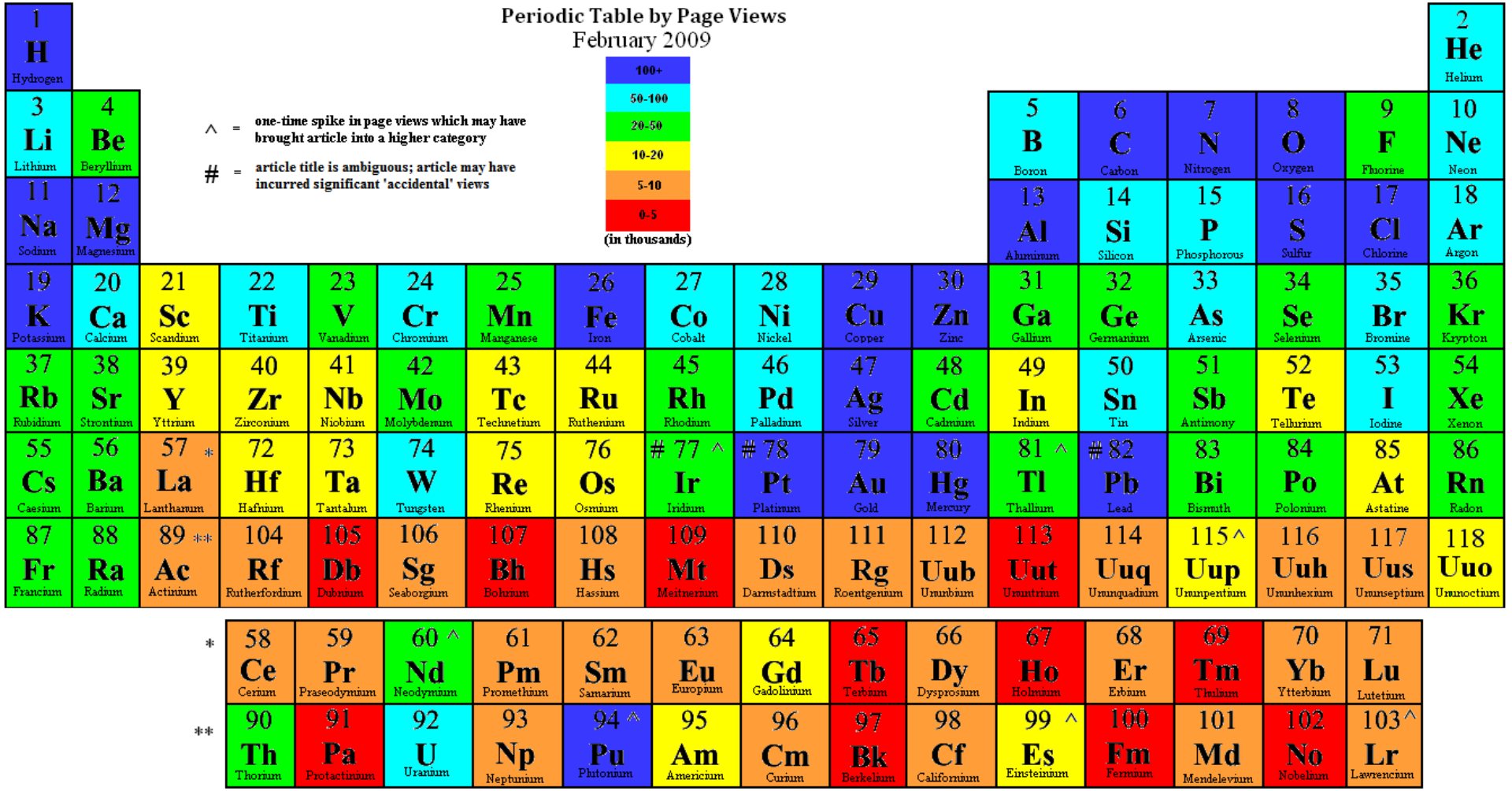
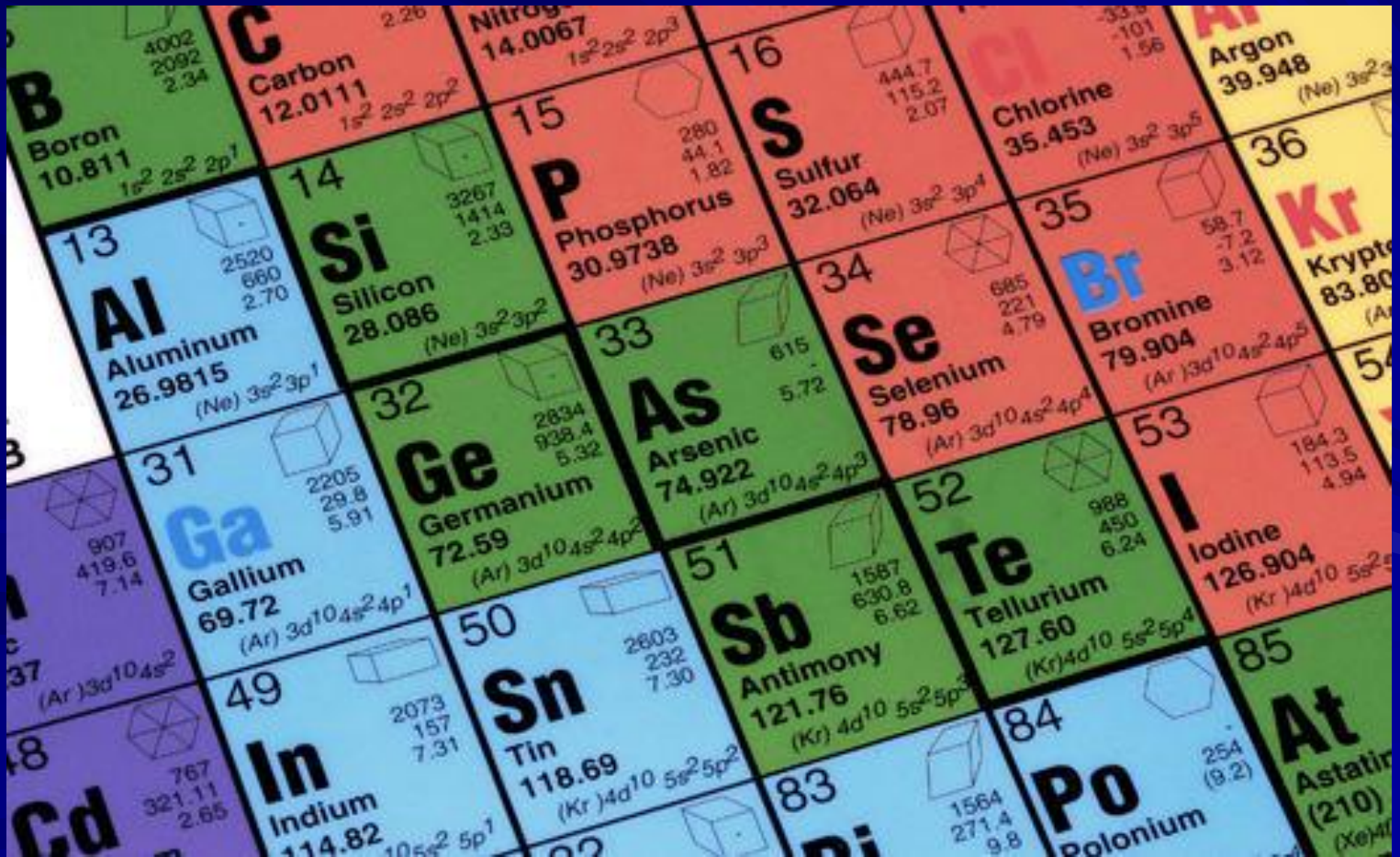
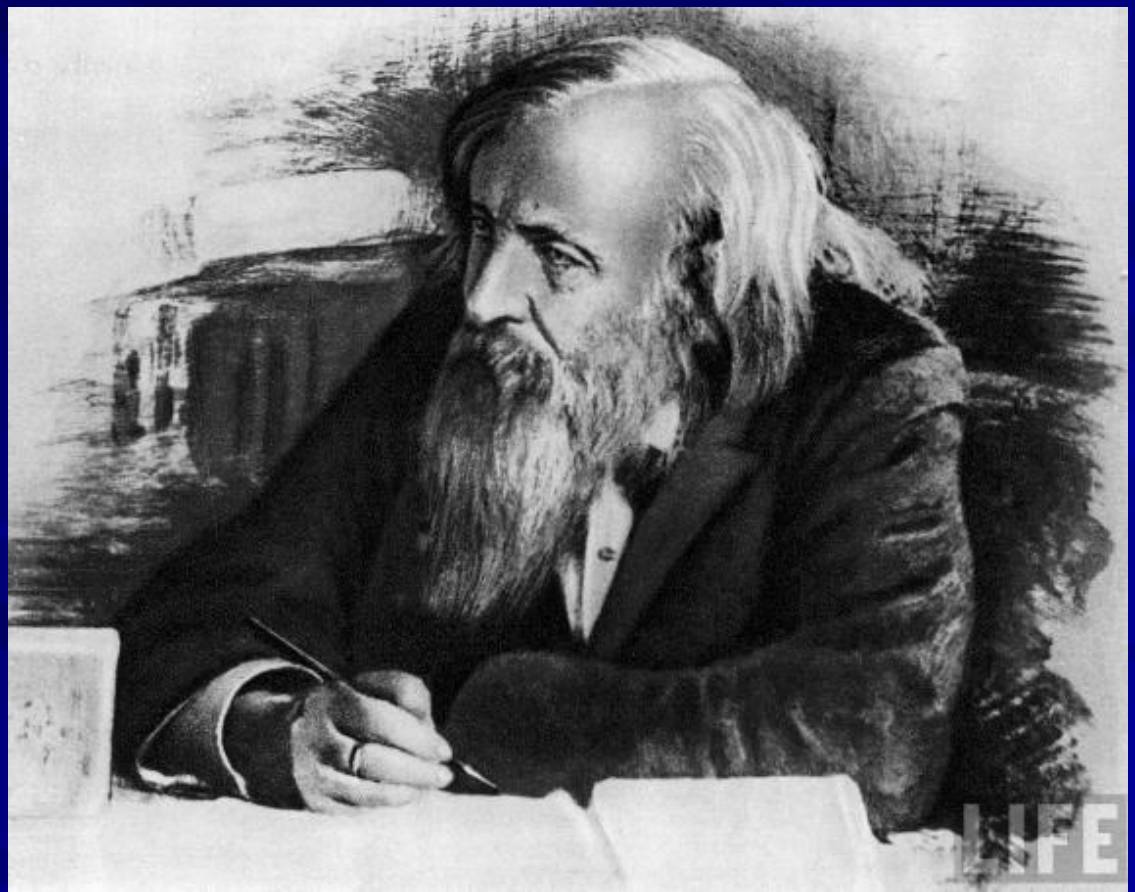
THE PERIODIC TABLE



