



CHEMISTRY

MATTER AND CHANGE

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STANDARDS	PAGE REFERENCES
I. HISTORY AND NATURE OF SCIENCE	
A. Scientific World View The student will understand the nature of scientific ways of thinking and that scientific knowledge changes and accumulates over time.	
1. The student will be able to distinguish among hypothesis, theory and law as scientific terms and how they are used to answer a specific question.	Student Edition: 13, 16 <i>Chapter Assessment 26 #41</i> Teacher Wraparound Edition: IM 15; R 16 Teacher Resources: <i>Chemistry Forensics Laboratory Manual 6</i> <i>Science Notebook 43</i>
2. The student will be able to explain how scientific and technological innovations as well as new evidence can challenge portions of or entire accepted theories and models including but not limited to cell theory, atomic theory, theory of evolution, plate tectonic theory, germ theory of disease and big bang theory.	Student Edition: 102-114, 146-152, 174-176, 744 <i>Chapter Assessment 169 #116</i> Teacher Wraparound Edition: CD 184; DI 745; E 104, 108, 116 Teacher Resources: <i>Laboratory Manual 25-28</i> <i>Science Notebook 45-46, 59-64, 71</i> <i>Standardized Test Practice 41</i>

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<p>3. The student will recognize that in order to be valid, scientific knowledge must meet certain criteria including that it: be consistent with experimental, observational and inferential evidence about nature; follow rules of logic and reporting both methods and procedures; and be falsifiable and open to criticism.</p>	<p>Student Edition: 12-16, 102-114, 146-152, 174-176, 744</p> <p>Teacher Wraparound Edition: CP 153; DI 745; E 104, 108, 116</p> <p>Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> iv-xiii <i>Laboratory Manual</i> 25-28 <i>Science Notebook</i> 45-46, 59-64, 71 <i>Standardized Test Practice</i> 41</p>
<p>4. The student will explain how traditions of ethics, peer review, conflict and general consensus influence the conduct of science.</p>	<p>Student Edition: 12, 102-114, 174-176, 744</p> <p>Teacher Wraparound Edition: CB 416; CJ 141; DI 745; E 104, 108, 116</p> <p>Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> v <i>Laboratory Manual</i> 25 <i>Science Notebook</i> 45-46, 59-64, 71 <i>Standardized Test Practice</i> 41</p>
<p>5. The student will recognize that some scientific ideas are incomplete, and opportunity exists in these areas for new advances.</p>	<p>Student Edition: 20-21, 114, 883-884 <i>In the Field</i> 505</p> <p>Teacher Wraparound Edition: CP 720, 729; DI 724; E 114, 388, 884</p> <p>Teacher Resources: <i>Science Notebook</i> 350</p>
<p>B. Scientific Inquiry The student will design and conduct a scientific investigation.</p>	
<p>1. The student will design and complete a scientific experiment using scientific methods by determining a testable question, making a hypothesis, designing a scientific investigation with appropriate controls, analyzing data, making conclusions based on evidence and comparing conclusions to the original hypothesis and prior knowledge.</p>	<p>Student Edition: <i>ChemLab</i> 230, 310, 432, 584 <i>Data Analysis Lab</i> 478</p> <p>Teacher Wraparound Edition: A 405, 524, 574; DI 415; E 14</p> <p>Teacher Resources: <i>Chemistry Calculator Based Laboratory Manual</i> 5-8, 13-16, 29-32 <i>Chemistry Forensics Laboratory Manual</i> 6-8, 14-16, 29-32 <i>Laboratory Manual</i> 33-36, 65-68, 85-88, 89-92, 101-104, 165-168 <i>Science Notebook</i> 10, 15</p>

