



STANDARDS	PAGE REFERENCES
Physical Science Content Standards	
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>The following references can be used to meet this objective.</p> <p>Student Edition: 60, 93-94, 241-245, 743-747 ChemLab 748 MiniLab 96</p> <p>Teacher Wraparound Edition: Identify Misconceptions 64 Demonstration 742-743</p>
<p>H.1P.2 Describe how different types and strengths of bonds affect the physical and chemical properties of compounds.</p>	<p>The following references can be used to meet this objective.</p> <p>Student Edition: 118-127, 141-143, 152-153, 168-169, 307-331 MiniLab 133, 169, 310, 323 ChemLab 134-135, 170-171, 326-327</p> <p>Teacher Wraparound Edition: Discovery Demo 298-299 Demonstration 308-309, 314-315</p>

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<p>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.</p>	
<p>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.</p>	<p>The following references can be used to meet this objective.</p> <p>Student Edition: 40-41, 193-194, 213-221, 584-591, 704-728 ChemLab 592-593, 720-721 MiniLab 218, 708, 722</p> <p>Teacher Wraparound Edition: Demonstration 40-41, 192-193, 216-217, 584-585, 712-713 Quick Demo 217, 220, 221, 712, 716, Identify Misconception 216, 709, 717</p>
<p>H.2P.2 Explain how physical and chemical changes demonstrate the law of conservation of mass.</p>	<p>The following references can be used to meet this objective.</p> <p>Student Edition: 20, 38-40, 53, 196-197, 330-331 ChemLab 18-19, 54-55, 326-327 MiniLab 21</p> <p>Teacher Wraparound Edition: Identify Misconception 15, 57 Demonstration 34-35, 38-39, 196-197 Quick Demo 51, 331</p>
<p>H.2P.3 Describe the interactions of energy and matter including the law of conservation of energy.</p>	<p>The following references can be used to meet this objective.</p> <p>Student Edition: 24-25, 33, 40-41, 346-363, 690-693, 707-710, 756 ChemLab 360-361 MiniLab 355, 708</p> <p>Teacher Wraparound Edition: Demonstration 354, 356-357, 358-359, 690-691 Quick Demo 350,</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>The following references can be used to meet this objective.</p> <p>Student Edition: 67-68, 339-343, 348-350 MiniLab 341</p> <p>Teacher Wraparound Edition: Demonstration 336-337, 342-343 Quick Demo 342 Identify Misconceptions 342, 343</p>

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<p>H.3 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>The following references can be used to meet this objective.</p> <p>Student Edition: 57, MiniLab 341, 384, 630, 687 ChemLab 649-651</p> <p>Teacher Wraparound Edition: 22T Demonstration 6-7</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>The following references can be used to meet this objective.</p> <p>Student Edition: Launch Lab 151 MiniLab 218, 602 ChemLab 266, 326-327</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>The following references can be used to meet this objective.</p> <p>Student Edition: 98-99, 362-363 ChemLab 170-171, 592-593</p> <p>Teacher Wraparound Edition: 98-99 Demonstration 302-303</p>
<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>The following references can be used to meet this objective.</p> <p>Student Edition: 50-52, 56, 59-63, 84-88, 228-229, 270</p> <p>Teacher Wraparound Edition: Demonstration 86-87</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>The following references can be used to meet this objective.</p> <p>Student Edition: 383, 417, 764, 766, 767 Chemistry and Technology 106, 236, 574, 724 How It Works 195, 468, 595, 598</p> <p>Teacher Edition: Discussion 767</p>

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<p>H.4 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>The following references can be used to meet this objective.</p> <p>Student Edition: How it Works – Think Critically 282, 468, 569, 706 Chemistry and Technology- Discuss the Technology 215, 325, 574, 725 Chemistry and Society – Analyze the Issue 29</p> <p>Teacher Wraparound Edition: Inquiry Extension in ChemLab 19, 55, 99 Everyday Chemistry – Explore Further 192, 395</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>The following references can be used to meet this objective.</p> <p>Student Edition: Chemistry and Technology- Discuss the Technology 325</p> <p>Teacher Wraparound Edition: Inquiry Extension in ChemLab 19, 267</p>
<p>H.4D.3 Analyze data, identify uncertainties, and display data so that the implications for the solution being tested are clear.</p>	<p>The following references can be used to meet this objective.</p> <p>Student Edition: Chemistry and Society – Analyze the Issue 58, 289, 495 How it Works – Think Critically 375</p> <p>Teacher Wraparound Edition: Inquiry Extension in ChemLab 99</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>The following references can be used to meet this objective.</p> <p>Student Edition: Chemistry and Society – Analyze the Issue 657 Chemistry and Technology- Discuss the Technology 107 Everyday Chemistry – Explore Further 273</p> <p>Teacher Wraparound Edition: Inquiry Extension in ChemLab 55</p>

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<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>The following references can be used to meet this objective.</p> <p>Student Edition: Chemistry and Society 144, 447, 495, 657 Chemistry and Technology 286, 388, 724 How it Works 282, 569, 595, 597, 598</p> <p>Teacher Wraparound Edition: 144, 286, 282, 388, 569</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>The following references can be used to meet this objective.</p> <p>Student Edition: 140, 230, 278, 566 Chemistry and Society 144, 495 In the Field 448, 634, 676</p> <p>Teacher Wraparound Edition: 140, 230, 448, 495, 634</p>