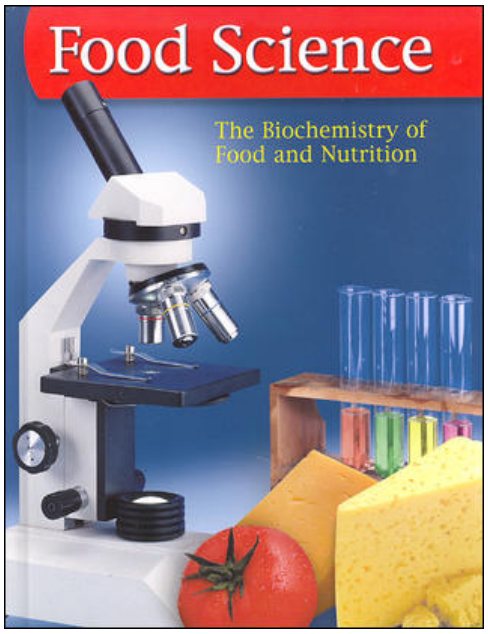
Glencoe



Food Science

The Biochemistry of Food and Nutrition

CORRELATION TO ALABAMA COURSE OF STUDY

	STANDARDS	PAGE REFERENCES
	Chemistry of Food	
	Evaluation of Chemical and Physical Changes of Food	
	Students will:	
1.	Apply sensory and objective methods to the evaluation of chemical and physical changes in food.	**Student Edition:** 115-116, 120-123, 123 *Experiment* 124-125 *Thinking Lab* 170 **Teacher Resource Guide:** F 37; T 37 #2
	Science Relationships	
2.	Compare the interrelationships among food science, nutrition, and other sciences.	**Student Edition:** 25, 25-27, 27-30, 30-31, 31 *Using Your Knowledge* 32 #1, #4, #7, #10 **Teacher Resource Guide:** EL 199-200; F 23; T 23 #2

Codes used for Teacher Resource Guide pages are the initial caps of headings on that page.

	STANDARDS	PAGE REFERENCES
	Chemistry	
3.	Differentiate among pure substances, mixtures, elements, and compounds. • Distinguishing between intensive and extensive properties of matter • Contrasting properties of metals, nonmetals, and metalloids • Distinguishing between homogeneous and heterogeneous forms of matter	**Student Edition:** 104-107, 116-120, 120-123 *Experiment* 110-111 *Real-World Impact* 113, 127 *Skill-Building Activities* 113 #3 *Using Your Knowledge* 112 #5, #7 **Teacher Resource Guide:** EL 216-217; SC 274, 275; T 35, 36 #3-#4, #6, 38 #4; TM 340, 341, 342, 343, 344, 345
4.	Describe the structure of carbon chains, branched chains, and rings. • Describing the impact of unsaturated, saturated, and supersaturated solutions for sugar crystallization	**Student Edition:** 221-223, 310-311 **Teacher Resource Guide:** SG 146 #7, 147 #8-9
5.	Use the periodic table to identify periodic trends, including atomic radii, ionization energy, electronegativity, and energy levels. • Utilizing electron configurations Lewis dot structures, and orbital notations to write chemical formulas • Calculating the number of protons, neutrons, and electrons in an isotope • Utilizing benchmark discoveries to describe the historical development of atomic structure, including proelectric effect, absorption, and emission spectra of elements Examples: Thomson's cathode ray, Rutherfod's gold foil, Millikan's oil drop, and Bohr's bright line spectra experiments	**Student Edition:** 104-107, 107-108, 116-120 *Inside Back Cover* *Skill-Building Activities* 127 #5 **Teacher Resource Guide:** A 38 #2-#3; EL 216; MC 276; SC 275; T 38 #4; TM 344

STANDARDS	PAGE REFERENCES
6. Describe solubility in terms of energy changes associated with the solution process. • Using solubility curves to interpret saturation levels • Explaining the conductivity of electrolytic solutions • Describing acids and bases in terms of strength, concentration, pH, and neutralization reactions Example: pH in food preparation • Describing factors that affect the rate of solution • Solving problems involving molarity, including solution preparation and dilution	**Student Edition:** 130-136, 136-140, 145-146, 146, 146-147, 147-148, 148, 148-149, 149-152, 152 *Experiment* 141 *Skill-Building Activities* 157 *Using Your Knowledge* 156 **Teacher Resource Guide:** A 42 #2-#3; MC 280; T 42 #2-#6; TM 347, 348; VC 281
7. Use the kinetic theory to explain states of matter, phase changes, solubility, and chemical reactions. Example: Describing how water at 25 degrees Celsius remains in the liquid state because of the strong attraction between water molecules while kinetic energy allows the sliding of molecules past one another	**Student Edition:** 103, 103-104, 104-107, 123, 130-136, 160-161 *Figure 11-1* 161 *Using Your Knowledge* 170 #3 **Teacher Resource Guide:** T 43 #2; TM 350
8. Solve stoichiometric problems involving relationships among the number of particles, moles, and masses of reactants and products in a chemical reaction. • Predicting ionic and covalent bond types and products given known reactants • Assigning oxidation numbers for individual atoms of monatomic and polyatomic ions • Identifying the nomenclature of ionic compounds, binary compounds, and acids • Classifying chemical reactions as composition, decomposition, single replacement, or double replacement • Determining the empirical or molecular formula for a compound using percent composition data	**Student Edition:** 115-116, 116-120, 120-123, 129-130 *Experiment* 124-125 *Skill-Building Activities* 127 #4-#7 *Using Your Knowledge* 126 **Teacher Resource Guide:** A 38 #2; MC 276; SC 277; TM 345

