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Suggested Pacing	Content Standards	Learning and Performance Expectations	Assessment of Learning	Learning Resources
Quarter 1				
14 DAYS	**SCIENTIFIC INQUIRY/ MEASUREMENT IN SCIENCE** **C.PM.4: Representing compounds** C.PM.4: Formula Writing	• I can **recognize and understand the patterns** associated with 30 of our common ion. • I can **name and write** the formulas of these ions and 30 more complex ions using patterns and the rules of naming.	**Weekly Quizzes and tutoring** **Test when chp 7-9 is beginning**	Powerpoint presentation, lecture, flash cards, practice. (*Labs to refresh understanding of Physical Science curricula and introduce proper lab techniques and measurement).* ***Demo & Lab: equipment reading.*** ***Lab: Chemistry of Fire*** ***Lab: Observation and Inference*** ***Lab: Chemical and Physical Changes*** ***Demo: Evidence of a chemical change***
15 DAYS including the atom.	**MEASUREMENT IN SCIENCE** C.PM.1: Molecular Calculations	• I can **apply** dimensional analysis to perform conversions and calculations of density, etc. • I can **calculate** the number and types of subatomic particles in an isotope.	**OTOT** **Weekly quizzes** **Homework practice** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Apple Pie worksheet.***

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See above	**THE ATOM** **C.PM.1: Atomic Structure** **C.PM.5: Quantifying Matter** C.PM.2: Chemical Properties Scientific Inquiry, Practice and Applications.	• I can **determine** the most abundant isotope by looking at the atomic mass of the element. • I can **calculate** the average atomic mass of an element from data gathered by a mass spectrum. • I can distinguish between accuracy and precision. • I can use a variety of equipment **in lab** and report measurements to the correct number of significant figures. • I can compare the accuracy of each measuring devices used **in lab.** • I can use water displacement **in lab** to find density of irregular objects. • I can apply the rules for determining significant digits when performing mathematical operations.	**CSU homework site** **OTOT** **Weekly quizzes,** **Homework practice** **Jeopardy/Kahoot** **Labs** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***CSU homework site*** ***Lab: Density of Beverages*** ***Videos: Big Sig Fig Gig; Where the Heck to Round.*** ***Lab: How Big is it?*** ***Lab: Conversion Factors*** ***Lab: How many atoms thick is this piece of Aluminum?***
	C.PM.1:Atomic structure C.PM.1:Electrons	• I can **identify** subatomic particles in an atom or isotope. • I can **understand** that the charge of an electron is negative.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, ***CSU homework site***, guided practice, homework practice. ***Lab: Beans in a Cup*** ***Lab: The Atomic Mass of Candium*** ***Demo: Cathode Ray Tube***

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				Video: WOC "The Atom"
12 DAYS	**ELECTRONS IN ATOMS** C.PM.1:Electron Configuration	• I can **determine** the extended (or long-hand) electron configurations of all atoms in the first 3 periods of the periodic table. • I can **determine** the Noble Gas electron configuration for any atom on the periodic table. • I can **determine and draw** Energy Level and Orbital diagrams for any atom in the first 3 period of the periodic table.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Lab: Introduction to the Spectrophotometer*** ***Lab: Working with the spectroscope*** ***Computer Activity: Atomic Orbitals.*** ***Lab: Flame Te***st ***Videos: I Heart Electron Configuration; What the heck is light?***
	C.PM.1: Evolution of atomic models/theory	• I can **name and identify** the contributions of Dalton, Thomson, Rutherford, and Bohr. • I can also **identify** the experiments that were instrumental in these scientists contributions. • I can **understand** that the atomic theory is an ongoing dynamic-theory that is updated as new information is gathered.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,modeling. ***Story of the Atom*** ***Lab: Black Box*** ***Movie: WOC: "The Atom"*** ***Video: Atomos, Atomos***
	C.PM.4:Representing compounds C.PM.4: Models and shapes	• I can, for an element in the first 3 periods, **connect** the Bohr models, to Lewis dot structures, to # of valence electrons, to electron configuration to the most common	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice.

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		ion formed by the element.	**Unit Test**	***Atomic structure activity***
Quarter 2				
10 DAYS	**PERIODIC TABLE** **C.PM.2: Periodic Table** C.PM.2: Chemical Properties	• I can **understand** that elements in a family have similar reactivities. • I can **predict** properties(reactivity, boiling point, melting point…) of an element due to its place on the periodic table.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Activity: Small Scale Investigation: Periodic Trends***. ***Lab: Periodic Properties*** ***Lab: Periodic Table***
	C.PM.2: Periodic Table C.PM.2: Periodic Trends	• I can **name** and **define** the major periodic trends. • I can explain how the shielding effect of electrons explains the trend in atomic radius (atomic size). • I can **name** and **identify** the location of the major groups on the periodic table. • I can **predict reactivity** of elements because of 1) their location and 2) knowledge of periodic trends.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Activity: Periodic Table Packet: Research families, groups,properties and trends on the periodic table.*** ***Videos: Periodic Table, describing groups and their trends.*** ***Movie: WOC: The Periodic Table***

