

**FORMAT FOR CORRELATION TO THE GEORGIA PERFORMANCE STANDARDS**

**Subject Area:** Chemistry I

**State-Funded Course:** 40.05100

**Textbook Title:** Active Chemistry

**Publisher:** It's About Time, Herff Jones Education Division

*The GPSs for grades K-12 Science and 9-12 Mathematics may be accessed on-line at: <http://www.georgiastandards.org/>.*

<u>Standard</u> (Cite Number)	<u>Standard</u> (Cite specific standard)	<u>Where Taught</u> (If print component, cite page number; if non-print, cite appropriate location.)
<b>SCSh1</b>	<b>Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.</b>	
SCSh1 (a)	Exhibit the above traits in their own scientific activities.	Ch 1 Act 3,8; Ch 2 Act 4,5; Ch 3 Act 6,7; Ch 4 Act 1,4,8; Ch 5 Act 3,5,6; Ch 6 Act 1,4; Ch 7 Act 2,3,4; Ch 8 Act 5,6,8; Ch 9 Act 4; Ch 10 Act 4,7; Ch 11 Act 1,3,4
SCSh1 (b)	Recognize that different explanations often can be given for the same evidence.	Ch 1 Act 3,8; Ch 2 Act 4,5; Ch 3 Act 6,7; Ch 4 Act 1,4,8; Ch 5 Act 3,5,6; Ch 6 Act 1,4; Ch 7 Act 2,3,4; Ch 8 Act 5,6,8; Ch 9 Act 4; Ch 10 Act 4,7; Ch 11 Act 1,3,4
SCSh1 (c)	Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.	Ch 1 Act 3,-7; Ch 2 Act 1; Ch 3 Act 1; Ch 9 Act 4,5
<b>SCSh2</b>	<b>Students will use standard safety practices for all classroom laboratory and field investigations.</b>	
SCSh2 (a)	Follow correct procedures for use of scientific apparatus.	Ch 1 Act 2,3; Ch 2 Act 1-6; Ch 3 Act 2-5,7,8; Ch 4 Act 1,4,6,7; Ch 5 Act 1,3-8; Ch 6 Act 1-6; Ch 7 Act 1-6, 8; Ch 8 Act 2, 4-8; Ch 9 Act 1-5,7; Ch 10 1, 3-8; Ch 11 Act 1-8
SCSh2 (b)	Demonstrate appropriate techniques in all laboratory situations.	Ch 1 Act 2,3; Ch 2 Act 1-6; Ch 3 Act 2-5,7,8; Ch 4 Act 1,4,6,7; Ch 5 Act 1,3-8; Ch 6 Act 1-6; Ch 7 Act 1-6, 8; Ch 8 Act 2, 4-8; Ch 9 Act 1-5,7; Ch 10 1, 3-8; Ch 11 Act 1-8