STANDARDS	PAGE REFERENCES
<p>2. The student will distinguish between qualitative and quantitative data.</p>	<p>Student Edition: 13 <i>Chapter Assessment 26 #39</i> <i>Section Assessment 16 #16</i> <i>Standardized Test Practice 29</i></p> <p>Teacher Wraparound Edition: CJ 14, 55; CU 16</p> <p>Teacher Resources: <i>Chemistry Calculator Based Laboratory Manual 1-4</i> <i>Science Notebook 8-9, 15</i></p>
<p>3. The student will apply mathematics and models to analyze data and support conclusions.</p>	<p>Student Edition: <i>ChemLab 60, 272</i> <i>Data Analysis Lab 408</i> <i>Problem-Solving Lab 150, 531, 890</i></p> <p>Teacher Wraparound Edition: DI 386, 421; MC 214, 262</p> <p>Teacher Resources: <i>Chemistry Calculator Based Laboratory Manual 13-16, 21-24, 25-27, 29-32</i> <i>Chemistry Forensics Laboratory Manual 2-5</i> <i>Laboratory Manual 29-32, 37-40, 57-60, 97-100, 117-120, 161-164</i> <i>Science Notebook 18, 107-108, 130-134, 148-150, 175-179, 192-193</i></p>
<p>4. The student will identify possible sources of error and their effects on results.</p>	<p>Student Edition: 47-54 <i>ChemLab 60, 126, 356, 734</i> <i>MiniLab 526</i> <i>Problem-Solving Lab 180</i></p> <p>Teacher Wraparound Edition: DI 52; IM 48, 51</p> <p>Teacher Resources: <i>Chemistry Calculator Based Laboratory Manual 4, 16, 24, 27, 32, 36</i> <i>Chemistry Forensics Laboratory Manual xi, 5, 8, 16</i> <i>Laboratory Manual 19, 40, 55, 88, 95, 112</i> <i>Science Notebook 28</i></p>

STANDARDS	PAGE REFERENCES
5. The student will know that professional scientists and engineers have ethical codes.	Student Edition: 7 <i>Chemistry & Health</i> 59 <i>In the Field</i> 505, 849 Teacher Wraparound Edition: CD 7; TS 505, 849 Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> 13
6. The student will give examples of how different domains of science use different bodies of scientific knowledge and employ different methods to investigate questions.	Student Edition: 11, 17 <i>Chemistry & Health</i> 389 <i>In the Field</i> 91, 505, 697, 849 Teacher Wraparound Edition: CJ 17; QD 14; R 22 Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> iv-xiii <i>Science Notebook</i> 73
C. Scientific Enterprise The student will understand the relationship between science and technology and how both are used.	
1. The student will compare and contrast the purposes and career opportunities of engineering, technology and science.	Student Edition: 11 <i>Chemistry & Health</i> 59 <i>In the Field</i> 23, 505, 697, 891 Teacher Wraparound Edition: A 421; CD 7; DI 532; E 11 Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> iv <i>Science Notebook</i> 73
2. The student will provide an example of a need or problem identified by science and solved by engineering or technology.	Student Edition: 724-727, 873-874 <i>Chemistry & Health</i> 163, 465 <i>Data Analysis Lab</i> 691 <i>How It Works</i> 125 Teacher Wraparound Edition: CJ 302; CP 212, 881 Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> 29, 33 <i>Laboratory Manual</i> 201-204

STANDARDS	PAGE REFERENCES
<p>3. The student will provide an example of how technology facilitates new discoveries and the development of scientific knowledge.</p>	<p>Student Edition: 107 <i>Chemistry & Health</i> 163 <i>Data Analysis Lab</i> 113 <i>How It Works</i> 125</p> <p>Teacher Wraparound Edition: CB 36; CD 184; CP 110; DI 871; E 107</p> <p>Teacher Resources: <i>Laboratory Manual</i> 37-40 <i>Science Notebook</i> 48</p>
<p>4. The student will know that technological changes and scientific advances are often accompanied by social, political, environmental and economic changes.</p>	<p>Student Edition: 20, 880-882</p> <p>Teacher Wraparound Edition: CD 694; CJ 290, 491, 888; CP 788; DI 724; E 880; MI 17</p> <p>Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> 13 <i>Science Notebook</i> 56, 68 <i>Standardized Test Practice</i> 43</p>
<p>5. The student will recognize that science and technology are influenced by cultural backgrounds and beliefs and by social needs, attitudes, values and limitations.</p>	<p>Student Edition: 880-882 <i>Chemistry & Health</i> 389 <i>How It Works</i> 733 <i>In the Field</i> 505, 849</p> <p>Teacher Wraparound Edition: CD 110, 486-487; CJ 290; CP 538; E 880</p> <p>Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> 1, 13, 25 <i>Laboratory Manual</i> 55, 201 <i>Science Notebook</i> 56 <i>Standardized Test Practice</i> 48</p>

