

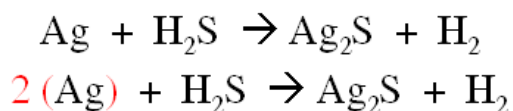
Teacher Notes-“Balancing Chemical Equations”

Here are 5 problems designed to teach students how to balance chemical equations. They start easy so students can see what's going on and build confidence.

Before doing even the easy problem you've got to establish the ground rules- 1. subscripts (little numbers below) cannot change, and 2. coefficients (big numbers in front) can.

This is available as a PowerPoint (see last page).

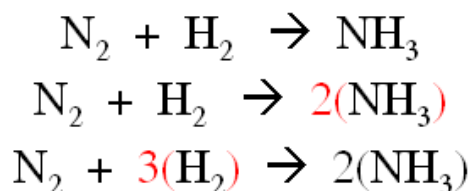
Problem One: easy, so you can focus on the process



Have students copy line 1. Go over how many of each kind of atom is “going in” and “coming out” of the equation. Remind everyone of the ground rules, then get to work deciding which coefficient to add, and where. 1 Ag goes in, but 2 come out. Since we can't change the little number on the one that comes out, we'll have to add a big 2 in front of the Ag that goes in. Have them re-copy line 2- it's repetitive, but at the end you can see the whole process, start to finish.

I like to use parenthesis, even from the start, because they are a good habit that helps you see things “cleanly”. You'll see how useful they are on the next problem.

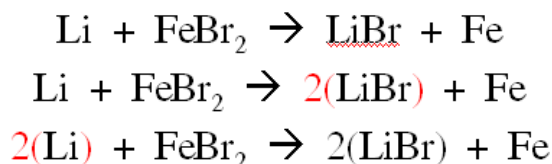
Problem Two: work the same way as problem 1. Stay on the slow and deliberate side.



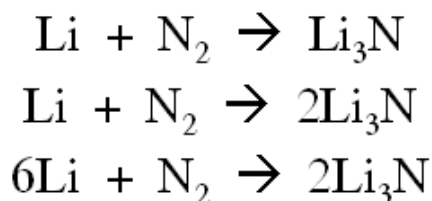
Two nitrogens go in, but only one comes out (no subscript is an implied 1). When you put a 2 in front of the N coming out, you're also doubling the H₃ because it's stuck on the N. That's ammonia, by the way. Make students using parenthesis helps them see that.

But doubling the H₃ means that now 6 H's are coming out, with only 2 going in. But that's a simple fix- putting a 3 in front of the H₂ going in means you now have 6 H's, which matches what you have going out. After checking everything one more time-2 N's in and out, 6 H's in and out- we're good, so we're done.

Problem Three

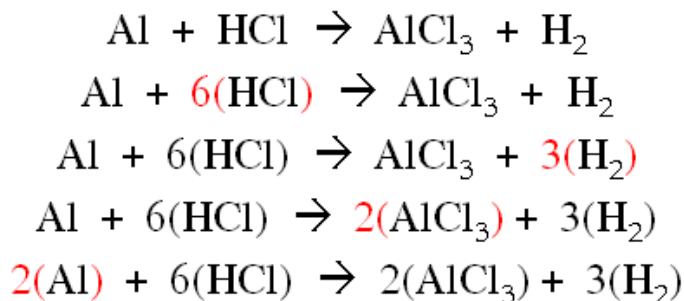


Problem Four



Your first impulse, to put a 3 in front of the Li going in, is not bad. In fact, go ahead and work that out on the board until you hit the dead end and realize you need to do something else. Everything works until you deal with the N's. Erasing in science is a GOOD thing- it means you're improving!

Problem Five: be careful on step two- you'll want to put a 2 in front of the HCl at first to even up the hydrogens. Go ahead and do that, but be ready to come back and change it.



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Balancing Equations