SCSh2 (c)	Follow correct protocol for identifying and reporting safety problems and violations.	Ch 1 Act 2,3; Ch 2 Act 1-6; Ch 3 Act 2-5,7,8; Ch 4 Act 1,4,6,7; Ch 5 Act 1,3-8; Ch 6 Act 1-6; Ch 7 Act 1-6, 8; Ch 8 Act 2, 4-8; Ch 9 Act 1-5,7; Ch 10 1, 3-8; Ch 11 Act 1-8
<b>SCSh3</b>	<b>SCSh3. Students will identify and investigate problems scientifically.</b>	
SCSh3 (a)	Suggest reasonable hypotheses for identified problems.	Ch 1 Act 1,2,4,5,6,8,9 Ch 2 Act 1-6, 8; Ch 3 Act 2-8; Ch 4 Act 1-5,7,8; Ch 5 Act 1-7; Ch 6 Act 1-4,6,7,8; Ch 7 Act 1, 3-6,8; Ch 8 Act 1-8; Ch 9 Act 1-7; Ch 10 Act 1-7; Ch 11 Act 1-8
SCSh3 (b)	Develop procedures for solving scientific problems.	Ch 1 Act 3,8; Ch 2 Act 4,5; Ch 3 Act 6,7; Ch 4 Act 1,4,8; Ch 5 Act 3,5,6; Ch 6 Act 1,4; Ch 7 Act 2,3,4; Ch 8 Act 5,6,8; Ch 9 Act 4; Ch 10 Act 4,7; Ch 11 Act 1,3,4
SCSh3 (c)	Collect, organize and record appropriate data.	Ch 1 Act 2,3,5,7; Ch 2 Act 1-9; Ch 3 Act 2-8; Ch 4 Act 1,4-8; Ch 5 Act 1,3-8; Ch 6 Act 1-8; Ch 7 Act 1-8; Ch 8 Act 2-6, 8; Ch 9 Act 1-5,7; Ch 10 Act 1,3-8; Ch 11 Act 1-8
SCSh3 (d)	Graphically compare and analyze data points and/or summary statistics.	Ch 1 Act 2,4,6,7; Ch 2 Act 1,2,3,5,6; Ch 3 Act 2-8; Ch 4 Act 1,4,5,6,8; Ch 5 Act 1-6,8; Ch 6 Act 1-8; Ch 7 Act 1-4,6,8; Ch 8 Act 2-6,8; Ch 9 Act 1-5,; Ch 10 Act 1,4-8; Ch 11 Act 1-8
SCSh3 (e)	Develop reasonable conclusions based on data collected.	Ch 1 Act 2,3,5,7; Ch 2 Act 1-9; Ch 3 Act 2-8; Ch 4 Act 1,4-8; Ch 5 Act 1,3-8; Ch 6 Act 1-8; Ch 7 Act 1-8; Ch 8 Act 2-6, 8; Ch 9 Act 1-5,7; Ch 10 Act 1,3-8; Ch 11 Act 1-8
SCSh3 (f)	Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.	Ch 1 Act 3,6,8,9 ; Ch 2 Act 1,2,4-9; Ch 3 Act 1-5,7,8; Ch 4 Act 3-8; Ch 5 Act 1, 3-8; Ch 6 Act 1-6; Ch 7 Act 1-8; Ch 8 Act 2-5; Ch 9 Act 1,2,3,5; Ch 10 Act 1,3-8; Ch 11 Act 1,3-8
	<b>Students will use tools and instruments for</b>	

<b>SCSh4</b>	<b>observing, measuring, and manipulating scientific equipment and materials.</b>	
SCSh4.a	Develop and use systematic procedures for recording and organizing information.	Ch 1 Act 2-9; Ch 2 Act 1,2,6; Ch 3 Act 1-4,7,8; Ch 4 Act 1-6; Ch 5 Act 2-5; Ch 6 Act 1-4, 6-8; Ch 7 Act 1-6,8; Ch 8 Act 1-4,6; Ch 9 Act 1,2,3,5; Ch 10 Act 1,3-8; Ch 11 Act 1-8
SCSh4.b	Use technology to produce tables and graphs.	Ch 1 Act 2,4,6,7; Ch 2 Act 1,2,6; Ch 3 Act 1-4,7,8; Ch 4 Act 1-6; Ch 5 Act 2-8; Ch 6 Act 1-8; Ch 7 Act 1-4,6,8; Ch 8 Act 2-6,8; Ch 9 Act 1-5.7; Ch 10 Act 1,4-8; Ch 11 Act 1-8
SCSh4.c	Use technology to develop, test, and revise experimental or mathematical models.	Ch 1 Act 5,3,4,7; Ch 2 Act 2,3,6,7,8; Ch 3 Act 4-8; Ch 4 Act 2,3,4,8; Ch 5 Act 2,7; Ch 6 Act 4; Ch 7 Act 1,4,5; Ch 8 Act 1,4,7,8; Ch 9 Act 4,5,6; Ch 10 Act 2-7; Ch 11 Act 1,2,5,6,7
<b>SCSh5</b>	<b>Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.</b>	
SCSh5.a	Trace the source on any large disparity between estimated and calculated answers to problems.	Ch 1 Act 3,8; Ch 2 Act 4,5; Ch 3 Act 6,7; Ch 4 Act 1,4,8; Ch 5 Act 3,5,6; Ch 6 Act 1,4; Ch 7 Act 2,3,4; Ch 8 Act 5,6,8; Ch 9 Act 5; Ch 10 Act 4,7; Ch 11 Act 1,3,4
SCSh5.b	Consider possible effects of measurement errors on calculations.	p 134-135, 139-140, 174, 256, 281, 522, 603, 748
SCSh5.c	Recognize the relationship between accuracy and precision	p 143, 174
SCSh5.d	Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.	Ch 1 Act 3,6; Ch 2 Act 1,9; Ch 3 Act 5,6; Ch 4 Act 2-4,6; Ch 5 Act 1,2,4,6,7; Ch 6 Act 2,4,6,8; Ch 7 Act 3,34; Ch 8 Act 7; Ch 9 Act 7; Ch 10 Act 2; Ch 11 Act 3-8
SCSh5.e	Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.	Ch 1 Act 2,3,9; Ch 2 Act 5; Ch 3 Act 5; Ch 4 Act 2,3,4,6; Ch 5 Act 4-7; Ch 6 Act 1; Ch 7 Act 3-6,8; Ch 8 Act 2; Ch 9 Act 3; Ch 11 Act 3-7

