Periodic Table of elements

With orbitals and ground state configurations

Quantum rule: l ≤ n-1

Notation	=	s	p	d	f
l	=	0	1	2	3
2(2l+1)	=	2	6	10	14
$\sum_{\text{same n}}$	=	2	8	18	32
$\sum$	=	2	10	28	60

Alkaline metals
Alkaline earth metals
Transition metals
Metals
Semimetals
Noble gazes
Halogens
Chalcogens
Lanthanides
Actinides

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Mean Atomic Mass
Symbol
Z
Name

O	IA	IIA	IIIA	IVA	VA	VIA	VIIA	O
1	1	2	13	14	15	16	17	18
1	1,00784 H 1 Hydrogen							4,00250 He 2 Helium
2	6,941 Li 3 Lithium	9,0122 Be 4 Berylium	10,811 B 5 Boron	12,011 C 6 Carbon	14,007 N 7 Nitrogen	15,999 O 8 Oxygen	18,998 F 9 Fluorine	20,180 Ne 10 Neon
3	22,989 Na 11 Sodium	24,305 Mg 12 Magnesium	26,982 Al 13 Aluminium	28,086 Si 14 Silicon	30,974 P 15 Phosphorus	32,095 S 16 Sulphur	35,453 Cl 17 Chlorine	39,948 Ar 18 Argon
4	39,098 K 19 Potassium	40,078 Ca 20 Calcium	69,723 Ga 31 Galliium	72,64 Ge 32 Germanium	74,922 As 33 Arsenic	78,96 Se 34 Selenium	79,904 Br 35 Bromine	83,80 Kr 36 Krypton
5	85,468 Rb 37 Rubium	87,62 Sr 38 Strontium	114,82 In 49 Indium	118,71 Sn 50 Tin	121,76 Sb 51 Antimony	127,60 Te 52 Tellurium	126,90 I 53 Iodine	131,29 Xe 54 Xenon
6	132,905 Cs 555 Caesium	137,33 Ba 56 Barium	204,383 Tl 81 Thallium	207,2 Pb 82 Lead	208,980 Bi 83 Bismuth	(209) Po 84 Poloniun	(210) At 85 Astanine	(222) Rn 86 Radon
7	(223) Fr 87 Francium	(226) Ra 88 Radium	Uut 113 Ununtriium	Fl 114 Flerovium	Uup 115 Ununpentium	Uuh 116 Ununtriium	117	Lv 118 Livermoriium

IIIB	IVB	VB	VIB	VIIB	VIIIB			IB	IIB
3	4	5	6	7	8	9	10	11	12
44,956 Sc 38 Scandium	47,867 Ti 22 Titanium	50,942 V 23 Vanadium	51,996 (Ar)3d⁵4s¹ Cr 24 Chromium	54,938 Mn 25 Manganese	55,845 Fe 26 Iron	58,933 Co 27 Cobalt	58,693 Ni 28 Nickel	63,546 Cu 29 Copper	65,39 Zn 30 Zinc
88,906 Y 39 Yttrium	91,224 Zr 40 Zirconium	92,906 (Kr)4d⁴5s¹ Nb 41 Niobium	95,94 (Kr)4d⁵5s¹ Mo 42 Molybdenium	(98) Tc 43 Technecium	101,07 (Kr)4d⁷5s¹ Ru 44 Ruthenium	102,91 (Kr)4d⁸5s¹ Rh 45 Rhodium	106,42 (Kr)4d¹⁰ Pd 46 Palladium	107,868 Ag 47 Silver	112,41 Cd 48 Cadmium
174,967 Lu 71 Lutetium	178,49 Hf 72 Hafnium	180,95 Ta 73 Tantalum	183,84 W 74 Tungsten	186,21 Re 75 Rhenium	190,23 Os 76 Osmium	192,22 Ir 77 Iridium	195,08 (Yb)5d⁶6s¹ Pt 78 Platinium	196,97 Au 79 Gold	200,59 Hg 80 Mercury
(262) Lr 103 Lawrencium	(262) Rf 104 Rutherfordium	(262-268) Db 105 Dubnium	(266) Sg 106 Seaborgium	(264) Bh 107 Bohrium	(277) Hs 108 Hassium	(268-276) Mt 109 Meitnerium	(281) Ds 110 Darmstadtium	(272-280) Rg 111 Roentgenium	(285) Cn 112 Copernicium

La → Yb (57 → 70)

Ac → No (89 → 102)

period

n

s		p					d										f
1	2	1	2	3	4	5	6	1	2	3	4	5	6	7	8	10	s¹	10	

Lanthanides:

138,905 (Ba)5d¹ La 57 Lanthanum	140,12 (Ba)4f¹5d¹ Ce 58 Cerium	140,908 Pr 59 Praseodymium	144,24 Nd 60 Neodymium	(145) Pm 61 Promethium	150,35 Sm 62 Samarium	151,96 Eu 63 Europium	157,25 (Ba)4f⁷5d¹ Gd 64 Gadolinium	158,925 Tb 65 Terbium	162,50 Dy 66 Dysprosium	164,934 Ho 67 Holmium	167,26 Er 68 Erbium	168,934 Tm 69 Thulium	173,04 Yb 70 Ytterbium

Actinides:

(227) (Ra)6d¹ Ac 89 Actinium	232,038 (Ra)6d² Th 90 Thorium	231,036 (Ra)5f²6d¹ Pa 91 Protactinium	238,029 (Ra)5f³6d¹ U 92 Uranium	237,048 (Ra)5f⁴6d¹ Np 93 Neptunium	(244) Pu 94 Plutonium	(243) Am 95 Americium	(247) (Ra)5f⁷6d¹ Cm 96 Curium	(247) Bk 97 Berkelium	(251) Cf 98 Californium	(254) Es 99 Einsteinium	(257) Fm 100 Fermium	(258) Md 101 Mendelevium	(252-254) No 102 Nobelium