

Chemistry Performance Level Descriptors (PLD) for Proficiency by the NM PED

<p>Scientific Thinking</p> <ul style="list-style-type: none"> <input type="checkbox"/> Identifies and applies the steps of the scientific method <input type="checkbox"/> Distinguishes between dependent and independent variables including graphical data <input type="checkbox"/> Reports the results of measurements and calculations to the correct number of significant figures <input type="checkbox"/> Correctly expresses numbers in scientific notation and standard form <input type="checkbox"/> Calculates molar mass from a given chemical formula <input type="checkbox"/> Distinguishes between accuracy and precision <input type="checkbox"/> Makes observations about uncertainty in measurement <input type="checkbox"/> Calculates percent composition from the formula of a compound or the mass data <input type="checkbox"/> Uses Avogadro's number and molar mass to convert among moles, mass, and number of particles 	<p>Structure of Matter</p> <ul style="list-style-type: none"> <input type="checkbox"/> Identifies subatomic particles, their charges, relative masses, and locations in the atom <input type="checkbox"/> Identifies and interprets electron configurations <input type="checkbox"/> Correctly writes an orbital filling diagram and identifies elements from orbital filling diagrams or electron configurations <input type="checkbox"/> States the VSEPR theory <input type="checkbox"/> Correctly predicts the charges of the representative element ions <input type="checkbox"/> Distinguishes between anions and cations <input type="checkbox"/> Classifies compounds as ionic or covalent, based on the chemical formula <input type="checkbox"/> Defines, compares, and contrasts ionic and covalent bonding <input type="checkbox"/> Relates the numbers of the subatomic particles to the atomic number, mass number, and charge <input type="checkbox"/> Relates states of matter to the arrangement of particles and their freedom of motion (entropy changes) <input type="checkbox"/> Identifies periodic trends including ionization energy, electronegativity, and atomic radii
<p>Chemical Reactions</p> <ul style="list-style-type: none"> <input type="checkbox"/> Balances chemical equations <input type="checkbox"/> Classifies chemical reactions <input type="checkbox"/> Predicts the products of chemical reactions <input type="checkbox"/> Relates the name to the formula of a compound and vice versa <input type="checkbox"/> Performs stoichiometric calculations including mole to mole and mass to mass conversions (and volume to volume for gases at STP) <input type="checkbox"/> Makes qualitative predictions based on Le Chatlier's Principle <input type="checkbox"/> Understands factors that affect the rates of reaction 	<p>Energy</p> <ul style="list-style-type: none"> <input type="checkbox"/> Knows how temperature and kinetic energy are related <input type="checkbox"/> Distinguishes between kinetic and potential energy <input type="checkbox"/> Describes energy transformations (potential to kinetic, etc.) <input type="checkbox"/> Classifies chemical reactions as endothermic or exothermic by observation <input type="checkbox"/> Identifies energy and temperature changes that a substance undergoes on heating or cooling curves
<p>Properties Of Matter</p> <ul style="list-style-type: none"> <input type="checkbox"/> Understands the properties of metals, nonmetals, and metalloids <input type="checkbox"/> Compares and contrasts the properties of ionic and covalent (molecular) compounds <input type="checkbox"/> Classifies matter as elements, compounds, or mixtures <input type="checkbox"/> Manipulates and solves for any of the variables in the density equation <input type="checkbox"/> Calculates partial pressures of a gas using Dalton's Law <input type="checkbox"/> Determines and ranks bond polarity based on electronegativity <input type="checkbox"/> Calculates the molarity of a solution <input type="checkbox"/> Calculates using gas laws <input type="checkbox"/> Predicts the solubility of compounds in water <input type="checkbox"/> Classifies compounds as acids or bases (using Arrhenius and Bronsted-Lowry definitions) 	