

MARLBORO CENTRAL SCHOOL DISTRICT-CURRICULUM MAP

Subject: Physical Setting: Chemistry

Grade 11

Title or Topics (Unit organizing idea)	Concepts (understandings)	Skills (What students actually do)	Major Assessments (Tests, projects, etc.)	Time Frame (Number of weeks)
Chemistry Skills	Metric conversions Significant figures & rounding % error Lab safety Density Temperature Scales °c/k	Convert units Rounding according to rules Calculate % error v-diagram & descriptive paper for lab Convert between temp scales	Labs: Safety lab HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. response	1
Varieties of matter	Physical & chemical properties & changes (3.1dd)(3.2a) Conservation of mass (3.3a) In reactions Homogeneous/heterogeneous Elements/compounds/mixtures substances Filtration/distillation (3.1q,r,st,u)(3.1nn)	Distinguish or describe types based on properties, bonding, composition, separation Filtration of precipitates Paper chromatography Use particle diagrams to represent varieties of matter Describe separation of substances based on differences in properties	Density of metals problem (Vee) Conservation of mass activity: (Vee & Descriptive Paper) DP consisting of parts: introduction, scientific principles, procedure, outcome, error, real world relevance) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. response	2
Basic Atomic Structure	Early Theories & models Rutherford empty space model Bohr energy level model Wave mechanical/Orbital model (3.1a) (3.1i,j,k) (3.1h) Subatomic particles – properties & arrangement Atomic number/Mass number/Atomic mass Isotopes (3.1m) (3.1n)(3.1b,c,d,e,f,l)	Describe Early models & evidence for Interpret bright-line spectra Interpret isotopic symbols/per. Tbl info Calculate atomic mass from % abundance Distinguish ground vs. excited state Electron configuration Use & calculate scientific notation	Lab activities: Atomic dimensions activity Weighted average of pennies Flame tests activity (DP) ½ mc ½ short answer math probs or constructed response HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	2

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Periodic Table	Metals/nonmetals/noble gases – properties Allotropes Chemistry of groups Radius & ionization – def. & trends Activity/reactivity (3.11,v,w)(5.2f)(3.1xx)	Distinguish element types based on properties Compare elements based on properties from trends & ref. Tbl S (3.1z)(3.1aa,bb) Predict relative activity based on table position	Labs: Element brochure/internet Project HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. response Graphing periodic trends activity	2
Nuclear Properties & changes	Nuclear stability Emanations-alpha,beta,gamma Nuclear equations Natural a transmutation & half life Artificial transmutation Fission & fusion Mass-energy conversion Radioisotope use & risks (3.1o,p)(4.4a,b,c,d,e,f)(5.3a,b,c,j)	Balancing nuclear equations Identify type of change based on equation Identify emanations based on characteristics & tbl Calculate half-life probs	HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. response	1 ½
Bonding	Electron dot (Lewis) structures for atoms Ion formation/octet rule Ionic bonding with Lewis structures Covalent (molecular) bonding & Lewis Structures Polyatomic ions Multiple bonds Bond polarity Electronegativity Molecule polarity Intermolecular forces Hydrogen bonds Metallic bonds Network (5.2a,b,c,d,e,h,j,k,l,m,n)	Draw Lewis structures for atoms, Ions, ionic compounds & molecular compounds Evaluate polarity of bonds based on electronegativity differences Identify bonding types/type of compound from properties	Labs: Molecular models lab (DP) Bonding characteristics lab (DP) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	2
Chemical Properties & changes (formulas)	Symbols/diatomic/subscripts Types of elements & properties Ionization energy (3.1cc) Empirical vs. molecular (3.1ee,d)(3.3d) Writing & naming ionic vs. molecular(5.2g) Stock system	Calculate atoms in formulas Empirical formula from molecular formula Writing & naming ionic vs. molecular Incl. Stock & traditional for molecular	Nuts & bolts: counting by mass activity (DP) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	1 ½

