



**Physical
Science**
with **Earth Science**
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STANDARDS	PAGE REFERENCES
S11.A The Nature of Science	
S11.A.1 Reasoning and Analysis	
<p>S11.A.1.1 Analyze and explain the nature of science in the search for understanding the natural world and its connection to technological systems.</p> <p><i>Reference: 3.1.10.A, 3.2.10.A, 3.1.10.E</i></p>	
<p>S11.A.1.1.1 Compare and contrast scientific theories, scientific laws, and beliefs (e.g., the law of gravity, how light travels, formation of moons, stages of ecological succession).</p>	<p>Student Edition: 12, 98-103, 105, 113-117, 206-207, 358-360, 669-673, 836-837 <i>Integrate Astronomy</i> 596 <i>Integrate Language Arts</i> 837 <i>Science and History</i> 120 Teacher Wraparound Edition: FF 105; FYI 99; IL 12; QD 102</p>

STANDARDS	PAGE REFERENCES
<p>S11.A.1.1.2 Analyze and explain how to verify the accuracy of scientific facts, principles, theories, and laws.</p>	<p>Student Edition: 7-10 <i>Design Your Own Lab</i> 242-243, 568-569 <i>Lab</i> 87, 379, 742-743 <i>Launch Lab</i> 97, 353, 719 <i>Science and History</i> 120, 146, 478, 810 <i>Science Skill Handbook</i> 853-858 Teacher Wraparound Edition: A 9; D 8</p>
<p>S11.A.1.1.3 Evaluate the appropriateness of research questions (e.g., testable vs. not-testable).</p>	<p>Student Edition: 8, 12, 50, 54 <i>Applying Science</i> 428, 499, 586 <i>Lab</i> 51, 741, 776-777 <i>Science Skill Handbook</i> 850 Teacher Wraparound Edition: PR 12; USW 8</p>
<p>S11.A.1.1.4 Explain how specific scientific knowledge or technological design concepts solve practical problems (e.g., momentum, Newton’s universal law of gravitation, tectonics, conservation of mass and energy, cell theory, theory of evolution, atomic theory, theory of relativity, Pasteur’s germ theory, relativity, heliocentric theory, ideal gas laws).</p>	<p>Student Edition: 42-45, 114, 369, 490-493 <i>Applying Math</i> 198, 325, 412 <i>Applying Science</i> 428, 499, 586 <i>Integrate Environment</i> 466 <i>National Geographic</i> 2-3, 44, 66-67, 115, 368, 388-389, 684-685 <i>Science and History</i> 312 <i>Science and Society</i> 778 Teacher Wraparound Edition: CD 115; IL 490; VL 41</p>
<p>S11.A.1.1.5 Analyze or compare the use of both direct and indirect observation as means to study the world and the universe (e.g., behavior of atoms, functions of cells, birth of stars).</p>	<p>Student Edition: 6-10, 186-187, 201-202, 218-220, 231-235, 581-583, 721-722, 801-803, 818-822, 836-839 <i>National Geographic</i> 233, 582 <i>Science Skill Handbook</i> 854-858 Teacher Wraparound Edition: FYI 234; QD 187, 722, 838; SJ 201</p>

STANDARDS	PAGE REFERENCES
<p>S11.A.1.2 Identify and analyze the scientific or technological challenges of societal issues; propose possible solutions and discuss implications. Reference: 3.2.10.A, 4.3.10.B</p>	
<p>S11.A.1.2.1 Apply and explain scientific concepts to societal issues using case studies (e.g., sea level change, spread of HIV, deforestation, environmental health, energy).</p>	<p>Student Edition: 486-491, 501-506, 536-538, 646-652, 661-662 <i>Applying Science</i> 499 <i>Integrate Social Studies</i> 497, 799 <i>Science and Society</i> 678, 778 <i>Use the Internet Lab</i> 508-509 Teacher Wraparound Edition: CU 539; D 499, 506; DI 804; IL 490</p>
<p>S11.A.1.2.2 Use case studies (e.g., Wright brothers' flying machine, Tacoma Narrows Bridge, Henry Petroski's Design Paradigms) to propose possible solutions and analyze economic and environmental implications of solutions for real-world problems.</p>	<p>Student Edition: 491-493, 497-499, 804-806 <i>Accidents in Science</i> 712, 744 <i>Applying Science</i> 428 <i>Integrate Health</i> 804 <i>Model and Invent Lab</i> 176-177 <i>National Geographic</i> 44, 368, 805 <i>Science and Society</i> 778 Teacher Wraparound Edition: A 492; D 503; FYI 498</p>
<p>S11.A.1.3 Describe and interpret patterns of change in natural and human-made systems. Reference: 3.1.10.C, 3.1.10.E, 4.8.10.A</p>	
<p>S11.A.1.3.1 Use appropriate quantitative data to describe or interpret change in systems (e.g., biological indices, electrical circuit data, automobile diagnostic systems data).</p>	<p>Student Edition: 79, 132-133, 257-258 <i>Applying Math</i> 72, 198, 220 <i>Lab</i> 51, 118-119, 310-311, 379 <i>Launch Lab</i> 69 <i>Model and Invent Lab</i> 176-177 <i>National Geographic</i> 78 Teacher Wraparound Edition: CC 257; DI 136; FYI 107; LD 102</p>

