



Gasconade R-2

**Objective Course Curriculum Report for: Chemistry II
- Twelfth Grade**

Generated on 11/23/2015

Name

Chemistry II Objective 1

Unit Objective

The students will exhibit safe and proper laboratory techniques and demonstrate the use of the scientific method by gathering data and constructing a graph accordingly.

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Sequence

1

Assessment Methods

Essential Questions

Course

Chemistry II

Unit

01 Lab Safety

Objective used to assess students

Formative Assessment Activities

The student will perform experiments and produce graphs from data collected. The student will present safe lab techniques to the class.

Depth of Knowledge

80

Learning Activity

The student will perform a lab and construct a line graph from the data collected. The students will make diagrams of safety rules and present them to class.

Research-based Instructional Strategies

The teacher will demonstrate proper safety techniques & the use of safety equipment. The teacher will model the correct method of constructing graph. The teacher will demonstrate the need for safety glasses using nitric acid and egg white.

Supporting Resources

Modern Chemistry, 1999 Holt, Rinenhart, & Winston
Teacher made resources
Flinn Scientific Chem Fax
SMARTBoard: N/A

Correction Exercise

The student will draw a diagram of all safety equipment in the lab.

Enrichment Exercise for Accelerated Learners

The student will make their own data table and then construct a graph.

Remediation for Struggling Learners

Gather demo materials.

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

Show-Me Standards

Code	Subject	Grade	Standard	Goal
7	Science	Grades: K-12	processes of scientific inquiry (such as formulating and testing hypotheses)	
1.1	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Develop questions and ideas to initiate and refine research
1.2	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Conduct research to answer questions and evaluate information and ideas
1.6	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Discover and evaluate patterns and relationships in information, ideas and structures
1.7	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Evaluate the accuracy of information and the reliability of its sources
1.8	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Organize data, information and ideas into useful forms (including charts, graphs, outlines) for analysis or presentation

Grade and Course Level Standards

Common Core Standards

Version

1

Files

Date Range

Other Standards

Other Diverse Learners

Students Self-Reflection About Personal Goals

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Guiding Questions Depth of Knowledge

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Name

Chemistry II Objective 2

Unit Objective

The student will summarize the kinetic-molecular theory of matter and explain how the theory accounts for certain physical properties of ideal gases.

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Assessment Methods

Essential Questions

Course

Unit

02 Physical Characteristics of Gases (Ch 10)

Objective used to assess students

Formative Assessment Activities

The student will explain the kinetic molecular theory of matter and relate it to properties of gases.

Depth of Knowledge

75

Learning Activity

The student will take notes on the main concepts of the kinetic molecular theory. The students will perform a lab activity on air pressure and also properties of common gases. Students will answer questions over a video on "Solids, Liquids, and Gases". Students will analyze gas properties through watching a series of demonstrations on gas properties.

Research-based Instructional Strategies

The teacher will lecture on the 5 major assumption of the kinetic molecular theory. The teacher will demonstrate many gas properties in a "Silent Lecture" format. The teacher will show a video "Bill Nye: Pressure"

Supporting Resources

SMARTBoard Lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher Made ResourcesUnited Streaming Videos
1. Elements of Chemistry: Gases, Liquids, and Solids. United Learning. 2003. unitedstreaming
2. Oxygen & Atoms: Bill Nye

Correction Exercise

The student will complete additional reinforcement worksheets on the concepts.

Enrichment Exercise for Accelerated Learners

The students will do research and present a report to the class on properties of common gases.

Remediation for Struggling Learners

Gather items for demonstrations and labs.

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

Show-Me Standards

Code	Subject	Grade	Standard	Goal
1	Science	Grades: K-12	properties and principles of matter and energy	
1.3	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Design and conduct field and laboratory investigations to study nature and society
1.5	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Comprehend and evaluate written, visual and oral presentations and works
1.6	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Discover and evaluate patterns and relationships in information, ideas and structures
3.5	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to recognize and solve problems.	Reason inductively from a set of specific facts and deductively from general premises

Grade and Course Level Standards

Common Core Standards

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Chemistry II Objective 3

Unit Objective

The student will apply the gas laws (i.e. Charles's, Boyle's, Gay-Lussac's, ideal gas law) to analyze relationships between pressure, temperature, volume, and moles of a gas.

