

# Year at a Glance Chemistry APA 2022-2023



## Readiness, Supporting, Process TEKS

1 <sup>st</sup> Grading Period	2 <sup>nd</sup> Grading Period
<p><b>Matter</b></p> <ul style="list-style-type: none"> <li>Matter vs. Energy (TEKS C.9B)</li> <li>Kinetic Theory / States: Solid, liquid, gas in terms of compressibility, structure, shape, and volume (TEKS C.9B, TEKS C.4C)</li> <li>Phys/Chem. Properties and Changes (TEKS C.4A)</li> <li>Intensive/Extensive properties (TEKS C.4B)</li> <li>Mixtures/pure substances (TEKS C.4D)</li> <li>Heat of fusion and heat of vaporization (ENE-2)</li> <li>Energy and phase change (ENE-2)</li> <li>% Composition of mixtures (SPQ-2.B)</li> </ul> <p><b>Atomic History and Periodic Table</b></p> <ul style="list-style-type: none"> <li>History of Periodic Table (TEKS C.5A), (TEKS C.3F)</li> <li>Families on Periodic Table: alkali metals, alkaline earth metals, halogens, noble gases, transition metals, (TEKS C.5B)</li> <li>Atomic theory: Dalton, Thomson, Rutherford, Bohr (TEKS C.6A), (TEKS C.3F)</li> <li>Calculate average atomic mass using Isotopes (TEKS C.6C)</li> <li>Mass spectrometry data to determine isotopes in elemental sample (SPQ-1.B)</li> </ul> <p><b>The Electrons and Periodic Table</b></p> <ul style="list-style-type: none"> <li>Trends of Periodic Table: atomic radii, electronegativity, ionization energy (TEKS C.5C)</li> <li>Atomic arrangement in Lewis dot structures (TEKS C.6D)</li> <li>Electron configuration of atoms (TEKS C.6D) of ions (SAP-1.A)</li> <li>Electromagnetic Spectrum with relationship to energy, frequency, and wavelength (TEKS C.6B)</li> <li>Aufbau principle (SAP-1.A)</li> <li>Nuclear charge and electron shielding on periodicity (SAP-2.A)</li> </ul>	<p><b>Compounds</b></p> <ul style="list-style-type: none"> <li>Bonding: properties of ionic, covalent, and metallic compounds (TEKS C.7C, TEKS C.7D)</li> <li>Electron dot structures to illustrate ionic and covalent bonding (TEKS C.7C)</li> <li>VESPR: linear, trigonal planar, tetrahedral (TEKS C.7E)</li> <li>Compare and contrast ionic and covalent bonding (SAP-3.A)</li> <li>Illustrate ionic and metallic bonding using models (SAP-3C, SAP-3D)</li> <li>Compare and contrast intra- and inter-molecular forces (SAP-5.A)</li> </ul> <p><b>The Mole</b></p> <ul style="list-style-type: none"> <li>Define mole (TEKS C.8A)</li> <li>Calculate number of moles, molecules and atoms of solids, liquids, and gases (TEKS C.8B, TEKS C.2G, C.8G, SPQ-1.A)</li> <li>Percent composition (TEKS C.8C)</li> <li>Empirical formula vs Molecular formula (TEKS C.8D)</li> <li>Calculate empirical and molecular formulas (SPQ-1.A)</li> </ul> <p><b>Reactions</b></p> <ul style="list-style-type: none"> <li>Types of Reactions (TEKS C.8F) <ul style="list-style-type: none"> <li>Double Replacement</li> <li>Redox Reactions: Synthesis, Decomposition, Single Replacement &amp; Combustion</li> </ul> </li> <li>Predict products in acid-base reactions that form water (TEKS C.10G)</li> </ul>
<p><b>Nomenclature</b></p> <ul style="list-style-type: none"> <li>Name ionic and covalent compounds, acids and bases (TEKS C.7A)</li> <li>Write ionic and covalent formulas, acids and bases (TEKS C.7B)</li> </ul>	<p><b>District Semester Exam</b></p>

### 3<sup>rd</sup> Grading Period

#### Stoichiometry

- Balance equations/Law of Conservation of Mass (TEKS C.8E)
- Stoichiometric calculation (TEKS C.8G)
- Mass relationships between reactants and products (TEKS C.8G)
- Limiting reagents (TEKS C.8H)
- Percent yield (TEKS C.8G)

#### Gas Laws

- Kinetic theory (TEKS C.9B)
- Ideal Gas vs Non Ideal gas (TEKS C.9A)
- Boyle's, Charles', Gay-Lussac's, Avogadro's, Dalton's Laws and Ideal Gas calculations (TEKS C.9A)
- Gas Stoichiometry (TEKS C.8G)
- Properties of non-ideal gases (SAP-7.C)

#### Solutions and Kinetics

- Role of water in solutions (polarity) (TEKS C.10A)
- Solubility Rules (TEKS C.10B)
- Types of solutions: electrolyte, nonelectrolyte, saturated, unsaturated, super saturated (TEKS C.10E)
- Rate of dissolving (TEKS C.10F)
- Calculate Molarity of solutions (TEKS C.10C)
- Use molarity to calculate dilutions (TEKS C.10D)
- Identify precipitation reactions (TEKS C.8F)
- Balance net ionic equations (TRA-1.B)
- Balance redox reactions using half-reactions (TRA-2.C)
- Factors that influence rate of a reaction (TRA-3.A)
- Determine the order of a reaction when given the rate law equation (TRA-3.B)
- Identify rate law expression using concentration vs time data (TRA-3.C)

### 4<sup>th</sup> Grading Period

#### Acids and Bases and Equilibrium

- Acids/Bases (TEKS C.10G)
  - Definitions
  - Arrhenius
  - Bronsted-Lowry
- Define and calculate pH and pOH (TEKS C.10H, SAP-9.B)
- Identify acid-base reactions (TEKS C.8F)
- Relationship between pH and pOH in a solution of a monoprotic weak acid or base (SAP-9.C)
- Use a reversible reaction to explain equilibrium (TRE-6.A)
- Define and investigate LeChatelier's Principle (TRA-8.A)

#### Thermochemistry and Reaction Rates

- Types of Energy (TEKS C.11A)
- Law of Conservation of Energy/Heat transfer (TEKS C.11B)
- Identify and measure energy in chemical reactions/ Endothermic and exothermic (TEKS C.11C)
- Calculations: specific heat equation & calorimetry (TEKS C.11D)
- Calculate the enthalpy change using the standard enthalpies of formation (ENE-3.B)
- Define entropy (ENE-4.A)
- Calculate  $\Delta G^\circ$ , when given  $\Delta H^\circ$ ,  $\Delta S^\circ$ , and the temperature (ENE-4.C)

#### Nuclear Chemistry

- Nuclear energy (TEKS C.12A)
  - Alpha radiation
  - Beta radiation
  - Gamma radiation
- Fission and Fusion (TEKS C.12B)
- Radioactive decay/Balance equations (TEKS C.12A)

Review/Semester Exam/Final Project