Date	Торіс	Section
Day 1		1.1 Structure of Water and Hydrogen Bonding 1.2 Elements of Life
Day 1 06/30 (원)	1. Chemistry of Life	1.4 Properties of Biological Macromolecules
00/00 (E)		1.5 Structure and Function of Biological Macromolecules
		1.6 Nucleic Acids
		2.1 Cell Structure: Subcellular Components
		2.2 Cell Structure and Fucntions
Day 2		2.3 Cell Size
07/03 (목)	2. Cell Structure and Function	2.4 Plasma Membranes
		2.5 Membrane Permeability
		2.7 Facilitated Diffusion
		2.8 Tonicity and Osmoregulation
Dav 3		2.9 Mechanisms of Transport
07/07 (월)	2. Cell Structure and Function	2.10 Cell Compartmentalization
, (_,		2.11 Origins of Cell Compartmentalization
		3.1 Enzyme Structure
Day 4	2 Collular Energation	3.2 Enzyme Catalysis
07/10 (목)	3. Cellular Energetics	3.3 Environmental Impacts on Enzyme Function
		3.4 Cellular Energy
Day 5	3 Cellular Energetics	3.5 Photosynthesis
07/14 (월)	5. Cellului Energetics	Week 1 Quiz
Day 6	2. Calludar Example	Quiz Review & Corrections
07/17 (목)	3. Cellular Energetics	3.6 Cellular Respiration
Day 7	4. Cell Communication and Cell Cycle	4.1 Cell Communication
Day 7 07/21 (원)		4.2 Introduction to Signal Transduction
01/21(2)		4.4 Changes in Signal Transduction Pathways
		45 Eeedback
Day 8	4. Cell Communication and Cell Cvcle	4.7 Regulation of Cell Cycle
07/24 (목)		5.1 Meiosis
		5.2 Meiosis and Genetic Diversity
		5.3 Mendelian Genetics
Day 9	5. Heredity	5.4 Non-Mendelian Genetics
07/28 (월)		5.5 Environmental Effects on Phenotype
D 40		5.6 Chromosomal Inheritance
Day 10 07/31 (목)	Mid-Quiz	Quiz (Unit 1-5)
		6.1 DNA and RNA Structure
Day 11 08/04 (월)	6. Gene Expression and Regulation	6.2 Replication
		6.3 Transcription and RNA Processing
		6.5 Pequilation of Gone Expression
		Week 2 Ouiz
Day 12 08/07 (목)	6. Gene Expression and Regulation	Ouiz review & Corrections
		6.6 Gene Expression and Cell Specialization
		6.7 Mutations
		6.8 Biotechnology
This schedule is subject to change based on the student's pace of learning.		
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방한미래의과학자들 FUTURE SCIENTISTS

<u>2025 AP Summer</u>

AP Physics 1/C Mechanics

Date	Торіс	Section
Day 1 06/30 (월)	1. Kinematics	1.1 Scalars and Vectors in One Dimension1.2 Displacement, Velocity, and Acceleration1.3 Representing Motion1.4 Reference Frames and Relative Motion1.5 Vectors and Motion in Two Dimensions
Day 2 07/03 (목)	2. Force and Translational Dynamics	2.1 Systems and Center of Mass2.2 Forces and Free-body Diagrams2.3 Newton's Third Law
Day 3 07/07 (월)	2. Force and Translational Dynamics	2.4 Newton's first Law2.5 Newton's Second Law2.6 Gravitational Force
Day 4 07/10 (목)	2. Force and Translational Dynamics	2.7 Kinetic and Static Friction 2.8 Spring Forces 2.9 Circular Motion
Day 5 07/14 (월)	3. Work, Energy, and Power	3.1 Translational Kinetic Energy3.2 Work3.3 Potential Energy
Day 6 07/17 (목)	3. Work, Energy, and Power	3.4 Conservation of energy 3.5 Power
Day 7 07/21 (월)	4. Linear Momentum	4.1 Linear Momentum 4.2 Change in Momentum and Impulse
Day 8 07/24 (목)	4. Linear Momentum	4.3 Conservation of Linear Momentum 4.4 Elastic and Inelastic Coliisions
Day 9 07/28 (월)	Mid Quiz	Mid Quiz
Day 10 07/31 (목)	5. Torque and Rotatioinal Dynamics	5.1 Rotational Kinematics 5.2 Connecting Linear and Rotational Motion 5.3 Torque
Day 11 08/04 (월)	5. Torque and Rotatioinal Dynamics	5.4 Rotational Inertia 5.5 Rotational Equilibrium and Newton's First Law in Rotational Form 5.6 Newton's Second Law in Rotational Form
Day 12 08/07 (목)	6. Energy and Momentum of Rotating Systems	6.1 Rotational Kinetic Energy 6.2 Torque and Work

