Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Science	Course:	Chemistry I (H)	Unit 8 Title:	Kinetics and Equilibrium	Grade Level(s):	10th
Assessed Trimester:	Trimester B	Pacing:	1 Trimester (Tri B)	Date Created:		Last Revision Date:	6/17/2013

Course Understandings: *Students will understand that:*

- Problems can be solved and knowledge gained in a systematic way: solutions to one problem can create new questions and problems.
- Chemistry is recognized as significant in its application to other disciplines and the world.
- Ideas are expressed symbolically, numerically, and graphically.
- Behavior and properties of materials are organized, classified, and predicted utilizing periodic trends.
- Mathematical relationships are interpreted and manipulated to model the real world.
- The basic building blocks combine and recombine in a variety of ways to make all matter from the simple to the complex.
- The laws of chemistry predict outcomes that impact and apply to daily life.

DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals

- **Standard:**
  Chemical reactions describe a chemical change in which one or more reactants are transformed into one or more products.
  9C.2.1.3.6: Describe the factors that affect the rate of a chemical reaction, including temperature, pressure, mixing, concentration, particle size, surface area and catalyst
  9C.2.1.3.7: Recognize that some chemical reactions are reversible and that not all chemical reactions go to completion.

- **ACT Standards:**
  ACT S-8: Understand complex experimental design.
  ACT S-16: Select a data presentation/model that supports/contradicts a hypothesis/conclusion.
  9C.2.1.3.6: Describe the factors that affect the rate of a chemical reaction, including temperature, pressure, mixing, concentration, particle size, surface area and catalyst
  9C.2.1.3.7: Recognize that some chemical reactions are reversible and that not all chemical reactions go to completion.

Transfer

Students will be able to independently use their learning to: (product, high order reasoning)

- The rates of chemical reactions change based on the collisions between particles. [9C.2.1.3.6]
- Chemical reactions at equilibrium will shift depending upon the stress placed on the system. [9C.2.1.3.7]

Meaning

Unit Understanding(s):	Essential Question(s):
Students will understand that: ●	**Students will keep considering:** ● How is Le Chatelier's Principle used to predict the direction of a chemical reaction? [9C.2.1.3.7] ● What factors influence the rate of a chemical reaction? [9C.2.1.3.6]

Acquisition

Knowledge - Students will:	Skills - Students will:
● Identify the factors the affect the rate of a chemical reaction (including temperature, pressure, mixing, concentration, particle size, surface area, and catalyst.) [9C.2.1.3.6]	● Calculate the rate of chemical reactions using laboratory or given data from an experiment. (not rate laws)[9C.2.1.3.6]

● Describe the dynamic effects of equilibrium. [9C.2.1.3.7] **Reasoning - Students will:** ● Predict how manipulating these factors impact the rate of a chemical reaction. [9C.2.1.3.6] ● Use Le Chatelier's principle to predict how a system at equilibrium will respond to an applied stress. [9C.2.1.3.7]	● Calculate the equilibrium constant using the laboratory or given data from an experiment. (only K_{eq}) [9C.2.1.3.7]

Common Misunderstandings	**Essential new vocabulary**
● Student thinking tends to be dominated by the obvious features of the change. (explosion, fire, etc.) ● Some students don't understand the relationship between large and small particles of a substance and the amount of surface area. ● Students believe that heat will speed up all chemical reactions. ● Students have a difficult time understanding that the rate of collisions of molecules dictates the direction a reaction will run at equilibrium.	● Kinetics ● Equilibrium ● Le Chatelier's principle