

# The Organization of the Periodic Table

## I. Overall Organization

### A. Period: Horizontal Row

- i. Elements in the same period (row) have the same number of orbitals. ("orbits" around the nucleus)

### B. Group: Vertical Column

- i. Elements in the same group have similar behaviors because they have the same number of valence electrons.

## II. Group Names

### A. Group 1: Alkali Metals

### B. Group 2: Alkaline earth metals

### C. Group 3-12: Transition metals

### D. Group 13: The Boron Family

### E. Group 14: The Carbon Family

### F. Group 15: The Nitrogen Family

### G. Group 16: The Oxygen Family

### H. Group 17: The Halogens

### I. Group 18: The Noble Gases

1											18							
1 <b>H</b> 1.008	2											13	14	15	16	17	2 <b>He</b> 4.0026	
3 <b>Li</b> 6.94	4 <b>Be</b> 9.0122												5 <b>B</b> 10.81	6 <b>C</b> 12.011	7 <b>N</b> 14.007	8 <b>O</b> 15.999	9 <b>F</b> 18.998	10 <b>Ne</b> 20.180
11 <b>Na</b> 22.990	12 <b>Mg</b> 24.305	3	4	5	6	7	8	9	10	11	12	13 <b>Al</b> 26.982	14 <b>Si</b> 28.085	15 <b>P</b> 30.974	16 <b>S</b> 32.06	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.948	
19 <b>K</b> 39.098	20 <b>Ca</b> 40.078	21 <b>Sc</b> 44.956	22 <b>Ti</b> 47.867	23 <b>V</b> 50.942	24 <b>Cr</b> 51.996	25 <b>Mn</b> 54.938	26 <b>Fe</b> 55.845	27 <b>Co</b> 58.933	28 <b>Ni</b> 58.693	29 <b>Cu</b> 63.546	30 <b>Zn</b> 65.38	31 <b>Ga</b> 69.723	32 <b>Ge</b> 72.63	33 <b>As</b> 74.922	34 <b>Se</b> 78.96	35 <b>Br</b> 79.904	36 <b>Kr</b> 83.798	
37 <b>Rb</b> 85.468	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.906	40 <b>Zr</b> 91.224	41 <b>Nb</b> 92.906	42 <b>Mo</b> 95.96	43 <b>Tc</b> (98)	44 <b>Ru</b> 101.07	45 <b>Rh</b> 102.91	46 <b>Pd</b> 106.42	47 <b>Ag</b> 107.87	48 <b>Cd</b> 112.41	49 <b>In</b> 114.82	50 <b>Sn</b> 118.71	51 <b>Sb</b> 121.76	52 <b>Te</b> 127.60	53 <b>I</b> 126.90	54 <b>Xe</b> 131.29	
55 <b>Cs</b> 132.91	56 <b>Ba</b> 137.33	57-71 *	72 <b>Hf</b> 178.49	73 <b>Ta</b> 180.95	74 <b>W</b> 183.84	75 <b>Re</b> 186.21	76 <b>Os</b> 190.23	77 <b>Ir</b> 192.22	78 <b>Pt</b> 195.08	79 <b>Au</b> 196.97	80 <b>Hg</b> 200.59	81 <b>Tl</b> 204.38	82 <b>Pb</b> 207.2	83 <b>Bi</b> 208.98	84 <b>Po</b> (209)	85 <b>At</b> (210)	86 <b>Rn</b> (222)	
87 <b>Fr</b> (223)	88 <b>Ra</b> (226)	89-103 #	104 <b>Rf</b> (265)	105 <b>Db</b> (268)	106 <b>Sg</b> (271)	107 <b>Eh</b> (270)	108 <b>Hs</b> (277)	109 <b>Mt</b> (276)	110 <b>Ds</b> (281)	111 <b>Rg</b> (280)	112 <b>Cn</b> (285)	113 <b>Uut</b> (284)	114 <b>Uuq</b> (289)	115 <b>Uup</b> (288)	116 <b>Uuh</b> (293)	117 <b>Uus</b> (294)	118 <b>Uuo</b> (294)	

