



## Alignment Document

### State of Georgia And Aventa Learning Physical Science

#### Physical Science 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
PS	Physical Science		
0	Co-Requisite - Characteristics of Science		
0	Habits of Mind		
PS.SCSH1	Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.	Doing Science	Scientific Method
PS.SCSH1.a	Exhibit the above traits in their own scientific activities.		
PS.SCSH1.b	Recognize that different explanations often can be given for the same evidence.	Doing Science	Scientific Method
PS.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.	Doing Science	Scientific Method
PS.SCSH2	Students will use standard safety practices for all classroom laboratory and field investigations.		
PS.SCSH2.a	Follow correct procedures for use of scientific apparatus.		
PS.SCSH2.b	Demonstrate appropriate techniques in all laboratory situations.		
PS.SCSH2.c	Follow correct protocol for identifying and reporting safety problems and violations.		

PS.SCSH3	Students will identify and investigate problems scientifically.	Doing Science	Scientific Method
		Doing Science	Experimental Set up
PS.SCSH3.a	Suggest reasonable hypotheses for identified problems.	Doing Science	Scientific method
		Doing Science	Experimental set up
PS.SCSH3.b	Develop procedures for solving scientific problems.	Doing Science	Scientific Method
		Doing Science	Experimental Set up
PS.SCSH3.c	Collect, organize and record appropriate data.	Doing Science	Scientific Method
		Doing Science	Experimental Set up
PS.SCSH3.d	Graphically compare and analyze data points and/or summary statistics.	Doing Science	Scientific Method
		Doing Science	Experimental Set up
PS.SCSH3.e	Develop reasonable conclusions based on data collected.		
PS.SCSH3.f	Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.	Doing Science	Experimental set up
PS.SCSH4	Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.		
PS.SCSH4.a	Develop and use systematic procedures for recording and organizing information.		
PS.SCSH4.b	Use technology to produce tables and graphs.		
PS.SCSH4.c	Use technology to develop, test, and revise experimental or mathematical models.		
PS.SCSH5	Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.		
PS.SCSH5.a	Trace the source on any large disparity between estimated and calculated answers to problems.		
PS.SCSH5.b	Consider possible effects of measurement errors on calculations.		
PS.SCSH5.c	Recognize the relationship between accuracy and precision.		

PS.SCSh5.d	Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.		
PS.SCSh5.e	Solve scientific problems by substituting quantitative values, using dimensional analysis, and/or simple algebraic formulas as appropriate.		
PS.SCSh6	Students will communicate scientific investigations and information clearly.		
PS.SCSh6.a	Write clear, coherent laboratory reports related to scientific investigations.		
PS.SCSh6.b	Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.		
PS.SCSh6.c	Use data as evidence to support scientific arguments and claims in written or oral presentations.		
PS.SCSh6.d	Participate in group discussions of scientific investigation and current scientific issues.		
0	The Nature of Science		
PS.SCSh7	Students will analyze how scientific knowledge is developed. Students will recognize that:		
PS.SCSh7.a	The universe is a vast single system in which the basic principles are the same everywhere.		
PS.SCSh7.b	Universal principles are discovered through observation and experimental verification.		

PS.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 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.		
PS.SCSh7.d	Hypotheses often cause scientists to develop new experiments that produce additional data.	Doing Science	Scientific method
PS.SCSh7.e	Testing, revising, and occasionally rejecting new and old theories never ends.	Doing Science	Scientific method
PS.SCSh8	Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:	Doing Science	Scientific method
PS.SCSh8.a	Scientific investigators control the conditions of their experiments in order to produce valuable data.	Doing Science	Scientific method
PS.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 interpretations.		
PS.SCSh8.c	Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.		
PS.SCSh8.d	The merit of a new theory is judged by how well scientific data are explained by the new theory.		
PS.SCSh8.e	The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.		
PS.SCSh8.f	Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.		