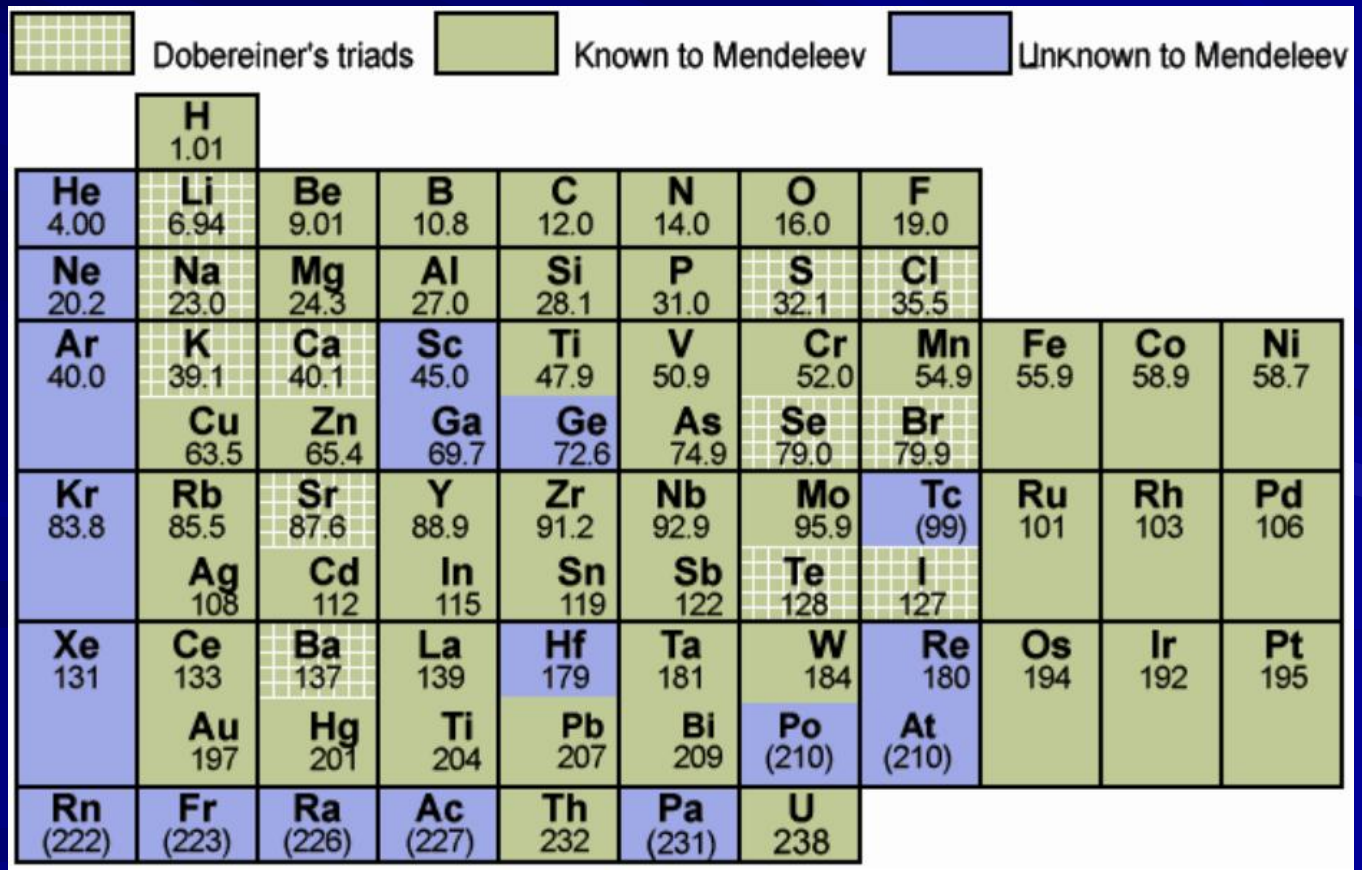
- The periodic table of the chemical elements is a ***tabular*** method of displaying the ***chemical elements***.



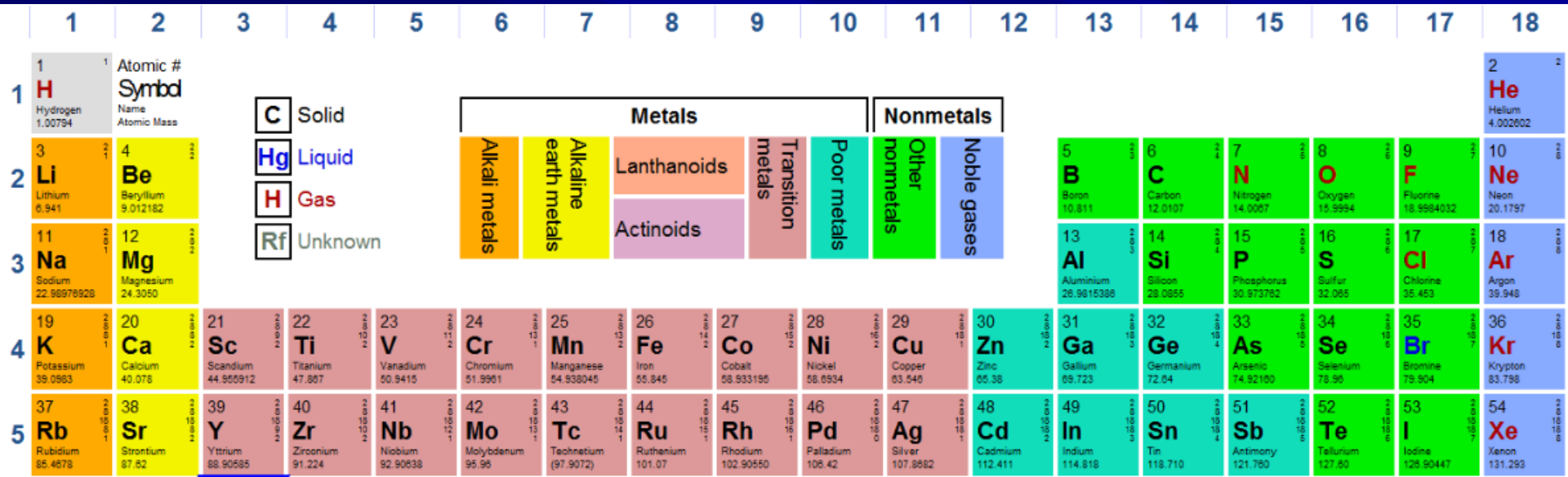
- Although earlier precursors exist, its invention is generally credited to Russian chemist Dimitri Mendeleev in 1869.