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25 DAYS (CHP 7-9) (30 Days if IMF)	**IONIC BONDING & METALLIC BONDING** **C.PM.4: Representing compounds** C.PM.4: Formula writing C.PM.4: Nomenclature (naming) **C.PM.3: Chemical bonding** C.PM.3: Ionic bonding C.PM.3: Polar/covalent bonding C.PM.4: Models and shapes (Lewis structures, ball and stick, molecular geometries)	• I can **apply** the rules of the Stock System to name and write the formulas of ionic compounds. i • I can **apply** the rules of the Stock System to name and write the formulas of molecular/covalent compounds and acids (formula from name specific for acids) • I can apply the rules of Lewis Dot Structures (LDS) to draw simple and complex LDS for atoms, ions, ionic compounds and molecular compounds. • I can **represent** molecules using ball and stick models. • I can **observe** the geometries of molecules using ball and stick models. • I can **predict** the geometries (shapes) of molecules using the rules of VSEPR theory.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Lab:Small scale investigation #17: making ionic compounds through double replacement reactions.*** ***Activity: Ions in a Bag*** ***Naming Game: Ionic*** ***Nine for Nine Quiz/Game*** ***Lab: Ionic vs Covalent*** ***Lab: Molecular Models*** ***Lab: Make your own Molecule*** ***Movie: WOC: The Periodic Table***
	C.PM.4: Representing compounds C.PM.4: Models and shapes (Lewis structures, ball and stick, molecular geometries) **C.PM.3: Chemical bonding**	• I can predict which type of compound (ionic, molecular, network covalent, metallic) is represented by looking at the chemical formula. • I can predict whether a compound is ionic, polar covalent or non-polar covalent by drawing its structure. • I can predict the properties (mp, bp, solubility, vapor pressure) of	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Lab: Chromatography*** ***Demo:Single, Double, Triple bond strength and length.*** ***Movie: WOC: "Chemical***

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		ionic, molecular, metallic and network covalent compounds. • I can predict the strength of a bond in different chemical compounds. • I can represent the formation of a bond by valence electron transfer or valence electron sharing. • I can understand that it is the valence electrons are the highest energy electrons in the atom, and then I can apply the octet rule to predict ion formation and bonding. • I can represent the formation of a bond using electron configuration of atoms and Lewis Dot Structures. • I can explain the difference between single, double and triple bonds. (# of electrons in the bond, bond length and bond strength).		***Bonding"***
Quarter 3				
5 DAYS (Often done in 2nd quarter)	**C.PM.6: Intermolecular forces of attraction** C.PM.6: Types and strength of IMF"'s C.PM.6: Implications for properties of substances. (Melting and boiling point, solubility, vapor pressure.)	• I can identify the three types of Intermolecular forces (IMF's). • I can explain why IMF's are always weaker than intramolecular bonds (Ionic, covalent and molecular) • I can determine which chemical compound will exhibit certain IMF's. • I can predict geometries for compounds, predict the IMF's it will exhibit and thereby predict its chemical properties (bp, mp,	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice ***Demo Separatory Funnel*** ***Video: Hydrogen Bonds*** ***Movie: WOC: "Water"***

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		phase…). • I can distinguish between bond polarity and molecular polarity. • I can explain what the statement "Like dissolves Like" when describing solubility due to IMF's.		
12 DAYS	**THE MOLE** **C.PM.5: Quantifying Matter** **C.PM.1: Atomic structure** C.PM.1: Molecular calculations C.PM.1: Solutions	• I can quantify matter using Dimensional analysis and Moleville to perform calculations using Molar mass, Avagadro's number, Molar volume and Molarity. • I can define the MOLE in 2 ways.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test** **Lab Practical**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice ***Activity: Counting by measuring (paper clips)*** ***Lab: Counting by measuring*** ***Lab: Mole Stations*** ***Lab: The Bean Lab*** ***Activity: How much is a Mole of Carbon*** ***Game: Moleman Challenge***
18 DAYS	**CHEMICAL REACTIONS** **C.IM.1: Chemical reactions** C.IM.1: Types of reactions	• I can classify a chemical reaction as synthesis, single replacement, double replacement decomposition, or organic combustion. • I can use the solubility rules and activity series to construct an outcome for double and single replacement reactions. • I can balance chemical equations to obey the Law of Conservation of	**OTOT** **Weekly quizzes,** **Homework practice** **Jeopardy/Kahoot** **Labs** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Activity: Translation shee***t ***Lab: Precipitation Reactions*** ***Lab: Metal Activity Series***

