Curriculum Mapping

Course:Chemistry 330	**Unit Title/ Timeframe: Unit 1: Matter and Change/ Timeframe: 1 week**
Enduring Understandings	● Course understandings: ● The world and everything in it is made from chemicals ● Understanding chemistry will lead to better consumers. ● Understanding chemistry will lead to safer living ● Problems can be solved through science applications. ● There is a relationship between mass and energy. ● Scientific principles can be expressed as mathematical relationships ● Science and experimentation form a symbiotic relationship. ● The Scientific method is an important tool for solving problems not only in school but for all aspects of life outside the classroom. ● How does the study of chemistry help with everyday living? ● Why is it important to study chemistry? ● What are the necessary skills that need to be transferred to become a successful in high school and college chemistry classes? ● How can applying chemistry in everyday life make a difference in the world? Chapter understandings ● Distinguish between physical properties and chemical properties of matter , explain the states of matter, gas, liquid, solid. ● Understand the law of conservation of energy and matter ● Distinguish between a mixture and pure substance.
Essential Questions	● What is matter made of? ● What is an atom made of? ● Why must scientist use the same symbolic language?
Common Core/ Massachusetts Standards/ AP Standards	P6 C.1 - Compare and contrast matter based on uniformity of particles: pure substances, solutions, heterogeneous mixtures. P6 C.2 - Distinguish between extensive and intensive physical properties of matter. P6 C.3 - Separate homogeneous mixtures using physical processes: chromatography P6 C.4 - Design experiments tracing the energy involved in physical changes and chemical changes. P6 C.5 - Predict the chemical properties of substances based on their electron configuration: active, inactive, inert. SIS1. Make observations, raise questions, and formulate hypotheses. SIS2. Design and conduct scientific investigations. SIS3. Analyze and interpret results of scientific investigations.

	SIS4. Communicate and apply the results of scientific investigations. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section1:What is chemistry, branches? Section 2: Physical properties and chemical properties. States of matter, conservation of enerty and matter. Mixtures and pure substances. Intensive and extensive properties. Section 3: Periodic table to mane symbols, write the symbols, sections of the table, metals, non-metals, and metalloids. Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Unit one: Tests: Unit test with pretest one week earlier CT Quizzes: three section quizzes CT Lab reports: conservation of matter, triple beam balance LS, CT, CS In-class work on observation , drops on a coin and observation of a penny CL, CT, LS
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **2** Measurements and Calculations Timeframe: 1 ½ weeks
Enduring Understandings	● Scientific Method-the scientific method is a data-based logical approach to problem solving. ● Metric System-the metric system is a world-wide measurement system based on powers of ten. ● Percent Error-precision of measurement and lab technique influence the relative (percent) error. ● Dimensional Analysis-dimensional analysis is a unit-based logical approach to problem solving. ● Significant Figures-significant figures limit the degree of reportable precision and the validity of results. ● Scientific Notation-very large and very small numbers can be written concisely using powers of 10. ● Measurement-accuracy and precision and units are important to achieve correct results.
Essential Questions	Unit two: Measurements and Calculations ● Why use metric units? ● How do you collect data? ● What is accuracy vs. precision?
Common Core/ Massachusetts Standards/ AP Standards	NS32 C.1 - Explain why science is limited to natural explanations of how the world works. NS32 C.2 - Compare and contrast hypotheses, theories, and laws. NS32 C.3 - Compare and contrast the criteria for the formation of scientific theory and scientific law. NS32 C.4 - Distinguish between a scientific theory and the term “theory” used in general conversation NS32 C.5 - Summarize the guidelines of science: • explanations are based on observations, evidence, and testing • hypotheses must be testable • understandings and/or conclusions may change with additional empirical data • scientific knowledge must have peer review and verification before acceptance NS35 C.1 - Collect and analyze scientific data using appropriate mathematical calculations, figures, and tables. Unit 3: Innumeracy: Mathematical Illiteracy & its Consequences (RI.11-12.5) NS35 C.2 - Use appropriate equipment and technology as tools for solving problems. NS35 C.3 - Utilize technology to communicate research findings. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connection	Section 1: scientific method steps. Quantitative and qualitative observations. Section 2: What is a: quantity, unit, and measurement standard, SI units of length, mass, time, volume, and density. Density calculations and conversions. Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID

	Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID Lab activities LS, CT, CS
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Unit two: Tests: Unit test with pretest one week earlier CT Quizzes: three section quizzes CT Lab report: measurement significant figures LS, CT, CS
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **Unit 3: Building blocks of matter Timeframe: 1 ½ weeks**
Enduring Understandings	● Student should understand the development of atomic theory, experiments that led to the discovery of the electron and nucleus and atomic particles and relationship to mass.
Essential Questions	Unit three: Building blocks of Matter ● What is the size of the atom?
Common Core/ Massachusetts Standards/ AP Standards	Strand 1: ATOMIC THEORY Content Standard 1: Students shall understand the historical development of the model of the atom. AT1 C.1 - Summarize the discoveries of the subatomic particles: Rutherford's gold foil, Chadwick's

	discovery of the neutron, Thomson's cathode ray, and Millikan's Oil Drop. AT1 C.2 - Explain the historical events that led to the development of the current atomic theory. Content Standard 2: Student shall understand the structure of the atom. AT2 C.1 - Analyze an atom's particle position, arrangement, and charge using: proton, neutron, electron. AT2 C.2 - Compare the magnitude and range of nuclear forces to magnetic forces and gravitational forces. AT2 C.3 - Draw and explain nuclear symbols and hyphen notations for isotopes: nuclear symbol: XAZ where Hyphen notation: X − A where X = element symbol; A = the mass number; Z = atomic number; the number of neutrons = A − Z AT2 C.4 - Derive an average atomic mass. Unit 1: Mysteries of Mass (RI.11-12.6) AT2 C.5 - Determine the arrangement of subatomic particles in the ion(s) of an atom RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section 1:Laws of conservation of mass, definite proportion, and multiple proportions. Daltons atomic theory. Section 2 Summarize the cathode ray, and Rutherford's experiment. The properties of protons, neutrons, and electrons. Define the atom. Section 3 Explain isotopes. Define atomic number mass and how does that applyu to isotopes. Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID Lab activities LS, CT, CS
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills	Unit three: Tests: Unit test with pretest one week earlier CT Quizzes: three section quizzes CT Lab report: Rutherford experiment lab, covered box activity. CT, CT, CS

CS = Communication Skills **CI** = Collaborative/Independent Learning	
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **Unit 4 Arrangement of Electrons in Atoms 2 weeks**
Enduring Understandings	● The student will be able to describe the electromagnetic spectrum and development of the Bohr model of the atom, the location of the electron around the nucleus from a wave mechanical and quantum perspective using quantum numbers and discuss the rules used to determine the electron configuration of a electron including all notations. ● Why does uv from the sun cause us harm?
Essential Questions	● How does light behave? ● Why do we see light when gases are excited? ● What is the difference between waves and matter? ● What is the dual wave particle nature? ● How can something with no mass push something with mass? ● What makes an electron identifiable, quantum numbers? ● What is the common notation for locating electron?
Common Core/ Massachusetts Standards/ AP Standards	AT3 C.1 - Correlate emissions of visible light with the arrangement of electrons in atoms: quantum, $c = v\lambda$ where v = frequency ; λ = wavelength . AT3 C.2 - Apply the following rules or principles to model electron arrangement in atoms: Aufbau Principle (diagonal filling, order), Hund's Rule, and Pauli's Exclusion Principle. AT3 C.3 - Predict the placement of elements on the Periodic Table and their properties using electron configuration. AT3 C.4 - Demonstrate electron placement in atoms using the following notations: orbital notations, electron configuration, Notation, Lewis electron dot structures. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7

Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section 1- The relationship between speed, wavelength and frequency of electromagnetic radiation. The dual wave particle nature of light. Bright line spectrum. Section 2- Louis de Broglie's role in the development of the quantum model, his influence on the development of the famous E=mc2 equation. Section 3- Principles' by Aufbau, Pauli, Hund and Heisenberg. Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) Bunsen Burner, Flame test lab Projects (CI,CT,LS) periodic element card Presentations(CS)Element presentation Demonstrations(CT,CS) Light video, laser beam single slit, double slit experiment, spring and slinky as a wave in the hallway,
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **5: Periodic Law/ Timeframe: 1.5 week**