SCSh6	<b>Students will communicate scientific investigations and information clearly.</b>	
SCSh6.a	Write clear, coherent laboratory reports related to scientific investigations.	All 89 activities require students to record and analyze data, make predictions and write coherent conclusions
SCSh6.b	Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.	Ch 2 Act 7; Ch 3 Act 1,2; Ch 5 Act 8; Ch 7 Act 7; Ch 8 Act 3,4; Ch 11 Act 8
SCSh6.c	Use data as evidence to support scientific arguments and claims in written or oral presentations.	Ch 1 Act 3,6,8,9; Ch 2 Act 1,2,4-9; Ch 3 Act 1-5,7,8; Ch 4 Act 3-8; Ch 5 Act 1, 3-8; Ch 6 Act 1-6; Ch 7 Act 1-8; Ch 8 Act 2-5; Ch 9 Act 1,2,3,5; Ch 10 Act 1, 3-8; Ch 11 Act 1,3-8
SCSh6.d	Participate in group discussions of scientific investigation and current scientific issues.	p. 35, 39, 40, 166, 270, 302-303, 333, 373, 383-387, 472, 525, 623, 698-700
SCSh7	<b>Students will analyze how scientific knowledge is developed.</b>	
SCSh7.a	The universe is a vast single system in which the basic principles are the same everywhere.	
SCSh7.b	Universal principles are discovered through observation and experimental verification.	Ch 1 Act 3-7; Ch 2 Act 1,5; Ch 3 Act 1,3; Ch 4 Act 2; Ch 5 Act 4; Ch 9 Act 4
SCSh7.c	From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small	Ch 1 Act 3-7; Ch 2 Act 1,5; Ch 3 Act 1,3; Ch 4 Act 2; Ch 5 Act 4; Ch 9 Act 4,5

	<p>modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.</p>	
SCSh7.d	Hypotheses often cause scientists to develop new experiments that produce additional data.	p 3-6, 9-11, 15, 19, 20, 21, 24, 26, 33, 34, 36, 39, 43, 64, 82, 139, 186-188, 250, 270, 272-273, 383, 714
SCSh7.e	Testing, revising, and occasionally rejecting new and old theories never ends	p 3-6, 9-11, 15, 19, 20, 21, 24, 26, 33, 34, 36, 39, 43, 64, 82, 139, 186-188, 250, 270, 272-273, 383, 714
<b>SCSh8</b>	<b>Students will understand important features of the process of scientific inquiry.</b>	
SCSh8.a	Scientific investigators control the conditions of their experiments in order to produce valuable data.	Ch 1 Act 3-7; Ch 2 Act 1,5; Ch 3 Act 1,3; Ch 4 Act 2; Ch 5 Act 4; Ch 9 Act 4,5
SCSh8.b	Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretation	Ch 1 Act 3-7; Ch 2 Act 1,5; Ch 3 Act 1,3; Ch 4 Act 2; Ch 5 Act 4; Ch 9 Act 4,5
SCSh8.c	Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.	Ch 1 Act 3-7; Ch 2 Act 1,5; Ch 3 Act 1,3; Ch 4 Act 2; Ch 5 Act 4; Ch 9 Act 4,5
SCSh8.d	The merit of a new theory is judged by how well scientific data are explained by the new theory	Ch 1 Act 3-7; Ch 2 Act 1,5; Ch 3 Act 1,3; Ch 4 Act 2; Ch 5 Act 4; Ch 9 Act 4,5

