

GCS Unit Plan Template

Unit Author	
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School	GCHS
Unit Overview	
Unit Title	Unit 6
Solutions, Equilibrium, Acids & Bases, Net Ionic Equations and Reaction Rates	
Subject Area	
Chemistry	
Grade Level	
10 & 11	
Approximate Time Needed	
15 days x 90 minutes	
Unit Foundation	
Targeted Content Standards and Benchmarks	
<p>Chem 2.2.1 Explain the energy content of chemical reactions.</p> <p>Chem 2.2.3 Write and balance ionic equations</p> <p>Chem 3.1.1 Explain the factors that affect the rate of a reaction</p> <p>Chem 3.1.2 Explain the conditions of a system at equilibrium</p> <p>Chem 3.1.3 Infer the shift in equilibrium when a stress is applied to a system.</p> <p>Chem 3.2.1 Classify substances using $[H^+]$ and $[OH^-]$.</p> <p>Chem 3.2.2 Summarize the properties of acids and bases.</p> <p>Chem 3.2.3 Infer quantitative relationships of a solution.</p> <p>Chem 3.2.4 Summarize the properties of a solution</p> <p>Chem 3.2.5 Interpret solubility graphs.</p> <p>Chem 3.2.6 Explain the solution process.</p>	
Student Objectives/Learning Outcomes	
<p>I can define acids and bases using both Arrhenius' and Bronsted-Lowery's rules.</p> <p>I will be able to identify compounds as acids or bases using those rules.</p> <p>I will be able to calculate pH, pOH, $[H^+]$ and $[OH^-]$ values.</p> <p>I can interpret and create acid/base titration curves.</p> <p>I can determine the direction a reaction will proceed in order to reach equilibrium.</p> <p>I will calculate the molarity of a solution as well as the mass or volume of material needed to produce a solution of said concentration.</p> <p>I can use laboratory methods to determine the pH of a solution.</p> <p>I can interpret the information on a solubility graph.</p> <p>I will identify the oxidized and reduced element as well as the oxidizing and reducing agents.</p> <p>I can use the rules of solubility to write ionic and net ionic equations.</p> <p>I will understand the factors that affect the rate of reactions</p> <p>I will be able to define catalyst and understand their role in the rate of chemical reactions.</p> <p>I will be able to interpret information from graphs that represent catalyzed and uncatalyzed endergonic and exergonic reactions.</p> <p>I can distinguish between a reversible reaction at equilibrium and one that is not at equilibrium.</p>	

I can determine the direction a reaction will proceed in order to reach equilibrium.

Cross-Curricular Connections

Math – Reading graphs and completing math equations

Curriculum-Framing Questions

Essential Question

How do chemical properties of elements and compounds affect how they interact with one another?

Unit Questions

Which do you think is more harmful, an acid or a base? Why?
Why do you think gases are less soluble at higher temperatures?
Why have spectator ions if they do not participate in the chemical reaction?
Do you think Fritz Haber should have been awarded a Nobel Prize in Chemistry for his contributions to the field? Explain your answer.
If you could create a catalyst to speed up any chemical reaction, which reaction would it be and describe the shape of your catalyst.

Content Questions

What is oxidation and reduction?
What is an oxidizing and reducing agent?
What is the definition of solubility and what are factors that affect solubility?

Assessment Summary

Above

Unit Details

Prerequisite Skills

Basic Math Skills, Writing, balancing and identifying types of chemical equations, graphical interpretation skills

Instructional Procedures

Days 1-4 <https://www.khanacademy.org/science/chemistry/states-of-matter/v/solubility>

Calculating molarity and mass of solute to make a solution

Reading Solubility graphs

Determining and comparing the K_{eq} and Q for reactions

Quiz on day 4

Days 5-8 <http://www.youtube.com/watch?v=ANi709MYnWg>

Arrhenius and Bronsted/Lowry definitions of acids and bases (identifying acids, bases, conjugate acids and conjugate bases)

Naming binary and ternary acids

Naming Arrhenius bases

Calculating pH, pOH, $[H]$ and $[OH]$

Conducting a titration and completing the math

Quiz on day 5

Days 9 & 10

Using the Solubility Rules in the packet to write net ionic equations

Days 11-13 <http://www.youtube.com/watch?v=-wvnX1f7yRY>

Defining the terms associated with redox rxns : oxidation, reduction, oxidizing agent and reducing agent.

Identifying redox reactions and writing simple half reactions

Day 14

Review for Unit Test

Day 15

Unit Test

Accommodations for Differentiated Instruction

Special Needs Students

One on one assistance, student tutors, small group assignments

Gifted/Talented Students

Writing complete half reactions

Materials and Resources Required For Unit

Technology – Hardware (Click boxes of all equipment needed)

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Interactive Technology | <input type="checkbox"/> Student Response System/Clickers | <input type="checkbox"/> Cell Phone |
| <input type="checkbox"/> Computer(s)/iPads, etc. | <input type="checkbox"/> Printer | <input type="checkbox"/> Video Camera |
| <input type="checkbox"/> Digital Camera | <input checked="" type="checkbox"/> Projection System | <input type="checkbox"/> Video Conferencing Equip. |
| <input checked="" type="checkbox"/> DVD Player | <input type="checkbox"/> Scanner | <input type="checkbox"/> Document Camera |
| <input checked="" type="checkbox"/> Internet | <input checked="" type="checkbox"/> Television | <input type="checkbox"/> Other |

Technology – Software (Click boxes of all software needed.)

- | | | |
|---|---|---|
| <input type="checkbox"/> Database/Spreadsheet | <input type="checkbox"/> Image Processing | <input type="checkbox"/> Web Page Development |
| <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Internet Web Browser | <input type="checkbox"/> Word Processing |
| <input type="checkbox"/> E-mail | <input type="checkbox"/> Multimedia | <input type="checkbox"/> Other |
- ☒ Web-Based Encyclopedia

Printed Materials

Test book Merrill and Prentice Hall and worksheets associated with each
Teacher made worksheets
Chemistry Reference Packet

Supplies

Pipets, vinegar, sodium hydroxide, phenolphthalein

Unit Plan Reflection

*Describe any adaptations or "tweaks" to the resource or lesson plan that were needed:
What do you plan to do differently the next time you teach this unit?:*

Due to the extended time required to complete previous units I only had 8 days to complete this unit in order to allow for 4 days of review. Eight days is not enough time to complete this unit. I was not able to allow honors students to write completed half reactions in the redox unit nor did I have time to complete a redox lab. I must make sure I have 15 days to cover this unit in future semesters.