

Pacing Guide 2010-2011
Subject Chemistry
Grade Level 10-12
Semester I

Approximate Time for Teaching Standards	Standard	Core Instructional Materials	Strategic Supplementary Materials	Assessment	
				Mat'ls	District
1 day (8/9)	State Standard: Investigation and Experimentation 1d. Formulate explanations by using logic and evidence.		Worksheet 1.1: Introduction to Graphical Analysis	Quiz 1.1: Graphical Analysis	
1 day (8/10)			Laboratory Assignment: Period of a Pendulum (Dependent vs. Independent Variable)		
1 day (8/11)		Textbook: Chemistry (Prentice Hall 2007) <u>Page Numbers</u>			
2 days (8/12–8/13)	1f. Distinguish between hypothesis and theory as scientific terms.	22-23	Worksheet 1.2: Qualitative vs. Quantitative Observations Demonstration 1.1: Penny in Nitric Acid	Quiz 1.2 : Scientific Theory	
1 day (8/16)	1e. Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.	28-32	Worksheet 1.3: Problem Solving		

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4 days (8/17-8/20)	1b. Identify and communicate sources of unavoidable experimental error.	63-92	Worksheet 3.1: Scientific Measurement	Exam 1: Investigation and Experimentation (Part I)	
	Chemistry State Standard 1: Atomic and Molecular Structure				
1 day (8/23)	1e. Students know the nucleus of the atom is much smaller than the atom yet contains most of its mass.	101-108	Worksheet 4.1: Models of the Atom (Electrons, Protons, Neutrons and Radioactivity) Inquiry Activity: Electric Charge Demonstration 4.1: The Cathode-Ray Tube	Quiz 4.1: Models of the Atom	
4 days (8/24-8/27)	1a. Students know how to relate the position of an element in the periodic table to its atomic number and atomic mass.	110-120	Worksheet 4.3: Atomic Number, Atomic Mass, and Isotopes	Exam 4: Atomic Structure	
5 days (8/30-9/3)	1a. Students know how to relate the position of an element in the periodic table to its atomic number and atomic mass.	127-137	Worksheet 5.1: Electrons in Atoms Activity: Writing Electron Configurations Virtual Labs: Thomson Cathode Ray Tube Experiment, Millikan Oil Drop Experiment, Atomic Structure, Rutherford's Experiment	Quiz 5.1: Electron Configuration	

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4 days (9/7-9/10)	<p>State Standard: Investigation and Experimentation</p> <p>1d. Formulate explanations by using logic and evidence.</p>	138-147	<p>Worksheet 5.3: Quantum Mechanical Model</p> <p>Quick Lab: Flame Tests</p> <p>Virtual Labs; Flame Tests, Atomic Emission Spectra, Photoelectric Effect, Diffraction Experiments, Electronic State: Energy Levels</p>	Exam 5: Electrons in Atoms	
3 days (9/13-9/15)	<p>Chemistry State Standard 1: Atomic and Molecular Structure</p> <p>1a. Students know how to relate the position of an element in the periodic table to its atomic number and atomic mass.</p> <p>1b. Students know how to use the periodic table to identify metals, semimetals, nonmetals, and halogens.</p> <p>1c. Students know how to use the periodic table to identify alkali metals, alkaline earth metals and transition metals, trends in ionization energy, electronegativity, and the relative sizes of ions and atoms.</p>	155-169	Worksheet 6.1: Periodicity	Exam 6.1 : Periodicity	