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Sequence

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Assessment Methods

Essential Questions

Course

Chemistry II

Unit

03 Physical Characteristics of Gases (Ch 10)

Objective used to assess students

Formative Assessment Activities

The student will solve problems related to the gas laws to analyze the relationships between measurable properties of a gas.

Depth of Knowledge

75

Learning Activity

The student will complete worksheets over the gas laws concepts. The student will perform calculations relating pressure, volume, and temperature of a gas. The student will complete labs over Boyle's law and also pressure vs. temp. The student will analyze gas data collected with computer sensors in the lab. The student will complete a lab to calculate the molar volume of Hydrogen gas. The student will calculate the pressure released in a party popper using the ideal gas law.

Research-based Instructional Strategies

Teacher will lecture on the gas laws. The teacher will model the correct way to solve gas law problems. The teacher will perform demonstration "Vapor Pressure With Pop."

Supporting Resources

SMART Board lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher made resourcesChemistry with Computers Lab Manual, Vernier

Correction Exercise

The student will complete additional reinforcement worksheets on the concepts.

Enrichment Exercise for Accelerated Learners

The students will do research and present a report to the class on the history and life of Robert Boyle or Henri Charles.

Remediation for Struggling Learners

Gather items for demonstrations and labs. Save bubble wrap. Set up computers with pressure and temperature sensors.

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

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Other Diverse Learners

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Name

Chemistry II Objective 4

Unit Objective

The student will describe the relationship between the mass of gas particles and the rate of effusion.

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Assessment Methods

Essential Questions

Course

Chemistry II

Unit

05 Molecular Composition of Gases (Ch 11)

Objective used to assess students

Formative Assessment Activities

The student will explain how the mass of a gas particle affects the rate of effusion.

Depth of Knowledge

70

Learning Activity

The student will complete a worksheet over the concepts presented.

Research-based Instructional Strategies

The teacher will lecture on Graham's Law of Effusion. The teacher will perform a demonstration "What You Can't See." The teacher will show a video online of a lab simulation.

Supporting Resources

SMARTBoard lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher made resources http://chemed.chem.purdue.edu/demos/main_pages/4.17.html

Correction Exercise

The student will complete additional worksheets on the concept.

Enrichment Exercise for Accelerated Learners

The student will research applications of the effusion law.

Remediation for Struggling Learners

Gather materials needed for the demonstration.

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

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Name

Chemistry II Objective 5

Unit Objective

The student will apply the kinetic-molecular theory to compare and contrast properties of solids and liquids.

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Assessment Methods

Essential Questions

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Chemistry II

Unit

06 Liquids and Solids

Objective used to assess students

Formative Assessment Activities

The student will compare and contrast properties of solids and liquids in terms of the kinetic molecular theory.

Depth of Knowledge

80

Learning Activity

The student will complete worksheets over the concepts presented. The student will take notes from the textbook on his/her own.

Research-based Instructional Strategies

The teacher will lead a discussion on properties of solids and liquids. The teacher will perform a demonstration "Viscosity: The Ketchup Race".

Supporting Resources

Modern Chemistry, 1999 Holt, Rinenhart, & Winston
Teacher made resources
Unitedstreaming videos
1. Chemistry Connections: Kinetic & Potential Energy Changes During Changes to States of Matter

Correction Exercise

The student will complete additional worksheets over this subject.

Enrichment Exercise for Accelerated Learners

The student will design an experiment to quantitatively measure the demonstration on ketchup.

Remediation for Struggling Learners

Purchase 4 different brands of ketchup for the demo.

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

Show-Me Standards

Code	Subject	Grade	Standard	Goal
1	Science	Grades: K-12	properties and principles of matter and energy	
3.1	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to recognize and solve problems.	Identify problems and define their scope and elements
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Grade and Course Level Standards

Common Core Standards

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Name

Chemistry II Objective 6

Unit Objective

The student will interpret phase diagrams and predict changes in state based on equilibrium vapor pressure.

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Assessment Methods

Essential Questions

Course

Chemistry II

Unit

07 Liquids and Solids

Objective used to assess students

Formative Assessment Activities

The student will analyze phase diagrams in order to predict changes in state based on equilibrium vapor pressure.

Depth of Knowledge

70

Learning Activity

The student will perform a lab "Wet Dry Ice" to analyze the conditions where carbon dioxide can be forced into the liquid state. The student will analyze phase diagrams of different substances on a worksheet.