STANDARDS	PAGE REFERENCES
<p>S11.A.1.3.2 Describe or interpret dynamic changes to stable systems (e.g., chemical reactions, human body, food webs, tectonics, homeostasis).</p>	<p>Student Edition: 86, 98-103, 113-114, 135-136, 142-143, 190-195, 254-256, 358-361, 720-722, 824-825, 836-838 <i>Integrate Astronomy</i> 105 <i>Integrate Environment</i> 139 <i>Integrate Health</i> 143 <i>Integrate History</i> 201, 218-219 <i>Integrate Physics</i> 90 <i>Science and History</i> 146 Teacher Wraparound Edition: FYI 82, 360</p>
<p>S11.A.1.3.3 Describe how changes in physical and biological indicators (e.g., soil, plants, animals) of water systems reflect changes in these systems (e.g., changes in bloodworm populations reflect changes in pollution levels in streams).</p>	<p>Student Edition: 288, 521-522, 539, 660-661, 668, 773-774 <i>Lab</i> 271 <i>National Geographic</i> 666 <i>Science and Society</i> 678, 778 Teacher Wraparound Edition: FYI 530; LD 762; QD 773; VL 291</p>
<p>S11.A.1.3.4 Compare the rate of use of natural resources and their impact on sustainability.</p>	<p>Student Edition: 466, 491-493, 501-506, 536-538, 652, 654, 660 <i>Integrate Environment</i> 466 <i>Science and Society</i> 678, 778 Teacher Wraparound Edition: A 538; D 492; SJ 660</p>
<p>S11.A.2 Processes, Procedures and Tools of Scientific Investigations</p>	
<p>S11.A.2.1 Apply knowledge of scientific investigation or technological design to develop or critique aspects of the experimental or design process. Reference: 3.2.10.B, 3.2.10.B</p>	
<p>S11.A.2.1.1 Critique the elements of an experimental design (e.g., raising questions, formulating hypotheses, developing procedures, identifying variables, manipulating variables, interpreting data, and drawing conclusions) applicable to a specific experimental design.</p>	<p>Student Edition: 7-10 <i>Design Your Own Lab</i> 88-89, 144-145, 344-345, 540-541, 568-569 <i>Science Skill Handbook</i> 853-858 <i>Use the Internet Lab</i> 476-477, 508-509 Teacher Wraparound Edition: A 9; FF 8; R 13</p>

STANDARDS	PAGE REFERENCES
<p>S11.A.2.1.2 Critique the elements of the design process (e.g., identify the problem, understand criteria, create solutions, select solution, test/evaluate, communicate results) applicable to a specific technological design.</p>	<p>Student Edition: 13, 819-821 <i>Accidents in Science</i> 210 <i>Design Your Own Lab</i> 28-29 <i>MiniLab</i> 819 <i>Model and Invent Lab</i> 176-177 <i>National Geographic</i> 168, 368 <i>Science and History</i> 146, 312 Teacher Wraparound Edition: DI 819</p>
<p>S11.A.2.1.3 Use data to make inferences and predictions, or to draw conclusions, demonstrating understanding of experimental limits.</p>	<p>Student Edition: 6-7, 12, 14-21, 218-219, 222, 356-361 <i>Integrate Astronomy</i> 105, 324 <i>Lab</i> 380-381, 616, 830 <i>Launch Lab</i> 577 <i>Science and History</i> 120, 312, 600 Teacher Wraparound Edition: DI 7; RS 198; VL 356</p>
<p>S11.A.2.1.4 Critique the results and conclusions of scientific inquiry for consistency and logic.</p>	<p>Student Edition: 10, 14, 218-219, 354-358, 836-839 <i>Design Your Own Lab</i> 28-29, 88-89, 242-243 <i>Lab</i> 51, 134 <i>Model and Invent Lab</i> 176-177 <i>Science and History</i> 120, 478 <i>Science Skill Handbook</i> 857-858 <i>Use the Internet Lab</i> 508-509 Teacher Wraparound Edition: CU 839; DI 10; QD 17; R 222</p>
<p>S11.A.2.1.5 Communicate results of investigations using multiple representations.</p>	<p>Student Edition: 22-26 <i>Communicating Your Data</i> 29, 134, 381, 693 <i>Lab</i> 51, 134, 379, 653, 830 <i>Model and Invent Lab</i> 176-177, 840-841 <i>Science Skill Handbook</i> 858 Teacher Wraparound Edition: CYD 89, 507; TPK 22</p>

