Science Planned Course: College Prep General Science – Grade 9

Unit: **The Nature of Science and Measurement**

Content Standard: **To apply the scientific method and measurement skills to solve scientific problems**

State Curriculum Standard: **3.1.10D Apply 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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10A Explain concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. The Scientific Method. B. Controlled Experiments. C. Dependent and Independent Variables. D. Theories Versus Laws. E. Laboratory Safety and Procedures. F. Measuring Length, Mass, and Volume to the Correct Number of Significant Digits and Correct Units. G. Metric Prefix Conversions. H. Mass Percent Calculations. I. Density Calculations. J. Constructing and Interpreting Graphs.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 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 • Teacher generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and Presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Motion**

Content Standard: **To apply the ideas of velocity and acceleration to solve real-world problems**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10C Distinguish among the principles of force and motion.

Course Content	Student Performance	Resources	Assessments
A. Frames of Reference. B. Distance Versus Displacement – Scalar and Vector Quantities. C. Speed and Velocity Calculations. D. Distance-time Graphs. E. Acceleration. F. Velocity-time Graphs.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 2006) – Chapter 11 • 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 • Teacher-generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Forces**

Content Standard: **To apply the idea of force to explain the motion of objects**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10C Distinguish among the principles of force and motion.

Course Content	Student Performance	Resources	Assessments
A. Definition of Force. B. Newton's First Law. C. Balanced and Unbalanced Forces. D. Drawing Vector Diagrams. E. Calculating Net Force From Vector Diagrams. F. Types of Friction G. Newton's Second Law Calculations. H. Newton's Third Law and its Applications. I. Momentum. J. Gravity and Free Fall. K. Weight and Mass. L. Projectile Motion. M. Archimedes' Principle and Buoyancy	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 2006) – Chapter 12 • 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 • Teacher-generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Work, Power, and Simple Machines**

Content Standard: **To understand the mechanical applications of force and motion.**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10C Distinguish among the principles of force and motion.

Course Content	Student Performance	Resources	Assessments
A. Forms of Energy. B. Energy Conversion; Pendulums. C. Work and Power Calculations. D. Types of Simple Machines. E. Compound Machines. F. Actual and Ideal Mechanical Advantage. G. Efficiency.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 2006) – Chapter 14 • 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 • Teacher-generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and Presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Phases of Matter**

Content Standard: **To apply the ideas of heat, temperature, and kinetic molecular theory to the four phases of matter and to explain phase changes.**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10A Explain concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Heat Versus Temperature. B. Temperature Conversions. C. Kinetic Molecular Theory and the Four Phases of Matter. D. Pressure and the Atmosphere. E. Calculating with Boyle's, Charles's, and the Combined Gas Laws F. Phase Changes. G. Heating and Cooling Curves.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 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 • Teacher-generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and Presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Atomic Structure**

Content Standard: **To understand the structure of the atom and the development of atomic models**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10A Explain concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Development of Atomic Models. B. Democritus and Aristotle C. Dalton's Atomic Theory. D. J.J. Thomson. E. Rutherford and the Nucleus. F. Bohr and the Planetary Model. G. Heisenberg Uncertainty Principle. H. Schrodinger and the Wave Model. I. Subatomic Particles. J. Calculations involving atomic number and mass number. K. Identifying isotopes L. Nuclear notation M. Mass number versus atomic mass N. Drawing Bohr diagrams	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 2006) – Chapter 4 • 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 • Teacher-generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **The Periodic Table**

Content Standard: **To understand the organization of the periodic table and use to predict electronic structure**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10A Explain concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Mendeleev's Periodic Table. B. Moseley and the Periodic Law. C. Periods and Groups. D. Classifying the Elements: Metals, Nonmetals, or Metalloid. E. Names of Groups/Families. F. Reactivity of the Alkali Metals. G. Elements from Minerals and Ores. H. Using Group Number to Predict Valence Electrons for Representative Elements. I. Using Period Number to Predict Energy Levels for Representative Elements.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 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 • Teacher-generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and Presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Bonding, Formulas, and Nomenclature**

Content Standard: **To understand the bonding of atoms, to write formulas, and to name various types of compounds**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10A Explain concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Ionic and Covalent Bonding. B. Dot Structures for Elements and Molecules. C. Non-Polar and Polar Bonds. D. Counting Atoms from Formulas. E. Oxidation States for Representative and Transition Elements. F. Writing Formulas for Binary Ionic, Ternary Ionic, and Binary Molecular Compounds. G. Naming Binary Ionic, Ternary Ionic, and Binary Molecular Compounds. H. Stock System Versus Classical Naming of Select Transition Metal Compounds	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 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 • Teacher generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and Presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Classification of Matter**

Content Standard: **To classify materials by their composition and their properties.**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10A Explain concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Pure Substances. B. Law of Definite Proportions. C. Heterogeneous Versus Homogeneous Mixtures. D. Types of Mixtures: Solutions, Colloids, Suspensions. E. Tyndall Effect. F. Separation Techniques (Filtration, Distillation, Extraction). G. Physical Versus Chemical properties. H. Solubility of Gases and Solids. I. Types of Solutions: Saturated, Unsaturated, and Supersaturated. J. Solubility Curves.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 2006) – Chapter 2 • 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 • Teacher generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and Presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Classification of Matter**

Content Standard: **To classify materials by their composition and their properties.**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10A Explain concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
K. Like Dissolves Like – Discussion of Polar and Non-polar Substances. L. Emulsifying Agents. M. Types of Polymers.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 2006) – Chapter 2 • 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 • Teacher generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and Presentations

Science Planned Course: College Prep General Science – Grade 9

Unit: **Chemical Reactions**

Content Standard: **To understand chemical changes and their equations**

State Curriculum Standard: **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.
3.2.10C Apply the elements of scientific inquiry to solve problems.
3.4.10A Explain concepts about the structure and properties of matter.

Course Content	Student Performance	Resources	Assessments
A. Chemical Versus Physical Changes. B. Conservation of Mass. C. Balancing Chemical Equations. D. Energy of Chemical Reactions. E. Types of Chemical Reactions (Synthesis, Decomposition, Single-Replacement, Double-Replacement, Combustion). F. Acid-Base Neutralization Reaction. G. pH of Solutions.	• Take notes from a variety of instructional presentations • Actively complete all reading assignments • Complete all assigned laboratory experiments • Participate in cooperative learning activities • Contribute to class discussions • Actively view and analyze all video presentations	• Physical Science, (Prentice Hall, 2006) – Chapters 7 & 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 • Teacher generated assessments • Oral questioning • Teacher observations • Evaluation of class work and homework • Quizzes • Projects and Presentations