

**Science Textbook Correlation to the
2018 Chemistry Standards of Learning Curriculum Framework**

**Text: *A Natural Approach to Chemistry*,
Student Edition (SB), Lab Manual (LIM) and
Teacher Edition (ATE)**

Publisher Lab-Aids, Inc

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2018 Chemistry Standards of Learning	
STANDARD	Correlation: Must address both the standards and the curriculum framework. Use page number and ATE for Annotated Teacher Edition or CT for Core Technology. (Identify no more than 8 correlations.)
CH.2 The student will investigate and understand that elements have properties based on their atomic structure. The periodic table is an organizational tool for elements based on these properties. Key information pertaining to the periodic table includes	
a) average atomic mass, isotopes, mass number, and atomic number;	Ch 2 - Matter and Atoms SB: 43-44, ATE: 76-78 Ch 5 - The Structure of the Atom LIM: 47-48, SB: 138-139, ATE: 176-182, 196-198
b) nuclear decay;	Ch 20 - Matter and Atoms LIM: 151-154, SB: 634-644, ATE: 758-761, 764-768
c) trends within groups and periods including atomic radii, electronegativity, shielding effect, and ionization energy;	Ch 5 - The Structure of the Atom SB: 151-154; ATE: 196-200 Ch 6 – Elements and the Periodic Table LIM: 53-58; SB: 171-176; ATE: 212-221, 230-232

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d) electron configurations, valence electrons, excited electrons, and ions; and	Ch 6 – Elements and the Periodic Table LIM: 53-58; SB: 176-188; ATE: 222-227, 233-234
e) historical and quantum models.	Ch 5 - The Structure of the Atom LIM: 47-48; SB: 140, 144-150; ATE: 176-182, 196-200 Ch 6 – Elements and the Periodic Table LIM: 57-58; ATE: 225-227

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STANDARD	Correlation: Must address both the standards and the curriculum framework. Use page number and ATE for Annotated Teacher Edition or CT for Core Technology. (Identify no more than 8 correlations.)
CH.3 The student will investigate and understand that atoms are conserved in chemical reactions. Knowledge of chemical properties of the elements can be used to describe and predict chemical interactions. Key ideas include	
a) chemical formulas are models used to represent the number of each type of atom in a substance;	Ch 2 - Matter and Atoms LIM: 11-15; SB: 47-52; ATE: 54-61, 76-79 Ch 4 – Physical and Chemical Change LIM: 43-46; SB: 114-119; ATE: 152-159, 162-165 Ch 7 – Bonding SB: 211-213; ATE: 260-263 Ch 8 – Compounds and Molecules LIM: 63-66; SB: 233-236, 243-244, 252-253; ATE: 276-287, 290-295 Ch 10 – Chemical Reactions LIM: 77-80; ATE: 358-365
b) substances are named based on the number of atoms and the type of interactions between atoms;	Ch 2 - Matter and Atoms SB: 47-52; ATE: 76-79 Ch 7 – Bonding SB: 211-213 Ch 8 – Compounds and Molecules LIM: 65-66; SB: 235-244; ATE: 282-287, 290-293

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c) balanced chemical equations model rearrangement of atoms in chemical reactions;	<p>Ch 4 – Physical and Chemical Change SB: 114-119; ATE: 162-165</p> <p>Ch 10 – Chemical Reactions LIM: 75-80; SB: 296-304; ATE: 350-365, 374-378</p>
d) atoms bond based on electron interactions;	<p>Ch 4 – Physical and Chemical Change SB: 107-111; ATE: 162-165</p> <p>Ch 6 – Elements and the Periodic Table LIM: 57-60; SB: 183-184; ATE: 222-227, 234</p> <p>Ch 7 – Bonding SB: 196-213; ATE: 260-264</p>
e) molecular geometry is predictive of physical and chemical properties; and	<p>Ch 7 – Bonding LIM: 61-62; SB: 214-223; ATE: 252-257, 264</p>
f) reaction types can be predicted and classified.	<p>Ch 4 – Physical and Chemical Change LIM: 43-46; SB: 122-125; ATE: 152-159, 162-166</p> <p>Ch 10 – Chemical Reactions LIM: 77-80; SB: 305-310; ATE: 358-365, 378</p>

