Length	Objectives	Chapter(s)	Activities
September 3 days	**C1.1A** Generate new questions that can be investigated in the laboratory or field. **P2.p1A** Describe energy changes associated with changes of state in terms of the arrangement and order of the atoms (molecules) in each state. *(prerequisite)* **P2.p1B** Use the positions and arrangements of atoms and molecules in solid, liquid, and gas state to explain the need for an input of energy for melting and boiling and a release of energy in condensation and freezing. *(prerequisite)* **P4.p1C** For a simple compound, present a drawing that shows the number of particles in the system does not change as a result of a phase change. *(prerequisite)* **C2.2A** Describe conduction in terms of molecules bumping into each other to transfer energy. Explain why there is better conduction in solids and liquids than gases. **C2.2B** Describe the various states of matter in terms of the motion and arrangement of the molecules (atoms) making up the substance. **P4.p1A** For a substance that can exist in all three phases, describe the relative motion of the particles in each of the phases. *(prerequisite)* **P4.p1B** For a substance that can exist in all three phases, make a drawing that shows the arrangement and relative spacing of the particles in each of the phases. *(prerequisite)* **P4.p2A** Distinguish between an element, compound, or mixture based on drawings or formulae. *(prerequisite)* **P4.p2B** Identify a pure substance (element or compound) based on unique chemical and physical properties. *(prerequisite)* **P4.p2C** Separate mixtures based on the differences in physical properties of the individual components. *(prerequisite)* **P4.p2D** Recognize that the properties of a compound differ from those of its individual elements. *(prerequisite)* **P5.p1A** Draw a picture of the particles of an element or compound as a solid, liquid, and gas. *(prerequisite)*	Chapter 2	Labs, test, HW

Unit 1 September	C4.3A Recognize that substances that are solid at room temperature have stronger attractive forces than liquids at room temperature, which have stronger attractive forces than gases at room temperature. C4.3B Recognize that solids have a more ordered, regular arrangement of their particles than liquids and that liquids are more ordered than gases.	Chapter 2	
Unit 2 4 days September	**C4.8A** Identify the location, relative mass, and charge for electrons, protons, and neutrons. **C4.8B** Describe the atom as mostly empty space with an extremely small, dense nucleus consisting of the protons and neutrons and an electron cloud surrounding the nucleus. C4.9A Identify elements with similar chemical and physical properties using the periodic table. C4.10A List the number of protons, neutrons, and electrons for any given ion or isotope. C4.10B Recognize that an element always contains the same number of protons. C4.10c Calculate the average atomic mass of an element given the percent abundance and mass of the individual isotopes. C4.10d Predict which isotope will have the greatest abundance given the possible isotopes for an element and the average atomic mass in the periodic table. C4.10e Write the symbol for an isotope, $X\ Z\ A$, where Z is the atomic number, A is the mass number, and X is the symbol for the element. **C4.9A** Identify elements with similar chemical and physical properties using the periodic table. **C4.9b** Identify metals, non-metals, and metalloids using the periodic table.	Chapter 3	

Unit 3 7 days September	**C4.2A** Name simple binary compounds using their formulae. **C4.2B** Given the name, write the formula of simple binary compounds. **C4.2c** Given a formula, name the compound. **C4.2d** Given the name, write the formula of ionic and molecular compounds. **C4.2e** Given the formula for a simple hydrocarbon, draw and name the isomers.	Chapter 4	Labs, test, HW
Unit 4 7 days September- October	Student will be able to use dimensional analysis to solve various problems. Students will be able to determine sig. Figs. Given numbers or math operations Students will be able to determine density. Students will be able to use scientific notation	Chapter 5	Labs, test, HW, group project
Unit 5 8 days October	**C4.1a** Calculate the percent by weight of each element in a compound based on the compound formula. **C4.1b** Calculate the empirical formula of a compound based on the percent by weight of each element in the compound. **C4.1c** Use the empirical formula and molecular weight of a compound to determine the molecular formula. **C4.6a** Calculate the number of moles of any compound or element given the mass of the substance. **C4.6b** Calculate the number of particles of any compound or element given the mass of the substance.	Chapter 6	Labs, test, HW
Unit 6 7 days October	Students will be able to classify reactions. Students will be able to use solubility rules to predict whether a solid will be formed. **C5.2A**: Balance simple chemical equations applying the conservation of matter. **C5.6b**: Predict single replacement reactions.	Chapter 7+8	Labs, test, HW

Unit 7 7 days November	**C5.2d** Calculate the mass of a particular compound formed from the masses of starting materials. **C5.2e** Identify the limiting reagent when given the masses of more than one reactant. **C5.2f** Predict volumes of product gases using initial volumes of gases at the same temperature and pressure. **C5.2g** Calculate the number of atoms present in a given mass of element.	Chapter 9	Labs, test, HW
Unit 8 6 days November	**P3.p1A** Explain that the amount of energy necessary to heat a substance will be the same as the amount of energy released when the substance is cooled to the original temperature. *(prerequisite)* **C3.3A** Describe how heat is conducted in a solid. **C3.3B** Describe melting on a molecular level. **C3.1a** Calculate the ΔH for a given reaction using Hess's Law. **C3.1b** Draw enthalpy diagrams for exothermic and endothermic reactions. **C3.1c** Calculate the ΔH for a chemical reaction using simple coffee cup calorimetry. **C3.1d** Calculate the amount of heat produced for a given mass of reactant from a balanced chemical equation. **C3.4A** Use the terms endothermic and exothermic correctly to describe chemical reactions in the laboratory. **C3.4B** Explain why chemical reactions will either release or absorb energy. **C3.4c** Write chemical equations including the heat term as a part of equation or using ΔH notation. **C3.4d** Draw enthalpy diagrams for reactants and products in endothermic and exothermic reactions. **C3.4e** Predict if a chemical reaction is spontaneous given the enthalpy (ΔH) and entropy (ΔS) changes for the reaction using Gibb's Free Energy, $\Delta G = \Delta H - T\Delta S$ (Note: mathematical computation of ΔG is not required.) **C3.4f** Explain why some endothermic reactions are spontaneous at room temperature. **C3.4g** Explain why gases are less soluble in warm water than cold water. *atoms.*	Chapter 10	Labs, test, HW

Unit 9 5 days November	**C2.4a** Describe energy changes in flame tests of common elements in terms of the (characteristic) electron transitions. **C2.4b** Contrast the mechanism of energy changes and the appearance of absorption and emission spectra. **C2.4c** Explain why an atom can absorb only certain wavelengths of light. **C2.4d** Compare various wavelengths of light (visible and nonvisible) in terms of frequency and relative energy.	Chapter 11	Labs, test, HW