Chemistry

Performance Expectations

HS-PS1-1: Valence Electrons and Properties of Elements
Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

HS-PS1-3: Electrical Forces and Bulk Scale Structure
Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. (Patterns)

HS-PS2-6: Molecular-Level Structure of Designed Materials
Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. (Structure and Function)

HS-PS1-9: Combined Gas Law
Analyze data to support the claim that the combined gas law describes the relationships among volume, pressure, and temperature for a sample of an ideal gas.

HS-PS1-10: Solutions
Use evidence to support claims regarding the formation, properties and behaviors of solutions at bulk scales.
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Assessments & Backward Design Elements

HS-PS1-1	Ordering Reactivity	Evidence Statement
HS-PS1-3	Testing SmartKlean's Claims	Evidence Statement
HS-PS2-6	The Most Prescribed Drugs in the World	Evidence Statement

HS-PS1-9

Clarification Statement: Real gases may be included at conditions near STP. The relationships of the variables in the combined gas law may be described both qualitatively and quantitatively.

Assessment Boundary: Assessment is limited to the relationships among the variables of the combined gas law, not the gas law names, i.e. Boyle's Law.

HS-PS1-10

Clarification Statement: Examples of physical properties could include colligative properties, degree of saturation, physical behavior of solutions, solvation process and conductivity. Examples of solution types could include solid-liquid, liquid-liquid, and gas-liquid solutions. Concentrations can be quantitatively expressed in ppm, molarity, and percent by mass

Assessment Boundary: Assessment of colligative properties is limited to qualitative statements of boiling point elevation and freezing point depression.

Backward Design Elements		
What new skills (practices) will students need to learn?	What thinking concepts will students need to learn?	What science concepts will students need to learn?
HS-PS1-1 Use the periodic table as a model Identify substructure of atoms Make prediction related to size, ions, bond forms, reactivity HS-PS1-3 Plan **and** Conduct Investigation	HS-PS1-1 Patterns at varying scale HS-PS1-3 Patterns at the particle scale determine the properties of the bulk scale	HS-PS1-1 Coulombs Law Vocab: Atoms Nucleus (positively-charged) - Protons - Neutrons Electrons (negatively-charged) Valence electrons Periodic table Elements Elemental properties (e.g. reactivity of metals, types of bonds formed, number of bonds formed, reactions with oxygen) Reactivity Patterns HS-PS1-3 The structure and interactions of matter at the bulk scale are determined by electrical forces within and between atoms. Vocab: Bulk scale structure Electrical forces between particles Particles (e.g. ions, atoms, molecules, and networked materials) Bulk properties (e.g. melting point and boiling point, vapor pressure, and surface tension) Thermal (kinetic) energy Patterns HS-PS2-6 Vocab: Designed materials Electric charges Intermolecular forces (attractive and repulsive) Electrons (e.g. delocalized in metals) Molecular-level structure

		Macroscopic properties (e.g., material strength, conductivity, reactivity, state of matter, durability) Structure and Function

Learning Performance
(Learning Performance Generator)