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CH.4 The student will investigate and understand that molar relationships compare and predict chemical quantities. Key ideas include	
a) Avogadro's principle is the basis for molar relationships; and	Ch 2 - Matter and Atoms SB: 45-46; ATE: 76-79 Ch 11 - Stoichiometry LIM: 83-90; SB: 326-359; ATE: 392-411, 414, 419 Ch 14 - Gases SB: 457-458; ATE: 552-556
b) stoichiometry mathematically describes quantities in chemical composition and in chemical reactions.	Ch 11 - Stoichiometry LIM: 83-90; SB: 326-359; ATE: 392-411, 414, 419

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CH.5 The student will investigate and understand that solutions behave in predictable and quantifiable ways. Key ideas include	
a) molar relationships determine solution concentration;	Ch 2 - Matter and Atoms SB: 57-61; ATE: 80 Ch 9 - Water and Solutions LIM: 69-72; SB: 270-273, 277; ATE: 314-322, 335-336
b) changes in temperature can affect solubility;	Ch 9 - Water and Solutions SB: 274-275; ATE: 335-336
c) extent of dissociation defines types of electrolytes;	Ch 9 - Water and Solutions SB: 287; ATE: 336
d) pH and pOH quantify acid and base dissociation; and	Ch 13 – Acids and Bases LIM: 101-106; SB: 410-426; ATE: 480-489, 514-519

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e) colligative properties depend on the extent of dissociation.

Ch 9 - Water and Solutions
SB: 285-286; ATE: 336

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CH.6 The student will investigate and understand that the phases of matter are explained by the kinetic molecular theory. Key ideas include	
a) pressure and temperature define the phase of a substance;	Ch 3 - Water and Solutions LIM: 35-36; SB: 88-95; ATE: 112-117, 124 Ch 4 - Chemical Change LIM: 37-38; ATE: 136-141 Ch 14 - Gases SB: 442; ATE 552-554
b) properties of ideal gases are described by gas laws; and	Ch 14 - Gases LIM: 117-122; SB: 450-465; ATE: 534-543, 555-556
c) intermolecular forces affect physical properties.	Ch 8 – Compounds and Molecules SB: 245-248; ATE: 294-295 Ch 16 – Solids and Liquids LIM: 131-134; SB: 525-529; ATE: 616-627, 635

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CH.7 The student will investigate and understand that thermodynamics explains the relationship between matter and energy. Key ideas include	
a) heat energy affects matter and interactions of matter;	Ch 3 – Temperature, Energy and Heat LIM: 23-36; SB: 70-95; ATE: 92-124 Ch 4 – Physical and Chemical Change LIM: 37-38; SB: 118-121; ATE: 136-141, 165 Ch 10 – Chemical Reactions LIM: 77-80; SB: 311-317; ATE: 358-365, 379 Ch 12 – Reaction Rates and Equilibrium LIM: 91-94; SB: 368, 374-377, 386; ATE: 438-445, 464-465
b) heating curves provide information about a substance;	Ch 3 – Temperature, Energy and Heat SB: 82-84, 88-90; ATE: 123-124 Ch 4 – Physical and Chemical Change LIM: 37-38; ATE: 136-141
c) reactions are endothermic or exothermic;	Ch 2 – Matter and Atoms SB: 40 Ch 10 – Chemical Reactions LIM: 81-82; SB: 311-317; ATE: 366-371, 379

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<p>d) energy changes in reactions occur as bonds are broken and formed;</p>	<p>Ch 2 - Matter and Atoms SB: 40 Ch 10 - Chemical Reactions LIM: 81-82; SB: 311-317; ATE: 366-371, 379 Ch 12 – Reaction Rates and Equilibrium SB: 373-376; ATE: 464</p>
<p>e) collision theory predicts the rate of reactions;</p>	<p>Ch 12 – Reaction Rates and Equilibrium LIM: 95-100; SB: 373-377; ATE: 454-459, 464</p>
<p>f) rates of reactions depend on catalysts and activation energy; and</p>	<p>Ch 12 – Reaction Rates and Equilibrium SB: 368, 373-377, 398-401; ATE: 464, 467</p>
<p>g) enthalpy and entropy determine the extent of a reaction.</p>	<p>Ch 10 - Chemical Reactions SB: 311-317; ATE: 379 Ch 12 – Reaction Rates and Equilibrium SB: 374-376; ATE: 467</p>