

Wilson Area School District Planned Course Guide

Title of planned course: College Prep Chemistry

Subject Area: Science

Level: 10

Course Description: Chemistry is the study of matter and the changes it undergoes. Students studying chemistry will investigate the physical properties and physical changes of matter including elements, compounds, and mixtures. Chemical properties will encompass a study of the formation of chemical compounds based on the Law of Definite Proportions, the mathematical determination of empirical and molecular formulas, chemical reactions and stoichiometry. Students will study states of matter and gas laws.

Time/Credit for this Course: 7 periods / week; 1.2 credits

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Wilson Area School District Planned Course Materials

Title of Planned Course: College Prep Chemistry

Textbook: Chemistry: Matter and Change;
Glencoe, ©2002

Resources: Teacher guide for textbook including ancillary materials and a CD with PowerPoint presentations, transparencies, labs, and handouts
The following web sites may be helpful:

www.Science.glencoe.com
www.fordhamprep.org/gcurran/sho/sho/index.htm
www.chemtutor.com/
antoine.frostburg.edu/chem/senese/101/tutorials/
www.learnchem.net/tutorials/
www.chemicalheritage.org
www.americanchemistry.org
www.amnh.org/science/divisions/physsci/
www.nasa.gov/audience/forstudents/9-12/index.html
<http://genesission.jpl.nasa.gov/index.html>

Demonstrations: Chemical Demonstrations, Shakashiri
<http://www.flinnsci.com/>

Curriculum Map

August:	Review of Math Concepts International System of Measurement Dimensional Analysis
September:	Lab Safety Reliability of Measurement
October:	Properties and Classification of Matter Overview of the Atom
November:	Scientific Method Historical Development of the Atom
December:	Quantum Mechanical Model of the Atom Periodic Table
January:	Mid-term Exams Ionic Bonding and Compounds
February:	Covalent Bonding and Molecular Compounds Chemical Formulas
March:	Chemical Reactions
April:	Stoichiometry
May:	State of Matter Gases
June:	Final Exams

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 1: I thought this was chemistry, not math: A review of some math concepts used in chemistry.

Time frame: 2 Weeks

State Standards: 3.1.10.C; 3.1.10.D; 3.7.10.B

Anchor(s) or adopted anchor: S11.A.1.1.5; S11.A.2.2.1

Essential content/objectives: At end of the unit, students will be able to:

- Write measurements using scientific notation
- Perform mathematical operations using scientific notation
- Solve algebraic expressions which involve scientific variables
- Solve chemistry problems using percentages
- Use dimensional analysis to perform unit conversions within the metric system including metric conversions and mole conversions
- Draw and interpret line graphs using scientific data

Core Activities: Students will complete/participate in the following:

- Pre-test: scientific notation, percent calculations, and algebra problems solving for one variable; metric system
- Math Handbook Transparency Masters 1 and 2 (Scientific Notation)
- Textbook problems in Chapter 2 and Appendix A
- Study Guides for Chapter 2
- Math Skills Transparency Master 3 (Percent by Mass)
- Math Skills Transparency Master 13 (Moles of Elements)
- Contribute to Blog

Extensions:

- Apply real life issues to chemistry using data obtained from reliable sources.
- Read and analyze current scientific research.
- Problem of the Week for Chapter 2
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Referral to math lab
- Completion of additional guided practice / independent practice
- Solving Problems: A Chemistry Handbook

Instructional Methods:

- Direct instruction
- PowerPoint presentations/ notes
- Cooperative learning structures
- Guided practice
- Videos

Materials & Resources:

- Textbook pages 31 - 35; 43 - 45
- Math Handbook (Textbook Appendix A)
- CD-ROM for textbook with the transparency masters and study guides
- Solving Problems: A Chemistry Handbook
- World of Chemistry Video: Measurement

Assessments:

- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 2: What does a chemist do?