STANDARDS	PAGE REFERENCES
<p>S11.A.2.2 Evaluate appropriate technologies for a specific purpose, or describe the information the instrument can provide.</p> <p>Reference: 3.7.10.B, 3.8.10.B</p>	
<p>S11.A.2.2.1</p> <p>Evaluate appropriate methods, instruments, and scale for precise quantitative and qualitative observations (e.g., to compare properties of materials, water quality).</p>	<p>Student Edition: 9-10, 17-21, 54-57 <i>Applying Science</i> 586 <i>Design Your Own Lab</i> 28-29 <i>Lab</i> 196, 406, 742-743, 775 <i>MiniLab</i> 19 <i>Model and Invent Lab</i> 176-177, 808-809 <i>Science Skill Handbook</i> 854-857</p> <p>Teacher Wraparound Edition: LD 54; QD 10, 17</p>
<p>S11.A.2.2.2</p> <p>Explain how technology (e.g., GPS, spectroscope, scanning electron microscope, pH meters, probe, interfaces, imaging technology, telescope) is used to extend human abilities and precision.</p>	<p>Student Edition: 39-41, 227-228, 240-241, 773, 798-799, 819-822 <i>Accidents in Science</i> 210 <i>Integrate Earth Science</i> 11 <i>Model and Invent Lab</i> 176-177 <i>National Geographic</i> 44, 233, 805 <i>Science and History</i> 312, 600 <i>Science and Society</i> 178</p> <p>Teacher Wraparound Edition: CD 236; FF 228, 234; FYI 799, 820; VL 41</p>
<p>S11.A.3 Systems, Models and Patterns</p>	
<p>S11.A.3.1 Analyze the parts of a simple system, their roles, and their relationships to the system as a whole.</p> <p>Reference: 3.1.10.A, 3.1.10.E, 4.3.10.C</p>	
<p>S11.A.3.1.1</p> <p>Apply systems analysis, showing relationships (e.g., flowcharts, decision trees, dichotomous keys, mind map), input and output, and measurements to explain a system and its parts.</p>	<p>Student Edition: 162-165, 260-263, 490-493, 535-539, 578-583, 634-635, 650-651, 663-668, 761-762, 823-826 <i>Integrate Astronomy</i> 596 <i>Science and History</i> 146, 312, 478</p> <p>Teacher Wraparound Edition: FYI 650; LD 634</p>

STANDARDS	PAGE REFERENCES
<p>S11.A.3.1.2 Analyze and predict the effect of making a change in one part of a system on the system as a whole.</p>	<p>Student Edition: 160-163, 197-202, 254-258, 272-273, 466, 522, 536-539, 738-740 <i>Design Your Own Lab</i> 144-145, 344-345 <i>Integrate Environment</i> 466 <i>Lab</i> 776-777 Teacher Wraparound Edition: FYI 537; IL 202; QD 273; SJ 257</p>
<p>S11.A.3.1.3 Use appropriate quantitative data to describe or interpret a system (e.g., biological indices, electrical circuit data, automobile diagnostic systems data).</p>	<p>Student Edition: 162-165, 404-405, 410-413, 492-493, 760-762, 773-774 <i>Design Your Own Lab</i> 88-89, 414-415, 568-569 <i>Integrate Astronomy</i> 105 <i>Integrate Health</i> 143 <i>Model and Invent Lab</i> 176-177 Teacher Wraparound Edition: DI 492; FYI 164, 772</p>
<p>S11.A.3.1.4 Apply the universal systems model of inputs, processes, outputs, and feedback to a working system (e.g., heating systems, motor, food production) and identify the resources necessary for operation of the system.</p>	<p>Student Edition: 41-45, 139-141, 162-165, 272-273, 275, 401-405, 409-413, 435-437, 490-491, 634-635, 720-727 <i>Model and Invent Lab</i> 176-177 <i>National Geographic</i> 44 <i>Science and History</i> 146 Teacher Wraparound Edition: A 172; FYI 276, 325; LD 120; SJ 139, 162</p>
<p>S11.A.3.2 Compare observations of the real world to observations of a constructed model. Reference: 3.1.10.B, 3.2.10.B, 4.1.10.B, 4.6.10.A</p>	
<p>S11.A.3.2.1 Compare the accuracy of predictions represented in a model to actual observations and behavior.</p>	<p>Student Edition: 11 <i>Design Your Own Lab</i> 344-345 <i>Integrate Earth Science</i> 11 <i>Lab</i> 196, 468, 507, 523 <i>Launch Lab</i> 353 <i>MiniLab</i> 656, 824 <i>Model and Invent Lab</i> 58-59, 176-177 Teacher Wraparound Edition: DI 581; VL 11</p>

