

**Portales Municipal Schools**  
**CURRICULUM MAP**

<b>Subject:</b>	Chemistry	<b>2009</b>	<b>Grade Level 10-12</b>
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<b>ESSENTIAL QUESTIONS: How do you convert units of measurements using correct significant figures?</b>					
<b>STRAND</b>		<b>BENCHMARK III. Use mathematical concepts principals and expressions to analyze data, develop models, understand patterns and relationships, evaluate findings, and draw conclusions</b>			
<b>I. Scientific Thinking and Practice</b>					
<b>STANDARD</b>					
<b>I. Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.</b>					
9 w e e k s	<b>PERFORMANCE STANDARD</b>	<b>CONCEPTS/SKILLS</b> Review/Extend previously introduced skill unless noted <b>I = Introduce</b> <b>R= Review AND Extend</b> <b>M = Master</b>	<b>STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES</b>	<b>ASSESSMENTS</b>	<b>STUDENT MATERIALS AND RESOURCES</b>
<b>1</b>	<p><b>4. Identify and apply measurement techniques and consider possible effects of measurement errors</b></p> <p><b>5. Use mathematics to express and establish scientific relationships ( e.g., scientific notations, vectors, dimensional analysis).</b></p>	<p><b>Measurement</b></p> <p><b>Significant Figures</b></p> <p><b>Dimensional Analysis</b></p>	<p><b>Student will distinguish between Micro and Macro measurements by analyzing metric prefixes.</b></p> <p><b>Students will compute information using correct scientific notation and significant figures</b></p> <p><b>Students will convert dimensional units using appropriate conversion factors.</b></p> <p>Students will solve problems by making accurate measurements and applying mathematics.</p>	<p>Guided reading and writing worksheet 1.1</p> <p>Chapter 1 assessment</p> <p>Guided reading and writing worksheet 3.1, 3.2,3.3</p> <p><b>Chapter 3 assessment</b></p> <p><b>Small scale lab Now what do I do?</b></p>	<p><b>Text book chapter 1</b></p> <p>Text book chapter 3 <a href="http://www.tinyurl.com/cmksvm">www.tinyurl.com/cmksvm</a> (practice problems) code cdn-1131</p> <p><a href="http://www.tinyurl.com/crdzlc">www.tinyurl.com/crdzlc</a> (math practice)</p> <p>Small Scale Lab Book <a href="http://tinyurl.com/puy8zz">http://tinyurl.com/puy8zz</a></p>

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<b>ESSENTIAL QUESTIONS: How is matter classified?</b>					
<b>STRAND II</b> <b>The Content of Science</b>			<b>BENCHMARK I</b> Understand the properties, underlying structure, and reactions of matter.		
<b>STANDARD I</b> Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.					
9 w e e k s	PERFORMANCE STANDARD	CONCEPTS/SKILLS Review/Extend previously introduced skill unless noted <b>I = Introduce</b> <b>R= Review AND Extend</b> <b>M = Master</b>	STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES	ASSESSMENTS	STUDENT MATERIALS AND RESOURCES
<b>1</b>	<p><b>1.</b> Classify matter in a variety of ways (e.g., element, compound, mixture; solid, liquid, gas; acidic, basic, neutral).</p> <p><b>2.</b> Identify, measure, and use a variety of physical and chemical properties (e.g., electrical conductivity, density, viscosity, chemical reactivity, pH, melting point).</p>	<p><b>Classification of matter</b></p> <p><b>Physical and Chemical properties matter</b></p> <p><b>Mixtures vs. pure substance</b></p>	<p>Students will classify matter as solids, liquids, gas, and plasma using physical properties.</p> <p>Students will compare physical and chemical properties to identify elements using extensive and intensive properties</p> <p>Students will distinguish between pure substances and mixtures using physical and chemical properties.</p> <p>Students will make macroscopic observations of chemical reactions and use them to solve problems.</p>	<p>Guided reading and writing 13 Chapter 13 test</p> <p>Guided reading and writing chapter 2 Chapter 2 Test</p> <p>Guided reading and writing chapter 2 Chapter 2 test</p> <p>Small scale lab 1+2+3=Black</p>	<p>Textbook chapter 13 <a href="http://www.tinyurl.com/cmksvm">www.tinyurl.com/cmksvm</a> allotropes code cdn-1133</p> <p>Textbook chapter 2 <a href="http://www.tinyurl.com/cmkcvm">www.tinyurl.com/cmkcvm</a> properties code cdn-1021</p> <p>Textbook chapter 2 Lab <a href="http://www.tinyurl.com/d3vdkn">www.tinyurl.com/d3vdkn</a> Separating mixtures</p> <p>Small scale lab book <a href="http://tinyurl.com/oo5flb">http://tinyurl.com/oo5flb</a></p>

