



Physical Science with Earth Science

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STANDARDS	PAGE REFERENCES
High School	
It is essential that these standards be addressed in contexts that promote scientific inquiry, use of evidence, critical thinking, making connections, and communication.	
H.1 <u>Structure and Function</u>: A system's characteristics, form, and function are attributed to the quantity, type, and nature of its components.	
<p>H.1P.1 Explain how atomic structure is related to the properties of elements and their position in the Periodic Table. Explain how the composition of the nucleus is related to isotopes and radioactivity.</p>	<p>Student Edition: 586-587, 588-596, 788-790 <i>MiniLab</i> 802 <i>Model and Invent Lab</i> 808-809 Teacher Wraparound Edition: FYI 585, 590; IM 586, 591; R 790</p>
<p>H.1P.2 Describe how different types and strengths of bonds affect the physical and chemical properties of compounds.</p>	<p>Student Edition: 609-612, 696-702, 768-770, 771-774 <i>National Geographic</i> 699 Teacher Wraparound Edition: CU 702; DI 698; FF 696; LD 762; TPK 771</p>

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H.1L.1	Compare and contrast the four types of organic macromolecules. Explain how they compose the cellular structures of organisms and are involved in critical cellular processes.	This life standard falls outside the scope of this text.
H.1L.2	Describe the chemical structure of DNA and its relationship to chromosomes. Explain the role of DNA in protein synthesis.	This life standard falls outside the scope of this text.
H.1L.3	Explain and apply laws of heredity and their relationship to the structure and function of DNA.	This life standard falls outside the scope of this text.
H.1L.4	Explain how cellular processes and cellular differentiation are regulated both internally and externally in response to the environments in which they exist.	This life standard falls outside the scope of this text.
H.1E.1	Classify the bodies in our solar system based on properties and composition. Describe attributes of our galaxy and evidence for multiple galaxies in the universe.	Student Edition: 189, 220-221, 223-229, 231-237, 827-829, 831-835, 838-839 <i>MiniLab</i> 235 Teacher Wraparound Edition: A 221, 232; CU 237; QD 228; R 839; TPK 223, 231
H.1E.2	Describe the structure and composition of Earth's atmosphere, geosphere, and hydrosphere.	Student Edition: 354-361, 362-363, 370-372, 373-378, 466, 518-522, 529-533, 536-538 <i>Integrate Environment</i> 466 <i>Science and History</i> 382 Teacher Wraparound Edition: CB 466; FF 366; FYI 359; IL 521; MM 530
H.2 Interaction and Change: The components in a system can interact in dynamic ways that may result in change. In systems, changes occur with a flow of energy and/or transfer of matter.		
H.2P.1	Explain how chemical reactions result from the making and breaking of bonds in a process that absorbs or releases energy. Explain how the rate of a chemical reaction is affected by temperature, pressure, and concentration.	Student Edition: 720, 730-733, 734-740 <i>Lab</i> 741, 742-743 <i>National Geographic</i> 737 Teacher Wraparound Edition: D 739; R 740; TPK 720

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<p>H.2P.2 Explain how physical and chemical changes demonstrate the law of conservation of mass.</p>	<p>Student Edition: 565-567, 721-722 <i>Applying Math</i> 566 <i>Design Your Own Lab</i> 568-569 Teacher Wraparound Edition: IM 566; QD 722</p>
<p>H.2P.3 Describe the interactions of energy and matter including the law of conservation of energy.</p>	<p>Student Edition: 128-130, 135-141, 256, 260-265, 269, 288-291, 327, 360-361, 734, 736-739 <i>Design Your Own Lab</i> 144-145 <i>Integrate Earth Science</i> 293 <i>Integrate Environment</i> 139 <i>Lab</i> 134 <i>Science and History</i> 146 Teacher Wraparound Edition: D 129; DI 136; IL 141; IM 269</p>
<p>H.2P.4 Apply the laws of motion and gravitation to describe the interaction of forces acting on an object and the resultant motion.</p>	<p>Student Edition: 81-86, 98-103, 104-111, 113-117, 154-157, 160-165 <i>Applying Math</i> 102 <i>Design Your Own Lab</i> 88-89 <i>Integrate Astronomy</i> 105 <i>Lab</i> 87, 112 <i>MiniLab</i> 99 Teacher Wraparound Edition: DI 161; FF 115; FYI 82; LD 102; TPK 81</p>
<p>H.2L.1 Explain how energy and chemical elements pass through systems. Describe how chemical elements are combined and recombined in different ways as they cycle through the various levels of organization in biological systems.</p>	<p>Student Edition: 142-143, 522, 536-538, 650-652, 663-668 <i>Integrate Earth Science</i> 565 <i>Integrate Environment</i> 139 <i>Integrate Health</i> 143 <i>Integrate Life Science</i> 522 <i>Science and Society</i> 678 Teacher Wraparound Edition: D 651; FYI 537; IM 142</p>

