

Course at a Glance

Plan

The Course at a Glance provides a useful visual organization of the AP Chemistry curricular components, including:

- Sequence of units, along with approximate weighting and suggested pacing. Please note, pacing is based on 45-minute class periods, meeting five days each week for a full academic year.
- Progression of topics within each unit.
- Spiraling of the big ideas and science practices across units.

Teach

SCIENCE PRACTICES

Science practices spiral throughout the course.

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

BIG IDEAS

Big ideas spiral across topics and units.

- | | |
|--|----------------------------|
| SPQ Scale, Proportion, and Quantity | TRA Transformations |
| SAP Structure and Properties | ENE Energy |

Assess

Assign the Personal Progress Checks—either as homework or in class—for each unit. Each Personal Progress Check contains formative multiple-choice and free-response questions. The feedback from the Personal Progress Checks shows students the areas where they need to focus.

UNIT 1

Atomic Structure and Properties

~9–10 Class Periods

7–9% AP Exam Weighting

SPQ 5	1.1 Moles and Molar Mass A
SPQ 5	1.2 Mass Spectroscopy of Elements A
SPQ 2	1.3 Elemental Composition of Pure Substances A
SPQ 5	1.4 Composition of Mixtures A
SAP 1	1.5 Atomic Structure and Electron Configuration H
SAP 4	1.6 Photoelectron Spectroscopy H
SAP 4	1.7 Periodic Trends H
SAP 4	1.8 Valence Electrons and Ionic Compounds H

Generally Biggs' order is A, D, B, F, C, E, G, H, J (no unit I)

For 2020 - The AP Exam will only cover units 1-7

UNIT 2

Molecular and Ionic Compound Structure and Properties

~12–13 Class Periods

7–9% AP Exam Weighting

SAP 6	2.1 Types of Chemical Bonds J
SAP 3	2.2 Intramolecular Force and Potential Energy J
SAP 4	2.3 Structure of Ionic Solids J
SAP 4	2.4 Structure of Metals and Alloys J
SAP 3	2.5 Lewis Diagrams J
SAP 6	2.6 Resonance and Formal Charge J
SAP 6	2.7 VSEPR and Bond Hybridization J

Personal Progress Check 1

Multiple-choice: ~20 questions

Free-response: 2 questions

- Short-answer
- Short-answer

Personal Progress Check 2

Multiple-choice: ~15 questions

Free-response: 1 question

- Long-answer

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UNIT 3

Intermolecular Forces and Properties

~14–15 Class Periods **18–22%** AP Exam Weighting

SAP	3.1	Intermolecular Forces
4	J	
SAP	3.2	Properties of Solids
4	J	
SAP	3.3	Solids, Liquids, and Gases
3	D	
SAP	3.4	Ideal Gas Law
5	D	
SAP	3.5	Kinetic Molecular Theory
4	D	
SAP	3.6	Deviation from Ideal Gas Law
6	D	
SPQ	3.7	Solutions and Mixtures
5	B	
SPQ	3.8	Representations of Solutions
3	B	
SPQ	3.9	Separation of Solutions and Mixtures Chromatography
2	J	
SPQ	3.10	Solubility
4	J	
SAP	3.11	Spectroscopy and the Electromagnetic Spectrum
4	B	
SAP	3.12	Photoelectric Effect
5	H	
SAP	3.13	Beer-Lambert Law
2	B	

Personal Progress Check 3

Multiple-choice: ~30 questions

Free-response: 2 questions

- Short-answer
- Short-answer

UNIT 4

Chemical Reactions

~14–15 Class Periods **7–9%** AP Exam Weighting

TRA	4.1	Introduction for Reactions
2	B	
TRA	4.2	Net Ionic Equations
5	B	
TRA	4.3	Representations of Reactions
3	B	
TRA	4.4	Physical and Chemical Changes
6	B	
SPQ	4.5	Stoichiometry
5	A&B	
SPQ	4.6	Introduction to Titration
3	B	
TRA	4.7	Types of Chemical Reactions
1	B	
TRA	4.8	Introduction to Acid-Base Reactions
1	B&G	
TRA	4.9	Oxidation-Reduction (Redox) Reactions
5	B	