\* Lanthanide series

57 <b>La</b> 138.91	58 <b>Ce</b> 140.12	59 <b>Pr</b> 140.91	60 <b>Nd</b> 144.24	61 <b>Pm</b> (145)	62 <b>Sm</b> 150.36	63 <b>Eu</b> 151.96	64 <b>Gd</b> 157.25	65 <b>Tb</b> 158.93	66 <b>Dy</b> 162.50	67 <b>Ho</b> 164.93	68 <b>Er</b> 167.26	69 <b>Tm</b> 168.93	70 <b>Yb</b> 173.05	71 <b>Lu</b> 174.97
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# Actinide series

89 <b>Ac</b> (227)	90 <b>Th</b> 232.04	91 <b>Pa</b> 231.04	92 <b>U</b> 238.03	93 <b>Np</b> (237)	94 <b>Pu</b> (244)	95 <b>Am</b> (243)	96 <b>Cm</b> (247)	97 <b>Bk</b> (247)	98 <b>Cf</b> (251)	99 <b>Es</b> (252)	100 <b>Fm</b> (257)	101 <b>Md</b> (258)	102 <b>No</b> (259)	103 <b>Lr</b> (262)
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## Alkali Metals

- Group 1
- lose 1 electron
- Most reactive of all the metals
- Are never found alone in nature
- shiny
- soft, can be cut with a butter knife

## Alkaline-Earth Metals

- Group 2
- lose 2 electrons
- 2nd Most reactive of all the metals
- hard
- grey-white
- good conductor of electricity

## Transition Metals

- Groups 3-12
- all count as one group
- hard and shiny
- less reactive
- good conductors of electricity

## Boron Family

- Group 13
- made of metals and metalloids
- lose 3 electrons
- metals-soft
- boron-grey powder
- metals-good conductors of electricity

*if metal*

## Carbon Family

- Group 14
- made of metals, metalloids and non-metals
- 4 valance electrons
- not very reactive

## Nitrogen Family

- Group 15
- made of metals and metalloids
- 5 valance electrons
- fairly reactive as a group

## Oxygen Family

- Group 16
- made of non-metals and metalloids
- 6 valance electrons

## Halogens

- Group 17
- made of metalloids and non-metals
- 7 valance electrons
- Very Reactive

## Noble Gases

- Group 18
- all non-metals
- 8 valance electrons
- extremely non- reactive

## Lanthanides

- Top row of the bottom removed section
- metals
- soft
- malleable
- shiny
- high conductivity

## Actinides

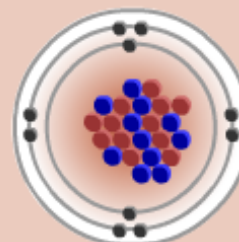
- below lanthanides
- 3 occur naturally on earth
- everything heavier than uranium is artificially created in labs
- most only last for a fraction of a second

The Periodic Table represents elements in such a way as to highlight their similarities and differences.

23  
**Na**  
11

## SODIUM

Element symbol: Na      Protons: 11 ●  
 Mass number: 23      Neutrons: 12 ●  
 Atomic number: 11      Electrons: 11 ●  
 Atomic Mass: 22.98977  
**Metal**  
**Group I - Alkali metals**  
**Electronic structure: 2.8.1**



	I	II	Transition metals										III	IV	V	VI	VII	VIII
Period 1																		He
Period 2	Li	Be										B	C	N	O	F		Ne
Period 3	Na	Mg										Al	Si	P	S	Cl		Ar
Period 4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Period 5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Period 6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Period 7	Fr	Ra	Ac															
				Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	
				Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	

Metals

Non-metals

Sodium

Instructions

Find the Elements

Unlock the Code