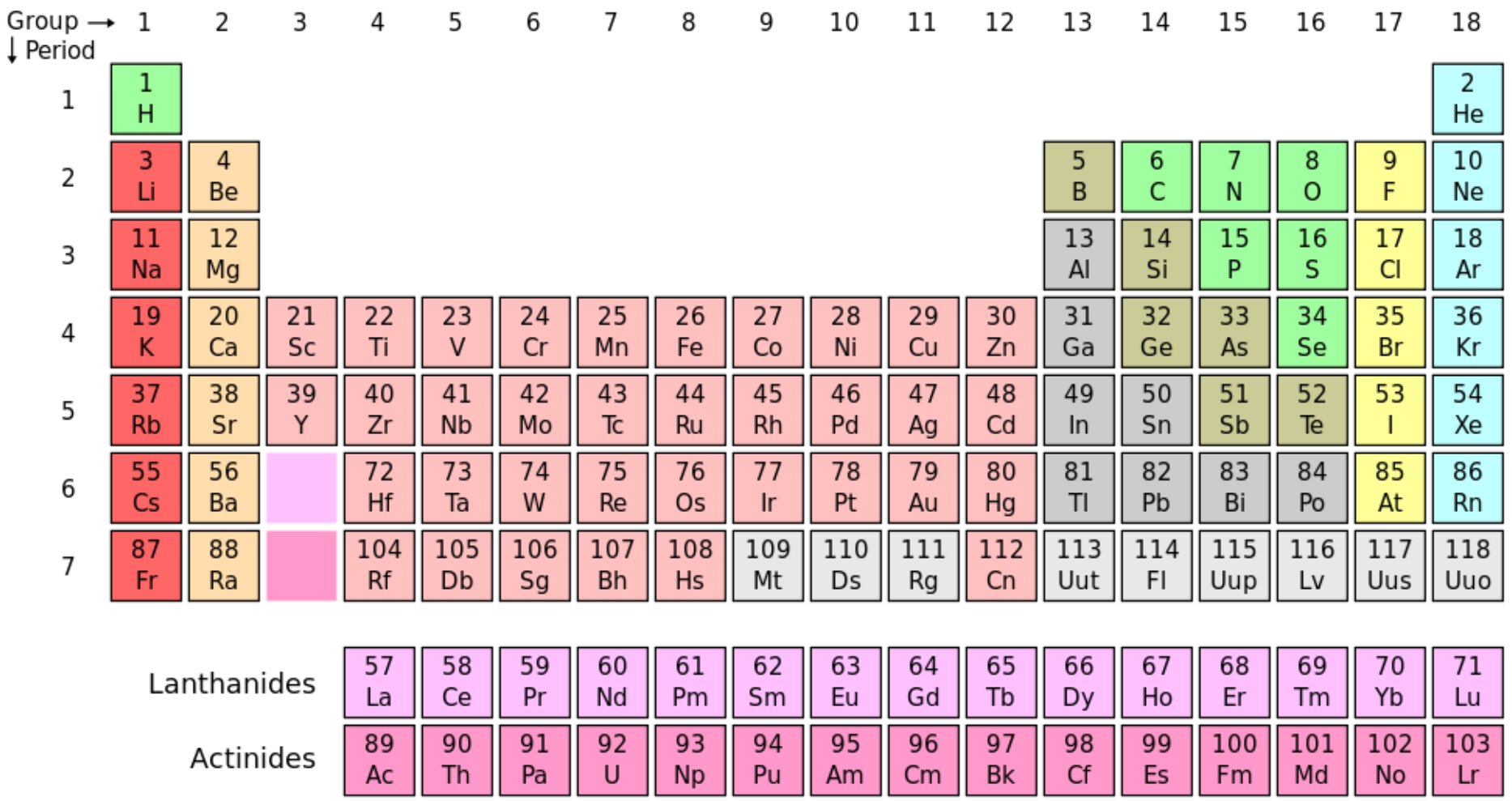
- Mendeleev intended the table to illustrate recurring ("periodic") trends in the properties of the elements.



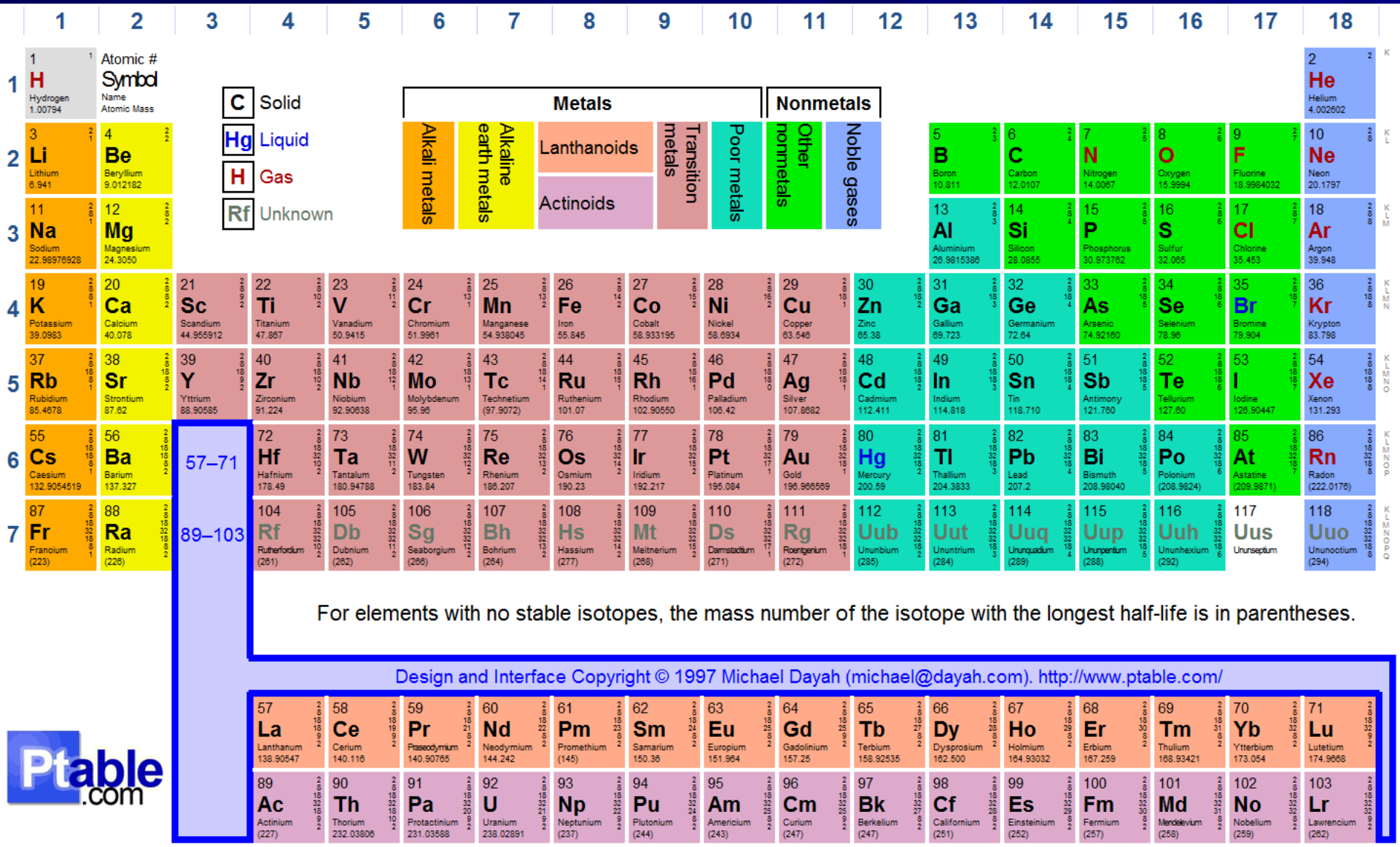
- The layout of the table has been refined and extended over time, as new elements have been discovered, and new theoretical models have been developed to explain chemical behavior.



- The current standard table contains 117 confirmed elements as of October 16, 2006



- While element 118 has been synthesized, element 117 has not.



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From **Discovery** to **Innovation...**

Periodic Table of the Elements

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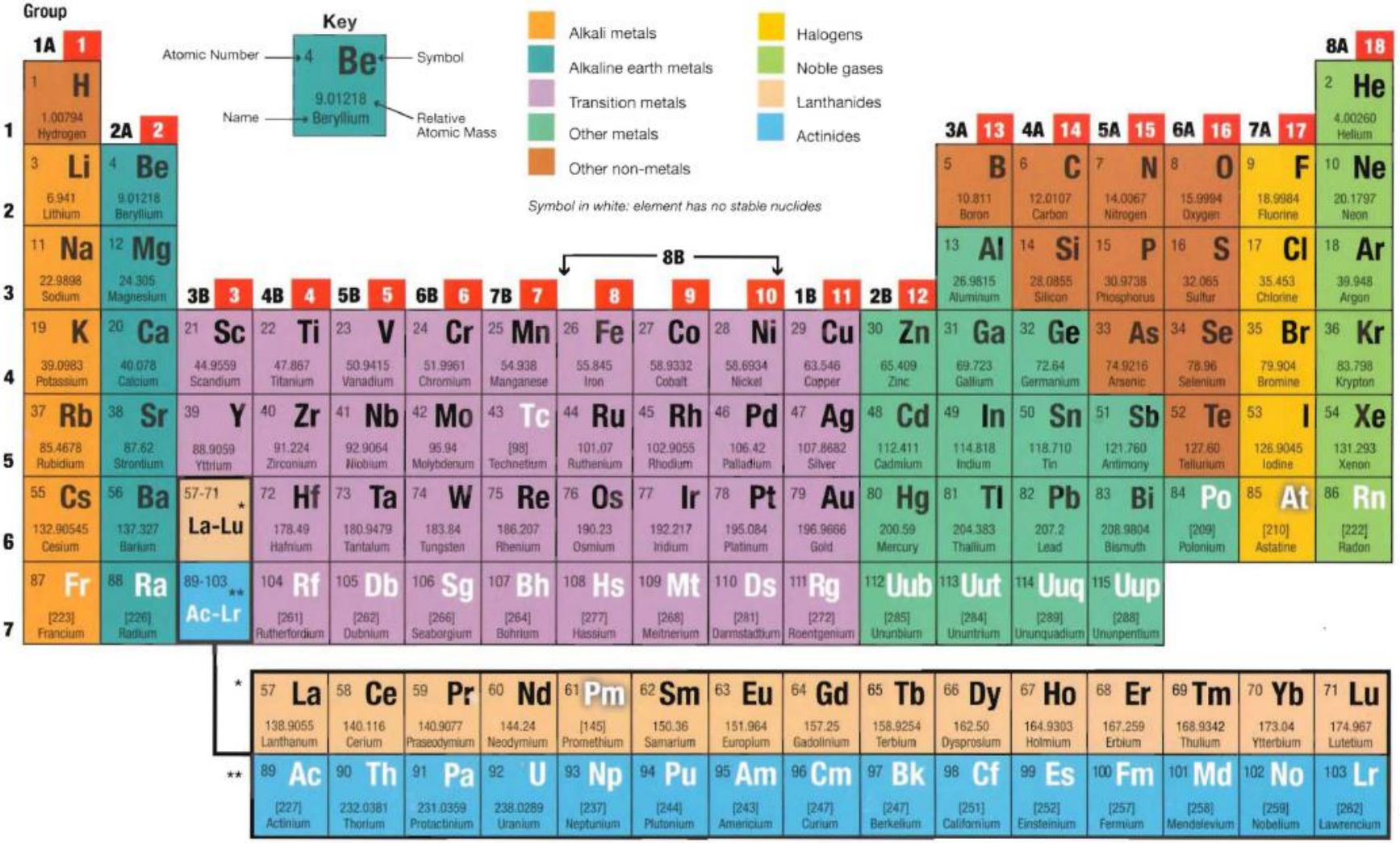

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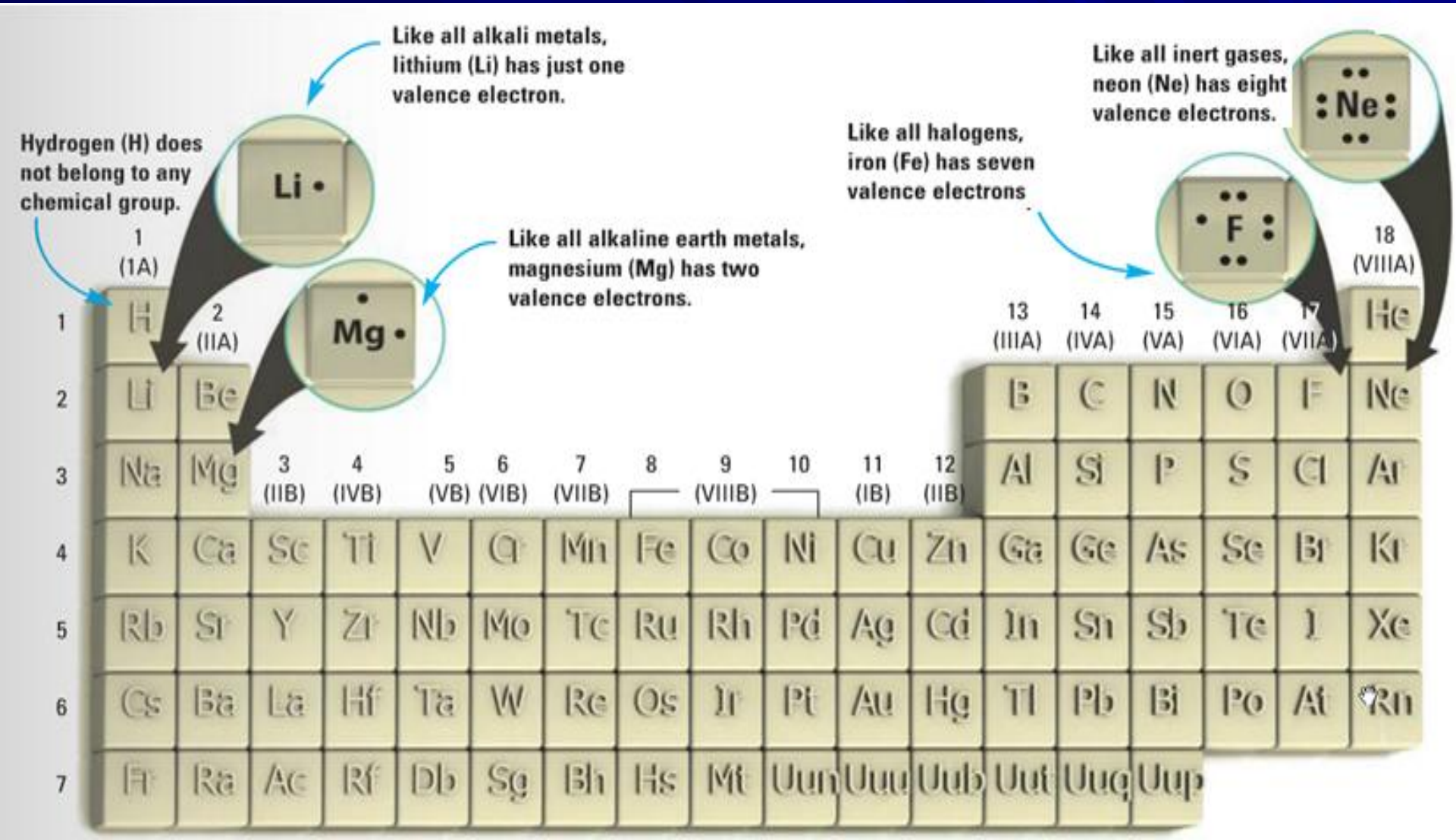
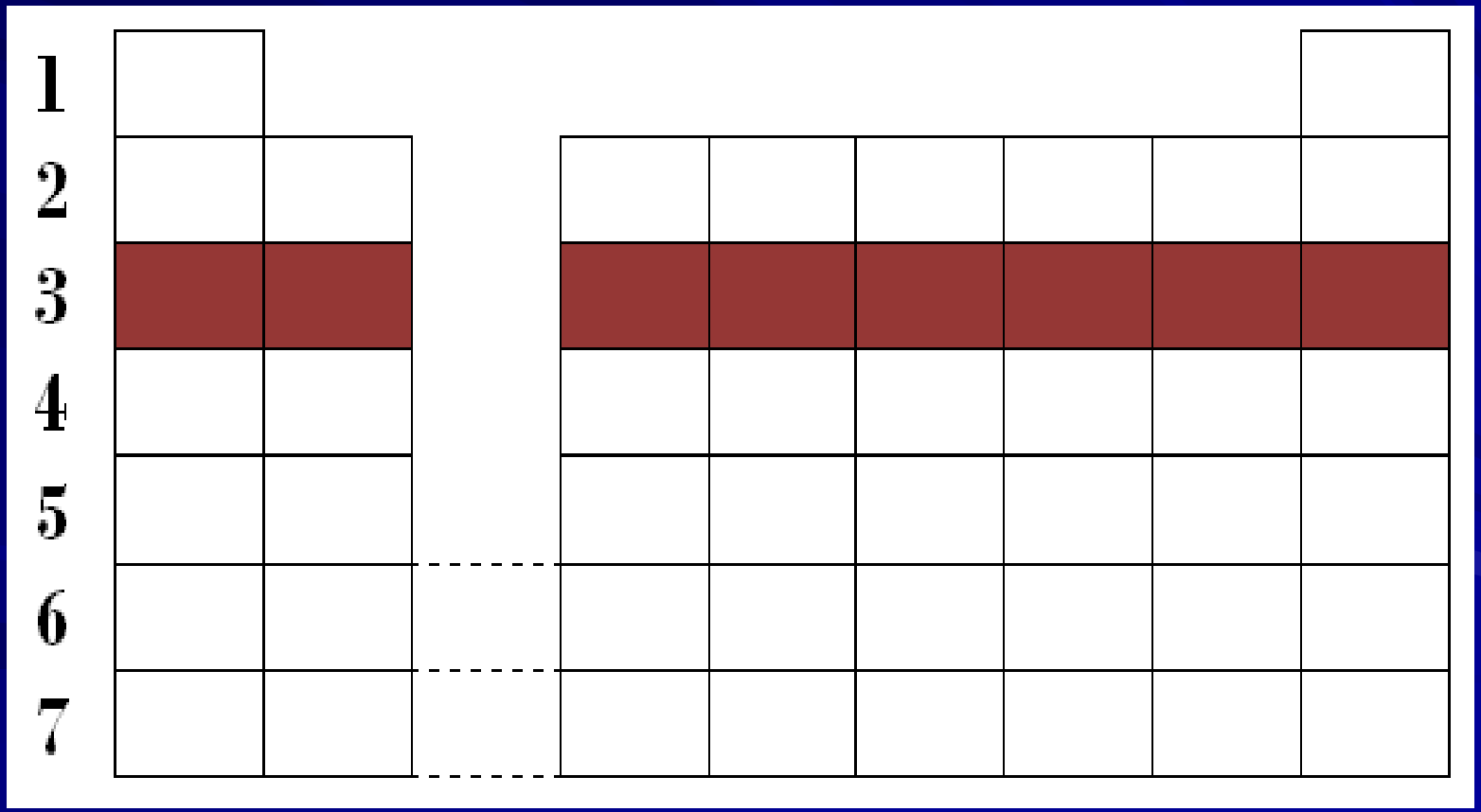
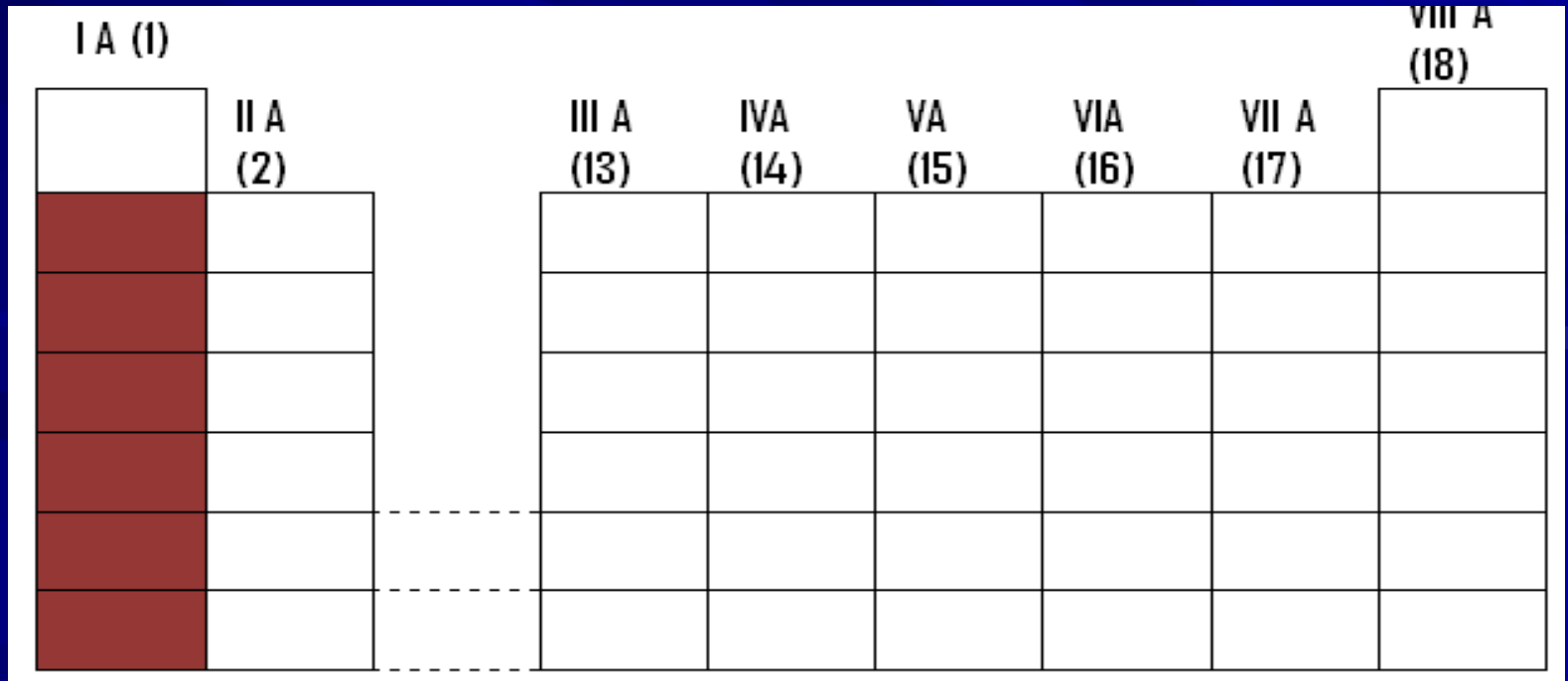
- In the periodic table, the elements are laid out in ***rows*** and ***columns***.



- Each row of the table is called ***a period.***
- Periods are marked with numbers from ***1 to 7***, on the ***left*** side of the periodic table.

