



Online Courses for High School Students
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Course Outline Chemistry

Basics

- Introduction
- Matter
- Element-Atom Connection
- Basics of Atoms
- Atomic Architecture 1
- Atomic Architecture 2
- Organizing All the Info
- The Periodic Table
- Periodic Table Divisions
- Introduction to Periodic Table Trends
- Trends in the Periodic Table
- Gravity
- Conversion to SI Units
- Density
- Food
- Basics Final Exam

Food

- Introduction
- Ordering of Molecules
- Categories of Food
- Lipids
- Basics of Bonding
- Covalent Bonding Analogy
- Introduction of Fats
- Fats
- Calories
- Calories Continued
- Introduction to Carbohydrates
- Carbohydrates
- Multiples and Ratios
- Mass Ratios
- Molecular Masses

Types of Carbohydrates
More Sugar Information
The Mole: The Chemist's Dozen
Introduction to Photosynthesis
Photosynthesis
More Photosynthesis
Introduction to Fudge
Colligative Properties
More Colligative Properties
Lead-in to Molality
Moles/Molality
Back to Fudge
Lead-in to Proteins
Proteins
Lead-in to Minerals
Sodium
Ionic Bonding Analogy
More Ions
Conclusion
Food Final Exam
Food Final Project

Transportation

Introduction
History of the Bicycle
Composition of the Bicycle
Metals in Bicycles
Composition of the Vehicle Frame
The Mining Process
Availability of Elements
Mining and Refining
Computing Percentages of Different Elements
Mass vs. Weight
Computing the Chemical Reactions
Balancing Equations
Computing Balanced Equations
Computing How Many Moles
Atomic Mass Units
Computing Moles, Masses, and Grams
Moles and AMU
Computing Grams to Process
Follow These Steps
Conclusion
Transportation Final Exam
Transportation Final Project

Energy

Introduction
What is Energy?
More on Energy
Measuring Energy
Energy for the Body
The Calorimeter
Energy for Other Things
Sources of Energy
Bond Energy
Fossil Fuels
Fossil Fuels and the Environment
Other Energy Sources
Conclusion
Energy Final Clearance
Energy Final Project

Air & Atmosphere

Atmosphere
The Gaseous State
Pressure Investigation
Pressure Measure
Consideration of Temperature
Temperature
What Affects Volume?
Boyle's Work
Temperature Affects Volume
Charles' Work
Particles Affect Volume
Law of Combining Volume
Who Studied the Mole?
Avogadro's Contribution
Many Things Affect Gases
Ideal Gas Equation
Gas Laws in the Atmosphere
Atmosphere Information
Global Warming Problem
The Greenhouse Effect
Acid Rain and the Ozone Problems
Global Warming Problem
The Ozone Layer
Conclusion
Air & Atmosphere Final Exam
Air & Atmosphere Final Project

Shelter and Clothing

Opening
What is Climate

The Rain Forest
Vapor Pressure and Relative Humidity
Return to the Rain Forest
The Desert
Properties of Water
Return to the Desert
The Arctic Region
Colligative Properties
Water Summary
Return to the Arctic Region
Properties of Carbon Dioxide
Shelter Discussion
Introduction to Polymers
Polymers
Polymer Types
Clothing Discussion
Natural Fabrics
Synthetic Fabrics
Conclusion
Shelter & Clothing Final Exam
Shelter & Clothing Final Project

Colligative Properties

How Hydroponics Works
Concentration
Electrolytes and Dissociation
Raoult's Law
Vapor Pressure and Boiling Point
Vapor Pressure and Freezing Point
Accurate Measurements
Boiling Point Elevation and Freezing Point Depression
Osmosis
Solubility
Lab

Kinetics and Equilibrium

Activation Energy
Other Factors Affecting Reaction Rates
Basic Equilibrium
Equilibrium Expressions
Le Chatelier's Principle
Lab

Acids and Bases

Mold
Acids, Bases, and Ions
Finding the pH

Definitions of Acids

Chemical Buffers

Acid Rain

Lab

Redox and Formulas

Oxidation and Reduction

Oxidation Numbers

Identifying Redox Reactions

Balancing Redox Reactions

Ionic and Molecular Compounds

Basic Formulas

Binary Molecular Compounds

Lab

Organic Chemistry

Crude Oil Recovery and Refining

Crude Oil and Hydrocarbons

Polymers in Nature

Lab