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		Matter.		***Lab: Chemical Reactions*** ***Snowman Challenge (balancing)*** ***LAb: What is it?***
12 DAYS	**STOICHIOMETRY** **C.IM.3: Stoichiometry** **C.PM.1: Atomic Structure** C.PM.1: Limiting reagents	• I can interpret the coefficients of a balanced equation in terms of moles and particles. • I can use mole ratios from a BCE to calculate the quantity of one substance in a reaction, given the quantity of another substance in the reaction. (Ie given moles, particles, mass or volume and end with moles, particles mass or volume of the desired substance.) • I can determine the theoretical yield and percent yield of a chemical reaction. • I can determine that one reactant may limit the amount of product that can form	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kakhoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Lab: Quantitative Analysis*** ***Lab: Gravimetric Analysis*** ***Activity: Lego and limiting reactants***
2 DAYS	**KINETICS** **C.IM.1: Chemical reactions** C.IM.1: Kinetics	• I can determine what factors can affect the rate of a chemical reaction and the effect they will have on the rate. (ie changes in concentration, surface area, temperature changes, pressure of gases and using a catalyst).	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Lab: Reaction Rates*** ***Graph :Poetntial Energy***

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				Diagram
8 days	**THERMOCHEMISTRY** **C.IM.1: Chemical reactions** C.IM.1:Energy	• I can define bond energy and recognize that bond-breaking is an endothermic process and bond-forming is an exothermic process. • I can calculate the thermal energy change (q), the change of temperature (ΔT), initial or final temperature and mass of a material using specific heat. • Given a table of bond energies I CAN determine whether a given reaction is exothermic or endothermic. • I can track (graphically) the flow of energy and explain why a reaction is an exothermic process or endothermic process. • I can generate and read quantitative potential energy diagrams for endothermic and exothermic reactions with and without a catalyst (including activation energy reactants and products). • I can compare how the specific heat of different substances impacts temperature change.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Lab: Calorimetry*** ***Lab: Heat of reaction***
2 days	**STOICHIOMETRY** **C.IM.3: Stoichiometry** C.IM.3: Solutions	• I can distinguish between solute, solvent and solution. • I can calculate the molarity of an	**OTOT** **Weekly quizzes,** **Homework practice**	Textbook, Powerpoint presentation,demonstration and modeling, guided

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		aqueous solution. • I can create a solution and a **dilution** of a known concentration.	**Labs** **Jeopardy/Kahoot** **Unit Test**	practice and homework practice. ***Lab: Make a Solution***
9 days	**EQUILIBRIUM** C.IM.1: Equilibrium	• I can show that equilibrium is dynamic and that the rates of the forward and reverse reactions are equal. • Describe the key features of equilibrium (That two opposing process occur simultaneously at the same rate). • I can illustrate equilibrium in a laboratory setting. • I can describe how factors (pressure, temperature and, concentration) can shift equilibrium to favor the formation of products or reactants. (Le Chatalier's principle)	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Lab: Scoops*** ***Demo: Milk of Magnesia*** ***Le Chatalier Practic*** ***Video: Stress, Shift, Change in Concentration***
Quarter 4				

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10 days (over AIR testing)	**GASES** **C.IM.2: Gas laws** C.IM.2: Pressure, Volume and Temperature C.IM.2: Ideal Gas Law	• I can use the Kinetic Molecular Theory to explain the motion of gas particles and how they are affected by changes in pressure, temperature and or volume. • I can identify units of pressure, volume and temperature. • I can convert between different pressure units. • I can explain both quantitative and qualitative relationships between pressure, volume and temperature. • I can solve problems using appropriate gas law equations. • I can determine whether pressure, temperature and volume are increasing or decreasing in a given situation. • I can apply the ideal gas law to solve for an appropriate variable.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***"AIR Bag"*** ***Lab: Boyle's Law*** ***Lab: Charles' Law*** ***Lab: Molar Volume of a Gas*** ***Lab: Alka Seltzer***

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10 days	**ACIDS AND BASES** **C.IM.1: Chemical Reactions** C.IM.1: Acids/Bases	• I can perform calculations relating pH to hydronium ion concentrations. • I can identify acids based on the formation of the hydronium ion in water. • I can identify bases by their dissociation in water to form the hydroxide ion. • I can predict the products of a neutralization reaction • I can perform a titration to find the endpoint and concentration of an unknown acid/base given the concentration of a standard solution acid/base.	**OTOT** **Weekly quizzes,** **Homework practice** **Labs** **Jeopardy/Kahoot** **Unit Test** **Lab Practical**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. ***Lab: pH and indicators*** ***Lab: Cabbage Titration*** ***Lab: Buffers***
5 days	**ELECTROCHEM** C.IM.1: Chemical reactions	• Assign oxidation numbers to reactants and products • Identify which substance is oxidized and which is reduced in a Redox reactions	**OTOT** **Weekly quizzes,** **Homework practice** **Lab** **Kahoot/Jeopardy** **Unit Test**	Textbook, Powerpoint presentation,demonstration and modeling, guided practice and homework practice. **Lab: Make a Battery** **Video: Start at the Anode**