Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Science, Matter, and Measurement**

Content Standard: **Evaluate the nature of scientific knowledge and experimental information**

State Curriculum Standard: **3.1.12D Analyze scale as a way of relating concepts and ideas to one another by some measure.**
3.2.10A Apply knowledge and understanding about the nature of scientific and technological knowledge.
3.2.10B Apply process knowledge and organize scientific and technological phenomena in varied ways.
3.2.12C Apply the elements of scientific inquiry to solve multi step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.7.12B Evaluate appropriate instruments and apparatus to accurately measure materials and processes.

Course Content	Student Performance	Resources	Assessments
A. The Scientific Method. B. Observations Versus Interpretations. C. Theories and Laws. D. Phlogiston Theory and Combustion. E. Qualitative and Quantitative Observations. F. Accuracy Versus Precision. G. Types of Error and Percent Error. H. Significant Figures. I. Classification of Matter. J. Physical and Chemical Properties.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 1 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Science, Matter, and Measurement**

Content Standard: **Evaluate the nature of scientific knowledge and experimental information**

State Curriculum Standard: **3.1.12D Analyze scale as a way of relating concepts and ideas to one another by some measure.**
3.2.10A Apply knowledge and understanding about the nature of scientific and technological knowledge.
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3.2.12C Apply the elements of scientific inquiry to solve multi step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.7.12B Evaluate appropriate instruments and apparatus to accurately measure materials and process

Course Content	Student Performance	Resources	Assessments
K. Separation Techniques (i.e. Filtration, Distillation, etc.) L. Dimensional Analysis with Applications to Density, Metric Conversion, and Temperature Conversions.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 1 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **2 Atoms, Molecules, Ions, and Chemical Equations**

Content Standard: **Understand the structure and properties of matter and the nature of chemical change**

State Curriculum Standard: **3.1.12 B Apply concepts of models as a method to predict and understand science and technology.**
3.1.12 E Evaluate change in nature, physical systems, and man made systems.
3.2.12 A Evaluate the nature of scientific and technological knowledge.
3.4.10 A Explain concepts about the structure and properties of matter.
3.4.12 A Apply concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Atomic Theory from Democritus to Rutherford. B. Types of Nuclear Radiation, Nuclear Stability, and Half-Life. C. Atomic Number, Mass Number, and Isotopes. D. Isotopic Abundance. E. Introduction to the Periodic Table and Diatomic Elements. F. Formulas for Ionic and Molecular Compounds. G. Nomenclature of Ionic and Molecular Compounds. H. Indicators of Chemical Change.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 2 and 19 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Atoms, Molecules, Ions, and Chemical Equations**

Content Standard: **Understand the structure and properties of matter and the nature of chemical change.**

State Curriculum Standard: **3.1.12 B Apply concepts of models as a method to predict and understand science and technology.**
3.1.12 E Evaluate change in nature, physical systems, and man made systems.
3.2.12 A Evaluate the nature of scientific and technological knowledge.
3.4.10 A Explain concepts about the structure and properties of matter.
3.4.12 A Apply concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
I. Conservation of Mass. J. Writing and Balancing Chemical and Nuclear Equations.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 2 and 19 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Stoichiometry**

Content Standard: **Understand the mathematical nature of chemistry with applications to chemical formulas and equations**

State Curriculum Standard: **3.1.12D Analyze scale as a way of relating concepts and ideas to one another by some measure.**
3.2.12B Evaluate experimental information for appropriateness and adherence to relevant science processes.
3.2.12C Apply the elements of scientific inquiry to solve multi-step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.4.12A Apply concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. The Mole and Molar Mass. B. Percent Composition. C. Empirical and molecular formulas D. Hydrates E. Mass relationships in chemical equations F. Limiting reactant G. Percent yield H. Gravimetric analysis I. Combustion analysis to determine chemical formulas	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 3 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Chemical Reactivity**

Content Standard: **Classify and describe chemical reactions and trends in reactivity**

