Chemistry 2016-2017 Course Syllabus

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COURSE GOALS

- For each student to achieve the defined state standards for high school chemistry.
- To prepare students for college-level study in chemistry and to apply its use in daily life.
- To encourage the spirit of scientific investigation, thought, and work.

COURSE CONTENT OVERVIEW

QUARTER 1

Unit 1 (14 Days) Chemical and Physical Properties:

- How do substances have different chemical and physical properties than their component elements?
- How can physical and chemical properties be used to identify an unknown substance?
- How do physical and chemical properties of a substance determine the amount of energy needed for a physical or chemical change?
- When examining the density of a substance, why is temperature an important factor to consider?
- A review of mathematics of measurement and chemistry measurements and calculations.

Unit 2 (10 Days) Atomic Structure and Theory

- How can the same element have two different masses or two different charges?
- How did the advances in technology allow scientists to revise the atomic theory?
- How can the structure of an atom be determined from the periodic table? 1.3 (10 Days) Nuclear Chemistry
- How can the type of decay for an isotope be determined?
- How can the use of an isotope's half-life determine the age of an artifact?
- Why is fission considered the best way to produce nuclear energy?

Unit 3 (10 Days) Nuclear Chemistry

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QUARTER 2

Unit 1 (10 Days) The Periodic Table

- How can the periodic table be used to predict chemical and physical properties of a given new element?
- How did Mendeleev's periodic table leave room for the discovery of new elements?
- What are the similarities between an element from Group 1 and an element from Group 7?

Unit 2 (6 Days) Periodic Trends

- Why do periodic trends vary both horizontally and vertically?
- How can knowledge of periodic trends be used to identify unknown elements on the periodic table?

Unit 3 (12 Days) Electron Configuration

- What is the relationship between an element's electron configuration and its oxidation state?
- Based on the electron configuration of two given elements, compare the energy needed to remove or gain electrons.

Unit 4 (16 Days) Chemical Bonding

- How do intermolecular forces determine the physical and chemical properties of compounds?
- How does the octet rule enable us to predict the type of bonds occurring between two different elements?
- How do electron configurations confirm the type of bond that forms in a molecule?
- Given a molecule, such as water, how do electron configurations and the octet rule confirm the molecular structure and the intermolecular forces between molecules?
- How is the periodic table used as a tool to help determine chemical formulas?

QUARTER 3

Unit 1 (10 Days) Writing Simple Chemical Equations

- How can you determine if a chemical equation is balanced or not?
- How does a balanced chemical reaction illustrate that matter is conserved?
- How does increasing one of the chemical equations affect the amount of substance produced?
- What information is needed in order to predict the products of a chemical reaction?

Unit 2 (11 Days) Stoichiometry of Chemical Reaction

- How can stoichiometry be used to determine the amount of reactant needed given a specific amount of product?
- Why are experimental and theoretical yields from a chemical reaction seldom equal?
- Why do chemists use the concept of moles to represent chemical quantities?

Unit 3 (9 Days) Chemical Reactions

- How can the products and nature of the products be determined given specific reactants?
- If two soluble substances are combined and produce a precipitate , how can the identity of that substance be determined?
- Why will certain substances react and others will not?
- What information is needed in order to predict the products of a chemical reaction?

QUARTER 4

Unit 1 (13 Days) Gas Laws

- How do changes in pressure or temperature affect the volume of a gas?
- How can Graham's Law of Effusion explain how perfume moves through a room?
- How does kinetic molecular theory explain the behavior of gases?
- How do the number of molecules, the temperature of the molecules, and the size of the container affect the pressure of a gas?

Unit 2 (19 Days) Energy and Chemical Reactions

- How does energy flow through a chemical reaction?
- How is a calorimeter used to collect data about energy flow in a given chemical reaction?
- Why would energy flow, ionization energies, and electron configurations be necessary to understanding the behaviors of substances during chemical reactions?
- How can the law of conservation of mass be validated through the study of earth changes?
- How do physical and chemical processes alter the earth's crust?

Unit 3 (12 Days) Chemistry and the Changing Earth

- Given a rock sample, what conditions were necessary for the formation of this sample?
- Given a rock sample, how can the rock be changed into another type of rock?

How is energy involved in crustal plate movement?

Classroom Policy

- While in class, you are expected to abide by behavioral and academic expectations so that successful learning is achieved.

- **ATTENDANCE**: You are expected to arrive on time. Students who are late or misbehave will receive 10 or 15 minutes detention. Those who do not show up for detention will be referred to their administrator. It is your responsibility to find out what assignments have been missed during an absence and make plans with me for getting caught up on missed tests, quizzes, and labs. If your illness will keep you out of school for more than two days I expect you to contact the school and request your homework assignments. You will have two school days to make up work for excused absence.

- **DAILY-WORK**: Come prepared with your textbook, notebooks, folders, calculator, pens, and pencils. Be prepared to learn every day. You are expected to make a serious effort to make each assignment. Many times getting the right answer is part of the job. Even if your answer is wrong, you can learn a great deal. You can show me that you are learning by demonstrating reasoning and logical thinking in your work. .

- **IN CLASS**: If you wish to speak, raise your hand. Please, ask questions if you do not understand. I expect everyone to listen carefully to the person who has the floor (one person speaks at the time). I also encourage you to participate in class discussions. Plan to use the bathroom between classes.

- In keeping school policy, non-academic, electronic devices that may distract class instruction is not permitted such as cell phones, I-pods, etc. Those who fail to comply may be subject to action by administrators.

- I extend to you both my respect and my greatest effort as an instructor. I ask you the same in return, both for myself and your classmates.

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- You are expected to act responsibly and cooperatively during lab experiments. Irresponsible and destructive behavior will result in immediate expulsion from the laboratory setting (this is your warning). Eating and drinking are not allowed.

- **HONESTY**: Cheating on tests and quizzes will not be tolerated. If caught, you will receive a zero as a consequence.

- If you need help, I am available after school Tuesday and Thursday to answer any questions.

- Have a great year!

Grading System

In keeping with the science department policy, the following formula is used to arrive at your grade:

30% Test average
20% Lab average
15% Quiz average
15% Class work , participation and Do now
15% Homework

- There will be quizzes every Friday. No quiz grade will be dropped.
- There will 3-5 tests per quarter. No test grade will be dropped. Tests will be announced a week in advance. Tests and quizzes are made up right after absence.
- Semester exams are two-hour department cumulative exams which will count 20% of your semester grade. Quarter grades are cumulative.

- If you are absent more than 5 days per quarter, this may affect your grade and possible registration for summer school. Missed tests are expected to be made up on the day of return unless other arrangements have been made.

Required Class Material

- Science journal – for daily notes and writing assignments
- Laboratory notebook – for laboratory experiments
- Lab folder – for laboratory handouts, lab reports, and homework
- Pencils, pens, and a scientific calculator

Homework Policy

- Assignments are to be handed in on time
- Assignments must be neat and well organized
- Assignments must be complete
- Late assignments will not receive credit
- Assignments must be properly identified with your name, class, and date of assignment

For the second semester, an oral presentation on a topic of chemistry, as well as a research paper on the topic. Laboratory work is also part of this course and reinforces the principles of learning chemistry.