DON'T CUT!

- **Single-Replacement with Cation**

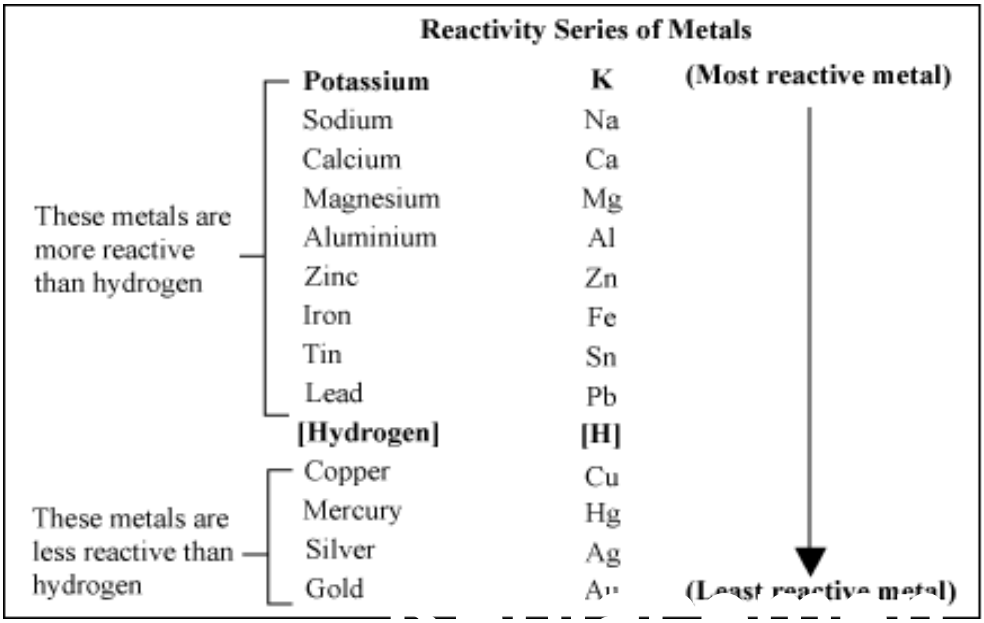
  $A + BX \rightarrow B + AX$

  $H_2 + Cu(NO_3)_2 \rightarrow Cu + 2NHO_3$

- **Single-Replacement with Anion**

  $y + Ax \rightarrow x + Ay$

  $Cl_2 + 2NaBr \rightarrow Br_2 + 2NaCl$



Single - t

DON'T CUT!

- **Also Called Metathesis**
- **Double Replacement**

$AX + BY \rightarrow AY + BX$

  - A & B are Cations
  - x & y are Anions

$BaCl_2 + 2NaBr \rightarrow 2NaCl + BaBr_2$

Soluble Compounds (aqueous)	**Insoluble Exceptions (solids/gases)**
Compounds containing alkali metal ions (Li^+, Na^+, K^+, Rb^+, Cs^+) and the ammonium ion (NH_4^+)	
Nitrates (NO_3^-), bicarbonates (HCO_3^-), and chlorates (ClO_3^-)	
Halides (Cl^{1-}, Br^{1-}, I^{1-})	Halides of Ag^+, Hg_2^{2+}, and Pb^{2+}
Sulfates (SO_4^{2-})	Sulfates of Ag^+, Ca^{2+}, Sr^{2+}, Ba^{2+}, Hg_2^{2+}, and Pb^{2+}
Insoluble (solids/gases)	Soluble Exceptions (aqueous)
Carbonates (CO_3^{2-}), phosphates (PO_4^{3-}), chromates (CrO_4^{2-}), and sulfides (S^{2-})	Compounds containing alkali metal ions (Column 1 Elements)
Hydroxides (OH^{1-})	Compounds containing alkali metal ions (Column 1 Elements) and the Ba^{2+} ion

Double **nt**

DON'T CUT!

- **Complete Combustion**
  Carbon Dioxide is Produced
  Blue Flame
  Hydrocarbon + $O_2 \rightarrow CO_2 + H_2O$
  $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$
- **Incomplete Combustion**
  Carbon Monoxide is Produced
  Yellow Flame
  Hydrocarbon + $O_2 \rightarrow CO + H_2O$
  $2CH_4 + 3O_2 \rightarrow 2CO + 4H_2O$

Combustion

DON'T CUT!

- **Diatomic Elements**

  N_2, O_2, F_2, Cl_2, Br_2, I_2, & H_2

- **Common Polyatomic Ions**

  OH^- (hydroxide)
  NO_3^{1-} (nitrate)
  CO_3^{2-} (carbonate)
  CrO_4^{2-} (chromate)
  ClO_3^{1-} (chlorate)
  SO_4^{2-} (sulfate)
  PO_4^{3-} (phosphate)
  NH_4^{1+} (ammonium)

- **Common Charges**

1	2
Li^+	
Na^+	Mg^{2+}
K^+	Ca^{2+}
Rb^+	Sr^{2+}
Cs^+	Ba^{2+}

13	14	15	16	17	18
		N^{3-}	O^{2-}	F^-	
Al^{3+}		P^{3-}	S^{2-}	Cl^-	
			Se^{2-}	Br^-	
				I^-	

Extras