



## Smarthinking provides help in a wide variety of Science topics

### Biology

- Chemistry of Life
- Evolution
- Cells
- Molecules
- Energy
- DNA
- Genetics
- Biodiversity
- Plant Form and Function
- Physiology
- Ecology

*Smarthinking tutorial support aligns with the AP<sup>®</sup> Biology course\*.*

### Introductory Human Anatomy & Physiology

- Structure and function of the human body, life processes, directional terms, body planes, and cavities
- Structure, classification, and function of cells, tissues, membranes, organs, and muscular, skeletal, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems
- Disorders of the respective systems and treatments

### General Chemistry

- Measurement and Units
- Atomic Structure
- Chemical Formulas, Nomenclature & Reaction Equations
- Chemical Reactions – Precipitation, Redox, Acid-Base, Gas-Forming, etc.
- Thermochemistry
- Electron Configurations
- Periodic Table Trends
- VSEPR
- Valence Bond Theory
- Introduction to Molecular Orbital Theory
- Properties and Characteristics of Solids, Liquids and Gases
- Solubility
- Kinetics
- Acids & Bases
- Gaseous Equilibria
- Aqueous Equilibria
- Entropy & Free Energy
- Galvanic and Electrolytic Cells
- Nuclear Equations
- Basic Organic Nomenclature & Functional Groups

*Smarthinking tutorial support aligns with standard first-year chemistry curricula and the AP<sup>®</sup> Chemistry course\*.*

## Physics

- Kinematics
- Forces and Newton's Laws of Motion
- Work and Energy
- Circular Motion
- Momentum
- Simple and Harmonic Motion
- Fluids
- Heat and Temperature
- The Ideal Gas Law
- Thermodynamics
- Electric Forces and Electric Fields
- Electric Circuits
- Magnetic Forces and Fields
- Optics
- Special Relativity
- Particles and Waves
- Nuclear Physics and Radioactivity
- Waves and Sound
- Electromagnetic Waves

*Smarthinking tutorial support aligns with the AP<sup>®</sup> Physics 1 & 2, AP<sup>®</sup> Physics C (Mechanics), AP<sup>®</sup> Physics C (Electricity & Magnetism) courses\*.*

## Organic Chemistry

- Atomic orbital hybridization, covalent bonding, electronegativity, resonance, Lewis acid-base theory
- Functional groups and nomenclature
- Structure, properties, and reactions of alkanes, alkenes, alkynes, cycloalkanes
- Aromaticity, properties and reactions of aromatic hydrocarbons
- Structure, properties and reactions of alkyl halides, alcohols, ethers, epoxides, aldehydes, ketones, amines, carboxylic acids and carboxylic acid derivatives
- Common reaction mechanisms: free radical chain mechanism, electrophilic addition, nucleophilic substitution, elimination, electrophilic substitution, nucleophilic acyl addition. Stereochemistry: E/Z-isomers, R/S-isomers, Fischer projections, enantiomers, diastereomers, optical activity

Topics supported will be of interest to students preparing for MCAT<sup>™</sup> Organic Chemistry.

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