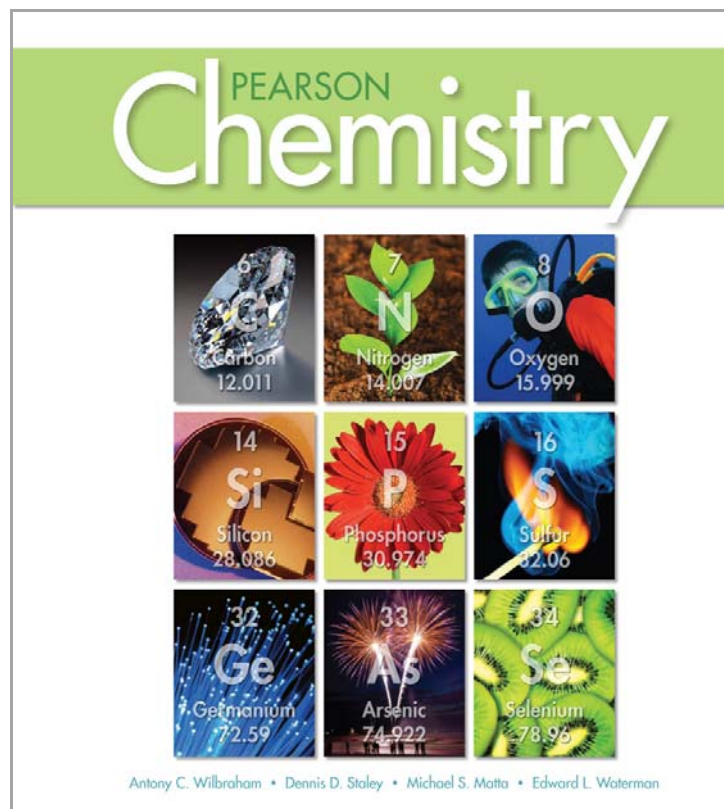


A Correlation of
Pearson Chemistry



to the
**South Carolina Academic Standards
and Performance Indicators**

Chemistry 1

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South Carolina Course Standards CHEMISTRY 1	Pearson Chemistry
SCIENCE AND ENGINEERING PRACTICES	
NOTE: Scientific investigations should always be done in the context of content knowledge expected in this course. The standard describes how students should learn and demonstrate knowledge of the content outlined in the other standards.	
Standard H.C.1: The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content.	
H.C.1A. Conceptual Understanding: The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.1A.1 Ask questions to (1) generate hypotheses for scientific investigations, (2) refine models, explanations, or designs, or (3) extend the results of investigations or challenge scientific arguments or claims.	SE/TE: Quick Lab: 17 Small-Scale Lab: 51, 92, 149, 200, 254, 374, 399, 435, 475, 508, 545, 635, 670, 717, 752, 752, 828, 849 TE Only: Class Activity: 15, 625 Teacher Demo: 674
H.C.1A.2 Develop, use, and refine models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.	SE/TE: Quick Lab: 17, 143, 238, 279, 519, 778, 856 Student Activity: 36 Small-Scale Lab: 51, 92, 149, 184, 200, 254, 374, 399, 435, 475, 508, 545, 635, 670, 717, 752, 828, 849, 887 TE Only: Class Activity: 227, 229, 885
H.C.1A.3 Plan and conduct controlled scientific investigations to answer questions, test hypotheses, and develop explanations: (1) formulate scientific questions and testable hypotheses based on credible scientific information, (2) identify materials, procedures, and variables, (3) use appropriate laboratory equipment, technology, and techniques to collect qualitative and quantitative data, and (4) record and represent data in an appropriate form. Use appropriate safety procedures.	SE/TE: Quick Lab: 17, 39, 207, 328, 354, 404, 467, 491, 571, 663, 699, 750, 818, 896 Small-Scale Lab: 51, 92, 149, 184, 200, 254, 295, 324, 374, 399, 435, 475, 509, 545, 593, 635, 670, 717, 752, 828, 849, 887 PearsonChem.com: In addition to the Quick Lab and Small-Scale Lab activities in the <i>Pearson Chemistry</i> text, editable Lab and Lab Practical activities are available online for each chapter of the text.

