Jefferson City High School Chemistry Syllabus, 2018-2019

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Welcome to Chemistry!

I. Course Description

Chemistry is an introductory course preparing the student for further studies in chemistry in college. It is directed toward explaining the composition of matter. Emphasis is placed on chemical principles and their application, problem solving, and the development of laboratory skills. **Prerequisite: Successful completion or, concurrent enrollment in Algebra II.**

Course Curricular Objectives

The Chemistry course at Jefferson City High School is vitally important in helping students experience the richness and excitement of knowing about and understanding the natural world.

- Appropriate scientific processes and principles in making personal decisions
- Effectively engage in public discourse and debate about matters of scientific and technological concern
- Increase in student's economic productivity throughout their careers through the use of the knowledge, understanding, and skills employed by the scientifically literate person

II. Course Materials and Preparation

We will use Google Classroom as our learning platform on which announcements will be posted. We will be using the book *Chemistry* published by Wilbrahm, Staley, Matta, and Waterman. Chemistry books may be checked out if requested. The students will also be provided with other materials that review or enrich the content presented in class. In addition, students are expected to bring a **three ring binder** to organize all class notes or handouts, **loose-leaf notebook paper**, and a pen or pencil to class every day. A set of calculators will be provided for use in the classroom. You also need to purchase a **wide-ruled composition book** for lab reports.

Students who review notes and complete assignments daily, utilize academic lab, and take advantage of retakes when available are most successful. Students need to be proactive and communicate with their teachers when they are confused or struggling.

III. Course Policies and Procedures

A. Behavior: Students will respect the rights of others in the classroom, and the school's equipment and facilities. All students will be required to pass a safety quiz and return a signed safety contract (student and guardian) in order to participate in labs. It is a privilege to do labs. They help to make learning meaningful, fun and exciting. For safety reasons, a student who behaves inappropriately during labs will not be allowed to finish the lab. If horseplay is involved, the student potentially endangers other students in class and will be referred to the office.

B. Absences: Daily attendance is **strongly recommended** in this course (and all other courses). Make-up privileges will be as follows:

- If you are **absent due to a school function** (extracurricular activities, field trips, etc.), you are expected to get your assignments **PRIOR** to your leave and complete them by the due date. It will be your responsibility to come in for any additional help as needed before/after school to get the work done on time.

- If you have an **Excused** absence, (not due to a school function), you are expected to see the teacher **before or after school on the day you return** to pick up all make-up work. Do not expect assignments to be given to you during valuable class time. The rule for any make-up work is if you miss one day, you will have two nights to make up the homework. If you miss two days of class, you will be given three days to make up the work and so on.

- Credit for make-up work will be allowed for up to four (4) absences during a nine (9)-week term for **Not Documented Excused** and **Unexcused absences.** However, if a student is **truant** they will not receive any credit for make-up work regardless of the number of days they have been absent. The fifth and above absence will result in a zero for any homework, labs, or tests given that day. The only one who can excuse your absence is your assigned principal.

C. Homework Policy: Students will be given homework assignments to practice their skills. These assignments are crucial for students to expand their understanding, and will give both teach and student an opportunity to check comprehension of the material before moving on. Homework assignments will be discussed and checked the next day in class, giving students the opportunity to ask questions to further increase their understanding. Homework is due at the start of the class period. Scoring on homework will be as follows:

- 4 All of the assignment is complete, and a **legitimate** attempt is shown on every problem
- 3 Most of the assignment has been attempted, but a few problems are missing
- 2 Half of the assignment is complete
- 1 One fourth of the assignment is complete
- 0 No homework assignment is turned in. Failure to turn in assignments on time may results in an academic referral

Late homework will be accepted from a unit until the unit test is taken. Any missing assignments will become a zero the day of the test. Late homework is automatically worth half credit, implying that if homework would have been worth a score of 4, it now receives a score of 2.

