

Trumbull Career and Technical Center

Mrs. Frankland

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Room D109a

Chemistry

2011-2012



Purpose:

Students will investigate the principles of introductory chemistry in a guided inquiry environment as a means of developing their logical and analytical thinking skills. Topics to be studied include: The Periodic Table, atomic structure, ionic and covalent bonds, the mole, stoichiometry, kinetic theory, and gas laws.

In addition to the central curriculum of chemistry, some classroom work will ask students to consider the roles science and technology play in society. For instance, how will human choices today impact the quality of life on Earth? How is scientific evidence used to develop and revise scientific predictions, ideas, or theories?

Materials:

Text “Chemistry” by Prentice Hall © 2005

Notebook- 3 ring binder with loose leaf paper

Calculator (TI-30 is a good choice or any scientific calculator)

Course Outline:

1st 9 Weeks

Matter

Measurement - scientific notation, significant figures

Density and properties of matter

Physical and chemical changes in matter

Conservation of matter

History, Atomic Structure, and the Periodic Table

Atomic structure

Electron configuration

Emission spectra

The periodic table

Periodic trends

2nd 9 Weeks

Compounds

Bonding

Ionic compounds

Covalent compounds

Shapes of compounds

Naming compounds

Reactions and Quantitative Analysis

Reaction types

The mole as a unit of measurement

Mole conversions
Balancing Reaction equations
Stoichiometry

3rd 9 Weeks

Redox Reactions

Oxidation numbers
Electron transfer
Balancing redox equations

Kinetic Theory and States of Matter (may be sooner in year)

Kinetic theory
Properties of liquids and solids
Phase changes and heating curves
Intermolecular forces
Heat of fusion
Exothermic and endothermic reactions
Energy diagrams
Reaction rates

Solutions

Solutions, solubility, and concentration
Colligative properties
Saturated solutions
Solution equilibrium

4th 9 Weeks

Acids and Bases

Properties of acids and bases
pH scale
Titrations
Serial dilutions
Acid rain

Gases

Properties of gases
Atmospheric pressure
The Gas Laws
The Ideal Gas Law
Molar volume
Gas storage for fuel cells

Nuclear Chemistry

Organic Chemistry (if time)

Standards:

1. Explain that elements with the same number of protons may or may not have the same mass and those with different masses (different numbers of neutrons) are called isotopes. Some of these are radioactive.
2. Explain how atoms join with one another in various combinations in distinct molecules or in

- repeating crystal patterns.
3. Describe how a physical, chemical or ecological system in equilibrium may return to the same state of equilibrium if the disturbances it experiences are small. Large disturbances may cause it to escape that equilibrium and eventually settle into some other state of equilibrium.
 4. Recognize that at low temperatures some materials become superconducting and offer little or no resistance to the flow of electrons.
 5. Recognize that some atomic nuclei are unstable and will spontaneously break down.
 6. Explain the characteristics of isotopes. The nuclei of radioactive isotopes are unstable and spontaneously decay emitting particles and/or wavelike radiation. It cannot be predicted exactly when, if ever, an unstable nucleus will decay, but a large group of identical nuclei decay at a predictable rate.
 7. Use the predictability of decay rates and the concept of half-life to explain how radioactive substances can be used in estimating the age of materials.
 8. Describe how atoms and molecules can gain or lose energy only in discrete amounts.
 9. Describe real world examples showing that all energy transformations tend toward disorganized states (e.g., fossil fuel combustion, food pyramids and electrical use).
 10. Describe how different atomic energy levels are associated with the electron configurations of atoms and electron configurations (and/or conformations) of molecules.
 11. Explain how atoms and molecules can gain or lose energy in particular discrete amounts (quanta or packets); therefore they can only absorb or emit light at the wavelengths corresponding to these amounts.

Assessment (Percentages are approximate)

- 30% Examinations**
- 30% Laboratory**
- 20% Homework/In-Class**
- 20% Project**

Possible Points

Usually between 500-600 points. Subject to change.

Grade Scale

- 92-100 A**
- 83-91 B**
- 74-82 C**
- 66-73 D**
- 65-0 F**

Midterm and Final Exams

There will be **NO** exemption from midterms or finals for having A's during any or all of the nine weeks' grading periods. This is analogous to a 'free lunch' for which, I believe, does not exist. There is however the possibility of earning a pass from the final exam (more details later).

Need to Contact Me?

Prep 8th (last) period (I will not write a pass that gets you out of another teacher's class.)

After school

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