

MARLBORO CENTRAL SCHOOL DISTRICT-CURRICULUM MAP

Subject: AP Chemistry

2015/16

Title or Topics (Unit organizing idea)	Concepts (understandings)	Tasks (What students actually do)	Major Assessments (Tests, projects, etc.)	Time Frame (Number of weeks)
Introduction: Matter & Measurement	<ul style="list-style-type: none"> ➤ Classification of matter ➤ Properties of matter ➤ Units of measurement ➤ Uncertainty of measurement & significant figures <li style="padding-left: 20px;">Conversions 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1
Atoms, Molecules & Ions	<ul style="list-style-type: none"> ➤ Atomic theory ➤ Discovery of atomic structure ➤ Atomic number, average atomic mass, & isotopes ➤ Molecules and chemical formulas (naming) ➤ Ions and ionic compounds 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1
Stoichiometry: Calculations with Chemical Formulas and Equations	<ul style="list-style-type: none"> ➤ Chemical equations (balancing) ➤ Types of reactions ➤ Gram formula mass (weight) ➤ The mole ➤ Empirical formulas from analysis ➤ Quantitative information from balanced equations ➤ Limiting reactants 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1

Aqueous Reactions and Solution Stoichiometry	<ul style="list-style-type: none"> ➤ Properties of aqueous solutions (electrolytes) ➤ Precipitation reactions ➤ Acid-base reactions ➤ Oxidation-reduction reactions ➤ Solution concentrations (molarity) ➤ Solution stoichiometry and chemical analysis (titrations) 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1-1/2
Thermochemistry	<ul style="list-style-type: none"> ➤ Nature of Energy ➤ First law of thermodynamics (exo- and endo- thermic reactions) ➤ Enthalpy (of reactions and formation) ➤ Calorimetry ➤ Hess's law 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1-1/2
Electronic Structure of Atoms	<ul style="list-style-type: none"> ➤ Wave nature of light ➤ Photons ➤ Line spectra and Bohr model ➤ Wave behavior of matter ➤ Quantum mechanics and atomic orbitals ➤ Electron configurations (and the periodic table) 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1-1/2
Periodic Properties of the Elements	<ul style="list-style-type: none"> ➤ Metals, nonmetals, and metalloids ➤ Groups and period trends 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1

Basic Concepts of Chemical Bonding	<ul style="list-style-type: none"> ➤ Chemical bonds, Lewis symbols, and octet rule ➤ Ionic and covalent bonding ➤ Bond polarity and electronegativity ➤ Resonance structures ➤ Strengths of bonds 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1-1/2
Molecular Geometry and Bonding Theories	<ul style="list-style-type: none"> ➤ Molecular shapes (and polarity) ➤ VSEPR model ➤ Hybrid orbitals ➤ Multiple bonds (sigma and pi bonds) ➤ Diatomic molecules 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1
Gases	<ul style="list-style-type: none"> ➤ Gas Laws (Boyle's, Charles's and Avogadro's Laws) ➤ Ideal gas equation ➤ Gas mixtures and partial pressures (Dalton's Law) ➤ Kinetic molecular theory ➤ Graham's Law ➤ Real Gases – deviations 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1
Intermolecular Forces, Liquids and Solids	<ul style="list-style-type: none"> ➤ Properties of liquids and solids ➤ Phase changes ➤ Intermolecular forces (Van der Waals, Hydrogen, London Dispersion) ➤ Vapor pressure ➤ Phase diagrams ➤ Bonding in solids 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1-1/2

Properties of Solutions	<ul style="list-style-type: none"> ➤ Saturated solutions and solubility ➤ Factors affecting solubility ➤ Concentrations (ppm, ppb, molarity and molality) ➤ Colligative properties and Raoult's Law ➤ Colloids 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1
Chemical Kinetics	<ul style="list-style-type: none"> ➤ Reaction Rates (and affecting factors) ➤ Reaction mechanisms ➤ Catalysis 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	2
Chemical Equilibria	<ul style="list-style-type: none"> ➤ Equilibrium constants ➤ Calculating equilibrium constants (K_{eq}) ➤ LaChatelier's Principle 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	2
Acid-Base Equilibria	<ul style="list-style-type: none"> ➤ Acids and Bases (strong and weak) ➤ Lewis and Bronsted-Lowry acids and bases ➤ Autoionization of water ➤ pH scale ➤ K_a and K_b ➤ Acid-Base properties and salts ➤ Amphoterism 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1-1/2

Additional Aspects of Aqueous Equilibria	<ul style="list-style-type: none"> ➤ Common-Ion Effect ➤ Buffered Solutions ➤ K_{sp} ➤ Factors that affect solubility ➤ Analysis of metallic elements 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1
Chemical Thermodynamics	<ul style="list-style-type: none"> ➤ Entropy ➤ Gibbs free energy 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1
Electrochemistry	<ul style="list-style-type: none"> ➤ Balancing oxidation-reduction half reactions ➤ Voltaic cells ➤ Cell EMF ➤ Electrolysis ➤ Electrolytic Cells ➤ Nerst Equation ➤ Faraday's Laws 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1-1/2
Nuclear Chemistry	<ul style="list-style-type: none"> ➤ Radioactivity ➤ Patterns of stability ➤ Nuclear transmutations ➤ Half-life ➤ Nuclear binding energies ➤ Nuclear fission and fusion ➤ Biological effects of radiation 	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1

The Chemistry of Life: Organic and Biological Chemistry	<ul style="list-style-type: none">➤ Organic molecules➤ Alkanes, alkenes alkynes, aromatic hydrocarbons➤ Functional groups➤ Addition reactions	Outlining Labwork Homework problems Regents review Free response problems	chapter Quiz Lab reports	1
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