

Enrichment/extension/homework

Why does an equation have to “balance”?

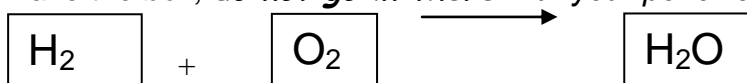
- It tells us how much will be needed to make a given amount of a new substance (like a recipe!)
- Law of Conservation of Mass.
 - The **mass** (of all atoms) you start with has to equal the mass (all of the atoms) that you end with (they can be re-arranged)
 - The **number and kind of atom** you start with has to be the **same as the number and kind of atoms** at the end.
 - This is the “balanced” part!!

Getting started...

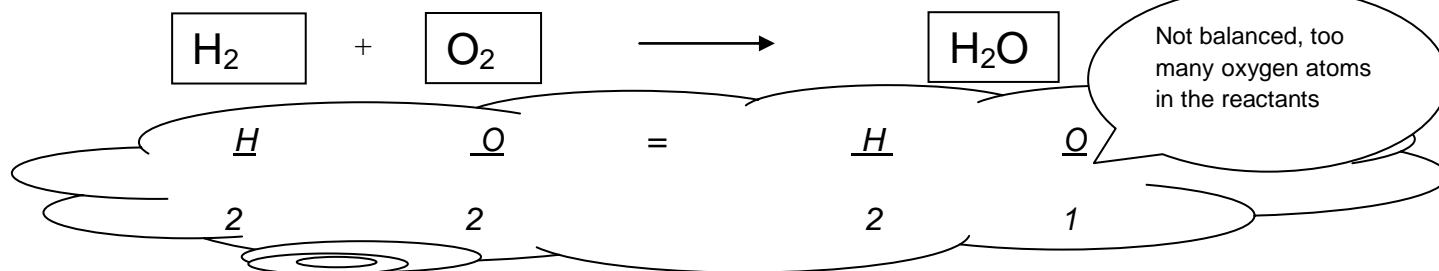
1. You need to have an equation with all the chemical formulas written for you (the next time your work with this you will be able to generate your own formulas for the equations!!! But for now... work with the ones I throw at you!

2. Draw boxes around all the chemical formulas.

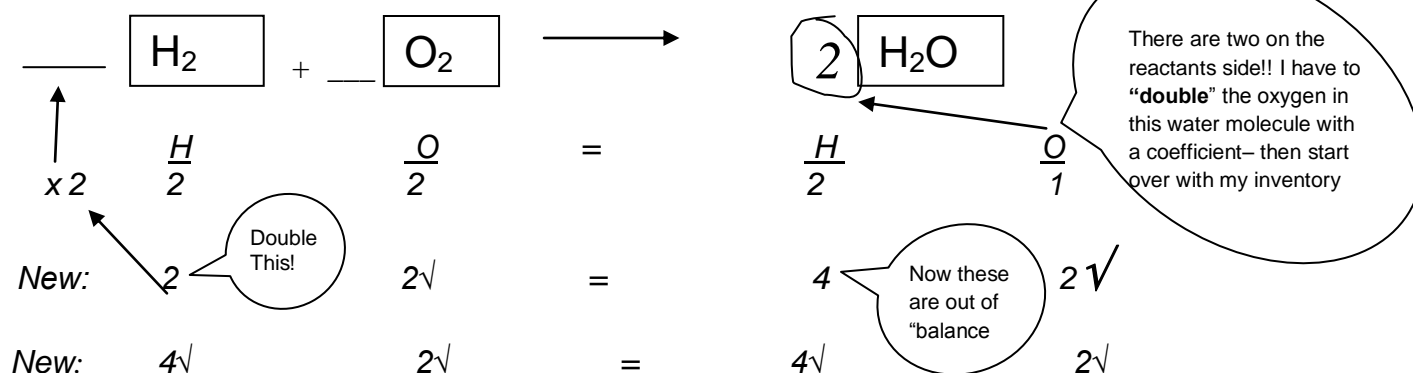
Once you make the box, **do not go in there with your pencil or pen...ever!!!



3. See what you have by making an “inventory” of the atoms present. For example:



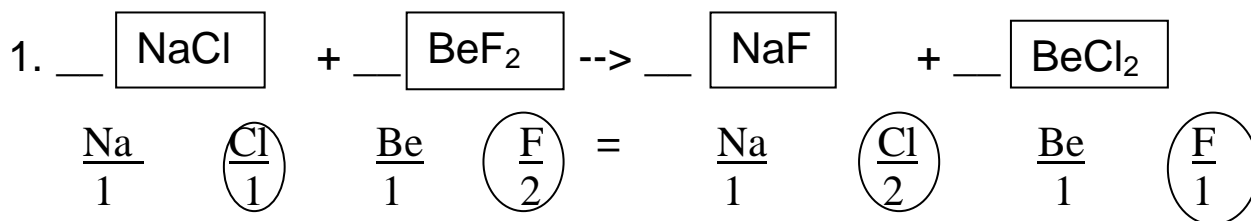
4. Write numbers in front of each of the boxes until the inventory for each element is the same on both sides of the arrow.



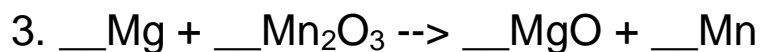
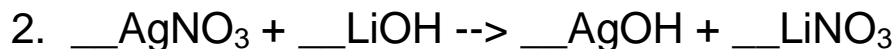
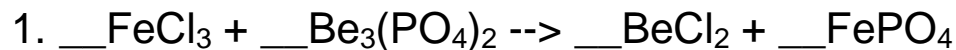


- Whenever you change a number, make sure to update the inventory - it is like a puzzle!
- When the number and type of atoms on the left equals the number and type on the right, (your inventory is equal on both sides)- the equation is balanced.
- Tip: I find that making “odd” atoms “even” - multiply the formula by (2)-really helps!
for example: 1 H₂O has only one oxygen atom, but **2**H₂O has two- this makes it easier to balance out the other atoms – (4 hydrogen) really helps!

Reminder: 1-boxes 2-inventory 3- balance out the “inventory” using coefficients to get common multiples of atoms 4- double check to see that the reactant atoms balance with the product atoms



Try some on your own:



Solutions for the practice problems:

