Chemistry Curriculum Map

Six weeks	Unit	Unit Focus	Chemistry Essential Standards	Literacy in Science &Technical Subjects/ 8 Mathematical Practices
First	Introductory Chemistry Material	- Density - Significant Digits - Metric Conversion - Dimensional Analysis - Scientific Notation	Embedded in all standards	**Literacy and Mathematical Practices :** Make sense of scientific notation in that students must be able to put numbers into and out of scientific notation and perform basic operations on a scientific calculator. Students must be able to utilize the concept of density to determine mass, volume, and density of any substance. Students must be able to utilize dimensional analysis to convert from one metric unit to another. Students must be able to manipulate numerical data to the correct number using proper significant figures based upon addition/subtraction, multiplication/division. **Writing:** Formal Lab Report on Density
First	Matter and the Atom	- Matter - Substances - Mixtures - Atoms - Elements - Compounds - Subatomic Particles - Isotopes - Average Atomic Mass - Radioactive	Chm.1.1.1 Chm.1.1.2 Chm.1.1.3 Chm.1.1.4	**Literacy and Mathematical Practices:** Students will be able to analyze the structure of atoms, isotopes, and ions. Students will be able to analyze an atom in terms of the location electrons. Students will be able to explain the emission of electromagnetic radiation in spectral form in terms of the Bohr model. Students will be able to explain the process of radioactive decay by the use of nuclear equations and half-life. **Writing:**

Chemistry Curriculum Map

		Particles		Formal Lab Report on Average Atomic Mass
First	Radioactivity	- Decay - Transmutation - Half-life	Chm.1.1.4	**Literacy and Mathematical Practices:** Students will be able to explain the process of radioactive decay by the use of nuclear equations and half-life.
First	The Electron and Periodic Table	-Bohr Model -Quantum Mechanics -Periodic Properties -Dot Diagram	Chm.1.1.2 Chm.1.1.3 Chm.1.3.1 Chm.1.3.2 Chm.1.3.3	**Literacy and Mathematical Practices:** Students will be able to analyze an atom in terms of the location electrons. Students will be able to explain the emission of electromagnetic radiation in spectral form in terms of the Bohr model. Students will be able to classify the components of a periodic table (period, group, metal, metalloid, nonmetal, transition). Students will be able to infer the physical properties (atomic radi metallic and nonmetallic characteristics) of an element based on its position on the Periodic Table. Students will be able to infer the atomic size, reactivity, electronegativity, and ionization energy of an element from its position in the Periodic Table. Students will be able to classify the components of a periodic table (period, group, metal, metalloid, nonmetal, transition). Student will be able to infer the physical properties (atomic radius, metallic and nonmetallic characteristics) of an element based on its position on the Periodic Table. Student will be able to infer the atomic size, reactivity, electronegativity, and ionization energy

Chemistry Curriculum Map

				Writing: Formal Report on Elements, reactivity, and their properties
Second	Inorganic Nomenclature	- Binary Compounds - Ternary Compounds - Formula Units - Polyatomic Ions - IUPAC	Chm.1.2.4 Chm.1.2.5	**Literacy and Mathematical Practices:** Students will be able to interpret the name and formula of compounds using IUPAC convention. Students will be able to compare the properties of ionic, covalent metallic, and network compounds. **Writing:** Formal Report on an Ionic Compound
Second	Molecular Structures and Compounds	- Lewis Structures - VESPR - Resonance Structures - Multiple Bonds - Molecular Nomenclature - Acid/Base Nomenclature	Chm.1.2.1 Chm.1.2.2 Chm.1.2.4	**Literacy and Mathematical Practices:** Students will be able to compare (qualitatively) the relative strengths of ionic, covalent, and metallic bonds. Students will be able to infer the type of bond and chemical formula formed between atoms. Students will be able to interpret the name and formula of compounds using IUPAC convention. **Writing:** Formal Report on the synthesis of Methane.

