Periodic Table

A story in itself

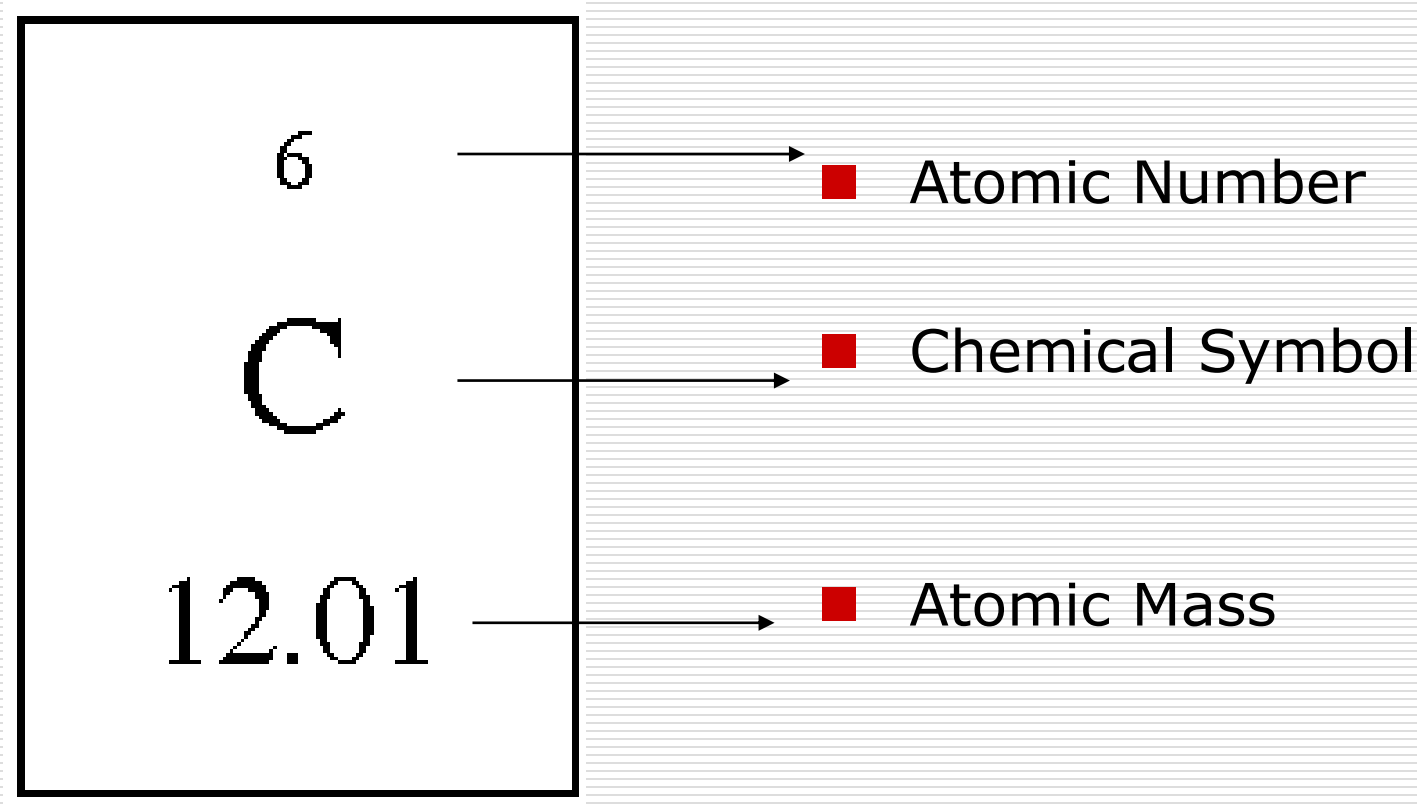
Original periodic table

TABELLE II

REIHEN	GRUPPE I. — R^2O	GRUPPE II. — RO	GRUPPE III. — R^2O^3	GRUPPE IV. RH^4 RO^2	GRUPPE V. RH^3 R^2O^5	GRUPPE VI. RH^2 RO^3	GRUPPE VII. RH R^2O^7	GRUPPE VIII. — RO^4
1	H=1							
2	Li=7	Be=9,4	B=11	C=12	N=14	O=16	F=19	
3	Na=23	Mg=24	Al=27,3	Si=28	P=31	S=32	Cl=35,5	
4	K=39	Ca=40	—=44	Ti=48	V=51	Cr=52	Mn=55	Fe=56, Co=59, Ni=59, Cu=63.
5	(Cu=63)	Zn=65	—=68	—=72	As=75	Se=78	Br=80	
6	Rb=85	Sr=87	?Yt=88	Zr=90	Nb=94	Mo=96	—=100	Ru=104, Rh=104, Pd=106, Ag=108.
7	(Ag=108)	Cd=112	In=113	Sn=118	Sb=122	Te=125	J=127	
8	Cs=133	Ba=137	?Di=138	?Ce=140	—	—	—	— — — —
9	(—)	—	—	—	—	—	—	
10	—	—	?Er=178	?La=180	Ta=182	W=184	—	Os=195, Ir=197, Pt=198, Au=199.
11	(Au=199)	Hg=200	Tl=204	Pb=207	Bi=208	—	—	
12	—	—	—	Th=231	—	U=240	—	— — — —

