

SAT Chemistry Check List

- **Unit 1- Intro to Chemistry**
 - Physical Properties
 - Chemical Properties
 - Elements and Compounds
 - Homogeneous & Heterogeneous Substances
 - Forms of Energy
 - Endothermic & Exothermic
 - Temperature
 - Freezing Point
 - Thermometry
 - Celsius & Kelvin
 - Phases of Matter
 - Phase changes
 - Vapor Pressure
 - Boiling Point
 - Heat of Fusion
 - Heat of Vaporization
 - Sublimation

- **Unit 2- Chemistry Math Skills**
 - Significant Figures
 - Significant Figures- Add
 - Significant Figures- Subtract
 - Significant Figures- Multiplication
 - Significant Figures- Division
 - Factor Label Method and Conversions

- **Unit 3- Nuclear Chem**
 - Natural Radioactivity
 - Radioactive Particles
 - Radiation Penetrating Power
 - Separating Nuclear Emanations
 - Alpha Decay
 - Beta Decay
 - Half Life
 - Binding Energy & Mass Defect
 - Artificial Transmutation
 - Fission
 - Fusion
 - Nuclear Reactions

- Radiation Detection Devices
- Uses of Radioactive Isotopes
- Radioactive Wastes
- Accelerators
- Nuclear Equations

- **Unit 4 Atomic Structure**
 - Rutherford's Gold Foil Experiment
 - Atom Particles
 - Nuclear Charge
 - Nucleons
 - Atomic Number
 - Atomic Mass Number
 - Determining the Number of Neutrons
 - Atomic Mass Unit Standard
 - Isotopes
 - Hydrogen Isotopes
 - Fractional Atomic Masses
 - Principal Energy Levels
 - Energy Levels
 - Spectrum
 - Isoelectronic Structures
 - Principal Quantum Number
 - Sublevels & Orbitals
 - Ground State & Excited State
 - Electronic Configuration
 - Valence Electrons

- **Unit 5- Periodicity and Atomic Structure**
 - Periodic Table
 - Chemistry of a Period
 - Chemistry of a Group
 - Atomic Radii
 - Ionic Radii
 - Ionization Energy
 - Metals- Ionization Energy
 - Nonmetals- Ionization Energy
 - Electronegativity
 - Valence Electrons
 - Transition Elements
 - Metalloids
 - Chemistry of Metals
 - Chemistry of Nonmetals

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- Alkali Group
- Alkaline Earth Group
- Carbon Group
- Nitrogen Group
- Oxygen Group
- Halogen Group
- Noble Group
- **Unit 6- Intro to Bonding**
 - Energy Changes in Bonding
 - Degree of Ionic Character
 - Ionic Bonding
 - Nonpolar Covalent Bond
 - Polar Covalent Bond
 - Coordinate Covalent Bond
 - Metallic Bond
 - Nonpolar Molecular Substances
 - Polar Molecular Substances
 - Network Substances
 - Ionic Substances
 - Oxidation Numbers- Formulas
- **Unit 7- Molecular Structure and IMF**
 - Molecules
 - Van der Waal's Force (London Dispersion, Dipole-Dipole, Ion Dipole)
 - Hydrogen Bonding
 - Shapes of Molecules
 - Chemical Formula
 - Nomenclature
 - Acids
- **Unit 8- Organic Chemistry**
 - Properties of Organic Compounds
 - Hydrocarbon Compounds
 - Alkanes
 - Alkenes
 - Alkynes
 - Alkadienes
 - Homologous Series
 - Benzene Series
- Primary Alcohols
- Secondary Alcohols
- Tertiary Alcohols
- Dihydroxy Alcohols
- Trihydroxy Alcohols
- Organic Acids
- Hydrocarbon Isomers
- Nonhydrocarbon Isomers
- Substitution Reactions
- Addition Reactions
- Esterification
- Saponification
- Polymerization
- Fermentation
- Hydrogenation
- Alkyl Halides
- Aldehydes
- Ketones
- Ethers
- Condensation Polymers
- Addition Polymers
- Petroleum Production
- Fraction Distillation
- Cracking Process
- **Unit 9 – Reactions**
 - Chemical Equations
 - Synthesis
 - Decomposition
 - Single Replacement
 - Using Standard Electrode Potential Tables
 - Oxidation Numbers- Formulas
 - Oxidation Numbers- Radicals
 - Oxidation
 - Reduction
 - Change in Oxidation Number
 - Oxidizing Agents
 - Reducing Agents
 - Redox Identification
 - Balancing Redox Equations
 - Ion Electron Equations- Reduction
 - Ion Electron Equations- Oxidation
 - Double Replacement