Enduring Understandings	● Use of the periodic table to explain how the periodic law is used to predict the elements'' physical and chemical properties ● Explaining how electron configuration, chap 4, and groups, blocks and general properties
Essential Questions	● Why do elements in the same family have similar properties? ● What are the trends as you travel in the periodic table? ● Why are valence electrons so important in the properties of elements?
Common Core/ Massachusetts Standards/ AP Standards	P4 C.1 - Compare and contrast the historical events leading to the evolution of the Periodic Table P4 C.2 - Describe the arrangement of the Periodic Table based on electron filling orders: Groups and periods. P4 C.3 - Interpret periodic trends: atomic radius, ionic radius, ionization energy, electron affinities, and electronegativities. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section 1: Describe the early periodic tables by Mendeleev and Moseley. Use the table to predict properties both chemical and physical. Section 2: Show how the relationship between the electron in each sublevel and the length of each period of the periodic table. Section 3: Compare atomic radii, ionization energy, and electronegativity.
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) Alien periodic table Projects (CI,CT,LS) cut and paste the lanthanides and actinies and make a wide periodic table, atomic radii graph, Demonstrations(CT,CS) reading of the Disappearing Spoon, chap 6 page 98-101
Major Resources	Modern Chemistry Holt Kahn Academy Online resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **6 Chemical bonding 2.0 weeks**
Enduring Understandings	● Chemicals have an affinities for each other. ● Why is energy locked up in a chemical bond?
Essential Questions	● Why do chemicals form bonds? ● Why are bonds not purely covalent or ionic, the grey scale? ● What are crystals? ● How can we use the electron configuration to understand how elements bond? ● What is a molecule?
Common Core/ Massachusetts Standards/ AP Standards	B8 C.1 - Determine ion formation tendencies for groups on the Periodic Table: main group elements and transition elements. B8 C.2 - Derive formula units based on the charges of ions. B8 C.3 - Use the electronegativitiy chart to predict the bonding type of compounds: ionic, polar covalent, non-polar covalent. Content Standard 9: Students shall understand the process of covalent bonding. B9 C.1 - Draw Lewis structures to show valence electrons for covalent bonding: lone pairs, shared pairs, hybridization, and resonance. B9 C.2 - Determine the properties of covalent compounds based upon double and triple bonding. B9 C.3 - Predict the polarity and geometry of a molecule based upon shared electron pairs and lone electron pairs: VSEPR Model. B9 C.4 - Identify the strengths and effects of intermolecular forces (van der Waals): hydrogen bonding, dipole-dipole, dipole-induced dipole, and dispersion forces (London). Content Standard 10: Students shall understand the process of metallic bonding. B10 C.1 - Explain the properties of metals due to delocalized electrons: molecular orbital model. Content Standard 11: Students shall relate the physical properties as they relate to different types of bonding. B11 C.1 - Distinguish between amorphous and crystalline solids. B11 C.2 - Compare and contrast the properties of crystalline solids: ionic, covalent network, covalent molecular, metallic. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section 1 Define the chemical bond. Section 2: relationships between potential energy, distances between atoms bond length and bond energy. The octet rule. Writing Lewis structures. Section 3: Chemical formulas ionic and covalent and their properties Section 4: Metallic bonding, and the electron-sea of electrons. Section 5: The VSEPR Theory, is used to predict shapes of molecules. Intermolecular forces and their

	effect on the properties of chemicals eg. Boiling and melting points.
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS)Determination of bonding lab, Lewis structures lab, VSEPR theory lab, Projects (CI,CT,LS) making the atomic models and ionic models Demonstrations(CT,CS) hydrogen bonding demo, metalic bonding demo (conductivity tester) ,
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **7 chemical formulas 1.0 weeks**
Enduring Understandings	● Use of a worldwide common naming system for chemicals. ● How oxidation number help match up elements.
Essential Questions	● How do we name chemical compounds? ● Why is there a need for universal language? ● What does H2O mean?
Common Core/ Massachusetts Standards/ AP Standards	P5 C.1 - Write formulas for binary and ternary compounds: IUPAC system, Greek prefixes, polyatomic ions. P5 C.2 - Name binary and ternary compounds. P5 C.3 - Predict the name and symbol for newly discovered elements using the IUPAC system. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section 1 The significance of a chemical formula, how to name an ionic compound. Section 2: Oxidation numbers to keep book of the compound and how it will match up with other elements. Stock system of naming. Section 3: Calculate formula mass , convert between mass and moles. Section 4: Empirical formulas, determine from percentage of mass. Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) Projects (CI,CT,LS) chemical naming activity, empirical formula activity, percent composition activity

CS = Communication Skills **CI** = Collaborative/Independent Learning	
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **9 Stoichiometry 1.5 weeks**
Enduring Understandings	● Defining moles and using that concept as a conversion factor in stoichiometry problems. ● Solving problems converting from moles to mass and back. ● Understanding limiting reactants and percent yield and solving problems.
Essential Questions	● How do we measure the ratio of chemical reactants and convert that amount to mass. ● How can we stay green and use the correct amounts of reactants.
Common Core/ Massachusetts Standards/ AP Standards	S12 C.1 - Balance chemical equations when all reactants and products are given. S12 C.2 - Use balanced reaction equations to obtain information about the amounts of reactants and products. S12 C.3 - Distinguish between limiting reactants and excess reactants in balanced reaction equations. S12 C.4 - Calculate stoichiometric quantities and use these to determine theoretical yields. Content Standard 13: Students shall understand the mole concept and Avogadro's number. S13 C.1 - Apply the mole concept to calculate the number of particles and the amount of substance:Avogadro's constant = 6.02 x 10 23 S13 C.2 - Determine the empirical and molecular formulas using the molar concept: molar mass, average atomic mass, molecular mass, and formula mass. Content Standard 14: Students shall predict the product(s) based upon the type of chemical reaction. S14 C.1 - Given the reactants predict products for the following types of reactions: synthesis, decomposition, single displacement, double displacement, and combustion. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) stoicometry lab

Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Projects (CI,CT,LS) titration poster Demonstrations(CT,CS) stoichometry demo,
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **8 chemical equations and reactions 1.0 weeks**
Enduring Understandings	● The five types of reactions ● The activity series of the metals and halogens.
Essential Questions	● How can a reaction be balanced? ● Why does a reaction need to be balanced? ● What kinds of reactions are there? ● How do we know a reaction took place?
Common Core/ Massachusetts Standards/ AP Standards	**None** RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) Projects (CI,CT,LS) Presentations(CS) Demonstrations(CT,CS)
Major Resources	Modern Chemistry Holt Kahn Academy

	On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **10: states of matter Timeframe: 1.5 week**
Enduring Understandings	● The kinetic molecular theory KMT of matter explains and accounts for physical properties of ideal gases. ● Ideal gases and real gases differ from each other. ● The KMT describes properties of liquids solids and gases. ● Matter has three states most accustom to and they can change from one to another.
Essential Questions	● Why does an open bottle of perfume in the front of the room smell in the back? ● What is the difference btw gas, liquid and solid? ● Why do things boil?
Common Core/ Massachusetts Standards/ AP Standards	P6 C.1 - Compare and contrast matter based on uniformity of particles: pure substances, solutions, heterogeneous mixtures. P6 C.2 - Distinguish between extensive and intensive physical properties of matter. P6 C.3 - Separate homogeneous mixtures using physical processes: chromatography P6 C.4 - Design experiments tracing the energy involved in physical changes and chemical changes. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section 1: How do gases behave? What are their properties? Section 2: How do liquids behave? What are their properties? Section 3: How do solids behave? What are their properties? Section 4: Surface tension, boiling vapor pressure. The use of LN2 to show examples of most of the concepts in this and the next chapter. Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID

	Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) Projects (CI,CT,LS) Presentations(CS) Demonstrations(CT,CS) liquid nitrogen seres of experiments, vacuum bell jar series of experiments
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **11 gases and pressure/ Timeframe: 1.0 week**
Enduring Understandings	● Mathematical relationships exist between pressure temperature and volume. ● Mathematical relationships can be developed between pressure volume temperature and the number of moles.
Essential Questions	● Why does the air in a car tire heat up when you drive? ● Why does the marshmallow get bigger in a vacuum? ● Why does water boil cold in a vacuum? ● Why is there the same amount of molecules of He as there are in N2 when the volume temp and pressure is equal?
Common Core/ Massachusetts Standards/ AP Standards	GL16 C.1 - Demonstrate the relationship of the kinetic theory as it applies to gas particles: molecular motion, elastic collisions, temperature, pressure, ideal gas. GL16 C.2 - Calculate the effects of pressure, temperature, and volume on the number of moles of gas

	particles in chemical reactions. Content Standard 17: Students shall understand the relationship among temperature, pressure, volume and moles of gas. GL17 C.1 - Calculate the effects of pressure, temperature, and volume to gases Gas Law Formula Avogadro's Law Boyle's Law Charles' Law Combined Law Dalton's Law of Partial Pressure Graham's Law of Effusion Guy-Lussac Ideal Gas Law PV = nRT RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	● Section 1: Define pressure and how it is measured. Dalton's law of partial pressures. ● Section 2: What is relationship between pressure and volume, between temperature and pressure, between volume and temperature? ● Section 3: How can we calculate moles, pressure, volume, temperature when one variable is missing? Inclusive Practices ● Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID ● Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID ● Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID ● Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID ● Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID ● Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) Projects (CI,CT,LS) Presentations(CS) Demonstrations(CT,CS)

CI = Collaborative/Independent Learning	
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Curriculum Mapping

