Standard Code	**Standards**
HS-SCI-CHM-ME.01.00.0	**Periodic Table: Students will demonstrate an understanding of principles of periodicity in the periodic table.**
HS-SCI-CHM-ME.01.A.0	Students can relate the position of an element in the periodic table to its atomic number and atomic mass.
HS-SCI-CHM-ME.01.B.0	Students can use the periodic table to identify metals, metalloids, and non-metals.
HS-SCI-CHM-ME.01.C.0	Students can use the periodic table to identify alkali metals, alkaline earth metals, transition metals, halogens, and noble gases. They will identify trends in ionization energy, electronegativity, and the relative sizes of ions and atoms.
HS-SCI-CHM-ME.01.D.0	Students can use the periodic table to determine the number of electrons available for bonding.
HS-SCI-CHM-ME.01.E.0	Students can relate the position of an element in the periodic table to its quantum electron configuration and to its reactivity with other elements in the table.
HS-SCI-CHM-ME.02.00.0	**Atomic Structure: Students will have knowledge of the historical development of the atomic model and relate the conclusions of experimental observations to the atomic model.**
HS-SCI-CHM-ME.02.A.0	Students know the nucleus of the atom is much smaller than the atom yet contains most of its mass.
HS-SCI-CHM-ME.02.B.0	Students know the experimental basis for subatomic particles and the scientists associated with them. To include: Thomsonôs discovery of the electron, Rutherfordôs nuclear atom, Millikanôs oil drop experiment, and Einsteinôs explanation of the photoelectric effect.
HS-SCI-CHM-ME.02.C.0	Students know the experimental basis for the development of the quantum theory of atomic structure and the historical importance of the Bohr model of the atom.
HS-SCI-CHM-ME.02.D.0	Students know that spectral lines are the result of transitions of electrons between energy levels and that these lines correspond to photons with a frequency related to the energy spacing between levels by using Planckôs constant and the speed of light equation. Students will also be able to relate wavelength and frequency of light to the energy of specific wavelengths of light.
HS-SCI-CHM-ME.03.00.0	**Chemical Bonds: Biological, chemical, and physical properties of matter result from the ability of atoms to form bonds from electrostatic forces between electrons and protons and between atoms and molecules.**
HS-SCI-CHM-ME.03.A.0	.Chemical Bonds: Students will know two different types of chemical bonds, how they form, and how they relate to the structure and properties of the substance.
HS-SCI-CHM-ME.03.B.0	Students know how covalent bonds between atoms form molecules such as H2.
HS-SCI-CHM-ME.03.C.0	Students know inorganic solids and salt crystals, such as NaCl, are repeating patterns of positive and negative ions held together in a matrix by electrostatic attraction.
HS-SCI-CHM-ME.03.D.0	Students know the atoms and molecules in liquids move in a random pattern relative to one another because the intermolecular forces are too weak to hold the atoms or molecules in a solid form.
HS-SCI-CHM-ME.03.E.0	Students can draw Lewis Dot Structures based on understanding of the valence electrons for each atom.
HS-SCI-CHM-ME.03.F.0	Students can predict the electronic and molecular geometry to determine the shape of simple molecules and their polarity from Lewis Dot Structures and VSEPR theory.

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HS-SCI-CHM-ME.03.G.0	Students know how electronegativity and ionization energy relate to bond formation.
HS-SCI-CHM-ME.03.H.0	Students can identify solids and liquids held together by Van der Waals forces or hydrogen bonding and relate these forces to volatility and boiling/melting point temperatures.
HS-SCI-CHM-ME.04.00.0	**Conservation of Matter and Stoichiometry: Students will apply the conservation of matter to balanced, chemical equations, and use chemical equations to calculate mass relationships between reactants and products.**
HS-SCI-CHM-ME.04.A.0	Students know how to describe chemical reactions by writing balanced equations.
HS-SCI-CHM-ME.04.B.0	Students know the quantity "one mole" is set by defining one mole as the number of atoms in exactly 12 grams of carbon-12.
HS-SCI-CHM-ME.04.C.0	Students know one mole equals 6.022 E 23 particles (atoms, molecules, ions, etc.)
HS-SCI-CHM-ME.04.D.0	Students can determine the molar mass of a molecule from its chemical formula and a table of atomic masses and how to convert the mass of a molecular substance to moles, number of particles, or volume of gas at standard temperature and pressure.
HS-SCI-CHM-ME.04.E.0	Students can calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products and the relevant atomic masses.
HS-SCI-CHM-ME.04.F.0	Students can calculate percent yield in a chemical reaction.
HS-SCI-CHM-ME.04.G.0	Students can identify reactions that involve oxidation and reduction and can balance oxidation-reduction reactions. In addition they can predict the products of acid-base, synthesis, decomposition, single-replacement, double-replacement, and combustion reactions.
HS-SCI-CHM-ME.05.00.0	**Gases and their Properties: Students will apply the kinetic molecular theory to the behavior of gases and use Boyle's, Charles' and Avogadro's laws to quantify this theory.**
HS-SCI-CHM-ME.05.A.0	Students should understand and know how to apply the definition (and formula) of pressure in gas vs. ñnonò gas situations. Students should understand the differences and similarities of effusion and diffusion..
HS-SCI-CHM-ME .05.B.0	Students should understand the difference between temperature and heat, and know how to apply random motion of gases as it relates to gas speed.
HS-SCI-CHM-ME.05.C.0	Students should understand and know how to apply the combined gas law (from Boyleôs. Charles' and Avogadro's laws.)
HS-SCI-CHM-ME.05.D.0	Students should understand and know how to apply STP (standard temperature and pressure) to the ideal gas law.
HS-SCI-CHM-ME.05.E.0	Students should understand and know how to apply formulas to convert from Kelvin to Celsius to Fahrenheit temperatures.
HS-SCI-CHM-ME.05.F.0	Students should understand and know how to apply the Law of Thermodynamics which states not possible.

