

Science Textbook Correlation Matrices

Chemistry Standards of Learning

Publisher: Glencoe/McGraw-Hill

Text/Instructional Material Title: Glencoe Chemistry: Concepts and Applications ©2002

Science Standard	Correlation By Page Numbers Make all correlations using the teacher text. Identify only <i>significant</i> areas of correlation. Use each bullet of the standard in the context of the stem. Please consult the 2003 Science Curriculum Framework for further information about each standard.
CH.1 The student will investigate and understand that experiments in which variables are measured, analyzed, and evaluated, produce observations and verifiable data. Key concepts include	
a) designated laboratory techniques;	45T-48T, 839-840
b) safe use of chemicals and equipment;	45T-48T, 839-840
c) proper response to emergency situations;	839
d) manipulation of multiple variables with repeated trials;	8, 38, 89, 172, 262, 266, 357, 362, 422, 504, 518, 560, 630, 674, 752
e) accurate recording, organizing, and analysis of data through repeated trials;	16, 56, 136, 172, 206, 236, 328, 384, 422, 456, 542, 560, 606, 650, 722, 804-808
f) mathematical and procedural error analysis;	791-794
g) mathematical manipulations (SI units, scientific notation, linear equations, graphing, ratio and proportion, significant digits, dimensional analysis);	785-790, 791-798, 804-808
h) the use of appropriate technology including computers, graphing calculators, and probeware for gathering data and communicating results; and	799-801
i) construction and defense of a scientific viewpoint (the nature of science).	59, 82, 150, 186, 228, 298, 367, 400, 432, 476, 550, 580, 617, 664, 782

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CH.2 The student will investigate and understand that the placement of elements on the periodic table is a function of their atomic structure. The periodic table is a tool used for the investigations of	
a) average atomic mass, mass number, and atomic number;	66–67, 86, 92
b) isotopes, half lives, and radioactive decay;	62–63, 747–750, 756
c) characteristics of subatomic particles as to mass and charge;	62–64
d) families or groups;	258–262, 263–265, 268–277, 278–281
e) series and periods;	96–98
f) trends including atomic radii, electronegativity, shielding effect, and ionization energy;	258–262, 303–306, 308–311
g) electron configurations, valence electrons, and oxidation numbers;	78–79, 157, 236–237, 242–247, 313–316
h) chemical and physical properties; and	20, 34–35, 40–41
i) historical and quantum models.	10–11, 52–55, 69–70, 230–231

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CH.3 The student will investigate and understand how conservation of energy and matter is expressed in chemical formulas and balanced equations. Key concepts include	
a) nomenclature;	27, 92
b) balancing chemical equations;	198–199
c) writing chemical formulas (molecular, structural, empirical, and Lewis diagrams);	79, 98, 155–156, 161–162, 180–181, 427–429
d) bonding types (ionic, covalent);	134, 140, 302–303, 305–306, 308–311
e) reaction types (synthesis, decomposition, single and double replacement, oxidation–reduction, neutralization, exothermic and endothermic); and	43, 195–196, 198–199, 203–204, 206, 207–208, 424–425, 516, 708–709, 713
f) reaction rates and kinetics (activation energy, catalysis, degree of randomness).	217–223, 713–714

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CH.4 The student will investigate and understand that quantities in a chemical reaction are based on molar relationships. Key concepts include	
a) Avogadro's principle and molar volume;	404–406, 416, 418–419
b) stoichiometric relationships;	404–406
c) partial pressure;	The opportunity to address this objective is available on the following pages: 372–380
d) gas laws;	382–401
e) solution concentrations;	458–459, 460–461
f) chemical equilibrium; and	211, 214–215
g) acid/base theory: strong electrolytes, weak electrolytes, and nonelectrolytes; dissociation and ionization; pH and pOH; and the titration process.	144, 453, 480–483, 486–488, 492, 504–505, 526, 527, 531–533, 539–545

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CH.5 The student will investigate and understand that the phases of matter are explained by kinetic theory and forces of attraction between particles. Key concepts include	
a) pressure, temperature, and volume;	344, 348–349, 372–376, 377–379, 789
b) vapor pressure;	357–358
c) phase changes;	352–359, 360–364
d) molar heats of fusion and vaporization;	361, 364
e) specific heat capacity; and	445
f) colligative properties.	The opportunity to address this objective is available. See the following: 357–358