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**ESSENTIAL QUESTIONS: How does the periodic table help identify properties of matter? How does it help determine bonding?**

<b>STRAND II The Content of Science</b>	<b>BENCHMARK I</b> Understand the properties, underlying structure, and reactions of matter.
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**STANDARD I** Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy

9 w e e k s	PERFORMANCE STANDARD	CONCEPTS/SKILLS Review/Extend previously introduced skill unless noted  I = Introduce R= Review AND Extend M = Master	STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES	ASSESSMENTS	STUDENT MATERIALS AND RESOURCES
<b>1</b>	<p><b>4.</b> Describe trends in properties (e.g., ionization energy or reactivity as a function of location on the periodic table, boiling point of organic liquids as a function of molecular weight).</p> <p><b>8.</b> Make predictions about elements using the periodic table (e.g., number of valence electrons).</p>	<p style="color: blue;"><b>Periodic trends of matter</b></p> <p style="color: red; text-align: center;"><b>Valence electrons</b></p>	<p><b>Students will identify properties of elements based on their location in the periodic table.</b></p> <p>Students will build a spectroscope and use it to measure the wavelengths, frequencies, and energies of atomic emission lines</p> <p><b>Students will predict reactivity and types of bond between elements based on their location in the periodic table.</b></p>	<p>Guided reading and writing 6.3 Chapter 6</p> <p><b>Chapter 6 Test</b></p> <p><b>Small scale lab Atomic Emission Spectra</b></p> <p><b>Guided reading and writing chapter 5 and 7.1</b></p> <p><b>Chapter 5 test</b></p>	<p><b>Textbook chapter 6</b> <a href="http://www.tinyurl.com/d22qm6">www.tinyurl.com/d22qm6</a> <b>quick lab periodic trends in atomic radii</b></p> <p><a href="http://www.tinyurl.com/c4kowb">www.tinyurl.com/c4kowb</a> <b>code cdn-1063</b> <b>electronegativity</b></p> <p>Small Scale lab Book <a href="http://www.tinyurl.com/qk218n">www.tinyurl.com/qk218n</a></p> <p>Textbook chapter 5 <a href="http://www.tinyurl.com/czt264">www.tinyurl.com/czt264</a> Valence code cdn-1082</p>



