Course Planning Guide for *Chemistry: Matter and Change*

Chapter/Session	Single-Class Scheduling (165 days)	Block Scheduling (90 days)
1 Introduction to Chemistry	**3**	**1**
1.1 The Stories of Two Chemicals	1/2	—
1.2 Chemistry and Matter	1/2	1/4
1.3 Scientific Methods	1	1/4
1.4 Scientific Research	1/2	—
Chapter Assessment	1/2	1/2
2 Data Analysis	**6**	**3**
2.1 Units of Measurement	1/2	1/2
2.2 Scientific Notation and Dimensional Analysis	2	1
2.3 How reliable are measurements?	1	1/2
2.4 Representing Data	1 1/2	1/2
Chapter Assessment	1	1/2
3 Matter—Properties and Changes	**6**	**3**
3.1 Properties of Matter	1	1/2
3.2 Changes in Matter	1	1/2
3.3 Mixtures of Matter	2	1
3.4 Elements and Compounds	1	1/2
Chapter Assessment	1	1/2
4 The Structure of the Atom	**6**	**3**
4.1 Early Theories of Matter	1	1/2
4.2 Subatomic Particles and the Nuclear Atom	1	1/2
4.3 How Atoms Differ	2	1
4.4 Unstable Nuclei and Radioactive Decay	1	1/2
Chapter Assessment	1	1/2
5 Electrons in Atoms	**6**	**3**
5.1 Light and Quantized Energy	1 1/2	1/2
5.2 Quantum Theory and the Atom	1 1/2	1
5.3 Electron Configurations	2	1
Chapter Assessment	1	1/2
6 The Periodic Table and Periodic Law	**6**	**3**
6.1 Development of the Modern Periodic Table	1	1/2
6.2 Classification of the Elements	2	1
6.3 Periodic Trends	2	1
Chapter Assessment	1	1/2
7 The Elements	**5**	**2**
7.1 Properties of s-Block Elements	1	1/2
7.2 Properties of p-Block Elements	1 1/2	1/2
7.3 Properties of d-Block and f-Block Elements	1 1/2	1/2
Chapter Assessment	1	1/2
8 Ionic Compounds	**6**	**3 1/2**
8.1 Forming Chemical Bonds	1	1/2
8.2 The Formation and Nature of Ionic Bonds	1 1/2	1
8.3 Names and Formulas of Ionic Compounds	1 1/2	1
8.4 Metallic Bonds and Properties of Metals	1	1/2
Chapter Assessment	1	1/2

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9 Covalent Bonding	**8**	**4**
9.1 The Covalent Bond	1	1/2
9.2 Naming Molecules	1	1/2
9.3 Molecular Structures	2	1
9.4 Molecular Shape	2	1
9.5 Electronegativity and Polarity	1	1/2
Chapter Assessment	1	1/2
10 Chemical Reactions	**6**	**3**
10.1 Reactions and Equations	2	1
10.2 Classifying Chemical Reactions	1	1/2
10.3 Reactions in Aqueous Solutions	2	1
Chapter Assessment	1	1/2
11 The Mole	**9**	**5 1/2**
11.1 Measuring Matter	1 1/2	1
11.2 Mass and the Mole	1 1/2	1
11.3 Moles of Compounds	1 1/2	1
11.4 Empirical and Molecular Formulas	2	1
11.5 The Formula for a Hydrate	1 1/2	1
Chapter Assessment	1	1/2
12 Stoichiometry	**9**	**6**
12.1 What is stoichiometry?	1	1/2
12.2 Stoichiometric Calculations	3	3
12.3 Limiting Reactants	2	1
12.4 Percent Yield	2	1
Chapter Assessment	1	1/2
13 States of Matter	**6**	**3 1/2**
13.1 Gases	1	1/2
13.2 Forces of Attraction	1 1/2	1
13.3 Liquids and Solids	1	1/2
13.4 Phase Changes	1 1/2	1
Chapter Assessment	1	1/2
14 Gases	**7**	**4 1/2**
14.1 The Gas Laws	1 1/2	1
14.2 The Combined Gas Law and Avogadro's Principle	1 1/2	1
14.3 The Ideal Gas Law	1	1/2
14.4 Gas Stoichiometry	2	1 1/2
Chapter Assessment	1	1/2
15 Solutions	**7**	**3 1/2**
15.1 What are solutions?	1	1/2
15.2 Solution Concentration	2	1
15.3 Colligative Properties of Solutions	2	1
15.4 Heterogeneous Mixtures	1	1/2
Chapter Assessment	1	1/2
16 Energy and Chemical Change	**8**	**5**
16.1 Energy	1	1/2
16.2 Heat in Chemical Reactions and Processes	1	1/2
16.3 Thermochemical Equations	2	1 1/2
16.4 Calculating Enthalpy Change	2	1 1/2
16.5 Reaction Spontaneity	1	1/2
Chapter Assessment	1	1/2

