

DEPARTMENT _____
 COURSE _____

SHAMOKIN AREA SCHOOL DISTRICT
 MAPPING

GRADE(s) _____

Content	Skills	PA Assessment Anchor	PA Standards	Pre-AP Standard				
1. Introduction to Chemistry	1.01 Demonstrate how the scientific method is used in laboratory investigations.	BIO.B.2.4	3.1.C.B.6					
	1.02 Distinguish between a theory and a law.	BIO.B.2.4	3.1.C.B.6					
2. Scientific Measurements	2.01 Distinguish between quantitative and qualitative measurements.	CHEM.A.1.1	3.2.C.A.3					
	2.02 Convert measurements to scientific measurements.	CHEM.A.1.1	3.2.C.A.3					
	2.03 Distinguish among the accuracy, precision, and error of a measurement.	CHEM.A.1.1	3.2.C.A.3					
	2.04 Use the rules of significant figures to perform mathematical calculations.	CHEM.A.1.1	3.2.C.A.3					
	2.05 Demonstrate the use of SI units of measurement and common SI prefixes to perform mathematical calculations.	CHEM.A.1.1	3.2.C.A.3					
	2.06 Calculate the density of an object from experimental data.	CHEM.A.1.1	3.2.C.A.3					
	2.07 Convert between Celsius and Kelvin temperature scales.	CHEM.A.1.1	3.2.C.A.3					
3. Matter and Change	3.01 Identify the characteristics of matter and substances.	CHEM.A.1.1	3.2.C.A.3					
	3.02 Differentiate among the 3 states of matter.	CHEM.A.1.1	3.2.C.A.3					
	3.03 Differentiate between homogeneous and heterogeneous samples of matter.	CHEM.A.1.2	3.2.C.A.1					
	3.04 Explain the difference between elements and compounds.	CHEM.A.1.2	3.2.C.A.1					
	3.05 Identify the chemical symbols of elements, and name common elements given their symbols.	CHEM.A.1.2	3.2.C.A.1					
	3.06 Differentiate between physical and chemical changes in matter.	CHEM.A.1.2	3.2.C.A.1					
	3.07 Apply the law of conservation of matter.	CHEM.A.1.2	3.2.C.A.1					
4. Atomic Structure and the Periodic Table	4.01 Summarize Dalton's atomic theory.	CHEM.A.2.1	3.2.C.A.6	C.1				
	4.02 Distinguish among protons, neutrons, and electrons in terms of mass, charge, and location in relation to the nucleus.	CHEM.A.2.1	3.2.C.A.6	C.1				

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	4.03 Use the atomic number and mass number of an element to find the number of protons, neutrons, and electrons.	CHEM.A.2.1	3.2.C.A.6	C.1				
	4.04 Explain how isotopes differ and why atomic masses are not whole numbers.	CHEM.A.2.1	3.2.C.A.6	C.1				
	4.05 Calculate the average atomic mass of an element from isotope data.	CHEM.A.2.1	3.2.C.A.6	C.1				
	4.06 Identify the position of groups, periods, and the transition metals in the periodic table.	CHEM.A.2.1	3.2.C.A.6	C.1				
5. Chemical Names and Formulas	5.01 Distinguish between ionic and molecular compounds.	CHEM.B.1.3	3.2.C.A.5	C.1				
	5.02 Define cation and anion and relate them to metal and nonmetal.	CHEM.B.1.3	3.2.C.A.5	C.1				
	5.03 Distinguish among chemical formulas and molecular formulas.	CHEM.B.1.3	3.2.C.A.6	C.1				
	5.04 Use the periodic table to determine the charge on an ion.	CHEM.B.1.3	3.2.C.A.6	C.1				
	5.05 Define a polyatomic ion, and give names and formulas for the most common polyatomic ions.	CHEM.B.1.3	3.2.C.A.6	C.1				
	5.06 Apply the rules for naming and writing formulas for binary and ternary ionic compounds.	CHEM.B.1.3, CHEM.A.1.1	3.2.C.A.6	C.2				
	5.07 Apply the rules for naming and writing formulas for binary molecular compounds.	CHEM.B.1.3, CHEM.A.1.1	3.2.C.A.6	C.2				
	5.08 Name and write formulas for common acids.	CHEM.B.1.3, CHEM.A.1.1	3.2.C.A.6	C.2				
	5.09 Classify a bond as being polar covalent, non-polar covalent, ionic.	CHEM.B.1.3, CHEM.A.1.1	3.2.C.A.6	C.2				
	5.10 Use illustrations to predict the polarity of molecule.	CHEM.B.1.3, CHEM.A.1.1	3.2.C.A.6	C.2				
6. Chemical Quantities	6.01 Describe how Avogadro's number is related to a mole of any substance.	CHEM.B.1.1	3.2.C.A.4	C.2				
	6.02 Calculate the mass of a mole of any substance.	CHEM.B.1.1	3.2.C.A.4	C.2				
	6.03 Use the molar mass to convert between mass and moles of a substance.	CHEM.B.1.1	3.2.C.A.4	C.2				
	6.04 Use the mole to convert among measurements of mass, volume, and number of particles.	CHEM.B.1.1	3.2.C.A.4	C.2				

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	6.05 Calculate the percent composition of a substance from its chemical formula or experimental data.	CHEM.B.1.2	3.2.C.A.4	C.2				
	6.06 Relate the percent composition and mass of each element present in a compound.	CHEM.B.1.2	3.2.C.A.4	C.2				
	6.07 Determine the empirical and molecular formulas of compounds.	CHEM.B.1.2	3.2.C.A.4	C.2				
	6.08 Apply the law of definite proportions to the classification of elements and compounds as pure substances.	CHEM.B.1.2	3.2.C.A.4	C.2				
7. Chemical Reactions	7.01 Write equations describing chemical reactions using appropriate symbols.	CHEM.B.2.1	3.2.C.A.3	C.2				
	7.02 Write balanced chemical reactions when given the names or formulas of the reactants and products in a chemical reaction.	CHEM.B.2.1	3.2.C.A.3	C.2				
	7.03 Identify and predict the products of combination, decomposition, single-replacement, double-replacement, or combustion reactions.	CHEM.B.2.1	3.2.C.A.3	C.2				
8. Behavior of Gases	8.01 Describe the properties of gas particles.	CHEM.B.2.2, CHEM.B.2.1	3.2.C.A.3	C.2				
	8.02 Explain how the kinetic energy of gas particles relates to Kelvin temperature.	CHEM.B.2.2, CHEM.B.2.1	3.2.C.A.3	C.2				
	8.03 Explain how the amount of gas and the volume of the container affect gas pressure.	CHEM.B.2.2, CHEM.B.2.1	3.2.C.A.3	C.2				
	8.04 Infer the effect of temperature changes on the pressure exerted by a contained gas.	CHEM.B.2.2, CHEM.B.2.1	3.2.C.A.3	C.2				
	8.05 State Boyle's Law, Charles' Law, and the combined gas law.	CHEM.B.2.2, CHEM.B.2.1	3.2.C.A.3	C.2				
	8.06 Apply the gas laws to problems involving the temperature, volume, and pressure of a contained gas.	CHEM.B.2.2, CHEM.B.2.1	3.2.C.A.3	C.2				
	8.07 Calculate the amount of gas at any specified conditions of pressure, volume, and temperature.	CHEM.B.2.2, CHEM.B.2.1	3.2.C.A.3	C.2				
	8.08 Distinguish between ideal and real gases.	CHEM.B.2.2, CHEM.B.2.1	3.2.C.A.3	C.2				
9. Chemical Periodicity	9.01 Explain why you can infer the properties of an element based on those of other elements in the periodic table.	CHEM.A.2.2	3.2.C.A.1	C.2				

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	9.02 Use electron configurations to classify elements as noble gases, representative elements, transition metals, or inner transition metals.	CHEM.A.2.2	3.2.C.A.1	C.2				
	9.03 Interpret group trends in atomic radii, ionic radii, ionization energies, and electronegativities.	CHEM.A.2.2	3.2.C.A.1	C.2				
	9.04 Interpret periodic trends in atomic radii, ionic radii, ionization energies, and electronegativities.	CHEM.A.2.2	3.2.C.A.1	C.2				
	9.05 Explain how the periodicity of chemical properties led to the arrangement of elements on the periodic table.	CHEM.A.2.3	3.2.C.A.1	C.2				
	9.06 Compare and/or predict the properties (electron affinity, ionization energy, chemical reactivity, electronegativity, atomic radius) of selected elements by using their locations on the periodic table and known trends.	CHEM.A.2.3	3.2.C.A.1	C.2				
10. Electrons in Atoms	10.01 Summarize the development of the atomic theory.	CHEM.A.2.1	3.2.C.A.1	C.1				
	10.02 Explain the significance of quantized energies of electrons as they relate to the quantum mechanical model of an atom.	CHEM.A.2.1	3.2.C.A.1	C.1				
	10.03 Predict ground state electron configuration and/or orbital diagram for atoms and ions.	CHEM.A.2.2	3.2.C.A.1	C.1				
	10.04 Calculate the wavelength, frequency, or energy of light, given two of these variables.	CHEM.A.2.2	3.2.C.A.1	C.1				
	10.05 Explain the origin of the atomic emission spectrum of an element.	CHEM.A.2.2	3.2.C.A.1	C.1				