

The Periodic Table

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Periodic Properties	☐ I can predict the properties of elements in chemical families based on valence electrons patterns using the Periodic Table, including: C.5(B) ☐ alkali metals ☐ alkaline earth metals ☐ halogens ☐ noble gases ☐ transition metals				
	☐ I can explain the development of the Periodic Table over time using evidence such as chemical and physical properties. C.5(A)				
Periodic Trends	☐ I can analyze and interpret elemental data to identify periodic trends, including: C.5(C) ☐ atomic radius ☐ atomic mass ☐ electronegativity ☐ ionization energy ☐ reactivity				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

Atomic Theory

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Atomic Theory	☐ I can construct models to show the development of modern atomic theory over time: C.6(A) ☐ Dalton's Postulates ☐ Thomson's discovery of electron properties ☐ Rutherford's nuclear atom ☐ Bohr's nuclear atom ☐ Heisenberg's Uncertainty Principle				
Atomic Structure	☐ I can describe the structure of atoms and ions, including: C.6(B) ☐ masses ☐ electrical charges ☐ locations of protons and neutrons in the nucleus ☐ location of electrons in the electron cloud				
	☐ I can construct models to express the arrangement of electrons in atoms of representative elements using electron configurations and Lewis dot structures. C.6(E)				
	☐ I can calculate average atomic mass of an element using isotopic composition. C.6(D)				
Atomic Properties	☐ I can investigate the mathematical relationship between energy, frequency, and wavelength of light using the electromagnetic spectrum and relate it to the quantization of energy in the emission spectrum. C.6(C)				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

Chemical Bonds

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Intramolecular Bonds	☐ I can construct an argument to support how periodic trends such as electronegativity can predict bonding between elements. C.7(A)				
	☐ I can classify and draw electron dot structures for molecules with linear, bent, trigonal planar, trigonal pyramidal, and tetrahedral molecular geometries as explained by Valence Shell Electron Pair Repulsion (VSEPR) theory. C.7(C)				
Intramolecular Forces	☐ I can analyze the properties of ionic, covalent, and metallic substances in terms of intramolecular and intermolecular forces. C.7(D)				
Chemical Nomenclature	☐ I can name and write the chemical formulas for ionic and covalent compounds using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules. C.7(B)				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

The Mole

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Mole Concept	☐ I can calculate the number of atoms or molecules in a sample of material using Avogadro's number. C.8(B)				
	☐ I can define mole and apply the concept of molar mass to convert between moles and grams. C.8(A)				
	☐ I can calculate percent composition of compounds. C.8(C)				
	☐ I can differentiate between empirical and molecular formulas. C.8(D)				

Process: Ways to Show		Notes	Check Up		
Models/ Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/ Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

Chemical Equations

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Stoichiometry	☐ I can perform stoichiometric calculations, including determination of: C.9(C) ☐ mass relationships ☐ gas volume relationships ☐ percent yield				
	☐ I can describe the concept of limiting reactants in a balanced chemical equation C.9(D)				
Mass Conservation and Reactions	☐ I can interpret, write, and balance chemical equations, including: ☐ synthesis ☐ decomposition ☐ single replacement ☐ double replacement ☐ combustion reactions using the law of conservation of mass. C.9(A)				
	☐ I can differentiate among: C.9(B) ☐ acid-base reactions ☐ precipitation reactions ☐ oxidation-reduction reactions				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

Principles of Gases

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Principles of Gases	☐ I can describe the postulates of the kinetic molecular theory. C.10(A)				
	☐ I can describe and calculate the relationships for an ideal gas among: C.10(B) ☐ volume ☐ pressure ☐ number of moles ☐ temperature				
	☐ I can define and apply Dalton's law of partial pressure. C.10(C)				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

Solutions

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Solutions	☐ I can distinguish among types of solutions, including: C.11(B) ☐ electrolytes and nonelectrolytes ☐ unsaturated, saturated, and supersaturated				
	☐ I can describe the unique role of water in solutions in terms of polarity. C.11(A)				
Solubility	☐ I can investigate how solid and gas solubilities are influenced by temperature using solubility curves. C.11(C)				
	☐ I can investigate how rates of dissolution are influenced by temperature, agitation, and surface area. C.11(C)				
	☐ I can investigate the general rules regarding solubility. C.11(D)				
	☐ I can predict the solubility of the products of a double replacement reaction. C.11(D)				
Molar Concentration	☐ I can calculate the concentration of solutions in units of molarity. C.11(E)				
	☐ I can calculate the dilutions of solutions using molarity. C.11(F)				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

Acids and Bases

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Chemical Nomenclature	☐ I can name and write the chemical formulas for acids and bases using IUPAC nomenclature rules. C.12(A)				
Chemical Properties	☐ I can differentiate between strong and weak acids and bases. C.12(C)				
	☐ I can define acids and bases and distinguish between Arrhenius and Bronsted-Lowry definitions. C.12(B)				
	☐ I can define pH and calculate the pH of a solution using the hydrogen ion concentration. C.12(E)				
Chemical Changes	☐ I can predict products in acid-base reactions that form water. C.12(D)				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

Thermochemistry

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Thermodynamics	☐ I can explain everyday examples that illustrate the four laws of thermodynamics. C.13(A)				
Heat Calculations	☐ I can classify processes as exothermic or endothermic. C.13(C)				
	☐ I can represent energy changes that occur in chemical reactions using thermochemical equations or graphical analysis. C.13(C)				
	☐ I can investigate the process of heat transfer using calorimetry. C.13(B)				
	☐ I can perform calculations involving: C.13(D) ☐ heat ☐ mass ☐ temperature change ☐ specific heat				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				

Nuclear Chemistry

Process: Tools to Know		Notes	Check Up		
Investigations	☐ I can plan and conduct investigations and design solutions. C.1(A), C.1(B), C.1(C), C.2(D)				
Tools and Equipment	☐ I can use appropriate tools and equipment. C.1(D)				
Information	☐ I can collect and record information. C.1(E), C.1(F)				

Content		Notes	Check Up		
Nuclear Reactions	☐ I can give examples of applications of nuclear phenomena such as nuclear stability, radiation therapy, diagnostic imaging, solar cells, and nuclear power. C.14(C)				
	☐ I can describe the characteristics of alpha, beta, and gamma radioactive decay processes in terms of balanced nuclear equations. C.14(A)				
	☐ I can compare fission and fusion reactions. C.14(B)				

Process: Ways to Show		Notes	Check Up		
Models/Information	☐ I can develop and use models/information. C.1(G), C.1(H), C.2(A), C.4(A)				
Data	☐ I can analyze and interpret data. C.2(B), C.2(C)				
Explanations/Solutions	☐ I can develop and communicate explanations/solutions. C.3(A), C.3(B), C.3(C)				
Science and the Real World	☐ I can connect science with the real world. C.4(B), C.4(C)				