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3 days (9/16-9/20)	1c. Students know how to use the periodic table to identify alkali metals, alkaline earth metals and transition metals, trends in ionization energy, electronegativity, and the relative sizes of ions and atoms.	170-179	Worksheet 6.2: Periodic Trends Quick Lab: Periodic Trends in Ionic Radii	Exam 6.2: Periodic Trends	
3 days (9/21-9/24)	1d. Students know how to use the periodic table to determine the number of electrons available for bonding. State Standard 2: Chemical Bonds 2e. Students know how to draw Lewis dot structures.	187-193	Worksheet 7.1: Ions and Valence Electrons	Quiz 7.1 : Valence Electrons	
2 days (9/27-9/28)	2a. Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds. 2c. Students know salt crystals, such as NaCl, are repeating patterns of positive and negative ions held together by electrostatic attraction.	194-200	Worksheet 7.2: Ionic Bonds Small scale Lab: Analysis of Anions and Cations	Quiz 7.2: Ionic Bonds	
2 days (9/29-9/30)	2a. Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds.	201-205	Worksheet 7.3: Metallic Bonds	Exam 7: Ionic and Metallic Bonding	

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6 days (9/30-10/7)	<p>2a. Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds.</p> <p>2b. Students know chemical bonds between atoms in molecules such as H₂, CH₄, NH₃, H₂ CCH₂, N₂, Cl₂, and many large biological molecules are covalent.</p>	213-216	<p>Worksheet 8.1: Molecular Compounds</p> <p>Review for Benchmark Assessment: State Standards 1a, b, c, d, e, 2a, b, c, e)</p>	<p>Quiz 8.1: Molecular Compounds</p> <p>Quarter I Midterm: Chapters 1-8.1</p>	1 st Quarter Benchmark Assessment State Standards 1a, b, c, d, e, 2a, b, c, e)
2 days (10/12-10/14)	<p>2a. Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds.</p> <p>2b. Students know chemical bonds between atoms in molecules such as H₂, CH₄, NH₃, H₂ CCH₂, N₂, Cl₂, and many large biological molecules are covalent.</p> <p>2e. Students know how to draw Lewis dot structures.</p>	217-229	Worksheet 8.2: Covalent Bonds	Quiz 8.2 : Covalent bonds	
5 days (10/15-10/21)	2b. Students know chemical bonds between atoms in molecules such as H ₂ , CH ₄ , NH ₃ , H ₂ CCH ₂ , N ₂ , Cl ₂ , and many large biological molecules are covalent.	230-236	Worksheet 8.3: Molecular Orbital/VSEPR Theory	Quiz 8.3: Molecular Orbital/VSEPR Theory	

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1 days (10/22)	2b. Students know chemical bonds between atoms in molecules such as H_2 , CH_4 , NH_3 , H_2CCH_2 , N_2 , Cl_2 , and many large biological molecules are covalent. 2d. Students know the atoms and molecules in liquids move in a random pattern relative to one another because the intermolecular forces are too weak to hold the atoms or molecules in a solid form.	237-245	Worksheet 8.4: Polarity and Hydrogen Bonds	Exam 8: Covalent Bonds	
5 days (10/25-10/29)	2a. Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds.	253-259 260-267	Worksheet 9.1: Naming Ions Demonstration 9.1: Colored Ions Worksheet 9.2: Naming and Writing Formulas for Ionic Compounds Laboratory Assignment: Names and Formulas for Ionic Compounds	Quiz 9.1: Naming Ions Quiz 9.2: Naming and Writing Formulas for Ionic Compounds	
2 days (11/1-11/2)		268-270	Worksheet 9.3: Naming and Writing Formulas for Molecular Compounds	Quiz 9.3: Naming and Writing Formulas for Molecular Compounds	
3 days (11/3-11/5)		271-273	Worksheet 9.4: Naming and Writing Formulas for Acids and Bases	Quiz 9.4: Naming and Writing Formulas for Acids and Bases	

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3 days (11/8-11/10)	State Standard 3: Conservation of Matter and Stoichiometry	274-279	Worksheet 9.5: The Laws Governing formulas and Names	Exam 9: Chemical Names and Formulas	
2 days (11/12-10/15)	3b. Students know the quantity one mole is set by defining one mole of carbon 12 atoms to have a mass of exactly 12 grams. 3c. Students know one mole equals 6.02×10^{23} particles (atoms or molecules). 3d. Students know how to determine the molar mass of a molecule from its chemical formula and a table of atomic masses and how to convert the mass of a molecular substance to moles, number of particles, or volume of gas at standard temperature and pressure.	287-296	Worksheet 10.1: The Mole	Quiz 10.1: The Mole	
3 days (11/16-11/18)	3d. Students know how to determine the molar mass of a molecule from its chemical formula and a table of atomic masses and how to convert the mass of a molecular substance to moles, number of particles, or volume of gas at standard temperature and pressure. State Standard 4: Gases and Their Properties 4d. Students know the values and meanings of standard temperature and pressure (STP).	297-304	Worksheet 10.2: Mole-Mass and Mole-Volume Relationships Virtual Lab: Counting by Measuring Mass	Quiz 10.2: Mole-Mass and Mole-Volume Relationships	