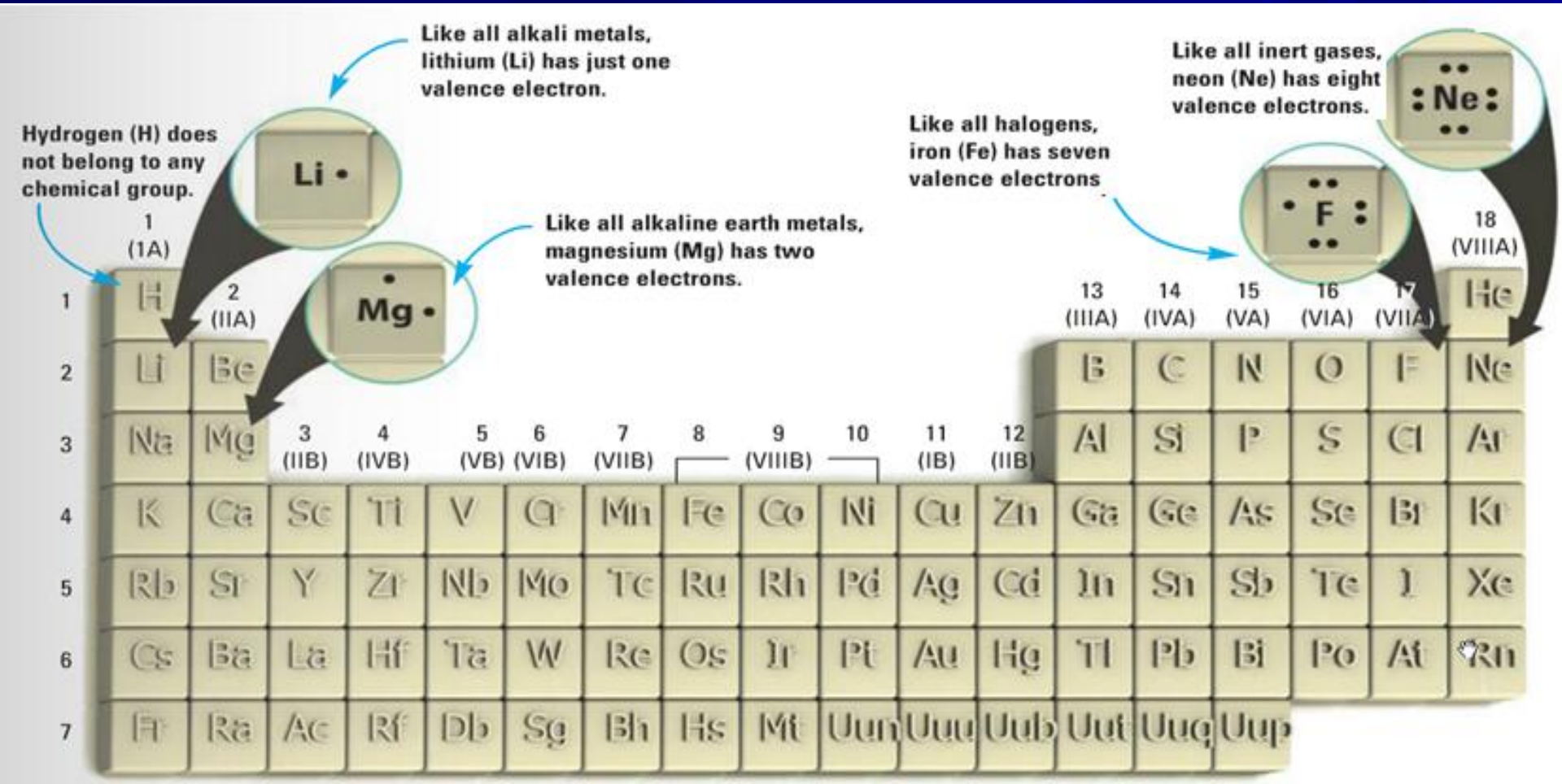


- Now look at the columns;
- Each column of the table represents a ***group(family).***
- The groups are numbered in two ways: from ***1-18*** and with ***roman numerals***: I, II, III, IV, V, VI VII and VIII.

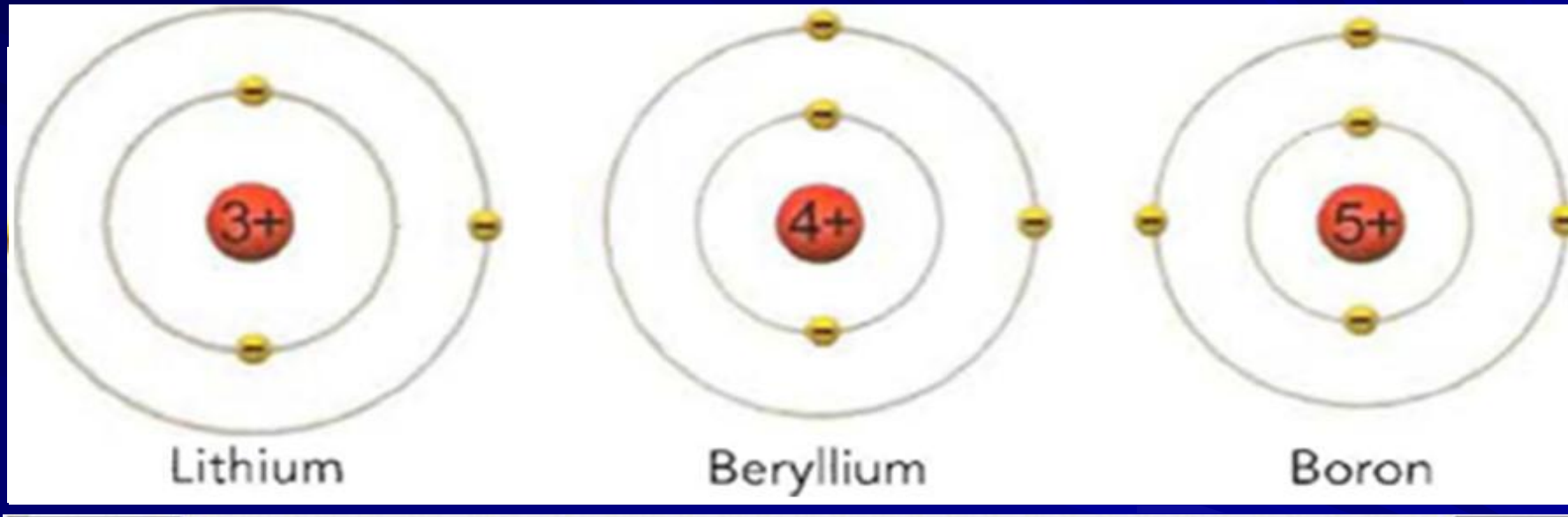


CHARACTERISTICS OF PERIODS

- Let us consider some elements found on the same period: Lithium, Beryllium and Boron.

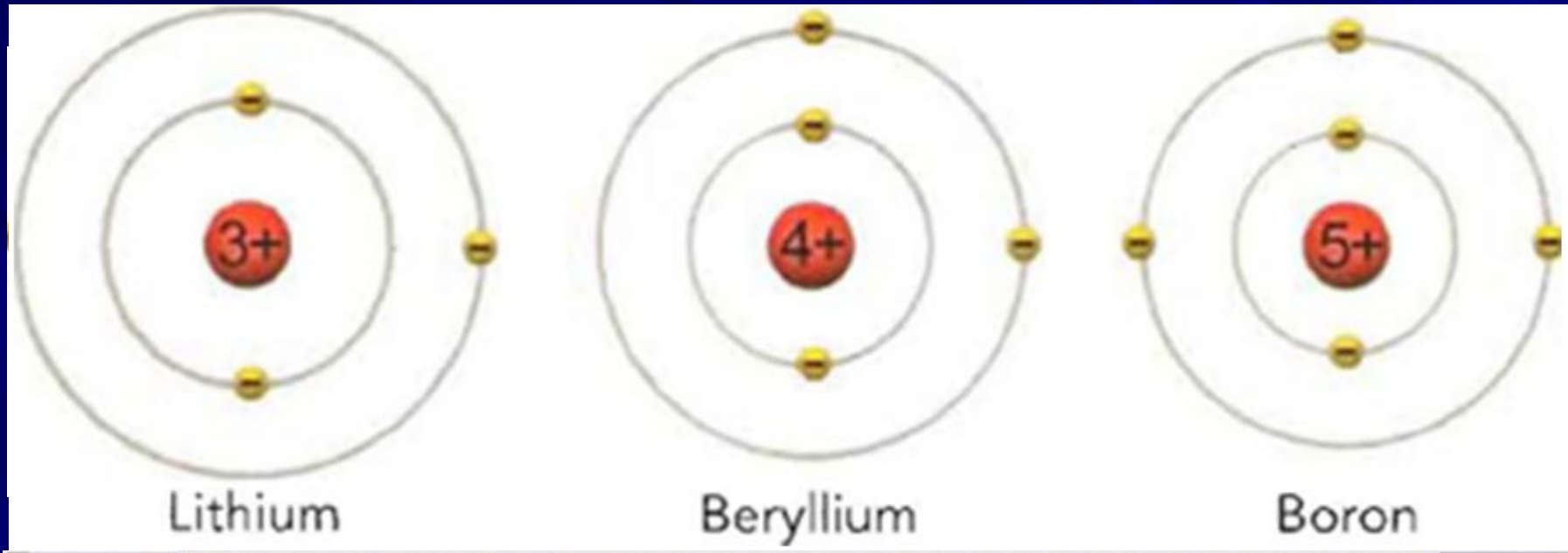


- According to the Rutherford-Bohr atomic model, the three elements are represented like this:



1 H 1.01																	2 He 4.00
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18

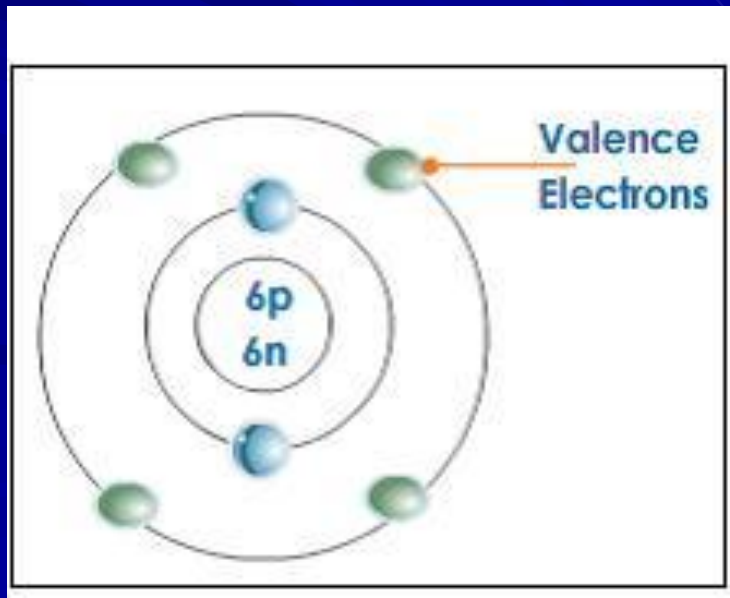
- Elements situated on the same period ***have the same number of electron shells.***