STANDARDS	PAGE REFERENCES
<p>S11.A.3.2.2 Describe advantages and disadvantages of using models to simulate processes and outcomes.</p>	<p>Student Edition: 11, 218-219, 581 <i>Integrate Earth Science</i> 11 <i>Integrate Physics</i> 30 <i>Lab</i> 807 <i>MiniLab</i> 195, 581, 819 <i>Science Skill Handbook</i> 853 Teacher Wraparound Edition: A 11; AS 822; DI 581</p>
<p>S11.A.3.2.3 Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., dimensions of the solar system, life spans, size of atomic particles, topographic maps).</p>	<p>Student Edition: 218-219, 581-583, 836 <i>Lab</i> 196, 468, 807 <i>Launch Lab</i> 185, 217, 785 <i>MiniLab</i> 195, 200, 375, 525, 628, 656, 789, 802, 819 <i>Model and Invent Lab</i> 710-711, 808-809, 840-841 <i>National Geographic</i> 582 <i>Science and History</i> 478 Teacher Wraparound Edition: A 838; IL 202; LD 665; MM 201, 803; QD 194; RS 219</p>
<p>S11.A.3.3 Compare and analyze repeated processes or recurring elements in patterns. Reference: 3.1.10.C, 3.2.10.B</p>	
<p>S11.A.3.3.1 Describe or interpret recurring patterns that form the basis of biological classification, chemical periodicity, geological order, or astronomical order.</p>	<p>Student Edition: 193-195, 221, 552-554, 588-591, 669-673, 690-692, 730-733, 823-825 <i>Integrate History</i> 9 <i>Lab</i> 693, 830 <i>National Geographic</i> 826 Teacher Wraparound Edition: A 221; LD 591; TPK 588; VL 672</p>
<p>S11.A.3.3.2 Compare stationary physical patterns (e.g., crystals, layers of rocks, skeletal systems, tree rings, atomic structure) to the object's properties.</p>	<p>Student Edition: 534, 592-596, 612-614, 617-635, 670-671, 674-675 <i>Applying Math</i> 621 <i>Lab</i> 616, 636-637, 676-677 <i>MiniLab</i> 555, 612 Teacher Wraparound Edition: DI 592; FYI 612; QD 619, 631; VL 671, 674</p>

STANDARDS	PAGE REFERENCES
<p>S11.A.3.3.3 Analyze physical patterns of motion to make predictions or draw conclusions (e.g., solar system, tectonic plates, weather systems, atomic motion, waves).</p>	<p>Student Edition: 190-195, 197-202, 254-257, 288-291, 356-361, 364-367, 458-461, 469-470, 524-528, 535, 539 <i>Integrate Earth Science</i> 293 <i>Integrate History</i> 201 <i>Lab</i> 379 <i>MiniLab</i> 519 <i>National Geographic</i> 292 <i>Use the Internet Lab</i> 476-477 Teacher Wraparound Edition: CB 200, 292; CU 361; FYI 199; IM 193, 198; R 259; VL 458</p>
<p>S11.B Biological Sciences</p>	
<p>S11.B.1 Structure and Function of Organisms</p>	
<p>S11.B.1.1 Explain structure and function at multiple levels of organization.</p>	
<p>S11.B.1.1.1 Explain how structure determines function at multiple levels of organization (e.g., chemical, cellular, anatomical).</p>	<p>Student Edition: 335-337, 428-430, 609-612, 690-692 <i>Integrate Chemistry</i> 613 <i>Integrate Life Science</i> 342, 428 <i>Lab</i> 693 <i>National Geographic</i> 168 Teacher Wraparound Edition: AS 702; CU 692; DI 698; FYI 335</p>
<p>S11.B.1.1.2 Compare and contrast the structural and functional similarities and differences among living things (e.g., classify organisms into classification groups, compare systems).</p>	<p>Student Edition: 238-239, 341, 518 <i>Integrate History</i> 9 <i>Integrate Life Science</i> 341, 342, 827 Teacher Wraparound Edition: CB 341; D 239; DI 533</p>
<p>S11.B.1.1.3 Compare and contrast cellular processes (e.g., photosynthesis and respiration, meiosis and mitosis, protein synthesis and DNA replication).</p>	<p>Student Edition: 518 <i>Integrate Life Science</i> 522, 827 Additional discussion of this topic may be found in <i>Glencoe's Science – Level Blue</i> © 2008.</p>

STANDARDS	PAGE REFERENCES
S11.B.2 Continuity of Life	
S11.B.2.1 Explain the mechanisms of the theory of evolution.	
S11.B.2.1.1 Explain the theory of evolution by interpreting data from fossil records, similarities in anatomy and physiology, or DNA studies that are relevant to the theory of evolution.	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.
S11.B.2.1.2 Explain the role of mutations, differential reproduction, and gene recombination in changing the genetic makeup of a population.	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.
S11.B.2.1.3 Explain the role of selective breeding and biotechnology in changing the genetic makeup of a population.	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.
S11.B.2.1.4 Explain why natural selection can act only on inherited traits.	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.
S11.B.2.2 Describe how genetic information is inherited and expressed.	
S11.B.2.2.1 Describe how genetic information is expressed (i.e., DNA, genes, chromosomes, transcription, translation, and replication)	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.
S11.B.2.2.2 Compare and contrast mitosis and meiosis in passing on genetic information.	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.
S11.B.2.2.3 Explain how different patterns of inheritance affect population variability (i.e., multiple alleles, co-dominance, dominance, recessiveness, sex-influenced traits, and sex-linked traits).	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.
S11.B.3 Ecological Behavior and Systems	
S11.B.3.1 Use evidence or examples to explain the characteristics of and interactions within an ecosystem.	
S11.B.3.1.1 Explain the significance of diversity in ecosystems.	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.
S11.B.3.1.2 Explain the biotic (i.e., plant, animal, and microbial communities) and abiotic (i.e., soil, air, temperature, and water) components of an ecosystem and their interaction.	Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.

