



BSCS Biology

A Molecular Approach
© 2006

| STANDARDS | | PAGE REFERENCES |
|--|---|---|
| Standard 1: Nature of Science | | |
| Students exercise the basic tenets of scientific investigation, make accurate observations, exercise critical thinking skills, apply proper scientific instruments of investigation and measurement tools, and communicate results in problem solving. Students evaluate the validity of information by utilizing the tools of scientific thinking and investigation. Students summarize their findings by creating lab reports using technical writing including graphs, charts, and diagrams to communicate the results of investigations. | | |
| Goal 1.1: Understand Systems, Order, and Organization | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.1.1.1 | Explain the scientific meaning of system, order, and organization. (648.01a) | Student Edition: 177, 179-181 |
| 9-10.B.1.1.2 | Apply the concepts of order and organization to a given system. (648.01a) | Student Edition: 52, 94-98, 177, 179-181, 186-191, 191-198, 633, 634 <i>Theory</i> 676 |
| Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanation | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.1.2.1 | Use observations and data as evidence on which to base scientific explanations. (648.02a) | Student Edition: <i>Investigation</i> 696-698, 700-702, 704-707, 712-713, 716-718, 720-723, 749-751, 760-762, 770-774, 778-780, 791-792 |

| STANDARDS | | PAGE REFERENCES |
|---|---|--|
| 9-10.B.1.2.2 | Develop models to explain concepts or systems. (648.02b) | Student Edition: <i>Investigation</i> 694-696, 709-711, 712-713, 730-731, 732-736, 741-742, 768-770 |
| 9-10.B.1.2.3 | Develop scientific explanations based on knowledge, logic and analysis. (648.02c) | <i>Investigation</i> 696-698, 700-702, 704-707, 712-713, 716-718, 720-723, 749-751, 760-762, 770-774, 778-780, 791-792 |
| Goal 1.3: Understand Constancy, Change, and Measurement | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.1.3.1 | Measure changes that can occur in and among systems. (648.03b) | Student Edition: <i>Investigation</i> 696-698, 716-718, 719-720, 726-728, 729, 791-792 |
| 9-10.B.1.3.2 | Analyze changes that can occur in and among systems. (648.03b) | Student Edition: <i>Investigation</i> 713-714, 716-718, 719-720, 726-728, 729, 791-792 |
| 9-10.B.1.3.3 | Measure and calculate using the metric system. (648.03c) | Student Edition: 687-688 <i>Investigation</i> 690-691, 693-694, 712-713, 770-774, 792-794 |
| Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State | | |
| Reference to 7.S.3.2.1 | | |
| Goal 1.5: Understand Concepts of Form and Function | | |
| No objectives in Biology. | | |
| Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.1.6.1 | Identify questions and concepts that guide scientific investigations. (649.01a) | Student Edition: 6-12, 14-17 <i>Investigation</i> 696-698, 700-702, 714-716, 720-723, 726-729, 736-741, 782-783 |
| 9-10.B.1.6.2 | Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b) | Student Edition: 685-687 <i>Investigation</i> 696-698, 700-702, 714-716, 720-723, 726-729, 736-741, 782-783 |
| 9-10.B.1.6.3 | Use appropriate technology and mathematics to make investigations. (649.01c) | Student Edition: <i>Investigation</i> 691-694, 702-704, 712-713, 723-725, 755-760, 768-770 |

| STANDARDS | | PAGE REFERENCES |
|--|--|--|
| 9-10.B.1.6.4 | Formulate scientific explanations and models using logic and evidence. (649.01d) | Student Edition: <i>Investigation</i> 696-698, 700-702, 704-707, 712-713, 716-718, 720-723, 749-751, 760-762, 770-774, 778-780, 791-792 |
| 9-10.B.1.6.5 | Analyze alternative explanations and models. (649.01e) | Student Edition: 444-446, 452-453, 537-539 <i>Investigation</i> 696-698, 700-702, 704-707, 712-713, 716-718, 720-723, 749-751, 760-762, 770-774, 778-780, 791-792 <i>Theory</i> 412, 514, 594, 676 |
| 9-10.B.1.6.6 | Communicate and defend a scientific argument. (649.01f) | Student Edition: <i>Investigation</i> 696-698, 700-702, 704-707, 712-713, 716-718, 720-723, 749-751, 760-762, 770-774, 778-780, 791-792 |
| 9-10.B.1.6.7 | Explain the differences among observations, hypotheses, and theories. (649.01g) | Student Edition: 6, 7, 8 <i>Investigation</i> 690-691 <i>Theory</i> 13 Annotated Teacher Edition: 8 |
| Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors | | |
| No objectives in Biology. | | |
| Goal 1.8: Understand Technical Communication | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.1.8.1 | Analyze technical writing, graphs, charts, and diagrams. (658.02a) | Student Edition: 61, 111, 115, 116, 117, 145, 671, 674, 675 <i>Investigation</i> 702-707, 716-718, 719-720, 729, 758-762, 770-776 |
| Standard 2: Physical Science | | |
| No goals or objectives in Biology. | | |