D. Testing and Retake Policy: Make-up and retakes tests or quizzes will be given in Academic Lab during FAST class, or at another time arranged with your teacher. If you miss the day before the test or quiz, you will be expected to take the test or quiz on the scheduled date. Students will have the option to retake the test or quiz if their score falls below mastery (80%), and provided all homework for the unit has a score of "4." The retake must be completed prior to the next test, and the second test or quiz will be recorded in the gradebook. Before the retake, each student must schedule and attend a study session during Academic Lab or at another time arranged with your teacher.

E. Lab Policy: Students are expected to do all lab activities. If a student is absent, he/she must come in the day they return during Academic Lab during FAST class to make-up the lab. All students are required to keep a Lab Notebook. Students must record the purpose, procedure, safety precautions, and data tables in their Lab Notebook **prior** to coming to lab.

F. Academic Dishonesty: Cheating on tests or homework will result in:

- A zero grade for the entire test or assignment.
- Parental notification if caught cheating on a test or assignment
- Notification to the appropriate principal if caught cheating on a test.

G. Technology: Electronic devices will be used for academic purposes only. Cell phones will not be needed for class and are expected to be put away for the entirety of the class period.

IV. Grading Policy/Assessment

A. Grading Scale - Jefferson City School District

A	93-100	B-	80-82	D+	67-69
A-	90-92	C+	77-79	D	63-66
B+	87-89	C	73-76	D-	60-62
B	83-86	C-	70-72	F	59-0

B. Weighting System of Grade Calculation per Term:

- Tests and quizzes 60%
- Labs 15%
- Homework and daily work 15%
- Comprehensive Exams 10%
- No extra credit assignments are offered in this course.

V. Course Procedures

- Students need to be in their seats when the bell rings and begin working on the daily opener question.
- Chemistry class is to be used for the study of chemistry. You will not be allowed to work on homework from any other class unless your chemistry work is complete. Any homework from other classes that is out when you should be working on chemistry will be confiscated.
- Daily participation in chemistry is expected. We do a lot of calculations and problems together as a class. If you do not participate, your grade will suffer.
- Labs need to be cleaned up appropriately before the end-of-class bell rings. No late passes will be written. There should be no used paper towels or lab materials left on the floor or counters, the sinks and strainer should be clean, and lab equipment returned to the proper place.
- Students must be in their seats at the end of class in order to be dismissed. The teacher will dismiss the students, not the bell. **You will not be permitted to line up at the door before the end of class.**

VI. Communication Statement

My intent is to help all students be successful and to facilitate a positive learning environment. I am easy to get along with, but I have high expectations for all of my students. I will not accept anything less than your best and you shouldn't either. I am at school by 7:30 a.m. and stay until at least 3:45 p.m.; I am willing to stay later if a student needs help. I am available before and after school in room J211 (terms 1 & 2) and room N253 (terms 3 & 4). Don't hesitate to ask for help or to discuss grades! Communication is key.

I provide students with printed and highlighted grade reports per unit, indicating progress and missing work. Infinite Campus is updated weekly and messages for missing work and unsatisfactory grades are generated and delivered via email to both parents and students. Please feel free to contact me by email anytime or by phone before or after school.

The course code for Google Classroom is _____. Please refer to daily announcements for practice, notes, classwork and homework.

VII. Contact Information

I arrive at school by 7:30 and stay until 3:45. You and your parents are welcome to contact me through the science department phone at 659-3096 or 659-3077 or through email at nicole.mcmorris@jcschools.us.

CHEMISTRY 2017-2018

Student and Parent Signature Form:

I _____ (student name and block), have read and understand the course expectations, prerequisites, recommendations and policies outlined in this syllabus. My signature indicates that I will use classroom resources with respect and understand and will comply with course policies as I put forth my best efforts to be successful in this class.

I _____ (parent or guardian), have read and understand the course expectations, prerequisites, recommendations and policies outlined in this syllabus.