Figure 2.5 Dmitri Mendeleev's 1872 periodic table. The spaces marked with blank lines represent elements that Mendeleev deduced existed but were unknown at the time, so he left places for them in the table. The symbols at the top of the columns (e.g., R^2O and RH^4) are molecular formulas written in the style of the 19th century.

Periodic table- The details



The Periodic Details

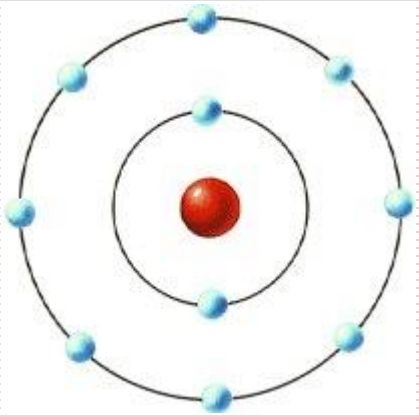
- The Atomic Number
  - Tells the position of the element on the periodic table
  - Tells you the NUMBER of PROTONS in the atom

The Periodic Details

- Atomic Mass
  - Shows the total average amount of protons and neutrons of the element
  - This number will ALWAYS have decimals
  - Atomic NUMBER does NOT

Electrons in the orbit

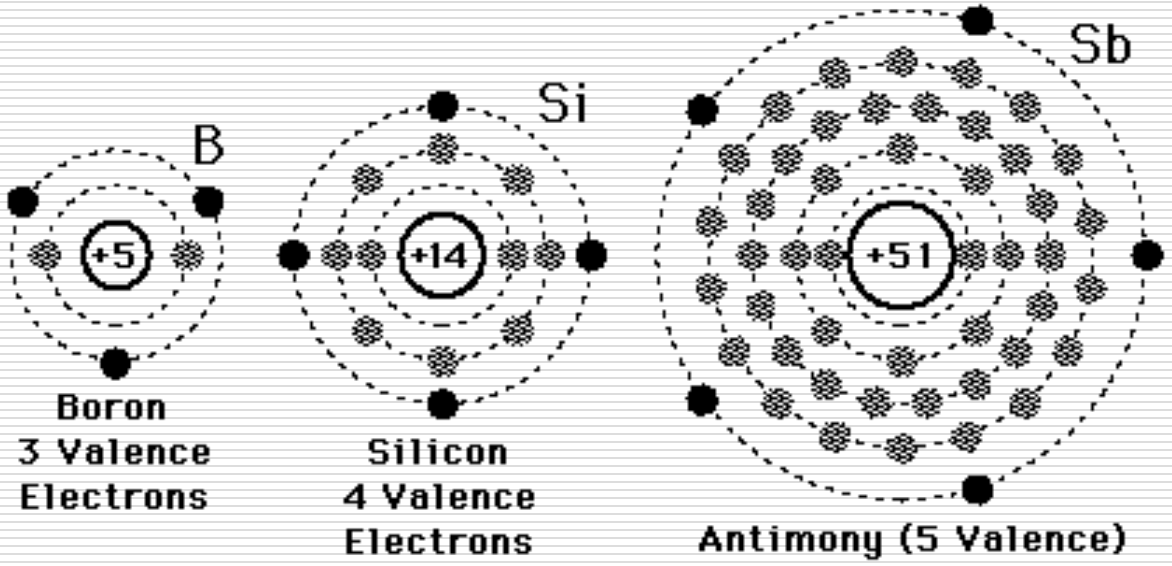
- Electrons in the Rutherford Bohr are organized into ORBITS



