



Mattawan Consolidated Schools Chemistry 10 Essential Standards Chart

Standard Description	Next Generation Science Standards (NGSS)	Example of Rigor	Prerequisite Skills	Common Assessment	When Taught?	Extension Standards
What is the essential standard to be learned? Describe in student friendly vocabulary.		What does proficient look like? Provide an example and/or description.	What prior knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?	What assessments will be used to measure student mastery?	When will this standard be taught?	What will we do when students have learned the essential standard(s)?
The student can plan, revise, and appropriately carry out a scientific investigation using appropriate lab equipment for data collection.	HS-PS1-2 HS-PS1-3 HS-PS2-6	The student can identify the purpose for controls, the independent and dependent variables, and can create tables and graphs to communicate results. The student can choose lab equipment according to the type of data being recorded.	Basic math skills Understanding of independent and dependent variables Understanding of what a control is	Lab folder quizzes Required questions on labs Graphs/Charts Post-Lab discussions	Flame test lab Periodic table lab Types of Reactions lab IMF lab Phase change lab Oreo Cookie Lab	Recognize the need to change the procedure

<p>Students will be able to use the Periodic Table and do calculations to determine the number of protons, neutrons and electrons in an atom, as well as the number of valence electrons.</p>	<p>HS-PS1-1</p>	<p>Students can determine the number of protons, neutrons, total electrons, and valence electrons in a selected group of isotopes.</p> <p>Student can identify the number of protons, neutrons and electrons for a neutral atom.</p> <p>Student can list the relative mass and charge for electrons, protons and neutrons.</p> <p>Student can draw Lewis Dot structures for any atom or ion.</p>	<p>Students will know the basic structure of the atom.</p> <p>Students will know the difference between an ion, an element, and a compound.</p>	<p>Unit 2 and 3 tests</p> <p>Isotope charts</p> <p>Periodic table lab</p> <p>Atom Boards</p>	<p>Unit 2 Atomic history and nuclear properties and change</p> <p>Unit 3 Periodicity and periodic table</p>	<p>Atomic orbitals</p> <p>Electron configurations</p>
<p>Students will be able to use the Periodic Table to determine ion charge, types of bonds formed, reactivities, and selected physical properties.</p>	<p>HS-PS1-1</p> <p>HS-PS1-8</p>	<p>Student can identify the number of protons, neutrons and electrons for an ion.</p> <p>Students will be able to determine the type of bond</p>	<p>Understanding subatomic particles, their location, and function.</p> <p>Understanding what an atom is and what the periodic table is.</p>	<p>Unit 2 and 3 tests</p> <p>Types of reactions lab</p> <p>Lewis Dot structures</p> <p>Atom Boards</p>	<p>Unit 2 Atomic history, nuclear properties, and change</p> <p>Unit 3 Periodic table and Periodicity</p>	<p>Polyatomic ions and resonance in Lewis structures</p> <p>Bonding lab</p>

		<p>that would form between two elements.</p> <p>Students will determine the relative relationships between pairs of elements.</p> <p>The students will define and describe nuclear processes and their components.</p> <p>Student can predict general trends of the periodic table.</p>	<p>Understanding of the difference between an ion and an atom.</p>			
<p>Students will show that a chemical equation is balanced, therefore obeying the Law of Conservation of Mass and Energy.</p>	HS-PS1-7	<p>Students will successfully balance a series of chemical reactions.</p>	<p>Students will know how to interpret a chemical formula.</p> <p>Students will understand the difference between a reactant and a product.</p>	<p>Unit 6 test</p> <p>Balancing activities</p> <p>Reactions Type lab</p> <p>Stoichiometry lab</p>	<p>Unit 6 Chemical Reactions</p>	<p>Net ionic equations</p>
<p>The student can differentiate and identify chemical and physical</p>	<p>HS-PS1-1</p> <p>HS-PS1-2</p>	<p>Student can distinguish between elements, compounds, and</p>	<p>Student can define and identify chemical properties.</p>	<p>Unit 4 and 7 test</p> <p>Drawings of elements,</p>	<p>Unit 4 Chemical Properties and Changes</p>	<p>Types of mixtures</p> <p>Dipole-dipole and London dispersion</p>