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<b>ESSENTIAL QUESTIONS: What is the difference between ionic and covalent bonds and how do you balance the reaction?</b>					
<b>STRAND II The Content of Science</b>			<b>BENCHMARK I</b> Understand the properties, underlying structure, and reactions of matter.		
<b>STANDARD I</b> Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy					
<b>9 w e e k s</b>	<b>PERFORMANCE STANDARD</b>	<b>CONCEPTS/SKILLS</b> Review/Extend previously introduced skill unless noted <b>I = Introduce</b> <b>R= Review AND Extend</b> <b>M = Master</b>	<b>STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES</b>	<b>ASSESSMENTS</b>	<b>STUDENT MATERIALS AND RESOURCES</b>
<b>1</b>	<p>7. Explain how electrons determine the properties of substances by:</p> <ul style="list-style-type: none"> <li>• interactions between atoms through transferring or sharing valence electrons</li> <li>• ionic and covalent bonds</li> <li>• the ability of carbon to form a diverse array of organic structures.</li> </ul>	<p style="color: red; text-align: center;"><b>Ionic vs Covalent Bonding</b></p> <p style="color: green; text-align: center;"><b>Formula Writing</b></p>	<p><b>Students will distinguish between ionic and covalent bonding using the atoms location in the periodic table</b></p> <p>Students will predict and write chemical formulas using the periodic table.</p> <p>Students will observe the formation of compounds, and to write their names and formulas.</p>	<p>Guided reading and writing workbook chapter 7 and 8</p> <p><b>Guided reading and writing worksheets chapter 9</b></p> <p><b>Small Scale Lab Names and Formulas for Ionic Compounds</b></p>	<p><b>Textbook chapters 7 and 8</b> <a href="http://www.tinyurl.com/d9tpah">www.tinyurl.com/d9tpah</a> code dcn-1072 <b>Links Ionic Compound</b></p> <p><b>Lab ion solutions</b> <a href="http://www.tinyurl.com/dzft8k">www.tinyurl.com/dzft8k</a>  <a href="http://www.tinyurl.com/com6qd">www.tinyurl.com/com6qd</a> code cdn-1081 <b>Covalent bond</b></p> <p><b>VSEPR Theory</b> <a href="http://WWW.tinyurl.com/ch6cq4">WWW.tinyurl.com/ch6cq4</a></p> <p><b>Textbook chapter 9, chapter 11 section 1</b></p> <p><b>Small scale lab book</b> <a href="http://tinyurl.com/qs4p4">http://tinyurl.com/qs4p4</a></p>

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<b>ESSENTIAL QUESTIONS: How do you identify and balance chemical equations?</b>					
<b>STRAND II The Content of Science</b>			<b>BENCHMARK I</b> Understand the properties, underlying structure, and reactions of matter.		
<b>STANDARD I</b> Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy					
9 w e e k s	<b>PERFORMANCE STANDARD</b>	<b>CONCEPTS/SKILLS</b> Review/Extend previously introduced skill unless noted <b>I = Introduce</b> <b>R= Review AND Extend</b> <b>M = Master</b>	<b>STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES</b>	<b>ASSESSMENTS</b>	<b>STUDENT MATERIALS AND RESOURCES</b>
<b>2</b>	<p><b>8.</b> Know that chemical reactions involve the rearrangement of atoms, and that they occur on many timescales (e.g., picoseconds to millennia).</p> <p><b>13.</b> Understand types of chemical reactions (e.g., synthesis, decomposition, combustion, redox, neutralization) and identify them as exothermic or endothermic.</p>	<p><b>Chemical reaction as a balanced equations</b></p> <p><b>Types of chemical reactions</b></p> <ol style="list-style-type: none"> <li><b>1. synthesis</b></li> <li><b>2. decomposition</b></li> <li><b>3. combustion</b></li> <li><b>4. single replacement</b></li> <li><b>5. double replacement</b></li> </ol>	<p>Students will balance a chemical reaction using coefficients.</p> <p>Student will predict the type of chemical reactions using a chemical equations template.</p> <p>Students will observe, identify, and write balanced equations for precipitation reactions.</p>	<p>Guided reading and writing 11.1</p> <p>Section 11.2 worksheet</p> <p>Small Scale Lab <b>Precipitation Reaction formation of a solid</b></p>	<p><b>Textbook chapter 11</b> <a href="http://www.tinyurl.com/dyq7k4">www.tinyurl.com/dyq7k4</a> Code cdn-1111 <b>Links chemical equations</b></p> <p><a href="http://www.tinyurl.com/cw8y71">www.tinyurl.com/cw8y71</a> Rules for balancing chemical equations</p> <p><a href="http://www.tinyurl.com/dh9vmb">www.tinyurl.com/dh9vmb</a> code dvn-1121 Cons. Of mass</p> <p><a href="http://www.tinyurl.com/cbdy4u">www.tinyurl.com/cbdy4u</a> code cdn.1112 Reaction types</p> <p><a href="http://www.tinyurl.com/c77qjw">www.tinyurl.com/c77qjw</a> Code cdn-1114 Combustion reaction</p> <p>Lab Book <a href="http://www.tinyurl.com/dcce4g">www.tinyurl.com/dcce4g</a> Lab Precipitation</p>