- Only the electrons that are in the OUTER orbit are accessible for reactions with other elements

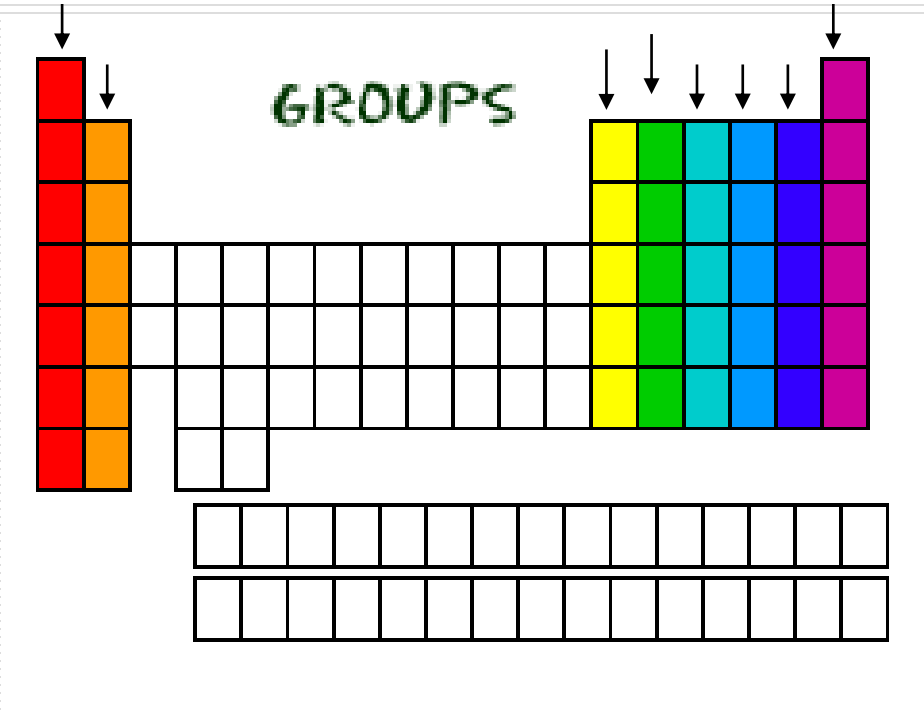
The VALENCE electron

- The electrons that are found in the outermost orbit are called VALENCE electrons



