

FORMAT FOR CORRELATION TO THE GEORGIA PERFORMANCE STANDARDS

Subject Area: Physical Science

State-Funded Course: 40.01100

Textbook Title: Active Physical Science

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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.)
SCSh1	Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.	
SCSh1 (a)	Exhibit the above traits in their own scientific activities.	94-98, 135, 184-188, 696-701, 740-747
SCSh1 (b)	Recognize that different explanations often can be given for the same evidence.	584, 574-575, 721-730, 731-739, 755-766
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.	171-175, 600-601, 716-717, 721-725, 726-730, 740-747
SCSh2	Students will use standard safety practices for all classroom laboratory and field investigations.	
SCSh2 (a)	Follow correct procedures for use of scientific apparatus.	86-91, 129-134, 147-150, 512-516, 517-525, 666-668, 669-672
SCSh2 (b)	Demonstrate appropriate techniques in all laboratory situations.	86-91, 129-134, 147-150, 512-516, 517-525, 666-668, 669-672
SCSh2 (c)	Follow correct protocol for identifying and reporting safety problems and violations.	142-146, 147-150, 533-537

SCSh3	SCSh3. Students will identify and investigate problems scientifically.	
SCSh3 (a)	a. Suggest reasonable hypotheses for identified problems.	86-91, 147-150, 456-457, 699-700, 710-718, 740-747
SCSh3 (b)	b. Develop procedures for solving scientific problems.	512-525, 86-91, 666-672, 129-134
SCSh3 (c)	c. Collect, organize and record appropriate data.	80-85, 86-93, 147-150, 171-175, 731-735, 736-739
SCSh3 (d)	d. Graphically compare and analyze data points and/or summary statistics.	18-25, 15-17, 176-183, 142-146, 340-345, 158-160, 214-217, 86-93, 147-150, 151-155, 239-255, 171-175, 721-725, 726-730, 755-766
SCSh3 (e)	e. Develop reasonable conclusions based on data collected.	94-98, 135, 171-175, 184-188, 600-601
SCSh3 (f)	f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.	171-175, 600-601, 716-717, 721-725, 726-730, 740-747
SCSh4	Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.	
SCSh4 (a)	a. Develop and use systematic procedures for recording and organizing information.	81-85, 208-213, 309-319, 324-325
SCSh4 (b)	b. Use technology to produce tables and graphs.	129-134, 86-93, 147-150, 151-155, 239-255, 721-725, 726-730
SCSh4 (c)	c. Use technology to develop, test, and revise experimental or mathematical models.	188-191, 117-121, 129-134

SCSh5	<p>Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.</p>	
SCSh5 (a)	<p>a. Trace the source on any large disparity between estimated and calculated answers to problems.</p>	<p>26-30, 80-85, 656-665</p>
SCSh5 (b)	<p>b. Consider possible effects of measurement errors on calculations.</p>	<p>656-665, 740-747, 80-85, 662-663, 147-150, 151-155, 239-255, 356, 167-170</p>
SCSh5 (c)	<p>c. Recognize the relationship between accuracy and precision</p>	<p>167-170, 80-85, 141-146, 147-150, 151-155, 239-255, 656-665</p>
SCSh5 (d)	<p>d. Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.</p>	<p>throughout 167-170, 656-665</p>
SCSh5 (e)	<p>e. Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.</p>	<p>15-25, 31-44, 56-60, 61-68, 86-93, 105-110, 117-121, 147-150, 160-166, 194-202, 429-432</p>
SCSh6	<p>Students will communicate scientific investigations and information clearly.</p>	
SCSh6 (a)	<p>a. Write clear, coherent laboratory reports related to scientific investigations.</p>	<p>620-621, 340-345, 86-93, 214-217, 142-146, 147-150, 156-160</p>
SCSh6 (b)	<p>b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.</p>	<p>105-121, 129-134, 151-155, 94-98, 576-586, 600-605</p>
SCSh6 (c)	<p>c. Use data as evidence to support scientific arguments and claims in written or oral presentations.</p>	<p>142-146, 147-150, 156-160, 214-217, 340-345</p>

SCSh6 (d)	d. Participate in group discussions of scientific investigation and current scientific issues.	94-98, 396-399, 400-404, 405-410, 411-416, 463-471, 576-578, 612-619, 673-677, 721-730
SCSh7	Students will analyze how scientific knowledge is developed.	
SCSh7 (a)	a. The universe is a vast single system in which the basic principles are the same everywhere.	147-150, 142-146, 533-537
SCSh7 (b)	b. Universal principles are discovered through observation and experimental verification.	94-98, 135, 171-175, 184-188, 600-601
SCSh7 (c)	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 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.	567-572, 573-574, 713-720, 111-116, 117-121, 129-134, 208-217
SCSh7 (d)	d. Hypotheses often cause scientists to develop new experiments that produce additional data.	94-98, 123-134
SCSh7 (e)	e. Testing, revising, and occasionally rejecting new and old theories never ends	94-98, 396-399, 400-404, 405-410, 411-416, 463-471, 576-478, 612-619, 673-677, 721-730
SCSh8	Students will understand important features of the process of scientific inquiry.	
SCSh8 (a)	a. Scientific investigators control the conditions of their experiments in order to produce valuable data.	81-85, 208-213, 309-319, 324-325