| STANDARDS | | PAGE REFERENCES |
|---|---|---|
| Standard 3: Biology | | |
| Students explain the importance of cells as they relate to the organization and structure of complex organisms, differentiation and specialization during development, and the chemical reactions necessary to sustain life. Students describe the functions of cell structures. Students use the theory of evolution to explain diversity of life. | | |
| Goal 3.1: Understand the Theory of Biological Evolution | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.3.1.1 | Use the theory of evolution to explain how species change over time. (652.01a) | Student Edition: 7-12, 417, 418, 423-428, 499, 501, 503-511, 513, 515 <i>Theory</i> 13, 514 <i>Investigation</i> 696 Annotated Teacher Edition: 12, 504 |
| 9-10.B.3.1.2 | Explain how evolution is the consequence of interactions among the potential of a species to increase its numbers, genetic variability, a finite supply of resources, and the selection by the environment of those offspring better able to survive and reproduce. (652.01a) | Student Edition: 7-12, 418, 423-428, 507-511, 513, 515 <i>Focus On</i> 421, 428 <i>Investigation</i> 696, 758-760 Annotated Teacher Edition: 417, 508, 509 |
| Goal 3.2: Understand the Relationship between Matter and Energy in Living Systems | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.3.2.1 | Explain how matter tends toward more disorganized states (entropy). (653.01a) | Student Edition: 56-60, 81 Annotated Teacher Edition: 59, 60 |
| 9-10.B.3.2.2 | Explain how organisms use the continuous input of energy and matter to maintain their chemical and physical organization. (653.01b) | Student Edition: 54-55, 58, 59-60, 66, 102, 130 <i>Investigation</i> 702-704 |
| 9-10.B.3.2.3 | Show how the energy for life is primarily derived from the sun through photosynthesis. (653.01c) | Student Edition: 55, 56, 59-60, 101-106, 108-112, 121 <i>Investigation</i> 714-718 |

| STANDARDS | | PAGE REFERENCES |
|--|---|--|
| 9-10.B.3.2.4 | Describe cellular respiration and the synthesis of macromolecules. (653.01d) | Student Edition: 55, 60, 129-142 <i>Investigation</i> 720-723 Annotated Teacher Edition: 134 |
| 9-10.B.3.2.5 | Show how matter cycles and energy flows through the different levels of organization of living systems (cells, organs, organisms, communities) and their environment. (653.01h) | Student Edition: 54-57, 59-60, 67-73, 636-638, 640-642 <i>Investigation</i> 702-704 |
| Goal 3.3: Understand the Cell is the Basis of Form and Function for All Living Things | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.3.3.1 | Identify the particular structures that underlie the cellular functions. (651.01a) | Student Edition: 104-105, 137, 163-173 <i>Biological Challenges</i> 220 <i>Focus On</i> 172, 179 <i>Investigation</i> 723-725 Annotated Teacher Edition: T106-T107 |
| 9-10.B.3.3.2 | Explain cell functions involving chemical reactions. (651.01b) | Student Edition: 61-66, 103-106, 108-112, 130-141, 144-146 <i>Focus On</i> 64 <i>Investigation</i> 704-707, 714-716 Annotated Teacher Edition: T92-T93 |
| 9-10.B.3.3.3 | Explain how cells use DNA to store and use information for cell functions. (651.01c) | Student Edition: 40-42, 43-45, 47, 233-236, 240-252 <i>Investigation</i> 732-736 Annotated Teacher Edition: T124; 234 |
| 9-10.B.3.3.4 | Explain how selective expression of genes can produce specialized cells from a single cell. (651.01e) | Student Edition: 263-265, 277-285, 287 <i>Biological Challenges</i> 286 <i>Focus On</i> 280 |

| STANDARDS | | PAGE REFERENCES |
|--|--|--|
| Standard 4: Earth and Space Systems | | |
| No goals or objectives in Biology. | | |
| Standard 5: Personal and Social Perspectives; Technology | | |
| Students understand that science and technology interact and impact both society and the environment. Students describe issues such as water and air quality, hazardous waste, renewable and nonrenewable resources. | | |
| Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.5.1.1 | Analyze environmental issues such as water and air quality, hazardous waste, forest health, and agricultural production. (656.01a) | Student Edition: 121-122, 668-672, 674-675, 677 <i>Biological Challenges</i> 673 <i>Investigation</i> 792-794 Annotated Teacher Edition: T227 |
| Goal 5.2: Understand the Relationship between Science and Technology | | |
| Objective(s): By the end of Biology, the student will be able to: | | |
| 9-10.B.5.2.1 | Explain how science advances technology. (655.01a) | Student Edition: 2-4, 17, 398-400, 402-405, 410-411 <i>Biological Challenges</i> 321, 350 <i>Focus On</i> 281 |
| 9-10.B.5.2.2 | Explain how technology advances science. (655.01a) | Student Edition: 156-158, 398-400, 402-405 <i>Biological Challenges</i> 46, 53, 159, 239, 401, 644 <i>Focus On</i> 120 |
| 9-10.B.5.2.3 | Explain how science and technology are pursued for different purposes. (656.01b) | This standard can be addressed by using the following page references. Student Edition: 2, 17, 156-158, 398-400, 402-405, 410-411 <i>Biological Challenges</i> 46, 53, 159, 239, 321, 350, 401, 644 <i>Focus On</i> 120 |

| STANDARDS | | PAGE REFERENCES |
|---|---|--|
| <p>Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them</p> | | |
| <p>Objective(s): By the end of Biology, the student will be able to:</p> | | |
| 9-10.B.5.3.1 | Describe the difference between renewable and nonrenewable resources. (656.03a) | <p>This standard can be addressed by using the following page references.</p> <p>Student Edition: 668-671</p> |