SCSh8.e	The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.	Ch 1 Act 5,7; Ch 2 Act 7.9; Ch 4 Act 2,3,4,8; Ch 5 Act 2,7; Ch 6 Act 4; Ch 7 Act 1,4,5; Ch 8 Act 1,4,7,8; Ch 9 Act 4,5,6; Ch 10 Act 2-7
SCSh8.f	Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.	
<b>SCSh9</b>	<b>SCSh9. Students will enhance reading in all curriculum areas by:</b>	
SCSh9.a	<p>Reading in All Curriculum Areas</p> <ul style="list-style-type: none"> <li>∞ Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas</li> <li>∞ Read both informational and fictional texts in a variety of genres and modes of discourse</li> <li>∞ Read technical texts related to various subject areas.</li> </ul>	Throughout
SCSh9.b	<p>Discussing books</p> <ul style="list-style-type: none"> <li>∞ Discuss messages and themes from books in all subject areas.</li> <li>∞ Respond to a variety of texts in multiple modes of discourse.</li> <li>∞ Relate messages and themes from one subject area to messages and themes in another area.</li> <li>∞ Evaluate the merit of texts in every subject discipline.</li> <li>∞ Examine author's purpose in writing.</li> <li>∞ Recognize the features of disciplinary</li> </ul>	Throughout

SCSh9.c	<p>texts</p> <p>Building vocabulary knowledge</p> <ul style="list-style-type: none"> <li>∞ Demonstrate an understanding of contextual vocabulary in various subjects.</li> <li>∞ Use content vocabulary in writing and speaking.</li> <li>∞ Explore understanding of new words found in subject area texts.</li> </ul>	Throughout
SCSh9.d	<p>Establishing context</p> <ul style="list-style-type: none"> <li>∞ Explore life experiences related to subject area content.</li> <li>∞ Discuss in both writing and speaking how certain words are subject area related</li> <li>∞ Determine strategies for finding content and contextual meaning for unknown words.</li> </ul>	Throughout
<b>SC1</b>	<b>Students will analyze the nature of matter and its classifications.</b>	
SC1.a	Relate the role of nuclear fusion in producing essentially all elements heavier than helium.	p 81, 86, 89
SC1.b	Identify substances based on chemical and physical properties.	p. 12,96, 112, 12, 128, 141, 14-147, 159-161, 204, 292, 339, 476, 522, 528, 588, 595-596, 599, 602-604, 606, 622, 623, 654, 672, 738, 838
SC1.c	Predict formulas for stable ionic compounds (binary and tertiary) based on balance of charges	p. 19, 71, 72, 76, 105, 106, 153-155, 228, 241-242, 258, 280, 449, 452, 775, 798, 818, 851, 852, 865

SC1.d	<p>Use IUPAC nomenclature for both chemical names and formulas:</p> <ul style="list-style-type: none"> <li>• Ionic compounds (Binary and tertiary)</li> <li>• Covalent compounds (Binary and tertiary)</li> <li>• Acidic compounds (Binary and tertiary)</li> </ul>	p 13, 83, 65, 69, 104, 105, 164, 215, 595, 760
SC2	<p><b>Students will relate how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions.</b></p>	
SC2.a	<p>Identify and balance the following types of chemical equations:</p> <ul style="list-style-type: none"> <li>• Synthesis</li> <li>• Decomposition</li> <li>• Single Replacement</li> <li>• Double Replacement</li> <li>• Combustion</li> </ul>	p. 21, 96, 154, 166, 222, 228-231, 392-397, 445, 457, 461-463, 525-526, 608, 613, 616, 626, 644-646, 672, 680-682, 725, 738, 761, 838
SC2.b	<p>Experimentally determine indicators of a chemical reaction specifically precipitation, gas evolution, water production, and changes in energy to the system.</p>	p 12, 165-166, 282, 322, 434, 436, 470, 472, 524-527, 530, 537-539, 677, 678
SC2.c	<p>Apply concepts of the mole and Avogadro's number to conceptualize and calculate</p> <ul style="list-style-type: none"> <li>• Empirical/molecular formulas,</li> <li>• Mass, moles and molecules relationships,</li> <li>• Molar volumes of gases.</li> </ul>	p 19-21, 78, 82, 96, 212, 215-216, 279, 394, 411, 412, 437, 570, 885