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<b>ESSENTIAL QUESTIONS: How do you convert units of measurements in chemical equations?</b>					
<b>STRAND II The Content of Science</b>			<b>BENCHMARK I</b> Understand the properties, underlying structure, and reactions of matter.		
<b>STANDARD I</b> Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy					
9 w e e k s	PERFORMANCE STANDARD	CONCEPTS/SKILLS Review/Extend previously introduced skill unless noted <b>I = Introduce</b> <b>R= Review AND Extend</b> <b>M = Master</b>	STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES	ASSESSMENTS	STUDENT MATERIALS AND RESOURCES
<b>2</b>	12. Know that chemical reactions involve the rearrangement of atoms, and that they occur on many timescales (e.g., picoseconds to millennia).	<b>Stoichiometry</b> <b>-Mass-Mole Concept</b> <b>-volume-mole</b> <b>-representative particles-mole</b> <b>-Limiting Reagent</b> <b>-Theoretical Yield</b>	<p>Students will convert measurements using the proper conversion factors.</p> <p>Students will determine the mass of sodium hydrogen carbonate in a sample of baking soda using stoichiometry.</p>	<p>Guided reading and writing worksheets chapter 12</p> <p><b>Small scale lab Analysis Baking Soda</b></p>	<p>Mass-mass  <a href="http://www.tinyurl.com/cdn8fw">www.tinyurl.com/cdn8fw</a>            molecules of product  <a href="http://www.tinyurl.com/dcx7mh">www.tinyurl.com/dcx7mh</a>            volume-volume  <a href="http://www.tinyurl.com/crddbbr">www.tinyurl.com/crddbbr</a>            volume gas product  <a href="http://www.tinyurl.com/da32vc">www.tinyurl.com/da32vc</a>            small scale lab baking soda  <a href="http://www.tinyurl.com/ckxedc">www.tinyurl.com/ckxedc</a>            limiting Reagent  <a href="http://www.tinyurl.com/ckrbyw">www.tinyurl.com/ckrbyw</a>            Theoretical Yield  <a href="http://www.tinyurl.com/c6z5yt">www.tinyurl.com/c6z5yt</a>            Percent Yield  <a href="http://www.tinyurl.com/cargx6">www.tinyurl.com/cargx6</a></p>





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<b>ESSENTIAL QUESTIONS: How do you make electricity with chemicals?</b>					
<b>STRAND II The Content of Science</b>			<b>BENCHMARK I</b> Understand the properties, underlying structure, and reactions of matter.		
<b>STANDARD I</b> Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy					
9 w e e k s	PERFORMANCE STANDARD	CONCEPTS/SKILLS Review/Extend previously introduced skill unless noted <b>I = Introduce</b> <b>R= Review AND Extend</b> <b>M = Master</b>	STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES	ASSESSMENTS	STUDENT MATERIALS AND RESOURCES
<b>4</b>	<b>13.</b> Understand types of chemical reactions (e.g., synthesis, decomposition, combustion, redox, neutralization) and identify them as exothermic or endothermic.	<b>Electrochemistry</b> <b>-Electrolytic</b> <b>-voltaic</b> <b>-Dry cell batteries</b> <b>-batteries</b>	<b>Students will describe how Redox reactions produce electricity by writing a balanced chemical equation and showing oxidation numbers.</b>  Students will electrolyze solutions and interpret your observations in terms of chemical reactions and equations.	Guided and Reading workbook chapter 21 Chapter 21 Exam  <b>Small Scale lab</b> <b>Electrolysis of water</b>	<b>Textbook chapter 21</b>  <b>Small scale lab book</b> <a href="http://tinyurl.com/oowadt">http://tinyurl.com/oowadt</a>

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**ESSENTIAL QUESTIONS: How is chemistry essential in life?**

<b>STRAND II The Content of Science</b>	<b>BENCHMARK I</b> Understand how the survival of species depends on biodiversity and on complex interactions, including the cycling of matter and the flow of energy.
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**STANDARD II** Understand the properties, structures, and processes of living things and the interdependence of living things and their environments

