Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hour \_\_\_\_\_\_\_\_\_\_

PHET – Balancing Equations Simulation

Go to <https://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_en.html> or use the link in MOODLE to access the simulation in PHET.

Background information:

The Law of Conservation of Matter states that matter is neither created nor destroyed. This means that chemical reactions need to be balanced. In other words, the number of atoms (C, H, O etc.) on the reactant side of the equation needs to be the same number on the product side. Elements can not just disappear. This online simulation will allow you to practice balancing chemical equations.

1. Do the *introduction* first. Make sure you are on “Make ammonia”. Click on “Tools” and select the balance tool. This is like a teeter totter on a playground.
2. Change the coefficients (large number before each compound) from 0 to 1 for all the molecules and compounds in the reaction.
3. Notice the scales on top. The “N” scale shows there are 2 nitrogen atoms on the left side (reactants) and only 1 on the right (products). Notice the “H” scale shows there are two on the reactant side and 3 on the product side. This does not follow the Law of conservation of matter. Use the simulation and the scale tool to change the coefficients to make this reaction balanced.
4. Answer the ammonia questions below
5. Move to the next task/equation and reset each coefficient to a 1
6. Continue to balance each equation until you have completed all 3 and recorded your information below.
7. Want more fun? Want a challenge? Click on “Game” on the bottom. Have fun!

Questions:

1. Fill in the proper coefficients when you have successfully balanced the equation

\_\_\_\_ N2 + \_\_\_\_ H2 🡪 \_\_\_\_ NH3

1. What type of reaction is represented by making ammonia? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Fill in the coefficients for separating water (balanced equation)

 \_\_\_ H2O 🡪 \_\_\_ H2 + \_\_\_ O2

1. What type of reaction is represented by separating water? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Fill in the coefficients for burning methane (balanced equation)

\_\_\_ CH4 + \_\_\_ O2 🡪 \_\_\_ CO2 + \_\_\_ H2O

1. What type of reaction is represented by burning methane? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_