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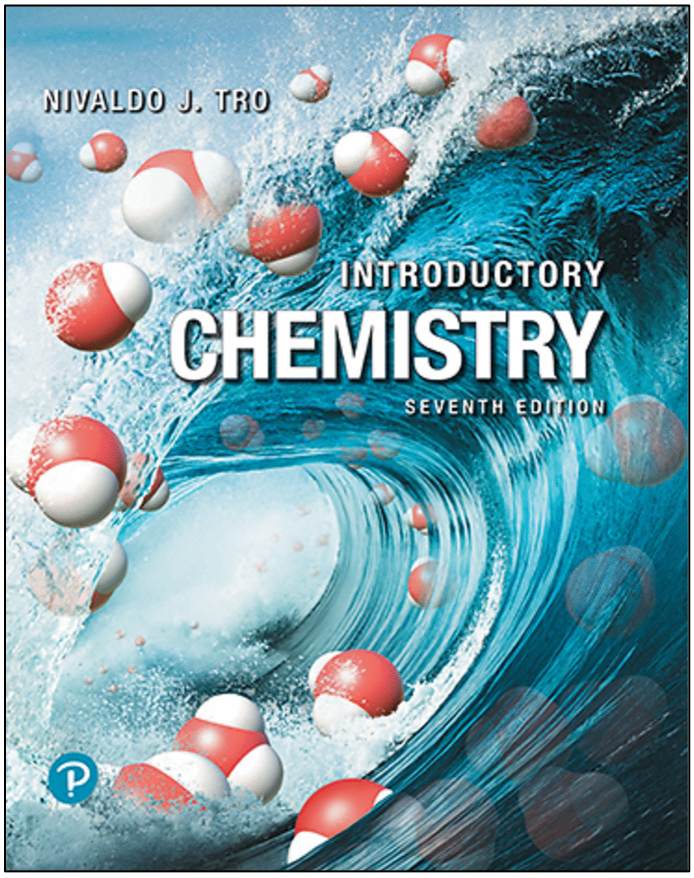

To the

Next Generation Science Standards Performance Expectation for Physical Science High School

Pearson

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A Correlation of *Introductory Chemistry, 7th Edition* © 2024
to the NGSS Performance Expectations, Physical Science, High School

NGSS Performance Expectations Physical Science, High School	*Introductory Chemistry, 7th Edition* © 2024
(HS-PS1) Matter and Its Interactions	
(HS-PS1-1) Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	**Chapter 4 Atoms and Elements** Lesson: 4.6 Looking for Patterns: The Periodic Law and the Periodic Table, pp. 114-118 Lesson: 4.7 Ions: Losing and Gaining Electrons, pp. 118-124
(HS-PS1-2) Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.	**Chapter 4 Atoms and Elements** Lesson: 4.3 The Nuclear Atom, pp. 107-109
(HS-PS1-3) Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	For supporting content, please see: **Chapter 1 The Chemical World** Lesson 1.3 The Scientific Method: How Chemists Think, pp. 5-8 **Chapter 12 Liquids, Solids, and Intermolecular Forces** Lesson 12.3 Intermolecular Forces in Action: Surface Tension and Viscosity, pp. 419-421 Lesson 12.4 Evaporation and Condensation, pp. 421-426 Lesson 12.5 Melting, Freezing, and Sublimation, pp. 426-430 **Chapter 13 Solutions** Lesson 13.9 Freezing Point Depression and Boiling Point Elevation, pp. 471-475
(HS-PS1-4) Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.	**Chapter 3 Matter and Energy** Lesson 3.9 Energy and Chemical and Physical Change, pp. 79-81 **Chapter 7 Chemical Reactions** Lesson 7.9 Oxidation–Reduction Reactions, pp. 235-237 Lesson 7.10 Classifying Chemical Reactions, pp. 237-241
(HS-PS1-5) Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.	**Chapter 15 Chemical Equilibrium** Lesson 15.2 The Rate of a Chemical Reaction, pp. 534-537
(HS-PS1-6) Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.	**Chapter 15 Chemical Equilibrium** Lesson 15.7 Disturbing a Reaction at Equilibrium: Le Châtelier's Principle, pp. 546-548
(HS-PS1-7) Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	**Chapter 3 Matter and Energy 64** Lesson 3.7 Conservation of Mass: There Is No New Matter, pp. 75-77
(HS-PS1-8) Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.	**Chapter 17 Radioactivity and Nuclear Chemistry** Lesson 17.3 Types of Radioactivity: Alpha, Beta, and Gamma Decay, pp. 615-622 Lesson 17.7 The Discovery of Fission and the Atomic Bomb, pp. 628-630 Lesson 17.8 Nuclear Power: Using Fission to Generate Electricity, pp. 630-632 Lesson 17.9 Nuclear Fusion: The Power of the Sun, p. 632

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(HS-PS3) Energy	
(HS-PS3-1) Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.	**Chapter 3 Matter and Energy** Lesson 3.8 Energy, pp. 77-79 Lesson 3.9 Energy and Chemical and Physical Change, pp. 79-81 Lesson 3.10 Temperature: Random Motion of Molecules and Atoms, pp. 81-84 Lesson 3.11 Temperature Changes: Heat Capacity, pp. 84-86
(HS-PS3-2) Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).	**Chapter 3 Matter and Energy** Lesson 3.8 Energy, pp. 77-79 **Chapter 7 Chemical Reactions** Lesson 7.9 Oxidation–Reduction Reactions, pp. 235-237 **Chapter 16 Oxidation and Reduction** Lesson 16.4 Balancing Redox Equations, CHEMISTRY IN THE ENVIRONMENT, Photosynthesis and Respiration: Energy for Life, p. 589
(HS-PS3-3) Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	**Chapter 3 Matter and Energy** Lesson 3.8 Energy: CHEMISTRY IN THE ENVIRONMENT, Getting Energy out of Nothing? p. 77 **Chapter 16 Oxidation and Reduction** Lesson 16.6 Batteries: Using Chemistry to Generate Electricity, pp. 593-597 Lesson 16.7 Electrolysis: Using Electricity to Do Chemistry, pp. 597-598
(HS-PS3-4) Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).	**Chapter 3 Matter and Energy** Lesson 3.11 Temperature Changes: Heat Capacity, pp. 84-86 Lesson 3.12 Energy and Heat Capacity Calculations, pp. 86-94
(HS-PS4) Waves and Their Applications in Technologies for Information Transfer	
(HS-PS4-3) Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	**Chapter 9 Electrons in Atoms and the Periodic Table** Lesson 9.2 Light: Electromagnetic Radiation, pp. 294-296 Lesson 9.3 The Electromagnetic Spectrum, pp. 296-299
(HS-PS4-4) Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	**Chapter 17 Radioactivity and Nuclear Chemistry** Lesson 17.10 The Effects of Radiation on Life, pp. 632-633 Lesson 17.11 Radioactivity in Medicine, pp. 633-634
(HS-PS4-5) Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.	**Chapter 17 Radioactivity and Nuclear Chemistry** Lesson 17.11 Radioactivity in Medicine, pp. 633-634