



Biology

© 2009

STANDARDS	PAGE REFERENCES
<p>Goal 1: Skills And Processes</p> <p>The student will demonstrate ways of thinking and acting inherent in the practice of science. The student will use the language and instruments of science to collect, organize, interpret, calculate, and communicate information.</p> <p>EXPECTATION</p> <p>1.1 The student will explain why curiosity, honesty, openness, and skepticism are highly regarded in science.</p>	
<p>INDICATOR</p> <p>1.1.1 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.</p>	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: 15, 129-131, 133-135, 256-257 <i>BioLab</i> 137 <i>Biology & Society</i> 50 <i>MiniLab</i> 77</p> <p>Teacher Wraparound Edition: DC 15, 257; DIB 50</p>
<p>INDICATOR</p> <p>1.1.2 The student will modify or affirm scientific ideas according to accumulated evidence.</p>	<p>Student Edition: 11-14, 182-183, 326-332, 401-407, 423-429 <i>BioDiscoveries</i> 350 <i>Data Analysis Lab</i> 406 <i>MiniLab</i> 184</p> <p>Teacher Wraparound Edition: CB 12; MI 423; RS 326</p>

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>1.1.3 The student will critique arguments that are based on faulty, misleading data or on the incomplete use of numbers.</p>	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: 11-15, 20 <i>Problem-Solving Skills</i> 1111</p> <p>Teacher Wraparound Edition: AC 13; CT 11; DC 15; FA 15</p>
<p>INDICATOR</p> <p>1.1.4 The student will recognize data that are biased.</p>	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: 11-15, 20 <i>Problem-Solving Skills</i> 1111</p> <p>Teacher Wraparound Edition: AC 13; CT 11; DC 15; FA 15</p>
<p>INDICATOR</p> <p>1.1.5 The student will explain factors that produce biased data (incomplete data, using data inappropriately, conflicts of interest, etc.).</p>	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: 11-15, 20 <i>Problem-Solving Skills</i> 1111</p> <p>Teacher Wraparound Edition: AC 13; CT 11; DC 15; FA 15</p>
<p>EXPECTATION</p> <p>1.2 The student will pose scientific questions and suggest investigative approaches to provide answers to questions.</p>	
<p>INDICATOR</p> <p>1.2.1 The student will identify meaningful, answerable scientific questions.</p>	<p>Student Edition: 16, 18 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035</p> <p>Teacher Wraparound Edition: ATD 23; MI 11</p>
<p>INDICATOR</p> <p>1.2.2 The student will pose meaningful, answerable scientific questions. (NTB)</p>	<p>Student Edition: 16, 18 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035</p> <p>Teacher Wraparound Edition: ATD 23; MI 11</p>

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>1.2.3 The student will formulate a working hypothesis.</p>	<p>Student Edition: 16, 18 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035</p> <p>Teacher Wraparound Edition: ATD 23</p>
<p>INDICATOR</p> <p>1.2.4 The student will test a working hypothesis. (NTB)</p>	<p>Student Edition: 16, 18 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035</p> <p>Teacher Wraparound Edition: ATD 23</p>
<p>INDICATOR</p> <p>1.2.5 The student will select appropriate instruments and materials to conduct an investigation.</p>	<p>Student Edition: 18-19 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035</p> <p>Teacher Wraparound Edition: ATD 23</p>
<p>INDICATOR</p> <p>1.2.6 The student will identify appropriate methods for conducting an investigation (independent and dependent variables, proper controls, repeat trials, appropriate sample size, etc.).</p>	<p>Student Edition: 18-19 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035</p> <p>Teacher Wraparound Edition: ATD 23</p>
<p>INDICATOR</p> <p>1.2.7 The student will use relationships discovered in the lab to explain phenomena observed outside the laboratory.</p>	<p>Student Edition: <i>BioLab</i> 107, 317 <i>BioLab: Design Your Own</i> 173, 533</p>
<p>INDICATOR</p> <p>1.2.8 The student will defend the need for verifiable data.</p>	<p>Student Edition: xxxv, 11-14, 20 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035</p> <p>Teacher Wraparound Edition: DC 13</p>

