**Chemical Reaction Classification**

**And balancing with polyatomic.**

**All chemical reactions can be classified as one of four different types of reactions.**

1. **Synthesis: (means: “to make something”) reactions occur when isolated elements react with each other to create one or more compound (s).**

**Example:**

 **2H2 + O2 🡪 2H2O**

1. **Decomposition: (means “to brake down”) reactions occur when one compound brakes up into two or more isolated elements.**

**Example:**

 **2H2O 🡪 2 H2 + O2**

1. **Single replacement: ( one ion exchange) reactions occur when an isolated element replaces the ion in a compound that shares the same charge (Oxidation #).**

**Example:**

 **2HCl + Mg 🡪 MgCl2 + H2**

1. **Double replacement: (two ions exchange) reactions occur when two compounds exchange positive and negative ions.**

**Example:**

**2Al(NO3)3 + 3 Mg(SO4) 🡪Al2(SO4)3 + 3 Mg(NO3)2**

**When balancing with polyatomic ions it is easiest to treat them like one element.**

**Mg(C2H3O2)2 + Al(NO3)3 🡪 Mg(NO3)2  +Al(C2H3O2)3**