

Lesson plan for [Balancing Chemical Equations](http://phet.colorado.edu): <http://phet.colorado.edu>

Learning Goals:

Students will be able to:

- Describe what “reactants” and “products” in a chemical equation mean.
- Explain the importance of knowing the difference between “coefficients” and “subscripts”.
- Use pictures and calculations to show how the number of atoms for each product or reactant is found.
- Identify the relationship between “reactants” and “products” atoms.
- Balance a chemical equation using the relationships identified.
- Given a chemical equation, draw molecular representations of the reaction and explain how the representations were derived.
- Given a molecular drawing of a chemical reaction, write the equation and explain how the symbols were derived.

Background:

We will have done some labs where the reactions are given and done my activity with. My students have had extensive practice with PhET and self-driven learning strategies. They know that the learning goals will appear on the exam. This unit we will have done my activity [Reactions and Rates 1](#). This unit aligns with Chapter 3 of [Chemistry Seventh Edition](#) by Zumdahl Houghton Mifflin 2007 which includes balancing chemical reactions. See my teaching [website](#) for the scope and sequence for the unit.

Balancing Chemical Equations Introduction:

I don't think there needs to be any introduction since we will have already done several labs and the interface is very simple. The game tab should serve as a self-check tool. The [Tips for Teachers](#) for this sim may be helpful.

Pre-Lesson: I plan to use this as the pre-lesson for the lecture which will correspond to the text.

Lesson: Students will work in pairs.

Post-Lesson: The first 2 questions on the included slide show are meant to evoke discussion. Then, there are some clicker questions meant to be more formative assessment. There are many text book problems that I use to give students practice.

Follow-up sims: [Reactants, Products, and Leftovers](#) This sim includes learning goals for limiting reagents. Here's a link to my lesson: [Reactants, Products and Leftovers Activity 1 PhET](#)