

**Question**

While the Bohr-Rutherford model tells us a great deal about the structure of individual atoms, what is the relationship between the Bohr-Rutherford model of the atom, and the structure of the periodic table for the first twenty elements?

1st orbital or shell  
valence e<sup>-</sup> (electron)

Group 18  
↓  
18

**Instructions**

- ① Label the Group at the top of each column (1, 2, 13, 14, ... 18) and the Period along the left side of each row (1,2,3,4).
- ② Print the atomic number (Z), chemical symbol, chemical name and atomic mass (A) - rounded to the nearest whole number - for each element as shown in the example (sodium-23).
- ③ Print the number of protons (p) and neutrons (n) inside the nucleus.
- ④ Fill in the electrons from the innermost shell outward as shown in the example (sodium-23).
- ⑤ On the back of this sheet express each of the first 20 elements in standard atomic notation.

1	1 H Hydrogen 1	2	13	14	15	16	17	18 He Helium 4	
2	Li Lithium 7	Be Beryllium 9	B Boron 11	C Carbon 12	N Nitrogen 14	O Oxygen 16	F Fluorine 19	Ne Neon 20	
3 → Period 3	11 Na Sodium 23	12 Mg Magnesium 24	13-12	Al Aluminum 27	Si Silicon 28	P Phosphorus 31	S Sulfur 32	Cl Chlorine 35	Ar Argon 40
4	K Potassium 39	Ca Calcium 40	<p>* 2-8-8 rule</p> <p>* fill the first shell with 2e<sup>-</sup>, the second is filled with 8e<sup>-</sup>, and the 3rd is filled with 8e<sup>-</sup></p>						

Group (vertical set) → same number of outer shell electrons is equal for every element and group number

Period (Horizontal set) → same number of outer shells