

AP Chemistry

One Year Program

Semester 1: Summer/Fall to January – Lecture (ONLINE) & HW Assignments

Semester 2: February to May – Review & 12 AP Chemistry Exams.

3 Hour 15 Min Exam (90 Minutes: 60 Multiple Choice, 105 Minutes: 7 Free Responses)

TABEL OF CONTENTS

Unit 1: Atomic Structure and Properties 7-9%

Unit 2: Molecular and Ionic Compound Structure and Properties 7-9%

Unit 3: Intermolecular Forces and Properties 18-22%

Unit 4: Chemical Reactions 7-9%

Unit 5: Kinetics 7-9%

Unit 6: Thermodynamics 7-9%

Unit 7: Equilibrium 7-9%

Unit 8: Acids and Bases 11-15%

Unit 9: Applications of Thermodynamics 7-9%

Unit 10: Laboratory Analysis Skills

Skill 1: Models and Representations
 Skill 2: Question and Method
 Skill 3: Representing Data and Phenomena
 Skill 4: Model Analysis
 Skill 5: Mathematical Routines
 Skill 6: Argumentation

Investigation 1: Spectrophotometry
 Investigation 2: Beer's law application - Mass Percent of Copper in Brass
 Investigation 3: Precipitation & Hard Water
 Investigation 4: Acid & Base Titration - How Much Acid Is in Fruit Juice and Soft Drinks?
 Investigation 5: Paper Chromatography
 Investigation 6: Identifying Unknown Compounds
 Investigation 7: Green Chemistry & Hydrates
 Investigation 8: Redox Titration – Hydrogen Peroxide & KMnO₄
 Investigation 9: Gravimetric analysis.
 Investigation 10: Acid & Carbonate Reactions
 Investigation 11: Study of Rate Laws using Beer's law
 Investigation 12: Exothermic Reactions & Calorimetry on Hand
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Investigation 13: Application of Le Chatelier's Principal.
 Investigation 14: Acid & Base Titration & Graphs
 Investigation 15: Acid & Base Buffers
 Investigation 16: Buffer Preparation & Capacity



Daniel Lee

He has been teaching AP Biology, AP Chemistry, AP Physics, and all levels of math since 1998. Daniel is a top honor graduate from UCLA in Biochemistry with 4 years of laboratory and clinical research experience.

AP Chemistry Unit 1 to 9 Summary

UNIT 1	Atomic Structure and Properties	UNIT 2	Molecular and Ionic Compound Structure and Properties	UNIT 3	Intermolecular Forces and Properties	UNIT 4	Chemical Reactions
~9-10	Class Periods	7-9%	AP Exam Weighting	~12-13	Class Periods	7-9%	AP Exam Weighting
~14-15	Class Periods	7-9%	AP Exam Weighting	~14-15	Class Periods	18-22%	AP Exam Weighting
~14-15	Class Periods	7-9%	AP Exam Weighting	~13-14	Class Periods	7-9%	AP Exam Weighting
~10-11	Class Periods	7-9%	AP Exam Weighting	~10-11	Class Periods	7-9%	AP Exam Weighting
SPQ	1.1 Moles and Molar Mass	SAP	2.1 Types of Chemical Bonds	SAP	3.1 Intermolecular Forces	TRA	4.1 Introduction for Reactions
5		6		4		2	
SPQ	1.2 Mass Spectroscopy of Elements	SAP	2.2 Intramolecular Force and Potential Energy	SAP	3.2 Properties of Solids	TRA	4.2 Net Ionic Equations
5		3		4		5	
SPQ	1.3 Elemental Composition of Pure Substances	SAP	2.3 Structure of Ionic Solids	SAP	3.3 Solids, Liquids, and Gases	TRA	4.3 Representations of Reactions
2		4		3		3	
SPQ	1.4 Composition of Mixtures	SAP	2.4 Structure of Metals and Alloys	SAP	3.4 Ideal Gas Law	TRA	4.4 Physical and Chemical Changes
5		4		5		6	
SAP	1.5 Atomic Structure and Electron Configuration	SAP	2.5 Lewis Diagrams	SAP	3.5 Kinetic Molecular Theory	SPQ	4.5 Stoichiometry
1		3		4		5	
SAP	1.6 Photoelectron Spectroscopy	SAP	2.6 Resonance and Formal Charge	SAP	3.6 Deviation from Ideal Gas Law	SPQ	4.6 Introduction to Titration
4		6		6		3	
SAP	1.7 Periodic Trends	SAP	2.7 VSEPR and Bond Hybridization	SPQ	3.7 Solutions and Mixtures	TRA	4.7 Types of Chemical Reactions
4		6		5		1	
SAP	1.8 Valence Electrons and Ionic Compounds			SPQ	3.8 Representations of Solutions	TRA	4.8 Introduction to Acid-Base Reactions
4				3		1	
				SPQ	3.9 Separation of Solutions and Mixtures Chromatography	TRA	4.9 Oxidation-Reduction (Redox) Reactions
				2		5	
				SPQ	3.10 Solubility		
				4			
				SAP	3.11 Spectroscopy and the Electromagnetic Spectrum		
				4			
				SAP	3.12 Photoelectric Effect		
				5			
				SAP	3.13 Beer-Lambert Law		
				2			
TRA	5.1 Reaction Rates	ENE	6.1 Endothermic and Exothermic Processes				
6		6					
TRA	5.2 Introduction to Rate Law	ENE	6.2 Energy Diagrams				
5		3					
TRA	5.3 Concentration Changes Over Time	ENE	6.3 Heat Transfer and Thermal Equilibrium				
5		6					
TRA	5.4 Elementary Reactions	ENE	6.4 Heat Capacity and Calorimetry				
5		2					
TRA	5.5 Collision Model	ENE	6.5 Energy of Phase Changes				
6		1					
TRA	5.6 Reaction Energy Profile	ENE	6.6 Introduction to Enthalpy of Reaction				
3		4					
TRA	5.7 Introduction to Reaction Mechanisms	ENE	6.7 Bond Enthalpies				
1		5					
TRA	5.8 Reaction Mechanism and Rate Law	ENE	6.8 Enthalpy of Formation				
5		5					
TRA	5.9 Steady-State Approximation	ENE	6.9 Hess's Law				
5		5					
TRA	5.10 Multistep Reaction Energy Profile						
3							
ENE	5.11 Catalysis						
6							