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4 days (11/19-11/24)	State Standard 3: Conservation of Matter and Stoichiometry 3a. Students know how to describe chemical reactions by writing balanced equations.	305-313	Worksheet 10.3: Percent Composition and Chemical Formulas Quick Lab: Percent Composition	Exam 10: Chemical Quantities	
2 days (11/29-11/30)	3a. Students know how to describe chemical reactions by writing balanced equations.	321-329	Worksheet 11.1: Describing Chemical Reactions	Quiz 11.1: Describing Chemical Reactions	
3 days (12/1-12/3)	3a. Students know how to describe chemical reactions by writing balanced equations.	330-341	Worksheet 11.2: Types of Chemical Reactions Demonstration 11.1: Single-Replacement Reactions	Quiz 11.2: Types of Chemical Reactions	
3 days (12/6-12/8)	3a. Students know how to describe chemical reactions by writing balanced equations.	342-345	Worksheet 11.3: Reactions in Aqueous Solutions Virtual Lab: Precipitation Reactions: Formation of Solids Virtual Lab: Identification of Cations in Solution Virtual Lab: Qualitative Analysis	Exam 11: Chemical Reactions	
2 days (12/9-12/10)	3e. Students know how to calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products and the relevant atomic masses.	353-358	Worksheet 12.1: Mole-Mole Conversions	Quiz 12.1: Mole-Mole Conversions	

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5 days (12/13-12/17)	State Standards 1a, b, c, d, e, 2a, b, c, e, 3a, e		Review for Semester I Final Exam (State Standards 1a, b, c, d, e, 2a, b, c, e, 3a, e)	Semester I Final Exam: Chapters 1-12.1	2 nd Quarter Benchmark Assessment State Standards 1a, b, c, d, e, 2a, b, c, e, 3a, e)

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4 days (1/6-1/11)	<p>3b. Students know the quantity of one mole is set by defining one mole of carbon 12 atoms to have mass of exactly 12 grams.</p> <p>3c. Students know one mole equals 6.02×10^{23} particles (atoms or molecules)</p> <p>3d. Students know how to determine molar mass of a molecule from its chemical formula and a table of atomic masses and how to convert the mass of a molecular substance to moles, number of particles, or volume of a gas at standard temperature and pressure.</p> <p>3e. Students know how to calculate the masses of reactants and products in a chemical reaction from the mass of one of the reactants or products and the relevant atomic masses.</p> <p>4d. Students know the values and meaning of standard temperature and pressure.</p> <p>4e. Students know how to convert between Celsius and Kelvin Temperature.</p>	359-367	<p>Worksheet 12.2: Stoichiometry</p> <p>Stoichiometry Practice</p> <p>Small Scale Lab: Analysis of Baking Soda</p>	Exam 12.1: Stoichiometry I	

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3 days (1/12-1/14)		368-375	Worksheet 12.3: Limiting Reagents Demonstration 12.1: Limiting Reagents Quick Lab: Limiting Reagents	Exam 12.2: Stoichiometry II	
3 days (1/18-1/20)	<p>State Standard 4: Gases and Their Properties</p> <p>4a. Students know the random motion of molecules and their collisions with a surface create the observable pressure on that surface.</p> <p>4d. Students know the values and meanings of standard temperature and pressure (STP).</p> <p>4f. Students know there is no temperature lower than 0 Kelvin.</p> <p>State Standard: Chemical Thermodynamics</p> <p>7a. Students know how to describe temperature and heat flow in terms of the motion of molecules (or atoms).</p>	385-389	Worksheet 13.1: The Nature of Gases Inquiry Activity: Observing Gas Pressure Demo: Air Pressure	Quiz 13.1: The Nature of Gases	

