

- Go to: <https://phet.colorado.edu/en/simulation/legacy/soluble-salts>
- Start the simulation by pressing the "play" button.
- Start with the "Table Salt" tab. What ions make up table salt? Sodium and Chloride
- The elemental symbol for the ions are: Na<sup>+</sup> and Cl<sup>-</sup> (Don't forget the proper charges!!)
- Shake the salt shaker. What do you notice happens to the salt when it hits the water?

The ions separate

- Keep shaking the salt shaker until the "Total" for Sodium and Chloride are **over 200** each.

a. How many "Dissolved" Sodium and Chloride ions are there?

~180

b. How many "Bound" Sodium and Chloride ions are there?

~20

The Same!

add to

- Keep shaking the salt shaker until the "Total" for Sodium and Chloride are **over 300** each.

a. How many "Dissolved" Sodium and Chloride ions are there?

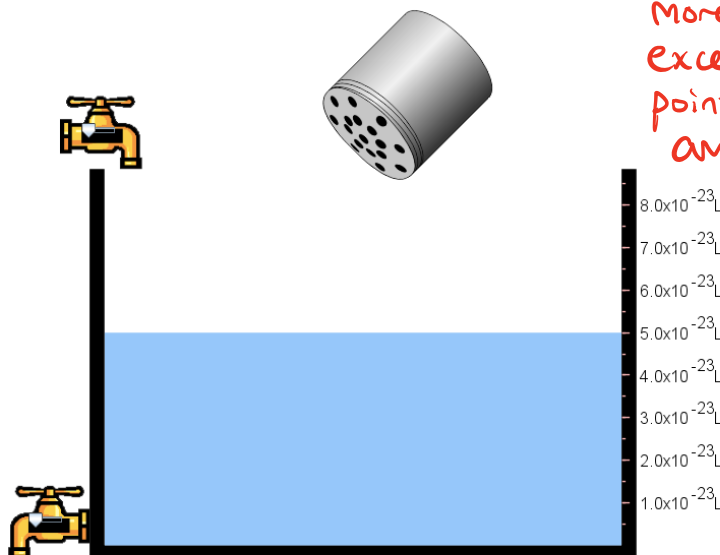
~180

b. How many "Bound" Sodium and Chloride ions are there?

~120

add to

- Sketch a picture of what you see.



\* No matter how much more we shake, we've exceeded saturation point and the max. amount of Na<sup>+</sup> & Cl<sup>-</sup> ions that can dissolve in this volume is 180 ions

9. Move to the "Slightly Soluble Salts" tab.

10. Fill in the following table:

Salt	Positive Ion (Cation)	Negative Ion (Anion)	Compound Formula and Ratio of Cations to Anions	Maximum Dissolved Cations	Maximum Dissolved Anions	Ratio of Dissolved Cations to Anions
Strontium Phosphate	$\text{Sr}^{2+}$	$\text{PO}_4^{3-}$	$\text{Sr}_3(\text{PO}_4)_2$ 3:2	45	30	3:2
Silver (I) Bromide	$\text{Ag}^+$	$\text{Br}^-$	$\text{AgBr}$ 1:1	45	45	1:1
Thallium (I) Sulfide	$\text{Tl}^+$	$\text{S}^{2-}$	$\text{Tl}_2\text{S}$ 2:1	7	3	2:1
Copper (I) Iodide	$\text{Cu}^+$	$\text{I}^-$	$\text{CuI}$ 1:1	65	65	1:1
Silver (I) Arsenate	$\text{Ag}^+$	$\text{AsO}_3^-$	$\text{Ag}_3\text{AsO}$ 3:1	260	80	3:1
Mercury (II) Bromide	$\text{Hg}^{2+}$	$\text{Br}^-$	$\text{HgBr}_2$ 1:2	15	30	1:2

11. What is the relationship between the compound formula and the ratio of dissolved cations to anions?

They are the same ratio !!!

12. Which salt is most soluble? (Can dissolve the most ions)

Silver (I) Arsenate

13. Which salt is least soluble?

Thallium (I) sulfide