State Curriculum Standard: **3.1.10 C Apply patterns as repeated processes or recurring elements in science and technology.**
3.1.12 C Assess and apply patterns in science and technology.
3.1.12 D Analyze scale as a way of relating concepts and ideas to one another by some measure.
3.2.12 B Evaluate experimental information for appropriateness and adherence to relevant science processes.
3.2.12 C Apply the elements of scientific inquiry to solve multi-step problems.
3.4.10 A Explain concepts about the structure and properties of matter.
3.4.12 A Apply concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Molarity and Dilutions. B. Electrolytes, Nonelectrolytes, and Dissociation Versus Ionization. C. Precipitation Reactions: Ionic and Net Ionic Equations. D. Common acid Names and Formulas. E. Acid-Base Reactions and Titrations. F. Assigning Oxidation Numbers to Elements Within Compounds G. Identification of Redox Reactions (i.e. Synthesis, Decomposition, Single Replacement, and Combustion).	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 4 and 10.1 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters / visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **The Gaseous State**

Content Standard: **Analyze and quantify gas behavior**

State Curriculum Standard: **3.1.10B Describe concepts of models as a way to predict and understand science and technology.**
3.1.10C Apply patterns as repeated processes or recurring elements in science and technology.
3.1.12C Assess and apply patterns in science and technology.
3.1.12D Analyze scale as a way of relating concepts and ideas to one another by some measure.
3.2.12B Evaluate experimental information for appropriateness and adherence to relevant science processes.
3.2.12C Apply the elements of scientific inquiry to solve multi-step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.4.12A Apply concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Kinetic Theory of Gases and Graham's Law. B. Pressure, Partial Pressure, and Pressure Unit Conversion. C. Boyle's Law. D. Charles' Law. E. Combined Gas Law. F. Ideal Gas Law Derivation Using the Initial and Final State Problems. G. Using the Ideal Gas Law. H. Gas Density. I. Avogadro's Law. J. Stoichiometry of Gaseous Reactions. K. Collecting Gases Over Water.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 5 • Assorted laboratory manuals • Textbook supplementary materials • Teacher developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Thermochemistry**

Content Standard: **Apply, analyze, and calculate the energy involved in chemical reactions**

State Curriculum Standard: **3.1.12D Analyze scale as a way of relating concepts and ideas to one another by some measure.**
3.2.12B Evaluate experimental information for appropriateness and adherence to relevant science processes.
3.2.12C Apply the elements of scientific inquiry to solve multi-step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.4.12A Apply concepts about the structure and properties of matter.
3.4.10B Analyze energy sources and transfers of heat.
3.4.12B Apply and analyze energy sources and conversions and their relationship to heat and temperature.

Course Content	Student Performance	Resources	Assessments
A. Principles of Heat Flow and Coffee Cup Calorimetry. B. Specific Heat. C. Enthalpy and Thermochemical Equations. D. Hess's Law.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 8 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Electronic Structure and the Periodic Table**

Content Standard: **Explain atomic structure in terms of light and energy with applications to the periodic table**

State Curriculum Standard: **3.1.10C Apply patterns as repeated processes or recurring elements in science and technology.**
3.1.10E Describe patterns of change in nature, physical and man made systems.
3.1.12B Apply concepts of models as a method to predict and understand science and technology.
3.1.12C Assess and apply patterns in science and technology.
3.1.12D Analyze scale as a way of relating concepts and ideas to one another by some measure.
3.2.12A Evaluate the nature of scientific and technological knowledge.
3.2.12B Evaluate experimental information for appropriateness and adherence to relevant science processes.
3.2.12C Apply the elements of scientific inquiry to solve multi-step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.4.10C Distinguish among the principles of force and motion.
3.4.12A Apply concepts about the structure and properties of matter.
3.4.12C Analyze the principles of motion and force.