Science Textbook Adoption Additional Criteria

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Additional Criteria	Evidence Please provide information that will assist the reviewers in identifying support for the following criterion indicators.
1. Safe use of materials and equipment is encouraged.	Appendix C, pages 839-840, provides a Safety Handbook with guidelines, first-aid and a safety symbols chart. Each lab includes safety material.
2. Materials emphasize the use of effective instructional practices and learning theories. <ul style="list-style-type: none">• Students are guided through different approaches such as the learning cycle.• Students are provided the opportunity to conduct scientific inquiry appropriate for their age, grade, and maturity. • Concepts are introduced through concrete experiences. • Students are required to use manipulative materials during investigations and activities.• Multiple opportunities are provided for students to apply concepts. • Learning activities offer opportunities for students to revise their prior knowledge and create new knowledge. • Students are encouraged to pose questions and to identify problems, as well as propose multiple solutions and design and conduct tests of inference.• Students collect and interpret data through a variety of technologies and draw conclusions based on that data.	<ul style="list-style-type: none">• These approaches including Basic Science Process Skills and Thinking Skills are included in the TWE on page 10T• The text is correlated to the guidelines in the National Science Education Standards. The Science Contents Standards for Grades 9-12 correlation is in the TWE on page 8T.• ChemLabs, ex. pages 266-267 and MiniLabs, ex. page 285 provide experiences and support the concepts being presented.• These are included in the ChemLabs, ex. pages 56-57. • Applying Concepts, ex. page 81 are included at the end of every chapter. Section Reviews, ex. page 68 and ChemLabs, ex. pages 56-57 also provide applying concepts opportunities.• Revealing Misconceptions, ex. TWE page 6 and Tying to Previous Knowledge, ex. TWE page 7 provide these opportunities.• The chart on TWE page 10T provides a checklist of the chapters that include these skills. Examples are Thinking Critically questions 48-57 on pages 48-49.• Covered throughout the text. Specific examples are ChemLab 2 on pages 16-17 and Skill Review question #58 on page 49.

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Additional Criteria	Evidence Please provide information that will assist the reviewers in identifying support for the following criterion indicators.
<p>3. Materials present content in an accurate, unbiased manner, and are based on sound science.</p> <ul style="list-style-type: none">• Materials do not contain content errors (omissions of current content, out-of-date content, overgeneralizations, etc.).• Materials do not contain production errors (misspelled words, word omissions, incorrect answers).• Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately.• The materials are free of non-scientific explanation.	<ul style="list-style-type: none">• The material was reviewed by consultants, teachers and editors and found to be free of content errors.• Page proofs were thoroughly checked by the editors to correct production errors.• As a matter of policy, all photos were checked to assure that diverse groups, males and females, people with disabilities and people of all ages were represented appropriately.• The material was checked by consultants, teachers and editors to assure that non-scientific explanation was not included.

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<p>4. Materials promote student assessment as an integral part of the instructional process.</p> <ul style="list-style-type: none">• Assessment suggestions and scoring criteria for student performances on work such as lab practicals or tasks, concept maps, research projects, observation checklists, etc., are provided.• Assessment items include multiple-choice, short answer, essay and open-ended questions with charts, graphs, and diagrams imbedded within the items.• Options include techniques for assessing students' prior knowledge.• Assessment items reflect the rigor and the intent of the standards. For example, they require students to use higher order thinking skills to apply, analyze, synthesize, evaluate, and make judgments or recommendations.	<ul style="list-style-type: none">• Assessment suggestions are included in Teaching Strategies. These are found on TWE pages 40T-42T.• These assessment items are in the Section Reviews, ex. page 169 and end of Chapter Assessment, ex. pages 148-151.• These are found in Tying to Previous Knowledge, ex. TWE page 7.• These are found throughout the text. The chart on TWE page 10T provides a checklist. Examples are ChemLabs, ex. page 39, MiniLabs, ex. page 135, Chapter Assessments, ex. pages 80-83.

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Additional Criteria	Evidence Please provide information that will assist the reviewers in identifying support for the following criterion indicators.
<p>5. Materials are presented in an organized, logical manner and are appropriate for the age, grade, and maturity of the students.</p> <ul style="list-style-type: none">• Materials are organized appropriately within and among units of study.• Format design includes titles, subheadings, and appropriate cross-referencing for ease of use.• Writing style, length of sentences, and vocabulary are appropriate.• Graphics and illustrations are appropriate.• Level of abstraction is appropriate, and real life examples, including careers are provided.• Sufficient applications are provided to promote depth of understanding.	<ul style="list-style-type: none">• Materials were reviewed by consultants, teachers and editors and found to be organized appropriately.• The design includes, titles, subheadings and cross references, ex. page 174.• The writing style, length of sentences and vocabulary were reviewed by consultants, teachers and editors and found to be appropriate.• The graphics and illustrations were reviewed by consultants, teachers and editors and found to be appropriate.• How It Works, ex. page 284, Chemistry and Technology, ex. page 288 and People in Chemistry, ex. page 490 provide examples.• Section Reviews, ex. page 44 and Chapter Assessments, ex. page 46-49 and Supplemental Practice Problems, ex. page 809-838 provide ample applications.