# **Chemical Interactions**

Х

60

Standards and Benchmarks

<b>eEdition</b>	Introducing Physical Science Unifying Principles of Physical Science The Nature of Science The Nature of Technology Using McDougal Littell Science	xii xiii xxii xxvi xxviii
	Unit Features	
SCIENTIFIC AMERICAN	FRONTIERS IN SCIENCE Medicines from Nature	2
	TIMELINES IN SCIENCE The Story of Atomic Structure	104
	Atomic Structure and the Periodic Table	6
A substance's atomic structure determines its physical and chemical properties.	13 Atoms are the smallest form of elements.  CONNECTING SCIENCES Elements of Life	9 16
	12 Elements make up the periodic table. CHAPTER INVESTIGATION Modeling Atomic Masses	17 24
	13 The periodic table is a map of the elements.  MATH IN SCIENCE Using Scientific Notation	26 33
	<b>2</b> Chemical Bonds and Compounds	38
The <b>BIG</b> idea  The properties of compounds depend on their atoms and chemical bonds.	<b>Elements combine to form compounds.</b> MATH IN SCIENCE Calculating Ratios	41 46
	<b>Chemical bonds hold compounds together.</b> THINK SCIENCE Stick to It	47 55
	Substances' properties depend on their bonds.	56

**CHAPTER INVESTIGATION** Chemical Bonds

How do these skydivers stay together? How is this similar to the way atoms stay together? page 38

	Chemical Reactions	66
Chemical reactions form	33 Chemical reactions alter arrangements of atoms.  MATH IN SCIENCE Analyzing Line Graphs	69 77
	The masses of reactants and products are equal.  SCIENCE ON THE JOB Chemistry in Firefighting	
	33 Chemical reactions involve energy changes. CHAPTER INVESTIGATION Exothermic or Endothermic?	86 92
	3. Life and industry depend on chemical reactions.	94
	Solutions Solutions	108
When substances dissolve to form a solution, the properties of the	43 A solution is a type of mixture.	111
	The amount of solute that dissolves can vary.  CONNECTING SCIENCES Cool, Clear Water	117 124
	Solutions can be acidic, basic, or neutral.  CHAPTER INVESTIGATION Acids and Bases	
	Metal alloys are solid mixtures.  MATH IN SCIENCE Calculating Percentages	134 139
	Carbon in Life and Materials	144
Carbon is essential to living things and to modern materials.	<b>Carbon-based molecules have many structures.</b> EXTREME SCIENCE Stronger Than Steel	147 153
	Carbon-based molecules are life's building blocks.  MATH IN SCIENCE Making Bar Graphs	154 162
	Carbon-based molecules are in many materials.  CHAPTER INVESTIGATION Polymers	163 170
	Handbooks and Resources	R1
	Scientific Thinking Glossary Handbook R2 Index Lab Handbook R36 Note-Taking Handbook R45	R52 R58 R64

## **Features**

MATH IN SCIENCE Using Scientific Notation Calculating Ratios	33 46	FRONTIERS IN SCIENCE  Medicines from Nature  TIMELINES IN SCIENCE	2
Analyzing Line Graphs Calculating Percentages Making Bar Graphs	77 139 162	The Story of Atomic Structure	104
THINK SCIENCE  Isolating Variables	55	Visual Highlights	
CONNECTING SCIENCES		The Periodic Table of the Elements	20
Physical Science and Life Science	16	Comparing Bonds	52
Physical Science and Earth Science	124	Balancing Equations with Coefficients	83
SCIENCE ON THE JOB		Chemical Reactions in Catalytic Converters	97
Chemistry in Firefighting	85	Common Acids and Bases	130
Chemistry in Firengilling	05	Carbon Chains and Carbon Rings	151
EXTREME SCIENCE		Nucleic Acid Structure and Function	160
Stronger Than Steel	153	Using Petroleum	165
SIMULATIONS  Build an Atom  Mixing Alloys	12 109	Alloys Polymers Nanotubes	136 145 153
3-D Carbon Molecules	150	Carbohydrates, Lipids, Proteins, and	
VISUALIZATIONS		Nucleic Acids	161 163
Radioactive Decay	32	Petroleum and Hydrocarbons	103
Ionic and Covalent Bonds	39	NSTA SCILINKS	
Polar Electron Cloud	51	Atomic Theory	7
Concentration and Reaction Rate	74	Compounds	39
Endothermic and Exothermic Reactions	90 118	Chemical Reactions Solutions	67 109
Supersaturated Solutions and Precipitation Petroleum Distillation	164	Organic Compounds	145
	101	· ·	
CAREER CENTER	_	MATH TUTORIALS	22
Chemistry	5	Scientific Notation Ratios	33 46
RESOURCE CENTERS		Interpreting Line Graphs	77
Periodic Table	7	Understanding Percents	139
The Atom	11	Bar Graphs	162
Elements Important to Life	16	CONTENT DEVIEW	
Chemical Formulas Properties of Ionic and Covalent Compound	44 dc 58	CONTENT REVIEW 8, 34, 40, 62, 68, 100, 110, 140, 146,	172
Balancing Chemical Equations	13 <b>36</b> 67		172
Catalysts in Living Things	76	TEST PRACTICE	4
Atomic Research	107	37, 65, 103, 143,	, 175
Aquifers and Purification	124		
Acids and Bases	126		

# INVESTIGATIONS AND ACTIVITIES

#### **EXPLORE THE BIG IDEA**

### Chapter Opening Inquiry

1. That's Far!, Element Safari, Internet Activity: Periodic Table	
2. Mixing It Up, The Shape of Things, Internet Activity: Bonding	39
3. Changing Steel Wool, A Different Rate, Internet Activity: Reactions	
4. Does It Dissolve?, Acid Test, Internet Activity: Alloys	
5. Structure and Function, Sweet Crackers, Internet Activity: Polymers	145

#### **CHAPTER INVESTIGATION**

- U.B. : 11 1	
Full-Period Labs	
1. Modeling Atomic Masses	24
2. Chemical Bonds	60
3. Exothermic or Endothermic?	92
4. Acids and Bases	132
5. Polymers	170

### **EXPLORE** INVESTIGATE

Introductory Inquiry Activites		Skill Labs		
The Size of Atoms	9	Masses of Atomic		
Similarities and Differences of Objects	17	Particles	Modeling	13
Compounds	41	Radioactivity	Modeling	31
Bonds in Metals	56	Element Ratios	Modeling	43
Chemical Changes	69	Crystals	Observing	53
Energy Changes	86	Chemical Reactions	Inferring	74
Mixtures	111	Conservation of Mass	Measuring	79
Solutions and Temperature	117	Sugar Combustion	Inferring	95
Acids and Bases	125	Solutions	Observing	113
Carbon in Food	154	Solubility	Design Your Own	120
		Alloys	Observing	137
		Carbon Bonding	Modeling	149
		Organic Molecules	Inferring	158