Lesson Plans for November 19th – December 3rd

AP Chemistry 2014-2015

Ms. Diane Paskowski

***Types of Reactions and Solution Stoichiometry***

**Massachusetts Science Curriculum Frameworks**

7.1 Describe the process by which solutes dissolve in solvents.

7.2 Calculate concentration in terms of molarity. Use molarity to perform solution dilution and solution stoichiometry.

7.3 Identify and explain the factors that affect the rate of dissolving (e.g., temperature, concentration, surface area, pressure, mixing).

**College Board Curriculum**

**Big Idea 2:** Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.

* **Enduring understanding 2.A:** Matter can be described by its physical properties. The physical properties of a substance generally depend on the spacing between the particles (atoms, molecules, ions) that make up the substance and the forces of attraction among them.
	+ **Essential knowledge 2.A.3:** Solutions are homogenous mixtures in which the physical properties are dependent on the concentration of the solute and the strengths of all interactions among the particles of the solutes and solvent.

**Big Idea 3:** Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.

* **Enduring understanding 3.A:** Chemical changes are represented by a balanced chemical equation that identifies the ratios with which reactants react and products form.
	+ **Essential knowledge 3.A.1:** A chemical change may be represented by a molecular, ionic, or net ionic equation.
	+ **Essential knowledge 3.A.2:** Quantitative information can be derived from stoichiometric calculations that utilize the mole ratios from the balanced chemical equations. The role of stoichiometry in real-world applications is important to note, so that it does not seem to be simply an exercise done only by chemists.
* **Enduring understanding 3.B:** Chemical reactions can be classified by considering what the reactants are, what the products are, or how they change from one into the other. Classes of chemical reactions include synthesis, decomposition, acid-base, and oxidation-reduction reactions.
	+ **Essential knowledge 3.B.1:** Synthesis reactions are those in which atoms and/or molecules combine to form a new compound. Decomposition is the reverse of synthesis, a process whereby molecules are decomposed, often by the use of heat.
	+ **Essential knowledge 3.B.2:** In a neutralization reaction, protons are transferred from an acid to a base.
	+ **Essential knowledge 3.B.3:** In oxidation-reduction (redox) reactions, there is a net transfer of electrons. The species that loses electrons is oxidized, and the species that gains electrons is reduced.

**Essential Questions**

* How do scientists classify chemical reactions?
* Why do so many reactions only take place in solution?
* What is the stoichiometry of a solution?

**Wednesday**, **November 19th**

**E day**

**Periods 4 and 5**

Lecture/discussion/lab: Acid-Base reactions and stoichiometry. Titrations and lab exercise – A Volumetric Analysis

**Thursday, November 20th**

**F day**

**Period 4**

Lecture/discussion/practice: Review titration exercise. Titrate vinegar and calculate the molarity.

**Friday, November 21st**

**G day**

**Period 5**

Lecture/discussion/practice**:** Oxidation-reduction reactions. Following the electrons and determining the oxidizing agent and reducing agent.

**Monday, November 24th**

**H day**

**Periods 4 and 5**

Lecture/Discussion/Practice: Practice stoichiometry problems for solutions. Identifying types of reactions. Predicting products of reactions. Assigning oxidation numbers. Identifying oxidizing agents and reducing agents.

**Tuesday, November 25th**

**A day**

**Periods 4 and 5**

Lecture/discussion/activity: Review Monday’s assignment. Balancing redox equations.

**Monday, December 1st**

**B Day**

**Period 4**

Lecture/discussion/practice: Practice balancing redox equatons, review stoichiometry of redox reactions. Do virtual titration.

**Tuesday, December 2nd**

**C Day**

**Period 5**

Lecture/discussion/practice: Review Chapter 4 for test.

**Wednesday, December 3rd**

**D day**

**Periods 4 and 5**

Assessment Chapter 4