STANDARDS	PAGE REFERENCES
<p>S11.B.3.1.3 Describe how living organisms affect the survival of one another.</p>	<p>Student Edition: <i>Integrate Environment</i> 139 <i>Integrate History</i> 536 <i>Integrate Life Science</i> 827 Teacher Wraparound Edition: IM 142 Additional discussion of this topic may be found in Glencoe's <i>Science – Level Blue</i> © 2008.</p>
<p>S11.B.3.1.4 Compare the similarities and differences in the major biomes (e.g., desert, tropical rain forest, temperate forest, coniferous forest, tundra) and the communities that inhabit them.</p>	<p>Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.</p>
<p>S11.B.3.1.5 Predict how limiting factors (e.g., physical, biological, chemical) can affect organisms.</p>	<p>Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.</p>
<p>S11.B.3.2 Analyze patterns of change in natural or human-made systems over time.</p>	
<p>S11.B.3.2.1 Use evidence to explain how cyclical patterns in population dynamics affect natural systems.</p>	<p>Discussion of these topics may be found in Glencoe's <i>Science – Level Blue</i> © 2008.</p>
<p>S11.B.3.2.2 Explain biological diversity as an indicator of a healthy environment.</p>	<p>Student Edition: 238-239 Additional discussion of this topic may be found in Glencoe's <i>Science – Level Blue</i> © 2008.</p>
<p>S11.B.3.2.3 Explain how natural processes (e.g., seasonal change, catastrophic events, habitat alterations) impact the environment over time.</p>	<p>Student Edition: 193-195, 374-375, 612-613, 620-623, 648-649, 654-662 <i>Integrate History</i> 377 <i>Integrate Social Studies</i> 297 <i>National Geographic</i> 666 <i>Science and History</i> 382 Teacher Wraparound Edition: DI 612; FYI 650; IM 193; UA 656</p>

STANDARDS	PAGE REFERENCES
<p>S11.B.3.3 Explain how human-made systems impact the management and distribution of natural resources.</p>	
<p>S11.B.3.3.1 Describe different human-made systems and how they use renewable and nonrenewable natural resources (i.e., energy, transportation, distribution, management, and processing).</p>	<p>Student Edition: 45, 272-276, 407-411, 435-437, 486-491, 497-498, 501-506 <i>Lab</i> 51 <i>Science and History</i> 312 <i>Science and Society</i> 678, 778 Teacher Wraparound Edition: CD 489; D 505; FF 275; R 500; TPK 272</p>
<p>S11.B.3.3.2 Compare the impact of management practices (e.g., production, processing, research, development, marketing, distribution, consumption, by-products) in meeting the need for commodities locally and globally.</p>	<p>Student Edition: 42-45, 410-413, 440, 444, 492-493 <i>National Geographic</i> 44 <i>Science and Society</i> 678 <i>Use the Internet Lab</i> 508-509 Teacher Wraparound Edition: FYI 53; IL 490; IM 503</p>
<p>S11.B.3.3.3 Explain the environmental benefits and risks associated with human-made systems (e.g., integrated pest management, genetically engineered organisms, organic food production).</p>	<p>Student Edition: 45, 48-49, 497-499, 501-506 <i>Applying Science</i> 49 <i>MiniLab</i> 47 <i>Science and Society</i> 510, 678, 778 Teacher Wraparound Edition: A 492; DI 499; FYI 48</p>
<p>S11.C Physical Sciences</p>	
<p>S11.C.1 Structure, Properties, and Interaction of Matter and Energy</p>	
<p>S11.C.1.1 Explain the relationship between the structure and properties of matter. <i>Reference: 3.4.10.A</i></p>	
<p>S11.C.1.1.1 Explain that matter is made of particles called atoms and that atoms are composed of even smaller particles (e.g., protons, neutrons, electrons).</p>	<p>Student Edition: 579-581, 584-587, 592-594, 786-788 <i>National Geographic</i> 582 Teacher Wraparound Edition: A 787; DI 579, 592; IM 586; TPK 786</p>
<p>S11.C.1.1.2 Explain the relationship between the physical properties of a substance and its molecular or atomic structure.</p>	<p>Student Edition: 588-589, 594, 609-612, 620-622, 700-702, 788-789 <i>Lab</i> 616 <i>Science and Society</i> 638 Teacher Wraparound Edition: VL 610</p>