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H.C.1A.4 Analyze and interpret data from informational texts and data collected from investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to (1) reveal patterns and construct meaning, (2) support or refute hypotheses, explanations, claims, or designs, or (3) evaluate the strength of conclusions.	SE/TE: Quick Lab: 17, 39, 72, 180, 207, 238, 279, 328, 354, 404, 437, 467, 491, 519, 571, 662, 750, 818, 896 Small-Scale Lab: 51, 92, 120, 149, 184, 200, 254, 295, 324, 374, 399, 435, 475, 509, 545, 583, 635, 670, 717, 752, 828, 849, 887 TE Only: Teacher Demo: 35, 36 Class Activity: 64, 77, 81, 229, 527, 705
H.C.1A.5 Use mathematical and computational thinking to (1) use and manipulate appropriate metric units, (2) express relationships between variables for models and investigations, and (3) use grade-level appropriate statistics to analyze data.	SE/TE: Quick Lab: 72, 238, 328, 404, 467, 571 Small-Scale Lab: 92, 120, 149, 324, 399, 545, 583, 635, 849, 887 TE Only: Teacher Demo: 35, 392 Class Activity: 64, 77, 81, 85, 89
H.C.1A.6 Construct explanations of phenomena using (1) primary or secondary scientific evidence and models, (2) conclusions from scientific investigations, (3) predictions based on observations and measurements, or (4) data communicated in graphs, tables, or diagrams.	SE/TE: Quick Lab: 17, 147, 180, 207, 238, 279, 437, 467, 491, 519, 583, 600, 750, 856 Small-Scale Lab: 51, 92, 149, 184, 200, 254, 399, 435, 475, 508, 635, 671, 752 Interpret Graphs: 8, 175, 423, 429, 456, 542, 597, 607, 765 Interpret Data: 35, 81, 177, 332 Chemistry & You: 12-13, 316, 334-335, 355, 397, 671, 681, 744 TE Only: Teacher Demo: 35, 178, 365, 392, 612, 633, 674 Student Activity: 139
H.C.1A.7 Construct and analyze scientific arguments to support claims, explanations, or designs using evidence and valid reasoning from observations, data, or informational texts.	SE/TE: Assessment: 57 (#84, 87), 58 (#91), 124 (#74, 80), 154 (#76), 155 (#86), 189 (#81), 339 (#83), 367 (#24), 415 (#84), 468 (#36), 589 (#99, 103) TE Only: 21 st Century Learning: 867

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South Carolina Course Standards CHEMISTRY 1	Pearson Chemistry
H.C.1A.8 Obtain and evaluate scientific information to (1) answer questions, (2) explain or describe phenomena, (3) develop models, (4) evaluate hypotheses, explanations, claims, or designs or (5) identify and/or fill gaps in knowledge. Communicate using the conventions and expectations of scientific writing or oral presentations by (1) evaluating grade-appropriate primary or secondary scientific literature, or (2) reporting the results of student experimental investigations.	SE/TE: Chemistry & You: 13, 83, 270, 440-441, 455, 577, 681 Assessment: 124 (#80), 155 (#86), 217 (#91), 341 (#106, 107), 379 (#63), 483 (#103), 513 (#96), 641 (#110, 111), 833 (#74) TE Only: Performance Tasks: 121, 150, 185, 213, 296, 546, 636, 753 21 st Century Learning: 110, 146, 316, 440, 700
H.C.1B. Conceptual Understanding: Technology is any modification to the natural world created to fulfill the wants and needs of humans. The engineering design process involves a series of iterative steps used to solve a problem and often leads to the development of a new or improved technology.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.1B.1 Construct devices or design solutions using scientific knowledge to solve specific problems or needs: (1) ask questions to identify problems or needs, (2) ask questions about the criteria and constraints of the device or solutions, (3) generate and communicate ideas for possible devices or solutions, (4) build and test devices or solutions, (5) determine if the devices or solutions solved the problem and refine the design if needed, and (6) communicate the results.	SE/TE: Chemistry & You: 744 Assessment: 483 (#103) TE Only: Performance Tasks: 753 21 st Century Learning: 744
ATOMIC STRUCTURE AND NUCLEAR PROCESSES	
Standard H.C.2: The student will demonstrate an understanding of atomic structure and nuclear processes.	
H.C.2A. Conceptual Understanding: The existence of atoms can be used to explain the structure and behavior of matter. Each atom consists of a charged nucleus, consisting of protons and neutrons, surrounded by electrons. The interactions of these electrons between and within atoms are the primary factors that determine the chemical properties of matter. In a neutral atom the number of protons is the same as the number of electrons.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.2A.1 Obtain and communicate information to describe and compare subatomic particles with regard to mass, location, charge, electrical attractions and repulsions, and impact on the properties of an atom.	SE/TE: 105-109, 112-113, 114-115, 116, 129, 130 TE Only: Check for Understanding: 107 Explain: 113, 129

