How to Recognize one Chemical Reaction from another.			
Type	Abstracts	Real examples	Thinks to remember
Synthesis	$M + N \rightarrow MN$ $X + Y \rightarrow XY$	$2Na + Cl_2 \rightarrow 2\ NaCl$ $N_2 + 3H_2 \rightarrow 2NH_3$	Two or more smaller reactants become a bigger product. AKA Combination Reaction.
Decomposition	$MN \rightarrow M + N$ $XY \rightarrow X + Y$	$CuCO_3 \rightarrow CuO + CO2$ $2Al_2O_3 \rightarrow 4Al + 3O_2$	Opposite of synthesis. Start with one reactant, which breaks down into smaller products.
Single Replacement (SR)	Cation (metal) replacement $Z + BC_{(AQ)} \rightarrow ZC_{(AQ)} + B$ Anion (nonmetal) replacement $N + CA_{(AQ)} \rightarrow CN_{(AQ)} + A$	$Li + NaCl_{(AQ)} \rightarrow LiCl_{(AQ)} + Na$ $F_2 + 2NaCl_{(AQ)} \rightarrow 2NaF_{(AQ)} + Cl_2$ $Au + HCl_{(AQ)} \rightarrow X$ no reaction A “no reaction” happens when the atoms are “lower” - less reactive than the ion already in solution. Gold is less reactive than hydrogen; the Au “can’t bump” the H out of solution.	Start: atoms are added to a SINGLE aqueous solution. Product is new AQ and diff. atoms. Check Table F, but in every SR a new AQ forms. Find the 2/3 on Table J ♥ Which ever metal (or H) is higher, goes into solution, or stays in solution. Which ever nonmetal is higher goes into solution, or stays in solution. Switch, fix, balance.

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Double Replacement (DR)	$AQ + AQ \rightarrow \text{diff } AQ + SOLID$ $\underline{A}B + \underline{X}Y \rightarrow \underline{A}Y + \underline{X}B$ Make sure the first part, the CATION, stays in front. Switch the anions only.	These are "so big" they would not fit in this box. Example below. $2LiBr_{(AQ)} + Pb(NO_3)_{2(AQ)} \rightarrow 2LiNO_{3(AQ)} + PbBr_{2(S)}$ $NaC_2H_3O_{2(AQ)} + AgNO_{3(AQ)} \rightarrow AgC_2H_3O_{2(AQ)} + NaNO_{3(AQ)}$ The 2nd line is NO REACTION, 2 AQ products means a mixture, not a reaction.	Always start with TWO AQ solutions. Switch, fix, balance, F'em. On the odd chance you end up with 2AQ products, that means it was no rection, just a mixture forms.
Combustion	$HC^* + O_2 \rightarrow CO_2 + H_2O$ No real "abstract", you always burn a hydrocarbon and oxygen; always get carbon dioxide & water products. *You might start with an oxygenated hydrocarbon. Rarely you have "incomplete combustion" (insufficient oxygen), then $C_{(S)}$ or $CO_{(G)}$ forms with $CO_2 + H_2O$	$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ $2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O$ $C_{23}H_{48(S)} + 35O_2 \rightarrow 23CO_2 + 24H_2O$ $2C_2H_3OH + 5O_2 \rightarrow 4CO_2 + 4H_2O$ $2CH_4 + 3O_2 \rightarrow C_{(S)} + CO_2 + 4H_2O$	These are always exothermic, heat is a product. Sometimes the numbers get bigger than "normal". You will always be given the formula for the HC or oxygenated HC.