Solubility Rules for some ionic compounds in water

	Soluble Ionic Compounds
1.	All sodium (Na^+), potassium (K^+) and ammonium (NH_4^+) salts are SOLUBLE.
2.	All nitrate (NO_3^-), acetate ($CH_3CO_2^-$), chlorate (ClO_3^-), and perchlorate (ClO_4^-) salts are SOLUBLE.
3.	All chloride (Cl^-), bromide (Br^-), and iodide (I^-) salts are SOLUBLE - EXCEPT those also containing: lead, silver, or mercury (I), (Pb^{+2}, Ag^+, Hg_2^{+2}) which are NOT soluble.
4.	All fluoride (F^-) salts are SOLUBLE - EXCEPT those also containing: magnesium, calcium, strontium, barium, or lead (Mg^{+2}, Ca^{+2}, Sr^{+2}, Ba^{+2}, Pb^{+2}) which are NOT soluble.
5.	All sulfate (SO_4^{-2}) salts are SOLUBLE - EXCEPT those also containing: calcium, silver, mercury (I), strontium, barium, or lead (Ca^{+2}, Ag^+, Hg_2^{+2}, Sr^{+2}, Ba^{+2}, Pb^{+2}), which are NOT soluble.
	Not Soluble Ionic Compounds
6.	Hydroxide (OH^-) and oxide (O^{-2}) compounds are NOT SOLUBLE - EXCEPT those also containing: sodium, potassium or barium (Na^+, K^+, Ba^{+2}), which are soluble.
7.	Sulfide (S^{-2}) salts are NOT SOLUBLE - EXCEPT those also containing: sodium, potassium, ammonium, or barium (Na^+, K^+, NH_4^+, Ba^{+2}), which are soluble.
8.	Carbonate (CO_3^{-2}) and phosphate (PO_4^{-3}) salts are NOT SOLUBLE EXCEPT those also containing: sodium, potassium or ammonium (Na^+, K^+, NH_4^+) which are soluble.

Precipitation Reactions … Predicting

$$K_2SO_4(aq) + Pb(NO_3)_2(aq) = ? + ?$$

1. *Identify the ions that are in the original solutions:*

2. *Swap them and write the write resultant compounds as possible products:*

3. *Is one or both of the new salts insoluble … solubility guidelines.*

4. *Now write and balance the chemical equation:*