

INQUIRY**Scientific Inquiry****Process Skills**

___ Collect, organize and analyze data accurately and precisely, using appropriate instruments, equipment and units. *AChem-01*

Technological Design

___ Propose and compare different solution designs to the design problem based upon given constraints including available tools, materials and time. *AChem-02*

___ Develop working visualizations of the proposed solution designs (e.g. blueprints, schematics, flowcharts and animations). *AChem-03*

CONTENT**Chemistry****Scientific Measurement/Problem Solving**

___ Solve problems using conversion factors and dimensional analysis, including the appropriate number of significant figures. *AChem-04*

Matter and Change

___ Discuss how properties can be used to classify matter. *AChem-05*

Atomic Structure

___ Explain the historical development of atomic theory and distinguish between elements and compounds on the submicroscopic level. *AChem-06*

Electrons in Atoms

___ Write the electron configurations and valence orbital diagrams of elements and ions and use them to compare and contrast properties of substances. *AChem-07*

Chemical Periodicity

___ Identify trends on the periodic table and relate the electron configuration of an element and its properties to position on the periodic table. *AChem-08*

Chemical Names and Formulas

___ Write correct formulas and names of binary compounds, compounds with polyatomic ions and molecular compounds of nonmetals. *AChem-09*

Bonding

___ Explain how the shape and polarity are determined from bond structure. *AChem-10*

Chemical Reactions

___ Complete and balance chemical reactions, identify the type of reaction, and describe whether it is exo or endothermic. *AChem-11*

Chemical Quantities

___ Use the mole concept to calculate empirical formulas, mass percent and molarity. *AChem-12*

Stoichiometry

___ Solve problems with limiting reactants and perform mass to mass calculations. *AChem-13*

States of Matter

___ Compare and contrast the physical properties of substances based on the strength of their intermolecular forces and predict the phase of a substance from these forces. *AChem-14*

Behavior of Gases

___ Compare and contrast the gas laws and calculate problems related to the variables of temperature, pressure and volumes of gases. *AChem-15*

Solutions

___ Interpret a solubility curve and identify ionic substances that precipitate from aqueous solutions. *AChem-16*

Thermochemistry

___ Describe and calculate the energy changes that occur in the system and surrounds for an endo and exothermic reaction. *AChem-17*

Reaction Rates and Equilibrium

___ Solve equilibrium problems and use the LeChatlier principle to predict the amounts of reactants and products when conditions of temperature, pressure and concentration change. *AChem-18*

Acids and Bases

___ Compare and contrast acids and bases, solve problems involving concepts of pH, neutralization and titration. *AChem-19*

Electrochemistry

___ Determine oxidation numbers, use Standard Reduction Potentials to determine what is oxidized and reduced and calculate voltage of an electrochemical cell. *AChem-20*

CONNECTIONS**Science Practices**

___ Assess the validity of scientific data by analyzing the results, sample sets, sample size, similar previous experimentation, possible misrepresentation of data presented and potential sources of error. *AChem-21*

S/T/S (Science, Technology and Society)

___ Identify chemistry-related careers and concepts that affect everyday life. *AChem-22*