VIII. Units of Study

Units	Time	Standard
Unit 1: Atomic Structure	2 weeks	**1**-(1E: a,b,c), (2E) **8**-(2A,B), (3B)
Unit 2: Electron Arrangement	2 weeks	**1**-(2A: b,c,d), (2C) **8**-(2A,B), (3B)
Unit 3: The Periodic Table & Periodic Table	2 weeks	**1**-(1F: a,b,c), (1A: b, d)
Unit 4 & 5: Ionic & Covalent Substances	6 weeks	**1**-(1A: c), (1F: c), (1H: a,c)
Unit 6: Chemical Equations & Reaction Rates	4 weeks	**1**-(1G: a), (1H: b,d), (1I: b)

*****Common Assessment/Terms 1 & 3: (Units 1-6)**

Unit 7: Measurements & The Mole	4 weeks	**1**-(1A: a), (1I: a)
Unit 8: Stoichiometry & Heat Transfer	3 weeks	**1**-(2A: a), (1I: a), (2D)
Unit 9: The States of Matter	4 weeks	**1**-(1D: a,b,b), (2A: a), (2F)
Unit 10: Water & Aqueous Solutions	3 weeks	**1**-(1B: a,c) **5**-(B)
Unit 11: Solution Concentrations & Solubility	2 weeks	**1**-(1B: a,c)

*****Common Assessment/Terms 2 & 4: (Units 7-11)**

*NOTE: Standards 7A, B, C, D are covered throughout the course

UNIT 1: ATOMIC MODELS

	Objective:	Chapter/ section	CLE
1.	Define chemistry.	1-1	
2.	List advantages and disadvantages of chemicals to our lives.	1-2	8,3,D
3.	Distinguish between pure and applied science.		
4.	Define an atom and give the name of the scientist who first named the atom.	5-1	
5.	Summarize Dalton's atomic theory.	5-1	8,2,A 8,2,B
6.	Distinguish between protons, electrons, and neutrons in terms of their symbols, relative masses, charges, and scientific discoverer.	5-2	
7.	Discuss Rutherford's experiment and contributions in the development of the structure of an atom.	5-2	1,1,E,a 1,2,E 8,2,A 8,2,B
8.	Distinguish between a direct observation and an inference.		
9.	Locate the atomic number, mass number, and atomic mass on a periodic table.	5-3	
10.	Use the atomic number and mass number of an element to find the number of protons, electrons, and neutrons.	5-3	1,1,E,b 1,1,E,c
11.	Draw simple atoms, including the location of the protons, electrons, and neutrons with respect to the nucleus.	5-2	
12.	Define an atomic mass unit.	5-3	
13.	State how isotopes of an atom differ and interpret the symbols of isotopes.	5-3	1,1,E,b
14.	Differentiate between the three major isotopes of hydrogen.	5-3	
15.	Use the concept of isotopes to explain why the atomic masses of elements are not whole numbers.	5-3	
16.	Calculate the average atomic mass of an element from isotope data.	5-3	
17.	Estimate the size of a molecule using data collected from experimental methods.		

Activities:

Draw models of atom	1,1,E,a,b,c
Rutherford's Scattering Activity	
Lab: Calculating the size of a BB	
Lab: Calculating the size of an oleic acid molecule	
Cathode Ray Tube Demonstration	
Video: ACPB: The World of Chemistry: "The Atom"	

UNIT 2: ELECTRON ARRANGEMENT

	Objective:	Chapter/ section	CLE
1.	Describe the contributions that Thomson, Rutherford, and Bohr made to the development of the atomic theory.	13-1	8,2,A 8,2,B 8,3,B
2.	Describe the quantum mechanical model of the atom.	13-1	8,2,A 8,2,B
3.	Identify and explain what is meant by the four quantum numbers.		
4.	Describe the general shape of s, p, and d orbitals.	13-1	
5.	Distinguish between energy level, sublevel, and orbital.		
6.	Use the formula $2n^2$ to predict the maximum number of electrons that may fit in a particular energy level.		
7.	Distinguish between excited and ground state atoms.		
8.	Explain the significance of quantized energies of electrons.	13-1	
9.	Explain how to perform a flame test and its purpose.		
10.	Distinguish between chemiluminescence, incandescence, and bioluminescence.		
11.	Use the Aufbau principle, the Pauli exclusion principle, andHund's rule to write electron configurations and orbital notations for elements.	13-2	
12.	Explain why the electron configurations of chromium and copper differ from those assigned using the Aufbau diagram.	13-2	
13.	Define electromagnetic radiation, and in particular, the visible spectrum.	13-3	1,2,A,b,c,d 1,2,C
14.	Use atomic emission spectra to identify elements.	13-3	