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Date	Торіс	Section
Day 1 06/30 (월)	1. Basic Economic Concepts	 1.1. Scarcity 1.2. Opportunity Cost and the Production Possibilities Curve (PPC) 1.3. Comparative Advantage and Gains from Trade 1.4. Demand 1.5. Supply 1.6. Market Equilibrium, Disequalibrium, and Changes in Equilibrium
Day 2 07/03 (목)	2. Economic Indicators and the Business Cycle	2.1. The Circular Flow and GDP2.2. Limitations of GDP2.3. Unemployment
Day 3 07/07 (월)	2. Economic Indicators and the Business Cycle	2.4. Price Indices and Inflation2.5. Costs of Inflation2.6. Real v. Nominal GDP2.7. Business Cycles
Day 4 07/10 (목)	3. National Income and Price Determination	3.1. Aggregate Demand (AD)3.2. Multipliers3.3. Short-Run Aggregate Supply (SRAS)3.4. Long-Run Aggregate Supply (LRAS)
Day 5 07/14 (월)	3. National Income and Price Determination	3.5. Equilibrium in the AD-AS Model 3.6. Changes in the AD-AS Model in the Short Run 3.7. Long-Run Self-Adjustment 3.8. Fiscal Policy 3.9. Automatic Stabilizes
Day 6 07/17 (목)	4. Financial Sector	4.1. Financial Asssets4.2. Nominal v. Real Interest Rates4.3. Definition, Measurement, and Functions of Money4.4. Banking and the Expansion of the Money Supply
Day 7 07/21 (월)	4. Financial Sector	4.5. The Money Market 4.6. Monetary Policy 4.7. The Loanable Funds Market
Day 8 07/24 (목)	5. Long-Run Consequences of Stabilization Policies	5.1. Fiscal and Monetary Policy Actions in the Short Run5.2. The Phillips Curve5.3. Money Growth and Inflation5.4. Government Deficists and the National Debt
Day 9 07/28 (월)	5. Long-Run Consequences of Stabilization Policies	5.5. Crowding Out 5.6. Economig Growth 5.7. Public Policy and Economic Growth
Day 10 07/31 (목)	6. Open Economy - International Trade and Finance	6.1. Balance of Payments Accounts6.2. Exchange Rates6.3. The Foreign Exchange Market
Day 11 08/04 (월)	6. Open Economy - International Trade and Finance	 6.4. Effect of Changes in Policies and Economic Conditions on the Foreign Exchange Market 6.5. Changes in the Foreign Exchange Market and Net Exports 6.6. Real Interest Rates and International Capital Flows
Day 12 08/07 (목)	Final Review	Practice Exam
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Date Topic Section 1.2 Defining Limits and Using Limit Notation 1.3 Estimating Limit Values from Graphs 1.4 Estimating Limit Values from Tables Day 1 1. Limits and Continuity 07/01 (화) 1.5 Determining Limits using Algebraic Properties of Limits 1.6 Determining Limiting using Algebraic Manipulation 1.7 Selecting Procedures for Determining Limits 1.8 Determining Limits using the Squeeze Theorem 1.9 Connecting Multiple Representations of Limits Day 2 1. Limits and Continuity 1.10 Exploring Types of Discontinuities 07/04 (금) 1.11 Defining Continuity at a Point 1.12 Confirming Continuity over an Interval 1.13 Removing Discontinuities Day 3 1.14 Connecting Infinite Limits and Vertical Asymptotes 1. Limits and Continuity 07/08 (화) 1.15 Connecting Limits at Infinity and Horizontal Asymptotes 1.16 Working with the Intermediate Value Theorem (IVT) 2.1 Defining Average and Instantaneous Rates of Change at a Point 2.2 Defining the Derivative of a Function and using Derivative Notation 2.3 Estimating Derivatives of a Function at a Point 2.4 Connecting Differentiability and Continuity: Determining When Dav 4 2. Differentiation: Definition and Fundamental Proper Derivatives Do and Do Not Exist 07/11 (금) 2.5 Applying the Power Rule 2.6 Derivative rules: Constant, Sum, Difference, and Constant Multiple 2.7 Derivatives of cos x, sin x, e^x, and ln x 2.8 The Product Rule Day 5 2.9 The Ouotient Rule 2. Differentiation: Definition and Fundamental Proper 07/15 (화) 2.10 Finding the Derivatives of Tangent, Cotangent, Secant, and/or Cosecant Functions 3.1 The Chain Rule 3.3 Differentiating Inverse Functions Day 6 3. Differentiation: Composite, Implicit, and Inverse 3.4 Differentiating Inverse Trigonometric Functions 07/18 (금) Functions 3.5 Selecting Procedures for Calculating Derivatives 3.6 Calculating Higher Order Derivatives Day 7 3. Differentiation: Composite, Implicit, and Inverse 3.2 Implicit Differentiation 07/22 (화) Functions 4.1 Interpreting the Meaning of the Derivative in Context Dav 8 4. Contextual Applications of Differentiation 4.2 Straight-Line Motion: Connecting Position, Velocity, and Acceleration 07/25 (금) 4.3 Rates of Change in Applied Contexts Other than Motion 4.4 Introduction to Related Rates 4.5 Solving Related Rates Problems Dav 9 4.6 Approximating Values of a Function using Local Linearity and 4. Contextual Applications of Differentiation 07/29 (화) Linearization 4.7 Using L'Hospital's Rule for Determining Limits and Inderminate Forms 5.1 Using the Mean Value Theorem 5.2 Extreme Value Theorem, Global Versus Local Extrema, and Critical Points Day 10 5.3 Determining Intervals on Which a Function is Increasing or Decreasing 5. Analytical Application of Differentiation 08/01 (금) 5.4 Using the First Derivative Test to Determine Relative (Local) Extrema 5.5 Using the Candidates Test to Determine Absolute (Global) Extrema 5.7 Using the Second Derivative Test to Determine Extrema 5.8 Sketching Graphs of Functions and Their Derivatives Day 11 5. Analytical Application of Differentiation 5.9 Connecting a Function, Its First Derivative, and Its Second Derivative 08/05 (화) 5.10 Introduction to Optimization Problems 5.11 Solving Optimization Problems 6.1 Exploring Accumulation of Change 6.2 Approximating Areas with Riemann Sums 6.3 Riemann Sums, Summation Notation, and Definite Integral Notation Dav 12 6. Integration and Accuulation of Change 6.4 The Fundamental Theorem of Calculus and Accumulation Functions 08/08 (금) 6.5 Interpreting the Behavior of Accumulation Functions Involving Area 6.6 Applying Properties of Definite Integrals 6.7 The Fundamental Theorem of Calculus and Definite Integrals This schedule is subject to change based on the student's pace of learning. 위 스케줄은 학생의 성취도에 따라 소폭 변경될 수 있습니다.