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- **Unit 10 - Stoichiometry**
 - Gram- Atomic Mass
 - Gram Molecular Mass
 - Mole
 - Gram- Mole Conversions
 - Liter- Mole Conversions
 - Particles- Mole Conversions
 - Mole- Particles Conversions
 - Mole- Gram Conversions
 - Particle- Mole- Liter Conversions
 - Gram- Liter Conversions
 - Gram- Particle Conversions
 - Weight of an Atom
 - Density
 - Density- Molecular Weight
 - Percentage Composition
 - Empirical Formulas
 - Molecular Formulas
 - Equations: Mole- Mole
 - Equations: Mole- Liter
 - Equations: Mass- Mass
 - Equations: Liter- Liter
 - Equations: Mass- Volume
 - Equations: Molecule- Molecule

- **Unit 11- Thermo chemistry and Thermodynamics**
 - Thermometry
 - Celsius & Kelvin
 - Calorimetry
 - Phases of Matter
 - Phase changes
 - Heat of Fusion
 - Heat of Vaporization
 - Heat of Formation
 - Heat of Reactions
 - Compound Stability
 - Hess Law – Direct Method
 - Enthalpy
 - Entropy
 - Gibb's Free Energy
 - Haber Process
 - Contact Process

- **Unit 12 – Gases**
 - Boyle's Law
 - Charles' Law
 - Combined Gas Law
 - Kinetic Theory
 - Ideal Gas Law Behavior
 - Deviation From the Gas Laws
 - Avogadro's Hypothesis
 - Mole Relationships
 - Determine the Volume of a Mole of Gas

- **Unit 13- Liquids and Solids**
 - Phase changes
 - Sublimation
 - Vapor Pressure
 - Boiling Point
 - Phase Diagrams
 - Triple Point
 - Critical Point
 - Types of solids
 - Nonpolar Molecular Substances
 - Polar Molecular Substances
 - Network Substances
 - Ionic Substances

- **Unit 14- Solutions**
 - How Things Dissolve
 - Solubility- Solutions
 - Solubility- Gases
 - Saturated- Unsaturated- Supersaturated
 - Using Solubility Charts
 - Molar & Molal
 - Molar Solution Problems
 - Molar Dilution Problems
 - Molar Freezing Point Depression
 - Molar Boiling Point Elevation
 - Percent Error

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- **Unit 15- Kinetics**
 - Factors Affecting Reaction Rates
 - Nature of the Reactants
 - Reaction Rates- Gases
 - Activation Energy
 - Catalyst
- **Unit 16- Equilibrium**
 - Lechatelier's Principle- Add
 - Lechatelier's Principle- Remove
 - Lechatelier's Principle- Pressure
 - Lechatelier's Principle- Temperature
 - Lechatelier's Principle- Catalyst
 - Equilibrium
 - Interpreting K Values
 - Interpreting K_{sp} Values
 - Equilibrium Expressions
- **Unit 17 – Acids and Bases**
 - Electrolytes
 - Nonelectrolytes
 - Factors Affecting Boiling Points
 - Factors Affecting Freezing Points
 - Reacting Going to Completion
 - Acid Nomenclature
 - Conjugate Acid- Base Pairs
 - Conjugate Acid & Base Strength
 - Ionization of Diprotic Acids
 - Amphiprotic Species
 - Amphoteric Hydroxides
 - Indicators
 - Neutralization
 - Titration- Mole Method
 - Titration- Equivalent Method
 - End Point- pH
 - K_w
 - Molarity- pH
 - $[H^+] < - > [OH^-]$
 - $pH \rightarrow []$
 - Common Ion Effect
 - Interpreting K_a
 - Hydrolysis- Neutral Salts
 - Hydrolysis- Basic Salts
 - Hydrolysis- Acid Salts
 - Hydrolysis & pH
- **Unit 18 – Electrochemistry**
 - Total E Zero Values
 - Standard E Zero
 - Using Standard Electrode Potential Tables
 - Electrochemical Cell
 - Electrolytic Cell
 - Active Metals & Water
 - Electrolysis of Brine
 - Electroplating
 - Reduction of Metals
 - Corrosion
 - Lead Acid Battery
 - Nickel- Cadmium Battery