Madison County Schools

Chemistry Pacing Guide

UNIT TOPIC	OBJECTIVE COVERED	TIME LENGTH
1st Nine Weeks		
Laboratory Equipment Measurement and Safety Rules • **Lab Safety Rules/Procedures** • **Accuracy/Precision** • **Identifying/Measuring using lab equipment**	CHE.1.2 Design and conduct experiments using appropriate measurements, significant figures, graphical analysis to analyze data.	2-3 blocks
Intro to Chemistry/Matter • **What is Chemistry?** • **Classification of Matter** • **Scientific Inquiry** • **Heating curves**	CHE.1.2 Design and conduct experiments using appropriate measurements, significant figures, graphical analysis to analyze data. CHE 7.3 Analyze and interpret heating curve graphs to explain the energy relationship between states of matter.	1-2 blocks
Atomic Theory and Structure • **History of the atom** • **Study work done by (but not limited to): Dalton, Rutherford, Thomson, Milikan, and Bohr** • **Structure of the Atom: subatomic particles** • **Atomic Number, Mass number, Atomic symbol, isotopes, average atomic mass**	CHE.2 Students will demonstrate an understanding of the atomic structure and the historical developments leading to modern atomic theory (CHE.2.1-2.4)	3-5 blocks
Quantum Theory • **Emission Spectrum** • **Quantum Model of the Atom** • **Electron Configurations**	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	4-6 blocks

	both laboratory experiments and real-world examples. CHE.3.3 Analyze the periodic table to identify quantum numbers (e.g., valence shell electrons, energy level, orbitals, sublevels, and oxidation numbers).	
2nd Nine Weeks		
Periodic Table • **History of the Periodic Table** • **Periodic Trends (electron configurations, ionization energy, atomic/ionic radii, electronegativity, electron affinity, metallic character)**	CHE.3 Students will demonstrate an understanding of the periodic table as a systematic representation to predict properties of elements.	4-6 blocks
Bonding • **Covalent Bonding** • **Ionic Bonding** • **Metallic Bonding** • **Molecular Geometry** • **Lewis dot, Lewis structures** • **Molecular polarity** • **Structural isomerism**	CHE.4 Students will demonstrate an understanding of the types of bonds and resulting atomic structures for the classification of chemical compounds.	4-6 blocks
Nomenclature • **Name and write formulas for ionic compounds-binary, ternary and stock** • **Name and write formulas for covalent compounds** • **Name and write formulas for acids-binary and ternary**	CHE 5 Students will investigate and understand the accepted nomenclature used to identify the name and chemical formulas of compounds.	4-6 blocks
3rd Nine Weeks		
Chemical Reactions • **Describe Chemical Reactions**	CHE 6 Students will demonstrate an understanding of the types, causes, and effects of chemical reactions.	4-6 blocks

• **Types of Reactions: Synthesis, Decomposition, Combustion, Single Replacement, Double Replacement** • **Predicting Products for all types of reactions**		
Chemical Quantities • **Mole Conversions** • **Empirical Formula** • **Molecular Formula** • **Percent Composition** • **Dimensional Analysis/Factor Label Method**	CHE 1 Students will use mathematical and computational analysis to evaluate problems. 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 composition for a substance. CHE 4.8 Plan and conduct controlled scientific investigations to produce mathematical evidence of the empirical composition of a compound.	4-6 blocks
Stoichiometry • **Mole ratios** • **Conservation of mass** • **Percent error** • **Percent yield** • **Limiting reactants**	CHE 6.3 Use mathematics and computational analysis to represent the ratio of reactants and products in terms of masses, molecules, and moles.	4-6 blocks
4th Nine Weeks		
Gas Laws • **Real vs ideal gases** • **Boyle's, Charles's, Dalton's, combined, and ideal gas laws**	CHE 7 Students will demonstrate an understanding of the structure and behavior of gases.	4-6 blocks

Solutions • **Concentration** • **Dissolving process** • **Effect of temp and pressure** • **Conductivity** • **Dilutions**	CHE 8 Students will demonstrate an understanding of the nature of properties of various types of chemical solutions.	4-6 blocks