Time frame: 2 weeks

State Standards: 3.1.10.C; 3.1.10.D; 3.2.10.A; 3.2.10.B; 3.7.10.B

Anchor(s) or adopted anchor: S11.A.1.1.5; S11.A.2.2.1

Essential content/objectives: At end of the unit, students will be able to:

- Perform safely in the lab.
- Identify and use common lab equipment properly
- Distinguish between base units and derived units
- Relate accuracy and precision of data to significant figures
- Discuss accuracy and precision in measurement using significant figures
- Perform mathematical operations using significant figures. Round answers to the correct number of significant figures

Core Activities: Students will complete/participate in the following:

- Pre-test: identify lab equipment; suggest safety rules for lab; define accuracy and precision; reliability of data
- Vocabulary
- Teaching Transparency 9: Precision and Accuracy
- Problems in textbook Chapter 2 Section 3 and Appendix A
- Lab: Lab Procedures and the Use of Common Laboratory Equipment
- Lab: Accuracy and Precision of Data
- Lab: Using Density to Find the Thickness of a Wire
- Contribute to Blog

Extensions:

- Design lab to collect and evaluate data
- Apply real life issues to chemistry using data obtained from reliable sources
- Read and analyze current scientific research. Prepare presentation for school news announcements
- Write article for school newspaper on science and the student
- Problem of the Week for Chapter 1
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- Solving Problems: A Chemistry Handbook
- www.science.glencoe.com

Instructional Methods:

- Direct instruction
- PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Guided practice / independent practice
- Labs

Materials & Resources:

- Textbook pages 36 - 42
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook

Assessments:

- Lab practical exam
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 3: What do we find in our universe?

Time frame: 3 weeks

State Standards: 3.1.10.E; 3.2.10.B; 3.2.10.C; 3.4.10A

Anchor(s) or adopted anchor: S11.A.1.1.1; S11.A.1.1.2; S11.A.1.1.3; S11.A.1.1.5; S11.C.1.1.1; S11.A.1.3.3; S11.A.2.1.1; S11A.2.1.3

Essential content/objectives: At end of the unit, students will be able to:

- Classify everything in the universe as matter, energy, or space
- Classify matter as pure substances or mixtures
- Compare and contrast pure substances and mixtures
- Classify mixtures as heterogeneous or homogeneous
- Identify elements and compounds as pure substances according to the Law of Definite Composition
- Apply the Law of Definite Composition and Law of Multiple Proportions to compounds using percent composition problems
- Classify elements and compounds
- Compare and contrast elements and compounds
- Identify elements as metals, nonmetals, or metalloids. Locate these elements on the periodic table
- Identify compounds of the same elements as different compounds according to the Law of Multiple Proportions
- Recognize and demonstrate that chemical changes obey the Law of Conservation of Mass
- Differentiate between physical and chemical properties; physical, chemical, and nuclear changes
- Compare experimental values to actual values. Discuss possible sources of error
- Classify physical properties of matter as intensive or extensive
- Describe how changes in physical indicators (soil, plants, or animals) of water systems reflect changes in these systems)
- Develop and perform an experiment to separate a mixture by physical means.
- Classify observations of matter as qualitative, quantitative, direct or indirect.

Core Activities: Students will complete/participate in the following:

- Pre-test: elements, compounds, mixtures, physical properties, chemical properties
- Thinking map: Tree map of the classification of matter
- Problems in textbook
- Study Guides
- Teaching Transparencies 7 - 10
- Math Skills Transparencies 2 and 3
- Lab: Five Powders
- Lab: Mixture Separation
- Analysis of Article on Water Quality
- Contribute to Blog

Extensions:

- Paper or plastic?
- Read and write a response to National Geographic articles.
- Investigate and report on the water quality of the local water supply.
- Challenge Problem for Chapter 3
- Problem of the Week for Chapter 3
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- Solving Problems: A Chemistry Handbook
- www.science.glencoe.com

Instructional Methods:

- Independent reading in textbook (Chapter 3)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Inquiry Labs

Materials & Resources:

- Textbook Chapter 3
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 4: What gives matter its properties?