STANDARDS	PAGE REFERENCES
<p>D. Historic Perspectives The student will recognize the historical and cultural context of scientific endeavors and how they influence each other.</p>	
<p>1. The student will be able to trace the development of a scientific advancement, invention or theory and its impact on society.</p>	<p>Student Edition: 102-114, 146-152, 877-882 <i>Chemistry & Health</i> 163, 465 <i>How It Works</i> 733</p> <p>Teacher Wraparound Edition: CB 880; CD 184; CP 227; E 880</p> <p>Teacher Resources: <i>Laboratory Manual</i> 55 <i>Science Notebook</i> 45-46, 59-64, 71, 339</p>
<p>2. The student will provide examples of scientific advancements contributed by other civilizations and cultures.</p>	<p>Student Edition: 79, 102-105, 174-176, 860-861 <i>Chapter Assessment</i> 363 #213</p> <p>Teacher Wraparound Edition: CD 86-87, 269, 806; E 77, 105</p> <p>Teacher Resources: <i>Laboratory Manual</i> 25, 33, 37, 97 <i>Science Notebook</i> 45-46</p>
<p>3. The student will compare and contrast the differences between scientific theories and theories from other bodies of knowledge, and the importance of each in a science discussion.</p>	<p>Student Edition: 16, 102-105</p> <p>Teacher Wraparound Edition: CU 105; E 102, 283; IM 15</p> <p>Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> 13 <i>Science Notebook</i> 157, 345</p>

STANDARDS	PAGE REFERENCES
II. PHYSICAL SCIENCE	
A. Structure of Matter The student will understand the nature of matter including its forms, properties and interactions.	
<p>1. The student will identify protons, neutrons and electrons as the major components of the atom, their mass relative to one another, their arrangement and their charge.</p>	<p>Student Edition: 106-119 <i>Chapter Assessment</i> 128 #39, #42, #43, #47 <i>Section Assessment</i> 114 #7, #10</p> <p>Teacher Wraparound Edition: A 114; CJ 110; DI 115; QD 119</p> <p>Teacher Resources: <i>Laboratory Manual</i> 25-28, 37-40 <i>Science Notebook</i> 47-49, 57, 69 <i>Standardized Test Practice</i> 8-9</p>
<p>2. The student will be able to explain the relationship of an element's position on the periodic table to its atomic number and atomic mass.</p>	<p>Student Edition: 115, 119-121 <i>ChemLab</i> 126 <i>MiniLab</i> 120</p> <p>Teacher Wraparound Edition: DI 119; MC 118</p> <p>Teacher Resources: <i>Laboratory Manual</i> 41-44, 45-48 <i>Science Notebook</i> 51-53, 70-73</p>
<p>3. The student will compare and contrast the properties of an element and its isotopes, and describe how isotopes can be used in research, medicine and industry.</p>	<p>Student Edition: 117-118, 861, 887 <i>In the Field</i> 891 <i>MiniLab</i> 120</p> <p>Teacher Wraparound Edition: CJ 117; CP 119, 886; DI 887; IM 117</p> <p>Teacher Resources: <i>Laboratory Manual</i> 29-32, 185-188, 189-192 <i>Science Notebook</i> 52, 56, 350, 352, 354</p>

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<p>4. The student will use the periodic table to identify regions, families, groups and periods.</p>	<p>Student Edition: 177-194 <i>ChemLab</i> 196 <i>MiniLab</i> 193</p> <p>Teacher Wraparound Edition: A 179, 285; CJ 184; DI 187; MC 191; R 186</p> <p>Teacher Resources: <i>Laboratory Manual</i> 41-44, 45-48, 197-200 <i>Science Notebook</i> 70-73, 77-80 <i>Standardized Test Practice</i> 11-12</p>
<p>5. The student will explain how neutral atoms become ions.</p>	<p>Student Edition: 189-193, 206-209 <i>Chapter Assessment</i> 232 #46, #54, #55</p> <p>Teacher Wraparound Edition: A 209; CJ 208; CU 209; MI 206; R 209; VL 192</p> <p>Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> 17 <i>Laboratory Manual</i> 149-152 <i>Science Notebook</i> 83, 94 <i>Standardized Test Practice</i> 13</p>
<p>6. The student will be able to explain how atoms form compounds through bonding.</p>	<p>Student Edition: 210-212, 225, 241-247 <i>ChemLab</i> 230</p> <p>Teacher Wraparound Edition: CJ 214, 241; CP 210; D 248-249; MI 225, 240</p> <p>Teacher Resources: <i>Laboratory Manual</i> 53-55, 57-60, 61-64 <i>Science Notebook</i> 85-86, 91-92, 96-98 <i>Standardized Test Practice</i> 13, 15</p>
<p>7. The student will compare and contrast the states of matter in terms of interactions between particles.</p>	<p>Student Edition: 71-72, 401-405, 415-427 <i>ChemLab</i> 432</p> <p>Teacher Wraparound Edition: A 429; CJ 417; DI 71; E 75; IM 426; MI 415</p> <p>Teacher Resources: <i>Chemistry Calculator Based Laboratory Manual</i> 9-12 <i>Laboratory Manual</i> 49-52, 93-96 <i>Science Notebook</i> 31, 161 <i>Standardized Test Practice</i> 6</p>