1 H 1.01																	2 He 4.00
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18

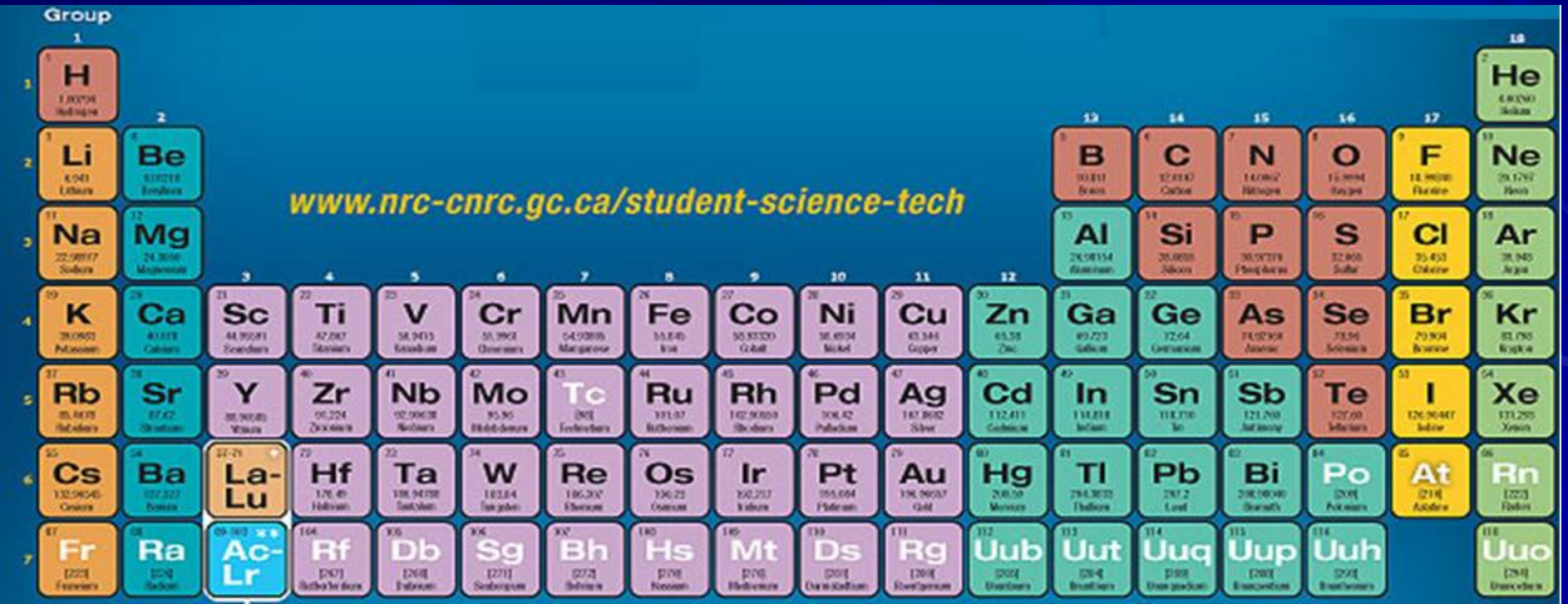
VALENCE ELECTRONS

- The electrons that are farthest from the nucleus are important because they are more frequently involved in the atom's chemical reactions.
- These electrons of the outermost shell are called ***valence electrons***.