Time frame: 2 weeks

State Standards: 3.1.10E; 3.2.10.A; 3.4.10.A

Anchor(s) or adopted anchor: S11.A.1.1.5; S11.C.1.1.1

Essential content/objectives: At end of the unit, students will be able to:

- Define atom
- Identify the properties of atoms (atomic mass, atomic number, mass number)
- Describe the smaller particles of an atom (electrons, protons, neutrons, quarks, etc.)
- Define isotope. Compare and contrast isotopes of the same element
- Calculate the average atomic mass of an element using the atomic masses of the isotopes and the percent abundance
- Identify nuclear reactions as alpha, beta, or gamma reactions
- Describe how radioactive isotopes that are subject to decay can be used to estimate the age of materials
- Apply the predictability of nuclear decay to estimate the age of materials that contain radioactive isotopes

Core Activities: Students will complete/participate in the following:

- Pre-test: atoms and the parts of an atom; reading the periodic table
- Thinking Map: Bubble map to describe the parts of an atom
- Study Guide Sections 4.3 and 4.4
- Problems in textbook for sections 4.3 and 4.4
- Teaching Transparencies 13 and 14
- Math Skills Transparency 4
- Lab: What's in the box?
- Lab: Isotopic Pennies
- Contribution to Blog

Extensions:

- Is nuclear power a viable alternative to the energy crisis?
- Read and report on an article on nuclear power in France
- Problem of the Week for Chapter 4
- Write an article on nuclear power for the school newspaper / announcements
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- www.science.glencoe.com

Instructional Methods:

- Independent reading in textbook (Chapter 4)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Inquiry Labs

Materials & Resources:

- Textbook Chapter 4 Sections 3 and 4
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 5: What is so special about an atom?

Time frame: 3 weeks

State Standards: 3.1.10.A; 3.2.10.A; 3.2.10.B; 3.4.10.A; 3.4.10.C

Anchor(s) or adopted anchor: S11.A.1.1.1; S11.A.1.1.2; S11.A.1.1.3; S11.A.1.1.4; S11.A.1.1.5; S11.A.2.2.1; S11.A.2.2.2; S11.A.3.2.1; S11.A.3.2.3; S11.A.3.3.3; S11.C.2.1.1

Essential content/objectives: At end of the unit, students will be able to:

- Discuss the main components of the scientific method
- Discuss the development of atomic theory with respect to the use of the scientific method and improvements in technology
- Know the contributions of Aristotle, Democritus, Lavoisier, Proust, Dalton, J.J. Thomson, Rutherford, Bohr, deBroglie, and Heisenberg
- Write orbital diagrams and electron configurations of elements using the Aufbau Principle, Pauli Exclusion Principle, and Hund's Rule
- Define and describe the electromagnetic spectrum
- Define emission and absorption spectrum
- Calculate the wavelength, frequency and energy changes of an electron as it moves from one energy level to another
- Analyze an atomic emission spectrum in terms of the energy transitions of electrons
- Identify the valence electrons of an atom
- Draw Lewis dot diagrams of atoms

Core Activities: Students will complete/participate in the following:

- Pre-test: scientific method, hypothesis, theory, scientific law
- Thinking Maps: Flow Map showing the effect of advances in technology on the development of atomic theory
- Teaching Transparency 2, 11, 12, 15, 16, 17
- Math Skills Transparency 5
- Appropriate questions in textbook
- Lab: Flame Tests
- Lab: Observing Electromagnetic Spectra of Elements
- Contribution to Blog

Extensions:

- Research and report on the Northern Lights / auroras.
- Research and report on the application of electromagnetic radiation in medicine.
- Prepare an article for the school newspaper or announcements.
- Problem of the Week for Chapter 5
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
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Instructional Methods:

- Independent reading in textbook (Chapter 5)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook Chapter 5
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos
- World of Chemistry video: The Atom

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 6: How can this electron configuration stuff help us predict the properties of elements and compounds?

