

Chemistry P

Ms. Sarah Lipetz

Topics:

I. Safety and Scientific Measurement
II. Matter and Change
III. Atomic Structure
IV. Periodic Trends and Bonding
V. Chemical Compounds
VI. Nuclear Chemistry
VII. The Mole
VIII. Chemical Reactions

IX. Stoichiometry
X. Gases
XI. Solutions
XII. Acids and Bases
XIII. Organic Chemistry
XIV. Thermochemistry

Grading Policy:

Grading Distribution

Tests	45%
Quizzes	15%
Labs	25%
Assignments	15%

Grading Scale

A	90-100%	C	65-74%
A-	88-89%	C-	63-64%
B+	85-87%	D+	60-62%
B	80-84%	D	57-59%
B-	77-79%	D-	55-56%
C+	75-76%	F	54% or less

Expectations of Students:

(1) *Be on Time*

Be seated in your desk with the required handouts by the time the bell rings. Students who are late three times will be given a warning and the advisor and parent/guardian will be notified. Students who are late four times will be assigned a Saturday School.

(2) *Come Prepared*

Come to class with the necessary materials. This includes your **notebook**, a **pen/pencil**, and a **calculator**. Have homework assignments/labs completed and be ready to write quizzes and tests.

(3) *Work On-Task*

Use class time wisely to complete the work that has been assigned. **Remain at your desk from the beginning of class until the bell rings** unless the teacher has directed you to move or you have asked permission to use the washroom.

(4) *Act Respectfully*

Respect the teacher, other students in the class, and the classroom. **Cell phones must be turned off and out of sight** during class time or they will be confiscated.

(5) *Follow the Safety Rules*

Read the safety rules and act accordingly at all times. Ensure that these rules have been reviewed and signed by both you and your parent/guardian.

Classroom Policy:

Quizzes/ Tests

Students will be told of upcoming tests one week before they are written and of upcoming quizzes one day before they are written. In the case of an absence on the day of a quiz or test, students will be required to write the missed exam at lunch, after school, or during class on the day of their return. Extended absences will be considered on an individual basis.

Labs

Students will be given one day to prepare for labs. For safety reasons, all lab preparations must be completed before students are allowed to begin an activity or experiment. All lab reports must be handed in at the beginning of the following class. In the case of an absence on the day of a lab, students will be required to make up the lab at lunch or after school on the day of their return.

Homework Assignments

Homework will be assigned daily. All homework is considered important and is expected to be completed. Review should take place on a regular basis. Students are strongly encouraged to ask for help if they are struggling with concepts.

Twenty percent will be deducted if an assignment/lab is handed in late. Assignments/Labs will only be accepted one day late.

Notebook

Notes will be taken every class. Students are expected to copy the notes and as they will be evaluated once each unit.

Contacting Me:

I am available in room S103 after school and at lunch. I can be emailed (preferred method) at sarah.lipetz@smmusd.org or called at (310) 395-3204 ext 123.

Website:

Course materials can be downloaded from the website below.

<http://teachers.yourhomework.com/Lipetz>

Chemistry P Topics

(1) Scientific Measurement

- convert between scientific notation and standard form of a number
- convert temperature between **Fahrenheit**, **Celsius**, and **Kelvin**
- read metric scales

Lab: Reading Scales and Conversions

(2) Matter and Change

- define **matter**
- distinguish between a **pure substance** and a **mixture**; an **element** and a **compound**; a **homogeneous mixture** and a **heterogeneous mixture** (by definition and with examples)
- distinguish between **qualitative** and **quantitative** properties; **intensive** and **extensive** properties; **chemical** and **physical** properties (by definition and with examples).
- compare **chemical** and **physical** changes (by definition and with examples)
- compare the three phases of matter (solid, liquid, and gas)
- define **evaporation/boiling**, **condensation**, **melting**, **freezing**, **sublimation**, and **deposition**
- define **density**
- perform calculations involving density
- discuss the early discovery of elements (Empedocles, Democritus, Brandt, Boyle, Priestly, Cavendish, Lavoisier)
- identify elements by both name and chemical symbol

Labs: Mixtures, Observing Changes in Matter, Thickness of Aluminum Foil

(3) Atomic Structure

- discuss the development of atomic models (Dalton, Thomson, Rutherford, Chadwick, Bohr)
- compare **protons**, **electrons**, and **neutrons** in terms of charge, mass, and location in an atom
- give the number of protons, electrons, neutrons, and atomic mass for a given element
- define **isotope**
- calculate average atomic mass from the relative abundance and individual masses of each isotope
- define **ion**
- define **cation** and **anion**
- define **valence electrons**
- determine the number of valence electrons for an atom
- locate **rows/periods** and **groups/families** on the periodic table
- draw Bohr diagrams for atoms and ions