STANDARDS		PAGE REFERENCES
9.	Explain the behavior of ideal gases in terms of pressure, volume, temperature, and number of particles using Charles's law, Boyle's law, Gay-Lussac's law, the combined gas law, and the ideal gas law.	This objective can be met through classroom research and activities.
10.	Distinguish among endothermic and exothermic physical and chemical changes. Examples: endothermic physical—phase change from ice to water endothermic chemical—reaction between citric acid solution and baking soda exothermic physical—phase change from water vapor to water exothermic chemical—formation of water from combustion of hydrogen and oxygen • Describing the impact of water in cooking vegetables • Calculating temperature change by using specific heat Example: explaining heat conduction and convection, radiation, and induction in the preparation of a variety of food products • Using Le Châtelier's principle to explain changes in physical and chemical equilibrium	**Student Edition:** 129-130, 130-136, 160-161, 161-163, 163-165 *Experiment* 124-125, 169 *Skill-Building Activities* 171 #2 *Using Your Knowledge* 170 #5-#8 **Teacher Resource Guide:** A 40 #2; T 43 #2, 44 #4, #7
11.	Distinguish between chemical and nuclear reactions. • Identifying atomic and subatomic particles, including mesons, quarks, tachyons, and baryons • Calculating the half-life of selective radioactive isotopes • Identifying types of radiation and their properties • Contrasting fission and fusion • Describing carbon-14 decay as a dating method	**Student Edition:** Radiation is described: 162, 458-462 *Using Your Knowledge* 466 #8-#9

STANDARDS		PAGE REFERENCES
	Food Microbiology	
12.	Describe the positive and negative impacts of microorganisms in food. Examples: positive—yogurt, sauerkraut, bleu cheese, cheddar cheese, mayonnaise negative—food spoilage, food contamination, food-borne illnesses	**Student Edition:** 343-347, 348, 350, 350-354, 354, 367-369, 401-409 *Experiment* 418-419 *Nutrition Link* 349 *Skill-Building Activities* 357 #2, #3, #5 *Thinking Lab* 376 *Using Your Knowledge* 356, 420 #1-#5 **Teacher Resource Guide:** A 66 #2-#3, 72 #2; C 66; F 65, 71; SG 163-165; T 65-66, 71 #1
	Food Science	
13.	Describe the chemical makeup of the major food nutrients. Examples: carbohydrates, protein, fats, vitamins, minerals and water	**Student Edition:** 121-122, 178-179, 219, 220-221, 221-223, 224-225, 225-228, 239-240, 240-242, 242-244, 251-252, 257-261, 276-277, 277-284, 285-287 *Experiment* 188-189 *Figure 8-9* 122 *Figure 12-1* 178 **Teacher Resource Guide:** TM 355, 356, 357, 358, 360, 363, 364
14.	Compare safe food-handling practices used in the food industry. • Describing the government's role in food safety • Analyzing the correct care and safe use of instruments, equipment, and chemicals	**Student Edition:** 401-409, 409-413, 414-417 *Figure 25-1* 404 *Food Science Careers* 412 *Real-World Impact* 421 *Skill-Building Activities* 421 #4-#6 *Using Your Knowledge* 420 #7-#12 **Teacher Resource Guide:** T 71 #2-#3, 72 #4-#9
	Food Preservation	
15.	Evaluate various food preservation techniques.	**Student Edition:** 423-424, 424, 424-425, 437-438, 438-442, 443-447, 453-456, 456-458, 458-462, 463-464 *Experiment* 432-433, 448-449, 465 *Skill-Building Activities* 451 #3-#4 *Using Your Knowledge* 434 #1-#2, 466 **Teacher Resource Guide:** A 76 #2, 78 #2-#3; F 75; T 74 #3

STANDARDS		PAGE REFERENCES
16.	Evaluate the impact of using food additives in products.	**Student Edition:** 379-381, 382-383, 383-389, 389-393, 393-394 *Experiment* 395 *Skill-Building Activities* 397 #3-#4 *Thinking Lab* 396 *Using Your Knowledge* 396 **Teacher Resource Guide:** A 70 #2-#3; C 70; EL 246-247, 248; SG 169-171; T 69-70
	Food Basics	
17.	Describe the major nutrients, including functions and sources of each.	**Student Edition:** 136, 178-179, 183, 219, 225-228, 239-240, 240-242, 244-248, 248-251, 257, 261-264, 275-276, 276, 277-284, 285-287, 288 *Skill-Building Activities* 237 #2, 255 #3, 291 #3 *Using Your Knowledge* 254 #1-#2, 290 **Teacher Resource Guide:** A 52 #2, 54 #2, 58 #2; C 52; EL 222, 223, 229; T 52 #4-#6, 56 #4, 58 #6
	Technology and Careers	
18.	Assess the impact of technology on the food industry. Examples: supercritical carbon dioxide technology	**Student Edition:** 26-27, 27-30, 90, 437-438, 453-456, 456-458, 458-462, 463-464 *Food Science Careers* 109, 198 *Real-World Impact* 33 *Tech Trends* 23, 47, 101, 173, 293, 399 *Thinking Lab* 32 *Using Your Knowledge* 44 #8 **Teacher Resource Guide:** A 78 #3; EL 197-198, 199-200, 206-207
19.	Analyze career options and entrepreneurial opportunities in food science and technology. Examples: food scientists, food technicians, microbiologists	**Student Edition:** 26-30, 36-37 *Food Science Careers* 29, 40, 55, 66, 81, 94, 109, 119, 132, 154, 181, 198, 210, 229, 246, 266, 300, 316, 329, 345, 371, 391, 412, 441, 460 *Thinking Lab* 44 *Using Your Knowledge* 44 #4 **Teacher Resource Guide:** A 26 #3; T 25 #2