STANDARDS	PAGE REFERENCES
<p>EXPECTATION 1.3 The student will carry out scientific investigations effectively and employ the instruments, systems of measurement, and materials of science appropriately.</p>	
<p>INDICATOR 1.3.1 The student will develop and demonstrate skills in using lab and field equipment to perform investigative techniques. (NTB)</p>	<p>Student Edition: xxxvi-xxxviii, xl-xliii, 18-20 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035 Teacher Wraparound Edition: SP 185</p>
<p>INDICATOR 1.3.2 The student will recognize safe laboratory procedures.</p>	<p>Student Edition: xxx-xxxiv, 21 <i>BioLab</i> 351 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035 Teacher Wraparound Edition: DC 21</p>
<p>INDICATOR 1.3.3 The student will demonstrate safe handling of the chemicals and materials of science. (NTB)</p>	<p>Student Edition: xxx-xxxiv, 21 <i>BioLab</i> 351 <i>BioLab: Design Your Own</i> 23, 173, 235, 533, 593, 653, 925, 1035 Teacher Wraparound Edition: DC 21</p>
<p>INDICATOR 1.3.4 The student will learn the use of new instruments and equipment by following instructions in a manual or from oral direction. (NTB)</p>	<p>Student Edition: xxxvi-xliii <i>BioLab</i> 351, 381 <i>BioLab: Design Your Own</i> 173 Teacher Wraparound Edition: SP 185</p>
<p>EXPECTATION 1.4 The student will demonstrate that data analysis is a vital aspect of the process of scientific inquiry and communication.</p>	
<p>INDICATOR 1.4.1 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).</p>	<p>Student Edition: <i>BioLab</i> 259 <i>BioLab: Design Your Own</i> 51, 107, 173, 653, 925 <i>MiniLab</i> 1002 <i>Skillbuilder Handbook: Math Skills</i> 1115-1118 Teacher Wraparound Edition: AC 275; DC 20</p>

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>1.4.2 The student will analyze data to make predictions, decisions, or draw conclusions.</p>	<p>Student Edition: <i>BioLab</i> 259 <i>BioLab: Design Your Own</i> 51, 107, 173, 653, 925 <i>Data Analysis Lab</i> 98, 274, 494, 1090 <i>MiniLab</i> 1002</p> <p>Teacher Wraparound Edition: AC 275; DC 20</p>
<p>INDICATOR</p> <p>1.4.3 The student will use experimental data from various investigators to validate results.</p>	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: <i>BioLab</i> 137, 443 <i>BioLab: Design Your Own</i> 23, 51, 107, 173, 533, 653, 925</p>
<p>INDICATOR</p> <p>1.4.4 The student will determine the relationships between quantities and develop the mathematical model that describes these relationships.</p>	<p>Student Edition: <i>BioLab</i> 443, 983 <i>BioLab: Design Your Own</i> 287 <i>MiniLab</i> 66, 281, 314, 1082</p> <p>Teacher Wraparound Edition: AC 97; FA 282</p>
<p>INDICATOR</p> <p>1.4.5 The student will check graphs to determine that they do not misrepresent results.</p>	<p>Student Edition: <i>BioLab</i> 259 <i>BioLab: Design Your Own</i> 51, 107, 173, 653, 925 <i>MiniLab</i> 1002</p> <p>Teacher Wraparound Edition: AC 275; DC 20</p>
<p>INDICATOR</p> <p>1.4.6 The student will describe trends revealed by data.</p>	<p>Student Edition: <i>BioLab</i> 137, 259 <i>BioLab: Design Your Own</i> 51, 107, 173, 653, 925 <i>MiniLab</i> 1002</p> <p>Teacher Wraparound Edition: AC 275; DC 20</p>
<p>INDICATOR</p> <p>1.4.7 The student will determine the sources of error that limit the accuracy or precision of experimental results.</p>	<p>Student Edition: <i>BioLab: Design Your Own</i> 23, 51, 83, 173, 235, 287, 533, 567, 593, 653, 925, 1035 <i>MiniLab</i> 19</p> <p>Teacher Wraparound Edition: AC 23, 51, 83, 173, 235, 287, 533, 567, 593, 653, 925, 1035</p>