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HS-SCI-CHM-ME.05.G.0	Students should understand and know how to apply the ideal gas law.
HS-SCI-CHM-ME.05.H.0	Students should understand and know how to apply direct vs. inverse relationships in gas laws ie. Boyleôs Law vs. Charlesô Law. Data from these laws should be graphed to illustrate direct and inverse relationships.
HS-SCI-CHM-ME.05.I.0	Students should understand and know how to apply R ñconstantò values from the ideal gas law based on pressure and volume units used in the gas law equation.
HS-SCI-CHM-ME.05.J.0	Students should understand and know how to apply the mole formula as it relates to the ideal gas law and how this relates to gas density.
HS-SCI-CHM-ME.05.K.0	Students should understand and know how to apply gas speed and density as these two factors relate to gas molecular mass.
HS-SCI-CHM-ME.06.00.0	**Acids and Bases: Students will identify substances that are acids, bases and salts and understand the characteristics of each.**
HS-SCI-CHM-ME.06.A.0	Students should understand and know how to apply the properties of acids, bases and salts.
HS-SCI-CHM-ME.06.B.0	Students should understand and know how to apply the differences between strong and weak acids; strong and weak bases (electrolyte, percent ionization).
HS-SCI-CHM-ME.06.C.0	Students should understand and recognize that an acid is a proton donor and a base is a proton acceptor. (Bronsted definitions)
HS-SCI-CHM-ME.06.D.0	Students can balance acid base reactions and can calculate the pH of the final solution after a particular acid is mixed with a particular base.
HS-SCI-CHM-ME.06.E.0	Students should understand and be able to predict products from an acid base reaction.
HS-SCI-CHM-ME.06.F.0	Students should understand and apply the pH scale for various solutions of acid or base.
HS-SCI-CHM-ME.06.G.0	Students should understand and know how to apply pH obtained via pH paper or pH indicators.
HS-SCI-CHM-ME.06.H.0	Students should understand and know how to apply stoichiometry of acid base reactions and can calculate pH, pOH, hydronium and hydroxide from any aqueous solution or acid base reaction.
HS-SCI-CHM-ME.07.00.0	**Solutions: Students will know that a solution is a homogeneous mixture, what occurs in the dissolving process, and the principles of separating the components of a solution.**
HS-SCI-CHM-ME.07.A.0	Know the definitions of solute and solvent.
HS-SCI-CHM-ME.07.B.0	Describe the dissolving process at the molecular level using the concept of random molecular motion.
HS-SCI-CHM-ME.07.C.0	Know the effects of temperature, pressure, and surface area on the solution process.
HS-SCI-CHM-ME.07.D.0	Use the definition of molarity to determine solution molarity and be able to apply the dilution formula, M1 x V1 = M2 x V2
HS-SCI-CHM-ME.07.E.0	Understand the separation of a mixture using filtration, distillation, and chromatography.
HS-SCI-CHM-ME.07.F.0	*Know the relationship between molality and freezing point depression and boiling point elevation.

Standard Code	**Standards**
HS-SCI-CHM-SI.08.00.0	**The student will demonstrate an understanding of how scientific inquiry, and mathematical modeling and analysis can be used appropriately to query, answer and develop solutions.**
HS-SCI-CHM-SI.08.A.0	Apply established rules for significant digits, both in reading scientific instruments and in calculating derived quantities from measurement
HS-SCI-CHM-SI.08.B.0	Use appropriate laboratory apparatuses, technology and techniques safely and accurately when conducting a scientific investigation
HS-SCI-CHM-SI.08.C.0	Use scientific instruments to record measurement data in appropriate metric units that reflect the precision and accuracy of each particular instrument
HS-SCI-CHM-SI.08.D.0	Design a scientific investigation with appropriate methods of control to test a hypothesis (including independent and dependent variables), and evaluate the designs of sample investigations
HS-SCI-CHM-SI.08.E.0	Organize and interpret the data from a controlled scientific investigation by using (including calculations in scientific notation, formulas, and dimensional analysis), graphs, tables, models, diagrams, and/or technology
HS-SCI-CHM-SI.08.F.0	Evaluate the results of a controlled scientific investigation in terms of whether they refute or verify the hypothesis
HS-SCI-CHM-SI.08.G.0	Evaluate conclusions based on qualitative and quantitative data (including the impact of parallax, instrument malfunction, or human error) on experimental design
HS-SCI-CHM-SI.08.H.0	Evaluate a technological design or product on the basis of designated criteria (including cost, time, and materials)
HS-SCI-CHM-SI.08.I.0	Communicate and defend a scientific argument or conclusion
HS-SCI-CHM-SI.08.J.0	Use appropriate safety procedures when conducting investigations