Western Line SCHOOL DISTRICT

Pacing Guide
2024-2025 School Year

Chemistry

TERM 1	
Term 1 Dates	**MS College and Career Readiness Standards**
WK 1: Aug 6-16	**CHE.1.1** Use dimensional analysis (factor/label) and significant figures to convert units and solve problems
WK 2: Aug 19-23	**CHE.1.2** Design and conduct experiments using appropriate measurements, significant figures, graphical analysis to analyze data. **CHE.1.3 Enrichment:** Research information from multiple appropriate sources and assess the credibility, accuracy, possible bias, and conclusions of each publication.
Unit Assessment 1 ***Mathematical and Computational Analysis***	
WK 3: Aug 26-30	**CHE.2.1** Investigate the historical progression leading to the modern atomic theory, including, but not limited to, work done by Dalton, Rutherford's gold foil experiment, Thomson's cathode ray experiment, Millikan's oil drop experiment, and Bohr's interpretation of bright line spectra.
WK 4: Sept 2-6	**CHE.2.2** Construct models (e.g., ball and stick, online simulations, mathematical computations) of atomic nuclei to explain the abundance weighted average (relative mass) of elements and isotopes on the published mass of elements.
Mid-term OR Unit Assessment 2 *(WK 4.5/ WK 5)* ***CHE.2 Atomic Theory***	
WK 5: Sept 9-13	**CHE.2.3** Investigate absorption and emission spectra to interpret explanations of electrons at discrete energy levels using tools such as online simulations, spectrometers, prisms, flame tests, and discharge tubes. Explore both laboratory experiments and real-world examples
WK 6: Sept 16-20	**CHE.2.4** Research appropriate sources to evaluate the way absorption and emission spectra are used to study astronomy and the formation of the universe.
Unit Assessment 3 ***CHE.2 Atomic Theory***	
WK 7: Sept 23-27	**CHE.3.1** Explore and communicate the organization of the periodic table, including history, groups, families, family names, metals, nonmetals, metalloids, and transition metals.
WK 8: Sept 30- Oct 4	**CHE.3.2** Analyze properties of atoms and ions (e.g., metal/nonmetal/metalloid behavior, electrical/heat conductivity, electronegativity and electron affinity, ionization energy, and atomic/ionic radii) using periodic trends of elements based on the periodic table. **CHE.3.3** Analyze the periodic table to identify quantum numbers (e.g., valence shell electrons, energy level, orbitals, sublevels, and oxidation numbers).
Unit Assessment 4 *optional due to BMA* ***CHE.3 Periodic Table***	
WK 9: Oct 7-11	***Benchmark or Unit Assessment***

TERM 1	
Recurring Standards **Standards taught the first 4-5 weeks; the mid-term data will indicate remediation is needed.**	
WK 5: Sept 9-13	CHE.1.1, CHE.1.2 & CHE.1.3
WK 6: Sept 16-20	CHE.2.1
WK 7: Sept 23-27	CHE.2.2

Western Line SCHOOL DISTRICT

Pacing Guide
2024-2025 School Year

Chemistry

TERM 2	
Term 2 Dates	**MS College and Career Readiness Standards**
WK 1: Oct 14-18	**CHE.4.1** Develop and use models (e.g., Lewis dot, 3-D ball-stick, 3-D printing, or simulation programs such as PhET) to predict the type of bonding between atoms and the shape of simple compounds. **CHE.4.2** Use models such as Lewis structures and ball and stick models to depict the valence electrons and their role in the formation of ionic and covalent bonds. **CHE.4.3** Predict the ionic or covalent nature of different atoms based on electronegativity trends and/or position on the periodic table **CHE.4.4** Use models and oxidation numbers to predict the type of bond, shape of the compound, and the polarity of the compound.
WK 2: Oct 21-25	**CHE.4.5** Use models of simple hydrocarbons to exemplify structural isomerism. **CHE.4.6** Use mathematical and computational analysis to determine the empirical formula and the percent composition of compounds. **CHE.4.7** Use scientific investigation to determine the percentage of composition for a substance (e.g., sugar in gum, water and/or unpopped kernels in popcorn, percent water in a hydrate). Compare results to justify conclusions based on experimental evidence. **CHE.4.8** Plan and conduct controlled scientific investigations to produce mathematical evidence of the empirical composition of a compound.
Unit Assessment 1 Bonding	
WK 3: Oct 28- Nov 1	**CHE.5.1** Use the periodic table and a list of common polyatomic ions as a model to derive chemical compound formulas from compound names and compound names from chemical formulas. **CHE.5.2** Generate formulas of ionic and covalent compounds from compound names. Discuss compounds in everyday life and compile lists and uses of these chemicals.
WK 4: Nov 4-8	**CHE.5.3** Generate names of ionic and covalent compounds from their formulas. Name binary.
Mid-term OR Unit Assessment 2 *(WK 4.5/ WK 5)* ***Naming Compounds***	
WK 5: Nov 11-15	**CHE.12.1 Enrichment:** Construct explanations to explain the bonding characteristics of carbon that result in the formation of basic organic molecules.
WK 6: Nov 18-22	**CHE.12.2 Enrichment:** Obtain information to communicate the system used for naming the basic linear hydrocarbons and isomers that contain single bonds, simple hydrocarbons with double and triple bonds, and simple molecules that contain a benzene ring.
Unit Assessment 3 Organic Nomenclature	
WK 7: Dec 2-6	**CHE.12.3 Enrichment:** Develop and use models to identify the functional groups that form the basis of alcohols, ketones, ethers, amines, esters, aldehydes, and organic acids.
WK 8: Dec 9-13	Review
WK 9: Dec 16-20	***Benchmark OR Unit Assessment***