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South Carolina Course Standards CHEMISTRY 1	Pearson Chemistry
H.C.2A.2 Use the Bohr and quantum mechanical models of atomic structure to exemplify how electrons are distributed in atoms.	SE/TE: 128-129, 130-132, 134-137 TE Only: Explain: 130, 131, 136 Teacher Demo: 131 Extend: 132
H.C.2A.3 Analyze and interpret absorption and emission spectra to support explanations that electrons have discrete energy levels.	SE/TE: 138-140, 142-145, 147-148 Quick Lab: 142 Small-Scale Lab: 149 TE Only: Explain: 139, 140, 145, 147 Extend: 144
H.C.2B. Conceptual Understanding: In nuclear fusion, lighter nuclei combine to form more stable heavier nuclei and in nuclear fission heavier nuclei are split to form lighter nuclei. The energies in fission and fusion reactions exceed the energies in usual chemical reactions.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.2B.1 Obtain and communicate information to compare alpha, beta, and gamma radiation in terms of mass, charge, penetrating power, and their practical applications (including medical benefits and associated risks).	SE/TE: 108, 877-879, 894-897 Quick Lab: 896 TE Only: Check for Understanding: 878 Explain: 877 Teacher Demo: 878 Extend: 897
H.C.2B.2 Develop models to exemplify radioactive decay and use the models to explain the concept of half-life and its use in determining the age of materials (such as radiocarbon dating or the use of radioisotopes to date rocks).	SE/TE: 880-881, 882-883, 885-886 Small-Scale Lab: 887 TE Only: Explain: 882 Extend: 881, 883
H.C.2B.3 Obtain and communicate information to compare and contrast nuclear fission and nuclear fusion and to explain why the ability to produce low energy nuclear reactions would be a scientific breakthrough.	SE/TE: 888-891 Chemistry & You: 892-893 TE Only: Explain: 889, 890 Teacher Demo: 889 Extend: 890
H.C.2B.4 Use mathematical and computational thinking to explain the relationship between mass and energy in nuclear reactions ($E=mc^2$).	TE Only: Differentiated Instruction: 889

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South Carolina Course Standards CHEMISTRY 1	Pearson Chemistry
BONDING AND CHEMICAL FORMULAS	
Standard H.C.3: The student will demonstrate an understanding of the structures and classification of chemical compounds.	
H.C.3A. Conceptual Understanding: Elements are made up of only one kind of atom. With increasing atomic number, a predictable pattern for the addition of electrons exists. This pattern is the basis for the arrangement of elements in the periodic table. The chemical properties of an element are determined by an element's electron configuration. Elements can react to form chemical compounds/molecules that have unique properties determined by the kinds of atoms combined to make up the compound/molecule. Essentially, the ways in which electrons are involved in bonds determines whether ionic or covalent bonds are formed. Compounds have characteristic shapes that are determined by the type and number of bonds formed.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.3A.1 Construct explanations for the formation of molecular compounds via sharing of electrons and for the formation of ionic compounds via transfer of electrons.	SE/TE: 201-202, 222-223, 224-225, 226-231 TE Only: Explain: 202 Check for Understanding: 202 Class Activity: 229
H.C.3A.2 Use the periodic table to write and interpret the formulas and names of chemical compounds (including binary ionic compounds, binary covalent compounds, and straight-chain alkanes up to six carbons).	SE/TE: 202-203, 271-275, 276-278, 280-283, 765-767 Quick Lab: 279 Assessment: 298 (#63-68, #69-73, #75-76), 299 (#80-90) TE Only: Explain: 272, 281, 282 Teacher Demo: 273, 276, 765 Class Activity: 274, 275, 282, 764
H.C.3A.3 Analyze and interpret data to predict the type of bonding (ionic or covalent) and the shape of simple compounds by using the Lewis dot structures and oxidation numbers.	SE/TE: 201-202, 203, 205, 223-224, 226-229, 230-231, 232-236, 242-243 Assessment: 214 (#43), 215 (#53), 256 (#49), 258 (#77, 79), 259 (#86, 87, 89) TE Only: Explain: 202 Class Activity: 242
H.C.3A.4 Plan and conduct controlled scientific investigations to generate data on the properties of substances and analyze the data to infer the types of bonds (including ionic, polar covalent, and nonpolar covalent) in simple compounds.	SE/TE: Quick Lab: 207 Chemistry & You: 208 TE Only: Class Activity: 203, 205 Teacher Demo: 250, 252

