

- Significant figures, accuracy and precision; metric conversions (including density)
- Heat and temperature (Celsius and Kelvin) and calculations related to them.
- Define and understand *matter, pure substance, mixture (homogeneous/heterogeneous), element, compound physical and chemical changes, as well as different forms of energy and exothermic vs. endothermic reactions.*
- Law of conservation of mass and law of conservation of energy and their relationships. Law of definite proportions, law of multiple proportions, atomic number and mass number and their relations to electrons, protons and neutrons as well as isotopes and calculations concerning percent abundance.
- Experiments and the results of Dalton, Thomson, Rutherford and Bohr; orbital theory, electron configurations, ground state and excited state.
- Quantum numbers *and what they mean*, energy transfer as a result of electron's movements and bright light spectrum of elements; electron configurations of ions and some exceptions.
- Relationship between wavelength, frequency and energy of light rays and their colors.
- Periodic law, periods and groups and names of special groups (such as halogens, actinides, etc.) and some characteristics of them; the difference between metals and nonmetals, main group elements, transition metals etc. and characteristics of metals and nonmetals and alloys.
- Periodic trends such as electron affinity, electronegativity, energy of first and second ionization (with the exceptions that they have), atomic radius and ionic radius.
- Naming and understanding ionic compounds, the octet rule, the meaning of cation and anion and energy transfer during the formation of an ionic compound and characteristics of ionic compounds.
- Polyatomic ions (memorize: phosphate, phosphite, sulfate, sulfite, nitrate, nitrite, carbonate, bicarbonate, hydroxide, and ammonium) and relate electron configurations to ionic compound formation.
- Naming of covalent compounds and understanding covalent bond formation.
- Polar, non-polar and coordinate covalent bonds, metallic compounds, network solids and their characteristics.
- Valence electrons, Lewis structures, unshared electron pairs, single, double and triple bonds (and resonance) orbital overlaps and hybridization; VSEPR theory and molecular shapes.
- Moles, molar mass, percent composition, empirical formula, molecular formula and all types of calculations associated with them.
- Study the three tests that you have so far taken. Study the 3 Regents question sets that you have so far received. Study the questions at the end of each of the first 7 chapters of your textbook. Study the handouts from the problem workbook (with an exception of the one with basic calculations and conversions)