Honors Chemistry 1 Syllabus

Fall 2018

Instructor Information

Instructor	Email
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General Information

Description

This semester long class will be focusing on basic chemistry concepts including: Matter, Atomic Theory, Radiation Periodic Law, Electron Configuration, Chemical Bonding, Nomenclature, Stoichiometry, Gas Laws, Solutions, and Acid/Base Chemistry. I will be using a variety of different methods to introduce the material including: hands-on activities, labs, demonstrations, group work, individual work, lectures, and other various ways. There will be added honors skills throughout the semester. The information taught will be based off the Tennessee State Standards.

Expectations and Goals

- The students will be assessed on the learning standards and skills used in the classroom. The standards can be found on the state website (https://www.tn.gov/education/article/science-standards). Grades will be updated at least once a week.

Course Materials

Required Materials

• 2-inch binder

• 12 tabs

• Pencils

• Colored pencils or markers

• Sheet protectors or 3 hole punch

• Highlighter

• Scientific Calculator

Grading System

I will be using the point system, and will calculating your overall average by the following formula

$$\frac{Points\ you\ have\ earned}{Points\ Possible}\ X\ 100$$

Overall Percentage Grading Scale: A= 100-93 B= 92-85 C= 84-75 D= 74-70 F= Below 70

Assignments and Projects

The following list shows the points system normally used. I reserve the right to adjust the assignments and points as needed.

- Test (100-200 points)
- Labs (40-60 points)
- Homework (30-60 points)
- Notebook (10-50 points)
- Projects (50-200 points)

Course Schedule

The following is an outline for the semester. You will have 1 test per unit and at least 1 lab that relates to each unit. This schedule is subject to change.

Topic	Number of Days on Topic	State Standards
Matter and Energy	4 Days	1) Contrast the concepts of temperature and heat in macroscopic and microscopic terms. Understand that thermal energy is a form of energy and temperature is a measure of average kinetic energy of a group of particles. 2) Draw and interpret heating and cooling curves and phase diagrams. Analyze the energy changes involved in calorimetry by using the law of conservation of energy quantitatively (use of q = mcΔT) and qualitatively
The Atom	4 Days	11) Develop and compare historical models of the atom (from Democritus to quantum model) and construct arguments to show how scientific knowledge evolves over time, based on experimental evidence, critique, and alternative interpretations.
Radiation	4 Days	9) Draw models (qualitative models such as pictures or diagrams) to demonstrate understanding of radioactive stability and decay. Understand and differentiate between fission and fusion reactions. Use models (graphs or tables) to explain the concept of half-life and its use in determining the age of materials (such as radiometric dating) 10) Compare alpha, beta, and gamma radiation in terms of mass, charge, and penetrating power. Identify examples of applications of different radiation types in everyday life (such as its applications in cancer treatment).
The Periodic Table	7 Days	12) Explain the origin and organization of the Periodic Table. Predict chemical and physical properties of main group elements (reactivity, number of subatomic particles, ion charge, ionization energy, atomic radius, and

Topic	Number of Days on Topic	State Standards
		electronegativity) based on location on the periodic table. Construct an argument to describe how the quantum mechanical model of the atom (e.g., patterns of valence and inner electrons) defines periodic properties. Use the periodic table to draw Lewis dot structures and show understanding of orbital notations through drawing and interpreting graphical representations (i.e., arrows representing electrons in an orbital).
		1) Using a model, explain why elements emit and absorb characteristic frequencies of light and how this information is used.
Bonding	11 Days	13) Use the periodic table and electronegativity differences of elements to predict the types of bonds that are formed between atoms during chemical reactions and write the names of chemical compounds, including polyatomic ions using the IUPAC criteria. 14) Use Lewis dot structures and electronegativity differences to predict the polarities of simple molecules (linear, bent, trigonal planar, trigonal pyramidal, tetrahedral). Construct an argument to explain how electronegativity affects the polarity of basic chemical molecules. 1) Draw, identify, and contrast graphical representations of chemical bonds (ionic, covalent, and metallic) based on chemical formulas. Construct and communicate explanations to show that atoms combine by transferring or sharing electrons. 2) Understand that intermolecular forces created by the unequal distribution of charge result in varying degrees of attraction between molecules. Compare and contrast the intermolecular forces (hydrogen bonding, dipole-dipole bonding, and London dispersion forces) within different types of simple substances (only those following the octet rule) and predict and explain their effect on chemical and physical properties of those substances using models or graphical representations.
Formulas, Equations,	9 Days	2) Demonstrate that atoms, and therefore mass, are conserved during a chemical reaction by

