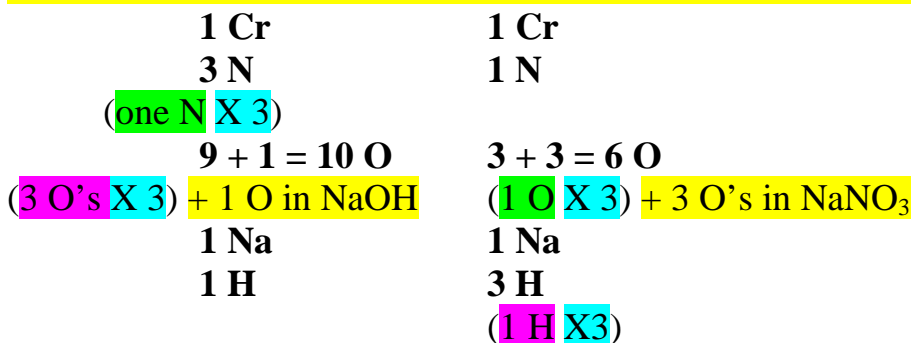


Step by Step: Balancing Chemical Reactions



First make a list of all of the elements on each side and their amounts.

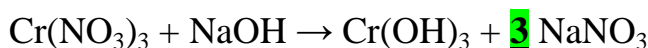


Either the N or the H needs fixed. Do not fix the oxygen, since they are everywhere.



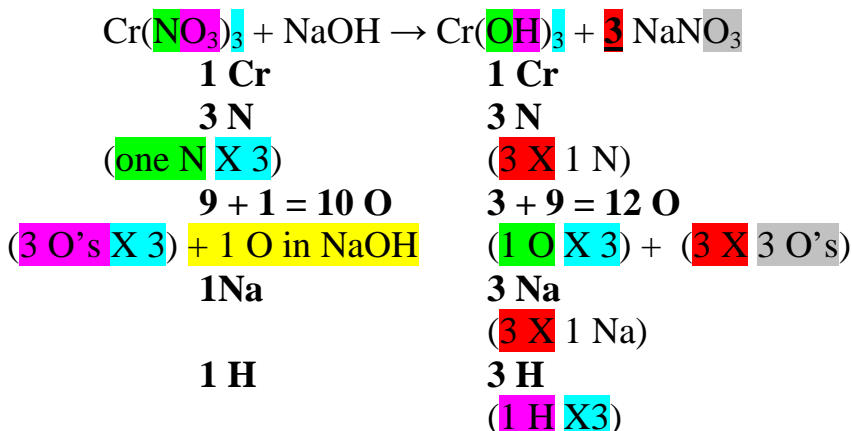
Multiply the 1 N by 3 to get three total on each side.

The 3 that is multiplied goes in the front of the compound containing the N.



This 3 we added will now be multiplied through the compound: 3 X 1Na = 3 Na, 3 X 1N = 3 N, 3 X 3O's = 9 O.

Again make a list of all elements and their amounts.

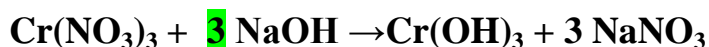


Either the Na or the H need fixed, O should be saved for last, since it is everywhere.

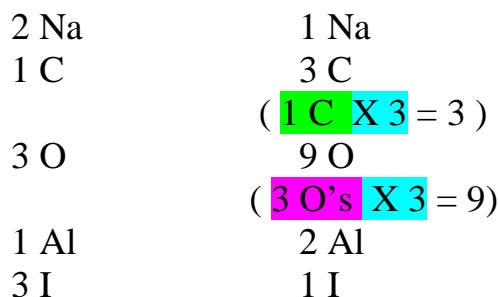
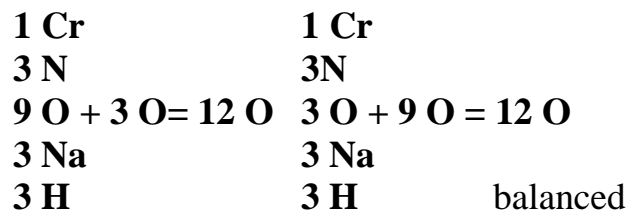
Multiply the Na by 3, so there will be 3 on each side.



The 3 that is multiplied goes in the front of the compound.



This 3 we added will now be multiplied through the compound: $3 \times 1\text{Na} = 3 \text{Na}$, $3 \times 1 \text{O} = 3 \text{O}$, $3 \times 1 \text{H} = 3 \text{H}$.



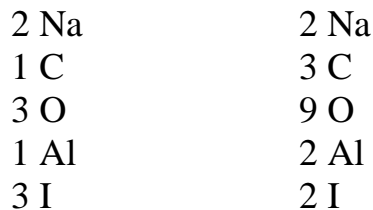
Fix either Na or Al first. (Start with the positive metals and then move to other elements.)
To fix Na we need to multiply by 2 on the right side.



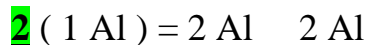
The 2 that is multiplied goes in the front of the compound.



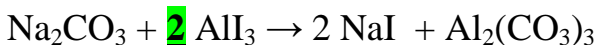
This 2 we added will now be multiplied through the compound: $2 \times 1\text{Na} = 2 \text{Na}$, $2 \times 1 \text{I} = 2 \text{I}$.



Now let's fix Al, by multiplying the left Al by 2.



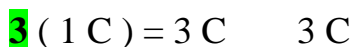
The 2 that is multiplied goes in the front of the compound.



This 2 we added will now be multiplied through the compound: 2 X 1 Al = 2 Al, 2 X 3 I = 6 I.

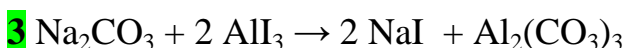


Next fix C or O or I. If we fix C, we need to multiply the C on the left by 3.

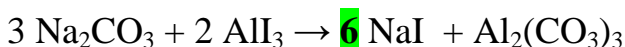
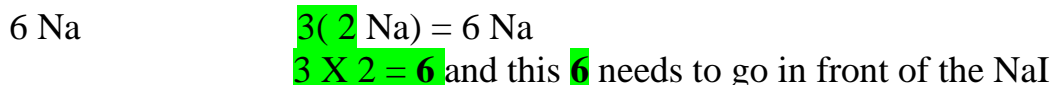


The 3 that is multiplied goes in the front of the compound.

This 3 we added will now be multiplied through the compound: 3 X 2Na = 6 Na, 3 X 1 C = 3 C, 3 X 3 O = 9 O.



Now fix either the Na or the I. We already have a 2 in front of NaI, which is not working. We have two choices. We can either multiply that 2 by some number to fix it or we can get rid of the 2 and put a number there that works. ****We can get rid of the 2 in front of the NaI, since it is not part of the compound. (We put that number there back in the 1st step, so we can change it.)**** In this case it will probably be easier to multiply the 2 by 3 making 6, which will fix both the Na and the I.

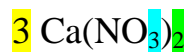


6 Na
3 C
9 O
2 Al
6 I

6 Na
3 C
9 O
2 Al
6 I

It is now balanced!

Counting with parenthesis:



$$3 \times 1 \text{ Ca} = 3 \text{ Ca}$$

$$3 \times (1 \text{ N} \times 2) = 6 \text{ N inside the parenthesis}$$

$$3 \times 2 = 6 \text{ N total}$$

$$3 \times (3 \text{ Oxygen} \times 2) = 18 \text{ Oxygen inside the parenthesis}$$

$$3 \times 6 = 18 \text{ Oxygen total}$$

End of Notes