Time frame: 2 weeks

State Standards: 3.1.10.C; 3.1.10.E; 3.2.10.B; 3.4.10.A

Anchor(s) or adopted anchor: S11.A.3.3.1; S11.C.1.1.2; S11.C.1.1.4

Essential content/objectives: At end of the unit, students will be able to:

- Discuss the historical development of the periodic table, citing the work of Mendeleev and Mosley
- Identify the regions of the periodic table
- Describe the arrangement of the periodic table: periods, families, metals, nonmetals, metalloids
- Discuss the correlation between electron configuration and placement of an element on the periodic table
- State the octet rule
- Predict the properties of elements based on the valence electrons and the position on the periodic table
- Define the properties of electronegativity, ionization energy, and atomic radius. Discuss the trends in these properties on the periodic table

Core Activities: Students will complete/participate in the following:

- Study Guides
- Questions in textbook
- Math Skills Transparency 6
- Teaching Transparencies 18 - 24
- Lab - Making the Periodic Table
- Activity: Groups and regions of the Periodic Table
- Activity: Trends on the Periodic Table
- Lab: Descriptive Properties of the Elements
- Inquiry Lab: Metal, Nonmetal, or Metalloid?
- Contribution to Blog

Extensions:

- Challenge Problem Chapter 6: Dobereiner's Triads
- Problem of the Week for Chapter 6
- Research and report on a famous scientist
- Research and report on glass and how it is given different properties
- Research and report on semiconductors
- Write an article for the school newspaper / announcements
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
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Instructional Methods:

- Independent reading in textbook (Chapter 6)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos
- World of Chemistry video: The Periodic Table

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 7: How do elements combine to make more than 92 substances in the universe?
Part One: Ionic Compounds

Time frame: 2 weeks

State Standards: 3.1.10.C; 3.2.10.A; 3.2.10.B; 3.4.10.A

Anchor(s) or adopted anchor: S11.A.3.3.1; S11.A.3.2.3; S11.A.3.3.3; S11.C.1.1.3

Essential content/objectives: At end of the unit, students will be able to:

- Define the terms chemical bonding, ionic bond, ion, cation, anion, electrolyte, lattice energy.
- Describe the forces of attraction and repulsion which are present when two atoms bond.
- Use Lewis dot structures to describe the formation of an ionic bond.
- Account for the properties of ionic compounds with respect to an ionic bond.
- Write names and formulas for ionic compounds.
- Describe the bonding in metals and account for the properties of metals.

Core Activities: Students will complete/participate in the following:

- Pretest
- Study Guides for Chapter 8
- Vocabulary
- Teaching Transparencies 25 - 28
- Math Skills Transparencies 7 - 9
- Lab: Properties of Ionic Compounds
- Lab: Making an Ionic Compound
- Contribution to Blog

Extensions:

- Chapter 8 Challenge Problem
- Problem of the Week for Chapter 8
- Research and report on gems
- Prepare an announcement for the school
- Research and present information on an ionic compound for its properties and uses
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- www.science.glencoe.com

Instructional Methods:

- Independent reading in textbook (chapter 8)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook Chapter 8
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 8: I still don't get it - why do compounds have specific properties?
Part Two: Covalent Bonding

Time frame: 3 weeks

State Standards: 3.1.10.A; 3.2.10.A; 3.2.10.C; 3.4.10A

Anchor(s) or adopted anchor: S11.A.1.1.5; S11.A.3.3.2; S11.C.1.1.2; S11.C.1.1.3

Essential content/objectives: At end of the unit, students will be able to:

- Define the terms covalent bond, single bond, double bond, triple bond, polar bond, nonpolar bond, bond dissociation energy, bond length, resonance structure
- Name and write formulas for molecular compounds and acids
- Name and write formulas for simple hydrocarbons
- Describe the formation of single, double, and triple covalent bonds
- Relate the strength of covalent bond to bond length and bond dissociation energy
- Draw Lewis structures for molecular compounds
- Identify resonance structures and exceptions to the octet rule
- Use VSEPR theory to identify the shape of a molecule when given the possibilities
- Describe the role of electronegativity in the type of bonding of atoms
- Determine the polarity of a molecule and the effect on the properties of a compound
- Compare and contrast polar and nonpolar bonds and polar and nonpolar molecules
- Discuss the bonding in carbon and provide reasons for the multitude of carbon compounds
- Predict the types of bonding in a substance using data such as melting point, boiling point, electrical conductivity, and solubility
- Develop and perform an experiment to determine the type of bonding in a substance based on its properties