Activities:

Lab: Flame Test
Lab: Atomic Spectra 1,2,A,b/1,2,C
Video: "Electron Arrangement in Atoms"

UNIT 3: PERIODIC TABLE AND TRENDS

	Objective:	Chapter/ section	CLE
1.	List uses of the periodic table to chemists.		
2.	Explain the origin of the periodic table.	5-4	
3.	State the periodic law.	5-4	1,1,F,a
4.	Distinguish between periods/rows and groups/families on the periodic table.	5-4	1,1,F,a
5.	Determine the number of outer valence electrons in Groups IA-VIIIA.	14-1	1,1,F,c
6.	Recognize the demarcation of the periodic table into an s block, p block, d block, and f block.	14-1	
7.	Identify an element as an alkali metal, alkaline earth metal, halogen, noble gas, transition metal, inner transition metal, or a representative element.	5-4, 14-1	
8.	Distinguish between the Lanthanide and Actinide Series in the f block.	14-1	
9.	Identify an element on the periodic table as being a solid, liquid, or gas.	14-1	
10.	Distinguish between the metals, nonmetals, and metalloids on the periodic table.	5-4	1,1,A,b 1,1,A,d 1,1,F,b
11.	Write long or short-hand electron configurations of elements using the periodic table as a guide.	14-1	
12.	Describe how the atomic radii vary within a group and within a period of the periodic table.	14-2	
13.	Tell how the ionization energies vary within a group and within a period of the periodic table.	14-2	
14.	Describe how the ionic sizes change within a group and within a period of the periodic table.	14-2	
15.	Tell how electronegativities change within a group and within a period of the periodic table.	14-2	
16.	Explain how the shielding effect influences periodic trends.	14-2	
17.	List some uses and characteristics of the elements in any group of representative elements.	5-4	

Activities:

Lab: Metals, Nonmetals, Metalloids 1,1,A,b/1,1,A,d
Lab: Chlorine Compounds
Video: ACPB The World of Chemistry: "The Periodic Table"
Video: Discovery "The Elements"
Video: Close up on Chemistry: "The Alkali Metals"
Video: Coronet Video: "Properties of Elements"
Video: "Sodium- A Spectacular Element"

UNIT 4: IONIC BONDING

	Objective:	Chapter/ section	CLE
1.	Recognize symbols and/or names of common elements.		
2.	Use the periodic table to find the number of valence electrons in an atom.	15-1	
3.	Draw electron dot formulas of the representative elements.	15-1	
4.	State the octet rule.	15-1	
5.	State the importance of the noble-gas electron configuration and the psuedo-noble gas electron configuration in the formation of ions.	15-1	
6.	Describe the formation of a cation from an atom of a metallic element.	15-1	1,1,H,a
7.	Describe the formation of an anion from an atom of a nonmetallic element.	15-1	1,1,H,a
8.	Explain how ions of different elements may be isoelectronic to each other.		
9.	Recognize a compound as having ionic bonds.	15-2	1,1,F,c
10.	Identify characteristics of ionic compounds.	15-2	1,1,H,c
11.	Explain the electrical conductivity of melted and of aqueous solutions of ionic compounds.	15-2	
12.	Distinguish between elements and compounds.	2-3	1,1,A,c
13.	Use the periodic table to determine the charge on ions of the representative groups.	6-3	
14.	Draw electron dot diagrams for ionic compounds.	15-2	
15.	Distinguish between a polyatomic ion and a monatomic ion.	6-3	
16.	Write the chemical formula of an ionic compound, either binary, or ternary, when given the name of the compound.	6-4	
17.	Explain why a systematic method of naming chemical compounds is necessary.	6-4	
18.	Name an ionic compound, either binary, or ternary, when given the formula of the compound.	6-4	
19.	Name and write the formulas of acids.	6-5	

