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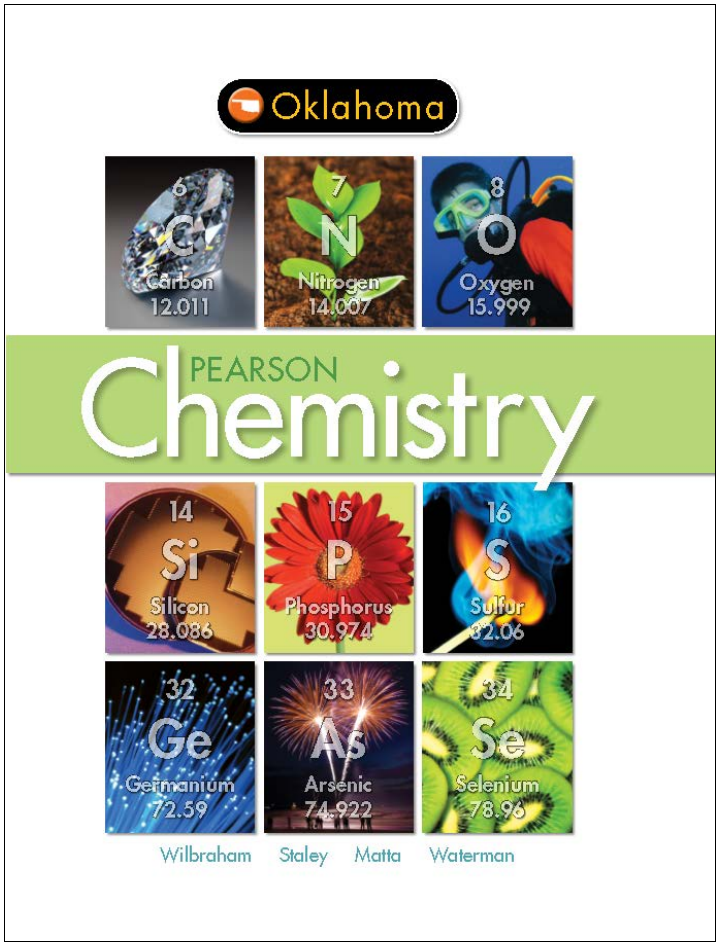

To the

Oklahoma Academic Standards for Chemistry

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CHEMISTRY	
HS-PS1 Matter and Its Interactions	
Performance Expectations	
HS-PS1-1 Students who demonstrate understanding can: 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.	**SE/TE:** Chapter 5, pp. 134-137; Chapter 6, pp. 160-182, p. 184, p. 200
HS-PS1-2 Students who demonstrate understanding can: 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.	**SE/TE:** Chapter 11, pp. 356-367, pp. 369–375
HS-PS1-3 Students who demonstrate understanding can: 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.	**SE/TE:** Chapter 7, pp. 201-207, pp. 209-212; Chapter 8, pp. 222-225, pp. 236-237, pp. 247–254; Chapter 13 p. 420, p. 425, and p. 431
HS-PS1-4 Students who demonstrate understanding can: 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.	**SE/TE:** Chapter 8, pp. 236-237; Chapter 17, pp. 562-568; Chapter 18, pp. 596-601, pp. 627-634, p. 636
HS-PS1-5 Students who demonstrate understanding can: 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.	**SE/TE:** Chapter 18, p. 593, pp. 596-598, pp. 612-615
HS-PS1-6 Students who demonstrate understanding can: Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.*	**SE/TE:** Chapter 18, pp. 609-615, p. 638

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HS-PS1-7 Students who demonstrate understanding can: Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	**SE/TE:** Chapter 2, p. 50; Chapter 11 pp. 346-354, pp. 356-367, pp. 369-373; Chapter 12, pp. 384-398
HS-PS1-8 Students who demonstrate understanding can: 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.	**SE/TE:** Chapter 25, pp. 876-891, p. 896
HS-PS2 Motion and Stability: Forces and Interactions	
Performance Expectations	
HS-PS2-6 Students who demonstrate understanding can: Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.*	**SE/TE:** Chapter 7, pp. 192-219; Chapter 8, pp. 222-238, pp. 247-253, p. 257; Chapter 15, pp. 488-493; Chapter 24, pp. 841-848, pp. 850-861
HS-PS3 Energy	
Performance Expectations	
HS-PS3-3 Students who demonstrate understanding can: Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.*	**SE/TE:** Chapter 21, pp. 728-736, pp. 744-751
HS-PS3-4 Students who demonstrate understanding can: 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).	**SE/TE:** Chapter 17, pp. 556-568, p. 571

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HS-PS4 Waves and Their Applications in Technologies for Information Transfer	
Performance Expectations	
HS-PS4-1 Students who demonstrate understanding can: Use mathematical representations to describe relationships among the frequency, wavelength, and speed of waves.	**SE/TE:** Chapter 5, pp. 138-141, p. 148, p. 149
HS-PS4-3 Students who demonstrate understanding can: 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.	**SE/TE:** Chapter 5, pp. 138-144, p. 148