Topic	Number of Days on Topic	State Standards
and Reactions		balancing chemical equations. 4) Use the reactants in a chemical reaction to predict the products and identify reaction classes (synthesis, decomposition, combustion, single replacement, double replacement). 3) Distinguish between endothermic and exothermic reactions by constructing potential energy diagrams and explain the differences between the two using chemical terms (e.g. activation energy). Recognize when energy is absorbed or given off depending on the bonds formed and bonds broken. 4) Analyze energy changes to explain and defend the law of conservation of energy.
Stoichiometry	11 Days	1) Understand and be prepared to use values specific to chemical processes: the mole, molar mass, molarity, and percent composition. 3) Perform stoichiometric calculations involving the following relationships: mole-mole; mass-mass; mole-mass; mole-particle; and mass-particle. Show a qualitative understanding of the phenomenon of percent yield, limiting, and excess reagents in a chemical reaction through pictorial and conceptual examples. (states of matter liquid and solid; excluding volume of gasses)
Gases	7 Days	5) Conduct investigations to explore and characterize the behavior of gases (pressure, volume, temperature), develop models to represent this behavior, and construct arguments to explain this behavior. Evaluate the relationship (qualitatively and quantitatively) at STP between pressure and volume (Boyle's law), temperature and volume (Charles's law), temperature and pressure (Gay-Lussac law), and moles and volume (Avogadro's law), and evaluate and explain these relationships with respect to kinetic-molecular theory. Be able to understand, establish, and predict the relationships between volume, temperature, and pressure using combined gas law both qualitatively and quantitatively. 6) Use the ideal gas law, PV = nRT, to algebraically evaluate the relationship among the number of moles, volume, pressure, and temperature for ideal gases.

Topic	Number of Days on Topic	State Standards
Solutions	7 Days	7) Analyze solutions to identify solutes and solvents, quantitatively analyze concentrations (molarity, percent composition, and ppm), and perform separation methods such as evaporation, distillation, and/or chromatography and show conceptual understanding of distillation. Construct an argument to justify the use of certain separation methods under different conditions. 15) Investigate, describe, and mathematically determine the effect of solute concentration on vapor pressure using the solute's van 't Hoff factor on freezing point depression and boiling point elevation. 3) Construct a model to explain the process by which solutes dissolve in solvents, and develop an argument to describe how intermolecular forces affect the solubility of different chemical compounds. 4) Conduct an investigation to determine how temperature, surface area, and stirring affect the rate of solubility. Construct an argument to explain the relationships observed in experimental data using collision theory.
Acids and Bases	3 Days	8) Identify acids and bases as a special class of compounds with a specific set of properties.

Additional Information and Resources

Attendance, Make-Up Work, and Late Work Policy:

The students must obtain their make-up work within three (3) days after returning from the absence. Failure of student to initiate the make-up of work within (3) days will result in a loss opportunity for credit for that assignment. Test(s) must be made up within a week. Students are expected to be prepared to participate in all previously assigned classroom activities, including tests, quizzes, and projects the day he/she returns to class. For planned absences, students should consult with me about completing work prior to being absent. Late work will result in a point deduction, based on assignment due date.

Refer to Student Handbook for the school attendance policy.

Science Class Fee:

There is a **$6 class fee** that helps pay for classroom and lab equipment and material.

Classroom Rules:

LEARN

1. **Listen to directions**- It is vital that you listen and participate in class.
2. **Enter and exit prepared**- To learn, you need to have all your materials everyday (books, homework, notes, and writing utensils. Being on time to class is just as important, and students have an appropriate amount of time in between classes to go to restroom and gather all materials necessary
3. **Always try your best**- It is important to do all your work to the best of your ability, and that includes being neat in your work. Take pride in what your do. Make up all missed work due to excused absents. Do your own work. Cheating is not tolerated. Get involved in your groups.
4. **Respect others**- Be polite to each other and to me. This means that cruel remarks, bullying, profanity, and rude gestures are NOT acceptable. Respect my property. Leave the room like it was before you were here.
5. **No excuses**- There is no reason you are not able to try your hardest. If you ever have any questions about chemistry or about my class itself, feel free to ask me.

No food or drinks in classroom on lab days: Where we are a chemistry class, we have no clue as to what chemicals have been where we sit, so for safety precautions there are to be no food or drinks.

Cell phones and electronics are to be turned off during the class time and must remain out of sight. The student handbook states when the use of cell phones is permitted. There will be some activities where the students may be able to use their cell phone, but they must get teacher's permission before they can be turned on.

Communication:

If you have any questions or concerns about any assignments, behavior, etc., please do not hesitate to contact me. I have 2nd block planning, so that is when I'll be able to respond the quickest, but I check my email periodically throughout the day:

Email: rbyers@jocoed.net

School phone number: 423-727-2620