Activities:

Video: ACPB The World of Chemistry: "Chemical Bonding"
Computer Lab: "Formulas and Nomenclature"

UNIT 5: COVALENT & METALLIC BONDING

	Objective:	Chapter/ section	CLE
1.	Describe the formation of a covalent bond between two nonmetallic elements.	16-1	1,1,H,c 1,1,F,c
2.	Describe single, double, and triple bonds.	l 6-1	
3.	Draw electron dot formulas and structural formulas for simple covalent molecules containing single, double, or triple bonds and identify lone pairs of electrons.	16-1	
4.	Explain the formation of a coordinate covalent bond.	16-1	
5.	Define resonance.	16-1	
6.	Show why some molecules which are exceptions to the octet rule may be paramagnetic.	16-1	
7.	Use the VSEPR theory to describe the shapes of simple covalently bonded molecules.	16-2	
8.	Use electronegativity values to determine whether a bond is nonpolar covalent, polar covalent, or ionic.	16-3	1,1,F,c
9.	Assign δ^+ and δ^- charges to dipolar molecules.	16-3	
10.	Use the symmetry of polar molecules to determine the overall polarity of the molecule.	16-3	
11.	Calculate bond dissociation energy.	16-1	
12.	Name and describe the weak attractive forces that hold molecules together.	16-3	
13.	Identify the characteristics of molecular substances.	16-3	
14.	Name a binary molecular compound when given the formula of a compound.	6-5	
15.	Write the chemical formula of a binary molecular compound when given the name of the compound.	6-5	
16.	List the properties of metals, nonmetals, and metalloids.	5-4	
17.	Use the theory of metallic bonds to explain the physical properties of metals.	15-3	1,1,H,c

Activities:

Fruit Loop Activity	1,1,H,c
VSEPR Activity Using Molecular Models	1,1,A,c
Video: Chemical Bonding: “Bonding in Molecules”	
Video: “Chemical Bonding”	
Day of Writing	1,1,H,c
Demonstration on Alloys	

UNIT 6: CHEMICAL EQUATIONS & REACTION RATES

	Objective:	Chapter/ section	CLE
1.	Classify changes in matter as physical or chemical changes.	2-l, 2-4	1,1,G,a
2.	Identify the reactants and products in a chemical equation.	8-1	
3.	Use appropriate symbols when writing an equation to accurately describe the chemical reaction.	8-1	
4.	Write a balanced chemical equation when given the names or formulas of all the reactants and products in a chemical reaction.	8-1	1,1,I,b
5.	Identify indicators of a chemical reaction.	2-4	
6.	Classify a reaction as combination, decomposition, single-replacement, double- replacement, or combustion.	8-2	1,1,H,d
7.	Predict the products of simple combination and decomposition reactions.	8-2	1,1,H,d
8.	Use the activity series of metals to predict the products of single-replacement reactions.	8-2	1,1,H,d
9.	Write the products of the double-replacement reaction between two ionic compounds.	8-2	1,1,H,d
10.	Write the products for complete and incomplete combustion reactions.	8-2	1,1,H,d
11.	Relate the ideas of activation energy and activated complex to the rate of reaction.	19-1	
12.	Use the collision theory to explain how the rate of a chemical reaction is influenced by the nature of the reactant, the temperature, concentration, panicle size of reactants, and catalysts.	19-1	1,1,H,b
13.	Given a potential energy diagram for a reaction, discuss the reaction mechanism for the reaction.	19-5	

Activities:

Types of Reactions Demonstration
Lab: Activity Series 1,1,H,d
Reaction Rate Demonstrations
Video: "Atoms, Molecules, and Chemical Change"
Video: Coronet Video: "Reaction Rates and Equilibrium"
Video: Chemical Equations

