

Chemistry 4th Edition Lesson Plan Overview

<i>Day(s)</i>	<i>Topic</i>	<i>Pages</i>	<i>Support Materials*</i>	<i>Bible Integration*</i>
Chapter 1: Chemistry for Life				
1–2	1A What Is Chemistry?	1–6	<ul style="list-style-type: none"> • Extra Reading: History of Chemistry • Extra Reading: Research Case Study 	<ul style="list-style-type: none"> • Science in light of a biblical worldview • History, science, and the Bible • Chemistry in the Bible • Science in Bible times
3	1B Why Is Chemistry Important?	7–10		<ul style="list-style-type: none"> • People created in the image of God • The Fall and Redemption • The Creation Mandate and loving your neighbor with chemistry • Faith as an aid in understanding science • The Bible as absolute truth • People as stewards of God's creation • Contrasting biblical and naturalistic worldviews • Christians and the environment • The glory of God seen in chemistry
4	1C Chemistry in Action	10–18		<ul style="list-style-type: none"> • Using science to help others for the glory of God • Combating naturalistic presuppositions
5	Lab 1A, The Great Biscuit Bake-Off			
6	Lab 1B, The Serial Safety Saga			
7	Chapter 1 Review			
8	Chapter 1 Test			
Chapter 2: Matter				
9–10	2A The Classification of Matter	23–31	<ul style="list-style-type: none"> • Lab 2C, Physical States of Matter • Lab 2D, Inquiring into Mixtures • Worldview Sleuthing grading rubric • Extra Reading: Common Elements and Their Symbols • Extra Reading: The History of Chemical Symbols 	<ul style="list-style-type: none"> • Interpreting evidence in light of the Bible • Creation <i>ex nihilo</i> • Changes in minerals as a result of the Flood • Bezaleel's use of the malleability of metal
11	Lab 2A, Needle in a Haystack			
12	2B Energy and Matter	31–35		<ul style="list-style-type: none"> • Matter, energy, and the Bible • God as the ultimate cause of all things • Thermodynamics and the Bible • The present decaying of creation and its future replacement by a new heaven and a new earth • The eternity of God
13	Lab 2B, Zebroids, Wolphins, and Ligers, Oh My!			
Chapter 2: Matter (continued)				
14	2B Energy and Matter (continued)	35–39		

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15–16	2C The States of Matter	39–46		<ul style="list-style-type: none"> • Serving God as a metallurgist • The origin of the universe
17	Chapter 2 Review			
18	Chapter 2 Test			
Chapter 3: Measuring and Calculating				
19–20	3A Measuring and Units	51–58	<ul style="list-style-type: none"> • Extra Problems • Lab 3C, Measurement of Matter • Lab 3D, Inquiring into Density 	<ul style="list-style-type: none"> • Improving people's lives with science • Learning about God's creation as an essential activity for Christians • Measurement compared to the infinity of God
21	3B Measurements	59–65	<ul style="list-style-type: none"> • Extra Reading: Compound Calculations 	<ul style="list-style-type: none"> • God as the absolute standard • The Fall's effect on man's ability to make measurements • Importance of integrity in science
22	3C Mathematics and Measurements	66–68		
23	Lab 3A, Metric Unicorns			
24	3D Orderly Problem Solving	68–72		<ul style="list-style-type: none"> • Learning about creation to glorify God and serve others
25	Lab 3B, Silver! Where?			
26	Chapter 3 Review			
27	Chapter 3 Test			
Chapter 4: Atomic Structure				
28–30	4A The Development of Atomic Models: A Historical Perspective	77–87	<ul style="list-style-type: none"> • Extra Problems 	<ul style="list-style-type: none"> • Knowledge of chemistry to enable better stewardship • The purpose of science as modeling and not ultimate truth
31	Lab 4A, Newsy Light			
32–34	4B The Electron Structure of the Atom	88–99		
35	4C Useful Element Notations	100–103		
36	Lab 4B, Copper Crooks			
37	4C Useful Element Notations (continued)	103–6		
	Chapter 4 Review			
38	Chapter 4 Test			
Chapter 5: Elements				
39–40	5A The Periodic Table	111–20	<ul style="list-style-type: none"> • Worldview Sleuthing grading rubric • Extra Reading: The Case of the Unknown Chemical 	<ul style="list-style-type: none"> • The origin of the universe • Evidence of design in the elements • The orderly nature of God
41	5B Periodic Trends	121–26		
42	Lab 5, An Elemental Merry-Go-Round			