Core Activities: Students will complete/participate in the following:

- Study Guides for Chapter 9
- Study Guides for Chapter 22 Sections 1 - 3
- Questions in textbook
- Vocabulary
- Thinking Map: Multi-Flow Map on the relationship between electronegativity and the type of bonding and type of compound
- Teaching Transparencies 29 - 31
- Math Skills Transparency 10
- Lab: Isomerism
- Lab: The Ripening of Fruit with Ethene
- Inquiry Lab: What type of compound?
- Contribute to Blog

Extensions:

- Challenge Problem for Chapter 9
- Challenge Problem for Chapter 22
- Problem of the Week for Chapter 9
- Problem of the Week for Chapter 22
- Research and present information on the uniqueness of water based on its structure
- Prepare an announcement for the school
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- www.science.glencoe.com

Instructional Methods:

- Independent reading in textbook (chapter 9; chapter 22 section 1, 2 and 3)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook Chapter 9
- Textbook Chapter 22 Sections 1 - 3
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos
- World of Chemistry video: Chemical Bonding
- World of Chemistry video: Water
- World of Chemistry video: Carbon

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 9: How does a chemist get those outrageous chemical formulas?

Time frame: 2 weeks

State Standards: 3.1.10.A; 3.2.10.A; 3.2.10.C; 3.2.10.D; 3.4.10.A

Anchor(s) or adopted anchor: S11.A.1.1.1; S11.A.1.1.2; S11.C.1.1.3

Essential content/objectives: At end of the unit, students will be able to:

- Calculate the molar mass and percent composition of a compound
- Determine the empirical formula of a compound given the mass or percent of each element in the compound
- Determine the molecular formula of a compound given the empirical formula and the molar mass
- Describe a hydrate and calculate the percent of water in a hydrate

Core Activities: Students will complete/participate in the following:

- Study Guides for Chapter 11
- Vocabulary
- Questions in textbook
- Teaching Transparency 37
- Math Skills Transparency 13, 14
- Lab: Determination of the empirical formula of a compound
- Lab: Percent of oxygen in potassium chlorate
- Lab: Percent of carbon dioxide in copper (II) carbonate
- Inquiry Lab: Percent of water in a hydrate
- Contribute to Blog

Extensions:

- Chapter 11 Challenge Problem
- Problem of the Week for Chapter 11
- Research and present the job of an analytical chemist
- Research and present common hydrates
- Prepare an announcement for the school
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
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Instructional Methods:

- Independent reading in textbook (chapter 11)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook Chapter 11
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 10: Did someone say explosion?

Time frame: 3 weeks

State Standards: 3.1.10.A; 3.1.10.C; 3.1.10.E; 3.2.10.C; 3.2.10.D; 3.4.10.A; 3.4.10.B; 4.8.10.A

Anchor(s) or adopted anchor: S11.A.1.1.2; S11.A.1.1.4; S11.A.1.1.5; S11.A.1.3.1; S11.A.2.2.1; S11.A.2.2.2; S11.A.3.1.3; S11.C.2.1.2

Essential content/objectives: At end of the unit, students will be able to:

- Define reactant and product
- Identify the reactants and products in a chemical reaction
- Interpret and balance a chemical equation in accordance with the Law of Conservation of Mass
- Classify chemical reactions as synthesis, decomposition, single replacement, double replacement or combustion
- Predict the products of the aforementioned chemical reactions
- Determine the reactants needed for a chemical reaction when given the type of reaction and desired products
- Describe energy changes in chemical reactions
- Analyze factors which will affect the rate of a chemical reaction using collision theory

Core Activities: Students will complete/participate in the following:

- Pretest
- Study Guides for Chapter 10
- Vocabulary
- Questions from textbook
- Teaching Transparencies 32 - 36
- Math Skills Transparency 12
- Lab: Water Analysis
- Inquiry Lab: How do you make that?
- Contribute to Blog

Extensions:

- Chapter 10 Challenge Problem
- Problem of the Week for Chapter 10
- Research and present information on common chemical reactions

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- www.science.glencoe.com

Instructional Methods:

- Independent reading in textbook (chapter 10)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook Chapter 10
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 11: How much can we make?

