Balancing Chemical Equations

- We balance equations with coefficients to following the Law of Conservation of Mass.
- Remember that you choose an element on left side of the equation. Ask yourself, "How many of that element are on the right side of the equation." Then use a coefficient to "balance" them to be the same number.
- You might have to use the least common multiple.
- Keep polyatomic ions together as a unit. For example, "How many phosphates do I have on the left side? How many phosphates do I have on the right side?"

1) _____F_2 + 2NaI → 2NaF + _____I_2

2) $2Na_3P + 3CaF_2 \rightarrow 6NaF +$ _____Ca_3P_2

3) $2Na_3PO_4 + 3CaCl_2 \rightarrow 6NaCl +$ _____$Ca_3(PO_4)_2$

4) $2Al + 6HNO_3 \rightarrow 2Al(NO_3)_3 + 3H_2$

5) $3FeCO_3 + 2Li_3PO_4 \rightarrow$ _____$Fe_3(PO_4)_2 + 3Li_2CO_3$

Identifying, Writing, & Balancing Chemical Reactions

Step 1: Write the formulas for the reactants.
Step 2: Identify the type of reaction.

- Synthesis: A + B → AB
- Decomposition: AB → A + B
- Single Replacement: A + BC → AC + B *(always pair cation & anion!)*
- Double Replacement: AB + CD → AD + CB

Step 3: Write the formulas for the reactants.

- Cross charges where elements are bonded.
- When an element is alone, check to see if it is diatomic: Br I N Cl H O F
  - If it is, put a subscript of 2

Step 4: Balance the equation.

	Reaction type?	Complete the reaction and balance.
1)	Synthesis	Sodium + chlorine → $2Na + Cl_2 \rightarrow 2NaCl$
2)	Double replacement	Calcium fluoride + iron II hydroxide → $CaF_2 + Fe(OH)_2 \rightarrow Ca(OH)_2 + FeF_2$ **it's already balanced!
3)	Decomposition	Strontium nitride → $Sr_3N_2 \rightarrow 3Sr + N_2$
4)	Single replacement **PreIB: the activity series is not on the SOL Test	Magnesium chloride + potassium → $MgCl_2 + 2K \rightarrow 2KCl + Mg$