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43–45	5C Element Families and Their Properties	126–43		<ul style="list-style-type: none"> Using science to help others Sulfur in the Bible Interpreting data on the basis of worldview Serving God as a science teacher
46				
	Chapter 5 Review			
47	Chapter 5 Test			
Chapter 6: Chemical Bonds				
48–50	6A Basics of Bonding	148–52		• Preparing for future service
	6B Types of Bonds	152–62		• Chemical bonds and loving your neighbor
51	6C Properties of Compounds	162–66		• Using science to help others
52	Lab 6, Bulletproof Chemistry			
53	Chapter 6 Review			
54	Chapter 6 Test			
Chapter 7: Bond Theories and Molecular Geometry				
55–56	7A Bond Theories	170–74	• Extra Problems	• Helping others through science
57–58	7B Molecular Geometry	175–86		<ul style="list-style-type: none"> God's design of the human nose God's care of His creation Science as the source of workable models and not universal truth
59	Lab 7, Atomic Architecture			
60	Chapter 7 Review			
61	Chapter 7 Test			
Chapter 8: Chemical Composition and Reactions				
62–63	8A Oxidation Numbers and Formulas	189–95	• Extra Problems	• Our responsibility to wisely manage the earth
64–66	8B Nomenclature	196–205		
67–68	8C Writing Equations	205–11		<ul style="list-style-type: none"> Why Christians should care about the environment Creation as a showcase of God's glory
69–70	8D Types of Reactions	211–17		<ul style="list-style-type: none"> Serving others by meeting their needs (Matt. 25:35–40) Serving God as a forensic scientist
71	Lab 8, Expeditions in Chemical Equations			
Chapter 8: Chemical Composition and Reactions (continued)				
72	Chapter 8 Review			
73	Chapter 8 Test			
Chapter 9: Chemical Calculations				
74–76	9A The Mole	224–36	<ul style="list-style-type: none"> Lab 9E, Percent Composition Extra Problems 	• Math as a tool to use for God's glory
77	Lab 9A, Torching Metals or Lab 9B, Water . . . Water!			

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78–80	9B Stoichiometry	236–46		<ul style="list-style-type: none"> • The orderliness of God's creation • God's wisdom in creation • The importance of a biblical worldview in chemistry
81	Lab 9C, Chymistry or Lab 9D, Cracking the Kernel (optional)			
82	Chapter 9 Review			
83	Chapter 9 Test			
Chapter 10: Gases				
84–85	10A Properties of Gases	251–56	<ul style="list-style-type: none"> • Extra Problems • Lab 10C, Boyle's Law • Lab 10D, Ideal Gas Law • Extra Reading: Harmful Gases 	<ul style="list-style-type: none"> • The value of human life • Science and common grace
86–87	10B Gas Laws	257–65		
88	Lab 10A, The Temperature Cliff			
89–91	10C Gases and the Mole	265–77		<ul style="list-style-type: none"> • God's design of air • Serving God as an anesthetist
92	Lab 10B, An Aquanaut's World			
93	Chapter 10 Review			
94	Chapter 10 Test			
Chapter 11: Solids and Liquids				
95	11A Intermolecular Forces	283–87		<ul style="list-style-type: none"> • Fulfilling the Creation Mandate by preserving and improving human life • God's design in the freezing point of water
96	11B Solids	287–90		
97	Lab 11B, Cracking the Crystal (optional)			
98	11B Solids (continued)	290–94		
99	11C Liquids	294–303		<ul style="list-style-type: none"> • Using skills and processes in a way that pleases the Lord • Death as God's penalty for sin • Everlasting life for those who place faith in Christ
100	Lab 11A, Forces of Nature			
Chapter 11: Solids and Liquids (continued)				
101	Chapter 11 Review			
102	Chapter 11 Test			
Chapter 12: Solutions				
103–104	12A The Dissolving Process	308–17	<ul style="list-style-type: none"> • Lab 12C, Frozen Frogs • Extra Problems • Extra Reading: In-Depth with the Dead 	<ul style="list-style-type: none"> • Meeting people's physical and spiritual needs • Solubility and the wisdom of God
105	Lab 12A, The Beach Is Closed			
106–107	12B Measures of Concentration	318–20		
108–109	12C Colligative Properties	321–27		

