

Course Syllabus for Chemistry in Society

Text Required for this Course: Chemistry in the Community, American Chemical Society

Week 1

Day 1 Morning

Introduction to Course
Laboratory Safety/Equipment
Pre-Assessment
Scientific Method
Scientific Measurements
Qualitative vs. Quantitative measurements
Introduction to:
 Atoms and atomic Theory
 Classification of Matter
 Physical properties/changes
 States of Matter
 Mixtures vs. pure substances

Day 1 Afternoon

Laboratory methods Laboratory Techniques Exercise
Density Lab
Mixtures

Day 1 Evening

You Decide
 Water Use and Riverwood
Problems

Day 2 Morning

Properties of Water (covalent compound)
Atoms vs compounds
Pure water vs Clean water
Ionic Compounds (a bit of naming and background)
Solubility
Concentration
Introduction of water pollution simulation

Day 2 Afternoon

Testing for Ions in Water
Solvents

Day 2 Evening

You Decide: Heavy Metal
Problems: concentration and naming
Prepare of Town Council meeting

Day 3 Morning

Town Council Meeting
Begin discussion of Resources and Waste disposal
Balancing Equations
Law of Conservation of Mass

Day 3 Afternoon

Metal Reactivity testing
Law of Conservation of Mass Percent. of Water in Popcorn Lab

Day 3 Evening

Problems: balancing and predicting formulas
You Decide: Statue of Liberty restoration and Recycling Drive

Day 4 Morning

Periodic variation in properties
Reactivity
Percent Composition
Single Replacement Reactions

Day 4 Afternoon

Producing Copper

Day 4 Evening

Problems: Percent Composition, predicting products and balancing single replacements
Combustion Reactions
You Decide: Petroleum and Who's got the Oil

Day 5 Morning

Redox Intro
More Redox (Batteries, Fuel Cells, Phtovoltaics)
Research alternative energies

Day 5 Afternoon

Electrochemistry labs

Day 5 Evening (Sunday)

Reivew Redox and other calculations from first week
Refine Alternative energy information for class
Work on Electrochemistry lab write up

Week 2

Day 6 Morning

Covalent Bonds and Molecular Modeling
Empirical and Molecular formulas
Specific Heat
Molar Heat

Day 6 Afternoon

Combustion demos and lab

Day 6 Evening

Problems: Heat, Empirical and Molecular formulas
Uses of Petroleum

Day 7 Morning

Alternatives to Petroleum
Present Alternative Energy options
Calorimetry
Bond Energies

Day 7 Afternoon

Calorimetry/Kitchen Calorimetry
Milk analysis
You Decide: Food

Day 7 Evening

Problems: Limiting Reactant
Calorimetry lab write up

Day 8 Morning

Bio molecules (structure, function)
Limiting Reactants
Introduce and begin Research project on food additives

Day 8 Afternoon

Vitamin C analysis
Iron in Foods

Day 8 Evening

Vitamin C lab write up
Finish Additive presentation

Day 9 Morning

Round Robin Presentation on additives
Write up additive information
Calories
Begin discussion of drugs and supplements

Day 9 Afternoon

Aspirin synthesis lab

Day 9 Evening

Write up aspirin lab
Organic molecule problems

Day 10 Morning

Atomic Nucleus
 Gold foil
 Isotopes
 Molar mass and isotopic abundance
Radioactive decay and cloud chamber demo
Half Life and simulation
Artificial Transmutation

Day 10 Afternoon

Fission
Reactors
Uses

Day 10 Evening (Sunday)

Problems: Half life and balancing nuclear equations
Nuclear Waste
Exposure

Weeks 3**Day 11 Morning**

Fusion
Future of nuclear energy
Introduce Gases and Kinetic Energy

Day 11 Afternoon

P, V, T exploration
Gas collection

Day 11 Evening

Analyze data from exploration
Begin to generate:
 Avogadro's Law
 Boyle' Law
 Charles Law

Day 12 Morning

Air pressure
Ozone and Global Warming

Day 12 Afternoon

Introduce acid base
Titration

Day 9 Evening

Problems: P, V, T and reaction calculations
Gas Collection lab Write up

Day 13 Morning

Acid Rain
Acids and Bases
 Neutralization Reactions
 Strength
 pH
 Buffering

Day 13 Afternoon

Effect of Buffers

Day 13 Evening

Problems: pH, Neutralization Reactions
Acid/Base lab Write up

Day 14 Morning

Soap (review of polarity and solubility)
Research project on products we put on our skin/hair

Day 14 Afternoon

Introduce Polymers

Demo polymers

Day 14 Evening

Review for Post Test

Day 15 Morning

Post Test

Present information on products