SCSh8 (b)	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	81-85, 208-213, 309-319, 324-325
SCSh8 (c)	c. Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.	572-574, 117-121, 171-175, 600-601
SCSh8 (d)	d. The merit of a new theory is judged by how well scientific data are explained by the new theory	561-566, 702-712, 94-98, 123-134
SCSh8 (e)	e. The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.	692-693, 699-701, 706-712, 716-720, 750-754
SCSh8 (f)	f. Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.	694-695, 78-79, 99-104, 105-110, 147-150, 673-677, 117-121, 572-574
SCSh9	SCSh9. Students will enhance reading in all curriculum areas by:	
SCSh9 (a)	a. Reading in All Curriculum Areas <ul style="list-style-type: none"> ∞ 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 ∞ Read both informational and fictional texts in a variety of genres and modes of discourse ∞ Read technical texts related to various subject areas. 	Throughout
SCSh9 (b)	b. Discussing books <ul style="list-style-type: none"> ∞ Discuss messages and themes from books 	

	<p>in all subject areas.</p> <ul style="list-style-type: none"> ∞ Respond to a variety of texts in multiple modes of discourse. ∞ Relate messages and themes from one subject area to messages and themes in another area. ∞ Evaluate the merit of texts in every subject discipline. ∞ Examine author’s purpose in writing. ∞ Recognize the features of disciplinary texts 	<p>Throughout</p>
SCSh9 (c)	<p>c. Building vocabulary knowledge</p> <ul style="list-style-type: none"> ∞ Demonstrate an understanding of contextual vocabulary in various subjects. ∞ Use content vocabulary in writing and speaking. ∞ Explore understanding of new words found in subject area texts. 	<p>Throughout</p>
SCSh9 (d)	<p>d. Establishing context</p> <ul style="list-style-type: none"> ∞ Explore life experiences related to subject area content. ∞ Discuss in both writing and speaking how certain words are subject area related ∞ Determine strategies for finding content and contextual meaning for unknown words. 	<p>Throughout</p>
SPS1	<p>Students will investigate our current understanding of the atom.</p>	
SPS1 (a)	<p>a. Examine the structure of the atom in terms of</p> <ul style="list-style-type: none"> ∞ proton, electron, and neutron locations. ∞ atomic mass and atomic number. ∞ atoms with different numbers of neutrons (isotopes). ∞ explain the relationship of the proton 	<p>660-670, 702-711, 713-719, 721-730, 740-747, 450-454, 826-829</p>

SPS1 (b)	<p>number to the element's identity.</p> <p>1. Compare and contrast ionic and covalent bonds in terms of electron movement.</p>	556-560, 567-575, 678-682, 713-720, 721-730, 826-831, 748-754, 702-711, 683-688, 785-791
SPS2	<p>Students will explore the nature of matter, its classifications, and its system for naming types of matter.</p>	656-665
SPS2 (a)	<p>Calculate density when given a means to determine a substance's mass and volume.</p>	748-754, 785-791
SPS2 (b)	<p>Predict formulas for stable binary ionic compounds based on balance of charges.</p>	
SPS2 (c)	<p>Use IUPAC nomenclature for transition between chemical names and chemical formulas of</p> <ul style="list-style-type: none"> ∞ binary ionic compounds (containing representative elements). ∞ binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride). 	748-754, 785-791 792-801, 826-832
SPS2 (d)	<p>Demonstrate the Law of Conservation of Matter in a chemical reaction.</p>	792-801, 779-784, 785-791
SPS2 (e)	<p>Apply the Law of Conservation of Matter by balancing the following types of chemical equations:</p> <ul style="list-style-type: none"> ∞ Synthesis ∞ Decomposition ∞ Single Replacement ∞ Double Replacement 	
SPS3	<p>Students will distinguish the characteristics and components of radioactivity.</p>	