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AP Chemistry Unit 1 to 9 Summary

 UNIT 7 Equilibrium		 UNIT 8 Acids and Bases		 UNIT 9 Applications of Thermodynamics							
~14-16	Class Periods	7-9%	AP Exam Weighting	~14-15	Class Periods	11-15%	AP Exam Weighting	~10-13	Class Periods	7-9%	AP Exam Weighting
TRA	6	7.1	Introduction to Equilibrium	SAP	5	8.1	Introduction to Acids and Bases	ENE	6	9.1	Introduction to Entropy
TRA	4	7.2	Direction of Reversible Reactions	SAP	5	8.2	pH and pOH of Strong Acids and Bases	ENE	5	9.2	Absolute Entropy and Entropy Change
TRA	3	7.3	Reaction Quotient and Equilibrium Constant	SAP	5	8.3	Weak Acid and Base Equilibria	ENE	6	9.3	Gibbs Free Energy and Thermodynamic Favorability
TRA	5	7.4	Calculating the Equilibrium Constant	SAP	5	8.4	Acid-Base Reactions and Buffers	ENE	6	9.4	Thermodynamic and Kinetic Control
TRA	6	7.5	Magnitude of the Equilibrium Constant	SAP	5	8.5	Acid-Base Titrations	ENE	6	9.5	Free Energy and Equilibrium
TRA	5	7.6	Properties of the Equilibrium Constant	SAP	6	8.6	Molecular Structure of Acids and Bases	ENE	6	9.6	Coupled Reactions
TRA	3	7.7	Calculating Equilibrium Concentrations	SAP	2	8.7	pH and pK_a	ENE	4	9.7	Galvanic (Voltaic) and Electrolytic Cells
TRA	3	7.8	Representations of Equilibrium	SAP	6	8.8	Properties of Buffers	ENE	2	9.8	Cell Potential and Free Energy
TRA	6	7.9	Introduction to Le Châtelier's Principle	SAP	5	8.9	Henderson-Hasselbalch Equation	ENE	5	9.9	Cell Potential Under Nonstandard Conditions
TRA	5	7.10	Reaction Quotient and Le Châtelier's Principle	SAP	6	8.10	Buffer Capacity	ENE	6	9.10	Electrolysis and Faraday's Law
SPQ	5	7.11	Introduction to Solubility Equilibria								
SPQ	2	7.12	Common-Ion Effect								
SPQ	2	7.13	pH and Solubility								
SPQ	4	7.14	Free Energy of Dissolution								



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AP & SAT II Scores Results

AP BIOLOGY

Jonathan H.	5
Renee C.	5
Wenbo D.	5
K.Z	5
Jolynn Z.	5
Michelle L.	5
Visshwam D.	5
Alan W.	4
Chang C.	4
Jeremy L.	4
Jesse D.	4
Major Y.	4
Sarah L.	4
Sherlene S.	4
Vera W.	4

AP CHEMISTRY

Anthony H.	5
Rachel Jiang	5
Sean Chang	5
Derek W.	5
Evelyn L.	5
Jasen C.	5
Justin J.	5
Kevin H.	5
Priscilla C.	5
Sharon T.	5
Ian L.	4
Lilliana R.	4
Tiffany H.	4
William W.	4

SAT II PHYSICS

Anthony M.	800
Stephan C.	800
Johnny Y.	790

AP PHYSICS

Laura T.	5
Sean R.	5
Sean C.	5
Chang C.	4
Jessica G.	4
Marco C.	4
Sean C.	4
Steven W.	4
Marco C.	4
Sean C.	4

SAT II BIOLOGY

Darren H.	800
Jolynn Z.	800
Eileen Z.	800
Patrick L.	800
Renee C.	800
Richard G.	790
Amanda R.	780
Kevin Z.	770
K.Z	770
Chan C.	750
Megan S.	700

SAT II CHEMISTRY

Helen S.	800
Jasen C.	800
Justin J.	800
Richard G.	800
S. M.	800
Sean C.	800
Ian L.	790
Nathan L.	790
Kristopher C.	770
William W.	710



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