Lab: Drawing Bohr diagrams

(4) Periodic Trends and Bonding

- discuss the development of the periodic table (Mendeleev)
- locate and give properties of main families including the **alkali metals, alkaline earth metals, transition metals, halogens, nobles gases, lanthanides, actinides, and hydrogen**
- define **atomic radius** and **ionic radius** and explain periodic trends in these properties
- define **ionization energy** and explain periodic trends in this property
- define **electronegativity** and explain periodic trends in this property
- draw Lewis dot structures
- assign **bond orders**
- assign shapes to molecules using **VSEPR Theory**

Lab: VSEPR Model Building

(5) Chemical Compounds

- draw electron dot diagrams for atoms
- draw **Lewis structures** for ionic and covalent compounds
- compare **metals, non metals, and metalloids** in terms of properties and location on the periodic table
- predict the charges of metal and non metal ions
- name and write formulas for ionic compounds including compounds with multivalent ions and those with polyatomic ions
- name and write formulas for acids
- name and write formulas for covalent compounds
- identify diatomic elements
- compare covalent and ionic compounds

Lab: Flame Test

(6) Nuclear Chemistry

- write **nuclide symbols** for a given isotope
- compare **alpha, beta, and gamma** radiation
- complete nuclear reactions
- define **half-life**
- perform calculations involving half-life

Lab: Half-Life of "Popcornium"

(7) The Mole

- state **Avagadro's number**
- determine the number of atoms of each element in a given compound
- determine molar mass for a given element/compound
- convert between moles, mass, and atoms/molecules
- name and write formulas for hydrates
- determine the **percent composition** for a compound

Labs: Mole Calculations

(8) Chemical Reactions

- identify the reactants and products in a chemical equation
- balance chemical equations
- classify reaction as **synthesis**, **decomposition**, **single replacement**, **double replacement**, **neutralization**, or **combustion**
- predict the products of a reaction given the reactants

Lab: Types of Reactions

(9) Stoichiometry

- define **stoichiometry**
- determine **mole ratios**
- perform stoichiometric calculations involving mass of a reactant or product

Lab: Metal Reactivities

(10) Gases

- define **pressure**
- perform calculations involving pressure
- describe how pressure is measured using a **barometer**
- convert pressures between the units of atm, Pascals, and mm Hg
- perform calculations involving **Boyle's Law**, **Charles' Law**, and **Gay-Lussac's Law**
- solve **combined law** problems
- state the conditions of **STP**
- state the volume of one mole of gas at STP
- perform calculations involving gases at STP
- perform calculations involving the **Ideal Gas Law**
- perform stoichiometric calculations involving volume of gases

Labs: Testing for Gases

(11) Solutions

- define **solution**
- define **solute** and **solvent**
- compare **unsaturated** and **saturated** solutions
- define **molarity**
- perform calculations involving molarity
- perform calculations involving solution dilution
- define **dissociation**
- write dissociation equations for ionic compounds
- calculate the concentration of ions in a solution
- determine if a compound is **soluble** or **insoluble** in water
- define **precipitate**

- write the formula equations, complete ionic equation, and net ionic equation for a precipitation reaction
- perform stoichiometric calculations involving concentration of solutions

Labs: Water Testing, Solubility

(12) Acids and Bases

- define and give examples of **acids** and **bases**
- give the properties of acids and bases
- calculate pH, pOH, $[H^+]$, and $[OH^-]$ for strong acids and bases

Labs: Acids and Bases

(13) Organic Chemistry

- name and draw hydrocarbons including **alkanes**, **cycloalkanes**, **alkenes**, and **alkynes**
- name and draw **structural isomers** for alkanes
- name and draw **stereoisomers** for alkenes
- name and draw molecules with functional groups including **alkyl halides**, **alcohols**, **ethers**, **aldehydes**, **ketones**, **carboxylic acids**, **esters**, **amines**, and **amides**
- complete **condensation reactions**

Lab: Ester Synthesis

(14) Thermochemistry

- define **temperature** and **heat**
- describe and graph the temperature changes for a heating or cooling curve
- define **heat of vaporization** and **heat of fusion**
- perform calculations involving heat of vaporization and heat of fusion
- define **specific heat capacity**
- perform calculations involving specific heat capacity
- define **heat of reaction**
- define **exothermic** and **endothermic**
- calculate the heat of a reaction from heats of formation

Labs: Heat of Reaction