Orange High School
Course Outline/Syllabus
High School Honors Chemistry

Instructor:Anna Erkan
Email: nairlath@orange.k12.nj.us
Phone #: 973-677-4050

Classroom #: TBA
Principal: Mr. Jason Belton

Website: https://sites.google.com/site/ohschemistry602/

Parents are encouraged to contact me with any questions or concerns about your child in my class. You can reach me *via* email or can leave a message at 973-677-4050. I will do my best to return emails and/or phone calls within 48 hours.

Course Description:

The purpose of this course is to develop a fundamental background in Chemistry to enable you to perform well in any freshman level Chemistry course required for the sciences or allied health area. Students will develop an understanding of the major concepts of general chemistry which includes states and properties of matter, atomic structure, nomenclature, mole concept and stoichiometry, solutions, acid base chemistry, etc. Knowledge is build up in a logical progression starting with the makeup of atoms, followed by a discussion of ionic and covalent compounds, their names and chemical reactions in which they take place. The quantitative aspects of chemistry will be emphasized and studied in details.

Course Objectives:

The specific objectives of this course are that upon successful completion of this course, students should be able to:

1. Understand fundamental principles of chemistry define and describe the various chemical terms, symbols and formulas studied.
2. Demonstrate basic skills essential to chemical problem solving and computation with the aid of analytical reasoning methods, use the metric system to perform scientific measurements, and carry out elementary calculations.
3. Describe the makeup of the atom with respect to the nucleus, and surrounding electrons, recognize and describe chemical bonding for simple compounds.
4. Write and balance chemical equations for different types of chemical reactions and be able to perform elementary stoichiometric calculations using these balanced equations.
5. Use basic laboratory techniques, methods of organization, presentation, communication of data and results in written format.
6. Draw upon knowledge to have a better understanding and appreciation of scientific discoveries and technological processes in the modern world. Utilize scientific reasoning skills through the use of the critical thinking methods. Place basic chemical knowledge in the context of their lives.

Monthly Outline (Including Chapters Used):

<u>September:</u>

- Chemistry: An Introduction.
- Chemical Foundations: Elements, Atoms and Ions

Monitor comprehension by:

- *Write the names and symbols*
- *Use models to describe the structure of the atom*
- *Relate experimental evidence to models of atom*
- *Determine the number of protons or electrons in an atom or ion when given one of these values*
- *Calculate the mass of an atom, the number of neutrons or protons, given the other two values*
- *Interpret and write isotopic notation*

- *Interpret the Periodic Table in terms of identifying whether on element is metal, semimetal or nonmetal and common names of different groups (families)*
- *Calculate the number of electrons in cations and anions*

October:

- Kinetic Theory and Gas Laws

Monitor comprehension by:

- *Kinetic theory of gases*
- *Ideal gas law*

November:

- Atomic Theory

Monitor comprehension by:

- *Distinguish between ground state and excited state electron configurations*
- *Distinguish between valence and non-valence electrons*
- *Give an electron configuration*

December:

- Periodic Trends

Monitor comprehension by:

- *Explain how periodicity relates to an element's electric properties; e.g., radius, electron affinity, electronegativity, ionization energy.*
- *Compare the physical properties of substances based on chemical bonds and intermolecular forces, eg., conductivity, malleability, solubility, hardness, melting point, and boiling point*
- *Determine the noble gas configuration an atom will achieve by bonding*

- Chemical Bonding

Monitor comprehension by:

- *Understanding the nature of bonds and their relationship to electronegativity.*
- *Draw structural formulas*
- *Relate electronegativity to bond type*
- *Describe ionic, covalent, metallic and hydrogen bonding*
- *Most important requirement atoms achieve noble gas electron configuration (octet rule, duet rule)*
- *Bonding pairs are shared between 2 atoms.*
- *Unshared pairs (lone pairs) are not shared and not involved in bonding.*

January:

- Nomenclature and Molecular Geometry

Monitor comprehension by:

- *Name type I binary compounds*
- *Name type II binary compounds*
- *Name binary compounds that contain only nonmetals experimental evidence to models of atom*
- *Naming compounds that contain polyatomic ions*
- *How to write formula of compound*
- *write the formula from name*
- *Employ VSEPR to model the geometric shape of a molecule*
- *To learn about bond polarity and how it is related to dipole moment and writing Lewis Structures.*
- *Show how valence electrons are arranged among atoms in a molecule.*

February:

- Chemical Reactions in Aqueous Solutions

Monitor comprehension by:

- *Recognize reactants and products*
- *Balance chemical equations by applying the law of conservation of mass.*
- *Determine missing reactant or product in balanced equation*
- *Identify types of chemical reactions and classifying*
- *Distinguish between chemical and physical changes*

March:

- Stoichiometry

Monitor comprehension by:

- *Calculate the mass using amu*
- *Calculate the number of atoms by the mass*
- *Calculate the moles*
- *Calculate the molar mass*
- *Calculate moles from mass and number of molecules*
- *Calculating empirical and molecular formulas*
- *Relating moles to molecules in chemical equations*
- *Determining mole ratios*
- *Using mole ratios in calculations*

April:

- Chemical Equilibrium

Monitor comprehension by:

- *Calculate the equilibrium constant (K_{eq}) for chemical reactions and interpret its meaning.*

May:

- Thermochemistry
- Reaction Rate

Monitor comprehension by:

- *Distinguish between exothermic and endothermic reactions and processes.*
- *Explain the relationship between a system and surroundings.*
- *Explain the relationship between physical changes and changes in energy.*
- *Explain the relationship between chemical changes and changes in energy.*
- *Identify factors that influence reaction rate and explain their impact.*
- *Rate laws can be used to predict reaction rates.*

June:

- Acids and Bases, Solutions

Monitor comprehension by:

- *Identify products formed in acid-base reactions.*
- *Describe the neutralization process.*
- *Explain pH and pOH.*
- *Identify the parts of a solution.*
- *Identify factors that impact the rate at which a solute dissolves.*
- *Identify the various colligative properties of solutions.*
- *Calculate the Concentration of solutions*

Disclaimer: The above monthly outline is according to the working days in the school calendar and the pacing may change according to the emergency holidays and other school related incidents (ex: class meetings, drills, standard tests etc.)

Required Supplies:
Pencil / Pen
• Notebook Paper – college ruled
• Binder (Can be used exclusively for Chemistry)
Note: It is mandatory that each student have their textbook and notes in class every day.
Note: Parents/Guardians & administrators will have the right to look at the students' notebooks at any time.

Grading Policy:
Grades will be given based on completion and performance on all assignments, quizzes, and tests as well as participation. A+ (97-100), A (90-96), B+ (87-89), B (80-86), C+ (77-79), C (70-76), D+ (67-69), D (65-66), F (<65).

Test scores_____	25%
Quiz scores _____	20%
Class Work_____	20%
Authentic Assessment _____	25%
Homework _____	10%

Extra Credit: Internet research to be announced, and Special Projects.

Homework:
Homework will be assigned regularly in this course. Homework is a way to practice concepts covered in class. Practice is essential for mastery and success. Without practice, without doing your homework, you will not pass. Unless otherwise instructed, homework assigned during the week will be due at the beginning of next class. **Late homework will be accepted only for a week but the highest grade possible for complete assignments will be a 70**. It is your responsibility to turn in your homework on time. Homework done timely will help you assess your understanding and need for support.

Projects: There will be assigned one to two small individual and/or group project(s)

Tests: You should expect at least 2 tests in each MP. These tests will cover the concepts covered during class. To be successful, you should complete all assigned homework, participate in class, as well as review these topics prior to the exams. It is my expectation that this minimum degree of preparation will be done by all students.

Make-Up Policy: Students who are absent are responsible for the work and instruction missed. IF you are absent on a due date and have an "excused absence" card, all work is due by the second day you return; deadline for assignments given on the day you

were absent will be discussed. **All works irrespective of class work or home work should be made up within a week. No make up packets will be given at the end of marking period.**

Classroom Rules of Conduct:

Be prepared for class in the following ways:
1. Bring your material to class everyday: pen/pencil, college ruled notebook paper, binder.
2. Be on time and be prepared to begin as soon as the bell rings.
3. Be considerate of other people's feelings, opinions and thoughts.
4. Pay attention and participate in class.
5. Classroom conduct will be graded using rubric.

Academic Dishonesty Policy:

Requirements to Receive Credit:

Student will lose credit for a course if unexcused absences exceed 18 for the school year. Any absence longer than 10 minutes during the class (whether at the beginning, in the middle or end of the class period) or cutting the class will result with marking the student as an absent for the respective class period.

Note to Parents/Guardians:

I am looking forward to working with your child. I strongly encourage parent/teacher conferences. If needed, a conference may be set through the counselor's office. The more you know about your child's school performance, achievement, and behavior, the more we will be able to assist him/her to obtain his/her achievement and success. Please feel free to call or email me if you have any questions about this class. I wish you and your child much happiness and success this school year!

COURSE OUTLINES/SYLLABUS AGREEMENT

I HAVE READ AND UNDERSTAND THE EXPECTATIONS OF THIS CLASS AS OUTLINED IN THIS SYLLABUS. I AGREE TO ABIDE BY THE RULES AND PROCEDURES ESTABLISHED BY THE INSTRUCTOR.

Student's Printed Name: _____

Student's Signature: _____

Date: _____

Parent/Guardian's Printed Name: _____

Parent/Guardian's Signature: _____

Date: _____

Current Phone Number:_____

Current Email Address: _____

PLEASE RETURN THIS PAGE SIGNED!