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8. The student will differentiate between an atom and a molecule.	<p>Student Edition: 106-107, 240-246 <i>Chemistry & Health</i> 195 <i>ChemLab</i> 272</p> <p>Teacher Wraparound Edition: A 245; BM 243; DI 243; MI 240</p> <p>Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> 17 <i>Standardized Test Practice</i> 15</p>
9. The student will differentiate between an element and a compound.	<p>Student Edition: 84-90 <i>Chapter Assessment</i> 95 #66, #67, #69, #70 <i>Chemistry & Health</i> 195</p> <p>Teacher Wraparound Edition: MI 84; QD 88; R 90</p> <p>Teacher Resources: <i>Laboratory Manual</i> 57-60, 61-64 <i>Science Notebook</i> 40</p>
<p>B. Chemical Reactions The student will describe chemical reactions and the factors that influence them.</p>	
1. The student will describe chemical reactions using words and symbolic equations.	<p>Student Edition: 283-287 <i>ChemLab</i> 310 <i>MiniLab</i> 301</p> <p>Teacher Wraparound Edition: A 288; CJ 293; CP 283; DI 300; IM 286; R 284</p> <p>Teacher Resources: <i>Chemistry Forensics Laboratory Manual</i> 29, 35 <i>Laboratory Manual</i> 65-68, 69-72, 81-84, 133-136 <i>Science Notebook</i> 115-116, 123 <i>Standardized Test Practice</i> 17</p>

STANDARDS	PAGE REFERENCES
<p>2. The student will explain the influence of temperature, surface area, agitation and catalysts on the rate of a reaction.</p>	<p>Student Edition: 568-573 <i>Chemistry & Health</i> 583 <i>ChemLab</i> 584 <i>MiniLab</i> 571</p> <p>Teacher Wraparound Edition: A 573, 574; CJ 570; D 568-569; DI 571; MI 568</p> <p>Teacher Resources: <i>Laboratory Manual</i> 121-124, 125-127 <i>Science Notebook</i> 226 <i>Standardized Test Practice</i> 30-32</p>
<p>3. The student will distinguish between a chemical reaction and a nuclear reaction.</p>	<p>Student Edition: 860, 877-878 <i>Chapter Assessment</i> 894 #34 <i>Section Assessment</i> 864 #2</p> <p>Teacher Wraparound Edition: IM 861; MI 860</p> <p>Teacher Resources: <i>Laboratory Manual</i> 65-68, 69-72 <i>Science Notebook</i> 339 <i>Standardized Test Practice</i> 7, 48</p>
<p>4. The student will explain how the rearrangement of atoms and molecules in a chemical reaction illustrates conservation of mass.</p>	<p>Student Edition: 77-79, 105, 288, 368-371</p> <p>Teacher Wraparound Edition: A 374; CJ 369; DI 286</p> <p>Teacher Resources: <i>Science Notebook</i> 35, 144-145 <i>Standardized Test Practice</i> 6, 17</p>
<p>5. The student will describe how combining acids and bases produce a neutral solution.</p>	<p>Student Edition: 659-661 <i>ChemLab</i> 670</p> <p>Teacher Wraparound Edition: A 660; CJ 660; MI 659</p> <p>Teacher Resources: <i>Chemistry Calculator Based Laboratory Manual</i> 33-36 <i>Laboratory Manual</i> 85-88, 137-140, 141-144 <i>Science Notebook</i> 255-256 <i>Standardized Test Practice</i> 35-36</p>