Date Topic Section 1.1. Scarcity 1.2. Resource Allocation and Economic Systems Day 1 1. Basic Economic Concepts 1.3. Production Possibilities Curve 07/01 (화) 1.4. Comparative Advantage and Trade Day 2 1. Basic Economic Concepts 1.5. Cost-Benefit Analysis 07/04 (금) 1.6. Marginal Analysis and Consumer Choice 2.1. Demand 2.2. Supply Day 3 2. Supply and Demand 2.3. Price Elasticity of Demand 07/08 (화) 2.4. Price Elasticity of Supply 2.5. Other Elasticities 2.6. Market Equilibrium and Consumer and Producer Surplus Day 4 2.7. Market Disequilibrium and Changes in Equilibrium 2. Supply and Demand 07/11 (금) 2.8. The Effects of Government Intervention in Markets 2.9. International Trade and Public Policy 3.1. The Production Function Day 5 3. Production, Cost, and the Perfect Competition 3.2. Short-Run Production Costs 07/15 (화) 3.3. Long-Run Production Costs 3.4. Types of Profit 3.5. Profit Maximization Day 6 3.6. Firms' Short-Run Decisions to Produce and Long-Run 3. Production, Cost, and the Perfect Competition 07/18 (금) Decisions to Enter or Exit a Market 3.7. Perfect Competition Day 7 Mid-Ouiz Units 1-3 Practice Test 07/22 (화) 4.1. Introduction to Imperfectly Competitive Markets Day 8 4. Imperfect Competition 4.2. Monopoly 07/25 (금) 4.3. Price Discrimination Day 9 4.4. Monopolistic Competition 4. Imperfect Competition 07/29 (화) 4.5. Oligopoly and Game Theory 5.1. Introduction to Factor Markets Day 10 5.2. Changes in Factor Demand and Factor Supply 5. Factor Markets 08/01 (금) 5.3. Profit-Maximizing Behavior in Perfectly Competitive Factor Markets 6.1. Socially Efficient and Inefficient Market Outcomes 6.2 Externalities Day 11 6.3. Public and Private Goods 6. Market Failure and the Role of Government 08/05 (화) 6.4. The Effects of Government Intervention in Different Market Structures 6.5. Inequality Day 12 **Final Review** Practice Exam 08/08 (금) This schedule is subject to change based on the student's pace of learning.