	Polyatomic ions			
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Chemical Properties & changes (formula math)	Formula mass/gram formula mass Mass ratios in formulas Mole concept % composition hydrates (3.3e,f)	Calculate formula or gram formula mass Calculate mass ratios from formulas Mole – mass conversion problems Calculate % composition from formulas % water in hydrates	Empirical formula of MgO lab % water in hydrate lab (Vee & DP) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	1 Midterm after this unit
Chemical Properties & changes (equations)	Reactants/products Types of reactions (3.2b)	Writing & balancing equations Coefficients/phase notation/energy Find missing mass or reactant/product Use particle diagrams to represent simple reactions	Types of reactions lab (DP) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	1
Chemical Properties & changes (equations math)	Mole relationships in equations (3.3c)	Mole – mole conversions from equations	Relating moles to coefficients Lab Molar gas volume lab (Vee & DP) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	1
Physical Properties & changes (phases)	Phases – solid/liquid/gases – Characteristics/arrangement/forces/ motion (3.1kk,jj,k) Kinetic molecular theory of solids & liquids Heating/cooling curves (4.2c) Changes – melting/freezing Boiling/condense – sublimation/deposition Vapor pressure curves Exothermic/endothermic Heat vs. temperature	Describe distinguish phases based on characteristics & KMT Use particle diagram to distinguish phases Draw/interpret heating & cooling curves in terms of Kinetic & Potential energy Distinguish heat & temp in terms of kinetic energy Interpret vapor pressure curves – find boiling point	Preparation of hearing curve Heat of fusion of ice activity Hot water heater calorimetry Problem Specific heat problem Design solar still project (Vee & DP) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. response	3

	Calorimetry Heat of fusion or vaporization	Find missing quantity in calorimetry problems & fusion/vaporization problems		
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Physical properties & changes (gases)	Kinetic molecular theory – gases (3.4b,c) Boyles/Charles/combined gas laws Ideal vs. real gases & deviations (3.4a) Independent vs. dependent variables Avogadro (3.e)	Describe/distinguish gases based on KMT Solve gas law problems Arrange variables appropriately on graphs	Labs: Elasticity of gases lab Design solar still project (Vee & Oral presentation) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	2
Solutions	Parts of a solution-solute/solvent Characteristics Solubility factors-nature/temp./press Solubility curves-saturated/unsat./supersat. Dilute/concentrated Concentration Molarity % by mass parts per million freezing point depression/boiling point elevation (3.1oo,pp,qq) Separation of mixture components based on properties-polarity/solubility 3.1nn	Predicting double replacement reactions Preparing & interpreting solubility curves – tbl G Preparation of known concentration Crystallization Calculate molarity, % by mass, Parts per million Paper Chromatography Describe Chromatography, 3.1xxiv	Solubility curves lab (Vee & DP) Chromatography lab HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. response	2
Kinetics & Equilibrium in Reactions	Collision theory & factors (3.4d) Bonding & energy (5.2i) Potential energy diagrams Heat of reaction/activation energy Catalyst Enthalpy/entropy (4.1a,b,c,d)(3.4f,g,h,i,j)(4.2b) Equilibrium-phase/solution/chemical LeChatelier's principle/shift/factors (3.1mm)	Evaluate potential energy diagrams Distinguish changes in entropy (3.1ll) Evaluate factors causing equilibrium shifts & predict changes in concentration, temp. or pressure	Labs: Reaction rate factors lab (Vee & DP) Hess's law lab (Vee & DP) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. response	2
Acids/Bases/Salts	Arrhenius acid/base/salt def./properties Naming Strength & ionization Neutralization & titration Bronsted-Lowry (3.1rr,ss,tt,uu,vv,ww,xx,yy,zz)	Determine pH from indicator colors Solve titration problems Interpret pH scale & indicator probs	Labs: Conductivity lab (Vee & DP) Titration lab (Vee & DP) Effectiveness of antacids prob. (Vee & DP) HW: Text Q's Short answer & math probs	2

	Mono/di hydroxy/hydroxide – acids/bases PH scale Indicators – tbl. M		QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. response	
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Oxidation & Reduction	Oxidation/reduction Oxidation numbers Oxidizing & reducing agents Half reactions Electrolytic cells Voltaic cells (3.2d,e,f,g,h,i,j,k,l)(3.3b)	Calculate oxidation numbers in formulas Write & interpret redox equations Write & interpret half reactions Predict outcome of single replacement Reactions from tbl Identify anode/cathode & parts of Electrochemical cells	Labs: Corrosion of iron (Vee & DP) Activity series lab (Vee & DP) HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	2
Chemistry of Organic Compounds	Carbon & properties Hydrocarbons – saturated/unsaturated Alkanes/alkenes/alkynes General & structural formulas Isomers & naming Functional groups Halides Alcohol-primary/secondary/tertiary Dihydroxy/trihydroxy lcohol Aldehyde/ketone Acids Ethers/esters Amines/amides Reactions-addition/substitution Esterification/saponification/fermentation Polymerization (3.1ff,gg,hh,ii)(5.2e)(3.2cc)	Identify & name organic compounds & reactions based on names, formulas & equations	HW: Text Q's Short answer & math probs QZ's: 1-5 short answer & math probs based on HW Tests: mc & short answers/constr. Response	2