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>1.4.8 The student will use models and computer simulations to extend his/her understanding of scientific concepts. (NTB)</p>	<p>Student Edition: <i>BioLab</i> 443, 843, 1097 <i>BioLab: Design Your Own</i> 83, 871 <i>Launch Lab</i> 269 <i>MiniLab</i> 66, 331, 334, 365, 396, 1035, 1052</p> <p>Teacher Wraparound Edition: DC 696; DE 272</p>
<p>INDICATOR</p> <p>1.4.9 The student will use analyzed data to confirm, modify, or reject a hypothesis.</p>	<p>Student Edition: 20 <i>BioLab: Design Your Own</i> 23, 51, 83, 173, 235, 533, 567, 593, 653, 925, 1035</p> <p>Teacher Wraparound Edition: CT 18</p>
<p>EXPECTATION</p> <p>1.5 The student will use appropriate methods for communicating in writing and orally the processes and results of scientific investigation.</p>	
<p>INDICATOR</p> <p>1.5.1 The student will demonstrate the ability to summarize data (measurements/observations).</p>	<p>Student Edition: <i>BioLab</i> 259 <i>BioLab: Design Your Own</i> 51, 173, 653, 925 <i>MiniLab</i> 1002 <i>Skillbuilder Handbook: Math Skills</i> 1115-1118</p> <p>Teacher Wraparound Edition: AC 275; DC 20</p>
<p>INDICATOR</p> <p>1.5.2 The student will explain scientific concepts and processes through drawing, writing, and/or oral communication.</p>	<p>Student Edition: <i>BioLab</i> 107, 137, 475, 953, 1097 <i>BioLab: Design Your Own</i> 23, 51, 83 <i>MiniLab</i> 42 <i>Writing in Biology</i> 208, 808</p> <p>Teacher Wraparound Edition: DC 273; RS 369; SP 271; WS 465</p>
<p>INDICATOR</p> <p>1.5.3 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. (NTB)</p>	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: <i>BioLab</i> 137, 259 <i>BioLab: Design Your Own</i> 51, 173, 653, 925 <i>MiniLab</i> 1002 <i>Skillbuilder Handbook: Math Skills</i> 1115-1118</p> <p>Teacher Wraparound Edition: AC 275; DC 20</p>

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>1.5.4 The student will use tables, graphs, and displays to support arguments and claims in both written and oral communication.</p>	<p>Student Edition: <i>BioLab</i> 259 <i>BioLab: Design Your Own</i> 51, 173, 653, 925 <i>MiniLab</i> 1002 <i>Skillbuilder Handbook: Math Skills</i> 1115-1118</p> <p>Teacher Wraparound Edition: AC 275; DC 20</p>
<p>INDICATOR</p> <p>1.5.5 The student will create and/or interpret graphics. (scale drawings, photographs, digital images, field of view, etc.)</p>	<p>Student Edition: <i>BioLab</i> 505, 1067 <i>BioLab: Design Your Own</i> 681 <i>Data Analysis Lab</i> 459, 544, 806 <i>MiniLab</i> 702 <i>National Geographic</i> 377, 397, 703</p> <p>Teacher Wraparound Edition: DC 703; SP 377, 397</p>
<p>INDICATOR</p> <p>1.5.6 The student will read a technical selection and interpret it appropriately.</p>	<p>Student Edition: 183-185, 363-370 <i>Cutting-Edge Biology</i> 106, 208, 234, 504, 982, 1096 <i>In the Field: Career</i> 566, 1038</p> <p>Teacher Wraparound Edition: SP 369; WIB 566; WS 366</p>
<p>INDICATOR</p> <p>1.5.7 The student will use, explain, and/or construct various classification systems.</p>	<p>Student Edition: 484-488, 490-496 <i>BioLab</i> 505, 519, 623 <i>MiniLab</i> 488, 500</p> <p>Teacher Wraparound Edition: DC 493; DE 484; FA 489; RS 496</p>
<p>INDICATOR</p> <p>1.5.8 The student will describe similarities and differences when explaining concepts and/or principles.</p>	<p>Student Edition: <i>BioLab</i> 317, 475, 505, 623 <i>MiniLab</i> 8, 220, 255, 488, 500, 605, 634, 672, 765, 938</p> <p>Teacher Wraparound Edition: FA 221; SP 275; WS 673</p>
<p>INDICATOR</p> <p>1.5.9 The student will communicate conclusions derived through a synthesis of ideas.</p>	<p>Student Edition: <i>BioLab</i> 475, 505, 623 <i>BioLab: Design Your Own</i> 23, 51, 83, 137, 533, 567, 871 <i>MiniLab</i> 77, 255, 1082</p> <p>Teacher Wraparound Edition: RS 99; WS 311, 313</p>