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2 days (1/21-1/24)	State Standard 2: Chemical Bonds 2d. Students know the atoms and molecules in liquids move in a random pattern relative to one another because the intermolecular forces are too weak to hold the atoms or molecules in a solid form.	390-395	Worksheet 13.2: The Nature of Liquids	Quiz 13.2: The Nature of Liquids	
2 days (1/25-1/26)	2c. Students know salt crystals, such as NaCl, are repeating patterns of positive and negative ions held together by electrostatic attraction.	396-400	Worksheet 13.3: The Nature of Solids	Quiz 13.3: The Nature of Solids	
2 days (1/27-1/28)	State Standard 7: Chemical Thermodynamics 7c. Students know energy is released when a material condenses or freezes and is absorbed when a material evaporates or melts.	401-405	Worksheet 13.4: Changes of State Small Scale Lab: Behavior of Liquids and Solids Demonstration 13.1: Sublimation of Dry Ice	Exam 13: States of Matter	
2 days (1/31-2/1)	State Standard: Gases and Their Properties 4c. Students know how to apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases.	413-417	Worksheet 14.1: Properties of Gases Virtual Lab: Investigation of Gas Pressure and Mass	Quiz 14.1: Properties of Gases	

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3 days (2/2-2/4)	4c. Students know how to apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases.	418-425	Worksheet 14.2: The Gas Laws Virtual Labs: Pressure-Volume Relationships for Gases and Temperature-Volume Relationships for Gases	Quiz 14.2: The Gas Laws	
3 days (2/10-2/14)	4c. Students know how to apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases.	426-431	Worksheet 14.3: Ideal Gases Demonstration 14.1: Carbon Dioxide from Antacid Tablets Virtual Labs: Derivation of the Ideal Gas Law & Ideal vs. Real Gases.	Quiz 14.3: Ideal Gases	
2 days (2/15-2/16)	4b. Students know the random motion of molecules explains the diffusion of gases. State Standard 6: Solutions	432-437	Worksheet 14.4: Diffusion Small Scale Lab: Diffusion	Exam 14: Gases	
2 days (2/17-2/22)	6b. Students know how to describe the dissolving process at the molecular level by using the concept of random molecular motion.	445-449	Worksheet 15.1: Water and Its Properties Inquiry Activity: Observing Surface Tension	Quiz 15.1: Water and Its Properties	
2 days (2/23-2/24)	6a. Students know the definitions of solute and solvent. 6b. Students know how to describe the dissolving process at the molecular level by using the concept of random molecular motion.	450-458	Worksheet 15.2: Homogeneous Aqueous Systems Quick Lab: Surfactants Demonstration 15.1: Electrolytes Virtual lab: Electrolytes	Quiz 15.2: Homogeneous Aqueous Systems	

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2 days (2/25-2/28)	6d. Students know how to calculate the concentration of a solute in terms of grams per liter, molarity, parts per million, and percent composition.	459-463	Worksheet 15.3: Heterogeneous Aqueous Systems Demonstration 15.2: Motion of Colloidal Particles	Exam 15: Solutions I	
2 days (3/1-3/2)	6c. Students know temperature, pressure, and surface area affect the dissolving process.	471-478	Worksheet 16.1: Properties of Solutions Demonstration 16.1: Salt and the Freezing Point of Water Demonstration 16.2: Effects of Pressure and Agitation on the Solubility of Gases	Quiz 16.1: Properties of Solutions	
3 days (3/4-3/7)	6d. Students know how to calculate the concentration of a solute in terms of grams per liter, molarity, parts per million, and percent composition.	480-486	Worksheet 16.2: Concentrations of Solutions Class Activity: Preparation of Molar Solutions Demonstration 16.3: Serial Dilutions	Quiz 16.2: Concentrations of Solutions	
2 days (3/8-3/11)	6d. Students know how to calculate the concentration of a solute in terms of grams per liter, molarity, parts per million, and percent composition.	487-490	Worksheet 16.3: Colligative Properties Quick Lab: Solutions and Colloids Class Activity: Freezing Point Depression	Quiz 16.3: Colligative Properties Quarter III Midterm	3 rd Quarter Benchmark Assessment State Standards 1a, b, c, d, e, 2a, b, c, d, e, 3a, b, c, d, e, 4a, b, c, d, e, f, 6a, b, c, d, 7c)