Time frame: 3 weeks

State Standards: 3.1.10.A; 3.1.10.B; 3.1.10.C; 3.1.10.E; 3.2.10.B; 3.2.10.D; 3.4.10.A; 4.1.10.B; 4.3.10.C; 4.6.10.A; 4.8.10.A;

Anchor(s) or adopted anchor: S11.A.1.1.3; S11.A.1.3.1; S11.A.1.3.2; S11.A.1.3.4; S11.A.2.1.2; S11.A.2.1.3; S11.A.2.1.4; S11A.3.1.1; S11.A.3.1.2; S11.A.3.2.1; S11.B.3.1.5; S11.B.3.3; S11.C.1.1.6

Essential content/objectives: At end of the unit, students will be able to:

- Define equilibrium, limiting reactant, excess reactant.
- Discuss factors which will result in the completion of a reaction (equilibrium or until a limiting reactant is exhausted).
- Apply the mole concept in stoichiometric calculations, including those involving limiting reactants and percent yield.
- Compare the rate of use of natural resources and their impact on sustainability.
- Explain how human-made systems impact the management and distribution of natural resources.

Core Activities: Students will complete/participate in the following:

- Study Guides for chapter 12 and chapter 17 sections 1 and 2
- Vocabulary
- Questions from textbook
- Project: Research and present a natural resource, its use, how it is a limiting reactant, possible substitutes. Discuss responsible management of the resource.
- Teaching Transparencies 38, 39
- Math Skills Transparencies 15 - 17
- Lab: A Mole Ratio
- Inquiry Lab: Preparation of 1.5 grams of an ionic compound
- Inquiry Lab: Factors that affect the rate of a reaction
- Contribute to Blog

Extensions:

- Chapter 12 Challenge Problem
- Chapter 12 Problem of the Week
- Chapter 17 Problem of the Week
- Prepare an announcement for school
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- www.science.glencoe.com

Instructional Methods:

- Independent reading in textbook (chapter 12 and chapter 17 sections 1 and 2)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook Chapter 12 and Chapter 17 Sections 1 and 2
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 12: Solid and liquids and gases, oh my!

Time frame: 3 weeks

State Standards: 3.4.10.A

Anchor(s) or adopted anchor: S11.C.1.1.1; S11.C.1.1.2; S11.C.1.1.3; S11.C.1.1.4

Essential content/objectives: At end of the unit, students will be able to:

- Compare and contrast the three major phases of matter based on kinetic theory
- Define the terms pressure, boiling point, melting point and vapor pressure
- State and apply Dalton's Law of Partial Pressures
- Describe and compare intramolecular and intermolecular forces
- Distinguish among intermolecular forces: dispersion forces, dipole-dipole forces and hydrogen bonds
- Draw and interpret phase diagrams
- Analyze a melting/boiling curve on a particle level with respect to kinetic theory
- Interpret phase changes with respect to particles and kinetic theory

Core Activities: Students will complete/participate in the following

- Study Guides Chapter 13
- Vocabulary
- Questions in textbook for Chapter 13
- Teaching transparencies 40, 41
- Lab: Melting and Boiling Point Curve
- Lab: Using Boiling Point to Determine an Unknown
- Lab: Effect of Impurities on the Boiling Point and Freezing Point
- Lab: Vapor Pressure and Boiling Point
- Lab: Vapor Pressure and Intermolecular Forces
- Contribution to the Blog

Extensions:

- Chapter 13 Challenge Problem
- Chapter 13 Problem of the Week
- Research and present one of the cycles in nature (water, carbon, nitrogen).
- Prepare an announcement for the school
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- www.science.glencoe.com

Instructional Methods:

- Independent reading in textbook (chapter 13)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook Chapter 13
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- United Streaming videos

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 13: Gases: That's too much pressure

Time frame: 2 weeks

State Standards: 3.1.10.A; 3.2.10.A; 3.1.10.A; 3.1.10.C; 3.1.10.E; 3.2.10.B; 3.2.10.D; 3.4.10.A; 4.3.10.C

Anchor(s) or adopted anchor: S11.A.1.1.3; S11.A.1.1.4; S11.A.1.3.1; S11.A.2.1.1; S11.A.2.1.3; S11.A.2.1.4; S11.A.3.1.3; S11.A.3.2.1; S11.A.3.2.2; S11.C.1.1.