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H.C.3A.5 Develop and use models (such as Lewis dot structures, structural formulas, or ball-and-stick models) of simple hydrocarbons to exemplify structural isomerism.	SE/TE: 775-777 Lesson Check: 778 (#23), Assessment: 790 (#49, 50) TE Only: Class Activity: 776 Teacher Demo: 777
H.C.3A.6 Construct explanations of how the basic structure of common natural and synthetic polymers is related to their bulk properties.	SE/TE: 9, 822-824, 825-827 Small-Scale Lab: 828 TE Only: Teacher Demo: 824, 826 Explain: 825 Extend: 827
H.C.3A.7 Analyze and interpret data to determine the empirical formula of a compound and the percent composition of a compound.	SE/TE: 325-328, 330-331 Quick Lab: 328 Interpret Data: 332 Lesson Check 333 (#46, 47, 49) Assessment: 338 (#71), 339 (#72, 73, 76, 77, 78) TE Only: Explain: 326, 331 Class Activity: 330
STATES OF MATTER	
Standard H.C.4: The student will demonstrate an understanding of the structure and behavior of the different states of matter.	
H.C.4A. Conceptual Understanding: Matter can exist as a solid, liquid, or gas, and in very high-energy states, as plasma. In general terms, for a given chemical, the particles making up the solid are at a lower energy state than the liquid phase, which is at a lower energy state than the gaseous phase. The changes from one state of matter into another are energy dependent. The behaviors of gases are dependent on the factors of pressure, volume, and temperature.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.4A.1 Develop and use models to explain the arrangement and movement of the particles in solids, liquids, gases, and plasma as well as the relative strengths of their intermolecular forces.	SE/TE: 36-37, 250-251, 252-253, 420-421, 425-426, 431-434, 450-451, 488-489, 490-491, 492-493 Chemistry & You: 440-441 Small-Scale Lab: 435 Quick Lab: 491 TE Only: Student Activity: 36 Teacher Demo: 36, 252, 433 Explain: 251, 426, 492

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H.C.4A.2 Analyze and interpret heating curve graphs to explain that changes from one state of matter to another are energy dependent.	SE/TE: Interpret Graphs: 438, 572 Assessment: 443 (#38) Standardized Test Prep: 447 (#1, 2) TE Only: Explain: 438, 573 Teacher Demo: 572
H.C.4A.3 Conduct controlled scientific investigations and use models to explain the behaviors of gases (including the proportional relationships among pressure, volume, and temperature).	SE/TE: 456-463 TE Only: Teacher Demo: 458 Student Activity: 460 PearsonChem.com: Ch. 14 Lab 23, Pressure-Volume Relationships of Gases Ch. 14 Lab 24, Temperature-Volume Relationships of Gases Lab Practical: 14-1, 14-2
SOLUTIONS, ACIDS, AND BASES	
Standard H.C.5: The student will demonstrate an understanding of the nature and properties of various types of chemical solutions.	
H.C.5A. Conceptual Understanding: Solutions can exist in any of three physical states: gas, liquid, or solid. Solution concentrations can be expressed by specifying the relative amounts of solute and solvent. The nature of the solute, the solvent, the temperature, and the pressure can affect solubility. Solutes can affect such solvent properties as freezing point, boiling point, and vapor pressure. Acids, bases, and salts have characteristic properties. Several definitions of acids and bases are used in chemistry.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.5A.1 Obtain and communicate information to describe how a substance can dissolve in water by dissociation, dispersion, or ionization and how intermolecular forces affect solvation.	SE/TE: 251, 494-495, 496-497, 653-654, 664-669 Small-Scale Lab: 508, 670 Chemistry & You: 671 TE Only: Class Activity: 497 Explain: 654, 665, 666, 667 Extend: 655
H.C.5A.2 Analyze and interpret data to explain the effects of temperature and pressure on the solubility of solutes in a given amount of solvent.	SE/TE: 518-523 TE Only: Explain: 520, 521, 523 Extend: 521 Teacher Demo: 522