Research-based Instructional Strategies

The teacher will lecture on phase diagrams. The teacher will perform 2 demonstrations " Freezing by Boiling" and "A Cool Way to Boil Water". The teacher will show a video "Chemistry Connections Kinetic and Potential Energy Changes During Changes to States of Matter"

Supporting Resources

SMARTBoard lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher made resourcesUnitedstreaming videos:Flinn Scientific Chem Fax

Correction Exercise

The student will complete additional worksheets on the concepts.

Enrichment Exercise for Accelerated Learners

The student will make a poster showing how dry ice is made.

Remediation for Struggling Learners

Purchase dry ice for lab. Gather all materials for demonstrations.

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

Show-Me Standards

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1	Science	Grades: K-12	properties and principles of matter and energy	
3.3	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to recognize and solve problems.	Develop and apply strategies based on one's own experience in preventing or solving problems
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Grade and Course Level Standards

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Name

Chemistry II Objective 7

Unit Objective

The student will compare and contrast solutions, suspensions, and colloids and analyze the physical and chemical factors that affect solubility rates.

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Assessment Methods

Essential Questions

Course

Chemistry II

Unit

08 Solutions (Ch 13)

Objective used to assess students

Formative Assessment Activities

The student will outline the physical and chemical factors that affect solubility and compare and contrast different types of mixtures.

Depth of Knowledge

75

Learning Activity

The student will perform a lab to analyze properties of different mixtures. The student will complete worksheets over the concepts presented. The student will perform a lab over chromatography. The student will perform a lab analyzing heat of solution.

Research-based Instructional Strategies

The teacher will show videos "Mixtures Together but Separate" and "Mixtures and Solutions". The teacher will lecture over properties of solutions and heat of solution.

Supporting Resources

SMARTBoard lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher made resourcesMixtures: Together but Separate . AIMS Multimedia. 1996. unitedstreaming. 28 November 2005
<http://www.unitedstreaming.com/>

Correction Exercise

The student will create a concept map showing the different types of mixtures.

Enrichment Exercise for Accelerated Learners

The student will research different mixture separation techniques on the Internet.

Remediation for Struggling Learners

Purchase hand warmers for heat of solution lab.

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

Show-Me Standards

Code	Subject	Grade	Standard	Goal
1	Science	Grades: K-12	properties and principles of matter and energy	
2.1	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to communicate effectively within and beyond the classroom.	Plan and make written, oral and visual presentations for a variety of purposes and audiences
1.5	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Comprehend and evaluate written, visual and oral presentations and works
1.6	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Discover and evaluate patterns and relationships in information, ideas and structures

Grade and Course Level Standards

Common Core Standards

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Summative Assessment Activities

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Family and Community Involvement

Name

Chemistry II Objective 8

Unit Objective

The student will perform calculations involving molarity and concentration of solutions.

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Assessment Methods

Essential Questions

Course

Chemistry II

Unit

09 Solutions (Ch 13)

Objective used to assess students

Formative Assessment Activities

The student will solve mathematical calculations involving molarity and concentration of solutions.

Depth of Knowledge

80

Learning Activity

The student will complete molarity and concentration calculations. The student will perform a serial dilution in a lab using computer sensors to collect data with colorimeters to determine the concentration of an unknown solution. The student will write a lab report.

Research-based Instructional Strategies

The teacher will lecture on molarity and model problem solving methods. The teacher will model the proper method of serial dilution.

Supporting Resources

SMARTBoard lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher made resourcesChemistry with Computers Lab book; Vernier

Correction Exercise

The student will do additional practice problems involving molarity.

Enrichment Exercise for Accelerated Learners

The student will research applications of Beer's Law and make a poster.

Remediation for Struggling Learners

Set up computer & sensors for lab.

English Language Learner

District Defined

Missouri School Improvement Program

Show-Me Standards

Code	Subject	Grade	Standard	Goal
1	Science	Grades: K-12	properties and principles of matter and energy	
3.3	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to recognize and solve problems.	Develop and apply strategies based on one's own experience in preventing or solving problems
1.5	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Comprehend and evaluate written, visual and oral presentations and works
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Grade and Course Level Standards

Common Core Standards

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Summative Assessment Activities

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Name

Chemistry II Objective 9

Unit Objective

The student will predict whether a precipitate will form when solutions are combined and compare dissociation with ionization.

