

# Physical Science Pacing Guide

	Standard #	Lessons	Incorporated Labs
Week 1 - 2	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>SPI 3202.4.1</b> Distinguish between mass and weight using SI units.         </div>	Units of measurement. Calculations within units of measurements. Dimensional Analysis Collecting Data and Graphing Scientific Notation and Significant Figures.	Length Lab with conversions to metric and non metric units.
Week 3	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>SPI 3202.1.2</b> Name, measure, and describe the physical properties of substances.  <b>SPI 3202.1.3</b> Compare different types of mixtures.         </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>SPI 3202.1.4</b> Distinguish between examples of common elements and compounds.         </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>3202.1.4</b> Calculate the density of substances or objects         </div> <div style="border: 1px solid black; padding: 5px;"> <b>SPI 3202.1.8</b> Distinguish between physical and chemical changes in matter.         </div>	Comparing pure substances and mixtures. Comparing compounds and elements. Comparing chemical and physical properties.  Analyzing solids liquids, and gasses.	Density Activity: density calculations from regular and irregular solids.
Week 4	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <b>SPI 3202.1.6</b> Determine the composition of an atom and the characteristics of its subatomic particles.         </div> <div style="border: 1px solid black; padding: 5px;"> <b>3202.1.8</b> List the three major subatomic particles and distinguish among their location, charges, and relative masses.  <b>3202.1.9</b> Distinguish between atomic number and atomic mass         </div>	Identifying particles of the Atom.  Predicting protons, neutrons, electrons, and electron configuration from element symbols.	Bohr Model Construction: Activity building Bohr models from given elements of the Periodic Table

	<p>3202.1.11 Identify the number of protons, neutrons, and electrons in an atom of an isotope based on its atomic number and atomic mass.</p> <p>3202.1.12 Know the chemical symbols for the common elements.</p>		
Week 5	<p><b>SPI 3202.1.9</b> Use information about an element's position in the periodic table to determine the charge of its ions.</p> <p>3202.1.10 Define an isotope and describe the use of common isotopes.</p> <p><b>SPI 3202.1.5</b> Compare the properties of metals, metalloids, and nonmetals.</p>	<p>Organization of the Periodic Table.</p> <p>Periodic Law in relation to ionic charges.</p> <p>Families of the Periodic Table</p>	<p>Building a Periodic Table</p> <p>Possible Research of Families of the Periodic Table.</p>
Week 6 – Week 7	<p><b>SPI 3202.1.10</b> Classify chemical bonds in a compound as ionic or covalent.</p> <p><b>SPI 3202.1.11</b> Construct the chemical formula of a compound using the periodic table.</p>	<p>Contrasting between ionic, covalent, and metallic bonds.</p> <p>Naming ionic bonds Constructing ionic formulas from compound names.</p> <p>Naming covalent bonds Constructing covalent formulas from compound names.</p>	<p>Flame Test: Characterization of metals dissolved in solutions and determines unknowns.</p>

<p>Week 8</p>	<p><b>SPI 3202.1.12</b> Identify the reactants and products in a chemical equation, and balance equations using proper coefficients.</p> <p><b>SPI 3202.1.12</b> Identify the reactants and products in a chemical equation, and balance equations using proper coefficients.</p> <p><b>SPI 3202.1.15</b> Explain the Law of Conservation of Mass/Energy in terms of a balanced chemical equation.</p> <p><b>SPI 3202.1.13</b> Predict the products of  common chemical reactions, given the reactants.</p> <p><b>SPI 3202.1.14</b> Distinguish among synthesis, decomposition, single-replacement, double-replacement, and combustion reactions.</p> <p><b>SPI 3202.1.16</b> Distinguish between endothermic and exothermic reactions.</p>	<p>Analyzing chemical equations and depicting reactants/products.</p> <p>Balancing chemical equations using coefficients.</p> <p>Determining types of reactions.</p> <p>Predicting products.</p>	<p>Lab: Predicting Products using Double Displacement Reactions.</p>
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<p>Week 9</p>	<p><b>SPI 3202.1.3</b> Compare different types of mixtures.</p> <p><b>SPI 3202.1.18</b> Recognize the effect of acid rain on the environment.</p> <p><b>SPI 3202.1.17</b> Identify a substance as acidic, basic, or neutral based on its pH or response to an indicator or instrument.</p>	<p>Analyzing Homogeneous and Heterogeneous mixtures.</p> <p>Factors that affect dissolving and solubility.</p> <p>Properties of Acids and Bases.</p> <p>Analyzing Neutralizing reactions to predict salts formed.</p>	<p>Acid Base Indicator Lab: Identifying pH of Acids and Bases</p>
<p>Week 10</p>	<p><b>SPI 3202.3.1</b> Distinguish between speed and velocity.</p> <p><b>SPI 3202.3.4</b> Interpret a position-time graph for velocity or a velocity-time graph for acceleration.</p> <p><b>SPI 3202.4.2</b> Identify the effects of gravitational force on a falling body or satellite.</p>	<p>Calculating speed and velocity from word equations.</p> <p>Explain how friction affects motion of an object.</p> <p>Examine weight of objects due to different gravitational affects.</p>	<p>Speed – Velocity graphs from student data</p> <p>Activity: Strength of Paper due to gravity.</p>
<p>Week 11</p>	<p><b>SPI 3202.3.2</b> Relate inertia, force, or action-reaction forces to Newton’s three laws of motion.</p> <p><b>SPI 3202.3.3</b> Distinguish among the concepts inherent in Newton’s three laws of motion.</p> <p><b>SPI 3202.2.8</b> Identify a scenario that illustrates the Law of Conservation of Energy.</p>	<p>Calculating acceleration and Force from Newton’s 2<sup>nd</sup> law of motion.</p> <p>Compare and Contrast Newton’s Laws of Motion.</p> <p>Distinguish between potential and kinetic energy.</p>	<p>Acceleration graphs of objects in motion</p>

