Lesson plan for *Reactants, Products, and Leftovers* Activity 2:
Limiting Reactants in Chemical Reactions

http://phet.colorado.edu

Learning Goals:
Students will be able to:

- Explain how subscripts and coefficients are used to solve limiting reactant problems.
- Predict the amounts of products and leftovers after reaction using the concept of limiting reactant
- Predict the initial amounts of reactants given the amount of products and leftovers using the concept of limiting reactant
- Translate from symbolic (chemical formula) to molecular (pictorial) representations of matter

Background: This activity will be part of the stoichiometry unit. Also, I will do a lab where the students make Smore's Lab to help reinforce this important concept (I have included my version of the lab with the activity). I will have done the activity linked below as an introduction to limiting reactions. Also we will have used Balancing Chemical Reactions-Inquiry Based Introduction . In addition, in physics, my students use particle models in second semester, so this activity is meant to expand their thinking on a molecular level about macroscopic phenomena. See my course syllabus for more information about integration of PhET sims.

Learning goals from Reactants, Products, and Leftovers Activity 1: (which we did in September)

- Relate the real-world example of making sandwiches to chemical reactions
- Describe what "limiting reactant" means using examples of sandwiches and chemicals at a particle level.
- Identify the limiting reactant in a chemical reaction

***Reactants, Products, and Leftovers* Introduction:**

This sim shouldn't require any introduction. Check the Teaching Tips from the design team for some helpful information.

Lesson: My students use this as homework or in class depending on availability of computers.

Post lesson: I will the clicker questions on my website for students to use or we may use them as a class activity.