<p>properties for a given material.</p>		<p>mixtures based on drawings, chemical formulas, and properties.</p> <p>Student can compare strength of intermolecular forces for elements and compounds.</p> <p>Student can identify and describe phase change on the molecular level.</p> <p>Student can separate mixtures based on differences in physical properties of the individual components.</p>	<p>Students can define and identify physical properties.</p>	<p>compounds and mixtures</p> <p>IMF lab</p>	<p>Unit 7 Physical Properties and Changes</p>	<p>forces.</p>
<p>Students can use numerical values to describe composition and amount of substances.</p>	<p>HS-PS1-2 HS-PS1-7</p>	<p>Student can calculate molar mass and percent composition of a substance based on chemical formula.</p> <p>Student can convert between mass, volume, moles, and molecular quantity</p>	<p>Basic math skills</p> <p>Basic understanding of fractions</p> <p>Students need to know how to balance chemical equations</p>	<p>Unit 9 and 10 test</p> <p>Stoichiometry/ Mole map problems</p> <p>Stoichiometry lab</p> <p>Dilution Lab</p>	<p>Unit 9 Measurement and Stoichiometry</p> <p>Unit 10 Reaction Stoichiometry</p>	<p>Average Atomic Mass</p> <p>Limiting reactants</p> <p>Empirical and molecular formulas</p>

		<p>for a substance.</p> <p>Students can use reactant quantity to predict quantity of product.</p> <p>Students can determine the molar quantity of a substance in a solution.</p>				
The student can describe how forces between molecules of solutions affect the physical properties.	HS-PS1-2 HS-PS1-3	Student can describe how intermolecular forces affect a substance's boiling/melting point and its ability to dissolve.	Student can compare the strength of forces for elements and compounds	Unit 7 test Phase change lab IMF lab	Unit 7 Physical Properties and Changes Phase change lab IMF lab Like-dissolves-like lab	Numerical use of EN charts
Student can identify and describe energy of a reaction system qualitatively and quantitatively.	HS-PS1-4	<p>Student can differentiate between endo- and exo- using a chemical reaction equation and graph.</p> <p>Student can calculate energy absorbed or released.</p> <p>Student can define and calculate</p>	<p>Basic Math Skills</p> <p>Definition of endo- and exo- thermic</p>	<p>Unit 12 test</p> <p>Hot or Cold lab (endo/exothermic lab)</p> <p>Specific heat capacity lab</p> <p>Calorimetry lab</p>	Unit 12 Energetics and Kinetics	<p>Bond Energies</p> <p>ΔH, ΔG, ΔS concepts and associated calculations</p> <p>Heats of reactions</p>

		specific heat and enthalpy.				
Student can identify and describe gas laws and their properties qualitatively and quantitatively.	HS-PS1-7 HS-PS1-2	<p>Student can define pressure, temperature, and volume at the molecular level.</p> <p>Student can describe theory behind Boyle's, Charles's, and Gay-Lussac's Laws and can apply gas law equations to solve for unknowns.</p> <p>Student can differentiate between convection and conduction at molecular level.</p>	Basic math skills	<p>Unit 13 test</p> <p>Drawings of different effects of pressure, temperature and volume on the molecular level</p> <p>Gas law lab</p>	Unit 13 Gas Laws	<p>$PV=nRT$</p> <p>Stoichiometry applications</p>
Student can understand properties and interactions of acids and bases	HS-PS1-2 HS-PS1-6	<p>Student can identify acids and bases based on their associated ions and pH.</p> <p>Students can write balanced acid/base equations and predict products of neutralization.</p>	<p>Balancing chemical equations</p> <p>Identification of ions</p> <p>Types of chemical reactions</p>	<p>Unit 14 test</p> <p>Acid/Base lab</p>	14 Equilibrium and Acid/Base	<p>Calculation and understanding of pOH</p> <p>Use of logarithmic scales for pH and pOH</p>

--	--	--	--	--	--	--