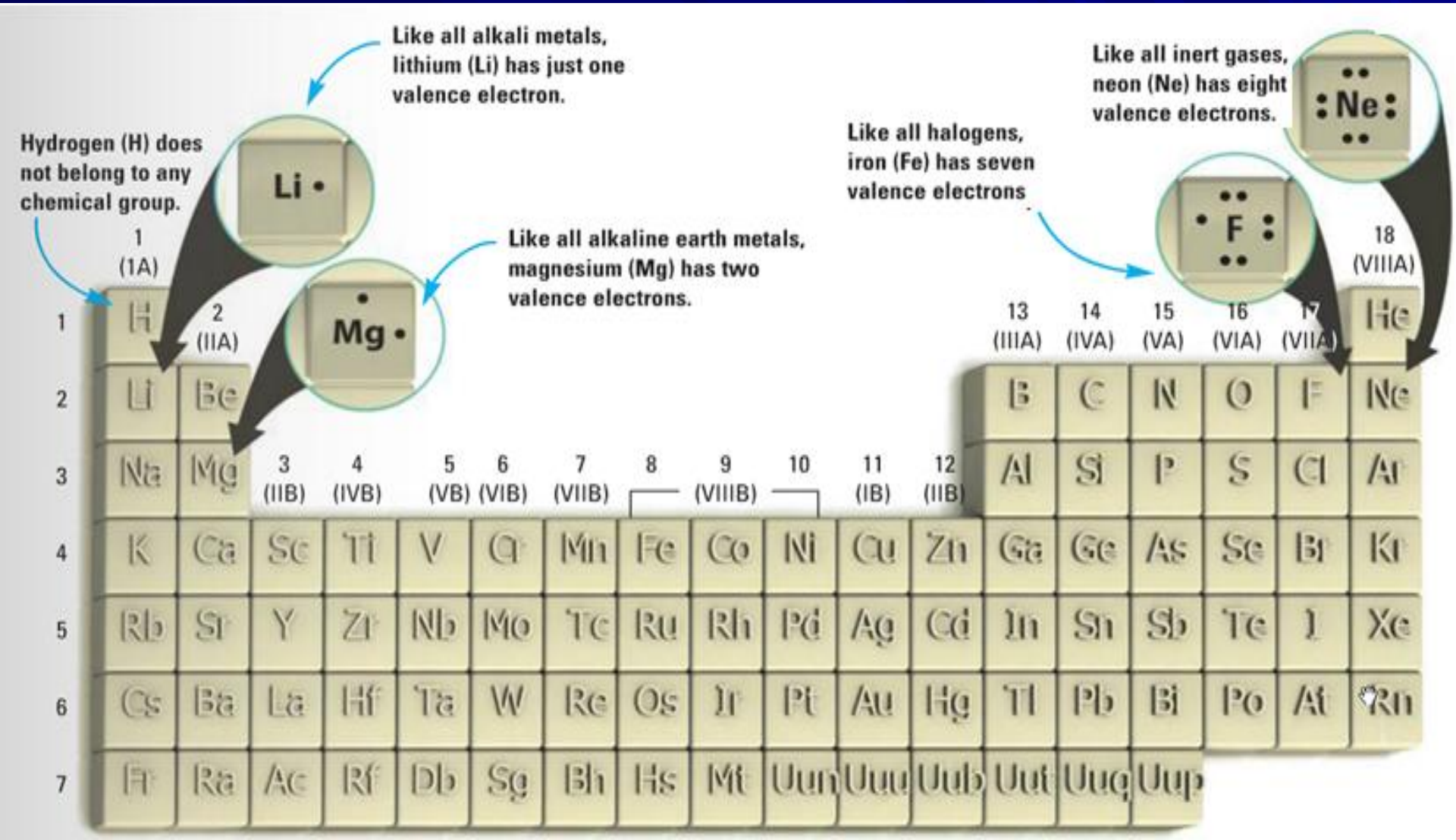


CHARACTERISTICS OF GROUPS

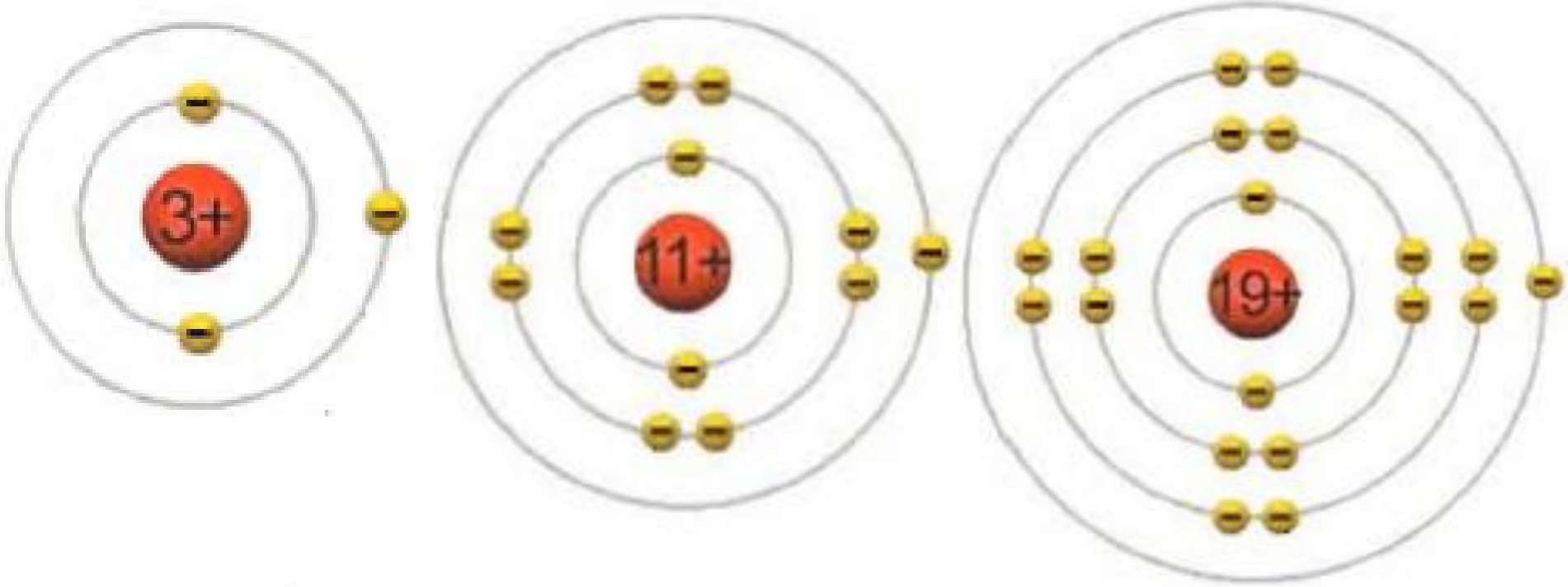
- Elements located in the same group display similar ***chemical properties***.
- To understand this similarity more clearly, consider 3 elements from the first column.



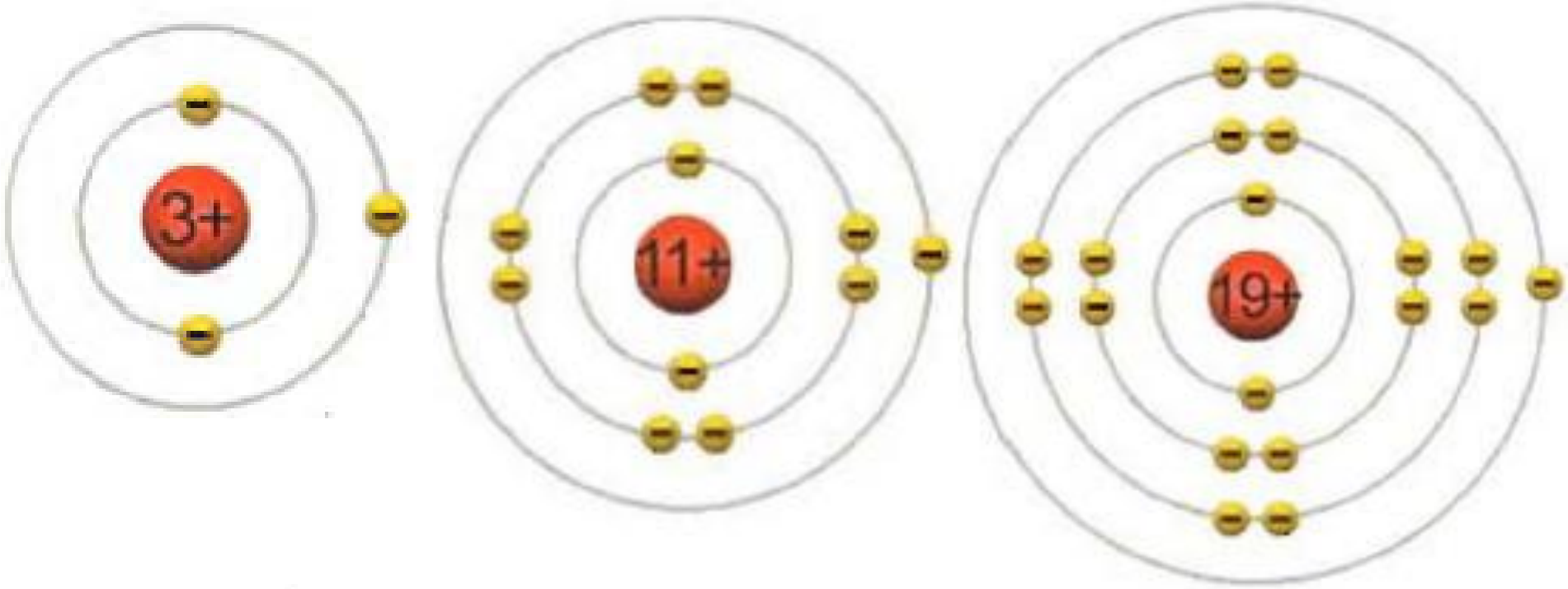
- Let us consider Lithium, Sodium and Potassium.



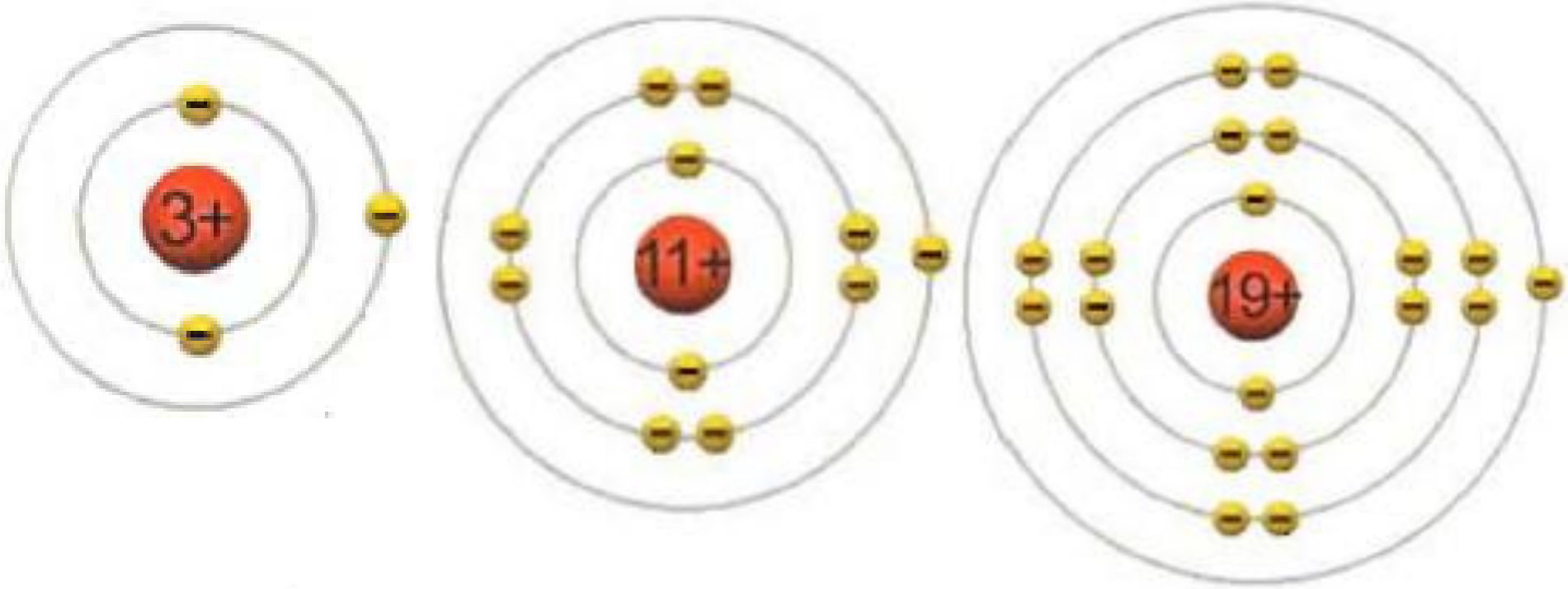
- According to the Rutherford-Bohr model of the atom, the three elements could be represented like this:



- As we can see, each of these elements has the same number of valence electrons.



Elements situated in the same group ***have the same number of valence electrons.***



Important to remember:

- The number of the ***group*** corresponds to the number of ***valence electrons*** that an atom has.

- The number of the ***period*** corresponds to the number of ***electron shells*** that an atom has.