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4	5.Explain how matter and energy flow through biological systems (e.g., organisms, communities, ecosystems), and how the total amount of matter and energy is conserved but some energy is always released as heat to the environment	<b>Biochemistry</b>	Students will identify the chemical reactions that by learning the chemical equations of <b>Photosynthesis, carbon cycle, nitrogen cycle</b>	Guided Reading and writing chapter 24 Chapter 24 exam	Textbook chapter 24

**ESSENTIAL QUESTIONS: How does the human body use chemistry daily?**

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<b>STRAND II The Content of Science</b>		<b>BENCHMARK III</b> Understand the characteristics, structures, and functions of cells.			
<b>STANDARD II</b> Understand the properties, structures, and processes of living things and the interdependence of living things and their environments					
9 w e e k s	PERFORMANCE STANDARD	CONCEPTS/SKILLS Review/Extend previously introduced skill unless noted <b>I = Introduce</b> <b>R= Review AND Extend</b> <b>M = Master</b>	STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES	ASSESSMENTS	STUDENT MATERIALS AND RESOURCES
<b>4</b>	<p>7. Describe how most cell functions involve chemical reactions, including:</p> <ul style="list-style-type: none"> <li>• promotion or inhibition of biochemical reactions by enzymes</li> <li>• processes of respiration (e.g., energy production, ATP)</li> <li>• communication from cell to cell by secretion of a variety of chemicals (e.g., hormones).</li> </ul>	<p><b>Chemistry in the body</b></p>	<p>Students will analyze cellular chemical reactions that drive life forces by learning the chemical makeup of Carbohydrates, amino acids, polymers, nucleic acids.</p> <p>Students will identify the chemical reactions that occur at the cellular level such as carbon cycle, Krebs cycle, Nitrogen cycle</p> <p>Students will explore some physical and chemical properties of a chicken egg.</p>	<p>Guided reading and writing chapter 24 Chapter 24 Test</p> <p>Guided Reading and Writing Chapter 24.6 Chapter 24 Test</p> <p>Small scale lab: The egg a biochemical storehouse</p>	<p><a href="http://www.tinyurl.com/cg67dh">http://www.tinyurl.com/cg67dh</a> (carbohydrate links)</p> <p>Textbook chapter 24 Biomedical Research <a href="http://tinyurl.com/qpgu7s">http://tinyurl.com/qpgu7s</a></p> <p>Small Scale Lab Book <a href="http://tinyurl.com/o4tc3s">http://tinyurl.com/o4tc3s</a></p>

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<b>ESSENTIAL QUESTIONS: Why is carbon the basis of life?</b>					
<b>STRAND II The Content of Science</b>			<b>BENCHMARK III</b> Understand the characteristics, structures, and functions of cells.		
<b>STANDARD II</b> Understand the properties, structures, and processes of living things and the interdependence of living things and their environments					
<b>9</b>	<b>PERFORMANCE STANDARD</b>	<b>CONCEPTS/SKILLS</b> Review/Extend previously introduced skill unless noted <b>I = Introduce</b> <b>R= Review AND Extend</b> <b>M = Master</b>	<b>STUDENT ACTIVITIES AND INSTRUCTIONAL STRATEGIES</b>	<b>ASSESSMENTS</b>	<b>STUDENT MATERIALS AND RESOURCES</b>
<b>4</b>	7 Describe how most cell functions involve chemical reactions, including: <ul style="list-style-type: none"> <li>• promotion or inhibition of biochemical reactions by enzymes</li> <li>• processes of respiration (e.g., energy production, ATP)</li> <li>• communication from cell to cell by secretion of a variety of chemicals (e.g., hormones).</li> </ul>	<b>Organic Chemistry</b>	<b>Students will identify the differences between organic chemistry and inorganic chemistry through deductive reasoning and producing a comparison matrix.</b>	Chapter 22 Guided reading and writing. Chapter 22 exam.	<b>Textbook chapter 22</b>