PS.SCSH9	Students will enhance reading in all curriculum areas by:		
PS.SCSH9.a	Reading in All Curriculum Areas		
PS.SCSH9.a.1	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.		
PS.SCSH9.a.2	Read both informational and fictional texts in a variety of genres and modes of discourse.		
PS.SCSH9.a.3	Read technical texts related to various subject areas.		
PS.SCSH9.b	Discussing books		
PS.SCSH9.b.1	Discuss messages and themes from books in all subject areas.		
PS.SCSH9.b.2	Respond to a variety of texts in multiple modes of discourse.		
PS.SCSH9.b.3	Relate messages and themes from one subject area to messages and themes in another area.		
PS.SCSH9.b.4	Evaluate the merit of texts in every subject discipline.		
PS.SCSH9.b.5	Examine author's purpose in writing.		
PS.SCSH9.b.6	Recognize the features of disciplinary texts.		
PS.SCSH9.c	Building vocabulary knowledge		
PS.SCSH9.c.1	Demonstrate an understanding of contextual vocabulary in various subjects.		
PS.SCSH9.c.2	Use content vocabulary in writing and speaking.		
PS.SCSH9.c.3	Explore understanding of new words found in subject area texts.		
PS.SCSH9.d	Establishing context		
PS.SCSH9.d.1	Explore life experiences related to subject area content.		
PS.SCSH9.d.2	Discuss in both writing and speaking how certain words are subject area related.		
PS.SCSH9.d.3	Determine strategies for finding content and contextual meaning for unknown words.		



0	Co-Requisite - Content		
PS.SPS1	Students will investigate our current understanding of the atom.	Atomic Structure	Protons, Neutrons and Electrons
PS.SPS1.a	Examine the structure of the atom in terms of	Atomic Structure	Protons, Neutrons and Electrons
PS.SPS1.a.1	proton, electron, and neutron locations.	Atomic Structure	Protons, Neutrons and Electrons
PS.SPS1.a.2	atomic mass and atomic number.	Atomic Structure	Protons, Neutrons and Electrons
PS.SPS1.a.3	atoms with different numbers of neutrons (isotopes).	Atomic Structure	Protons, Neutrons and Electrons
PS.SPS1.a.4	explain the relationship of the proton number to the element's identity.	Atomic Structure	Protons, Neutrons and Electrons
PS.SPS1.b	Compare and contrast ionic and covalent bonds in terms of electron movement.	Chemical Bond	Covalent Bonds
PS.SPS2	Students will explore the nature of matter, its classifications, and its system for naming types of matter.	Matter	Matter
PS.SPS2.a	Calculate density when given a means to determine a substance's mass and volume.	Matter	Length
PS.SPS2.b	Predict formulas for stable binary ionic compounds based on balance of charges.		
PS.SPS2.c	Use IUPAC nomenclature for transition between chemical names and chemical formulas of		
PS.SPS2.c.1	binary ionic compounds (containing representative elements).		
PS.SPS2.c.2	binary covalent compounds (i.e., carbon dioxide, carbon tetrachloride).		
PS.SPS2.d	Demonstrate the Law of Conservation of Matter in a chemical reaction.		
PS.SPS2.e	Apply the Law of Conservation of Matter by balancing the following types of chemical equations:		
PS.SPS2.e.1	Synthesis		
PS.SPS2.e.2	Decomposition		
PS.SPS2.e.3	Single Replacement		
PS.SPS2.e.4	Double Replacement		

PS.SPS3	Students will distinguish the characteristics and components of radioactivity.	Atomic Structure	Nuclear Process
PS.SPS3.a	Differentiate among alpha and beta particles and gamma radiation.	Atomic Structure	Nuclear Process
PS.SPS3.b	Differentiate between fission and fusion.	Atomic Structure	Nuclear Process
PS.SPS3.c	Explain the process half-life as related to radioactive decay.	Atomic Structure	Nuclear Process
PS.SPS3.d	Describe nuclear energy, its practical application as an alternative energy source, and its potential problems.		
PS.SPS4	Students will investigate the arrangement of the Periodic Table.		
PS.SPS4.a	Determine the trends of the following:	Atomic Structure	The Periodic Table
PS.SPS4.a.1	Number of valence electrons	Atomic Structure	The Periodic Table
PS.SPS4.a.2	Types of ions formed by representative elements	Atomic Structure	Protons, Neutrons and Electrons
PS.SPS4.a.3	Location of metals, nonmetals, and metalloids	Atomic Structure	The Periodic Table
PS.SPS4.a.4	Phases at room temperature		
PS.SPS4.b	Use the Periodic Table to predict the above properties for representative elements.	Atomic Structure	The Periodic Table
PS.SPS5	Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.	Matter	States of Matter
PS.SPS5.a	Compare and contrast the atomic/molecular motion of solids, liquids, gases and plasmas.	Matter	States of Matter
PS.SPS5.b	Relate temperature, pressure, and volume of gases to the behavior of gases.	Matter	States of Matter
PS.SPS6	Students will investigate the properties of solutions.		
PS.SPS6.a	Describe solutions in terms of		
PS.SPS6.a.1	solute/solvent		
PS.SPS6.a.2	conductivity	Electricity and Magnetism	Conductors and insulators
PS.SPS6.a.3	concentration		
PS.SPS6.b	Observe factors affecting the rate a solute dissolves in a specific solvent.		

