, 56-57, 67-69, 113-114 <i>Problem-Solving Lab 50</i> <i>BioDigest 132-134</i> TWE: RE 44 TTPK 51 CB 133
<i>The student will conclude that populations grow or decline due to a variety of factors. (CLG 6.2.3)</i>	SE: 91-93, 95-99 <i>MiniLab 92</i> <i>Inside Story 94</i> <i>Problem-Solving Lab 95</i> <i>BioDigest 135</i> TWE: CA 93 AL 96-97 QD 97 IN 97
<i>The student will provide examples showing that natural selection leads to organisms that are well suited for survival in particular environments. (CLG 6.2.4)</i>	SE: 72, 76, 77, 78, 79, 396-399, 412-413 <i>Problem-Solving Lab 397</i> <i>MiniLab 398</i> TWE: BJ 78 AS 398 PO 401
Natural Resources and Human Needs	
<i>6.12.4 use concepts from chemistry, physics, biology, and ecology to analyze and interpret the impact both positive (recycling) and negative (toxic wastes) of human activities on the earth's resources (land, water, air, energy, biological).</i>	
<i>The student will evaluate the interrelationships between humans and air quality. (CLG 6.3.1)</i>	SE: 118 <i>Physical Science Connection 118</i> TWE: AL 118-119
<i>The student will evaluate the interrelationship between humans and water quality and quantity. (CLG 6.3.2)</i>	SE: 118, 119 <i>Biology and Society 60</i> <i>Skill Review 120</i> TWE: BA 60 AL 118-119

CONTENT STANDARDS	PAGE REFERENCES
<i>The student will evaluate the interrelationships between humans and land resources. (CLG 6.3.3)</i>	SE: 119-120, 122-123 <i>MiniLab</i> 122 <i>Biology and Society</i> 600 TWE: IN 116 CD 116 QD 117 EN 117, 119
<i>The student will evaluate the interrelationships between humans and biological resources. (CLG 6.3.4)</i>	SE: 114, 123 <i>Biology and Society</i> 26, 600 <i>Connection to Health</i> 572 <i>Focus On</i> 1076-1079 TWE: EN 119 EX 120 CD 123 GF 600
<i>The student will evaluate the interrelationships between humans and energy resources. (CLG 6.3.5)</i>	SE: 118 <i>Physical Science Connection</i> 118 TWE: EN 117 PSC 119
Environmental Issues	
<i>6.12.5 investigate and analyze environmental issues from local to global perspectives (e.g., world population, food production and distribution, pollution and epidemics, biodiversity) to develop an action project that protects, sustains, or enhances the natural environment.</i>	
<i>The student will identify an environmental issue and formulate related research questions. (CLG 6.4.1)</i>	SE: <i>Writing About Biology</i> 106 <i>MiniLab</i> 122 <i>Internet BioLab</i> 126-127
<i>The student will design and conduct the research. (CLG 6.4.2)</i>	SE: <i>Writing About Biology</i> 106 <i>MiniLab</i> 122 <i>Internet BioLab</i> 126-127
<i>The student will interpret findings to form conclusions and make recommendations to help resolve the issue. (CLG 6.4.3)</i>	SE: <i>Writing About Biology</i> 106 <i>MiniLab</i> 122 <i>Internet BioLab</i> 126-127
<i>The student will apply the conclusions to develop and implement an action project. (CLG 6.4.4)</i>	Students can read about a plan to restore the Everglades. SE: 60
<i>The student will analyze the effectiveness of the action project in terms of achieving the desired outcomes. (CLG 6.4.5)</i>	To find out more about the Everglades, visit bdol.glencoe.com/biology_society .

Codes Used for TWE Pages

A	Activity
AL	Additional Lab
AS	Assessment
BA	Background
BJ	Biology Journal
BR	Brainstorming
CA	Challenge Activity
CB	Content Background
CD	Concept Development
CE	Chalkboard Example
CT	Critical Thinking
CTB	Connection to Biology
DI	Daily Intervention
EA	Error Analysis
EN	Enrichment
EX	Extension
FR	Further Reading
FYO	Forming Your Opinion
GF	Going Further
IN	Inquiry
IS	Inclusion Strategies
MA	Modified Assessment
PO	Portfolio
PR	Project
PSC	Physical Science Connection
QD	Quick Demo
RE	Reinforcement
SYD	Share Your Data
TP	Tech Prep
TS	Teaching Strategy
TTPK	Tying to Previous Knowledge
UAA	Using an Analogy
UM	Using Models
UST	Using Science Terms
VL	Visual Learning