Course:Chemistry 330	**Unit Title/ Timeframe:** **12: solubility and solutions/ Timeframe: 1.5 week**
Enduring Understandings	● Mixtures come in three kinds, solutions, colloid and suspensions. ● Physical and chemical factors that affect solubility. ● How concentration is expressed, molarity, molality and calculations
Essential Questions	● Why does sugar added to iced coffee not dissolve? ● Why is milk not transparent? ● Why don't oil and water mix?
Common Core/ Massachusetts Standards/ AP Standards	S15 C.3 - Calculate the following concentration expressions involving the amount of solute and volume of solution: molarity (M), molality (m), percent composition, and normality (N). RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section 1: What are the types of mixtures? Section 2: What factors affect the rate of dissolution? Section 3: How do you express the concentration of a solution? Inclusive Practices

	Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) Projects (CI,CT,LS) Presentations(CS) Demonstrations(CT,CS)
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **13: Ions in aqueous solutions and colligative properties/ Timeframe: 2.0 week**
Enduring Understandings	● Ionic compounds dissociate and molecular compounds ionize. ● Ionization happens at either 100 % (strong) or less than 100% (weak). ● Boiling and freezing points are changed based on how much solute is in the solution. Osmotic pressure is described and accounted for
Essential Questions	● Will there be a precipitate if two compounds are mixed?

	• Can a person get shocked if they put their finger in a solution of water sugar and electric current? Water salt and electric current? • Why does the number of particles change the properties of a solution? • Why does the town highway department put salt on the road in the winter? • Why should the public spend extra money and buy calcium chloride for my walkway in winter and not buy sodium chloride.
Common Core/ Massachusetts Standards/ AP Standards	S15 C.3 - Calculate the following concentration expressions involving the amount of solute and volume of solution: molarity (M), molality (m), percent composition, and normality (N). RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	 Inclusive Practices Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
Assessment Expectations for Student Learning **CT** = Critical Thinking **LS** = Literacy Skills **CS** = Communication Skills **CI** = Collaborative/Independent Learning	Tests (CT,) Quizzes (CT) Lab reports (CT,LS,CS) Projects (CI,CT,LS) Presentations(CS) Demonstrations(CT,CS)
Major Resources	Modern Chemistry Holt Kahn Academy On line resources Lab books

Course:Chemistry 330	**Unit Title/ Timeframe:** **14 acids and bases 2.0 weeks**
Enduring Understandings	● Acids and bases descriptions, definitions of Arrhenius acids and bases. Nomenclature and characteristics of strong and weak. ● Definitions of Bronsted-Lowery and Lewis theories. ● Acid and base reactions in aqueous solutions.
Essential Questions	● Are acids or bases dangerous? ● Where are they in the household? ● Are they in our food? ● Can they hurt me? ● Can they help me?
Common Core/ Massachusetts Standards/ AP Standards	AB19 C.1 - Compare and contrast the following acid/base theories: Arrhenius Theory, Bronsted-Lowry Theory, Lewis Theory. Content Standard 20: Students shall apply rules of nomenclature to acids, bases and salts. AB20 C.1 - Name and write formulas for acids, bases and salts: binary acids, ternary acids, ionic compounds. Content Standard 21: Students shall understand the general properties of acids, bases and salts. AB21 C.1 - Compare and contrast acid and base properties. AB21 C.2 - Describe the role that dissociation plays in the determination of strong and weak acids or bases. AB21 C.3 - Explain the role of the pH scale as applied to acids and bases. Content Standard 22: Students shall demonstrate an understanding of titration as a laboratory tool. AB22 C.1 - Perform a titration to solve for the concentration of an acid or base. AB22 C.2 - Use indicators in neutralization reactions. AB22 C.3 - Investigate the role of buffers. RST-1,7, 8, WHST-1a, b, e 8 2a,b,c,d,e 4 5 7
Instructional Strategies* **TI** = Technology Integration **ID** = Interdisciplinary connections	Section 1: List 5 properties of aqueous acids and bases? Nomenclature including strong vs. weak, binary vs. oxy, and mono-protic vs. poly-protic. Section 2: Other acids and bases Bronstead Lowery and Lewis ? Section 3: How acids and bases react with each other, conjugate acids and bases? Inclusive Practices

	Activators: do now, picture graph, 3-2-1, KNL, word web splash net, concept map, list generator, admit slip, lesson starter, puzzle, anticipation guide. TI, ID Summarizers: ticket to leave, game show, recapping, concept map test , quick write, share pain, what did we learn, three keys, report 5 paragraphs, critique, post it note. TI, ID Process guides: steps 1-2-3, lab report instructions, instructions on outlining. TI, ID Reading supports; making outlines, prompts on wall, reading guide, interactive note taking. TI, ID Grouping strategies: check your neighbor, co-teaching, three level of teaching(college, honors, AP), expert groups. TI, ID Note taking tools: outlining, Cornell note taking. TI, ID
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