PS.SPS6.c	Demonstrate that solubility is related to temperature by constructing a solubility curve.		
PS.SPS6.d	Compare and contrast the components and properties of acids and bases.	Chemical Reactions	Acid/Base Reactions
PS.SPS6.e	Determine whether common household substances are acidic, basic, or neutral.		
PS.SPS7	Students will relate transformations and flow of energy within a system.		
PS.SPS7.a	Identify energy transformations within a system (e.g. lighting of a match).		
PS.SPS7.b	Investigate molecular motion as it relates to thermal energy changes in terms of conduction, convection, and radiation.		
PS.SPS7.c	Determine the heat capacity of a substance using mass, specific heat, and temperature.		
PS.SPS7.d	Explain the flow of energy in phase changes through the use of a phase diagram.	Electricity and Magnetism	Electrical Current
PS.SPS8	Students will determine relationships among force, mass, and motion.	Energy and Motion	Acceleration
PS.SPS8.a	Calculate velocity and acceleration.	Energy and Motion	Acceleration
PS.SPS8.b	Apply Newton's three laws to everyday situations by explaining the following:	Energy and Motion	Newton's First Law of Motion
		Forces	Newton's Second Law of Motion
		Forces	Newton's Third Law
PS.SPS8.b.1	Inertia	Energy and Motion	Newton's First Law of Motion
PS.SPS8.b.2	Relationship between force, mass and acceleration	Forces	Newton's Second Law of Motion
PS.SPS8.b.3	Equal and opposite forces	Forces	Newton's Third Law
PS.SPS8.c	Relate falling objects to gravitational force.	Simple Machines	Overcoming gravity and friction
		Forces	Newton's Second Law of Motion
PS.SPS8.d	Explain the difference in mass and weight.	Forces	Newton's Second Law of Motion

PS.SPS8.e	Calculate amounts of work and mechanical advantage using simple machines.	Simple Machines	Overcoming gravity and friction
PS.SPS9	Students will investigate the properties of waves.	Waves	Waves
PS.SPS9.a	Recognize that all waves transfer energy.	Waves	Waves
PS.SPS9.b	Relate frequency and wavelength to the energy of different types of electromagnetic waves and mechanical waves.	Waves	Electromagnetic Radiation
		Waves	Waves
		Atomic Structure	Electromagnetic Radiation
PS.SPS9.c	Compare and contrast the characteristics of electromagnetic and mechanical (sound) waves.	Atomic Structure	Electromagnetic Radiation
		Waves	Electromagnetic Radiation
		Waves	Waves
PS.SPS9.d	Investigate the phenomena of reflection, refraction, interference, and diffraction.	Waves	Wave Properties of Light
PS.SPS9.e	Relate the speed of sound to different mediums.	Waves	Waves
PS.SPS9.f	Explain the Doppler Effect in terms of everyday interactions.		
PS.SPS10	Students will investigate the properties of electricity and magnetism.	Electricity and Magnetism	Static electricity
PS.SPS10.a	Investigate static electricity in terms of	Electricity and Magnetism	Static electricity
PS.SPS10.a.1	friction	Simple Machines	Overcoming gravity and friction
		Forces	Newton's Second Law of Motion
		Electricity and Magnetism	Static electricity
PS.SPS10.a.2	induction		
PS.SPS10.a.3	conduction	Electricity and Magnetism	Static electricity
PS.SPS10.b	Explain the flow of electrons in terms of		
PS.SPS10.b.1	alternating and direct current.		
PS.SPS10.b.2	the relationship between voltage, resistance and current.	Electricity and Magnetism	Electrical Current
PS.SPS10.b.3	simple series and parallel circuits.	Electricity and Magnetism	Electrical Current



PS.SPS10.c	Investigate applications of magnetism and/or its relationship to the movement of electrical charge as it relates to		
PS.SPS10.c.1	electromagnets		
PS.SPS10.c.2	simple motors		
PS.SPS10.c.3	permanent magnets		