TERM 2	
Recurring Standards **Standards taught the first 4-5 weeks; the mid-term data will indicate remediation is needed.**	
WK 5: Nov 11-15	CHE.4.1, CHE 4.2, CHE.4.3 & CHE.4.4
WK 6: Nov 18-22	CHE.4.5, CHE.4.6, CHE.4.7 & CHE.4.8
WK 7: Dec 2-6	CHE.5.1 & CHE.5.2

Western Line SCHOOL DISTRICT

Pacing Guide
2024-2025 School Year

Chemistry

TERM 3	
Term 3 Dates	**MS College and Career Readiness Standards**
WK 1: Jan 6-10	**CHE.6.1** Develop and use models to predict the products of chemical reactions (e.g., synthesis reactions; single replacement; double displacement; and decomposition, including exceptions such as decomposition of hydroxides, chlorates, carbonates, and acids). Discuss and/or compile lists of reactions used in everyday life. **CHE.6.2** Plan, conduct, and communicate the results of investigations to demonstrate different types of simple chemical reactions. **CHE.6.3** Use mathematics and computational analysis to represent the ratio of reactants and products in terms of masses, molecules, and moles (stoichiometry)
WK 2: Jan 13-17	**CHE.6.4** Use mathematics and computational analysis to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. Give real-world examples (e.g., burning wood). **CHE.6.5** Plan and conduct a controlled scientific investigation to produce mathematical evidence that mass is conserved. Use percent error to analyze the accuracy of results. **CHE.6.6** Use mathematics and computational analysis to support the concept of percent yield and limiting reagent. **CHE.6.7** Plan and conduct a controlled scientific investigation to produce mathematical evidence to predict and confirm the limiting reagent and percent yield in the reaction. Analyze quantitative data, draw conclusions, and communicate findings. Compare and analyze class data for validity.
Unit Assessment 1 Chemical Reactions	
WK 3: Jan 20-24	**CHE.10.1 Enrichment:** Construct explanations to explain how temperature and heat flow in terms of the motion of molecules (or atoms). **CHE.10.2 Enrichment:** Classify chemical reactions and phase changes as exothermic or endothermic based on enthalpy values. Use a graphical representation to illustrate the energy changes involved
WK 4: Jan 27-31	**CHE.10.3 Enrichment:** Analyze and interpret data from energy diagrams and investigations to support claims that the amount of energy released or absorbed during a chemical reaction depends on changes in total bond energy. **CHE.10.4 Enrichment:** Use mathematical and computational thinking to solve problems involving heat flow and temperature changes, using known values of specific heat and latent heat of phase change.
Mid-term OR Unit Assessment 2 *(WK 4.5/ WK 5)* ***Thermochemistry (Enrichment)***	
WK 5: Feb 3-7	**CHE.9.1 Enrichment:** Analyze and interpret data to describe the properties of acids, bases, and salts.