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Assessment Methods

Essential Questions

Course

Chemistry II

Unit

10 Ions in Aqueous Solutions (Ch 14)

Objective used to assess students

Formative Assessment Activities

The student will predict whether a precipitate will form when solutions are combined and compare dissociation with ionization.

Depth of Knowledge

70

Learning Activity

The student will perform a lab to predict the outcome of double replacement reactions and determine whether the products are solid or aqueous. The student will watch a video "Simply Science: Water Highway of Life" and complete worksheets over the video.

Research-based Instructional Strategies

The teacher will lecture on net ionic equations and compare and contrast ionization and dissociation.

Supporting Resources

Modern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher made resourcesSimply Science: Water: Highway of Life. United Learning. 1998.
unitedstreaming. 12 January 2007 <http://www.unitedstreaming.com/>

Correction Exercise

The student will do additional practice problems involving writing formulas for ionic compounds.

Enrichment Exercise for Accelerated Learners

The student will make a venn diagram comparing ionization and dissociation.

Remediation for Struggling Learners

Assemble all materials needed for lab.

District Defined

Objective is A+

Missouri School Improvement Program

Show-Me Standards

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1	Science	Grades: K-12	properties and principles of matter and energy	
3.2	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to recognize and solve problems.	Develop and apply strategies based on ways others have prevented or solved problems
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Grade and Course Level Standards

Common Core Standards

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Name

Chemistry II Objective 10

Unit Objective

The student will describe the causes of vapor-pressure lowering, boiling-point elevation, freezing point depression, and osmotic pressure.

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Assessment Methods

Essential Questions

Course

Chemistry II

Unit

11 Colligative Properties (Ch 14)

Objective used to assess students

Formative Assessment Activities

The student will explain the effects that various colligative properties have on a solution

Depth of Knowledge

70

Learning Activity

Students will perform a lab, Colder than Ice, comparing the colligative properties of electrolytes and. Students will complete worksheets over the concepts presented. Students will do a lab to make homemade ice cream.

Research-based Instructional Strategies

The teacher will lead a discussion of colligative properties of solutions and discuss applications.

Supporting Resources

SMARTBoard lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher made resources

Correction Exercise

The student will complete additional worksheets on the concepts.

Enrichment Exercise for Accelerated Learners

The student will research applications of colligative properties on the Internet and present a report to the class.

Remediation for Struggling Learners

Purchase all items needed for ice cream making.

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

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Chemistry II Objective 11

Unit Objective

The student will apply Le Chatelier's principle to predict how equilibria will shift in response to changes in concentration, pressure, temperature, and common-ion effect.

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Assessment Methods

Essential Questions

Course

Chemistry II

Unit

12 Chemical Equilibrium (Ch 18)

Objective used to assess students

Formative Assessment Activities

The student will predict how equilibria will shift under various conditions based on applying Le Chatelier's principle.

Depth of Knowledge

70

Learning Activity

The students will practice calculating equilibrium constants for various situations, i.e. K_a , K_{sp} . The students will perform a lab on effects of buffers. The students will complete worksheets over the topics presented. The students will review using a computer game.

Research-based Instructional Strategies

The teacher will lecture on Le Chatelier's principle and its effects on chemical equilibrium. The teacher will perform a demonstration "Buffering of Lakes" to show the equilibrium conditions set up in limestone lakes to minimize the effects of acid rain. The teacher will perform a demonstration showing the hydrolysis of salts. The teacher will model the correct way to calculate the equilibrium constant. The teacher will show video "Chemistry Connections Buffers & Buffer Systems"

Supporting Resources

SMARTBoard lessons by: AAModern Chemistry, 1999 Holt, Rinehart, & Winston Teacher made resources Unitedstreaming Videos

1. Chemistry Connections: Introduction to Chemical Equilibrium Systems
2. Chemistry Connections: Opposing Reactions in Equilibrium Systems

Correction Exercise

Enrichment Exercise for Accelerated Learners

Remediation for Struggling Learners

English Language Learner

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Grade and Course Level Standards

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Use of Technology

Guiding Questions

Guiding Questions Depth of Knowledge

Summative Assessment Activities

Summative Correction Exercise

Family and Community Involvement

Name

Chemistry II Objective 12

Unit Objective

The student will balance oxidation-reduction reactions using the half-reaction method and describe how the strength of oxidizing reducing agents affects a redox reaction.