STANDARDS	PAGE REFERENCES
<p>EXPECTATION 1.6 The student will use mathematical processes.</p>	
<p>INDICATOR 1.6.1 The student will use ratio and proportion in appropriate situations to solve problems.</p>	<p>Student Edition: 280-282 <i>BioLab</i> 137, 317, 443 <i>MiniLab</i> 127, 281, 284, 314 Teacher Wraparound Edition: CT 297; DC 282; FA 282, 285</p>
<p>INDICATOR 1.6.2 The student will use computers and/or graphing calculators to perform calculations for tables, graphs, or spreadsheets. (NTB)</p>	<p>Student Edition: <i>BioLab</i> 107, 137, 443, 983 <i>BioLab: Design Your Own</i> 51, 653 <i>MiniLab</i> 127 Teacher Wraparound Edition: AC 275</p>
<p>INDICATOR 1.6.3 The student will express and/or compare small and large quantities using scientific notation and relative order of magnitude.</p>	<p>The following page references can be used to meet this standard. Student Edition: 97, 148 Teacher Wraparound Edition: AC 97; SP 185</p>
<p>INDICATOR 1.6.4 The student will manipulate quantities and/or numerical values in algebraic equations.</p>	<p>The following page references can be used to meet this standard. Student Edition: 431-432 <i>BioLab: Design Your Own</i> 127, 137 <i>MiniLab</i> 284 Teacher Wraparound Edition: CB 432; DC 432</p>
<p>INDICATOR 1.6.5 The student will judge the reasonableness of an answer.</p>	<p>Student Edition: <i>BioLab</i> 107, 137, 443, 983 <i>BioLab: Design Your Own</i> 51, 653 <i>MiniLab</i> 127 Teacher Wraparound Edition: AC 275</p>

STANDARDS	PAGE REFERENCES
<p>EXPECTATION</p> <p>1.7 The student will show that connections exist both within the various fields of science and among science and other disciplines including mathematics, social studies, language arts, fine arts, and technology.</p>	
<p>INDICATOR</p> <p>1.7.1 The student will apply the skills, processes, and concepts of biology, chemistry, physics, or earth science to societal issues.</p>	<p>Student Edition: <i>BioLab</i> 381, 1011, 1097 <i>Biology & Society</i> 50, 258, 680, 1066 <i>MiniLab</i> 77</p> <p>Teacher Wraparound Edition: DC 133; DIB 50; RS 129</p>
<p>INDICATOR</p> <p>1.7.2 The student will identify and evaluate the impact of scientific ideas and/or advancements in technology on society.</p>	<p>Student Edition: 11-15, 66, 100-101, 363, 370-371, 372-374, 401-404, 1076-1077, 1089-1090 <i>Biology & Society</i> 258, 1066 <i>Cutting-Edge Biology</i> 982</p> <p>Teacher Wraparound Edition: CB 401; DC 15; RS 370</p>
<p>INDICATOR</p> <p>1.7.3 The student will describe the role of science in the development of literature, art, and music. (NTB)</p>	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: 121, 498 <i>Timeline</i> 992</p>
<p>INDICATOR</p> <p>1.7.4 The student will recognize mathematics as an integral part of the scientific process. (NTB)</p>	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: xxxv-xi, 20, 280-282 <i>BioLab: Design Your Own</i> 287 <i>Data Analysis Lab</i> 14, 348, 970 <i>MiniLab</i> 66, 245, 281, 314 <i>Skillbuilder Handbook: Math Skills</i> 1114-1118</p> <p>Teacher Wraparound Edition: CB 20; DC 20, 282; WS 20</p>
<p>INDICATOR</p> <p>1.7.5 The student will investigate career possibilities in the various areas of science. (NTB)</p>	<p>Student Edition: 4-5 <i>Careers in Biology</i> 13, 35, 46, 200, 343, 403, 522, 663, 816, 932, 939, 1060 <i>In the Field: Career</i> 172, 316, 622, 782, 1038</p> <p>Teacher Wraparound Edition: BA 316, 622, 782</p>