STANDARDS	PAGE REFERENCES
<p>S11.C.1.1.3 Explain the formation of compounds (ionic and covalent) and their resulting properties using bonding theories.</p>	<p>Student Edition: 688-692, 694-702 <i>Model and Invent Lab</i> 710-711 <i>National Geographic</i> 699 Teacher Wraparound Edition: DI 691, 697, 698; R 692</p>
<p>S11.C.1.1.4 Explain how the relationships of chemical properties of elements are represented in the repeating patterns within the periodic table.</p>	<p>Student Edition: 588-596, 690-692, 703-704 Teacher Wraparound Edition: FYI 590; R 596; VL 690</p>
<p>S11.C.1.1.5 Predict the behavior of gases through the application of laws (e.g., Boyle's law, Charles' law, or ideal gas law).</p>	<p>Discussion of this topic may be found in Glencoe's <i>Science – Level Blue</i> © 2008.</p>
<p>S11.C.1.1.6 Describe factors that influence the frequency of collisions during chemical reactions that might affect the reaction rates (e.g., surface area, concentration, temperature).</p>	<p>Student Edition: 738-740 <i>Lab</i> 741, 742-743 Teacher Wraparound Edition: D 739</p>
<p>S11.C.2 Forms, Sources, Conversion, and Transfer of Energy</p>	
<p>S11.C.2.1 Analyze energy sources and transfer of energy, or conversion of energy. Reference: 3.4.10.B</p>	
<p>S11.C.2.1.1 Compare or analyze waves in the electromagnetic spectrum (e.g., ultraviolet, infrared, visible light, X-rays, microwaves) as well as their properties, energy levels, and motion.</p>	<p>Student Edition: 458-461, 462-467, 469-475 <i>National Geographic</i> 471 <i>Use the Internet Lab</i> 476-477 Teacher Wraparound Edition: CC 470; DI 464; QD 465; R 461; VL 458</p>
<p>S11.C.2.1.2 Describe energy changes in chemical reactions.</p>	<p>Student Edition: 136, 142, 720, 734-740 <i>Integrate Environment</i> 139 <i>Integrate Health</i> 143 <i>National Geographic</i> 737 Teacher Wraparound Edition: R 740; TPK 734; VL 136</p>

STANDARDS	PAGE REFERENCES
<p>S11.C.2.1.3 Apply the knowledge of conservation of energy to explain common systems (e.g., refrigeration, rocket propulsion, heat pump).</p>	<p>Student Edition: 135-136, 139-140, 163, 276, 734 <i>Design Your Own Lab</i> 144-145 <i>Integrate Environment</i> 139 <i>Science and History</i> 146 Teacher Wraparound Edition: FF 140, 275; LD 138; MM 276</p>
<p>S11.C.2.1.4 Use Ohm's Law to explain relative resistances, currents, and voltage.</p>	<p>Student Edition: 404-405, 408 <i>Design Your Own Lab</i> 414-415 <i>Integrate Physics</i> 416 Teacher Wraparound Edition: AIL 414; R 405; SJ 411</p>
<p>S11.C.2.2 Demonstrate that different ways of obtaining, transforming, and distributing energy have different environmental consequences. Reference: 3.4.10.B, 4.8.10.C, 4.2.10.A</p>	
<p>S11.C.2.2.1 Explain the environmental impacts of energy use by various economic sectors (e.g., mining, logging, transportation) on environmental systems.</p>	<p>Student Edition: 45, 47-49, 492-493, 506, 536-538 <i>Integrate Earth Science</i> 542 <i>Integrate Environment</i> 466 <i>National Geographic</i> 44 <i>Science and Society</i> 510, 678, 778 <i>Use the Internet Lab</i> 508-509 Teacher Wraparound Edition: CYD 509; DI 44; FYI 538; VL 48</p>
<p>S11.C.2.2.2 Explain the practical use of alternative sources of energy (i.e., wind, solar, and biomass) to address environmental problems (e.g., air quality, erosion, resource depletion).</p>	<p>Student Edition: 501-506, 536-538 <i>Use the Internet Lab</i> 508-509 Teacher Wraparound Edition: CYD 509; D 506; FYI 538; LD 537</p>
<p>S11.C.2.2.3 Give examples of renewable energy resources (e.g., wind, solar, biomass) and nonrenewable resources (e.g., coal, oil, natural gas) and explain the environmental and economic advantages and disadvantages of their use.</p>	<p>Student Edition: 489-493, 501-506, 536-538 <i>Science and Society</i> 510 <i>Use the Internet Lab</i> 508-509 Teacher Wraparound Edition: A 492; CC 489; ER 493; FYI 519, 538</p>