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17 Reaction Rates	**7**	**4**
17.1 A Model for Reaction Rates	1	1/2
17.2 Factors Affecting Reaction Rates	1	1/2
17.3 Reaction Rate Laws	2	1 1/2
17.4 Instantaneous Reaction Rates and Reaction Mechanisms	2	1
Chapter Assessment	1	1/2
18 Chemical Equilibrium	**6**	**3**
18.1 Equilibrium: A State of Dynamic Balance	1 1/2	1/2
18.2 Factors Affecting Chemical Equilibrium	1 1/2	1/2
18.3 Using Equilibrium Constants	2	1 1/2
Chapter Assessment	1	1/2
19 Acids and Bases	**7**	**4 1/2**
19.1 Acids and Bases: An Introduction	1	1/2
19.2 Strengths of Acids and Bases	1 1/2	1
19.3 What is pH?	1 1/2	1
19.4 Neutralization	2	1 1/2
Chapter Assessment	1	1/2
20 Redox Reactions	**5**	**3**
20.1 Oxidation and Reduction	1	1/2
20.2 Balancing Redox Reactions	1 1/2	1
20.3 Half-Reactions	1 1/2	1
Chapter Assessment	1	1/2
21 Electrochemistry	**5**	**3**
21.1 Voltaic Cells	2	1
21.2 Types of Batteries	1	1/2
21.3 Electrolysis	1	1
Chapter Assessment	1	1/2
22 Hydrocarbons	**7**	**4 1/2**
22.1 Alkanes	1	1
22.2 Cyclic Alkanes and Alkane Properties	1	1/2
22.3 Alkenes and Alkynes	1 1/2	1
22.4 Isomers	1 1/2	1
22.5 Aromatic Hydrocarbons and Petroleum	1	1/2
Chapter Assessment	1	1/2
23 Substituted Hydrocarbons and Their Reactions	**8**	**5**
23.1 Functional Groups	1	1/2
23.2 Alcohols, Ethers, and Amines	1 1/2	1
23.3 Carbonyl Compounds	1 1/2	1
23.4 Other Reactions of Organic Compounds	1 1/2	1
23.5 Polymers	1 1/2	1
Chapter Assessment	1	1/2
24 The Chemistry of Life	**6**	**3**
24.1 Proteins	1	1/2
24.2 Carbohydrates	1	1/2
24.3 Lipids	1	1/2
24.4 Nucleic Acids	1	1/2
24.5 Metabolism	1	1/2
Chapter Assessment	1	1/2

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25 Nuclear Chemistry	**6**	**3 1/2**
25.1 Nuclear Radiation	1	1/2
25.2 Radioactive Decay	1	1/2
25.3 Transmutation	1	1
25.4 Fission and Fusion of Atomic Nuclei	1	1/2
25.5 Applications and Effects of Nuclear Reactions	1	1/2
Chapter Assessment	1	1/2
26 Chemistry of the Environment	**4**	**—**
26.1 Earth's Atmosphere	1 1/2	—
26.2 Earth's Water	1/2	—
26.3 Earth's Crust	1/2	—
26.4 Cycles in the Environment	1/2	—
Chapter Assessment	1	—
Total sessions	**165**	**90**