UNIT 7: MEASUREMENTS & THE MOLE

	Objective:	Chapter/ section	CLE
1.	Differentiate between qualitative and quantitative measurements.	3-1	
2.	Differentiate between accuracy and precision and calculate accuracy.	3-2	
3.	Determine the number of significant figures in a measurement.	3-2	
4.	Express answers to mathematical problems to the correct number of significant figures.	3-2	
5.	Correctly read balances, thermometers, rulers, and graduated cylinders to their maximum precision.	3-3	
6.	Correctly identify metric prefixes (kilo-, deci-, centi-, milIi-, and micro-) and their appropriate powers of 10 and convert from one unit to another.	3-3	
7.	Solve problems involving density.	3-4	1,1,A,a
8.	Name the basic SI unit for measuring the amount of a substance.	7-1	
9.	Describe how Avogadro's number is related to a mole of any substance.	7-1	
10.	Identify the representative particle of elements and compounds		
11.	Calculate the molar mass of one mole of any substance.	7-2	
12.	Use the factor-label method to make mole-volume, mole-representative particle, and mole-mass conversions.	7-2	
13.	Use the factor-label method to convert among measurements of mass, volume, and number of particles.	7-2	
14.	Calculate the molar mass of a gas from density measurements of gases at STP.	7-2	
15.	Calculate the percentage composition of a substance from its chemical formula or experimental data.	7-3	
16.	Derive empirical and molecular formulas from appropriate experimental data.	7-3	

Activities:

Measurement Activity
Lab: % Zinc in a Penny
Lab: Determination of an Empirical Formula 1,1,I,a
Lab: Dehydration of $CuSO_2 \cdot 5H_2O$
Video: ACPB The World of Chemistry: "The Mole"
Lab: The Mole
Video: Chemistry: "The SI (Metric) System of Measurement"
Video: Chemistry: "Quantitative Reasoning in Life and Chemistry"
Video: Chemistry: "The Mole Concept- Preliminary Ideas"

UNIT 8: STOICHIOMETRY AND HEAT TRANSFER

	Objective:	Chapter/ section	CLE
1.	Perform stoichiometric calculations with balanced equations using moles, mass, representative particles, and volumes of gases (at STP).	9-1, 9-2	1,1,I,A
2.	Identify the limiting reactant in a reaction.	9-3	
3.	Knowing the limiting reactant in a reaction, calculate the maximum amount of product(s) produced and the amount of any unreacted excess reactant.	9-3	
4.	Given information from which any two of the following may be determined, calculate the third: theoretical yield, actual yield, and percentage yield.	9-3	
5.	Classify reactions as exothermic or endothermic.	11-1	1,2,D
6.	Differentiate among heat and temperature.	11-1	
7.	Convert temperature measurements between the Celsius and Kelvin scales.	3-5	
8.	Solve problems involving heat transfer.	11-1, 11-2	1,2,A,a

Activities:

Video: Discovery: "Heat and Temperature"
Lab: Percentage Yield
Lab: Calorimetry and Specific Heat of a Metal

