

# 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.

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

### BIG IDEAS

Big ideas spiral across topics and units.

- |  |                                       |
|--|---------------------------------------|
| <b>SPQ</b> Scale, Proportion, and Quantity | <b>TRA</b> Transformations and Energy |
| <b>SAP</b> Structure and Properties        | <b>ENE</b> 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

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

UNIT  
2

## Molecular and Ionic Compound Structure and Properties

~12–13

Class Periods

7–9%

AP Exam Weighting

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

### 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

continued on next page

## UNIT 3

# Intermolecular Forces and Properties

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

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

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

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

### Personal Progress Check 5

Multiple-choice: ~25 questions  
Free-response: 2 questions

- Short-answer
- Long-answer

continued on next page

# 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

continued on next page

**UNIT**  
**9**

**Applications of  
Thermodynamics**

**~10-13**

Class  
Periods

**7-9%**

AP Exam  
Weighting

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

**Personal Progress Check 9**

**Multiple-choice: ~30 questions**

**Free-response: 2 questions**

- Short-answer
- Long-answer