Course Content	Student Performance	Resources	Assessments
A. Problems with Rutherford's Model. B. The Nature of Light. C. Spectroscopy. D. The Hydrogen Atom and Bohr. E. Heisenberg Uncertainty Principle. F. Quantum Mechanical Model. G. Orbital Diagrams and Electron Configurations. H. Applications of the Quantum Mechanical Model to the Periodic Table.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 6 • Assorted laboratory manuals • Textbook supplementary materials • Teacher developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

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3.2.12A Evaluate the nature of scientific and technological knowledge.
3.2.12B Evaluate experimental information for appropriateness and adherence to relevant science processes.
3.2.12C Apply the elements of scientific inquiry to solve multi-step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.4.10C Distinguish among the principles of force and motion.
3.4.12A Apply concepts about the structure and properties of matter.
3.4.12C Analyze the principles of motion and force.

Course Content	Student Performance	Resources	Assessments
I. Periodic Trends. J. Survey of the Main Group Elements.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 6 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Chemical Bonding**

Content Standard: **Explain and apply chemical bonding theory to the structure and properties of molecules**

State Curriculum Standard: **3.1.10C Apply patterns as repeated processes or recurring elements in science and technology.**
3.1.10E Describe patterns of change in nature, physical and man made systems.
3.1.12B Apply concepts of models as a method to predict and understand science and technology.
3.1.12C Assess and apply patterns in science and technology.
3.2.12A Evaluate the nature of scientific and technological knowledge.
3.2.12B Evaluate experimental information for appropriateness and adherence to relevant science processes.
3.2.12C Apply the elements of scientific inquiry to solve multi-step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.4.12A Apply concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Lewis Dot Structures. B. Ionic Versus Covalent Bonding and the Periodic Table. C. Writing Lewis Structures. D. Resonance. E. Electronegativity and Polar Bonds. F. VSEPR Theory. G. Polar Molecules. H. Orbital Hybridization with Applications to Organic Molecules. I. Cis and Trans Isomers of Alkenes.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapter 7, 22.1, 22.2, and 22.5 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes

Science Planned Course – Honors Chemistry I – Grade 11

Unit: **Solids, Liquids, and Solutions**

Content Standard: **Qualify and quantify solid, liquid, and solution behavior**

State Curriculum Standard: **3.1.10C Apply patterns as repeated processes or recurring elements in science and technology.**
3.1.10E Describe patterns of change in nature, physical and man made systems.
3.1.12C Assess and apply patterns in science and technology.
3.1.12D Analyze scale as a way of relating concepts and ideas to one another by some measure.
3.2.12A Evaluate the nature of scientific and technological knowledge.
3.2.12B Evaluate experimental information for appropriateness and adherence to relevant science processes.
3.2.12C Apply the elements of scientific inquiry to solve multi-step problems.
3.4.10A Explain concepts about the structure and properties of matter.
3.4.12A Apply concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Crystal Structure and Types of Unit Cells. B. Density of a Unit Cell C. Types of Intermolecular Forces D. Phase Changes E. Heating and Cooling Curves. F. Heats of Fusion and Vaporization. G. Vapor Pressure. H. Liquid-Vapor Equilibrium. I. Solutions and Solubility Curves. J. Qualitative Interpretations of Colligative Properties.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Collect and analyze laboratory data • Participate in cooperative learning activities focusing on problem solving • Contribute to class discussions • Evaluate laboratory data and discuss theory in a formal laboratory report • Actively view and analyze all video presentations	• Chemistry: Principles and Reactions, 5th ed., (Thomson Publishing Co, 2006), Chapters 9 and 10 • Assorted laboratory manuals • Textbook supplementary materials • Teacher-developed notes and handouts • Videos/DVDs • Primary and secondary source readings • Websites • Library services • Posters/visual aides	• Laboratory report evaluation based on a rubric • Teacher-generated assessments with primary focus on open-ended questions and problems • Oral questioning • Teacher observations • Evaluation of class work and homework • Content based quizzes