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2 days (3/21-3/22)	6d. Students know how to calculate the concentration of a solute in terms of grams per liter, molarity, parts per million, and percent composition. State Standard: Chemical Thermodynamics	491-497	Worksheet 16.4: Calculations Involving Colligative Properties Interpreting Graphics: Vapor Pressure vs. Temperature Small Scale Lab: Making a Solution	Quiz 16.4: Calculations Involving Colligative Properties Exam 16: Solutions II	
2 days (3/23-3/24)	7a. Students know how to describe temperature and heat flow in terms of the motion of molecules (or atoms). 7b. Students know chemical processes can either release (exothermic) or absorb (endothermic) thermal energy.	505-510	Worksheet 17.1: Heat and Work Inquiry Activity: observing Heat Flow Virtual Lab: Specific Heat of a Metal	Quiz 17.1: Heat and Work	
3 days (3/25-3/29)	7d. Students know how to solve problems involving heat flow and temperature changes, using known values of specific heat and latent heat of phase change.	511-519	Worksheet 17.2: Enthalpy Change Virtual Labs: Heat of Fusion of Water & Heat of Combustion	Quiz 17.2: Enthalpy Change	
3 days (3/30-4/1)	7c. Students know energy is released when a material condenses or freezes and is absorbed when a material evaporates or melts. 7d. Students know how to solve problems involving heat flow and temperature changes, using known values of specific heat and latent heat of phase change.	520-526	Worksheet 17.3: Changes of State	Quiz 17.3: Changes of State	

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5 days (4/4-4/8)	7b. Students know chemical processes can either release (exothermic) or absorb (endothermic) thermal energy. State Standard 8: Reaction Rates	527-533	Worksheet 17.3: Heat of Reaction Virtual Lab: Heats of Reaction	Exam 17: Thermochemistry	
3 days (4/18-4/20)	8a. Students know the rate of reaction is the decrease in concentration of reactants or the increase in concentration of products with time. 8b. Students know how reaction rates depend on such factors as concentration, temperature, and pressure. 8c. Students know the role a catalyst plays in increasing the reaction rate.	541-548	Worksheet 18.1: Reaction Rates Inquiry Activity: Temperature and Reaction Rate	Quiz 18.1: Reaction Rates	
3 days (4/27-4/29)	8b. Students know how reaction rates depend on such factors as concentration, temperature, and pressure. State Standard 9: Equilibrium 9a. Students know how to use Le Chatelier's principle to predict the effect of changes in concentration, temperature, and pressure. 9b. Students know equilibrium is established when forward and reverse reaction rates are equal.	549-559	Worksheet 18.2: Equilibrium	Quiz 18.2: Equilibrium	