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South Carolina Course Standards CHEMISTRY 1	Pearson Chemistry
H.C.5A.3 Use mathematical representations to analyze the concentrations of unknown solutions in terms of molarity and percent by mass.	SE/TE: 525-527, 528-531 Small-Scale Lab: 545 Chemistry & You: 532-533 TE Only: Explain: 526, 528, 529, 530, 533 Class Activity: 527, 528 Teacher Demo: 530
H.C.5A.4 Analyze and interpret data to describe the properties of acids, bases, and salts.	SE/TE: 646-652, 653-655, 656-659, 664-669, 673-675, 676-678 TE Only: Explain: 647, 648, 649, 650, 651, 666, 677 Extend: 651, 668 Teacher Demo: 647, 660, 674, 677 Class Activity: 659
CHEMICAL REACTIONS	
Standard H.C.6: The student will demonstrate an understanding of the types, the causes, and the effects of chemical reactions.	
H.C.6A. Conceptual Understanding: A chemical reaction occurs when elements and/or compounds interact, resulting in a rearrangement of the atoms of these elements and/or compounds to produce substances with unique properties. Mass is conserved in chemical reactions. Reactions tend to proceed in a direction that favors lower energies. Chemical reactions can be categorized using knowledge about the reactants to predict products. Chemical reactions are quantifiable. When stress is applied to a chemical system that is in equilibrium, the system will shift in a direction that reduces that stress.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.6A.1 Develop and use models to predict the products of chemical reactions (1) based upon movements of ions; (2) based upon movements of protons; and (3) based upon movements of electrons.	SE/TE: 356-358, 360-361, 362-364, 366-367, 369-370, 371-372, 728-735, 876-879, 880-881, 885-886 Small-Scale Lab: 374 TE Only: Explain: 357, 362, 363, 372, 734 Extend: 881 Teacher Demo: 360, 365, 366, 730, 732, 733, 878
H.C.6A.2 Use Le Châtelier's principle to predict shifts in chemical equilibria resulting from changes in concentration, pressure, and temperature.	SE/TE: 612-614 TE Only: Explain: 613, 614 Teacher Demo: 612, 615

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South Carolina Course Standards CHEMISTRY 1	Pearson Chemistry
H.C.6A.3 Plan and conduct controlled scientific investigations to produce mathematical evidence that mass is conserved in chemical reactions.	SE/TE: 386-389, 393 Small-Scale Lab: 399 TE Only: Explain: 388 Teacher Demo: 387, 392 PearsonChem.com: Ch. 12 Lab 19, Quantitative Analysis Lab Practical 12-1
H.C.6A.4 Use mathematical and computational thinking to predict the amounts of reactants required and products produced in specific chemical reactions.	SE/TE: 400-403, 404-406 Quick Lab: 404 Chemistry & You: 407 TE Only: Class Activity: 405
THERMOCHEMISTRY AND CHEMICAL KINETICS	
Standard H.C.7: The student will demonstrate an understanding of the conservation of energy and energy transfer.	
H.C.7A. Conceptual Understanding: The first law of thermodynamics states that the amount of energy in the universe is constant. An energy diagram is used to represent changes in the energy of the reactants and products in a chemical reaction. Enthalpy refers to the heat content that is present in an atom, ion, or compound. While some chemical reactions occur spontaneously, other reactions may require that activation energy be lowered in order for the reaction to occur.	
Performance Indicators: Students who demonstrate this understanding can:	
H.C.7A.1 Analyze and interpret data from energy diagrams and investigations to support claims that the amount of energy released or absorbed during a chemical reaction depends on changes in total bond energy.	SE/TE: 236-237, 556-558, 565-568, 578-580, 597 TE Only: Extend: 568 Teacher Demo: 557, 566
H.C.7A.2 Use mathematical and computational thinking to write thermochemical equations and draw energy diagrams for the combustion of common hydrocarbon fuels and carbohydrates, given molar enthalpies of combustion.	SE/TE: 565-568, 578-582 Small-Scale Lab: 583 Assessment: 586 (#59, 62, 65), 587 (#66, 78, 79, 80), 588 (#82, 83, 89), 589 (#95) TE Only: Evaluate: 568

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South Carolina Course Standards CHEMISTRY 1	Pearson Chemistry
H.C.7A.3 Plan and conduct controlled scientific investigations to determine the effects of temperature, surface area, stirring, concentration of reactants, and the presence of various catalysts on the rate of chemical reactions.	SE/TE: 598-601 Quick Lab: 600 TE Only: Teacher Demo: 599 PearsonChem.com: Ch. 18 Lab 36, Factors Affecting Reaction Rates Ch. 18 Lab 37, The Clock Reaction Lab Practical 18-1
H.C.7A.4 Develop and use models to explain the relationships between collision frequency, the energy of collisions, the orientation of molecules, activation energy, and the rates of chemical reactions.	SE/TE: 596-597, 600-601, 604-608 Chemistry & You: 602-603 TE Only: Explain: 596, 601, 605