A periodic GROUP/ FAMILY

- The group corresponds to a column of the period table



A periodic GROUP

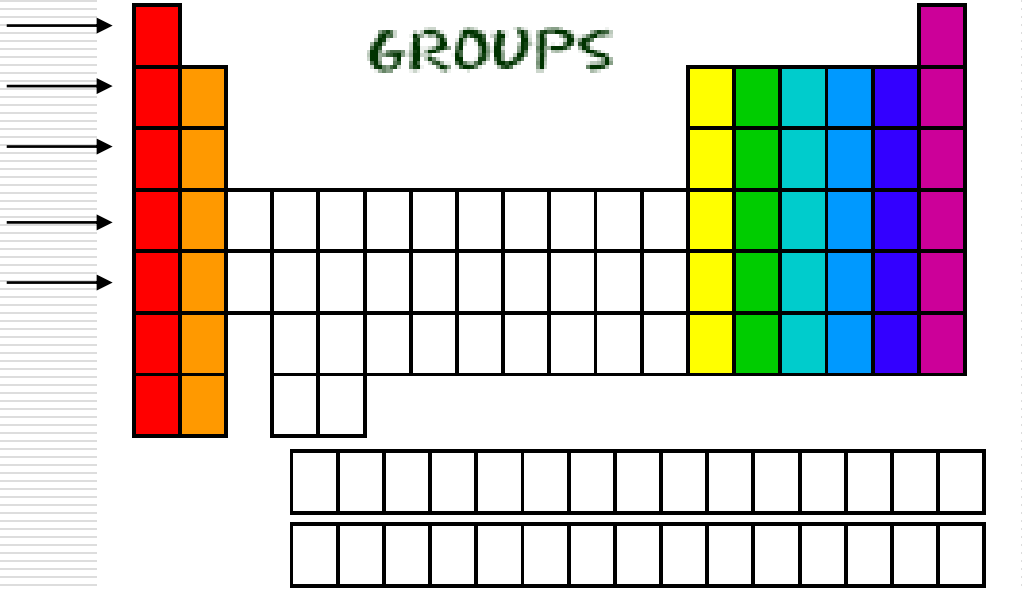
- The ROMAN numeral over the TOP of the column represents the GROUP number
- The GROUP NUMBER tells you the number of valence electrons for that atom

Examples

- Oxygen is in the column VIA. It will therefore have 6 valence electrons
- Chlorine is in the column VIIA. It will therefore have 7 valence electrons
- Lithium is in coumn IA. It will therefore have 1 valence electron

What about the rows of the periodic table?

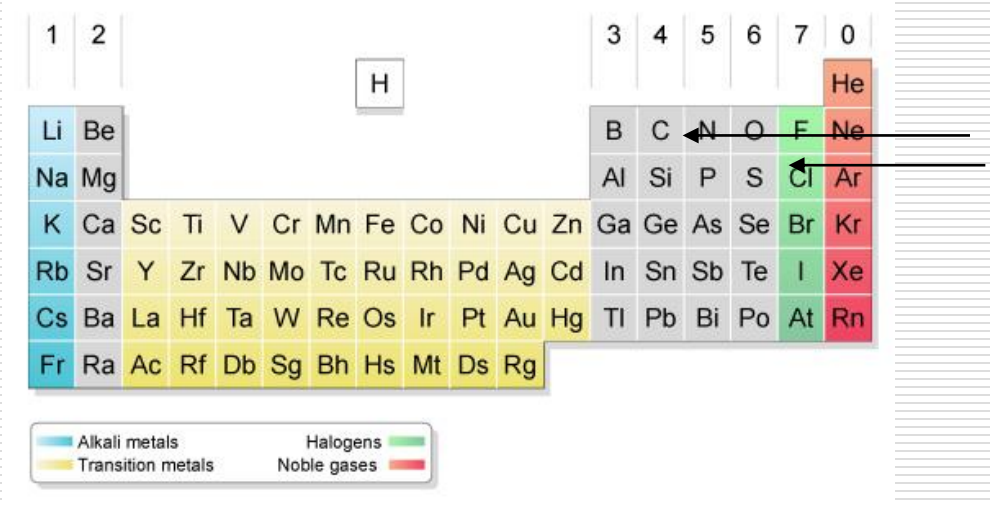
ROWS



Rows are important too!

- Rows determine the number of electron shells that an atom contains
- The lower they are on the periodic table, the more shells they have

Examples



- Carbon will have 2 shells since it is in the second row
- Sulfur will have 3 shells since it is in the third row

Each orbit is like upgrading your household, from apartment to house

- Each orbit can fit only a certain number of electrons
- 1st orbit: 2 electron
- 2nd orbit: 8 electrons
- 3rd orbit:8 electrons