STANDARDS	PAGE REFERENCES
S11.C.3 Principles of Motion and Force	
S11.C.3.1 Use the principles of motion and force to solve real-world challenges. <i>Reference: 3.4.10.C, 3.6.10.C</i>	
S11.C.3.1.1 Explain common phenomena (e.g., a rock in a landslide, an astronaut during a space walk, a car hitting a patch of ice on the road) using an understanding of conservation of momentum.	Student Edition: 116-117 <i>Applying Math</i> 116 <i>Lab</i> 118-119 Teacher Wraparound Edition: D 116
S11.C.3.1.2 Design or evaluate simple technological or natural systems that incorporate the principles of force and motion (e.g., simple machines, compound machines).	Student Edition: 76-80, 81-86, 98-103, 110-111, 113-114, 154-159, 160-165, 166-174, 218-221, 358-361 <i>Applying Math</i> 102 <i>Design Your Own Lab</i> 88-89 <i>Integrate Earth Science</i> 293 <i>Integrate History</i> 77 <i>Lab</i> 87 <i>Science and History</i> 120, 312, 448 Teacher Wraparound Edition: D 156; DI 100; IM 171; LD 102; QD 82; SJ 162
S11.C.3.1.3 Describe the motion of an object using variables (i.e., acceleration, velocity, displacement).	Student Edition: 70-73, 76-80, 102-103, 218-220, 358-361 <i>Applying Math</i> 102 <i>Design Your Own Lab</i> 88-89 <i>Integrate Physics</i> 220, 358 <i>Lab</i> 379 <i>MiniLab</i> 71, 219 Teacher Wraparound Edition: D 77; LD 79; QD 360
S11.C.3.1.4 Explain how electricity induces magnetism and how magnetism induces electricity as two aspects of a single electromagnetic force.	Student Edition: 431-437, 438-444 <i>Design Your Own Lab</i> 446-447 <i>Lab</i> 445 <i>National Geographic</i> 441 Teacher Wraparound Edition: QD 433; R 437, 444

STANDARDS	PAGE REFERENCES
<p>S11.C.3.1.5 Calculate the mechanical advantage for moving an object by using a simple machine.</p>	<p>Student Edition: 164-165, 166-173 <i>Lab</i> 175 <i>Model and Invent Lab</i> 176-177 Teacher Wraparound Edition: D 171; FYI 164; LD 170</p>
<p>S11.C.3.1.6 Identify elements of simple machines in compound machines.</p>	<p>Student Edition: 174 Teacher Wraparound Edition: FF 173</p>
<p>S11.D Earth and Space Sciences</p>	
<p>S11.D.1 Earth Features and Processes that Change Earth and Its Resources</p>	
<p>S11.D.1.1 Explain and analyze the forces in the lithosphere that continually shape Earth.</p>	
<p>S11.D.1.1.1 Classify and describe major types of rocks (i.e., igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss) and minerals (e.g., quartz, calcite, dolomite, clay, feldspar, mica, halite, pyrite) by their origin and formation.</p>	<p>Student Edition: 609-615, 617-623, 624-629, 630-635 <i>Integrate Chemistry</i> 631 <i>Lab</i> 636-637 <i>National Geographic</i> 633 <i>Science and Society</i> 638 Teacher Wraparound Edition: CU 629; FYI 634; QD 626; SJ 622; TPK 608</p>
<p>S11.D.1.1.2 Explain the processes that take place at plate boundaries and how these processes continue to shape Earth (e.g., volcanic activity, earthquakes, mountain building, mid-ocean ridges, deep-sea trenches, new land being formed).</p>	<p>Student Edition: 356-360, 362-369, 373-378, 623 <i>Integrate Earth Science</i> 293 <i>Integrate History</i> 377 <i>Lab</i> 379 <i>Science and History</i> 382 Teacher Wraparound Edition: CC 377; FYI 359; VL 356</p>
<p>S11.D.1.1.3 Analyze features caused by the interaction of processes that change Earth's surface (e.g., wind and moving water help break down rock into soil; plate movement, earthquakes, and volcanic activity help cause mountains and valleys to form; flowing water and deposition of material help form deltas).</p>	<p>Student Edition: 646-652, 654-662, 664-665, 674-675 <i>MiniLab</i> 656 <i>National Geographic</i> 666 Teacher Wraparound Edition: D 658; DI 660; IM 649; LD 659; TPK 646, 654</p>