Week 12	<p><b>SPI 3202.3.5</b> Solve application problems related to velocity, acceleration, force, work, and power using appropriate units of measurement (<math>v=d/t</math>, <math>a=\Delta v/t</math>, <math>F=ma</math>, <math>W=Fd</math>, and <math>P=W/t</math>).</p>	Using Force and distance perform calculations to find the amount of Work done by an object.	Lab: Horsepower calculations from student power collections.
Week 13	<p><b>SPI 3202.4.3</b> Identify various types of simple machines.  <b>SPI 3202.4.4</b> Recognize the simple machines found in a compound machine.  <b>SPI 3202.4.5</b> Solve application problems related to mechanical advantage and the efficiency of simple machines, given appropriate equations (<math>MA=FO/FI</math> and <math>Eff=WO/WI</math>).</p>	<p>Calculate the Mechanical Advantage of various simple machines.</p> <p>Determine why machines make work easier.</p> <p>Calculate the efficiency of simple machines.</p>	<p>Lab: Student analysis of Compound machines from various simple machines.</p> <p>Project: Building Compound Machines.</p>
Week 14	<p><b>SPI 3202.2.7</b> Classify heat transfer as conduction, convection, or radiation.</p> <p><b>SPI 3202.2.10</b> Distinguish between nuclear fission and nuclear fusion.</p> <p><b>SPI 3202.2.4</b> Identify the boiling and freezing points of water using Celsius, Fahrenheit, or Kelvin scales.</p> <p><b>SPI 3202.2.11</b> Solve problems regarding heat, mass, specific heat capacity, and temperature change (<math>Q=mC\Delta T</math>).</p>	<p>Recognize heat as a form of energy.</p> <p>Determine various pathways of heat flow.</p> <p>Calculate temperature conversions</p> <p>Calculate specific heat problems.</p>	Lab: Converting temperatures to Celsius and Kelvin from observed readings in Fahrenheit.

<p>Week 15</p>	<p><b>SPI 3202.2.9</b> Solve application problems related to voltage, resistance, and current in a series circuit (<math>V=IR</math>).</p> <p><b>3202.2.9</b> Solve problems related to voltage, resistance, and current in a series circuit.</p>	<p>Calculate the cost of electrical energy.</p> <p>Describe how batteries are a source of voltage.</p> <p>Calculate electric power and energy.</p>	<p>Lab: Static Electricity. Charging materials to predict interaction of charges.</p> <p>Activity: Building circuits and calculating current from given voltage readings.</p>
<p>Week 16</p>	<p><b>SPI 3202.2.1</b> Classify waves as transverse or longitudinal.</p> <p><b>SPI 3202.2.2</b> Distinguish between mechanical and electromagnetic waves.</p>	<p>Describe the Doppler Effect.</p> <p>Identify the parts of a transverse wave.</p>	
<p>Week 17 - 18</p>	<p><b>SPI 3202.2.5</b> Compare and contrast sound and light waves.</p> <p><b>SPI 3202.2.3</b> Distinguish between wavelength, frequency, and amplitude.</p> <p><b>SPI 3202.2.6</b> Distinguish among wave reflection, refraction, diffraction, and interference</p>	<p>Explain patterns of interference.</p> <p>Calculating wave length and frequency.</p> <p>Factors that affect the speed of sound.</p> <p>Describe the different parts of the electromagnetic spectrum.</p>	