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법형 비러의과학자들

UTURE SCIENTISTS



2025 AP S<u>ummer</u>

AP Physics 2/C_Electricity and magnetism

Date	Торіс	Section
Day 1	10 Electric Former Field and Determined	10.1 Electric Charge and Electric Force
07/01 (화)	10. Electric Force, Field, and Potential	10. 2Conservation of Electric Charge and the Process of
Day 2		10.3 Electric Fields
07/04 (금)		10.4 Electric Potential Energy
Day 3		10.5 Electric Potential
07/08 (화)		10.6 Capacitors
Day 4		10.7 Concentration of Electric Energy
07/11 (금)		10.7 Conservation of Electric Energy
Day 5	11 Electric Circuite	11.1 Electric Current
07/15 (화)		11.2 Simple Circuits
Day 6		11.3 Resistance, Resistivity, and Ohm's Law
07/18 (금)		11.4 Electric Power
Day 7		115 Compound Direct Current (DC) Circuits
07/22 (화)		The compound Direct Current (DC) Circuits
Day 8		11.6 Kirchhoff's Loop Rule
07/25 (금)		11.7 Kirchhoff's Junction Rule
Day 9		11.8 Peristor-Canacitor (PC) Circuits
07/29 (화)		
Day 10	12 Magnetism and Electromagnetism	12.1 Magnetic Fields
08/01 (금)	12. Magnetism and Electromagnetism	12.2 Magnetism and Moving Charges
Day 11		12.2 Magnetism and Moving Charges
08/05 (화)		12.3 Magnetism and Current-Carrying Wires
Day 12		
08/08 (금)		12.4 Electromagnetic Induction and Faraday's Law