SC2.d	Identify and solve different types of stoichiometry problems, specifically relating mass to moles and mass-to-mass.	p. 166, 280-282, 286, 348, 525, 623
SC2.e	Demonstrate the conceptual principle of limiting reactants.	p. 278, 280-283, 286
SC2.f	Explain the role of equilibrium in chemical reactions.	p 877, 880-884, 886-888, 932
<b>SC3</b>	<b>Students will use the modern atomic theory to explain the characteristics of atoms.</b>	
SC3.a	Discriminate between the relative size, charge, and position of protons, neutrons, and electrons in the atom.	p. 29-31, 39, 78, 79-85, 159, 196, 304, 448, 499, 611, 763
SC3.b	Use the orbital configuration of neutral atoms to explain its effect on the atom's chemical properties.	2,3 20-23, 26-28, 32-34, 42-44, 48-52, 54, 62, 64-65, 71, 73, 196, 197, 200, 595
SC3.c	Explain the relationship of the proton number to the element's identity.	p. 33, 47, 49, 54, 77, 79, 82, 83, 96
SC3.d	Explain the relationship of isotopes to the relative abundance of atoms of a particular element	p 77. 79 81, 83, 87, 89-91, 96
SC3.e	Compare and contrast types of chemical bonds (i.e. ionic, covalent).	p 68-74, 164, 196, 200, 250, 312, 366, 450-453, 758-759, 772-774, 838, 850-851

SC3.f	Relate light emission and the movement of electrons to element identification.	p. 35, 39-40,43, 77 159-161, 196, 302
<b>SC4</b>	<b>Students will use the organization of the Periodic Table to predict properties of elements.</b>	
SC4.a	Use the Periodic Table to predict periodic trends including atomic radii, ionic radii, ionization energy, and electronegativity of various elements.	2,3 20-23, 26-28, 32-34, 42-44, 48-52, 54, 58, 366, 595, 772-774, 851
SC4.b	Compare and contrast trends in the chemical and physical properties of elements and their placement on the Periodic Table.	2,3 20-23, 26-28, 32-34, 42-44, 48-52, 54, 58, 96, 112, 126-128, 141, 146-147, 159-161, 204, 292, 339, 366, 595, 599, 602-604, 606, 654, 672, 772-774, 851
<b>SC5</b>	<b>Students will understand that the rate at which a chemical reaction occurs can be affected by changing concentration, temperature, or pressure and the addition of a catalyst.</b>	
SC5.a	Demonstrate the effects of changing concentration, temperature, and pressure on chemical reactions.	p 166, 266, 272, 321, 335, 341, 348, 393, 457-462, 480-481, 484, 506, 525, 706, 860

SC5.b	Investigate the effects of a catalyst on chemical reactions and apply it to everyday examples.	p 170, 325, 481, 528, 613-614, 706
SC5.c	Explain the role of activation energy and degree of randomness in chemical reactions.	p 324, 325, 341, 470, 480-481, 538, 539
<b>SC6</b>	<b>Students will understand the effects motion of atoms and molecules in chemical and physical processes.</b>	
SC6.a	Compare and contrast atomic/molecular motion in solids, liquids, gases, and plasmas.	111-113, 114-116, 118, 136, 153, 174, 362, 364, 404,405, 487, 491, 546-548, 553-555, 557, 588, 603, 859,
SC6.b	Collect data and calculate the amount of heat given off or taken in by chemical or physical processes.	165, 322, 470, 472, 524-527, 530,537-538
SC6.c	Analyzing (both conceptually and quantitatively) flow of energy during change of state (phase).	p. 114-116, 1118, 174, 362, 487, 491, 546-548, 553-555, 557, 588, 603
<b>SC7</b>	<b>Students will characterize the properties that describe solutions and the nature of acids and bases.</b>	
SC7.a	Explain the process of dissolving in terms of solute/solvent interactions:	p. 122, 405, 436, 437, 476, 480, 490, 617, 624-626, 633, 672, 867, 821-823, 848, 852,

<p>SC7.b</p>	<ul style="list-style-type: none"> <li>• Observe factors that effect the rate at which a solute dissolves in a specific solvent,</li> <li>• Express concentrations as molarities,</li> <li>• Prepare and properly label solutions of specified molar concentration,</li> <li>• Relate molality to colligative properties.</li> </ul> <p>Compare, contrast, and evaluate the nature of acids and bases:</p> <ul style="list-style-type: none"> <li>• Arrhenius, Bronsted-Lowry Acid/Bases</li> <li>• Strong vs. weak acids/bases in terms of percent dissociation</li> <li>• Hydronium ion concentration</li> <li>• pH</li> <li>• Acid-Base neutralization</li> </ul>	<p>857-859, 869, 870, 884, 888, 914</p> <p>p. 10, 13, 182, 184-190, 210, 213, 215, 233-234, 250, 257, 424, 445, 488-490, 491, 539, 570, 588, 625, 687-689, 703, 706, 754, 817, 820-824, 828-829</p>
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