Karen McCann and Ken Steffen
Level 2 lesson plan

A. Description of the topics that the lesson is intended to address
    1. SWBAT understand the role of enzymes
    2. SWBAT manipulate variables that effect the rate of enzyme action and therefore better understand reaction rates.
    3. SWBAT work with a mathematical model on STELLA and use it to better understand #1 and #2.

B. Standards that apply are:
    1. Standard 1:Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.
        a. Key Idea 1: The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing and creative process.
        b. Key Idea 3: The observations made while testing proposed explanations, when analyzed using convention and invented methods, provide new insights into natural phenomena.
    2. Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.
        a. Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life.

C. ACTIVITY
    Students will continue the lesson described in the lesson 1 lesson plan.
    1. Students will model using toothpicks the action of enzymes
    2. They will record at different time intervals how many toothpicks they can break. They will record this data in a data table and then graph their results.
    3. They will then calculate the slope mathematically at different time intervals and graph these results as well.
    4. Students will then have to use their knowledge of enzymes and the results from their experiment to answer conclusion questions that relate both to what they had done as well as other factors that could affect the rate of reaction.
    5. This next lesson would take off where the last left off. After students had answered the questions to the best of their ability they will have the chance to use a STELLA model to check their answers and better understand the different relationships. They will study the effects of pH, temperature, enzyme concentration, substrate concentration, area, and competitive inhibitors.