Personal Progress Check 4

Multiple-choice: ~20 questions

Free-response: 1 question

- Long-answer

UNIT 5

Kinetics

~13–14 Class Periods **7–9%** AP Exam Weighting

TRA	5.1	Reaction Rates
6	E	
TRA	5.2	Introduction to Rate Law
5	E	
TRA	5.3	Concentration Changes Over Time
5	E	
TRA	5.4	Elementary Reactions
5	E	
TRA	5.5	Collision Model
6	E	
TRA	5.6	Reaction Energy Profile
3	E	
TRA	5.7	Introduction to Reaction Mechanisms
1	E	
TRA	5.8	Reaction Mechanism and Rate Law
5	E	
TRA	5.9	Steady-State Approximation
5	E	
TRA	5.10	Multistep Reaction Energy Profile
3	E	
ENE	5.11	Catalysis
6	E	

Personal Progress Check 5

Multiple-choice: ~25 questions

Free-response: 2 questions

- Short-answer
- Long-answer

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UNIT 6

Thermodynamics

~10–11

Class Periods

7–9%

AP Exam Weighting

ENE 6	6.1 Endothermic and Exothermic Processes
ENE 3	6.2 Energy Diagrams
ENE 6	6.3 Heat Transfer and Thermal Equilibrium
ENE 2	6.4 Heat Capacity and Calorimetry
ENE 1	6.5 Energy of Phase Changes
ENE 4	6.6 Introduction to Enthalpy of Reaction
ENE 5	6.7 Bond Enthalpies
ENE 5	6.8 Enthalpy of Formation
ENE 5	6.9 Hess's Law

Personal Progress Check 6

Multiple-choice: ~20 questions

Free-response: 2 questions

- Short-answer
- Short-answer

UNIT 7

Equilibrium

~14–16

Class Periods

7–9%

AP Exam Weighting

TRA 6	7.1 Introduction to Equilibrium
TRA 4	7.2 Direction of Reversible Reactions
TRA 3	7.3 Reaction Quotient and Equilibrium Constant
TRA 5	7.4 Calculating the Equilibrium Constant
TRA 6	7.5 Magnitude of the Equilibrium Constant
TRA 5	7.6 Properties of the Equilibrium Constant
TRA 3	7.7 Calculating Equilibrium Concentrations
TRA 3	7.8 Representations of Equilibrium
TRA 6	7.9 Introduction to Le Châtelier's Principle
TRA 5	7.10 Reaction Quotient and Le Châtelier's Principle
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

Personal Progress Check 7

Multiple-choice: ~30 questions

Free-response: 2 questions

- Short-answer
- Long-answer

UNIT 8

Acids and Bases

~14–15

Class Periods

11–15%

AP Exam Weighting

SAP 5	8.1 Introduction to Acids and Bases
SAP 5	8.2 pH and pOH of Strong Acids and Bases
SAP 5	8.3 Weak Acid and Base Equilibria
SAP 5	8.4 Acid-Base Reactions and Buffers
SAP 5	8.5 Acid-Base Titrations
SAP 6	8.6 Molecular Structure of Acids and Bases
SAP 2	8.7 pH and pK_a
SAP 6	8.8 Properties of Buffers
SAP 5	8.9 Henderson-Hasselbalch Equation
SAP 6	8.10 Buffer Capacity

Personal Progress Check 8

Multiple-choice: ~30 questions

Free-response: 1 question

- Long-answer

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UNIT 9

Applications of Thermodynamics

~10–13

Class
Periods

7–9%

AP Exam
Weighting

ENE 6	9.1 Introduction to Entropy C
ENE 5	9.2 Absolute Entropy and Entropy Change C
ENE 6	9.3 Gibbs Free Energy and Thermodynamic Favorability C
ENE 6	9.4 Thermodynamic and Kinetic Control C&E
ENE 6	9.5 Free Energy and Equilibrium C
ENE 4	9.6 Coupled Reactions C&B
ENE 2	9.7 Galvanic (Voltaic) and Electrolytic Cells B
ENE 5	9.8 Cell Potential and Free Energy B
ENE 6	9.9 Cell Potential Under Nonstandard Conditions B
ENE 5	9.10 Electrolysis and Faraday's Law B

Personal Progress Check 9

Multiple-choice: ~30 questions

Free-response: 2 questions

- Short-answer
- Long-answer