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>1.7.6 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.</p>	<p>Student Edition: 5-6, 182-185, 363-371, 372-376 <i>Cutting-Edge Biology</i> 208, 234, 504, 952, 982, 1096 <i>Data Analysis Lab</i> 376 <i>National Geographic</i> 377</p> <p>Teacher Wraparound Edition: RS 5; SP 182</p>
<p>Goal 3: Concepts Of Biology</p> <p>The student will demonstrate the ability to use scientific skills and processes (Core Learning Goal 1) and major biological concepts to explain the uniqueness and interdependence of living organisms, their interactions with the environment, and the continuation of life on earth.</p>	
<p>EXPECTATION</p> <p>3.1 The student will be able to explain the correlation between the structure and function of biologically important molecules and their relationship to cell processes.</p>	
<p>INDICATOR</p> <p>3.1.1 The student will be able to describe the unique characteristics of chemical substances and macromolecules utilized by living systems.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • water (inorganic molecule, polarity, density, and solvent properties) • carbohydrates (organic molecule; monosaccharides are building blocks; supplier of energy and dietary fiber; structural component of cells: cell wall, cellulose) • lipids (organic molecule; component of cell membranes; stored energy supply) • proteins (organic molecule; amino acids are building blocks; structural and functional role, including enzymes) • nucleic acids (organic molecule; nucleotides are building blocks - sugar, phosphate, & nitrogen bases; DNA is a double helix, RNA is a single strand; DNA replication; DNA role in storage of genetic information) • minerals (inorganic substances essential for cellular processes) • vitamins (organic molecule; role in human body: C – wound healing, K – blood clotting, D – bone growth) 	<p>Student Edition: 161, 163, 166-171, 329-332, 333-335, 336-338, 1026-1028 <i>MiniLab</i> 331, 334 <i>National Geographic</i> 162</p> <p>Teacher Wraparound Edition: DC 168; FA 165; RS 169; SP 161; WS 1027</p>

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>3.1.2 The student will be able to discuss factors involved in the regulation of chemical activity as part of a homeostatic mechanism.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • osmosis (predicting water flow across a membrane based on the cell's environment; explain role in living systems) • temperature (effect upon enzyme activity and metabolic rate; effect upon rate of diffusion and states of matter) • pH (pH scale: relative values for acids and bases; effect on living systems: cellular, organismal) • enzyme regulation (effect of temperature, pH, and enzyme/substrate concentration on enzyme activity) 	<p>Student Edition:</p> <p>159-160, 164-165, 170, 203-205</p> <p><i>BioLab: Design Your Own</i> 173</p> <p><i>Data Analysis Lab</i> 164</p> <p><i>MiniLab</i> 159, 203</p> <p>Teacher Wraparound Edition:</p> <p>CT 165</p>
<p>INDICATOR</p> <p>3.1.3 The student will be able to compare the transfer and use of matter and energy in photosynthetic and non-photosynthetic organisms.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • water cycle (movement of water between living systems and the environment) • carbon cycle (movement of carbon between living systems and the environment, cyclic relationship between photosynthesis and respiration) • nitrogen cycle (roles of bacteria; human impact) • photosynthesis (energy conversion: light, chemical; basic molecules involved) • cellular respiration (distinctions between aerobic and anaerobic, energy released, use of oxygen; basic molecules involved in aerobic) • chemosynthesis (from inorganic compounds) • ATP (energy carrier molecule) 	<p>Student Edition:</p> <p>41, 45-48, 218-221, 222-224, 228-233, 517</p> <p><i>MiniLab</i> 220</p> <p><i>National Geographic</i> 225</p> <p>Teacher Wraparound Edition:</p> <p>CT 47, 221; DC 45, 46, 232; FA 49, 227; WS 219</p>

STANDARDS

PAGE REFERENCES

EXPECTATION

3.2 The student will demonstrate an understanding that all organisms are composed of cells which can function independently or as part of multicellular organisms.

3.2.1 The student will explain processes and the function of related structures found in unicellular and multicellular organisms.