STANDARDS	PAGE REFERENCES
<p>C. Energy Transformations The student will understand energy forms, transformations and transfers.</p>	
<p>1. The student will know that potential energy is stored energy and is associated with gravitational or electrical force, mechanical position or chemical composition.</p>	<p>Student Edition: 516-518, 710 <i>Chapter Assessment 552 #54</i> <i>Section Assessment 522 #8, #9</i> Teacher Wraparound Edition: MI 516; QD 240 Teacher Resources: <i>Science Notebook 205</i></p>
<p>2. The student will differentiate between kinetic and potential energy and identify situations where kinetic energy is converted into potential energy and vice versa.</p>	<p>Student Edition: 516-518, 710 <i>Chapter Assessment 552 #55</i> <i>Section Assessment 522 #8</i> Teacher Wraparound Edition: MI 516 Teacher Resources: <i>Science Notebook 205</i></p>
<p>3. The student will differentiate between AC and DC current.</p>	<p>See Glencoe's <i>Physics: Principles and Problems</i> © 2009.</p>
<p>4. The student will describe the production, storage and transmission of electricity.</p>	<p>Student Edition: 708-711, 718-723, 880-881 <i>ChemLab 734</i> <i>Section Assessment 884 #24</i> Teacher Wraparound Edition: A 716; CP 720; DI 719; E 528, 752 Teacher Resources: <i>Chemistry Calculator Based Laboratory Manual 37-40</i> <i>Chemistry Forensics Laboratory Manual 26-28</i> <i>Science Notebook 272-278, 282, 350</i> <i>Standardized Test Practice 39</i></p>
<p>5. The student will be able to describe physical and chemical changes in terms of the law of conservation of energy.</p>	<p>Student Edition: 517 Teacher Wraparound Edition: CJ 78; MI 516 Teacher Resources: <i>Chemistry Forensics Laboratory Manual 2</i> <i>Science Notebook 205</i></p>

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<p>6. The student will compare and contrast the amount of energy released through chemical reactions and nuclear fission and fusion.</p>	<p>Student Edition: 860, 877-878 <i>Chapter Assessment</i> 894 #34 Teacher Wraparound Edition: QD 878 Teacher Resources: <i>Laboratory Manual</i> 113-116 <i>Science Notebook</i> 339</p>
<p>7. The student will describe the risks and benefits of fossil fuels, renewable sources and nuclear power as sources of usable energy.</p>	<p>Student Edition: 522, 880-882 <i>Chapter Assessment</i> 397 #116, 555 #122, #123 <i>How It Works</i> 549 Teacher Wraparound Edition: A 539; CJ 517, 882; DI 880; E 883 Teacher Resources: <i>Laboratory Manual</i> 120, 156, 201 <i>Science Notebook</i> 42, 56, 206</p>
<p>8. The student will describe applications of the different wavelengths of the electromagnetic spectrum.</p>	<p>Student Edition: 137-140, 145 <i>Chemistry & Health</i> 163 Teacher Wraparound Edition: CP 139 Teacher Resources: <i>Laboratory Manual</i> 152 <i>Science Notebook</i> 60</p>
<p>9. The student will describe energy, work and power both conceptually and quantitatively.</p>	<p>Student Edition: Energy is described both conceptually and quantitatively on: 516-528, 534-541 <i>ChemLab</i> 550 <i>Problem-Solving Lab</i> 531 Teacher Wraparound Edition: CJ 535, 539; CP 526; MI 523; R 528 Teacher Resources: <i>Chemistry Calculator Based Laboratory Manual</i> 25-27, 29-32 <i>Chemistry Forensics Laboratory Manual</i> 2-3 <i>Laboratory Manual</i> 21-24, 113-116, 117-120 <i>Science Notebook</i> 205-216 <i>Standardized Test Practice</i> 29</p>

STANDARDS	PAGE REFERENCES
<p>D. Motion The student will understand the nature of force and motion.</p>	
<p>1. The student will use Newton's three laws of motion to qualitatively and quantitatively describe the interaction of objects.</p>	<p>See Glencoe's <i>Physics: Principles and Problems</i> © 2009.</p>
<p>2. The student will describe the effect of friction and gravity on the motion of an object.</p>	<p>See Glencoe's <i>Physics: Principles and Problems</i> © 2009.</p>
<p>E. Forces of Nature The student will understand the forces of nature and their application.</p>	
<p>1. The student will recognize the factors that affect the presence and magnitude of gravitational, electromagnetic, weak and strong nuclear forces.</p>	<p>Student Edition: 710-711, 865 <i>Chapter Assessment</i> 894 #42 <i>Launch Lab</i> 101 Teacher Wraparound Edition: CP 37; DI 108; QD 107 Teacher Resources: <i>Laboratory Manual</i> 37-40 <i>Science Notebook</i> 342</p>
<p>2. The student will identify the dominant force or forces in a variety of interactions.</p>	<p>Student Edition: 269-270, 411-414, 597 <i>How It Works</i> 271 Teacher Wraparound Edition: A 412; R 414 Teacher Resources: <i>Laboratory Manual</i> 49-52 <i>Science Notebook</i> 164</p>