UNIT 9: STATES OF MATTER AND THE GAS LAWS

	Objective:	Chapter/ section	CLE
1.	Name and characterize the three states of matter.	2-1	1,2,F
2.	List three basic assumptions of the kinetic theory of gases.	10-1	
3.	Relate temperature to the average kinetic energy of the particles in a substance.		1,1,D,a 1,2,A,a
4.	Use the kinetic theory of gases to explain gas pressure and atmospheric pressure.		
5.	Convert between units of pressure of atm. and mm. Hg.	10-1	
6.	State the values of standard temperature and pressure (STP).	7-2	
7.	Distinguish between real and ideal gases.	12-4	
8.	Use Dalton's law of partial pressures to calculate the total pressure of gases in a container.	12-5	
9.	Process data and put in appropriate graphic form.	12-3	1,1,D,c
10.	Use Boyle's law to account for pressure-volume changes in a gas.		
11.	Use Charles' law to account for temperature-volume changes in a gas.	12-3	1,1,D,b
12.	Use Gay-Lussac's law to account for temperature-pressure changes in a gas.	12-3	1,1,D,b 1,1,D,c
13.	Perform calculations involving the combined gas law.	12-3	
14.	Perform calculations involving the ideal gas law.	12-4	
15.	Use Graham's law of diffusion.	12-5	
16.	Explain why a liquid has a vapor pressure, and why change in temperature causes a change in vapor pressure.	10-2	
17.	Describe what happens at the boiling point of a liquid and the effects of pressure and temperature on boiling point.	10-2	
18.	Distinguish between crystalline-and amorphous solids.	10-3	
19.	Identify energy changes and phase changes that matter can undergo by using a phase diagram.	10-4	1,1,D,a
20.	Describe and give a practical use for sublimation.	10-4	

Activities:

Lab: Boyle's Law	1,1,D,c
Lab: Charles' Law	1,1,D,b
Video: ACPB The World of Chemistry: "A Matter of State"	
Video: Nova: "Race to Catch a Buckyball"	

UNIT 10: WATER AND AQUEOUS SOLUTIONS

	Objective:	Chapter/ section	CLE
1.	Describe the hydrogen-bonding that occurs in water on the basis of the structure of the polar water molecule.	17-1	
2.	Use the concept of hydrogen bonding to explain the following properties of water: high surface tension, low vapor pressure; high specific heat; high heat of vaporization; and high boiling point.	17-1,17-2	
3.	Explain the low density and high heat of fusion of ice.	17-2	
4.	Define the terms solution, aqueous solution, solute, and solvent and give examples of each.	17-3	
5.	Use the rule that "like dissolves like" to predict the solubility of one substance in another.	17-3	1,1,B,c
6.	Describe the role of solvation in the dissolving process.	17-3	
7.	Define the term water of hydration and calculate the percent of water in a given hydrate.	17-3	
8.	Distinguish among strong electrolytes, weak electrolytes, and nonelectrolytes. Give examples.	17-3	
9.	Describe the relationship between concentration of an aqueous electrolyte and conductivity.		
10.	Write equations to show how substances ionize or dissociate in water.	17-3	
11.	Give the characteristics of colloids and suspensions that distinguish them from solutions.	17-4	
12.	Explain the role of emulsifying agents.	17-4	

Activities:

Video: ACPB The World of Chemistry: "Water"	5,B
Surface Tension Activity	
Conductivity Apparatus Demonstration	
Electric Pickle Demonstration	
Lab: Conductivity and Concentration	1,1,B,a
Laser Demonstration of Solution, Colloid, & Suspension	
Gluep Activity	

UNIT 11: SOLUTIONS

	Objective:	Chapter/ section	CLE
1.	List three factors that determine how fast a soluble substance dissolves.	18-1	1,1,B,c
2.	Define solubility and interpret a solubility curve or table	18-1	
3.	Explain the difference between saturated, unsaturated, and supersaturated	18-1	1,1,B,a
4.	Use Henry's Law to solve gas solubility problems.	18-1	
5.	Explain how chromatography can be used to separate mixtures.		
6.	Use Beer's Law to find the concentration of an unknown solution.		
7.	Calculate the molarity of a solution.	18-2	
8.	Describe how to prepare dilute solutions from concentrated solutions of known molarity	18-2	
9.	Calculate the molality of a solution.	18-4	
10.	Calculate freezing point depression and boiling point elevation of aqueous solutions.	18-3, 18-4	
11.	Determine the molar mass of an unknown from experimental freezing point depression or boiling point elevation measurements.	18-4	

Activities:

Video: "Solutions"
Lab: Chromatography
Lab: Beer's Law
Lab: Iodine Clock Reaction
Lab: Preparing Molar Solutions
Video: "Solutions: Ionic and Molecular"
Video: Chemistry: "Introduction to Molarity"