Assessment limits:

- transportation of materials (role of cellular membranes; role of vascular tissues in plants and animals; role of circulatory systems)
- waste disposal (role of cellular membrane; role of excretory and circulatory systems)
- movement (cellular – flagella, cilia, pseudopodia; interaction between skeletal and muscular systems)
- feedback (maintaining cellular and organismal homeostasis - water balance, pH, temperature, role of endocrine system)
- asexual (binary fission, budding, vegetative, mitosis: role in growth and repair, chromosome number remains the same) and sexual reproduction (angiosperms, mammals)
- control of structures (cellular organelles and human systems) and related functions (role of nucleus, role of sensory organs and nervous system)
- capture and release of energy (chloroplasts, mitochondria)
- protein synthesis (ribosomes)

Student Edition:

187, 193, 197-198, 201-207, 220-221, 222-224, 226, 228-233, 248, 270-271, 276, 336-338, 340, 519, 520, 550, 580, 637-638, 645, 674-679, 887, 938-939, 948, 962-965, 967, 992-996, 1005-1007, 1031-1035, 1037

MiniLab 203, 223, 1035

Teacher Wraparound Edition:

CB 206; DC 187, 201; DE 1005; MI 992

INDICATOR

3.2.2 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 changes in the metabolic activity of the cell or organism.

Assessment limits:

- pH
- temperature
- light
- water
- oxygen
- carbon dioxide
- radiation (role in cancer or mutations)
- toxic substances (natural, synthetic)

Student Edition:

160, 165, 254-255, 348-349

BioLab 259

BioLab: Design Your Own 173

Data Analysis Lab 164

Teacher Wraparound Edition:

CT 165

STANDARDS

PAGE REFERENCES

EXPECTATION

3.3 The student will analyze how traits are inherited and passed on from one generation to another.

<p>INDICATOR</p> <p>3.3.1 The student will demonstrate that the sorting and recombination of genes during sexual reproduction has an effect on variation in offspring.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • meiosis (process that forms gametes; chromosome number reduced by one-half; crossing-over occurs; new gene combinations) • fertilization (combination of gametes to form zygote) 	<p>Student Edition: 271-272, 274-276, 283, 695, 1054-1055 <i>Launch Lab</i> 269 <i>National Geographic</i> 273</p> <p>Teacher Wraparound Edition: DC 272; DE 283</p>
<p>INDICATOR</p> <p>3.3.2 The student will illustrate and explain how expressed traits are passed from parent to offspring.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • phenotypes (expression of inherited characteristics) • dominant and recessive traits • sex-linked traits (X-linked only; recessive phenotypes are more often expressed in the male) • genotypes (represented by heterozygous and homozygous pairs of alleles) • punnett square (use to predict and/or interpret the results of a genetic cross; translate genotypes into phenotypes - monohybrid only) • Pedigree (use to interpret patterns of inheritance within a family) 	<p>Student Edition: 277-282, 296-301, 307-308 <i>BioLab: Design Your Own</i> 287 <i>MiniLab</i> 281, 300</p> <p>Teacher Wraparound Edition: FA 282; RS 279; SP 297</p>
<p>INDICATOR</p> <p>3.3.3 The student will explain how a genetic trait is determined by the code in a DNA molecule.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • definition of gene (a segment of DNA that codes for a protein or RNA) • sequence of nitrogen bases directing protein formation (role of DNA, mRNA, tRNA, rRNA) • proteins determine traits 	<p>Student Edition: 171, 270, 278, 336-338, 340-341 <i>National Geographic</i> 339</p> <p>Teacher Wraparound Edition: DE 339; WS 336</p>