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Date	Торіс	Section
Day 1 07/02 (수)	1. Atomic Structure and Properties	 1.1 Moles and Molar Mass 1.2 Mass Spectra of Elements 1.3 Elemental Composition of Pure Substances 1.4 Composition of Mixtures 1.5 Atomic Structure and Electron Configuration
Day 2 07/05 (토)	 Atomic Structure and Properties Compound Structure and Properties 	 1.6 Photoelectron Spectroscopy 1.7 Periodic Trends 1.8 Valence Electrons and Ionic Compounds 2.1 Types of Chemical Bonds 2.2 Intramolecular Force and Potential Energy 2.3 Structure and Ionic Solids 2.4 Structure of Metals and Allyos 2.5 Lewis Diagrams
Day 3 07/09 (수)	 Compound Structure and Properties Properties of Substances and Mixtures 	 2.6 Resonance and Formal Charge 2.7 VSEPR and Hybridization 3.1 Intermolecular and Interparticle Forces 3.2 Properties of Solids 3.3 Solids, Liquids, and Gases 3.4 Ideal Gas Law
Day 4 07/12 (토)	3. Properties of Substances and Mixtures	 3.5 Kinetic Molecular Theory 3.6 Deviation from Ideal Gas Law 3.7 Solutions and Mixtures 3.8 Representations of Solutions 3.9 Separation of Solutions and Mixtures 3.10 Solubility
Day 5 07/16 (个)	 Properties of Substances and Mixtures Chemical Reactions 	 3.11 Spectroscopy and the Electromagnetic Spectrum 3.12 Properties of Photons 3.13 Beer-Lambert Law 4.1 Introduction for Reactions 4.2 Net Ionic Equations 4.3 Representations of Reactions 4.4 Physical and Chemical Changes
Day 6 07/19 (토)	4. Chemical Reactions	4.5 Stoichiometry4.6 Introduction to Titration4.7 Types of Chemical Reactions4.8 Introduction to Acid-Base Reactions4.9 Oxidation-Reduction (Redox) Reactions
Day 7 07/23 (수)	5. Kinetics	5.1 Reaction Rates 5.2 Introduction to Rate Law 5.3 Concentration Changes over Time 5.4 Elementary Reactions 5.5 Collision Model 5.6 Reaction Energy Profile
Day 8 07/26 (토)	5. Kinetics	5.7 Introduction to Reaction Mechanism 5.8 Reaction Mechanism and Rate Law 5.9 Pre-Equilibrium Approximation 5.10 Multistep Reaction Energy Profile 5.11 Catalysis
Day 9 07/30 (수)	6. Thermochemistry	 6.1 Endothermic and Exothermic Processes 6.2 Energy Diagrams 6.3 Heat Transfer and Thermal Equilibrium 6.4 Heat Capacity and Calorimetry 6.5 Energy of Phase Changes 6.6 Introduction to Enthalpy of Reactions
Day 10 08/02 (토)	6. Thermochemistry 7. Equilibrium	6.7 Bond Enthalpies 6.8 Enthalpy of Formation 6.9 Hess's Law 7.1 Introduction to Equilibrium 7.2 Direction of Reversible Reactions 7.3 Reaction Quotient and Equilibrium Constant 7.4 Calculating the Equilibrium Constant 7.5 Magnitude of the Equilibrium Constant
Day 11 08/06 (수)	7. Equilibrium	7.5 Magnitude of the Equilibirum Constant 7.6 Properties of the Equilibrium Constant 7.7 Calculating Equilibrium Concentrations 7.8 Representations of Equilibrium
Day 12 08/09 (토)	7. Equilibrium	7.9 Introduction to Le Chatelier's Principle 7.10 Reaction Quotient and Le Chatelier's Principle 7.11 Introduction to Solubility Equilibria 7.12 Common-Ion Effect
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Date	Торіс	Section
Day 1		1.1 Change in Tandem
07/02 (스)	1. Polynomial and Rational Functions	1.2 Rates of Change
07/02 (干)		1.3 Rates of Change in Linear and Quadratic Functions
Day 2		1.4 Polynomial Functions and Rates of Change
07/05 (토)		1.5 Polynomial Functions and Complex Zeros
Day 3		1.6 Polynomial Functions and End Behavior
07/09 (수)		1.7 Rational Functions and End Behavior
Day 4		1.8 Rational Functions and Zeros
07/12 (토)		1.9 Rational Functions and Vertical Asymptotes
		1.10 Rational Functions and Holes
Day 5		1.11 Equivalent Representations of Polynomial and Rational
07/16 (수)		Expressions
		1.12 Transformations of Functions
Day 6		1.13 Function Model Selection and Assumption Articulation
07/19 (토)		1.14 Function Model Construction and Application
Day 7		2.1 Change in Arithmetic and Geometric Sequences
07/23 (수)	2. Exponential and Logarithmic Functions	2.2 Change in Linear and Exponential Functions
Day 0		2.3 Exponential Functions
		2.4 Exponential Function Manipulation
07/26 (도)		2.5 Exponential Function Context and Data Modeling
		2.6 Competing Function Model Validation
Day 9		2.7 Composition of Functions
07/30 (수)		2 2.8 Inverse Functions
		2.0. Logarithmic Everacions
Day 10		2.9 Logantific Expressions
08/02 (토)		2.10 Inverses of Exponential Functions
		2.11 Logarithmic Functions
		2.12 Logarithmic Function Manipulation
Day 11		2.13 Exponential and Logarithmic Equations and Inequalities
08/06 (수)		2.14 Logarithmic Function Context and Data Modeling
		2.15 Semi-log Plots
Day 12	2. Exponential and Logarithmic Functions	3.1 Periodic Phenomena
08/09 (토)	3. Trigonometric and Polar Functions	3.2 Sine, Cosine, and Tangent
, , ,		3.3 Sine and Cosine Function Values

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