Essential content/objectives: At end of the unit, students will be able to:

- Qualitatively predict the changes in temperature, pressure, and volume using Boyle's Law, Charles' Law and Gay-Lussac's Law.
- Define and describe the derivation of absolute temperature.
- Apply gas laws to problems involving pressure, temperature, volume, and amount of gas.

Core Activities: Students will complete/participate in the following

- Study Guides Chapter 14
- Vocabulary
- Questions in textbook for Chapter 14
- Teaching transparencies 42, 43, 44
- Lab: Boyle's Law
- Lab: Charles' Law
- Lab: Gay-Lussac's Law
- Lab: Calculation of the Ideal Gas Constant, r
- Contribution to the Blog

Extensions:

- Chapter 14 Challenge Problem
- Chapter 14 Problem of the Week
- Research and present the preparation and purification of gases for industrial use
- Research and present the effect of green house gases on our atmosphere
- Research and present information on the destruction of the ozone layer
- Prepare an announcement for the school
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation:

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- www.science.glencoe.com

Instructional Methods:

- Independent reading in textbook (chapter 14)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources:

- Textbook Chapter 14
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- World of Chemistry video: Our Atmosphere
- United Streaming videos

Assessments:

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Title of Planned Course: College Prep Chemistry

Unit 14: Chemistry: The Solution to Everything

Time frame: 2 weeks

State Standards: 3.1.10.A; 3.2.10.A; 3.1.10.A; 3.1.10.C; 3.1.10.E; 3.2.10.B; 3.2.10.D; 3.4.10.A; 3.4.12.A

Anchor(s) or adopted anchor: S11.A.1.1.3; S11.A.1.1.4; S11.A.1.3.1; S11.A.2.1.1; S11.A.2.1.3; S11.A.2.1.4; S11.A.3.1.3; S11.A.3.2.1; S11.A.3.2.2; S11.C.1.1.5

Essential content/objectives - At end of the unit, students will be able to:

- Describe the characteristics of solutions and identify the various types.
- Relate the intermolecular forces and the process of solvation.
- Define solubility and identify factors affecting it.
- State the concentrations of solutions in different ways.
- Calculate the concentrations of solutions.
- Identify the physical and chemical properties of acids and bases.
- Classify solutions as acidic, basic, or neutral.
- Compare the Arrhenius and Bronsted-Lowry models of acids and bases.
- Relate the strength of an acid or base to its degree of ionization.
- Explain the relationship between the strengths of acids and bases and the values of their ionization constants.
- Explain the meaning of pH and pOH.
- Relate pH and pOH to the ion product constant for water.

Core Activities - Students will complete/participate in the following:

- Study Guides Chapter 15 Sections 1 and 2
- Study Guides Chapter 19 Sections 1, 2, and 3
- Vocabulary
- Questions in textbook for Chapters 15, and 19
- Teaching transparencies
- Contribution to the Blog

Extensions

- Prepare an announcement for the school.
- Intervention
- Teacher directed remediation based on formative assessment
- Completion of additional guided practice / independent practice
- Web sites as given on page 1 of the planned course.
- Prepare questions and answers on a topic of interest that relate to the unit

Remediation

- Teacher directed based on formative assessment
- Completion of additional guided practice / independent practice
- www.science.glencoe.com

Instructional Methods

- Independent reading in textbook (chapter 15, 19)
- Vocabulary
- Direct instruction with PowerPoint presentations / notes
- Demonstrations
- Cooperative learning structures
- Labs

Materials & Resources

- Textbook Chapter 15, 19
- CD-ROM for textbook with the transparency masters and study guides
- Lab manuals
- Solving Problems: A Chemistry Handbook
- World of Chemistry videos
- United Streaming videos

Assessment

- Lab report
- Quizzes
- Test
- Individual participation / consultation
- Other individualized assessment strategies as necessary