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>3.3.4 The student will interpret how the effects of DNA alteration can be beneficial or harmful to the individual, society, and/or the environment.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • mutations • chromosome number (abnormalities) • genetic engineering (gene splicing, recombinant DNA, cloning) 	<p>Student Edition: 254, 313-314, 345-349, 364, 370-371, 378, 434 <i>Biology & Society</i> 680</p> <p>Teacher Wraparound Edition: DC 347, 434; WS 346</p>
<p>EXPECTATION</p> <p>3.4 The student will explain the mechanism of evolutionary change.</p>	
<p>INDICATOR</p> <p>3.4.1 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.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • natural selection (definition; effects of environmental pressure) • adaptations (effects on survival) • variation (effects on survival and reproductive success) 	<p>Student Edition: 275-276, 420, 428-430, 431-436 <i>BioLab</i> 443 <i>Data Analysis Lab</i> 435 <i>National Geographic</i> 421</p> <p>Teacher Wraparound Edition: AC 275; DC 421; DE 429</p>
<p>INDICATOR</p> <p>3.4.2 The student will estimate degrees of relatedness among organisms or species.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • classification (recognize relationships among organisms; distinguish between prokaryotes and eukaryotes) • anatomical similarities (evolutionary relationships; homologous structures) • similarities of DNA base and/or amino acid sequence (including results from gel electrophoresis) 	<p>Student Edition: 424-427, 490-496 <i>BioLab</i> 505 <i>Data Analysis Lab</i> 494</p> <p>Teacher Wraparound Edition: DC 493; WS 492</p>

STANDARDS

PAGE REFERENCES

EXPECTATION

3.5 The student will investigate the interdependence of diverse living organisms and their interactions with the components of the biosphere.

INDICATOR

3.5.1 The student will analyze the relationships between biotic diversity and abiotic factors in environments and the resulting influence on ecosystems.

Assessment limits:

- Abiotic/Biotic factors
 - space
 - soil
 - water
 - air
 - temperature
 - food
 - light
 - organisms
- Relationships
 - predator – prey
 - parasite – host
 - mutualism
 - commensalism
 - competition

Student Edition:

35, 38-40, 65-66, 68-73, 94-98

BioLab 107

BioLab: Design Your Own 51, 83

Teacher Wraparound Edition:

DC 35

INDICATOR

3.5.2 The student will analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem.

Assessment limits:

- diversity
- succession
- trophic level (producer; consumer: herbivore, carnivore, omnivore, scavenger; decomposer)
- niche (role of organism within an ecosystem)
- pyramid (energy, biomass)

Student Edition:

38, 41-44, 62-64, 116-118

Data Analysis Lab 63

MiniLab 42

Teacher Wraparound Edition:

DC 38, 43; MI 116; SP 44

STANDARDS	PAGE REFERENCES
<p>INDICATOR</p> <p>3.5.3 The student will investigate how natural and man-made changes in environmental conditions will affect individual organisms and the dynamics of populations.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • depletion of food • destruction of habitats • disease • natural disasters • pollution • population increase • urbanization 	<p>Student Edition: 62-64, 66, 94-96, 123-128 <i>BioLab</i> 137 <i>BioLab: Design Your Own</i> 83 <i>MiniLab</i> 77</p> <p>Teacher Wraparound Edition: DC 126; DE 126; FA 128; WS 96</p>
<p>INDICATOR</p> <p>3.5.4 The student will illustrate how all organisms are part of and depend on two major global food webs that are positively or negatively influenced by human activity and technology.</p> <p>Assessment limits:</p> <ul style="list-style-type: none"> • oceanic food web • terrestrial food web 	<p>The following page references can be used to meet this standard.</p> <p>Student Edition: 42-43, 68-73, 74-81, 123-128 <i>Biology & Society</i> 870, 1010 <i>Cutting-Edge Biology</i> 106 <i>MiniLab</i> 42</p> <p>Teacher Wraparound Edition: FA 128; SP 125</p>
<p>EXPECTATION</p> <p>3.6 The student will investigate a biological issue and develop an action plan.</p>	
<p>INDICATOR</p> <p>3.6.1 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, or food supply. (NTB)</p>	<p>Student Edition: 5-6, 15, 118-121, 122-123, 370-371, 372-374, 378-379 <i>Biology & Society</i> 258, 680, 1066</p> <p>Teacher Wraparound Edition: DE 118; DIB 680, 1066; RS 370</p>
<p>INDICATOR</p> <p>3.6.2 The student will investigate a biological issue and be able to defend their position on topics such as animal rights, drug and alcohol abuse, viral diseases (e.g., AIDS), genetic engineering, bioethics, biodiversity, population growth, global sustainability, or origin of life. (NTB)</p>	<p>Student Edition: 15, 100-105, 129-135, 370-371, 378-379, 978-981 <i>Biology & Society</i> 258, 680, 1066 <i>MiniLab</i> 77, 101</p> <p>Teacher Wraparound Edition: DIB 680, 1066; FA 105</p>