Cardinal Rules for Balancing Chemical Reaction Equations

1) Get a pencil! Stay calm.

2) Write the skeleton equation – this means convert the names of chemicals into formulas.

3) Be sure that all formulas are written correctly.

4) Count atoms of each element on each side of the arrow to figure out what needs to be balanced.

5) Change ONLY coefficients to balance, NEVER change subscripts!

6) Reduce coefficients to lowest ratio. (i.e. 2-4, is 1-2)

7) Check your work when done.

Sample Problem:
Iron (II) chloride reacts with aluminum sulfate to form iron (II) sulfate and aluminum chloride.

Steps 2-3:
$FeCl_2 + Al_2(SO_4)_3 \rightarrow FeSO_4 + AlCl_3$
(The formulas are correct, every + is cancelled out by a negative and vice versa. Now we balance...)

Step 4:
Reactants: Fe=1, Cl=2, Al=2, S=3, O=12
Products: Fe=1, Cl=3, Al=1, S=1, O=4

Steps 5-6:
$\underline{3}\ FeCl_2 + Al_2(SO_4)_3 \rightarrow \underline{3}\ FeSO_4 + \underline{2}\ AlCl_3$

Step 7:
Count atoms on either side of the arrow to make sure the equation is balanced!
Reactants: Fe=3, Cl=6, Al=2, S=3, O=12
Products: Fe=3, Cl=6, Al=2, S=3, O=12
Yay! It is balanced! ☺

Cardinal Rules for Balancing Chemical Reaction Equations

1) Get a <u>pencil</u>! Stay calm.

2) Write the skeleton equation – this means convert the names of chemicals into formulas.

3) Be sure that all formulas are written correctly.

4) Count atoms of each element on each side of the arrow to figure out what needs to be balanced.

5) Change ONLY coefficients to balance, NEVER change subscripts!

6) Reduce coefficients to lowest ratio. (i.e. 2-4, is 1-2)

7) Check your work when done.

Sample Problem:
Iron (II) chloride reacts with aluminum sulfate to form iron (II) sulfate and aluminum chloride.

Steps 2-3:
$FeCl_2 + Al_2(SO_4)_3 \rightarrow FeSO_4 + AlCl_3$
(The formulas are correct, every + is cancelled out by a negative and vice versa. Now we balance...)

Step 4:
Reactants: Fe=1, Cl=2, Al=2, S=3, O=12
Products: Fe=1, Cl=3, Al=1, S=1, O=4

Steps 5-6:
<u>3</u> $FeCl_2 + Al_2(SO_4)_3 \rightarrow$ <u>3</u> $FeSO_4 +$ <u>2</u> $AlCl_3$

Step 7:
Count atoms on either side of the arrow to make sure the equation is balanced!
Reactants: Fe=3, Cl=6, Al=2, S=3, O=12
Products: Fe=3, Cl=6, Al=2, S=3, O=12

Yay! It is balanced! ☺