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<p>H.2L.2 Explain how ecosystems change in response to disturbances and interactions. Analyze the relationships among biotic and abiotic factors in ecosystems.</p>	<p>Student Edition: 48-49, 539, 660-662 <i>Integrate Earth Science</i> 258, 542 <i>Integrate Environment</i> 466 <i>Integrate History</i> 377 <i>Science and History</i> 382, 600 <i>Science and Society</i> 678, 778 Teacher Wraparound Edition: A 538; FYI 48, 519</p>
<p>H.2L.3 Describe how asexual and sexual reproduction affect genetic diversity.</p>	<p>This life standard falls outside the scope of this text.</p>
<p>H.2L.4 Explain how biological evolution is the consequence of the interactions of genetic variation, reproduction and inheritance, natural selection, and time.</p>	<p>This life standard falls outside the scope of this text.</p>
<p>H.2L.5 Explain how multiple lines of scientific evidence support biological evolution.</p>	<p>This life standard falls outside the scope of this text.</p>
<p>H.2E.1 Identify and predict the effect of energy sources, physical forces, and transfer processes that occur in the Earth system. Describe how matter and energy are cycled between system components over time.</p>	<p>Student Edition: 269, 354-361, 362-369, 373-378, 466, 520-522, 536-538, 663-668 <i>Integrate Environment</i> 466 <i>National Geographic</i> 268 <i>Science and Society</i> 678 Teacher Wraparound Edition: CB 466; CU 270, 539; D 520; FYI 360</p>
<p>H.2E.2 Explain how Earth’s atmosphere, geosphere, and hydrosphere change over time and at varying rates. Explain techniques used to elucidate the history of events on Earth.</p>	<p>Student Edition: 354-361, 362-363, 373-378, 520-522, 524-528, 529-533, 536-538, 634-635, 646-651, 670-673 <i>Integrate Physics</i> 673 <i>Lab</i> 379, 676-677 <i>Science and History</i> 382 <i>Science and Society</i> 678 Teacher Wraparound Edition: CB 466, 673; FF 366; FYI 359, 634; IM 649</p>
<p>H.2E.3 Describe how the universe, galaxies, stars, and planets evolve over time.</p>	<p>Student Edition: 221, 223-229, 823-825, 833, 836-839 <i>Lab</i> 830 <i>National Geographic</i> 826 Teacher Wraparound Edition: D 825; SJ 824; VL 221</p>

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<p>H.2E.4 Evaluate the impact of human activities on environmental quality and the sustainability of Earth systems. Describe how environmental factors influence resource management.</p>	<p>Student Edition: 466, 491-493, 497-499, 501-506, 536-538, 652, 667-668 <i>Integrate Earth Science</i> 542 <i>Integrate Environment</i> 466, 667 <i>Science and Society</i> 510, 678, 778 Teacher Wraparound Edition: A 492, 538; D 499; DI 498; SJ 660</p>
<p>H.3 Scientific Inquiry: Scientific inquiry is the investigation of the natural world by a systematic process that includes proposing a testable question or hypothesis and developing procedures for questioning, collecting, analyzing, and interpreting multiple forms of accurate and relevant data to produce justifiable evidence-based explanations and new explorations.</p>	
<p>H.3S.1 Based on observations and science principles formulate a question or hypothesis that can be investigated through the collection and analysis of relevant information.</p>	<p>Student Edition: 8, 12, 50, 54 <i>Applying Science</i> 428, 499, 586 <i>Lab</i> 51, 380-381, 741, 776-777 <i>Model and Invent Lab</i> 508-509 <i>Science Skill Handbook</i> 850 Teacher Wraparound Edition: DI 7; USW 8</p>
<p>H.3S.2 Design and conduct a controlled experiment, field study, or other investigation to make systematic observations about the natural world, including the collection of sufficient and appropriate data.</p>	<p>Student Edition: 7-10 <i>Design Your Own Lab</i> 88-89, 144-145, 242-243, 344-345, 540-541, 568-569 <i>Lab</i> 616, 636-637 <i>Science Skill Handbook</i> 853-858 Teacher Wraparound Edition: A 9; FF 8; R 13</p>
<p>H.3S.3 Analyze data and identify uncertainties. Draw a valid conclusion, explain how it is supported by the evidence, and communicate the findings of a scientific investigation.</p>	<p>Student Edition: 10, 22-26 <i>Communicating Your Data</i> 29, 89 <i>Design Your Own Lab</i> 28-29, 88-89 <i>Lab</i> 278-279, 742-743 <i>Science Skill Handbook</i> 857-858, 868 <i>Use the Internet Lab</i> 508-509 Teacher Wraparound Edition: DI 10; EA 29, 89, 279</p>

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<p>H.3S.4 Identify examples from the history of science that illustrate modification of scientific knowledge in light of challenges to prevailing explanations.</p>	<p>Student Edition: 38-39, 218-220, 460-461, 581-583, 721-722, 801-802, 836-837 <i>Accidents in Science</i> 210 <i>Integrate History</i> 201, 218 <i>National Geographic</i> 582 <i>Science and History</i> 120, 478 Teacher Wraparound Edition: CB 219, 478; CD 336; IH 201</p>
<p>H.3S.5 Explain how technological problems and advances create a demand for new scientific knowledge and how new knowledge enables the creation of new technologies.</p>	<p>Student Edition: 45, 48-49, 52-57, 497-499, 501-506, 801-805 <i>Accidents in Science</i> 210, 712, 744 <i>Science and History</i> 312, 382, 448, 478, 600, 810 Teacher Wraparound Edition: CD 410; D 53, 499</p>
<p>H.4 <u>Engineering Design:</u> Engineering design is a process of formulating problem statements, identifying criteria and constraints, proposing and testing possible solutions, incorporating modifications based on test data, and communicating the recommendations.</p>	
<p>H.4D.1 Define a problem and specify criteria for a solution within specific constraints or limits based on science principles. Generate several possible solutions to a problem and use the concept of trade-offs to compare them in terms of criteria and constraints.</p>	<p>Student Edition: 7-8, 54-55 <i>Applying Science</i> 428, 499 <i>Design Your Own Lab</i> 344-345, 540-541 <i>Model and Invent Lab</i> 58-59, 176-177 <i>Science Skill Handbook</i> 850-853 Teacher Wraparound Edition: A 9; IL 54</p>
<p>H.4D.2 Create and test or otherwise analyze at least one of the more promising solutions. Collect and process relevant data. Incorporate modifications based on data from testing or other analysis.</p>	<p>Student Edition: 7-8, 12, 14-21, 218-219, 222, 356-361 <i>Integrate Astronomy</i> 105, 324 <i>Lab</i> 134, 380-381, 616, 693, 830 <i>Launch Lab</i> 577 <i>Science and History</i> 120, 600 <i>Science and Society</i> 778 <i>Science Skill Handbook</i> 854-857 Teacher Wraparound Edition: FF 8; RS 198; VL 356</p>

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<p>H.4D.3 Analyze data, identify uncertainties, and display data so that the implications for the solution being tested are clear.</p>	<p>Student Edition: 10, 14, 218-219, 354-358, 836-839 <i>Design Your Own Lab</i> 28-29, 88-89, 242-243, 344-345 <i>Lab</i> 51, 134, 278-279 <i>Model and Invent Lab</i> 176-177 <i>Science and History</i> 448, 600 <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>H.4D.4 Recommend a proposed solution, identify its strengths and weaknesses, and describe how it is better than alternative designs. Identify further engineering that might be done to refine the recommendations.</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>
<p>H.4D.5 Describe how new technologies enable new lines of scientific inquiry and are largely responsible for changes in how people live and work.</p>	<p>Student Edition: 52-57, 503-506 <i>Accidents in Science</i> 60, 712, 744 <i>National Geographic</i> 2-3, 250-251, 684-685 <i>Science and History</i> 312, 382, 448, 478, 810 <i>Science and Society</i> 178 Teacher Wraparound Edition: CD 410; D 53</p>
<p>H.4D.6 Evaluate ways that ethics, public opinion, and government policy influence the work of engineers and scientists, and how the results of their work impact human society and the environment.</p>	<p>Student Edition: 10, 12, 45, 46-48, 50, 354-361, 536-538 <i>Integrate Environment</i> 48 <i>MiniLab</i> 47 <i>Science and Society</i> 510 <i>Science Skill Handbook</i> 858 Teacher Wraparound Edition: A 48; CU 50; D 49; DI 7, 44; PR 12, 539; SJ 55</p>