STANDARDS	PAGE REFERENCES
<p>S11.D.1.2 Analyze how human-made systems impact the management and distribution of natural resources.</p>	
<p>S11.D.1.2.1 Evaluate factors affecting availability, location, extraction, and use of natural resources.</p>	<p>Student Edition: 489-491, 495, 536-537, 608-609, 615 <i>Integrate Language Arts</i> 615 <i>National Geographic</i> 488 <i>Science and Society</i> 510, 638 Teacher Wraparound Edition: A 488; AS 493; CC 609; DI 498; FYI 490</p>
<p>S11.D.1.2.2 Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation).</p>	<p>Student Edition: 489-493, 497-499, 501-506, 536-538 <i>Use the Internet Lab</i> 508-509 <i>Science and Society</i> 510 Teacher Wraparound Edition: A 492, 498, 538; D 499; ER 493; FYI 497, 537</p>
<p>S11.D.1.3 Explain the significance and contribution of water as a resource to living things and the shaping of the land.</p>	
<p>S11.D.1.3.1 Explain the multiple functions of different water systems in relation to landforms (e.g., buffer zones, nurseries, food production areas, habitat, water quality control, biological indicators).</p>	<p>Student Edition: 522, 532-533, 612, 624-629, 655-661, 663-668 <i>Integrate Earth Science</i> 258, 558 <i>MiniLab</i> 656 <i>National Geographic</i> 666 Teacher Wraparound Edition: A 666; D 257, 532, 658; DI 660; FYI 530; SJ 667</p>
<p>S11.D.1.3.2 Explain relationships among physical characteristics, vegetation, topography, and flow as it relates to water systems.</p>	<p>Student Edition: 522, 536-537, 647, 655-657, 660-661, 663-668 <i>Applying Math</i> 665 <i>Integrate Earth Science</i> 558 <i>Integrate Life Science</i> 522 <i>National Geographic</i> 666 Teacher Wraparound Edition: IM 649; LD 665</p>
<p>S11.D.1.3.3 Explain factors (e.g., nutrient loading, turbidity, rate of flow, rate of deposition, biological diversity) that affect water quality and flow through a water system.</p>	<p>Student Edition: 539; 624-625, 663-668 <i>Integrate Earth Science</i> 558 <i>MiniLab</i> 628 <i>Science and Society</i> 678, 778 Teacher Wraparound Edition: A 538; AS 668; CB 558; LD 627, 665; QD 626, 664</p>

STANDARDS	PAGE REFERENCES
S11.D.2 Weather, Climate, and Atmospheric Processes	
S11.D.2.1 Analyze how the transfer of energy and substances between Earth's atmosphere and its surface influences regional or global weather or climate.	
<p>S11.D.2.1.1 Describe how changes in concentration of minor components (e.g., O₂, CO₂, dust, pollution) in Earth's atmosphere may be linked to climate change.</p>	<p>Student Edition: 466, 518-519, 536-539 <i>Applying Math</i> 537 <i>Integrate Environment</i> 466 <i>Integrate History</i> 536 <i>Science and History</i> 382, 600 Teacher Wraparound Edition: CU 538; D 536; FYI 519; LD 537</p>
<p>S11.D.2.1.2 Compare the transmission, reflection, absorption, and radiation of solar energy to and by Earth's surface under different environmental conditions (e.g., major volcanic eruptions, greenhouse effect, reduction of ozone layer, increased global cloud cover).</p>	<p>Student Edition: 269, 466, 520-521, 536-538, 663 <i>Integrate Environment</i> 466 <i>Integrate History</i> 536 <i>National Geographic</i> 268 <i>Science and History</i> 382 Teacher Wraparound Edition: CB 466; CU 270, 539; D 520</p>
<p>S11.D.2.1.3 Explain weather patterns and seasonal changes using the concepts of heat and density.</p>	<p>Student Edition: 520-521, 524-528, 530-534, 535, 539 Teacher Wraparound Edition: FYI 526; QD 533; TPK 535</p>
<p>S11.D.2.1.4 Analyze weather maps and weather data (e.g., air masses, fronts, temperature, air pressure, wind speed, wind direction, precipitation) to predict regional or global weather events.</p>	<p>Student Edition: 39, 524-528 <i>Lab</i> 523 <i>Launch Lab</i> 517 <i>Reference Handbook</i> 898 Teacher Wraparound Edition: A 526; CC 39; FF 520; FYI 519, 532; RS 527; TPK 524</p>

STANDARDS	PAGE REFERENCES
S11.D.3 Composition and Structure of the Universe	
S11.D.3.1 Explain the composition, structure, and origin of the universe.	
<p>S11.D.3.1.1 Describe planetary motion and the physical laws that explain planetary motion.</p>	<p>Student Edition: 218-220 <i>Applying Math</i> 220 <i>Integrate Astronomy</i> 105 <i>Integrate History</i> 218 <i>Integrate Physics</i> 220 <i>MiniLab</i> 219 <i>Science and History</i> 120 Teacher Wraparound Edition: FYI 220; TPK 218</p>
<p>S11.D.3.1.2 Describe the structure, formation, and life cycle of stars.</p>	<p>Student Edition: 823-825, 827-829 <i>Integrate Astronomy</i> 596 <i>Lab</i> 830 <i>National Geographic</i> 826 Teacher Wraparound Edition: D 825; DI 828; IM 827; SJ 824</p>
<p>S11.D.3.1.3 Explain the current scientific theories of the origin of the solar system and universe (e.g., big bang theory, solar nebular theory, stellar evolution).</p>	<p>Student Edition: 221, 824-827, 833-835, 836-839 <i>Lab</i> 830 <i>Model and Invent Lab</i> 840-841 <i>National Geographic</i> 826 Teacher Wraparound Edition: A 838; FF 840; R 222; TPK 836</p>