Created By

System

Creation Date

5/19/2013 7:18:18 PM +00:00

Modified By

System

Modification Date

11/19/2013 3:10:10 PM +00:00

Sequence

12

Assessment Methods

Essential Questions

Course

Chemistry II

Unit

Objective used to assess students

Formative Assessment Activities

The student will balance oxidation-reduction reactions using the half-reaction method and describe the role of oxidizing agents and reducing agents in the redox reaction.

Depth of Knowledge

70

Learning Activity

The students will practice assigning oxidation numbers to compounds. The students will practice balancing equations using the half-reaction method. The students will perform a lab investigating Oxidation and Reduction reactions. The students will write equations for all reactions observed.

Research-based Instructional Strategies

The teacher will model how to assign oxidation numbers to elements in compounds. The teacher will model balancing of redox equations using the half-reaction method. The teacher will show the video "An Introduction to Oxidation & Reduction" The teacher will lecture on strengths of oxidizing and reducing agents. The teacher will perform demonstrations "Silver Mirror" and "Redox in Breathalyzers"

Supporting Resources

SMARTBoard lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & Winston
Teacher made resources
Unitedstreaming Videos
1. Primary Cells Secondary Cells and Fuel Cells

Correction Exercise

Enrichment Exercise for Accelerated Learners

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

Show-Me Standards

Code	Subject	Grade	Standard	Goal
1	Science	Grades: K-12	properties and principles of matter and energy	
3.2	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to recognize and solve problems.	Develop and apply strategies based on ways others have prevented or solved problems
1.5	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Comprehend and evaluate written, visual and oral presentations and works
1.6	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Discover and evaluate patterns and relationships in information, ideas and structures

Grade and Course Level Standards

Common Core Standards

Version

1

Files

Date Range

Other Standards

Other Diverse Learners

Students Self-Reflection About Personal Goals

Use of Technology

Guiding Questions

Guiding Questions Depth of Knowledge

Summative Assessment Activities

Summative Correction Exercise

Family and Community Involvement

Name

Chemistry II Objective 13

Unit Objective

The student will describe the operation of electrochemical cells and distinguish between voltaic cells and electrolytic cells.

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System

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System

Modification Date

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Sequence

13

Assessment Methods

Essential Questions

Course

Unit

14 Electrochemistry (Ch 19)

Objective used to assess students

Formative Assessment Activities

The student will explain how electrochemical cells operate and distinguish between voltaic cells (batteries) and electrolytic cells (electrolysis).

Depth of Knowledge

70

Learning Activity

The students will investigate the construction of a voltaic pile using various coins to determine the maximum voltage that can be produced. The students will discuss the practical application and uses of batteries. The students will construct a lead storage battery (car battery) and measure the voltage produced. The students will compare and contrast voltaic and electrolytic cells.

Research-based Instructional Strategies

The teacher will lecture over electrolytic and voltaic cells. The teacher will demonstrate the construction of a Zinc/Copper wet cell battery. The teacher will model the correct way to calculate the electrode potential that can be obtained from a battery. The teacher will demonstrate the electroplating of copper.

Supporting Resources

SMARTBoard lessons by: AAModern Chemistry, 1999 Holt, Rinenhart, & WinstonTeacher made resourcesUnitedstreaming Videos

1. Primary Voltaic Cells
2. Voltage and Voltaic CellsVernier Chemistry With Computers Lab Manual

Correction Exercise

Enrichment Exercise for Accelerated Learners

Remediation for Struggling Learners

English Language Learner

District Defined

Objective is A+

Missouri School Improvement Program

Show-Me Standards

Code	Subject	Grade	Standard	Goal
1	Science	Grades: K-12	properties and principles of matter and energy	
1.6	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Discover and evaluate patterns and relationships in information, ideas and structures
1.10	Knowledge Standards	Grades: K-12	Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.	Apply acquired information, ideas and skills to different contexts as students, workers, citizens and consumers

Grade and Course Level Standards

Common Core Standards

Version

1

Files

Date Range

Other Standards

Other Diverse Learners

Students Self-Reflection About Personal Goals

Use of Technology

Guiding Questions

Guiding Questions Depth of Knowledge

Summative Assessment Activities

Summative Correction Exercise

Family and Community Involvement