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2 days (5/1-5/2)	<p>State Standard 9: Equilibrium</p> <p>9a. Students know how to use Le Chatelier's principle to predict the effect of changes in concentration, temperature, and pressure.</p> <p>9b. Students know equilibrium is established when forward and reverse reaction rates are equal.</p>	560-565	<p>Worksheet 18.3: Solubility Equilibrium</p> <p>Demonstration 18.1: Common Ion Effect</p>	Exam 18: Reaction Rates and Equilibrium	
2 days (5/2-5/4)	<p>State Standard: Acids and Bases</p> <p>5a. Students know the observable properties of acids, bases, and salt solutions.</p> <p>5b. Students know acids are hydrogen-ion-donating and bases are hydrogen-ion-accepting substances.</p>	587-593	<p>Worksheet 19.1: Acid-Base Theories</p> <p>Quick Lab: Indicators from Natural Sources</p>	Quiz 19.1: Acid-Base Theories	
2 days (5/4-5/6)	<p>5d. Students know how to use the pH scale to characterize acid and base solutions.</p>	594-604	Worksheet 19.2: Hydrogen Ion and Acidity	Quiz 19.2: Hydrogen Ion and Acidity	
2 days (5/4-5/5)	<p>5c. Students know strong acids and bases fully dissociate and weak acids and bases partially dissociate.</p> <p>5d. Students know how to use the pH scale to characterize acid and base solutions.</p>	605-617	Worksheet 19.3: Strengths of Acids and Bases	Quiz 19.3: Strengths of Acids and Bases	

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2 days (5/6-5/7)	5a. Students know the observable properties of acids, bases, and salt solutions.	618-623	Worksheet 19.5: Salts in Solution Virtual Labs: Ionization Constants of Weak Acids, Study of Acid Base Titrations, Acid Base Titrations, Molecular Weight Determination by Acid Base Titration	Exam 19: Acids, Bases, and Salts	
2 days (5/7-5/8)	2b. Students know chemical bonds between atoms in molecules such as H ₂ , CH ₄ , NH ₃ , H ₂ CCH ₂ , N ₂ , Cl ₂ , and many large biological molecules are covalent. State Stanard 10: Organic Chemistry and Biochemistry	693-703	Worksheet 22.1: Hydrocarbons I	Quiz 22.1-22.2: Hydrocarbons I Chapter 22 Exam	
2 days (5/9-5/10)	10b. Students know the bonding characteristics of carbon that result in the formation of a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules.	704-717	Worksheet 22.3: Hydrocarbons II	Quiz 22.3: Hydrocarbons II	

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2 days (5/11-5/12)	10a. Students know large molecules (polymers), such as proteins, nucleic acids, and starch, are formed by repetitive combinations of simple subunits.	747-755	Worksheet 23.4: Polymerization	Quiz 23.4: Polymerization	
2 days (5/13-5/16)	<p>State Standard 2: Chemical Bonds</p> <p>2b. Students know chemical bonds between atoms in molecules such as H₂, CH₄, NH₃, H₂CCH₂, N₂, Cl₂, and many large biological molecules are covalent.</p> <p>10a. Students know large molecules (polymers), such as proteins, nucleic acids, and starch, are formed by repetitive combinations of simple subunits.</p> <p>10b. Students know the bonding characteristics of carbon that result in the formation of a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules.</p> <p>10c. Students know amino acids are the building blocks of proteins.</p>	763-785	Worksheet 24.2-5: Biochemistry	<p>Quiz 24.2-5: Biochemistry</p> <p>Exam 22-24: Organic/Biochemistry</p>	

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2 days (5/17-5/18)	<p>State Standard: Nuclear Processes</p> <p>11c. Students know some naturally occurring isotopes of elements are radioactive, as are isotopes formed in nuclear reactions.</p> <p>11d. Students know the three most common forms of radioactive decay (alpha, beta, and gamma) and know how the nucleus changes in each type of decay.</p> <p>11e. Students know alpha, beta, and gamma radiation produce different amounts and kinds of damage in matter and have different penetrations.</p>	799-802	<p>Worksheet 25.1: Nuclear Radiation</p> <p>Inquiry Activity: Simulating Radioactive Decay</p>	Quiz 25.1: Nuclear Radiation	
2 days (5/19-5/20)	<p>11a. Students know protons and neutrons in the nucleus are held together by nuclear forces that overcome the electromagnetic repulsion between the protons.</p> <p>11b. Students know the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions. The change in mass (calculated by $E = mc^2$) is small but significant in nuclear reactions.</p>	803-819	Worksheet 25.2-25.4: Nuclear Changes	<p>Quiz 25.2-25.4: Nuclear Changes</p> <p>Benchmark V</p>	

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