SPS3 (a)	Differentiate among alpha and beta particles and gamma radiation	755-76, 595-604, 605-611, 612-619
SPS3 (b)	Differentiate between fission and fusion.	755-76, 595-604, 605-611, 612-619
SPS3 (c)	Explain the process half-life as related to radioactive decay.	595-604
SPS3 (d)	Describe nuclear energy, its practical application as an alternative energy source, and its potential problems.	595-604, 605-611, 612-619, 620
SPS4	Students will investigate the arrangement of the Periodic Table.	
SPS4 (a)	Determine the trends of the following: <ul style="list-style-type: none"> ∞ Number of valence electrons ∞ Types of ions formed by representative elements ∞ Location of metals, nonmetals, and metalloids ∞ Phases at room temperatur 	666-672, 702-712, 713-720, 731-739, 755-766, 785-791
SPS4 (b)	Use the Periodic Table to predict the above properties for representative elements.	666-672, 702-712, 713-720, 731-739, 755-766, 785-791
SPS5	Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.	
SPS5 (a)	Compare and contrast the atomic/molecular motion of solids, liquids, gases and plasmas	634-643
SPS5 (b)	Relate temperature, pressure, and volume of gases to the behavior of gases.	634-643

<p>SPS6</p> <p>SPS6.a</p> <p>SPS6.b</p> <p>SPS6.c</p> <p>SPS6.d</p> <p>SPS6.e</p>	<p>Students will investigate the properties of solutions.</p> <p>Describe solutions in terms of</p> <ul style="list-style-type: none"> ∞ solute/solvent ∞ conductivity ∞ concentration <p>Observe factors affecting the rate a solute dissolves in a specific solvent.</p> <p>Demonstrate that solubility is related to temperature by constructing a solubility curve.</p> <p>Compare and contrast the components and properties of acids and bases.</p> <p>Determine whether common household substances are acidic, basic, or neutral.</p>	<p>644-649, 626-633, 696-701, 772-778, 740-747, 792-801, 802-807</p> <p>644-649</p> <p>809-815</p> <p>816-825, 779-784</p> <p>816-825, 779-784</p>
<p>SPS7</p> <p>SPS7.a</p>	<p>Students will relate transformations and flow of energy within a system.</p> <p>Identify energy transformations within a system (e.g. lighting of a match).</p>	<p>99-104, 105-110, 123-134, 721-730, 31-44, 45-49, 802-808, 56-60, 61-66, 489-497, 634-643, 683-688, 713-720</p> <p>416-420, 425-428, 429-432</p>

SPS7.b	Investigate molecular motion as it relates to thermal energy changes in terms of conduction, convection, and radiation.	433-440, 486-497, 411-415
SPS7.c	Determine the heat capacity of a substance using mass, specific heat, and temperature.	
SPS7.d	Explain the flow of energy in phase changes through the use of a phase diagram.	
SPS8	Students will determine relationships among force, mass, and motion.	
SPS8.a	Calculate velocity and acceleration.	86-93, 142-146, 156-159, 171-175, 31-44, 45-49, 50-55, 151-155, 160-166, 176-183, 184-193
SPS8.b	Apply Newton's three laws to everyday situations by explaining the following: <ul style="list-style-type: none"> ∞ Inertia ∞ Relationship between force, mass and acceleration ∞ Equal and opposite forces 	15-25, 31-44, 45-49, 69-74, 99-104, 105-110, 117-121, 123-134, 161-166, 208-217, 253-265, 239-252
SPS8.c	Relate falling objects to gravitational force	553-554, 253-265, 19-20, 277-281, 31-44, 558-559
SPS8.d	Explain the difference in mass and weight.	656-665, 253-265
SPS8.e	Calculate amounts of work and mechanical advantage using simple machines.	286-296, 297-308
SPS9	Students will investigate the properties of waves.	
SPS9.a	Recognize that all waves transfer energy.	326-339, 340-345, 346-353, 411-415, 416-420

SPS9.b	Relate frequency and wavelength to the energy of different types of electromagnetic waves and mechanical waves.	326-339, 340-345, 576-586
SPS9.c	Compare and contrast the characteristics of electromagnetic and mechanical (sound) waves.	416-420, 326-339, 576-586
SPS9.d	Investigate the phenomena of reflection, refraction, interference, and diffraction.	354-361, 362-370, 371-376, 377-385, 386-390
SPS9.e	Relate the speed of sound to different mediums.	346-353, 326-339, 371-376
SPS9.f	Explain the Doppler Effect in terms of everyday interactions.	
SPS10	Students will investigate the properties of electricity and magnetism.	
SPS10.a	Investigate static electricity in terms of <ul style="list-style-type: none"> ∞ friction ∞ induction ∞ conduction 	548-555, 713-720, 755-766
SPS10.b	Explain the flow of electrons in terms of <ul style="list-style-type: none"> ∞ alternating and direct current. ∞ the relationship among voltage, resistance and current. ∞ simple series and parallel circuits. 	455-462, 463-471, 472-485
SPS10.c	Investigate applications of magnetism and/or its relationship to the movement of electrical charge as it relates to <ul style="list-style-type: none"> ∞ electromagnets ∞ simple motors 	512-516, 517-520, 450-454, 455-462, 472-485, 521-525, 526-532, 533-538, 539-541, 548-555

	∞ permanent magnets	
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