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110	Lab 12B, One Giant Solution			
111	12D Colloids	327–30		
112	Chapter 12 Review			
113	Chapter 12 Test			
Chapter 13: Chemical Thermodynamics				
114	13A Thermochemistry	335–40	• Extra Problems	• The order seen in creation
115	Lab 13A, Hot Shot			
116–117	13A Thermochemistry (continued)	340–45		
118	Lab 13B, Snow Monkeys			
119–120	13B Reaction Tendency	345–57		<ul style="list-style-type: none"> • The order and complexity of life • God and the laws of thermodynamics • Entropy and creation
121	Chapter 13 Review			
122	Chapter 13 Test			
Chapter 14: Chemical Kinetics				
123–124	14A Reaction Rates	361–69	<ul style="list-style-type: none"> • Lab 14B, Reaction Rates: Temperature, Surface Area, and Concentration • Extra Problems 	• Loving your neighbor through the chemistry of pharmacology
125	Lab 14, Collision Course			
126–127	14B Reaction Mechanisms	370–76		
	Chapter 14 Review			
128	Chapter 14 Test			
Chapter 15: Chemical Equilibrium				
129–131	15A Theories of Chemical Equilibrium	381–92	<ul style="list-style-type: none"> • Extra Problems • Lab 15B, Le Châtelier's Principle • Lab 15C, Inquiring into Le Châtelier's Principle • Extra Reading: Predicting Precipitation with Common Ions • Extra Reading: Punch Bowl 	• Chemistry as a tool to either help or hurt people
132	Lab 15, Old Faithful			
133–135	15B Applications of Equilibrium Chemistry	392–401		• Scripture as the basis for moral decisions
	Chapter 15 Review			
136	Chapter 15 Test			
Chapter 16: Acids, Bases, and Salts				

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137–138	16A Defining Acids and Bases	407–12	<ul style="list-style-type: none"> • Extra Problems • Extra Reading: Some Common Industrial Acids, Bases, and Salts 	• Keeping people safe with chemistry
139–141	16B Acid-Base Equilibria	413–24		
142	Lab 16A, Rainbow of Chemistry			
143–144	16C Neutralization	424–30		<ul style="list-style-type: none"> • God's design of buffers in blood • Combating drunk driving with the Creation Mandate
145	Lab 16B, Cheesy Chemistry			
146	Chapter 16 Review			
147	Chapter 16 Test			
Chapter 17: Oxidation and Reduction				
148–149	17A Redox Reactions	436–44	<ul style="list-style-type: none"> • Lab 17C, Electrolysis of Water • Extra Problems • Extra Reading: Balancing Redox Equations—the Half-Reaction Method 	• Using electrochemistry to help others, wisely manage resources, and glorify God
150	Lab 17A, The Dead, Twitching Frog Mystery, or Lab 17B, Danger Under the Sink			
151–153	17B Electrochemical Reactions	444–53		• Serving God as an electrochemist
154	Chapter 17 Review			
155	Chapter 17 Test			
Chapter 18: Organic Chemistry and Biochemistry				
156	18A Organic Compounds	457–60	<ul style="list-style-type: none"> • Lab 18C, Soaps and Detergents • Lab 18D, Enzymes • Worldview Sleuthing grading rubric • Extra Reading: Anabolic Steroids • Extra Reading: Lipoproteins—the Good, the Bad, and the Ugly • Extra Reading: Enzymes, Vitamins, and Hormones • Extra Reading: Functions of Proteins 	• The origin of life and abiogenesis
157	18B Hydrocarbons	460–68		
158	18C Substituted Hydrocarbons	468–76		
159				
160	Lab 18A, Makes Scents!			
161	18D Organic Reactions	476–78		
162–163	18E Biochemistry	478–91		<ul style="list-style-type: none"> • Biochemistry and moral issues • The Bible as the ultimate authority • God's wisdom and power seen in creation
164	Lab 18B, Milking Chemistry			
165	Chapter 18 Review			

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166	Chapter 18 Test			
Chapter 19: Materials Chemistry				
167	19A Ceramics	499–503	• Extra Reading: Beyond Paper and Plastic	• Dominion science through recycling
168	19B Semiconductors	503–7		
169–170	19C Polymers	507–15		• Improving people's lives with wise stewardship
171	Lab 19, A Plastic World			
172	19D Nanotechnology	515–21		• The need for discernment in the use of new technology • Serving God as a materials scientist
173	Chapter 19 Review			
174	Chapter 19 Test			
Chapter 20: Nuclear Chemistry				
175	20A Inside the Nucleus	525–33	• Extra Problems • Worldview Sleuthing grading rubric • Final lab exam and grading rubric	• The effect of worldview on health and safety
176	20B Nuclear Decay	534–40		
177	Lab 20, Atomic Asteroids			
178–179	20C Using Nuclear Chemistry	541–49		• Our responsibility to use chemistry for the good of others
	Chapter 20 Review			
180	Chapter 20 Test			

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