Chemistry Curriculum Map

Second	Chemical Equations	- Synthesis - Decomposition - Single Replacement/Displacement - Double Replacement/Displacement - Combustion - Law of Conservation of Mass - Chemical change indicators - Balancing reactions	Chm.2.2.2 Chm.2.2.3	**Literacy and Mathematical Practices:** Students will be able to analyze the evidence of chemical change. Students will be able to analyze the law of conservation of matter and how it applies to various types of chemical equations (synthesis, decomposition, single replacement, double replacement, and combustion). **Writing:** Formal Lab Report the five types of Chemical Reactions
Second	The MOLE	- Avogadro's Number - Percentage composition - Molar mass - Empirical formula - Molecular formula - hydrates	Chm.2.2.4 Chm.2.2.5	**Literacy and Mathematical Practices:** Students will be able to analyze the stoichiometric relationships inherent in a chemical reaction. Students will be able to analyze quantitatively the composition of a substance (empirical formula, molecular formula, percent composition, and hydrates). **Writing:** Formal Report on a Hydrate Lab
Third	Stoichiometry	-percent yield -Dimensional Analysis -Reaction product analysis	Chm.2.2.4	**Literacy and Mathematical Practices:** Students will be able to analyze the stoichiometric relationships inherent in a chemical reaction. . **Writing:** Formal Report on the production of table salt during a

				double displacement reaction
Third	Intermolecular Forces and Changes of State	- Ionic Bonding - Covalent Bonding - Metallic Bonding - Intra-molecular particle forces - Inter-molecular particle forces -Phase change Diagram -Heating Curve	Chm.1.2.1 Chm.1.2.2 Chm.1.2.3 Chm.2.1.1 Chm.2.1.2 Chm.2.1.3	**Literacy and Mathematical Practices:** Student will be able to compare (qualitatively) the relative strengths of ionic, covalent, and metallic bonds. Student will be able to infer the type of bond and chemical formula formed between atoms. Student will be able to compare inter- and intra- particle forces. Student will be able to explain the energetic nature of phase changes. Students will be able to explain heating and cooling curves (heat of fusion, heat of vaporization, heat, melting point, and boiling point). Students will be able to interpret the data presented in phase diagrams. **Writing:** Formal Lab Report on the solution process of Ammonium chloride and Sodium Hydroxide to produce an exothermic reaction
Third	Gas Laws	- Combined Gas Law - Boyle's Law - Charlie' Law - Gay Lussac's Law - Inert ideal gas law equation	Chm.2.1.5 Chm.2.2.3 Chm.2.2.4	**Literacy and Mathematical Practices :** Students will be able to explain the relationships between pressure, temperature, volume, and quantity of gas both qualitative and quantitative. Students will be able to analyze the law of conservation of matter and how it applies to various types of chemical equations (synthesis, decomposition, single replacement,

				double replacement, and combustion). Students will be able to analyze the stoichiometric relationships inherent in a chemical reaction. **Writing:** Formal Lab Report on Charles' Law Formal Lab Report on the production of a gas
Third	Solutions	- Molarity - Solvent - Solute - Dilution - Titration - Saturated - Supersaturated - Unsaturated	Chm.3.2.3 Chm.3.2.4 Chm.3.2.5 Chm.3.2.6	**Literacy and Mathematical Practices:** Students will be able to infer the quantitative nature of a solution (molarity, dilution, and titration with a 1:1 molar ratio). Students will be able to summarize the properties of solutions. Students will be able to interpret solubility diagrams. Students will be able to explain the solution process. **Writing:** Formal Lab Report on Titration
Third	Thermo-dynamics And Equilibrium	- Entropy - Enthalpy - Specific Heat - Equilibrium - Le Chatelier's Principle - Calorimetry	Chm.3.1.2 Chm.3.1.3 Chm.2.1.4	**Literacy and Mathematical Practices:** Students will be able to explain the conditions of a system at equilibrium. Student will be able to infer the shift in equilibrium when a stress is applied to a chemical system (Le Chatelier's Principle).

Chemistry Curriculum Map

				Students will be able to infer simple calorimetric calculations based on the concepts of heat lost equals heat gained and specific heat.
Third	Acids and Bases	- Acid - Base - pH Scale - hydronium - hydroxide - titration - neutralization equation	Chm.3.2.1 Chm.3.2.2	**Literacy and Mathematical Practices:** Students will be able to classify substances using the hydronium and hydroxide ion concentrations. Students will be able to summarize the properties of acids and bases. **Writing:** Formal Report on the Neutralization of an Acid
Third	Redox	- reduction - oxidation - Oxidation state - Oxidizing agent - Reducing agent - Balancing equation	Chm.2.2.3	**Literacy and Mathematical Practices:** Students will be able to analyze the law of conservation of matter and how it applies to various types of chemical equations (synthesis, decomposition, single replacement, double replacement, and combustion).