WK 6: Feb 10-14	**CHE.9.2 Enrichment:** Analyze and interpret data to identify differences between strong and weak acids and bases (i.e., dissociation).
Unit Assessment 3	
WK 7: Feb 17-21	**CHE.9.3 Enrichment:** Plan and conduct investigations using the pH scale to classify acid and base solutions. **CHE.9.4 Enrichment:** Analyze and evaluate the Arrhenius, Bronsted-Lowry, and Lewis acid-base definitions.
WK 8: Feb 24-28	**CHE.9.5 Enrichment:** Use mathematical and computational thinking to calculate pH from the hydrogen-ion concentration. **CHE.9.6 Enrichment:** Obtain, evaluate, and communicate information about how buffers stabilize pH in acid-base reactions.
Unit Assessment 4 <u>Acids and Bases (Enrichment)</u> *optional due to BMA*	
WK 9: March 3-7	***BMA OR Unit Assessment***

TERM 3	
Recurring Standards **Standards taught the first 4-5 weeks; the mid-term data will indicate remediation is needed.**	
WK 5: Feb 3-7	CHE.6.1, CHE.6.2 & CHE.6.3
WK 6: Feb 10-14	CHE.6.4, CHE.6.5, CHE.6.6 & CHE.6.7
WK 7: Feb 17-21	CHE.10.1 & CHE.10.2

Western Line SCHOOL DISTRICT

Pacing Guide
2024-2025 School Year

Chemistry

TERM 4	
Term 4 Dates	**MS College and Career Readiness Standards**
WK 1: March 17-21	**CHE.7.1** Analyze the behavior of ideal and real gases in terms of pressure, volume, temperature, and number of particles. **CHE.7.2 Enrichment:** Use an engineering design process to develop models (e.g., online simulations or student interactive activities) to explain and predict the behavior of each state of matter using the movement of particles and intermolecular forces to explain the behavior of matter.*
WK 2: March 24-28	**CHE.7.3** Analyze and interpret heating curve graphs to explain the energy relationship between states of matter (e.g., thermochemistry-water heating from -20o C to 120o C). **CHE.7.4** Use mathematical computations to describe the relationships comparing pressure, temperature, volume, and number of particles, including Boyle's law, Charles's law, Dalton's law, combined gas laws, and ideal gas laws. **CHE.7.5 Enrichment:** Use an engineering design process and online simulations or lab investigations to design and model the results of controlled scientific investigations to produce mathematical evidence that confirms the gas-laws relationships.*
Unit Assessment 1	
WK 3: March 31- April 4	**CHE.7.6** Use the ideal gas law to support the prediction of volume, mass, and number of particles produced in chemical reactions (i.e., gas stoichiometry). **CHE.7.7** Plan and conduct controlled scientific investigations to produce mathematical evidence that confirms that reactions involving gases conform to the law of conservation of mass. **CHE.7.8 Enrichment:** Using gas stoichiometry, calculate the volume of carbon dioxide needed to inflate a balloon to occupy a specific volume. Use an engineering design process to design, construct, evaluate, and improve a simulated air bag.*
WK 4: April 7-11	**CHE.8.1** Use mathematical and computational analysis to quantitatively express the concentration of solutions using the concepts such as molarity, percent by mass, and dilution. **CHE.8.2** Develop and use models (e.g., online simulations, games, or video representations) to explain the dissolving process in solvents on the molecular level. **CHE.8.3** Analyze and interpret data to predict the effect of temperature and pressure on solids and gases dissolved in water.
Mid-term OR Unit Assessment 2 *(WK 4.5/ WK 5)*	
WK 5: April 14-18	**CHE.8.4** Design, conduct, and communicate the results of experiments to test the conductivity of common ionic and covalent compounds in solution.

	CHE.8.5 Use mathematical and computational analysis to analyze molarity, molality, dilution, and percentage dilution problems. **CHE.8.6** Design, conduct, and communicate the results of experiments to produce a specified volume of a solution of a specific molarity, and dilute a solution of a known molarity
WK 6: April 21-25	**CHE.8.7** Use mathematical and computational analysis to predict the results of reactions using the concentration of solutions (i.e., solution stoichiometry). **CHE.8.8 Enrichment:** Investigate parts per million and/or parts per billion as it applies to environmental concerns in your geographic region, and reference laws that govern these factors.
Unit Assessment 3	
WK 7: April 28- May 2	**CHE.11.1 Enrichment:** Construct explanations to explain how to use Le Chatelier's principle to predict the effect of changes in concentration, temperature, and pressure. **CHE.11.2 Enrichment:** Predict when equilibrium is established in a chemical reaction. **CHE.11.3 Enrichment:** Use mathematical and computational thinking to calculate an equilibrium constant expression for a reaction.
Unit Assessment 4 *optional due to BMA*	
WK 8: May 5-9	*Review for benchmark*
WK 9: May 12-21	***BMA OR EOC Assessment***

TERM 4	
Recurring Standards **Standards taught the first 4-5 weeks; the mid-term data will indicate remediation is needed.**	
WK 5: April 14-18	CHE.7.1 & CHE.7.2
WK 6: April 21-25	CHE.7.3, CHE.7.4 & CHE.7.5
WK 7: April 28- May 2	CHE.7.6, CHE.7.7 & CHE.7.8